

# STRATEGIC ASSET MANAGEMENT PLAN

As part of BPA's fish and wildlife mitigation obligations, the Environment, Fish & Wildlife (EF&W) organization provides funding for the development of fish hatcheries. This SAMP describes EF&W's activities and considerations in assuring the ongoing management of hatcheries in which BPA has an interest.

*For EF&W  
Hatcheries*

## Table of Contents

1.0	EXECUTIVE SUMMARY.....	4
2.0	ACKNOWLEDGEMENTS.....	5
2.1	Senior ownership.....	5
2.2	Strategy Development Approach .....	5
2.2.1	Key Contributors.....	5
2.2.2	Key Activities.....	5
3.0	STRATEGIC BUSINESS CONTEXT.....	6
3.1	Alignment with Agency Strategic Plan (SAMP).....	6
3.2	Scope .....	6
3.3	Asset Description and Delivered Services.....	6
3.4	Demand Forecast for Services .....	7
3.5	Strategy Duration .....	8
4.0	STAKEHOLDERS.....	8
4.1	Asset Owners and Operators.....	8
4.2	Stakeholders and Expectations.....	8
5.0	EXTERNAL AND INTERNAL INFLUENCES .....	9
5.1	SWOT Analysis .....	11
6.0	ASSET MANAGEMENT CAPABILITIES AND SYSTEM .....	11
6.1	Current Maturity Level .....	11
6.2	Long Term Objectives .....	15
6.3	Current Strategies and Initiatives .....	15
7.0	ASSET CRITICALITY .....	17
7.1	Criteria .....	17
7.2	Usage of Criticality Model .....	17
8.0	CURRENT STATE.....	18
8.1	Historical Costs .....	18
8.2	Asset Condition and Trends.....	20
8.3	Asset Performance .....	21
8.4	Performance and Practices Benchmarking.....	21
9.0	RISK ASSESSMENT.....	22
10.0	STRATEGY AND FUTURE STATE.....	26

10.1	Future State Asset Performance.....	26
10.2	Asset Conditions and Trends .....	26
10.2.1	Sustainment Strategy .....	26
10.2.2	Growth (Expand) Strategy .....	26
10.2.3	Strategy for Managing Technological Change and Resiliency .....	26
10.3	Planned Future Investments/Spend Levels .....	27
10.4	Implementation Risks .....	30
10.5	Asset Condition and Trends.....	30
10.6	Performance and Risk Impact.....	30
11.0	ADDRESSING BARRIERS TO ACHIEVING OPTIMAL PERFORMANCE.....	31
12.0	DEFINITIONS .....	32

## 1.0 EXECUTIVE SUMMARY

BPA manages the largest fish and wildlife protection program in the nation. In fact, fish and wildlife mitigation and environmental compliance are essential parts of our business and reflect the agency's core values of trustworthy stewardship and operational excellence. BPA's hatchery program is an important part of this effort.

The purpose of this Strategic Asset Management Plan is to define the actions, roles, and responsibilities for the long-term construction, operation, and maintenance of fish hatcheries funded through BPA's Fish and Wildlife program. It was also developed in alignment with the following objectives from the agency's strategic plan: objective 1a, to improve cost management discipline, objective 2a, to administer an industry-leading asset management program, and objective 3c, to prioritize fish and wildlife investments based on biological effectiveness and mitigation for FCRPS impacts; and manage fish and wildlife program costs at or below inflation, inclusive of new obligations and commitments.

Fish and Wildlife staff have worked with the Council to develop a hatchery strategy that aims to fund hatchery projects based on their ability to meet the following objectives:

1. Ensure mitigation for loss of harvest associated with the FCRPS dams does not impede recovery of listed species
2. Preserve and rebuild genetic resources to reduce short-term extinction risk and promote recovery of ESA listed species
3. Support Tribal and State Accord commitments

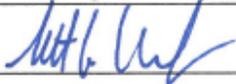
The Hatchery Program plans to utilize project implementation support to inform and educate its strategy through lessons learned, information sharing, and best practices to achieve improved management of its assets and long term sustainability. Annual operations and maintenance funding will be used to ensure assets are operating efficiently. Non-recurring maintenance is being addressed by the hatchery conditions assessments. Unforeseen and emergency maintenance and repair needs are addressed through the BPA and NPCC budget oversight group (BOG) process. Fish and Wildlife will provide the appropriate level of funding to meet mitigation objectives including contribution to tribal treaty and non-treaty fisheries, mitigation for lost habitat and reduced population sizes, and to assist in the conservation of endangered and threatened salmon and steelhead populations.

BPA manages the largest fish and wildlife protection program in the nation. In fact, fish and wildlife mitigation and environmental compliance are essential parts of our business and reflect the agency's core values of trustworthy stewardship and operational excellence. BPA's hatchery program is an important part of this effort.

## 2.0 ACKNOWLEDGEMENTS

### 2.1 Senior ownership

The responsibility for operational ownership, coordination, and updating of this strategy is assigned by the Fish and Wildlife (EW) Executive Manager.

Crystal Ball, Executive Manager, Fish and Wildlife		Date: 3/5/20
Dorie Welch, Deputy Vice President, Environment, Fish and Wildlife		Date: 3/5/2020
Scott Armentrout, Vice President, Environment, Fish and Wildlife		Date: 3/10/2020

### 2.2 Strategy Development Approach

#### 2.2.1 Key Contributors

EF&W’s asset management team facilitated the development of this plan, with primary input from policy and implementation staff (who also function as subject matter experts), and with support from Business Operations (EWB).

BPA intends this plan to be complementary to, and compliant with the purposes, mandates, and directives found in the 1980 Northwest Power Act, applicable biological opinions, and various judicial rulings.

Per the terms of the Northwest Power Act, the Northwest Power and Conservation Council’s current Columbia River Basin Fish and Wildlife Program provides ongoing and comprehensive guidance for regional fish and wildlife mitigation objective and initiatives, and significantly influences BPA’s strategy.

#### 2.2.2 Key Activities

- Document the Hatchery program and processes for asset management
- Develop SAMP goals and objectives in alignment with the Agency’s Strategic Plan
- Evaluate risks to Hatchery program with program SMEs
- Identify capital and expense budget forecasts based on expected key projects in future fiscal years
- Perform final EW management review and signoff

### 3.0 STRATEGIC BUSINESS CONTEXT

#### 3.1 Alignment with Agency Strategic Plan (SAMP)

The Fish and Wildlife program, including this hatchery strategic asset management plan, aligns with BPA’s strategic objective 1a, to improve cost management discipline, and objective 2a, to administer an industry-leading asset management program. It also meets objective 3c, to prioritize fish and wildlife investments based on biological effectiveness and mitigation for FCRPS impacts; and manage fish and wildlife program costs at or below inflation, inclusive of new obligations and commitments.

#### 3.2 Scope

Hatcheries and their associated facilities (e.g. weirs, traps, acclimation facilities, etc.) that are funded by BPA’s Fish & Wildlife Direct Program including the design, construction, operation, and maintenance are covered under the scope of this plan. This funding helps satisfy BPA’s legal obligations under the Northwest Power Act, Endangered Species Act, and other laws to protect, mitigate, and enhance fish and wildlife affected by the construction and operation of the federal dams. BPA has direct funding agreements with the Army Corps of Engineers (COE), Bureau of Reclamation (BOR), and U.S. Fish and Wildlife Service (USFWS)/Lower Snake River Compensation Plan (LSRCP) that fund other regional hatcheries. However, due to the shared responsibility between the agencies, these hatcheries are out of scope of this strategy.

#### 3.3 Asset Description and Delivered Services

Hatcheries, which meet certain criteria to satisfy BPA’s fish and wildlife mitigation obligations, may be funded (partially or wholly) for construction, operation, and maintenance with BPA funds. BPA may also commit to providing funds to operate and maintain the hatchery for a specified timeframe. These hatcheries when installed and maintained by operating agencies preserve and rebuild fish stocks throughout the Columbia River Basin. The Asset inventory does not include direct funded agreements (e.g. LSRCP, BOR, Corps), or facilities proposed under our direct program.

*Table 3.3-1, Assets*

BPA Fish and Wildlife Program Direct Funded Hatcheries		
Hatchery Facility	Operator	Focal Species
Nez Perce Tribal Hatchery	Nez Perce Tribe	Snake River Spring/Summer Chinook (not listed); Snake River Fall Chinook (Threatened)
Colville Hatchery	Colville Tribe	Triploid Rainbow Trout
Parkdale Hatchery	Warm Springs Tribe	LCR Spring Chinook (Threatened); LCR Steelhead (Threatened)
Kootenai Tribal Hatchery	Kootenai Tribe	White Sturgeon (Endangered)
Twin Rivers Hatchery	Kootenai Tribe	White Sturgeon (Endangered); Burbot

Umatilla Hatchery	ODFW	MCR Spring Chinook; Snake River Fall Chinook; MCR Steelhead (Threatened)
Sekokini Springs Hatchery	MT Dept. FW & Parks	Westslope Cutthroat
Sherman Creek Hatchery	WDFW	Triploid Rainbow Trout
Spokane Tribal Hatchery	Spokane Tribe	Triploid Rainbow Trout; Triploid Kokanee Salmon
Kalispel Tribal Hatchery	Kalispel Tribe	Triploid Rainbow Trout
Cle Elum Hatchery	Yakama Tribe	MCR Spring Chinook
Chief Joseph Hatchery	Colville Tribe	UCR Spring Chinook (Endangered); UCR Summer/Fall Chinook; Spring Chinook experimental population
Springfield Hatchery	IDFG	Snake River Sockeye Salmon
Eagle Fish Hatchery	IDFG	Snake River Sockeye Salmon
Manchester Research Station Seawater Rearing Facility	NOAA	Snake River Sockeye Salmon
Burley Creek Hatchery	NOAA	Snake River Sockeye Salmon
Prosser Hatchery	Yakama Tribe	UCR Summer/Fall Chinook; Coho (unspecified population); MCR Steelhead (Threatened) - Steelhead Kelt Reconditioning; Pacific Lamprey (experimental production phase)
Marion Drain Hatchery	Yakama Tribe	UCR Summer/Fall chinook

### 3.4 Demand Forecast for Services

BPA funds artificial production at basin hatcheries. The hatcheries preserve and rebuild genetic resources to reduce short-term extinction risk and promote recovery of ESA listed species through safety-net and conservation programs. The Hatchery program also supports tribal and state accord commitments which include the conservation of non-listed species such as coho, lamprey, sturgeon, and resident fish. Hatcheries continue to play a mitigation role in the overall Fish and Wildlife program at BPA. NOAA will be issuing a new Biological Opinion this year (2020) that will outline BPA’s commitments to mitigation in the region. This document will shape the demand and strategy of the Hatchery program. The next version of the SAMP will reflect any necessary changes to the plan based on the 2020 BiOp.

### 3.5 Strategy Duration

The duration of this strategy is 10 years except as it may be impacted by future legislation, judicial decisions, or initiatives of the Northwest Power and Conservation Council. The strategy will be reviewed annually and published every 2 years unless there is a significant change in strategy at the annual review. New hatcheries will be added to the scope of the SAMP as they become operational.

## 4.0 STAKEHOLDERS

### 4.1 Asset Owners and Operators

BPA does not own or operate these assets, but rather they are owned by various operators. BPA coordinates and contracts with tribes, states, and other regional organizations, both public and private, to fund the construction, operation, and maintenance of hatchery projects throughout the Columbia River Basin. Once construction is complete, the sponsor assumes ownership of the facility to operate and maintain the hatchery and its associated sites.

### 4.2 Stakeholders and Expectations

*Table 4.2-1, Stakeholders*

Stakeholders	Expectations	Current Data Sources	Measures
Sponsors (Tribes, States, other federal agencies)	Collaboration	BPA Tribal Affairs Organization Project Manager Contracting Officer’s Representative (COR)	Annual Reports
	Project/Contract Management	Pisces Work Elements Project Documents	Milestones Status Reports
	Funding	Pisces Asset Suite Contracts Module Line Item Budgets SOY Process	Invoices Due Diligence
	Communications	Project Manager COR	Pisces WE Milestones WE Reports Project Manager
	Compliance Monitoring	On-site Visits	Periodic Reporting Annual Report
Northwest Power and Conservation Council	Collaboration	Council Meetings and Agendas Sub-Committees BPA Staff	F&W Program Reports Council Reports and Categorical Reviews of F&W Program Sub-committee Participation Analyses and Recommendations
	Program Implementation	Council Meetings, Agendas, and Reports BPA F&W Reports	Periodic Reports Program Metrics
	Funding	Pisces, Council Financial Statements	Annual Financial Reports BPA Financial Reports (4h10c)
Regulators	Safety	Industry Regulations and Standards	Incident Report Statistics and Non-compliances
Staff	Safety	Public Safety Management System	Non-conformance Records
Public	Safety	Public Safety Management System	Non-conformance Records

## 5.0 EXTERNAL AND INTERNAL INFLUENCES

*Table 5.0-1, External and Internal Influences*

External Influences	Affects and Actions
Federal laws/regulations specific to BPA	<p>The 1937 Bonneville Project Act and other specific laws, executive orders, and Federal energy regulations (FERC) directly govern BPA’s actions and obligations. The 1980 Northwest Power Act specifies the strategic role of the Northwest Power and Conservation Council and the obligation of BPA to fund fish and wildlife mitigation programs.</p> <p>Long-term program strategies, funding levels, project planning and analyses are all subject to periodic evaluation and adjustment as an inherent aspect of the relationship between BPA and the Council. While the relationship is defined by statute, a key aspect of funding levels and project emphasis is the determination of a broad consensus by the stakeholders; that consensus view is facilitated by ongoing engagement between BPA and the Council.</p>
Federal environmental laws	<p>The effects of general environmental laws (e.g., Endangered Species Act, Clean Water Act, NEPA, etc.) are to place specific requirements on BPA’s actions, accountability, and procedural compliance.</p> <p>Actions by BPA are primarily focused on ongoing implementation of applicable environmental laws, executive orders, and departmental directives. The EC (Environmental Planning and Analysis) organization will continue to provide regulatory expertise and site analysis for the hatchery process.</p>
Climate change	<p>Effects are uncertain, particularly at specific localities; in general, however, it is anticipated that environmental changes will result in changes to existing habitats and will stress the ability of fish and wildlife to adapt. Effects may also include increased costs associated with hatchery design, equipment, and infrastructure to mitigate impacts of climate change e.g. additional chillers, fish health.</p> <p>Actions to address the impacts of climate change may include changes to the strategic plan for constructing hatcheries throughout the region; or redirection of hatchery development to support newly threatened species, etc. Such actions might be considered, as necessary, in attempting to maintain the mitigation value of the hatchery program.</p>
Construction and project delivery costs	<p>As land and construction costs continue to increase throughout the region, this may limit BPA’s ability to fund newly proposed hatchery projects. Identifying cost efficiencies and savings will become more critical to ensure BPA can continue to fund the construction and O&amp;M of new and existing hatcheries.</p>
Operations and maintenance costs	<p>It is critical that annual operation and maintenance budgets for hatchery projects continue to receive an appropriate level of funding to ensure that important maintenance activities are completed on schedule to reduce the likelihood of emergency maintenance needs in the future.</p> <p>Scheduled preventative maintenance programs for hatcheries reduce unexpected operating and maintenance costs and provide greater reliability of hatchery assets and predictability of program costs. Fish and Wildlife will continue to work with the Council and sponsors to strategize and plan for future O&amp;M funding needs. As proposed facilities become operational, O&amp;M costs will increase.</p>

Internal Influences	Affects and Actions
Finance, budget and cost management	<p>Finance takes the lead role in defining the budget development cycle, budgeting rules, and financial policy. Finance also leads agency efforts to control costs and build budget forecasts.</p> <p>Fish and Wildlife (EWB) compile hatchery budgets in coordination with the Finance budget cycle. Cost management initiatives are increasing the need for F&amp;W to provide comprehensive forecasts of hatchery spending.</p>
FTE resource availability and skills	<p>Workforce staffing shortages, FTE hiring constraints, long lead-times, and increasing retirement rates all negatively impact the ability to implement the program and provide proper oversight. Fish and Wildlife will continue to prioritize critical activities, defer lower priorities, look for process efficiencies, and employ IT tools where available and appropriate.</p>
Support resources and skills	<p>Execution of the hatchery program is dependent on skills and resources from supporting organizations, such as Engineering Tech Services, Realty, Legal, Environmental Compliance, etc. Efficient access to those resources depends on clear procedures and handoffs, regular communication, and tracking capabilities. F&amp;W will continue to employ standardized processes, documentation, regular team meetings, and automation tools as appropriate.</p>

## 5.1 SWOT Analysis

Table 5.1-1: SWOT

Favorable	Unfavorable
<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• The program maintains solid, collaborative relationships with sponsors</li> <li>• Asset condition assessment performed by outside engineering firm resulted in an inventory of assets in need of maintenance or replacement</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of centralized database of hatchery assets</li> <li>• Inability to directly develop or manage asset maintenance programs</li> <li>• Infrequent coordination between Council and BPA on strategic asset management plans</li> <li>• BPA is the funding entity and lacks ownership and maintenance responsibility over physical asset</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Room to improve planning of O&amp;M funding</li> <li>• Chance to provide input on preventative maintenance standards or programs for assets to gain more</li> <li>• Improved coordination with the Council, sponsors, and stakeholders in developing an asset management strategy for hatcheries</li> </ul>	<ul style="list-style-type: none"> <li>• External influences e.g. climate change, political decisions, regulatory oversight</li> <li>• Aging infrastructure of facilities</li> <li>• Litigation</li> </ul>

## 6.0 ASSET MANAGEMENT CAPABILITIES AND SYSTEM

Using the IAM maturity model, Fish and Wildlife staff evaluated the maturity of the Hatchery Asset Management program in six different categories. While sponsors share involvement in the asset management of hatcheries, this maturity survey was completed from a BPA perspective. The following section identifies strengths and weaknesses of the program to achieve these objectives.

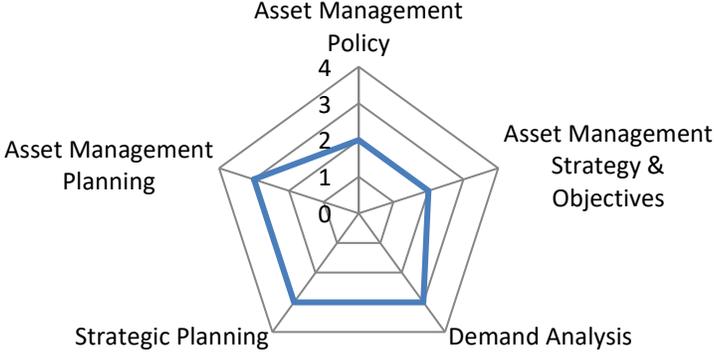
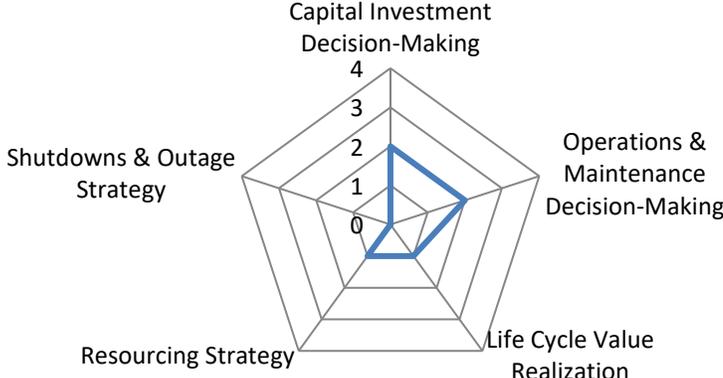
### 6.1 Current Maturity Level

Based on the results of the maturity model and the associated survey, the current maturity level of the Hatchery Asset Management program is immature, but developing. While there are weaknesses in the areas of decision making and life cycle delivery, staff has identified areas of improvement.

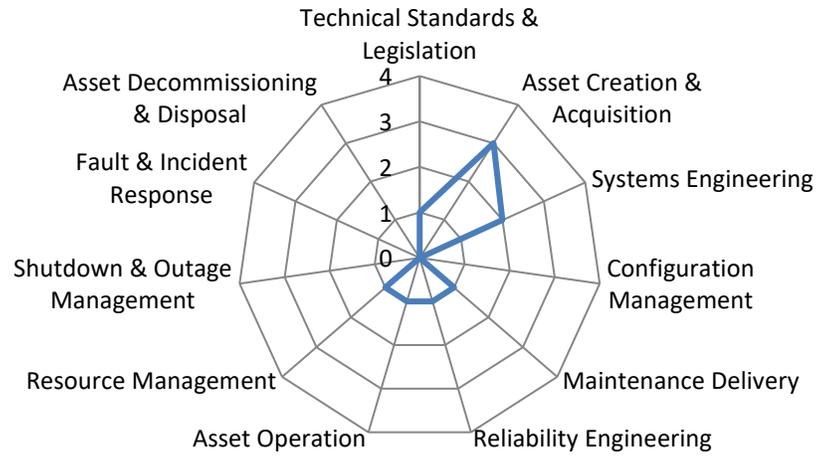
Fish and Wildlife staff have worked with the Council to develop a hatchery strategy that aims to fund hatchery projects based on their ability to meet the following objectives:

1. Ensure mitigation for loss of harvest associated with the FCRPS dams does not impede recovery of listed species
2. Preserve and rebuild genetic resources to reduce short-term extinction risk and promote recovery of ESA listed species
3. Support Tribal and State Accord commitments

**Table 6.1-1 Current Maturity**

Subject Area	Maturity Level
<p><b>Strategy &amp; Planning</b></p>	<div style="text-align: center;">  </div> <p><b>Strength:</b> BPA staff has worked collaboratively with Council and sponsors to develop and implement a hatchery O&amp;M strategy that will address overdue maintenance and develop a more structured plan to evaluate O&amp;M issues and funding going forward.</p> <p><b>Weakness:</b> The operator of the hatchery is responsible for their own maintenance programs, thus limiting BPA’s ability to optimize planning efforts for preventative maintenance or asset management.</p>
<p><b>Decision Making</b></p>	<div style="text-align: center;">  </div> <p><b>Strength:</b> Decisions regarding strategy and planning are shaped by an intention to be consistent with the Council’s program, and through compliance with the rule-making processes defined by federal environmental laws (i.e., Endangered Species Act, NEPA). BPA works closely with sponsors to identify asset O&amp;M budget needs to ensure asset management of the Hatchery and its equipment are properly funded.</p> <p><b>Weakness:</b> Although BPA can and does exercise their own discretion in setting hatchery budgets, there are many factors that impact the final decision. In addition, BPA is only responsible for funding the hatchery projects, therefore any operational or maintenance decision making is left to the operators of the hatchery.</p>

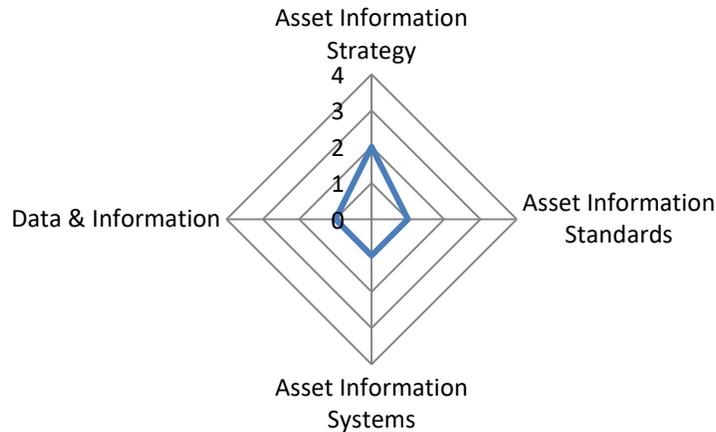
**Lifecycle Delivery**



**Strength:** BPA works closely with sponsors to identify appropriate O&M budgets to ensure hatcheries can continue to meet production goals.

**Weakness:** BPA is dependent upon the sponsors for the hatchery asset inventories and condition of assets. A limited understanding of hatchery assets can limit BPA’s ability to strategize the O&M of aging assets that directly impact the lifecycle of hatcheries.

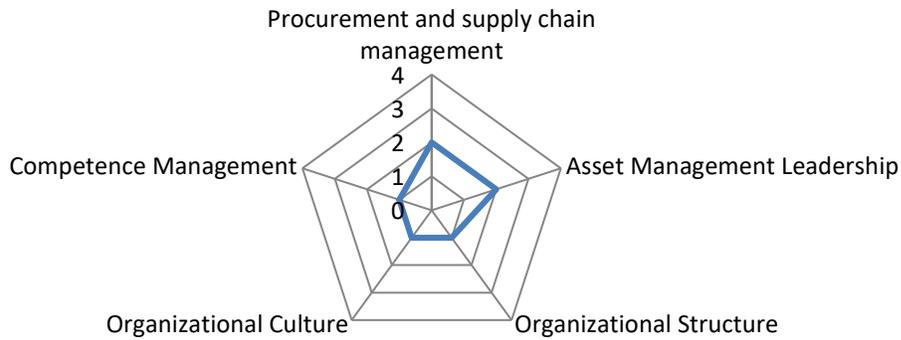
**Asset Information**



**Strength:** BPA and the Council contracted an engineering firm, HDR, to perform an assessment of all BPA funded hatcheries and equipment. HDR developed an inventory of critical assets that are in need essential maintenance/improvement.

**Weakness:** Most asset data is captured and maintained by sponsors, potentially limiting access to data for BPA staff and hindering their ability to develop coordinated strategies that maximize benefits to fish across sub-basins.

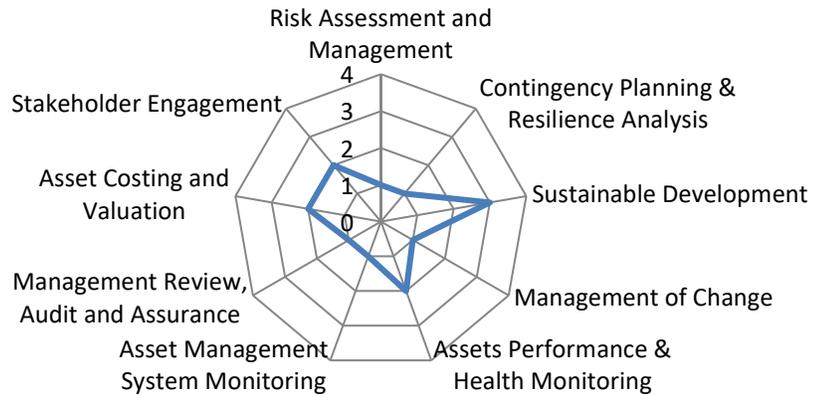
**Organization & People**



**Strength:** The hatchery program is managed by two Fish and Wildlife leads – implementation and O&M. These leads are responsible for providing leadership and coordination of hatchery activities via project managers and regular meetings of the Hatchery Team. A new hatchery policy lead role has been filled which will provide additional support to the team.

**Weakness:** Without a dedicated resource in the Hatchery Lead role, the hatchery sub-program has been unable to develop a consistent, sustainable strategy.

**Risk & Review**



**Strength:** BPA works closely with sponsors and stakeholders to identify risks and develop mitigation plans for hatchery projects.

**Weakness:** The process for risk analysis is informal.

## 6.2 Long Term Objectives

The following long term objectives are meant to improve the transparency, responsiveness, and accountability of the Hatchery program so it can strategically manage its assets, effectively and efficiently mitigate for the hydro system, and provide biological benefits to fish and wildlife throughout the region. Through this plan, the goal is to ensure the longevity and integrity of BPA's and the Council's Fish and Wildlife Programs' past investments made for the benefit of fish and wildlife.

1. Create a singular, internal inventory that includes age, condition, life expectancy, and replacement costs for critical hatchery equipment that is funded by the EFW program by FY 2022.
2. Implement annual funding commitments for 100% of priority non-recurring maintenance needs for program hatcheries by the end of FY 2020, which have been identified through the HDR assessment and funded using cost savings.
3. Develop a more comprehensive long-term strategic asset management plan that will address maintenance needs of *all* program hatcheries by FY 2022.
4. Create a policy to address the asset management requirements for the direct funded hatcheries that BPA shares responsibility with the other action agencies by the next SAMP update.
5. Identify areas for cost savings and efficiencies through preventative maintenance requirements for program hatcheries by FY 2027.
6. Improve asset management competencies of the team through available IAM training.

## 6.3 Current Strategies and Initiatives

### Strategy & Planning

*Council Initiative to Develop an Asset Management Strategic Plan:* BPA has worked with the Northwest Power and Conservation Council's Asset Management Subcommittee to (1) implement annual funding commitments for priority maintenance needs, which have now been identified and funded using cost savings, and (2) develop a long-term Asset Management Strategic Plan to address non-recurring maintenance needs. This plan is intended to define and provide a strategy to achieve a long-term maintenance, rehabilitation, and replacement system for Program investments associated with hatcheries. This includes developing a prioritized assessment for non-recurring maintenance and securing a monetary mechanism for implementation. The Council's plan is also complementary to this strategic asset management plan.

### Decision-Making

*Shared Responsibility of Direct Funded Hatcheries with Other Federal Partners:* Fish and Wildlife's Policy and Planning group, EWP, in coordination with the hatchery sub program, and BPA's Power Services are working to define the scope of BPA's funding obligations for direct-funded hatcheries and develop a policy that outlines in part the asset management responsibilities of BPA for the construction and O&M of shared hatchery facilities.

### Life Cycle Delivery

*Work Element Review and Contract Management:* Fish and Wildlife staff perform an annual review of the work elements that govern contracted work performed by EFW sponsors. Updating work elements that require sponsors to develop preventative maintenance programs or schedules and making it a requirement of the contract is an opportunity to improve the maintenance of assets and reduce the amount of unexpected costs associated with delayed maintenance. Some maintenance being performed under Emergency and/or non-recurring maintenance funding should or could be a part of the annual O&M maintenance budget at the hatchery facilities. Tying asset management to contract

requirements may provide a way for BPA to influence O&M programs without having to directly develop and implement them.

### **Asset Information**

*Non-Recurring Maintenance Needs Assessment and Asset Inventories:* An effort to inventory a list of essential maintenance/improvements as identified by 9 of 14 hatcheries part the Council's Fish and Wildlife program including all associated sites and facilities occurred in 2017 for the fiscal years 2018, 2019, and 2020. The inventory provided allowed the NPCC, BPA, and its sponsors to prioritize overdue O&M needs and appropriate funding in an efficient and cost-effective manner. Budget prioritization is ongoing for the remaining non-recurring maintenance needs not yet implemented

### **Organization & People**

*Fish and Wildlife Hatchery Sub-Program:* The role of the Hatchery Sub Program is to provide collaborative engagement and project lifecycle planning through proactive and consistent involvement in Sub Program operations across the agency. Points of contacts are staff with past or present hatchery project experience or the necessary subject matter expertise. The Hatchery Policy Lead Role, which has been vacant for over a year, has recently been filled providing the Hatchery Sub Program the opportunity to develop a more strategic and decisive voice. Current initiatives for the team include creating a team charter that outlines roles and responsibilities, a decision-making and prioritization framework, and an annual work plan for the group in FY20. EF&W staff will also improve asset management competencies through available IAM training in FY 2020.

## 7.0 ASSET CRITICALITY

### 7.1 Criteria

Hatcheries preserve and rebuild genetic resources to reduce short-term extinction risk and promote recovery of ESA listed species. The classifications are as follows:

1. Safety net – a rearing facility that prevents extinction of a run where too few wild fish remain to sustain a population
2. Conservation – a rearing facility to breed and propagate a stock of fish with equivalent genetic resources of the native stock, and with the full ability to return to reproduce naturally in its native habitat

### 7.2 Usage of Criticality Model

Hatcheries are localized within sub-basins of the Columbia River basin. Within those sub-basins, one or more long-term projects will be active and will include a variety of fish and wildlife mitigation actions – either planned, in-process, or completed. Projects within a sub-basin will be coordinated in terms of objectives and actions, and may include hatcheries as part of the suite of mitigation actions within the given geographic scope of the sub-basin. Operational areas are broadly represented by the geographic divisions and basins of the Pacific Northwest; e.g. the Willamette Valley, upper Columbia River, lower Snake River. These units, however, are not static with regard to project operations nor are they exclusive with regard to hatcheries.

A full physical component inventory of hatcheries funded by BPA was developed by an outside engineering contractor, HDR, in collaboration with the Council and sponsors. This inventory includes the condition and criticality of the component and associated O&M costs. Examples of components include tanks, pumps, generators, screens, compressors, and hoses. See Appendix A for the full component inventory of the Hatchery Program.

## 8.0 CURRENT STATE

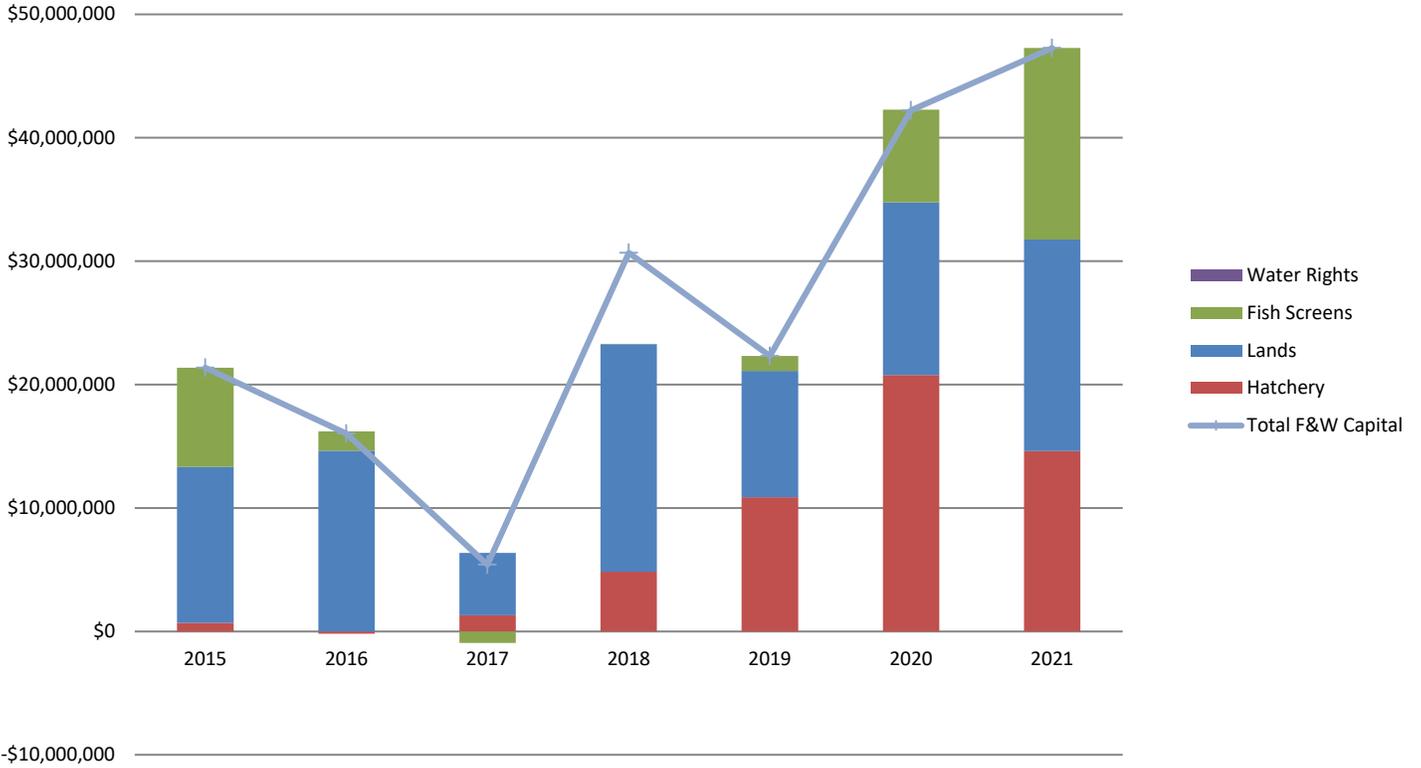
### 8.1 Historical Costs

*Table 8.1-1 Fish and Wildlife Historical Expenditures*

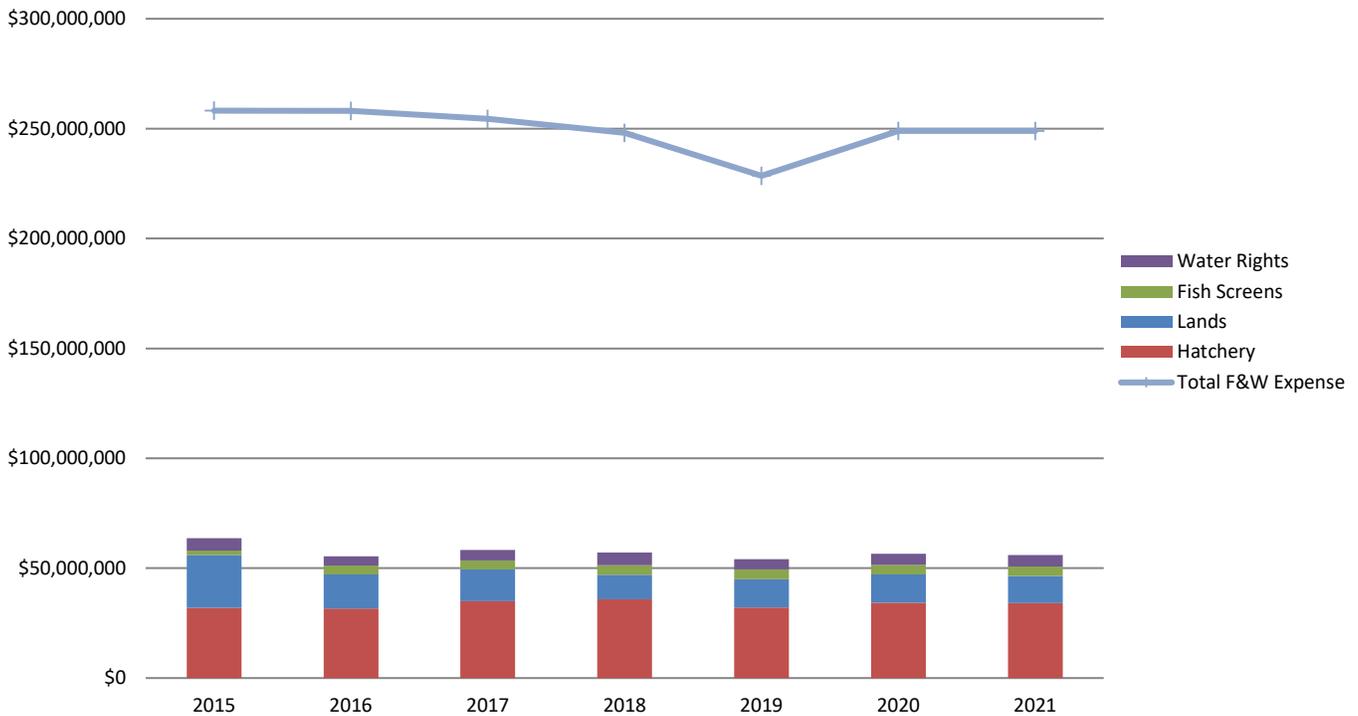
Program	Historical Spend (in thousands) With Current Rate Case						
Capital (CapEx)	2015	2016	2017	2018	2019	2020	2021
Hatchery	\$681	(\$178)	\$1,311	\$4,840	\$10,868	\$20,500	\$14,607
Lands	\$12,649	\$14,628	\$5,039	\$18,439	\$10,236	\$14,000	\$17,159
Fish Screens*	\$8,044	\$1,580	(\$948)	\$20	\$1,209	\$7,500	\$15,500
Water Rights	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Capital</b>	\$21,374	\$16,030	\$5,402	\$23,299	\$22,313	\$42,000	\$47,226
Expense (OpEx)							
Hatchery	\$31,931	\$31,662	\$34,996	\$35,846	\$32,118	\$34,320	\$34,320
Lands	\$23,980	\$15,426	\$14,460	\$11,184	\$12,885	\$12,843	\$12,843
Fish Screens	\$2,063	\$4,044	\$4,081	\$4,288	\$4,480	\$4,283	\$4,283
Water Rights	\$5,712	\$4,212	\$4,789	\$5,761	\$4,642	\$5,064	\$5,064
<b>Total Expense</b>	\$63,687	\$55,345	\$58,326	\$57,079	\$54,125	\$56,510	\$56,510

\*Includes passage projects

Table 8.1-1 Historical Expenditures shows how Fish and Wildlife asset capital and expense funds were spent over the last 5 years, with Hatchery spending represented in blue. The increase in capital expenditures over the last 2 years is a result of new hatchery construction agreements and funding of the non-recurring maintenance needs identified in the HDR assessments.



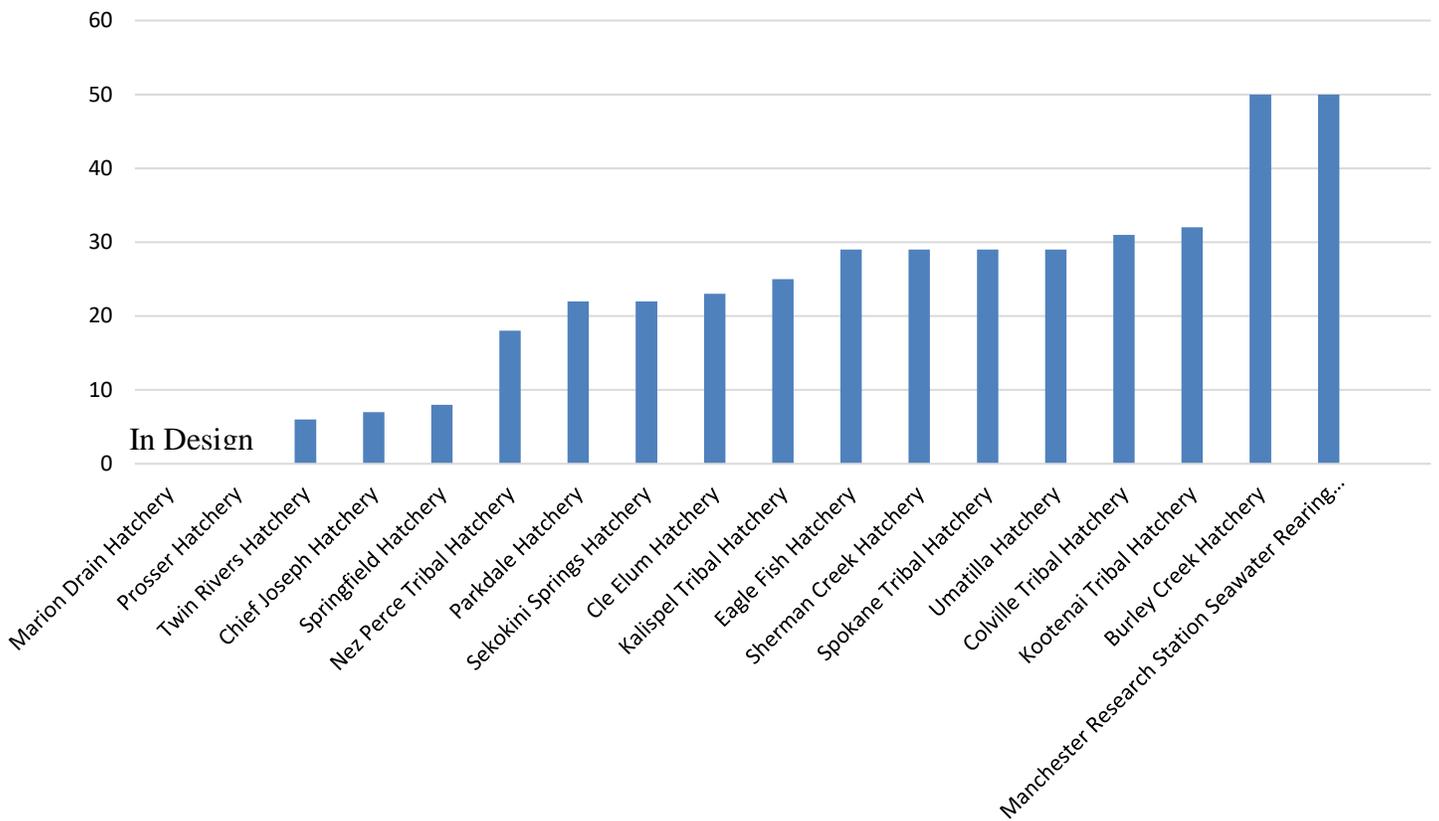
*Figure 8.1-1 Historical Capital Expenditures*



*Figure 8.1-2 Historical Expense Expenditures*

**8.2 Asset Condition and Trends**

In 2016 HDR, an engineering firm hired by BPA and the Council, performed condition assessments on 14 Fish and Wildlife Program Hatcheries included in the scope of this SAMP. A condition assessment report for each hatchery can be found on the Council’s artificial production programs website<sup>1</sup>. These assessments were then used to develop an estimate of costs to address outstanding mission critical elements from FY 2017 and essential non-recurring maintenance needs and improvements for FY 2018, 2019, 2020 for 9 of the 14 hatcheries (Appendix A). The assessments for these 14 hatcheries will be updated every 5 years to incorporate needs and inform prioritization and planning associated with the facilities, program, and out year budgets.



*Figure 8.2-1, Current Hatchery Age*

<sup>1</sup> <https://www.nwcouncil.org/fish-and-wildlife/fw-topics/operation-and-maintenance-strategic-plan/artificial-production-programs>

### 8.3 Asset Performance

Hatchery programs are managed to achieve a variety of objectives including contribution to tribal treaty and non-treaty fisheries, mitigation for lost habitat and reduced population sizes, and to assist in the conservation of endangered and threatened salmon and steelhead populations. Specific performance measures/standards for each program are defined in the program’s Biological Opinion issued by NOAA, and are consistent with the goals, objectives and strategies of the sub-basin plans if available. Performance standards in the Biological Opinion and/or sub-basin plans are designed to achieve the program’s goals and objectives and are generally measurable, realistic, and time specific. BPA manages hatchery assets to ensure they are meeting state and federal compliance requirements.

Specific Biological Opinions for each hatchery can be found in the individual hatchery project files. The project files are maintained by our Environmental Compliance Division. One example of a possible performance measure that could be included (shown in the table below) in a future version of the SAMP is tracking the % of non-recurring maintenance work completed at program hatcheries based on the condition assessments. As this strategy matures, the team will continue to evaluate sensible performance measures for hatchery assets.

*Table 8.3-1, Historical Asset Performance Summary*

Strategic Goal	Objective	Measure	Units	Year -5	Year – 4	Year - 3	Year - 2	Year - 1
<b>Modernize assets</b>	Reliability	% of critical maintenance work completed	%	100%	85%	75%	60%	50%

### 8.4 Performance and Practices Benchmarking

Due to the unique nature of hatcheries, it is difficult to benchmark against other Hatchery Programs in the industry. Hatchery programs are operated to meet performance and compliance guidelines established in the Biological Opinion and approved by NOAA.

## 9.0 RISK ASSESSMENT

Risk Category	Risk Name: Risk Description, Mitigation	Likelihood	Impact
Safety	<b>Liability:</b> As hatcheries are not under BPA ownership, liability associated with personal safety remains the responsibility of the property owner, not BPA. However, as a major funding source for O&M, BPA may assume some risk if it is determined to be a result of budget constraints.	Low	Low
Reliability	<b>Equipment Failure:</b> The possibility of equipment failure of a physical asset is always a risk to the reliability of the system. A hatchery’s operating equipment is always at risk of failing and needing repair and/or replacement. Failed equipment could result in loss of artificial production that could impact salmon populations.	Moderate	High
Financial	<b>Costs:</b> Financial risks associated with hatcheries are represented by the initial investment and by commitments to long-term O&M funding. These risks are mitigated by BPA policies and procedures that require prioritization.	Low	Low
Environment/Stewardship	<b>Environment Hazards:</b> Environmental risks include the impact of the construction and operation of the hatchery on the surrounding ecosystem, including use of instream water for hatchery production and potential impact of hatchery born fish on wild species.	Low	Low
Compliance	<b>Regulatory Assets:</b> Hatcheries are an integral part of BPA’s Fish and Wildlife program that meet the legal obligation of BPA (Endangered Species Act, Northwest Power Act) to mitigate for the impacts of the Federal Columbia River Power System.	Low	Moderate

Due to the range of hatcheries, each asset may have its own risk profile. For this plan, Fish and Wildlife evaluated the risk of lands as a whole on its program.

Safety Consequence Risk Map						
<b>Probability</b>	<b>Almost Certain</b> This event could occur within the next 2 years.					
	<b>Likely</b> This event could occur within the next 5 years.					
	<b>Possible</b> This event could occur within the next 13 years.					
	<b>Unlikely</b> This event could occur within the next 50 years.				Fish Screens Hatcheries	
	<b>Rare</b> This event could occur within the next 100 years.	Lands Water Rights				
		Insignificant	Minor	Moderate	Major	Extreme
<b>Consequence</b>						

Figure 9.0-1, Risk Assessment, Safety

Reliability Consequence Risk Map						
<b>Probability</b>	<b>Almost Certain</b> This event could occur within the next 2 years.					
	<b>Likely</b> This event could occur within the next 5 years.					
	<b>Possible</b> This event could occur within the next 13 years.				Fish Screens Hatcheries	
	<b>Unlikely</b> This event could occur within the next 50 years.		Lands			
	<b>Rare</b> This event could occur within the next 100 years.	Water Rights				
		Insignificant	Minor	Moderate	Major	Extreme
<b>Consequence</b>						

Figure 9.0-2, Risk Assessment, Reliability

Financial Consequence Risk Map						
<b>Probability</b>	<b>Almost Certain</b> This event could occur within the next 2 years.					
	<b>Likely</b> This event could occur within the next 5 years.					
	<b>Possible</b> This event could occur within the next 13 years.					
	<b>Unlikely</b> This event could occur within the next 50 years.		Fish Screens Water Rights Hatcheries	Lands		
	<b>Rare</b> This event could occur within the next 100 years.					
		Insignificant	Minor	Moderate	Major	Extreme
<b>Consequence</b>						

Figure 9.0-3, Risk Assessment, Financial

Environment Consequence Risk Map						
<b>Probability</b>	<b>Almost Certain</b> This event could occur within the next 2 years.					
	<b>Likely</b> This event could occur within the next 5 years.					
	<b>Possible</b> This event could occur within the next 13 years.					
	<b>Unlikely</b> This event could occur within the next 50 years.		Fish Screens Hatcheries	Water Rights	Lands	
	<b>Rare</b> This event could occur within the next 100 years.					
		Insignificant	Minor	Moderate	Major	Extreme
<b>Consequence</b>						

Figure 9.0-4, Risk Assessment, Environment/Stewardship

Compliance Consequence Risk Map						
<b>Probability</b>	<b>Almost Certain</b> This event could occur within the next 2 years.					
	<b>Likely</b> This event could occur within the next 5 years.					
	<b>Possible</b> This event could occur within the next 13 years.					
	<b>Unlikely</b> This event could occur within the next 50 years.			Fish Screens Water Rights Lands Hatcheries		
	<b>Rare</b> This event could occur within the next 100 years.					
		Insignificant	Minor	Moderate	Major	Extreme
<b>Consequence</b>						

*Figure 9.0-5, Risk Assessment, Compliance*

## **10.0 STRATEGY AND FUTURE STATE**

The Fish and Wildlife Hatchery Program plans to utilize project implementation support to inform and educate its strategy through lessons learned, information sharing, and best practices to achieve improved management of its assets and long term sustainability.

### **10.1 Future State Asset Performance**

Fish and Wildlife will continue to fund the implementation of hatchery programs to ensure the programs are meeting mitigation objectives including contribution to tribal treaty and non-treaty fisheries, mitigation for lost habitat and reduced population sizes, and to assist in the conservation of endangered and threatened salmon and steelhead populations.

### **10.2 Asset Conditions and Trends**

#### **10.2.1 Sustainment Strategy**

Annual operations and maintenance funding is used to ensure assets are operating efficiently. Non-recurring maintenance is being addressed by the hatchery conditions assessments. Unforeseen and emergency maintenance and repair needs are addressed through the BPA and NPCC budget oversight group (BOG) process.

#### **10.2.2 Growth (Expand) Strategy**

Fish and Wildlife will provide the appropriate level of funding to meet mitigation objectives including contribution to tribal treaty and non-treaty fisheries, mitigation for lost habitat and reduced population sizes, and to assist in the conservation of endangered and threatened salmon and steelhead populations.

#### **10.2.3 Strategy for Managing Technological Change and Resiliency**

Fish and wildlife is proactively partnering with NPCC to implement regular condition assessments to prioritize and address critical components to operating existing hatchery programs. We are leveraging in basin lessons learned from past projects. For example, the Fish and Wildlife contracting process includes a project team approach to early project planning and development.

The hatchery subprogram is a manager sponsored team that includes subject matter experts in operations & maintenance, design & construction, research, monitoring & evaluation, engineering technical services, environmental compliance, and policy. The subprogram keeps informed on emerging hatchery technology and management.

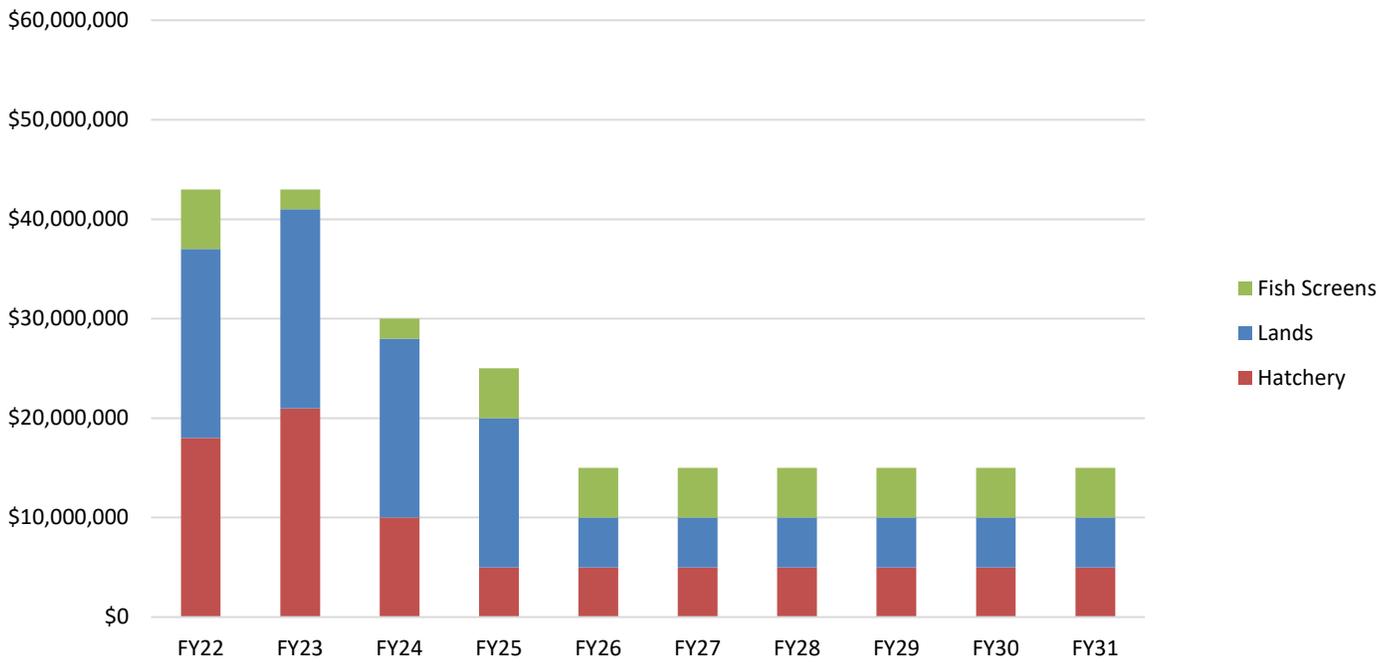
### 10.3 Planned Future Investments/Spend Levels

*Table 10.3-1, Future Fish and Wildlife Expenditures (in thousands)*

Program	Rate Case FYs		Future Fiscal Years							
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>Capital (CapEx)</b>										
Hatchery	\$18,000	\$21,000	\$10,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Lands	\$19,000	\$20,000	\$18,000	\$15,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Fish Screens*	\$6,000	\$2,000	\$2,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Water Rights	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
<b>Total Capital</b>	<b>\$43,000</b>	<b>\$43,000</b>	<b>\$30,000</b>	<b>\$25,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>	<b>\$15,000</b>
<b>Expense (OpEx)</b>										
Hatchery	\$34,320	\$34,320	\$34,320	\$34,320	\$34,320	\$34,320	\$34,320	\$34,320	\$34,320	\$34,320
Lands	\$12,843	\$12,843	\$12,843	\$12,843	\$12,843	\$12,843	\$12,843	\$12,843	\$12,843	\$12,843
Fish Screens	\$4,283	\$4,283	\$4,283	\$4,283	\$4,283	\$4,283	\$4,283	\$4,283	\$4,283	\$4,283
Water Rights	\$5,064	\$5,064	\$5,064	\$5,064	\$5,064	\$5,064	\$5,064	\$5,064	\$5,064	\$5,064
<b>Total Expense</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>	<b>\$56,510</b>

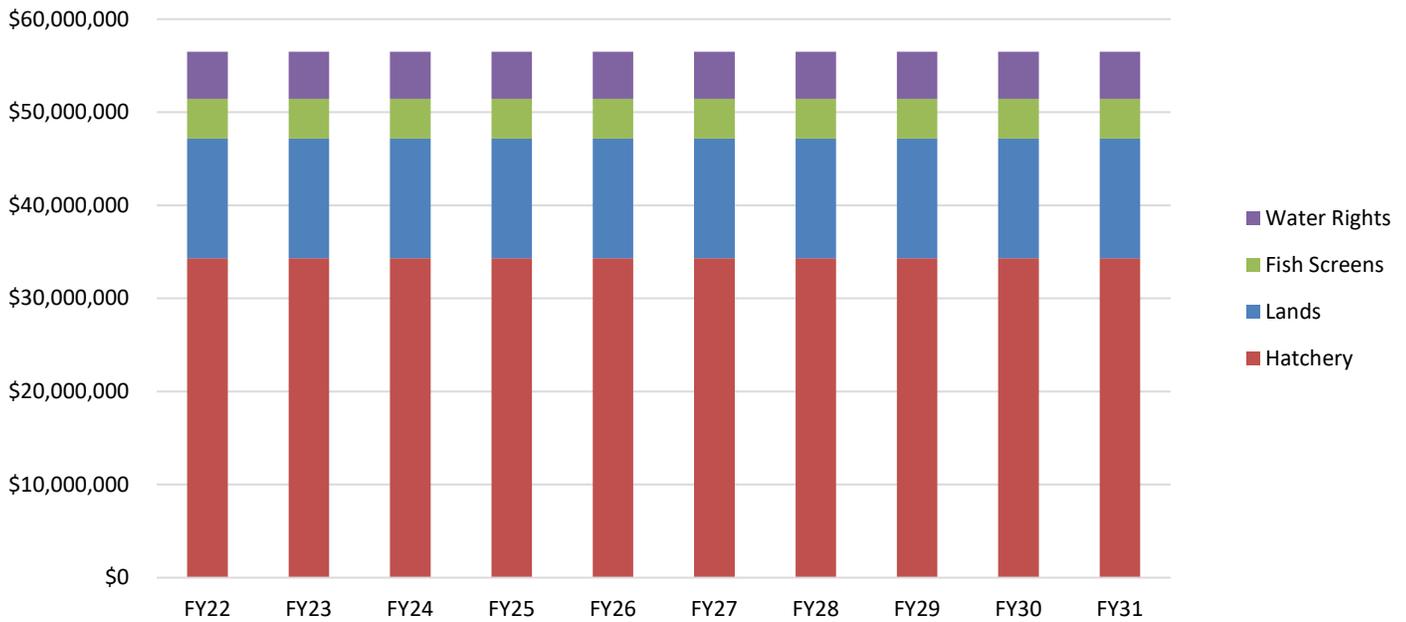
\*Includes passage projects

Hatchery capital budgets are dependent upon estimated project schedules which may move due to unexpected circumstances outside of BPA’s control. In those cases, forecasted budgets may need to be adjusted to align with the actual work.



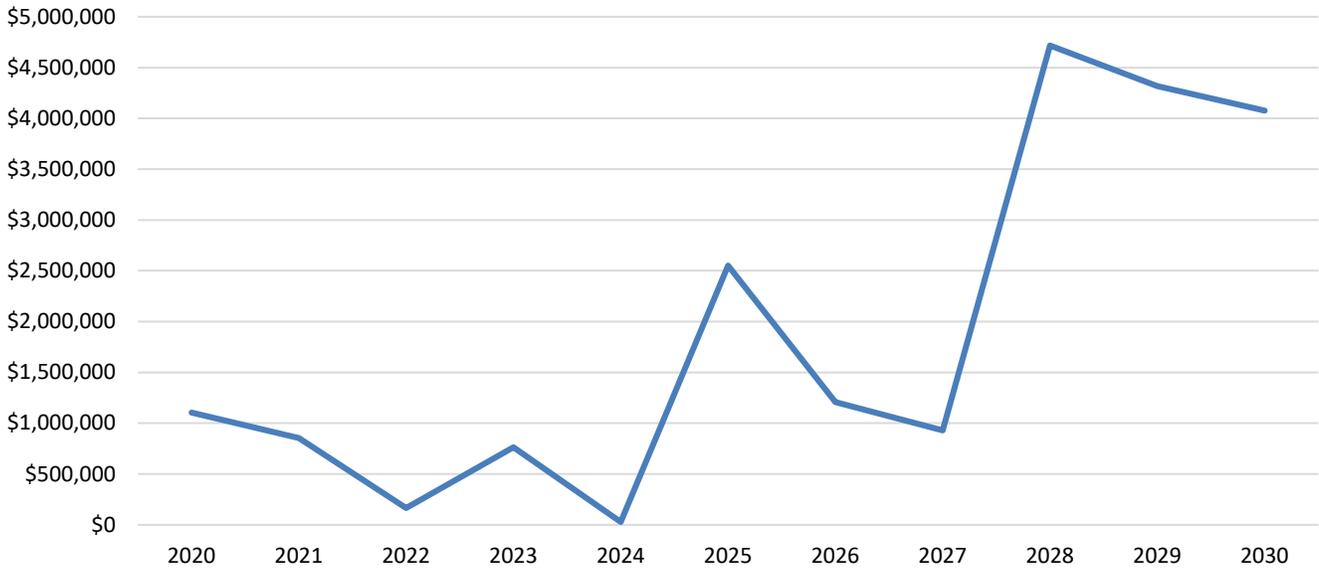
*Figure 10.3-1, Future Fish and Wildlife Capital Budgets*

Hatchery expense budgets are forecasted to stay constant over the next 5-10 years, although may be adjusted as annual planning efforts further clarify project needs. Fish and Wildlife does not do true expense budget forecasts and are based on the previous years’ costs. The expense budget forecast are an average of the previous years’ expense expenditures and used as a guideline for expense budget forecasts.

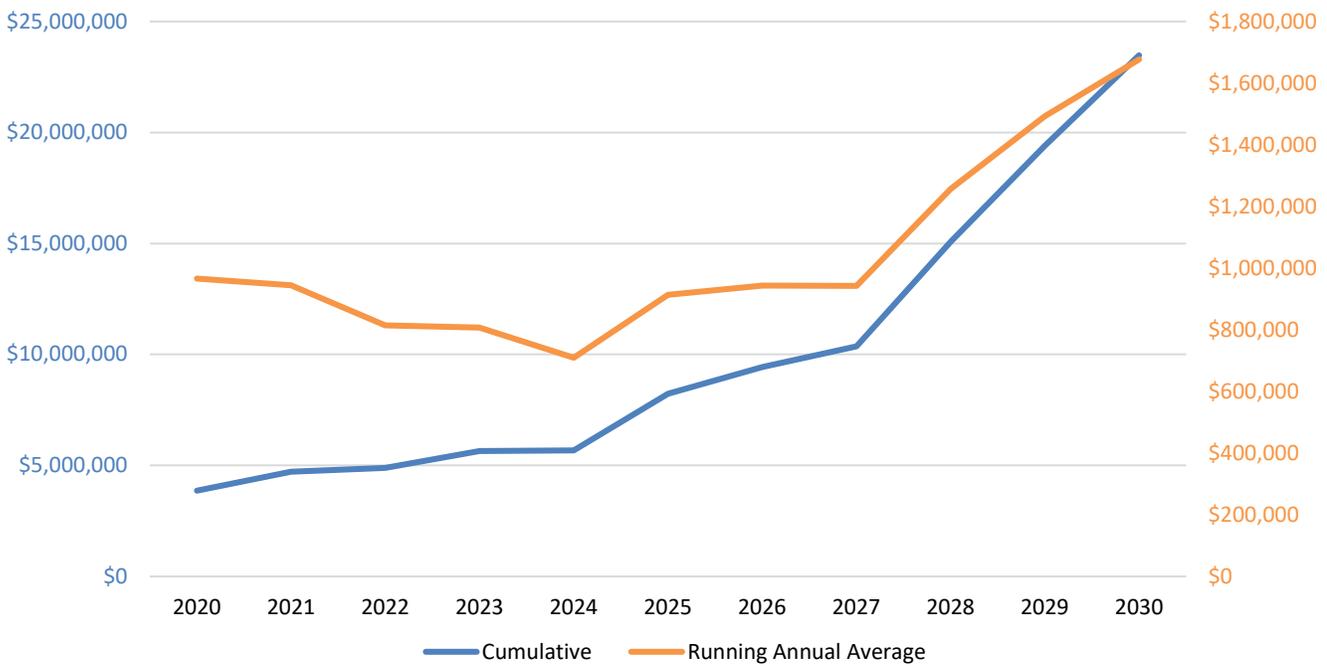


*Figure 10.3-2, Future Fish and Wildlife Expense Budgets*

Based on the hatchery condition assessments conducted by HDR, the following budget forecast was developed to address essential, non-recurring maintenance priorities at program hatcheries over the next 10 years. Planning for the large increase in expected maintenance costs in 2025-2030 will require the program to look for cost efficiencies.



**Figure 10.3-3, Hatchery Non-Recurring Maintenance Costs, All Facilities and Equipment**



**Figure 10.3-4, Hatchery Non-Recurring Maintenance Costs Cumulative and Rolling Average**

## 10.4 Implementation Risks

*Table 10.4-1, Implementation Risks*

Risk	Impact	Mitigation Plan
Lack of adequate O&M funding	Moderate - Delayed and deferred maintenance on critical hatchery assets which could impact hatchery performance objectives	Maintain adequate funding levels, identify cost savings within the program so funds can be reallocated for critical maintenance priorities.
Unforeseen natural events (e.g. flood, fires, icing, earthquakes, etc.)	Potentially High - Impacts could range depending on event, but there is potential for large damage to facilities that could pose a financial risk to the program and biological risk to fish.	Utilize the Budget Oversight Group (BOG) to address needs as they arise, anticipate the effect of these events during project planning to incorporate design solutions for mitigation.
Climate change	Potentially High - Impacts to hatchery performance and ability for BPA to meet mitigation objectives and commitments	Utilize the Budget Oversight Group (BOG) to address needs as they arise, anticipate the effect of these events during project planning to incorporate design solutions for mitigation.

## 10.5 Asset Condition and Trends

Aging facilities have components that deteriorate which will require replacement. The hatchery condition assessment is repeated every 5 years to identify expected remaining life on assets. These are prioritized annually and asset replacement and/or repairs are addressed on an annual basis through BPA and Council funding mechanisms. Interim condition assessments may be conducted by hatchery operators and addressed on an as needed basis using O&M expense funds.

## 10.6 Performance and Risk Impact

The strategy for the hatchery program is to maintain current planning and implementation practices, therefore there is expected to be little impact to performance or risk of the asset over in the near-term. However, it may become necessary for the program to develop a strategy for addressing climate change impacts that could affect performance of hatcheries that are critical to mitigation obligations. This could raise risk levels for reliability, financial, environment, and compliance of the asset management program in future years. This will be re-evaluated during the next annual review of the SAMP to determine the need to incorporate this effort into the next strategic plan.

## 11.0 ADDRESSING BARRIERS TO ACHIEVING OPTIMAL PERFORMANCE

### **Program resources**

Budget constraints on the Fish and Wildlife program could limit adequate resourcing to optimally implement this asset management strategy. Fish and Wildlife plans to improve asset management competencies across its staff by encouraging staff to take the IAM training offered by the agency. This will improve the confidence of its employees to adopt and continually improve their strategic asset management plans.

### **Internal/external relationships**

A critical element of achieving optimal performance of this strategy is establishing and maintaining strong internal and external relationships. The Fish and Wildlife program works closely with other agency organizations as well as external entities throughout the region. Developing and maintaining trust, shared learning efforts, and approaches towards common goals will help to gather consensus around this strategy and improve the likelihood it will be implemented successfully.

### **Program alignment with broader Fish and Wildlife program**

Optimal performance of this asset is contingent on its alignment with the broader BPA Fish and Wildlife program, including any future Biological Opinions. A change in hatchery strategy away from the current/status quo approach would need to be considered in terms of this broader program, and a modification of the broader program may modify the approach to this asset. Hatcheries are one component of many that address the broader mitigation requirements BPA addresses.

### **Data management and sharing**

In terms of the management actions that will support sustaining the asset, the near-term emphasis will be on updating and standardizing the inventory and associated data, including the ability to efficiently produce desired metrics and reports, as well as cost forecasts under various program scenarios. Actions should be identified that will potentially enhance the current information management and other areas where efficiencies in reporting might be evaluated.

## 12.0 DEFINITIONS

Reference BPA Policy 240-2 and BPA Procedure 240-2-1 for standard definitions. Definitions specific to this asset category, if any, are listed below:

**Northwest Power and Conservation Council (NPCC)<sup>2</sup>:** An eight-member council, established by the Pacific Northwest Electric Power Planning and Conservation Act, comprised of two voting members from the four northwestern states: Washington, Oregon, Idaho, and Montana. Helps guide BPA and the region with planning for conservation and generation resources and for protection, mitigation, and enhancement of fish and wildlife in the Columbia River Basin.

**Project Sponsor:** The entity proposing and performing the duties of constructing, operating, and maintaining a hatchery for the Fish and Wildlife Program.

**Biological Opinion:** A document that is the product of formal consultation, stating the opinion of the Service on whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

---

<sup>2</sup> <https://www.nwcouncil.org>

**Appendix A – Hatchery Condition Assessment, NPCC Asset Management Strategic Plan**

List of artificial production projects in the Program including all sites and facilities associated with specific Program hatcheries

The following table was developed for the Asset Management Strategic Plan (Plan) to reflect the inventory of programs associated with artificial production in the Fish and Wildlife Program (Program). The assessment identified the facilities/program and associated projects that were constructed through the Program and other hatchery programs that were supported but are dependent on facilities that were not constructed with Program funds. The facilities/programs being addressed in the assessment associated with the Plan are bricks and mortar capital type investments, not the associated facilities/programs that were provided non-capital support for the artificial production (i.e., non-Program hatcheries).

Of the 42 projects listed, 14 existing facility/programs<sup>3</sup> (involving 24 projects) are currently considered “Program Hatcheries” for the Plan (shaded boxes in the following table). There are seven existing facility/programs (involving seven projects) that do not warrant an assessment due to the lack of capital investment by the Program. In addition, eight proposals (involving 11 projects) are for new facility/programs and are in step review that will need to be tracked and incorporated at the appropriate time into the Plan.

Direct F&W Program (capital investment)				Associated Facilities (non-Program) and Comments
Facility/Program	Project #	Assessment	Facilities	
Nez Perce Tribal Hatchery	1983-350-00	X	2 rearing sites (NPTH and Sweetwater Springs) and 5 acclimation sites (Cedar Flats, Luke’s Gulch, North Lapwai Valley, Newsome Creek, and Yoosa Creek)	
Colville Hatchery	1985-038-00 2008-117-00	X	Colville Tribal hatchery	Project #2008-117-00 (Rufus Woods net pens) is being combined with #1985-038-00
Hood River Production	1988-053-07 1988-053-08	X, and in Step review	2 rearing sites (Parkdale Fish Hatchery and Moving Falls Fish Facility)	MOU with Oak Springs Hatchery (ODFW), Pelton Ladder and Round Butte Hatchery (PGE/CTWSRO). Neal Creek Acclimation is equipment only.
Kootenai River Native Fish Conservation Aquaculture	1988-064-00	X	2 rearing sites (Tribal Sturgeon Hatchery and Twin Rivers Hatchery)	Twin Rivers just came on line and upgrades made to sturgeon hatchery
Umatilla Hatchery	1989-035-00 1983-435-00 1983-436-00	X	Umatilla Hatchery, 5 acclimation sites (Bonifer, Minthorn, Imeques C-mem-inkem, Thornhollow Satellite Facility, and Pendleton) and 3 adult holding sites	Adult holding and eggs taken and transferred from Walla Walla

<sup>3</sup> Note that there are four existing facility/programs that are in step review for increase production.

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Direct F&W Program (capital investment)				Associated Facilities (non-Program) and Comments
Facility/Program	Project #	Assessment	Facilities	
			(Minthorn, Three Mile Dam and South Fork Walla Walla) and Westland Irrigation District Sampling Facility	
	1988-022-00	NA		Equipment only
Sekokini Springs Westslope Cutthroat Trout Isolation Facility	1991-019-03	X		Continues to be constructed
Lake Roosevelt Resident	1991-046-00	X	Spokane and Sherman hatcheries. Spokane Hatchery audit is complete.	
	1991-047-00			
	2001-029-00	NA		MOU Ford Hatchery (WDFW)
	1995-009-00	NA		Equipment only – 8 Lake Roosevelt net pens
Select Area Fisheries Enhancement	1993-060-00	NA		MOU, Gnat, Greys and Kaskanine hatcheries. Equipment only. 5 net pen sites (Deep River, Blind Slough, Tongue Point, Youngs Bay).
Kalispel Tribal Fish Hatchery	1995-001-00	X, and In Step review		This program has been proposed to phase out of LMB to native trout recovery.
Nez Perce Trout Ponds stocking	1995-013-00	NA		Equipment only. Stocking 3 ponds (Mud Creek, Talmaks and Tunnel)
Duck Valley Reservation Fish Stocking	1995-015-00	NA		Equipment only. Stocking 3 reservoirs (Mountain View, Sheep Creek and Lake Billy Shaw)
Lake Roosevelt Sturgeon Recovery	1995-027-00	In Step review		
Mid-Columbia Coho Reintroduction Feasibility Study	1996-040-00	In Step review		
Johnson Creek Artificial Propagation	1996-043-00	NA		MOU, McCall Hatchery (LSRCP). Equipment only.
Cle Elum Supplementation and Research Facility	1997-013-25,	X, and In Step review	3 acclimation sites (Clack Flat, Easton and Jack Creek) and Prosser hatchery and Marion Drain Fish Facility.	Project is comprehensive. Other species are being dealt with in this project and/or other projects (e.g., sturgeon, kelts). Coho in Step review (Holmes Ranch). Prosser Fish Facility and Marion Drain Fish Facility (kelts, sturgeon and fall Chinook). In addition, some activities are mixed with non-Program efforts. Nelson Springs mobile acclimation equipment only. <i>Roza Adult Trapping Facility (BOR owned--MOA between BOR, WDFW, BPA).</i>
	1988-115-25			
Klickitat River Operations and Maintenance (O&M)	1988-115-35	X, and in Step review	Castile Falls trap, Lyle Falls trap. Proposed – Wahkiacus acclimation.	MOU, Klickitat Hatchery (Mitchell Act). In Step review.
Grande Ronde Supplementation	1998-007-02	X	Lostine River – weir and acclimation	MOU, Lookingglass NFH (LSRCP), Bonneville Hatchery Captive Brood Facility (ODFW).
	1998-007-03		Catherine Creek and Upper GR Rivers - weir and acclimation	

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Direct F&W Program (capital investment)				Associated Facilities (non-Program) and Comments
Facility/Program	Project #	Assessment	Facilities	
Fall Chinook Acclimation Facilities	1998-010-05	X	3 sites (Captain John Rapids, Pittsburg Landing, Big Canyon)	MOU, Lyons Ferry NFH (LSRCP)
Walla Walla Spring Chinook	2000-038-00	In Step review		Current relation with the Umatilla Hatchery program (see above)
Chief Joseph Hatchery	2003-023-00	X	4 acclimation sites (Oroville-Tonasket Irrigation District irrigation ponds, one tribe-owned and two new ponds will be modified and/or constructed)	MOU, Oroville-Tonasket Irrigation District irrigation ponds
Lower Granite Dam Adult Trap	2005-002-00	NA		Used for RME & hatchery practices in Snake River. US Army Corps of Engineers
Okanogan Basin Locally Adapted Steelhead Broodstock Step 1 and 2 (Cassimer Bar)	2007-212-00	NA		No activity, in Step review
Develop a Master Plan for a Rearing Facility to Enhance Selected Populations of White Sturgeon in the Columbia River Basin	2007-155-00 (and 2008-455-00)	In Step review		Marion Drain Fish Facility and 1 other site (Ringold, MaNary and Bonneville). Addressed under CRITFC (Objectives 2 and 3) and YN (Objective 1).
Kelt Reconditioning and Reproductive Success Evaluation Research	2007-401-00	In Step review		Merged from Project #2000-017-00 and 2003-062-00. In evaluation stage in the Columbia plateau and lower Snake.
Snake River Sockeye Propagation	2007-402-00	X	2 sites (Springfield and Eagle)	MOU, 2 sites (Manchester and Burley Creek)
Lamprey - implement an experimental safety-net lamprey artificial production facility for the conservation of the species	2008-524-00 (2008-470-00, and 1994-026-00)	In Step review	proposed	Addressed under CRITFC (Objective 6) and YN (Objective 8)
Chum Salmon Restoration in the tributaries below Bonneville Dam	2008-710-00	In Step review		Merged from Project #2001-053-00. Also associated with Project #1999-003-00.
Crystal Springs Planning and Operations/Maintenance	2008-906-00,	In Step review	Crystal Springs Hatchery and 2 sites (Yankee Fork and Panther Creek)	Activities link to LSRCP
Upper Columbia Spring Chinook & Steelhead Acclimation	2009-001-00	NA		MOU, acclimation sites in the Wenatchee and Methow PUD's. Equipment only.

Table 2: Actions taken by the Asset Management Subcommittee to address priority maintenance elements for the Program's hatcheries.

The following list of elements (mission-critical and essential) \* were identified through the hatchery assessments and the managers/sponsors for Fiscal Year 2017, 2018, 2019 and 2020. Also listed are outstanding mission-critical (*italic*) elements from FY 2017. Recommended actions for FY 2019 and 2020 are dependent on review (i.e., engineering) and confirmation (e.g., environmental compliance) by Bonneville by the end of March 2018 and 2019, respectively. Shaded cells reflect elements that are dependent on further evaluations and discussion (e.g., outstanding mission-critical elements from FY 2017).

Site - Manager	Element	Estimated Cost by Fiscal Year				Description
		2017	2018	2019	2020	
Sekokini - MFWP	Generator	\$5,000				
	Spring #2 Infiltration Gallery		\$15,000			Implemented - in contracting. Spring 2 infiltration gallery needs maintenance to capture flow that is currently diverted away from the cistern. Large snowpack and runoff this spring have led to even more of the flow being routed past the cistern, reducing flow to the hatchery building.
	French Drain			\$5,000		French drain is needed in front of the isolation building to redirect seepage behind the retaining wall and prevent ice formation in front of the entry way.
	Roof				\$12,000	Metal roof replacement on the original hatchery building (not the expansion building).
	Settle Pond Drain				\$7,000	The concrete outflow structure that controls the elevation of the hatchery's effluent settling pond is crumbling and needs to be replaced.
Lake Roosevelt Resident**						
Spokane - STOI	NA					Utilizing BIA O&M funds.
Sherman - WDFW	Sanitary Lift Station Pumps	\$20,000				
	Emergency Generator	\$40,000				
	Lake Water Pumps		\$30,000			Move pumps and extend to deeper water to maintain flow during reservoir drawdown. Total costs include pumps, piping, and ancillary equipment. Subject to engineering and permitting before purchase of equipment.
	Net Pens			TBD	TBD	Additional evaluation needed, TBD. Reservoir drawdown causing early release of fish and the effect on program goals, current location does not function during reservoir drawdown.
Umatilla**						
Umatilla - District	Leaking pipe, adult trap					\$20,000 Covered by accord funds. Westland Irrigation District (District)
ODFW	Well System		\$20,000	TBD	TBD	Efforts to initiate a comprehensive review of well systems (ranney well system (pumps #1 through #4) and wells #1 through #4 (pumps #5 through#8)) is ongoing. All essential needs (listed below) are linked to this review. Determination of path to address needs will

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Site - Manager	Element	Estimated Cost by Fiscal Year				Description
		2017	2018	2019	2020	
						be defined by end of calendar year. If emergencies arise, action will be addressed through BOG. Bonneville working with ODFW and CTUIR on urgent electrical issues. <u>\$20,000 allocated</u> to assist in comprehensive review for specialized engineering services. Total cost unknown until a complete evaluation is completed - Well system provides a fraction of the flow the facility was designed for. <u>In the interim and to ensure the production at the hatchery is protected an urgent BOG request, in the first quarter of FY 2018, was approved by the Council and Bonneville to recondition the wells #1 - #4 and correctly size the pumps at \$150,000.</u>
ODFW	Pumps #1 -#4					Initiate a comprehensive review of ranney well system is ongoing. <i>See Mission Critical item above.</i>
ODFW	Productioun Well #1, 15HP Submersible					Completed. Wells 1-4 and Pumps #5-#8 were all refurbished and the pumps were rightsized in the fall of 2017. <i>See Mission Critical item above.</i>
ODFW	Production Well #2, 50 HP Submersible					Completed. Wells 1-4 and Pumps #5-#8 were all refurbished and the pumps were rightsized in the fall of 2017. <i>See Mission Critical item above.</i>
ODFW	Production Well #3, 25 HP Submersible					Estimate at \$25,000. Wells 1-4 and Pumps #5-#8 were all refurbished and the pumps were rightsized in the fall of 2017. <i>See Mission Critical item above.</i>
ODFW	Production Well #4, 60 HP Submersible					Estimate at \$25,000. Wells 1-4 and Pumps #5-#8 were all refurbished and the pumps were rightsized in the fall of 2017. <i>See Mission Critical item above.</i>
ODFW	Chillers (4) 50 ton					Estimate at \$194,000. Efforts to initiate a comprehensive review of well system is ongoing. Chillers are 25 years old and walls are thin from sand scour. Chillers need to be replaced. <i>See Mission Critical item above.</i>
ODFW	Incubation/Aeration Tower Submersible Pumps (2), 15 HP					Estimate at \$30,000. Efforts to initiate a comprehensive review of well system is ongoing. Rewire pump. <i>See Mission Critical item above.</i>
CTUIR	Eight Sites (acclimation, trapping and adult holding)					In the near future, the CTUIR annual budgets are sufficient to take care of required O&M as identified in the hatchery assessments.
Kootenai - KTOI	NA					At this time KTOI is utilizing BIA Hatchery Cyclical Maintenance Grant.
Snake River Sockeye Propagation - IDFG**						
Springfield	Chiller system		\$75,000	\$75,000	TBD	Engineering services contracted to develop design and specifications for chilled water delivery system upgrade at Springfield Hatchery (estimated at \$75,000 for 2018 and possibly 2019. In 2019 determination on use of accord funds being discussed). Estimate based on hatchery assessment report and then includes an estimate on installation.

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Site - Manager	Element	Estimated Cost by Fiscal Year				Description
		2017	2018	2019	2020	
	Concrete Clarifier			\$109,250		<u>Additional needs are deferred until current assessment is completed.</u> Undersized waste removal system necessitates modifications (estimated at \$109,250) - upsize early rearing trough effluent piping to larger size & increase size of effluent clarifier system.
	Early rearing trough effluent piping				\$195,000	<u>Additional needs are deferred until current assessment is completed.</u> Undersized waste removal system necessitates removal of only 1 cleaning standpipe at a time. Modification by increasing the diameter of tough effluent piping (estimated at \$195,000). This in conjunction with increasing the size of effluent clarifier system will allow 500 gpm influent rate. This will also allow inside vat cleaning to be more efficient and will enhance bio-security in the early rearing building and eliminate the multiple removal of sludge from the clarifier on an annual basis. Estimate reflects estimate of modify troughs with large diameter piping and not replacement of troughs.
Eagle	2 Fiberglass Transportation Tanks (250 gallon)		\$16,500			Fiberglass transport tank for hauling sockeye adults from the RFLC trap to Eagle or in some years from Lower Granite Dam to Eagle are at the end of their life expectancy. These tanks have been rebuilt and re-fiberglassed a number of times and continue to leak water. Water is also damaging the internal wooden framework as water is trapped within fiberglassed shell. Price quotes to replace this tank have been requested from JetCo at an estimated cost of \$8,250 each.
	Well #3: VFD Unit		\$11,500			Due to the age of this critical unit, replacement is necessary.
	Well #1: 50 HP submersible pump			\$9,000		Pump is 5 years old, due to be replaced and refurbished for backup.
	Well #1 & #2 Degassing Tower Water Level Sensor.			\$120,000		Aeration column needs minor modification to improve flow through dispersion plate. This unit has failed in cold damp winter conditions and is bypassed for this reason. <i>(Discussions with an electrician to move this unit into the Well #2 building have been initiated, but no cost estimate at this time)</i>
	Chiller (100 TON)				\$84,500	Adult holding chiller needs to be replaced, old R-22 refrigerant filled chiller. Conversion needed to Freon or replace with new unit, whichever is deemed appropriate.
Colville - CCT	Generator					\$75,000 Covered by accord funds
	Chiller (15 TON APPROX)					Accord Funded @ \$42,000 in 2018. Leaks Freon, needs to be replaced
	Aluminum Troughs (14), 21' X 2.75'			\$74,200		Inside rearing troughs are corroding and pinhole leaks observed, need to be replaced
	Aluminum Troughs (6), 16' X 1.3'				\$15,000	Inside rearing troughs are corroding and pinhole leaks observed, need to be replaced

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Site - Manager	Element	Estimated Cost by Fiscal Year				Description
		2017	2018	2019	2020	
<b>Nez Perce Tribal Hatchery - NPT**</b>						
NPTH	River water pumps (2)	\$50,000				
	River water filtration system			TBD	TBD	Additional evaluation needed - Relationship of this high priority item, in association to the Snake River Basin Steelhead Kelt Reconditioning Facility Master Plan (Project #2007-401-00). Kelt decision anticipated in 2018.
	heat exchanger			TBD	TBD	Additional evaluation needed, TBD - Relationship of this high priority item, in association to the Snake River Basin Steelhead Kelt Reconditioning Facility Master Plan (Project #2007-401-00). Kelt decision anticipated in 2018.
	UV Disinfection System			\$92,000		Treatment effectiveness is affected by fine sediment. Estimated @ \$92,000. <i>Link to mission critical element (surface water filtration element)</i>
Yoosa Creek	Yoosa Creek Intake Bypass Flow			TBD	TBD	The dam structure that impounds water for the intake leaks significantly enough to reduce intake flow. NPT are evaluating the cost benefit of this need as part of hatchery evaluation, TBD.
Lukes Gulch	Paint 20' diameter Aluminum Circular Tanks (16)			\$20,000		Paint is worn through on interior surfaces and faded.
<b>Grande Ronde Supplementation</b>						
Lostine - NPT	Alarm System, Flow Detection		\$8,315			Has been partially damaged by erosion. Needs to be repaired.
Catherine Creek - CTUIR	NA					In the near term, the CTUIR annual budgets are sufficient to take care required O&M as identified in the hatchery assessments.
Upper Grande Ronde - CTUIR	Mission Critical - Raceway liners. NA					\$15,000 Covered by accord funds. In the near term, the CTUIR annual budgets are sufficient to take care of required O&M as identified in the hatchery assessments.
<b>Fall Chinook Acclimation Facilities - NPT***</b>						
Pittsburg	Water Supply and Drain Hoses			\$27,750		Hoses are getting brittle. Estimate @ \$27,750
	Feed Storage Building				\$5,625	Estimated at \$5,625
	Resident 1, Camp Trailer				\$25,500	21 years old, due for replacement. Estimated @ \$25,500
Big Canyon	Flexible Hoses for Water Supply/Drains			\$27,250		Hoses are getting brittle. Estimated @ \$27,250
	Residence 1, Park Model Trailer				\$25,500	19 years old, due for replacement. Estimated @ \$25,500
Captain John Rapids	Alarm System, Low Water Level and No Flow Detection			\$20,000		Estimated @ \$20,000
	Electrical System Improvements				\$5,000	Generator currently feeds through main breaker, no power to pumps if breaker fails. Estimated @ \$5,000
	Supplemental Oxygen System				\$10,000	Estimated @ \$10,000

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Site - Manager	Element	Estimated Cost by Fiscal Year				Description
		2017	2018	2019	2020	
Kalispel** - KT	Mission Critical - Alarm system					Additional evaluation needed, TBD - Estimated cost @ \$50,000. Original System is non-functional and no longer supported. Activities at the hatchery are dependent on a future review. This item may be funded as part of the ongoing cold-water conversion program upgrades. This program has phased out of LMB and raising triploid trout for put-and-take.
Total		\$115,00	\$176,315	\$228,200	\$118,500	
Variation Expected (+35%) with cost confirmation and installation costs.		NA	\$238,025	\$308,070	\$159,975	
Outstanding mission critical and essential elements that are dependent on further evaluations and discussions.				\$351,250	\$241,125	Totals do not include costs associated with Umatilla, NPTH (heat exchanger, filter and Yoosa Creek Intake Bypass) and Sherman (net pens). In addition, does not include Variance.
*Mission Critical Elements -- These are items that have either already failed, or failure is considered to be imminent and the failure has a direct negative effect on the ability of the facility to perform its mission.						
*Essential Maintenance/Improvements --These items are considered essential for the facility to continue to perform the mission that was originally identified as the purpose for the facility relative to the relevant BPA Program, but the need is less immediate than mission critical elements.						
** Hatchery facilities that have unresolved Mission Critical Elements that need to be addressed						
*** BPA and Lower Snake River Compensation Plan staff are currently working on determining project overlap, items listed under these facilities will be addressed once that exercise is complete.						

Attachment 1: Annual Process and timelines

Asset Management Strategic Plan - Annual Process and timelines													
Category/Update	Process	Jan.	Feb.	Mar.	Apr.	May	June	July	August	Sept.	Oct	Nov.	Dec.
Hatcheries	Confirming Monitoring and updating non-recurring elements												
	Request priorities (needs) from managers/sponsors												
	Confirmation of priority essential elements for 2019/2020												
	Confirmation (costs, permitting, environmental)												
	Subcommittee Decision												
	F&W Committee and Council												
Screens	Monitoring and updating prioritized non-recurring needs												
	Request priorities (needs) from managers/sponsors												
	Confirm priority non-recurring needs for 2019/2020												
	Confirmation (costs, permitting, environmental)												
	Subcommittee Decision												
	F&W Committee and Council												
Wildlife Lands	Lands Monitoring Assessment – remote BPA												
Annual Update to Council													