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**From:** Lee Carlson [lcarlson@yakama.com]  
**Sent:** Friday, May 20, 2005 3:11 PM  
**To:** BPA Public Involvement  
**Cc:** parker@yakama.com; ed@edsheets.com; lcarlson@yakama.com  
**Subject:** Yakama Nation comments on PFR document 5-20-2005



Yakama Nation  
comments on PFR ..

Attached please find the Yakama Nation's comments on the Power Function Review. If there are questions, please contact Steve Parker at 509-865-5121 or parker@yakama.com.

*200 page attachment  
request by e-mail to BPA Public Involvement*



Confederated Tribes and Bands  
of the Yakama Nation

Established by the  
Treaty of June 9, 1855

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May 16, 2005

Mr. Steve Wright  
Administrator and CEO,  
Bonneville Power Administration  
P.O. Box 3621  
Portland, OR 97208-3621

Dear Mr. Wright:

I am writing on behalf of the Yakama Nation to express our strong concerns about the inadequacy of BPA's proposed funding levels for the Integrated Fish and Wildlife Program. The levels that you have proposed will not make adequate progress in restoring the habitat that is critical to the wild salmon and steelhead runs that restrict Treaty-reserved tribal fisheries.

For at least the past four decades, the Yakama Nation has voluntarily imposed severe restrictions on our treaty-reserved fisheries to assist in rebuilding wild populations of salmon and steelhead. This action was taken based on the expectation that other relevant parties would also take actions to share the burden of wild stock conservation. The tribes are still waiting for these actions, particularly in the area of habitat protection and improvement. Improving habitat is the only way to rebuild to sustainable, harvestable levels those wild runs that presently constrain treaty fisheries.

Based on our analysis, BPA's level of funding would take more than 80 years to implement the habitat actions in the subbasin plans that are part of the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program; the production measures would never be completed. Even using BPA's assumptions, it would take more than 40 years to address the habitat actions. BPA's proposed level of effort increases the risk that more salmon and steelhead runs will go extinct. BPA's proposal is not consistent with the assurances by the Federal government for an aggressive effort to protect and improve habitat for wild stocks.


We have said on several occasions that we would like to work with BPA to develop a program that will meet the dual goals of delisting salmon and steelhead listed under provisions of the ESA and restoring these populations to levels that provide sustainable harvest sufficient to allow for a meaningful exercise of tribal fishing rights. Your proposal will not put us on a path to achieve these goals. If BPA fails to accept its obligations under Federal laws and its Treaty and Trust obligations, we will have no choice but to take other actions to address this issue.



We have attached detailed comments on your draft close-out letter on the Power Function Review. We have also attached previous comments on the PFR that were submitted by the earlier April 29<sup>th</sup> deadline.

If you have any questions, please contact Mr. Steve Parker at 509-865-6262.

Sincerely,



Jerry Meninick  
Chair, Yakama Tribal Council

Attachments

The Yakama Nation Comments on  
Bonneville Power Administration's Power Function Review  
Closeout Letter



May 20, 2005

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## I. Summary

The Yakama Nation is providing comments to BPA on the Power Function Review Closeout letter. This BPA process is intended to determine the costs of BPA programs for the BPA rate case that will determine BPA revenues for Fiscal Years 2007 through 2009.

Over the past eight months, the Yakama Nation has been working with other fish and wildlife managers through a workgroup of the Columbia Basin Fish and Wildlife Authority to develop the costs to fully implement the Northwest Power and Conservation Council (NPCC) Program and the Federal Columbia River Power System (FCRPS) Biological Opinions.

Working with CBFWA, we have developed the most detailed budgets ever prepared for this kind of effort<sup>1</sup>. Those budgets clearly show that implementing the subbasin plans, wildlife program, and other ongoing activities will require a significant increase in BPA funding. That should not come as any surprise. Restoring the habitat in the Columbia Basin—an area the size of France—will require a major effort.

The Yakama Nation endorses the CBFWA workgroup recommendation that BPA ramp up its funding during the next rate case from \$186 million in FY 2006 to \$240 million in FY 2009 as follows:

\$186 million in FY 2006,  
\$200 million in FY 2007,  
\$225 million in FY 2008,  
\$240 million in FY 2009.

**Benefits from fully implementing the Council Program:** These funding levels will put BPA on a path to complete implementation of most of the NPCC's Program during the next ten years. This is an essential first step in meeting the NPCC's rebuilding goals for fish and wildlife.

Implementing the subbasin plans would result in significant accomplishments:

- Protection for more than 48,000 acres of habitat;
- Improvements to more than 1,300 miles of streams;
- Construction of 1,600 miles of fence
- Enhancement activities on more than 75,000 acres of habitat;
- Correcting passage problems at more than 1,200 diversions and culverts;
- Complete 80 percent of the habitat units for wildlife, and,
- Additions or major enhancements to fish production facilities in 11 subbasins.

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<sup>1</sup> As these comments are due, the CBFWA report is going through consent review; it has been approved by the state fish and wildlife agencies in Idaho, Montana, Oregon, and Washington and all of the Columbia Basin Indian tribes, except the Coeur d'Alene, Colville, Kalispell, Kootenai, and Spokane tribes. It is our understanding that CBFWA is working with these tribes to address suggested changes.

An aggressive implementation schedule has the lowest biological risk. There are a number of listed species that are declining and at risk of extinction; improving habitat is critical for their survival. Implementing these actions quickly will save money in the long run. The costs of acquiring land or easements for riparian habitat are going up very fast.

The NPCC Fish and Wildlife Program and the FCRPS Biological Opinions rely heavily on improving habitat as off-site mitigation for the dams. These efforts are especially important to us. For at least the past four decades, the Columbia Basin Treaty tribes have voluntarily imposed severe restrictions on their treaty-reserved fisheries to assist in rebuilding wild populations of salmon and steelhead. This action was taken based on the expectation that other relevant parties would also take actions to share the burden of wild stock conservation. The tribes are still waiting for these actions, particularly in the area of habitat protection and improvement. Improving habitat is the only way to rebuild to sustainable, harvestable levels those wild runs that presently constrain treaty fisheries.

Implementing the subbasin plans will also provide thousand of jobs in rural and tribal communities in eastern Washington and Oregon and in Idaho and Montana. This is an important issue for us. In recent years, unemployment on our reservation was about 70 percent outside of the fishing season. We have worked very hard to bring that down to about 40 percent. Providing jobs to restore habitat and rebuilding our tribal fishery are very important to the Yakama Nation.

**BPA's proposal is inadequate:** Based on BPA's assumptions, it would take 22 years to implement the production measures in the subbasin plans and over 40 years to implement the fish and wildlife habitat measures based on the cost identified by the CBFWA workgroup. Under more realistic assumptions, it would take more than 80 years to implement the habitat measures and the production actions would never be implemented.

Our detailed comments document that BPA's cost assumptions are not based on the best information available and that the proposal is flawed. Specifically, we show that BPA's assumptions are unrealistically low; the proposal is not adequate to implement the NPCC Program and FCRPS Biological Opinion; the proposal does not address hatchery reform; the proposal does not address other fish and wildlife costs; and it would delay implementation of measures needed to avoid extinction of listed species and rebuild Treaty-protected resources.

Our comments also show that BPA's practice of counting the "costs" of meeting its legal requirements is flawed; that BPA is responsible for implementing the NPCC Program; and that BPA can meet its fish and wildlife obligations and continue to be competitive. We also provide comments on the importance of meeting the NPCC goals for conservation and renewable resources, our concerns about BPA's proposal to provide benefits to the Direct Service Industries, and the importance of robust risk mitigation strategies.



**Summary recommendations:** Our detailed recommendations can be found at the end of these comments, they are summarized below.

1. BPA should incorporate the cost estimates and recommendations developed by the Columbia Basin Fish and Wildlife Authority into the next rate case. These are the best estimates available. A copy of the report and recommendations are incorporated as Appendix 1 to these comments.
2. The CBFWA estimates are based on the assumption that BPA will use its borrowing authority for land and water acquisition. BPA should modify its capitalization policy to set up mechanisms to allow borrowing funds or the use of its borrowing authority to purchase land and water.
3. BPA must meet the goals of the Fish and Wildlife Program to rebuild salmon and steelhead returns above Bonneville Dam to five million by 2025. The funding recommended by the fish and wildlife managers through FY 2009 is not likely to exceed the Fish and Wildlife Program goal.
4. The Columbia Basin needs an Implementation Plan for fish and wildlife. We strongly recommend development of an implementation plan detailing the actions, schedule, and costs needed to implement the Fish and Wildlife Program, and we are committed to assist in that effort.
5. Full implementation of the F&W Program and ESA activities will create economic benefits in tribal and rural areas.
6. BPA should address the fact that there are a number of events that could significantly increase fish and wildlife funding. For example:
  - The current lawsuit against the FCRPS biological opinion could result in higher costs.
  - CBFWA assumed that other Federal agencies will fund habitat restoration on federal land. Given the tight federal budget, these costs could fall on BPA.
  - The BPA and Council have assumed that monitoring and evaluation costs will decrease. These assumptions are untested and the ESA may require more monitoring.
  - NOAA fisheries Service has said recently that the recovery plans under the ESA may go well beyond the actions called for in the subbasin plans in the Council's Program. This would add to costs.
  - When the currently favorable ocean conditions deteriorate, BPA may be called upon to fund additional activities to address weak-stock survival or productivity.
  - The costs for hatchery reforms are not addressed in the BPA estimates.
  - None of the estimates adequately address the effects of inflation. The fish and wildlife program has been flat funded for the last four year.

7. BPA needs an effective cost recovery mechanism that will ensure that it makes adequate progress in meeting the Council's goal of five million returning salmon and steelhead by 2025. During the last rate case, BPA promised the Yakama Nation that it would increase its rates if necessary to meet fish and wildlife costs. What BPA actually did was reduce fish and wildlife costs over the five year rate period and eliminated spill and flow protections in 2001.

The Yakama Nation wants to work with other fish and wildlife managers, the NPCC, and BPA to resolve these issues. If BPA refuses to meet its obligations under Federal laws and its Treaty and Trust obligations we will have no choice but to take other actions to address this issue.

## **II. Background**

### **A. Yakama Nation's Interest in Fish and Wildlife Funding**

The Yakama Nation is the largest Indian tribe in the Northwest. We are also the largest employer in Central Washington, with over 4,600 jobs in our tribal government and tribal enterprises.

The Yakama Nation also has the largest number of tribal fishermen on the Columbia River. The Nation signed a Treaty with the United States in 1855 that guaranteed our rights to fish and hunt to support our culture, religion, and tribal economy. The loss of salmon has had a devastating effect on the Yakama Nation.

The NPCC Fish and Wildlife Program and the FCRPS Biological Opinions rely heavily on improving habitat as off-site mitigation for the dams. These efforts are especially important for the Columbia Basin Treaty tribes. For at least the past four decades, the tribes have voluntarily imposed severe restrictions on their treaty-reserved fisheries to assist in rebuilding wild populations of salmon and steelhead. This action was taken based on the expectation that other relevant parties would also take actions to share the burden of wild stock conservation. The tribes are still waiting for these actions, particularly in the area of habitat protection and improvement. Improving habitat is the only way to rebuild to sustainable, harvestable levels those wild runs that presently constrain treaty fisheries.

The Yakama Nation has been waiting a long time for the United States to fulfill this commitment in our Treaty. The federal government has repeatedly asked us to reduce our harvest and promised to restore habitat to promote long-term rebuilding of salmon runs. The failure by the United States to exercise all of its authorities and powers to improve wild salmon runs has deprived the Columbia River treaty tribes of vast numbers of harvestable salmon that were guaranteed by the federal government in the treaties of 1855. It is time for the United States to start living up to this commitment.

That is why the Yakama Nation was a party in the last BPA rate case. We spent considerable resources trying to convince BPA to include sufficient funding to fully implement the NPCC Fish and Wildlife Program and the FCRPS Biological Opinion.

We are currently suing BPA in the Ninth Circuit; we believe BPA's last rate case violated the Northwest Power Act because its rates were not sufficient to meet its costs, including fish and wildlife costs, and assure repayment to the Treasury as required by the Act. That case is pending.

Now BPA is starting a new rate case. We need to ensure that BPA provides adequate funding to implement the NPCC Program, the ESA, and fulfill its treaty and trust obligations to our tribe.

## **B. The Treaty Rights of the Yakama Nation**

Since time immemorial, the Columbia River and its tributaries were viewed by the Columbia River Basin tribes as "a great table where all the Indians came to partake." *Seufert Brothers Co. v. United States*, 249 U.S. 194, 197 (1919). More than a century after the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes and Bands of the Yakama Indian Nation, and the Nez Perce Tribe signed the treaties which created their reservations, the tribes' place at the table has been subordinated to energy production and other non-Indian land and water development. Today, the Columbia River treaty tribes struggle for a very small fraction of their reserved fishing rights.<sup>2</sup> The treaties -- the supreme law of the land under the United States Constitution -- promised more.

The Columbia River treaty tribes reserved the right to fish at all usual and accustomed fishing stations "in common with" the citizens of the United States. The fishing right means more than the right of Indians to hang a net in an empty river. *Washington v. Washington State Commercial Passenger Fishing Vessel Association*, 443 U.S. 658, 679 (1979). Columbia River runs of sockeye, steelhead, coho, and spring, summer, and fall chinook salmon have declined drastically since the mid-1800's.<sup>3</sup> Where once the Columbia produced annual runs of at least 10-16 million salmon, its runs are now diminished to tens of thousands. *See generally, Confederated Tribes and Bands of the*

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<sup>2</sup> The Northwest Power Planning Council offered a conservative estimate that in the early 1800s a population of 50,000 to 62,000 Columbia Basin aboriginal peoples caught approximately 5 to 6 million fish annually, almost 97 fish per individual. COMPILATION OF INFORMATION ON SALMON AND STEELHEAD LOSSES IN THE COLUMBIA RIVER BASIN at 74. In 1990, the Yakima Nation, Umatilla Confederated Tribes, Warm Springs and Nez Perce Tribe, whose members number approximately 16,000, took only 77,000 fish, or under five fish per person. TECHNICAL ADVISORY COMMITTEE, 1991 ALL SPECIES REVIEW COLUMBIA RIVER FISH MANAGEMENT PLAN (May 10, 1991).

<sup>3</sup> A run is the annual return of adult salmon and steelhead trout. Total runs include those fish that are harvested prior to reaching any dams. *See Generally*, U.S. COMPTROLLER GENERAL, HYDROELECTRIC DAMS: ISSUES SURROUNDING COLUMBIA RIVER BASIN JUVENILE FISH BYPASSES, H.R. Rep. No. 90-180, at 8 (1990).

*Yakima Indian Nation v. Northwest Power Planning Council*, 35 F.3d 1371, 1375-79 (9<sup>th</sup> Cir. 1994) (describing the effects of the development and operation of the Federal Columbia River Power System upon the Basin's anadromous fishery resources)(hereinafter cited as *Yakima Nation*).<sup>4</sup> The devastation of fish runs has been inimical to Indian treaties and the United States' trust responsibilities to tribes.

### **C. Fish and Wildlife Related Financial Commitments**

The Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes and Bands of the Yakama Indian Nation, and the Nez Perce Tribe have adopted a salmon recovery plan entitled: *Wy-Kan-Ush-Mi Wa-Kit-Wit, the Spirit of the Salmon*. This comprehensive plan describes the actions that must be taken to restore fish and wildlife and make progress toward meeting the tribes' Treaty rights.

The Bonneville Power Administration provides significant financial capability for Columbia River salmon recovery. Our comments dated April 29, 2005 detailed the funding history by BPA; those comments are attached along with a detailed report on the funding history and incorporated in these comments by reference.

Given the overwhelming impacts of the Federal Columbia River Power System on the Basin's salmon,<sup>5</sup> this is appropriate. As discussed below, salmon stocks throughout the Columbia Basin are now listed under the Endangered Species Act. Recovery plans are in development by the National Marine Fisheries Service, Bonneville Power Administration, U.S. Fish and Wildlife Service, Army Corps of Engineers and others. During Bonneville's next rate period, federal salmon recovery strategies will be implemented. Substantial portions of their costs will be allocated to Bonneville as required by federal law. 16 USC 839b(h)(8)(B), 839b(h)(10)(C). Bonneville's rate proposal will determine its revenues through 2009—a critical period for salmon restoration. This rate case also needs to position Bonneville to be able to fund fish and wildlife restoration actions after 2009 when many of the costs of the measures being contemplated by the Federal agencies will have to be paid.

Unfortunately, the Bonneville Proposal in the Power Function Review is not adequate to rebuild salmon or fulfilling federal treaty obligations. Like the Northwest Power Planning Council in 1992, Bonneville has “sacrific[ed] the Act's fish and wildlife goals for what is, in essence, the lowest common denominator acceptable to power interests and DSIs.” *Yakima Nation*, at 1395.

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<sup>4</sup> Since publication of the opinion and the sources cited therein, Columbia River wild salmon stocks have continued to decline.

<sup>5</sup> Eighty percent of the loss of salmon from these former runs sizes is attributable hydropower development and operation. *Id.* at 1376 citing Endangered and Threatened Species; Proposed Endangered Status for Snake River Sockeye Salmon 56 Fed. Reg. 14,055, 14,058 (1991).

## **D. Bonneville's Fiduciary Responsibilities**

Bonneville's fiduciary responsibilities to the tribes' and their treaty secured interests dictate that a higher standard of care must be exercised in this proceeding as it affects these tribal interests. Bonneville, like the federal government and its agencies, is subject to the United States' fiduciary responsibilities to tribes. *See e.g., Pyramid Lake Paiute Tribe of Indians v. United States Department of the Navy*, 898 F.2d 1401, 1411 (9th Cir. 1991); *Covello Indian Community v. FERC*, 895 F.2d 581, 584 (9th Cir. 1990); *Nance v. EPA*, 645 F.2d 701, 711 (9th Cir. 1981), *cert. denied*, 454 U.S. 1081 (1981). All federal actions and the implementation of federal statutory schemes affecting Indian people, land or resources must be "judged by the most exacting fiduciary standards." *Seminole Nation v. United States*, 316 U.S. 286, 296-97 (1942). *See also United States v. Mason*, 412 U.S. 391, 398 (1973). The federal government, as "fiduciary" of tribal resources, must act with good faith and utter loyalty to the best interests of the Indians. *See Nevada v. U.S.*, 463 U.S. 110 (1983). If a statute or agreement requires federal action on behalf of tribal interests, the trust responsibility is specific and the courts generally impose a fiduciary duty on the agency to act with a high degree of care and responsibility. *U.S. v. Mitchell*, 463 U.S. 206 (1983); *Assiniboine & Sioux Tribes v. Board of Oil and Gas Conservation*, 792 F. 2d 782 (9<sup>th</sup> Cir. 1986); *Pawnee v. U.S.*, 830 F.2d 187 (Fed. Cir. 1987), *cert. denied*, 486 U.S. 1032 (1988). Bonneville's proposed funding levels for the Integrated Fish and Wildlife Program has not met its fiduciary responsibilities.

## **E. BPA's Responsibility under the Northwest Power Act**

Under the Northwest Power Act, measures to protect, mitigate, and conserve fish and wildlife damaged by the hydroelectric development and operations in the Columbia River Basin are to be paid by the Bonneville Power Administration. 16 U.S.C. 839b(h)(8), 839b(h)(10). These costs are appropriately part of Bonneville's total system costs.

Specifically, 16 U.S.C. 839b(h)(10) states:

The Administrator shall use the Bonneville Power Administration Fund and the authorities available to the Administrator under this Act and other laws administered by the Administrator to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of any hydroelectric project of the Columbia River and its tributaries in a manner consistent with the plan, if in existence, the program adopted by the Council under this subparagraph, and the purposes of the Act.

In addition, BPA, the Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission are also required to take the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program "into account at each relevant stage of decisionmaking processes to the fullest extent practicable" 16 U.S.C. 839b(h)(11)(A)(ii).



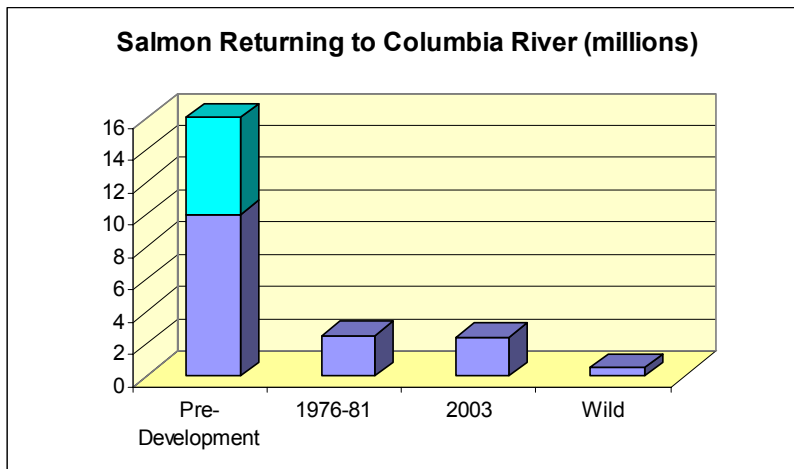
In addition, BPA must generally comply with other federal law in setting rates. “All purposes of the Northwest Power Act, together with the provisions of other laws applicable to the Federal Columbia River Power System are all intended to be construed in a consistent manner. Such Purposes are also intended to be construed in a manner consistent with applicable environmental laws.” 16 U.S.C. 839. Section 7(a)(1) of the Northwest Power Act, 16 U.S.C. 839e(a)(1), requires that rates be “established in accordance with sections 9 and 10 of the Federal Columbia River Transmission System Act (16 U.S.C. 838) [16 U.S.C. 838g and 838h], section 5 of the Flood Control Act of 1944 [16 U.S.C.825s], and the provisions of this chapter.”

## **F. BPA’s Responsibility under the NPCC Program**

### **1. Losses affected by the hydroelectric system**

In the mid 1980s, the Northwest Power Planning Council (now called the Northwest Power and Conservation Council) conducted an exhaustive study of the historical size and current status of salmon and steelhead populations. The Council also made policy decisions on what share of the losses were the responsibility of the hydroelectric system. The Council also set a goal for the Fish and Wildlife Program. BPA is the only Federal agency with statutory responsibility under the Northwest Power Act for funding the off-site measures to implement the NPCC Program.

The study examined all of the historical information on salmon runs and concluded that ten to fourteen million salmon and steelhead used to return to the mouth of the Columbia River every year. In 1976 to 1981, an average of about two and a half million fish returned to the Columbia, five hundred thousand were naturally spawning fish—eighty percent of the runs came from hatcheries.



The study concluded that salmon and steelhead populations had declined by seven to fourteen million and that natural salmon runs were less than five percent of historical levels.

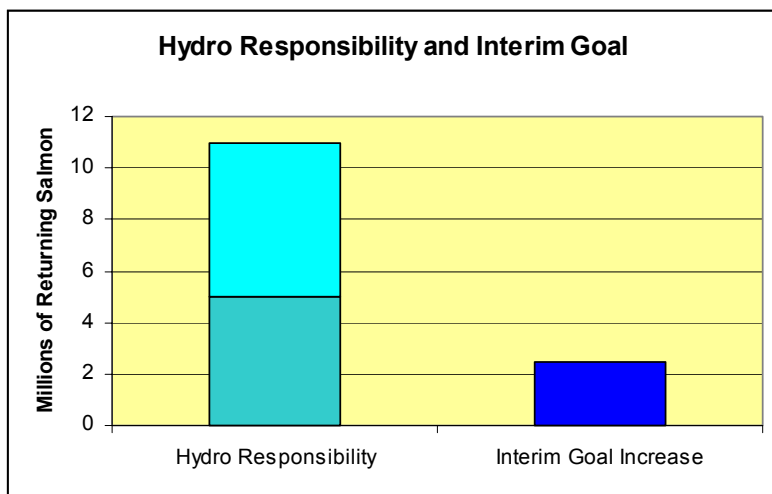
The Council concluded that the dams were responsible for five to eleven million of the fish losses. As part of the rationale for the conclusion, the study found that about four million fish had used the habitat that had been blocked by the dams and that the operations of the dams accounted for the loss of another four million salmon. The Council noted it did “not take into account the accumulation of hydropower-related losses of salmon and steelhead year by years since hydropower development started. Such cumulative losses would be far greater than 5 to 11 million adult fish.”<sup>6</sup>

## 2. NPCC 1987 Program Goal

The Council set an interim goal of “doubling the runs.” According to the NPCC, “Doubling means increasing the current run size of about 2.5 million adult fish to a run size of about 5 million adult fish, as a result of implementation of this Program. The current run size was based on the five year average prior to the NPCC’s first Program in 1982<sup>7</sup>.

The figure below shows that this interim goal was designed to rebuild salmon and steelhead runs to about one-half of the low end of the range of the hydrosystem’s responsibility. The Council said it would reevaluate a higher goal once the interim target was achieved<sup>8</sup>.

The Yakama Nation viewed the Program’s 1987 doubling goal as a compromise that would allow BPA to focus on an achievable interim goal and leave BPA’s ultimate responsibility to a future decision process.



## 3. NPCC 2000 Program Goal

In the NPCC 2000 Program the goal was revised to include three milestones.

<sup>6</sup> See 1987 Columbia River Basin Fish and Wildlife Program, page 39.

<sup>7</sup> Id., page 35.

<sup>8</sup> Id. Page 39.

- First, stop the decline of salmon and steelhead populations above Bonneville Dam by 2005.
- Second, restore the widest possible set of healthy naturally reproducing populations of salmon and steelhead in each relevant province by 2012.
- And third, increase returning salmon and steelhead to an average of five million adults returning above Bonneville Dam by 2025 in a manner that supports tribal and non-tribal harvest<sup>9</sup>.

The Program also set goals for the substitution of anadromous fish losses, resident fish losses, and wildlife losses.

The ultimate goal for the Federal government should be to address the requirements of the Endangered Species Act, the Northwest Power Act, and the Treaties, Executive Orders, and other commitments made to Indian tribes in the Columbia Basin. In the case of salmon and steelhead, we seek to implement the dual goals of recovery and delisting of salmonids listed under provisions of the ESA and the restoration of salmon populations to levels that provide a sustainable harvest sufficient to allow for a meaningful exercise of tribal fishing rights.

The Columbia River Basin Fish and Wildlife Program states:

The vision for this program is a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing the benefits from fish and wildlife valued by the people of the region. This ecosystem provides abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest and the conditions that allow for the recovery of the fish and wildlife affected by the operation of the hydrosystem and listed under the Endangered Species Act.

Wherever feasible, this program will be accomplished by protecting and restoring the natural ecological functions, habitats, and biological diversity of the Columbia River Basin. In those places where this is not feasible, other methods that are compatible with naturally reproducing fish and wildlife populations will be used. Where impacts have irrevocably changed the ecosystem, the program will protect and enhance the habitat and species assemblages compatible with the altered ecosystem. Actions taken under this program must be cost-effective and consistent with an adequate, efficient, economical and reliable electrical power supply<sup>10</sup>.

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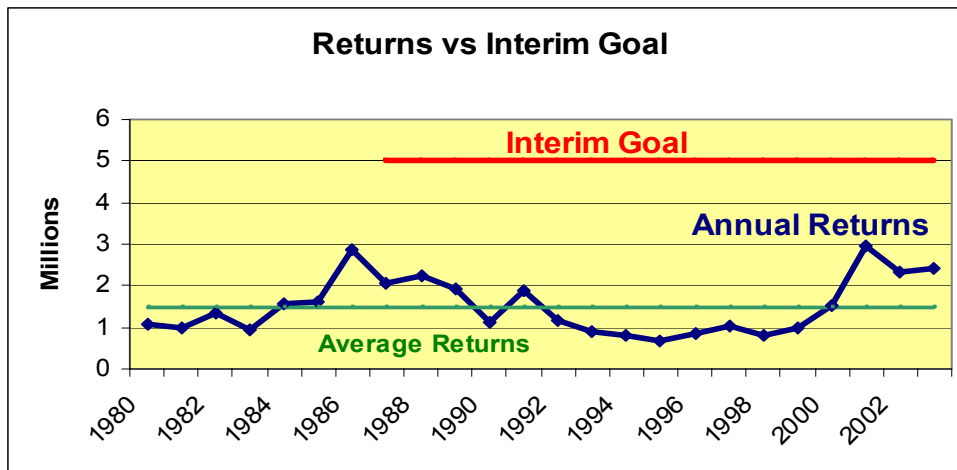
<sup>9</sup> See of the 2000 Columbia River Basin Fish and Wildlife Program, page 16 and 17.

<sup>10</sup> Id., page 13.

The Program also established a number of scientific principles<sup>11</sup>, biological objectives<sup>12</sup>, and strategies<sup>13</sup> to guide fish and wildlife restoration.

#### 4. Progress in meeting the NPCC Goal

The figure below shows that many salmon and steelhead populations actually declined in the 1990s—the average run size during the past twenty years was 1.5 million fish. The runs size in 2003 was about the same as the average between 1976 and 1981. So with conditions in the Pacific Ocean providing excellent feeding conditions for Columbia Basin salmon, we have seen the total salmon runs return to about where they were thirty years ago and wild stocks continue to decline.



A review of the status of wild salmon and steelhead listed under the Endangered Species Act shows that most listed stocks continue to decline. In a declaration by Gretchen Oosterhout, Ph.D. for the current litigation regarding the FCRPS Biological Opinion she states:

Even with adult returns for the past few years that are higher than recent averages for most (but not all) listed stocks, Columbia and Snake River salmon and steelhead still face an immediate and substantial threat to their continued existence. NMFS’ scientists’ most recent assessments of the long-term trends for Snake River steelhead<sup>1</sup>, spring chinook, and fall Chinook, and Upper Columbia River chinook<sup>4</sup> and steelheads (the upper basin ESUs) are discouraging. Although some ESUs have experienced short-term increases in adult returns, all ESA-listed ESUs are still experiencing a long-term population decline and remain at significant risk, especially in terms of abundance (number of adults) and productivity (reproductive success rate) (see Table 1; especially “BRT findings” column) (attached to these comments). The 2004 FCRPS BiOp itself shows that upper basin ESUs have fallen to such seriously low levels that only one major

<sup>11</sup> Id., page 15.

<sup>12</sup> Id., page 16-18

<sup>13</sup> Id., pages 19-33.

population group still exists for four of the 6 upper basin ESUs, and only one population exists for the other two.

In NMFS' last published report on the status of Upper Columbia River Steelhead before it issued the 2004 FCRPS BiOp, NMFS found that the level of survival improvement still required to achieve recovery targets was "high" and that "...the natural survival rate would have to increase nearly seven-fold to meet the indicator criteria under all assumptions and for all spawning aggregations" (Toole 2003, p. 8). NMFS' assessment of this ESU in the 2004 FCRPS BiOp is no more encouraging (NMFS 2004, section 8.8). "Although its status has been improving recently, most factors indicate high risk for the UCR steelhead, both range-wide and in the action area. Because of the single major population group and poor action-area status, caused largely by effects of the FCRPS and USBR projects that are included in the hydro portion of the environmental baseline (represented by the reference operation), tolerance for additional risk to this ESU is low." (NMFS 2004, p. 8-25).

Only one major population of UCR steelhead remains, and although the last few years have seen higher adult returns, its long-term trajectory is still a fairly dramatic decline (population growth rates for sub-populations of 0.63 to 0.93, depending on assumptions, with a mean of 0.76 – or a 24% long-term decline since 1980) (Toole 2003, Table 13). Based on calculations I have made using current NMFS data (discussed more fully in section II), the longterm population growth rate ( $\lambda$ ) calculated from 1980 – 2003 for this ESU overall is currently about 13% lower than when NMFS calculated it in the 2000 FCRPS BiOp.

The Snake River steelhead ESU faces a similarly serious decline. NMFS recently estimated an aggregate population growth rate of 0.73 to 0.87 (Toole 2003, Table 9), or a decline of 13% to 27% per year. This continued decline (which is approximately the same as the rate of decline NMFS calculated in 2000, see 2000 FCRPS BiOp at 9-221) is particularly discouraging since other ESUs have seen at least some improvement in long-term population trajectories from recent improved ocean survival.<sup>14</sup>

Based on the analysis of total runs size and the status of ESA listed stocks, the Federal agencies responsible for implementing the NPCC Program (BPA, the Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission) have not achieved the goals set in the 1987 and 2000 Programs.

## **G. The 2002 BPA Rate Case**

### **1. Power and Fish and Wildlife Decisions**

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<sup>14</sup> Third declaration of Gretchen Oosterhout, Ph.D. dated February 10, 2005 (attached)



BPA began its last rate case process in 1999, before decisions were made on the measures that would be included in the 2000 Biological Opinion for the FCRPS. Those rate decisions addressed BPA's revenues for FY 2002 through FY 2006. Fish and wildlife managers raised concerns that BPA's rate case decisions could foreclose fish and wildlife decisions, including the implementation of the Biological Opinion and NPCC Program by limiting funding. Federal, state, and tribal governments worked to develop 13 alternatives for future fish and wildlife funding through 2011; the costs for these alternatives averaged \$438 to \$721 million per year. BPA assured the fish and wildlife managers that it would "keep the options open" by including the range of costs in its rates. BPA also committed that it would adjust its rates, if necessary, to accommodate future funding needs.

## **2. Problems with the 2002 Rate Case Process**

BPA states that it gave equal weight to the 13 alternatives in setting its rates and assumed an average for the direct program of \$139 million per year. In the initial rate proposal, BPA stated that these assumptions would not limit actual funding.

The Columbia River Inter-Tribal Fish Commission and the Yakama Nation were parties to the rate case. We raised concerns that BPA's methodology had actually assumed a one per cent probability that costs would be at the high end of the range. We also raised concerns that BPA had changed the methodology in calculating direct fish and wildlife costs. Rather than weighting 12 of the alternatives at \$179 million per year and one alternative at \$100 million, consistent with the alternatives developed by the Federal, state, and tribal process and arriving at an equally weighted estimate of \$173 million per year, BPA averaged the high and low alternatives and assumed \$139 million per year. This assumption lowered the direct costs by \$170 million during the rate period. BPA did not dispute any of the CRITFC and Yakama contentions in the rate case.

BPA finalized its rates in 2001, and then immediately reopened its rate process to address higher costs associated with supplying power to its customers. BPA had committed to serve 3,300 megawatts of power beyond its available resources. When the manipulation of the California electricity markets caused prices to soar, BPA estimated that the added cost of serving these additional commitments was \$3.9 billion during the current rate period. These added costs were included as part of a Cost Recovery Adjustment Clause known as the load-based and financial-based CRACs.

In 2003, BPA faced additional costs associated with its own operations, the operations of the federal dams and the nuclear plant. As a result, BPA conducted a Safety Net Cost Recovery Adjustment Clause (SN-CRAC) process to address these additional costs. During that process, CBFWA provide analysis that the cost of implementing the Provincial Review would add \$100 million per year above BPA's current fish and wildlife funding. The Review was conducted by CBFWA and the NPCC and based on measures that had gone through the project review process and been approved by the Independent Science Review Panel (ISRP). BPA did not address these additional fish and wildlife costs as part of the SN-CRAC. BPA has subsequently set a cap on the direct

fish and wildlife program of \$139 million. In 2001, BPA and the Corps of Engineers eliminated fishery spill and flow provisions to ensure BPA's ability to make its payment to the U.S. Treasury.

## **H. Developing Fish and Wildlife Costs for the Next Rate Case**

### **1. Coordinating Power and Fish and Wildlife Decision Processes**

Given the problems of the 2002 rate case, fish and wildlife managers began discussions in 2003 on ways to coordinate the next BPA rate case with fish and wildlife decisions. They wanted to ensure that BPA decisions regarding its revenues after 2006 would not foreclose fish and wildlife recovery under the Northwest Power Act or the Endangered Species Act. It appeared that the Subbasin Planning Process being conducted by the NPCC and BPA could provide the information needed for the next rate case.

The NPCC's 2000 Program included a framework for fish and wildlife in the Columbia Basin and called for the development of subbasin plans that would include subbasin assessments, an inventory of existing activities, and a management plan. The management plan was required to have a vision, biological objectives for fish and wildlife, strategies that will be employed to meet the vision and biological objectives, a projected budget (including both a three-year implementation budget and more general 10-15 year budget), a monitoring and evaluation plan, and additional steps necessary to comply with the Endangered Species Act and the Clean Water Act<sup>15</sup>.

NOAA Fisheries had indicated that it could use these subbasin plans as the basis for recovery plans under the Endangered Species Act. Therefore, it appeared that these subbasin plans, scheduled for completion by May 2004, could provide detailed budgets for the BPA rate case that would begin in early 2005.

Unfortunately, most of the subbasin plans did not include budgets; we view this as a significant failure by BPA and the NPCC. To further complicate things NOAA Fisheries is working to develop recovery plans under the ESA; however, final adoption of all of the subbasin and the NOAA recovery plans will not be completed prior the initiation of the BPA rate case.

The Biological Opinion for the FCRPS also creates uncertainty for future fish and wildlife funding. CBFWA estimates that 75 percent of BPA's fish and wildlife funding goes to implement the Biological Opinion. NOAA Fisheries adopted a new Biological opinion on November 30, 2004. Several parties have filed law suits against the new Biological Opinion; the briefing schedule for this case could result in a decision in the spring of 2005.

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<sup>15</sup> See Columbia River Basin Fish and Wildlife Program, document 2000-19, pages 39-41.

BPA and the Council began meeting in the fall of 2004 to review the major budget categories and identify the factors that may increase or decrease costs in the future. In November of 2004, CBFWA formed a workgroup to coordinate the development of fish and wildlife costs for the next BPA rate case. The workgroup reported to the Members Management Group in December and made the following recommendations:

1. The fish and wildlife managers should review the assumptions made by the Council and BPA about future fish and wildlife costs.
2. The fish and wildlife managers should prepare fish and wildlife costs based on the subbasin plans. The primary focus of this work would be in the areas of habitat and production.
3. The fish and wildlife managers should work with BPA to design ways to provide flexibility to adjust fish and wildlife funding as information on the Biological Opinion, subbasin plans and recovery plans becomes available to ensure that BPA can fully implement these important plans.

The report developed by the CBFWA workgroup is discussed below.

### **III. BPA's Proposed Funding is Not Adequate**

#### **A. BPA costs assumptions are not based on the best information available**

In the fall of 2004, the Columbia Basin Fish and Wildlife Authority, the organization that represents all of the fish and wildlife managers in the Columbia Basin, formed a workgroup to develop cost estimates for the habitat and production portions of the BPA Integrated Fish and Wildlife budget. The workgroup worked with fish and wildlife managers that had been active in the development of the subbasin plans and wildlife plans developed for the NPCC Fish and Wildlife Program.

The workgroup compiled the cost estimates for 30 subbasins into province level costs; where costs were not available for a subbasin, the workgroup extrapolated costs from similar subbasins based on land area. The workgroup incorporated the production and habitat costs into the other costs estimates that had been developed by the NPCC and BPA to develop an overall budget for the Integrated Fish and Wildlife Program.

The CBFWA workgroup circulated its draft report in beginning in January of 2005 to the fish and wildlife managers, NPCC staff, BPA, utilities, and others. The workgroup incorporated all of the comments it received and the review process improved the quality of the analysis.

Based on our participation in this process, we believe that the CBFWA workgroup report is the most detailed estimate of the costs of implementing the NPCC Fish and Wildlife Program and the FCRPS Biological Opinions available. In fact, it is the most detailed estimate ever produced on this issue. The Yakama Nation provided this report to BPA staff several times, including in our April 29, 2005 comments on the PFR. We have

attached the CBFWA workgroup report and incorporate it in these comments by reference.

Unfortunately, it appears that the BPA proposal in the PFR closeout letter ignores the CBFWA workgroup report. The only reference to the CBFWA work misstates the conclusions of the report and appears to use the wrong cost figure from an early draft that is twice as high as the CBFWA workgroup recommendation.

## **1. CBFWA Cost Report is the best information available**

The CBFWA workgroup report is based on the detailed analysis of the fish and wildlife managers of the production and habitat costs associated with implementing the NPCC Fish and Wildlife Program and the FCRPS Biological Opinion. The report includes detailed appendices on the costs for 30 subbasins as well as detailed estimates of the costs of the wildlife mitigation needed.

The workgroup specifically requested comments on whether there were any better assumptions or costs for the report. We incorporated the best information available into the final report. We did not receive any analysis from BPA that provides alternative costs for implementing the subbasin plans and other elements in the Program and Biological Opinion.

The workgroup found that the total cost of implementing the habitat and production activities was \$1.5 billion and the cost of wildlife mitigation was \$300 million over the next ten years.

Based on this work, CBFWA wrote to BPA and the NPCC on March 16, 2005 to support adequate funding for fish and wildlife in the next rate case. The letter states:

While CBFWA Members are continuing to review the detailed costs, the analysis completed to date provides a strong basis for increasing the funding for BPA's Integrated Program in the next rate case period to at least \$240 million per year. This figure assumes that BPA would use its borrowing authority for new production facilities and the acquisition of land and water to protect habitat. It also does not include a comprehensive assessment of costs for mainstem measures beyond those contemplated in the Updated Proposed Action or the NPCC Program. Additional mainstem measures are necessary to protect, recover, and restore anadromous fish impacted by the federal hydrosystem. Consistent with recommendations the Members have made in the past, the analysis supports the need for BPA to begin to ramp up efforts by returning to the funding levels originally assumed in the 2002 rate case. BPA set its rates and has been collecting revenues on the assumption that funding for the Integrated Program would be \$186 million per year. It is important to increase funding in FY 2006 to at least this level.

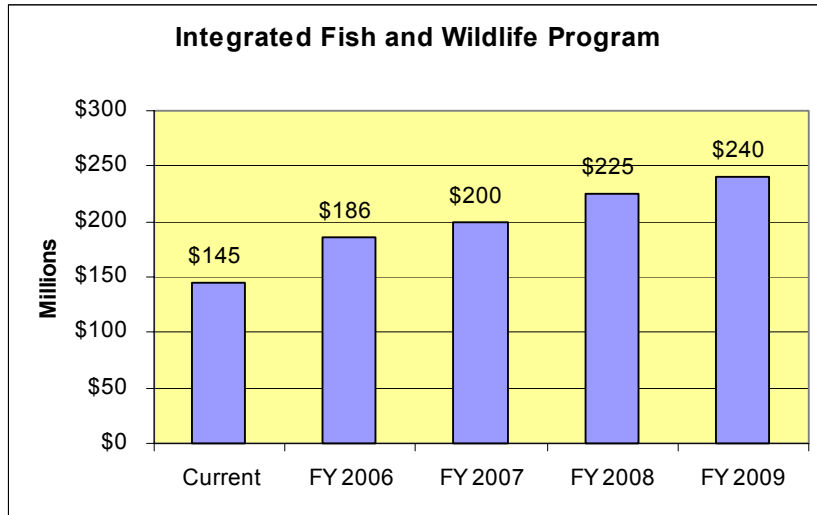
Based on our work to date, it is clear that the current spending levels are inadequate to protect, mitigate, and enhance fish and wildlife under the Northwest Power Act. Our analysis shows that at the current spending levels, it would take over 100 years to implement all the measures contemplated in the NPCC Program.

A copy of the letter is attached to our comments.

We believe that most fish and wildlife managers support the concept of putting a higher percentage of the funding on-the-ground. BPA has proposed that 70 percent of the funding go to on-the-ground projects, 25 percent to research, monitoring and evaluation, and five percent to coordination activities. This allocation will be difficult to reach without either: making difficult cuts to specific programs or eliminating them; or, increasing funding for on-the-ground activities. The CBFWA workgroup budget would put 80 percent of the funds on-the-ground.

## 2. CBFWA Proposal for the rate case is realistic

A key issue was the pace of implementation for the habitat and production activities. The CBFWA workgroup developed recommendations that would ramp up costs over the next four years. This would provide time to build the necessary staffing, programs, and other infrastructure for implementing the strategies in the NPCC Program. The workgroup recommended that FY 2006 funding should be \$186 million—this is the level originally assumed in the 2002 Rate Case; we also understand that it is the approximate planning target being used by the BPA fish and wildlife division. The workgroup recommended that funding should ramp up to \$200 million in FY 2007, \$225 million in FY 2008, and \$240 million in FY 2009.



This funding level would put the region on a path to implement the subbasin plans in about ten years. This pace of implementation would have much lower biological risk to



listed species and offers some hope of progress on restoring the treaty fisheries of the Columbia Basin Indian tribes.

These recommendations would minimize biological risk to species in the Columbia River Basin; BPA should implement actions to provide the habitat conditions that these species need to survive as soon as possible. Many of the ESUs listed under the ESA have growth rates ( $\lambda$ s) that are less than 1.0—that means these populations are not replacing themselves and will continue to decline toward extinction.

The costs of acquiring or leasing land and water to protect and enhance habitat will continue to increase as human population grows. We project that these costs will increase significantly faster than inflation, especially the acquisition of land in riparian areas to protect habitat.

Therefore, we conclude that a ten-year implementation schedule for the subbasin plans has the lowest biological risk and the lowest long-term costs. We also note that implementation of the subbasin plans represents a small portion of the habitat protection and enhancements needs in the Basin. The CBFWA workgroup did a course grain analysis of the total habitat work needed to protect and enhance habitat and found that this effort would be significantly larger than the work identified in the subbasin plans. Completing the subbasin plans as quickly as possible will provide a good start to the long-term habitat work that is likely to be needed to meet our goals.

On May 19, 2005, the Affiliated Tribes or Northwest Indians adopted a resolution supporting these funding levels for the rate case. A copy of the resolution is attached.

### **3. Implementation would provide significant benefits**

Implementing the subbasin plans in the Council Program would provide protection for more than 48,000 acres of habitat; improvements to more than 1,300 miles of streams; enhancement activities on more than 75,000 acres of habitat; and, correcting passage problems at more than 1,200 diversions and culverts. The CBFWA recommendations would complete 80 percent of the habitat units for wildlife.

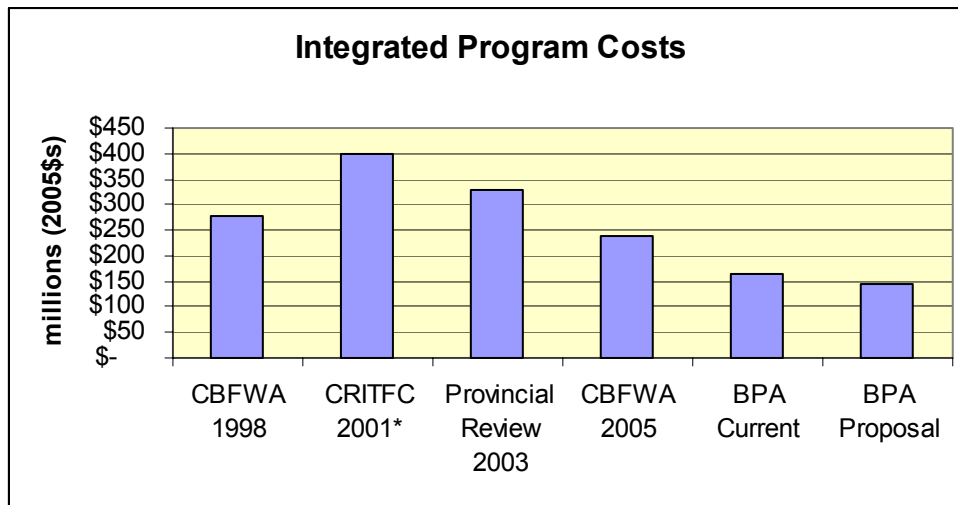
### **4. Comparison of CBFWA costs to previous estimates**

CBFWA has developed two previous fish and wildlife cost estimates. The first was in 1998 as part of the Multi-Year Implementation Plan. This effort developed costs for implementing all of the elements of the Council Program and FCRPS Biological Opinion. The annual costs were \$200 to \$225 million (approximately \$275 million adjusted for inflation to 2005 dollars).

In 2003, CBFWA and the Council conducted the Provincial Review to determine the costs of implementing projects that had been approved by the fish and wildlife managers, the Council, and the Independent Science Review Panel. The Provincial Review identified BPA revenue requirements (capital, reimbursable costs, and direct program) of

\$310 million per year for FY 2003 through FY 2006 (approximately \$329 million adjusted for inflation to 2005 dollars).

CRITFC, the Oregon NPCC office, and the Yakama Nation also developed estimates of the costs of implementing the 2000 FCRPS Biological Opinion and NPCC Program in January of 2001. This estimate was based on more aggressive habitat restoration activities to implement the “Aggressive Non-Breach Alternative” in the Biological Opinion and had an annual cost of \$356 million (approximately \$400 million adjusted for inflation to 2005 dollars). This figure assumed that all of the costs would be expensed; if CRITFC had assumed that some of the costs would be capitalized, the estimate would be similar to the recent CBFWA costs. The following figure has been adjusted for inflation and shows that BPA has never provided funding at the levels recommended by the fish and wildlife managers.

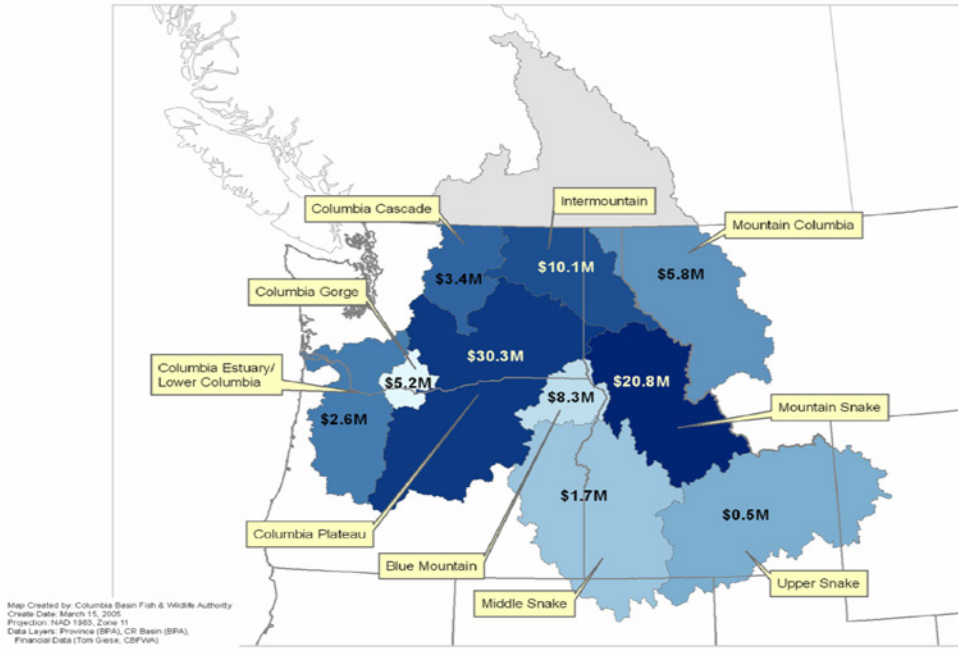


## 5. Economic impacts

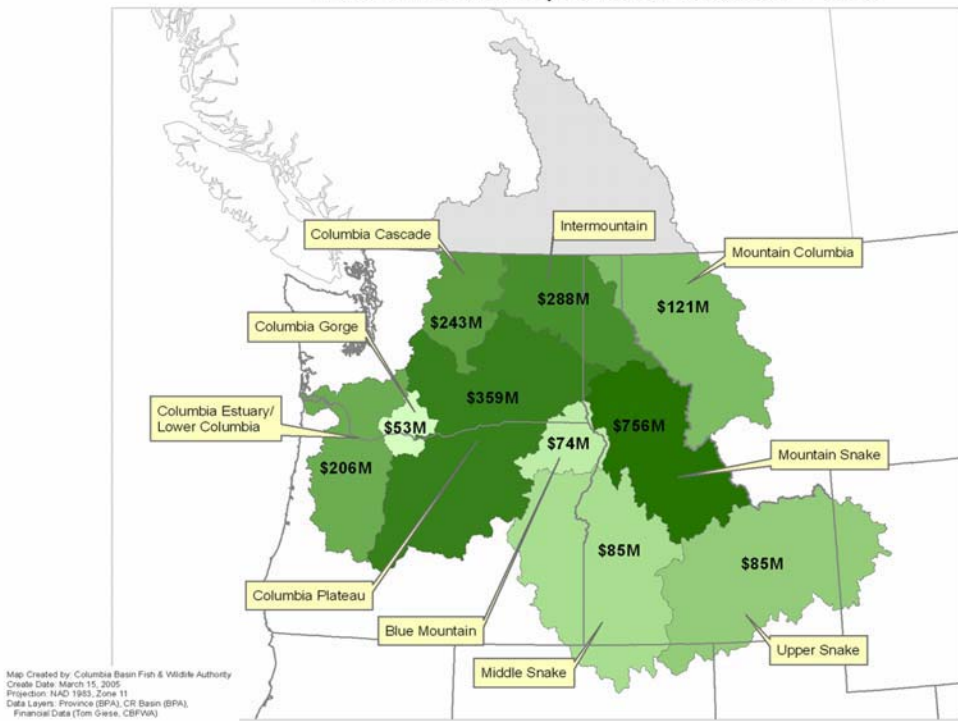
Most of the fish and wildlife activities would be implemented in rural areas east of the Cascade Mountains (Figures 1 and 2). Figure 1 shows the geographic distribution of BPA average annual fish and wildlife spending from its Integrated Program budget for the Fiscal Years 2001 through FY 2004. These investments pay salaries and purchase materials creating additional jobs and economic activity. Figure 2 shows the geographic distribution of estimated ten-year investments in implementing the NPCC subbasin plans. The effects of these investments can be expected to ripple through the tribal and rural economies, creating thousands of additional jobs and significant economic activity.

As fish and wildlife populations increase as a result of these BPA investments, east-side tribal and rural areas will experience increased spending by fishers, hunters, and recreationalists creating additional jobs and economic benefits. For example, in 2001, as a result of previous investments in salmon mitigation and improvements in ocean conditions, salmon runs increased sufficiently for Idaho to open a recreational fishing season on salmon.

**Figure 1. BPA Fish and Wildlife Average Investment (FY2001-04)**



**Figure 2. Estimated Future Fish and Wildlife Investment to Implement Subbasin Plans**



The Idaho Department of Fish and Game examined the economic benefits of the 2001 salmon season and found that the increased fish opportunity was responsible for almost \$90 million in expenditures. These expenditures were split evenly between the local river communities and the rest of the state. However, impacts were more significant in the smaller local economies. Angler expenditures in Riggins, Idaho (on the Salmon River) during the salmon fishing season stimulated 23 percent of the town's annual sales.

The budget levels recommended here would result in customers served by utilities purchasing all of their power from BPA paying about \$1.00 per month more. The impact to those served by utilities that purchase less than their full requirements from BPA would be less.

As a rule of thumb, BPA assumes that every \$85 million represents 1 mill or \$0.001 per kilowatt hour on BPA's wholesale power rates for full requirements customers. The CBFWA recommendations for FY 2007 through FY 2008 average \$80 million more than current spending or approximately \$0.001 per kilowatt-hour. The average residential consumer uses about 1,100 kilowatt-hours per month; therefore the fish and wildlife cost increase represents about \$1 per month for the average residential customer served by a utility that purchases all of its power from BPA. BPA provides approximately 40 percent of the electricity used in the Pacific Northwest; the impacts for 60 percent of the region's residential consumers would be less than \$1 per month.

Therefore, the Yakama Nation recommends that BPA also consider the important benefits to rural economies of its investments in fish and wildlife while considering the costs of the actions.

## **B. BPA's proposal for the Integrated Program is flawed**

### **1. BPA ignored information on the Integrated Program components.**

BPA worked with staff at the NPCC and CBFWA to develop information on the average funding, fixed costs, and drivers that could increase or decrease the various compartments that comprise the Integrated Program. The CBFWA workgroup views on whether these costs would increase or decrease can be found in Table 1 of the attached CBFWA workgroup report.

The table shows that the fish and wildlife managers assumed that information management, coordination and administration would increase by approximately \$4.5 million; there would be no net change in research and monitoring; that there would be minor reductions in research; and mainstem programs would increase by \$2 million. CBFWA also identified large increases in production and habitat.

The BPA proposal includes significant reductions in research, monitoring, evaluation, information management, coordination, and management.

## 2. BPA ignored information from the tribes

The Yakama Nation, the Columbia River Inter-Tribal Fish Commission, and other tribes provided detailed comments by BPA's deadline of April 29<sup>th</sup> for material that would be considered prior to the development and release of the BPA draft closeout letter. Copies of the comments are attached.

The draft close out letter makes no reference to the information, analysis, comments, or concerns raised in the tribal comments. This failure clearly does not address BPA's fiduciary and Trust responsibilities to the tribes.

## 3. BPA's proposed cost assumptions are unrealistically low

**Research, Management, and Evaluation:** BPA has assumed a reduction of \$8 million from the average funding in FY 2001-FY2004. When adjusted for inflation from 2001 to 2008 (the middle of the next rate period), the reduction in the current service level is \$12 million—a real reduction of approximately 30 percent. BPA has not provided any details on the RM&E activities that would be reduced or eliminated.

Given the requirements for these activities in the FCRPS Biological Opinions, the recommendations of the Independent Science Review Panel, and the recommendations of the CBFWA workgroup, the reductions that BPA has assumed are unrealistic.

**Information Management, Coordination, and Administration:** BPA has proposed a reduction of \$2.9 million. Adjusted for inflation, this is a real reduction of \$5.2 million. Currently funding for the information management, coordination and administration portion of the budget is used for: StreamNet (\$2.4 million/year), the PIT tag info system (\$2.1 million/year), CBFWA (\$1.7 million/year), the Fish Passage Center (\$1.3 million/year), the ISRP/ISAB (\$1.1 million/year), CRITFC watershed support (\$0.27 million/year), Second-Tier Database (\$0.24 million/year), Columbia Basin Bulletin (\$0.17 million/year), and one-half million in miscellaneous small projects. We find it unlikely that the region collectively, or BPA unilaterally, will decide to eliminate and/or substantially cut these efforts in sufficient time to realize the projected reductions by FY 2009.

At the NPCC meeting on May 11<sup>th</sup>, Greg Delwiche indicated that BPA was assuming that StreamNet and the PIT tag info system were moved to research, monitoring, and evaluation. This assumption makes the cuts in RM&E even deeper and does not address the reduction in current IMCA services due to inflation.

We also note that BPA's proposal acknowledges the many additional steps that must be negotiated before funding decisions will be made. This will delay decisions to reduce current RM&E and IMCA costs at least until FY 2008, mid-way through the rate period.

**Mainstem:** BPA's proposal would reduce these activities by \$700,000; however, adjusted for inflation the real reduction would be approximately \$1.8 million per year.



BPA's assumptions run counter to the increased requirements for mainstem activities in the Biological Opinion and the NPCC mainstem amendments. BPA has not provided any basis for its funding level; there is no relationship to the cost estimates developed by the CBFWA workgroup.

**Production:** BPA assumes a \$2.3 million increase for production; without inflation, this funding level would mean that the production activities identified in the subbasin plans would take approximately 22 years to complete. However, adjusted for inflation BPA's proposal is actually a \$6 million reduction in current services levels. This raises a concern about maintaining current activities and would leave no additional funds for new production strategies called for in the subbasin plans. BPA has not provided any basis for its funding level; there is no relationship to the cost estimates developed by the CBFWA workgroup.

**Habitat:** BPA's proposal shows an increase of approximately \$12.7 million for current habitat and new Biological Opinion and subbasin plan implementation. Using BPA's assumption of a 1.5 percent inflation rate, this is a real increase of approximately \$8.8 million. Using a more realistic inflation rate for the cost of land and water acquisitions and easements of 6 percent the real purchasing power is actually reduced by \$5 million per year. BPA has not provided any basis for its funding level; there is no relationship to the cost estimates developed by the CBFWA workgroup.

It is important to note that the ongoing costs (operations and maintenance, etc.) for habitat activities are approximately \$12 million per year. Therefore, with modest inflation it would take about 45 years to implement the strategies in the subbasin plans based on the costs identified by the CBFWA workgroup; this assumes that there would still be habitat available for purchase in forty years. Using more realistic inflation assumptions, BPA's proposed pace of implementation would take 75 years to complete these strategies.

**Efficiencies:** BPA appears to rely on the assumption that there are a number of projects that are unnecessary in the Integrated Program and it can reprogram funding from such projects. The NPCC, CBFWA, and ISRP went through an exhaustive effort as part of the Provincial Review in 2003 to evaluate all of the ongoing and proposed activities for the Integrated Program. The Provincial Review identified funding needs of approximately \$300 million per year, yet BPA has capped funding at \$139 million. The priority setting process has carefully reviewed the priorities and effectiveness of the current activities; assumptions that there are a number of unnecessary projects that can be cut is unrealistic.

#### **4. BPA's proposal is not adequate to implement the Program and Biological Opinions**

The Yakama Nation has analyzed the BPA proposal for the Integrated Fish and Wildlife Program and concluded that it is not adequate to implement the NPCC Columbia River Basin Fish and Wildlife Program and the FCRPS Biological Opinion in a timely manner.

BPA and the other Federal agencies have already failed to meet the first Program milestone: “stop the decline of salmon and steelhead populations above Bonneville Dam by 2005”.

Our analysis shows that under the best case assumptions (BPA can cut RM&E and IMCA and there is no inflation) the levels that BPA has proposed would take 22 years to implement the production strategies in the NPCC subbasin plans and over 40 years to implement the fish and wildlife habitat strategies. Even under these BPA assumptions, it would not “restore the widest possible set of healthy naturally reproducing populations of salmon and steelhead in each relevant province by 2012...and increase returning salmon and steelhead to an average of five million adults returning above Bonneville Dam by 2025 in a manner that supports tribal and non-tribal harvest”. This pace clearly does not address BPA’s Treaty and Trust responsibilities. Without adequate progress to rebuild wild stocks, the Treaty-protected Tribal harvest will continue to suffer.

Under more realistic assumptions (factoring in inflation and continuing the current level of effort for research, monitoring, evaluation, information management, coordination, and administration) the habitat work would take more than 80 years and the additional production activities would never be complete at the pace that BPA is proposing. Under these assumptions, BPA would clearly not achieve the NPCC objectives and it is likely that more listed wild salmon and steelhead runs will go extinct.

Neither BPA’s assumptions nor the more realistic analysis would meet BPA’s Treaty and Trust obligations.

**BPA proposal:** Table 1 shows the average funding for each compartment of the Integrated Program for FY 2001 to FY 2004. It also shows the BPA proposal and the difference. The final column shows the number of years to complete the activities in the subbasin and wildlife plans based on the costs identified by the CBFWA workgroup. It shows a net increase of \$3.4 million, with reductions in most categories and increases in habitat and costs for the new biological opinion and subbasin plans.

**Table 1: BPA Proposal**

	FY 2001-2004			Complete Program
	Average	Proposal	Difference	
RM&E	\$ 41,000,000	\$ 33,000,000	\$ (8,000,000)	
IMCA	\$ 9,900,000	\$ 7,000,000	\$ (2,900,000)	
Production	\$ 36,100,000	\$ 38,400,000	\$ 2,300,000	22 years
Mainstem	\$ 6,000,000	\$ 5,300,000	\$ (700,000)	
Habitat	\$ 35,800,000	\$ 38,500,000	\$ 2,700,000	
New BiOp/SBP	\$ -	\$ 10,000,000	\$ 10,000,000	43 years
BPA Overhead	\$ 11,000,000	\$ 11,000,000	\$ -	
<b>TOTAL</b>	<b>\$ 139,800,000</b>	<b>\$ 143,200,000</b>	<b>\$ 3,400,000</b>	

**More realistic assumptions for the BPA proposal:** Table 2 makes changes to several assumptions. First, we have added inflation to the current funding levels for FY 2001 to FY 2004. We used the inflation factors that BPA provided during the PFR workshops: 1.5 percent per year for activities that have less energy and salary components and 3

percent per year for activities with greater energy and salary components. We note that this calculation is conservative because it uses BPA's assumption that the cost of habitat will increase at 1.5 percent per year. In reality, the costs of acquiring riparian land or easements and water have increased much faster. Table 2 also assumes that RM&E and IMCA will continue at their current service levels for FY 2007-FY 2009. To keep the total funding the same, we assumed that inflation and the additional RM&E and IMCA costs would have to come out of habitat work (this has been our experience since 1981).

**Table 2: BPA Proposal with Inflation and Funding Adjustments\***

	<b>FY 2001-2004 Average (\$'08)</b>	<b>Proposal</b>	<b>Difference</b>	<b>Complete Program</b>
<b>RM&amp;E</b>	\$ 45,503,641	\$ 45,503,641	\$ -	
<b>IMCA</b>	\$ 12,175,751	\$ 12,175,751	\$ -	
<b>Production</b>	\$ 44,398,447	\$ 38,400,000	\$ (5,998,447)	<b>Never</b>
<b>Mainstem</b>	\$ 7,132,115	\$ 5,300,000	\$ (1,832,115)	
<b>Habitat</b>	\$ 39,732,448	\$ 30,800,000	\$ (8,932,448)	
<b>New BiOp/SBP</b>	\$ -		\$ -	<b>84 years</b>
<b>BPA Overhead</b>	\$ 12,208,294	\$ 11,000,000	\$ (1,208,294)	
<b>TOTAL</b>	<b>\$ 161,150,696</b>	<b>\$ 143,179,393</b>	<b>\$ (17,971,303)</b>	

\*Inflation over 7 years and current level of effort for RM&E and IMCA

Table 2 shows that the effects of inflation actually reduce the level or effort by approximately \$18 million from current service levels. Reallocating habitat funds to cover inflation and more realistic assumptions about RM&E and IMCA means that it would take more than 80 years to implement the habitat strategies in the NPCC Program based on the CBFWA workgroup cost estimates; the production strategies would never be completed because these activities are significantly reduced when adjusted for inflation.

## **5. BPA's proposal does not address hatchery reform**

BPA has assumed \$250,000 per year for hatchery reform through FY 2009. This assumption may be sufficient for planning, but would not allow any progress toward actually implementing these reforms. NOAA Fisheries and the NPCC have spent significant time and resources developing APRE and HGMPs to address the requirements of the Biological Opinion and NPCC Program. Under BPA's assumptions, none of the required reforms would start implementation until FY 2010.

We have developed an initial cost estimate based on the mid-point of the cost range indicated for the "reform" actions identified by the NOAA Fisheries Service process. BPA's proposal fails to address the likelihood that the hatchery reform decisions will be made in the next few years and implementation will need to start during the FY 2007 to FY 2009 rate period.

## Estimated Costs for Hatchery Reform (\$millions)

Province	Expense	Capital
Estuary	\$11.825	\$24
Lower Columbia	\$42.125	\$114
Gorge	\$37.125	\$43
Plateau	\$7.500	\$ 74
Blue Mountain	\$5.775	\$ 26
Mountain Snake	\$15.175	\$ 56
Columbia Cascade	\$10.350	\$ 3
	\$123	\$340

This estimate assumes:

- Facilities that cost less the \$1 million are considered Capital.
- The reform plans assume that recommended actions must have general agreement.
- We have attempted to remove duplicate actions.
- As a general observation, O&M costs of new facilities are not fully represented and in many cases are not even included. Thus, the expense portion is low.

### **6. The BPA does not addressed other fish and wildlife costs**

We also believe that BPA’s draft proposal does not address a number of important uncertainties that could increase its fish and wildlife costs. When CBFWA conducted a review of the costs of future fish and wildlife activities, the workgroup identified a number of issues that could significantly increase those costs. For example:

1. The CBFWA workgroup cost analysis assumed that other branches of the federal government would provide contributions. For example, the costs for implementing plans in several subbasins (notably those in the Intermountain Province) assume funding from the federal land management agencies that may or may not be forthcoming. If additional Federal appropriations are not available, the region will need to address how to accomplish this work.
2. NOAA Fisheries staff has indicated on several occasions that implementing the subbasin plans may not address all of the activities in the forthcoming recovery plans.
3. Pending litigation on the current Biological Opinions may result in significant changes in required fish and wildlife activities, and may increase costs or affect revenues.
4. Implementation of the “Mainstem Amendment” to the NPCC Fish and Wildlife Program may increase costs or affect revenues also.
5. When the currently favorable ocean conditions deteriorate, BPA may be called upon to fund additional activities to address weak-stock survival or productivity.
6. The prospect of shifting the cost of the Mitchell Act hatcheries to BPA is a substantial uncertainty, considering Congress's previous interest in this issue and increasing pressures on the federal budget.

Given this analysis, the Yakama Nation is concerned that the BPA proposal for the Integrated Fish and Wildlife Program is not adequate to implement the Council Program and the Biological Opinions. Failure to make adequate progress could increase the risk of extinction for listed species and makes it unlikely that the region will achieve the fish and wildlife rebuilding goals in the Council's Program.

## **7. BPA's Proposal would delay implementation**

On page 22 of the draft closeout letter, BPA lists a number of steps to refine the activities that it will fund in the future. It concludes the list with the assessment that "Many of these issues will be addressed in the next two years, through, most likely a project selection process or a Council Program Amendment process."

The listed activities are not a prerequisite for sizing the Integrated Program in FY 2007 through FY 2009; the cost identified by the CBFWA workgroup report provides sufficient detailed justification to size the level of effort.

Moreover, the issues BPA identifies should be addressed early in FY 2007. Failure to provide adequate funding in the FY 2007 through FY 2009 rate period will result in a delay until at least FY 2010.

## **IV. BPA analysis of the "costs" of operations to meet legal requirements is flawed**

### **A. BPA's approach is not consistent with the Northwest Power Act.**

BPA states that its combined net costs include a little more than \$300 million for hydro system operations for fish and wildlife. BPA counts the revenue foregone from operating the FCRPS to meet the requirements of the Endangered Species Act, the Northwest Power Act, the Clean Water Act, and other laws and regulations as a part of these costs.

Section 16 U.S.C. 839b(h)(6)(E) requires the NPCC to include measures in the Program that:

- (i) provide for improved survival of such fish at hydroelectric facilities located in the Columbia River system; and
- (ii) provide flows of sufficient quality and quantity between such facilities to improve production, migration, and survival of such fish as necessary to meet sound biological objectives.

The NPCC Program includes these measures.

In addition, the FCRPS Biological Opinion requires specific flow and spill operation to ensure that the operation of the FCRPS does not jeopardize the continued existence of listed species under the ESA.

It is important to note that the flow targets in the Program and Biological Opinion are constrained by the current configuration of the hydroelectric system. Average spring flows in the Columbia before the dams was 450,000 cubic feet per second. The current target is 200,000 cubic feet per second—less than half the historical average. Unfortunately, the FCRPS has not been successful in meeting the Columbia and Snake River flow targets about 40 percent of the time.

We are not aware of other businesses or government agencies that calculate the revenues or profits that they could have made if they had violated Federal laws, regulations, or court orders as a part of foregone revenue and “costs”. This is exactly what BPA is doing.

### **B. BPA’s approach is not consistent for other federally authorized purposes**

Given BPA’s practice of reporting foregone revenue for fish and wildlife protection, it is interesting that BPA does not report the foregone revenue associated with meeting other legal constraints on power generation such as providing irrigation water, flood control, transportation, or recreation. All of these other federally-mandated actions limit the ability to generate electricity and reduce BPA’s potential revenue. Hence, to be consistent, BPA would need to count them as “costs” as well.

For example, the Northwest Power and Conservation Council has calculated that the 14.4 million acre-feet withdrawn for irrigation could generate an additional 625 average megawatts if the water remained in the river. At BPA’s rates, this additional power would be worth \$170 million per year or \$1.7 billion dollars over 10 years. At average market rates, the foregone revenue would be \$280 million per year—about the same as BPA’s estimate of the “foregone revenue cost” of its fish and wildlife operations. At the market prices that are projected for this summer, the lost revenue associated with irrigation withdrawals would be over \$380 million. BPA does not count these “costs.”

The Yakama Nation has requested on numerous occasions that BPA stop its practice of singling out the costs of meeting one of the purposes of the dams—fish and wildlife—in reporting foregone revenue. We believe that BPA does not need to report the costs of operating the FCRPS to meet Federal laws and regulations. If BPA believes it is required to report these costs, then we formally request that it calculate the costs of each of the other purposes of the dams and report all of them on a consistent basis.

### **C. BPA’s calculation of foregone revenue is flawed**

In the BPA handouts for the PFR, BPA calculated that the average “cost” was \$357 million per year. We assume that this average includes the very high costs that BPA



reported for 2001. We continue to be concerned that BPA does not count the credits that it receives for these operations. Since BPA started taking these credits in 1994, it has reduced its U.S. Treasury repayments by more than \$1 billion, yet it does not offset the “costs” with the credits. Finally, BPA did not share its methodology in calculating the operations “costs”. When we used the NPCC model using BPA’s wholesale power rate as the foregone revenue, the “costs” appears to be closer to \$280 million.

#### **D. Foregone salmon**

The NPCC found that 5 to 11 million of the salmon lost each year (compared to the predevelopment period) were attributable to the hydroelectric system. Based on this estimate, the Columbia River Indian tribes and others have “foregone” 340 to 750 million salmon and steelhead since the dams were built.

Salmon and steelhead are invaluable to tribal culture and religion—we would not put a price on this loss. Non-tribal economists, on the other hand, would probably value the annual losses in the billions of dollars and the cumulative losses in the trillions of dollars.

We offer this observation to provide perspective and to reinforce the importance of the Federal government in honoring its treaty and trust obligations to the tribes.

### **V. BPA is responsible for implementing the Council Program**

In BPA’s response to CBFWA dated April 22, 2005, BPA contends that it is not responsible for the full implementation of the subbasin plans in the NPCC Fish and Wildlife Program:

Because the causes of fish and wildlife decline within individual subbasins go well beyond the impacts of the existence and operation of the federal hydrosystem, it is inappropriate to sum-up all future potential subbasin mitigation strategy costs and attribute these to a category of potential BPA “offsite mitigation” responsibilities. Consequently, we believe the funding estimates you have provided perpetuate a point-of-view: that the fundamental function of subbasin plans is to guide only BPA spending.

#### **A. BPA’s Position is not consistent with the Northwest Power Act or the NPCC Program**

The Yakama Nation views this issue in the context of the Northwest Power Act. Under Section 4(h)(10) of the Act, BPA must use its fund consistent with the Council Program. Section 4(h)(11) of the Act also requires that BPA, the Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission must also take the Program

into account at each relevant stage of decision making to the maximum extent practicable.

The NPCC Fish and Wildlife Program relies heavily on off-site habitat and production strategies to partially offset the mortality associated with mainstem passage and the loss of habitat caused by the dams. We believe that under the Northwest Power Act, BPA is responsible for implementing the off-site actions necessary to achieve the NPCC Program goal. There are no other Federal agencies that have this responsibility.

In the mid-1980's the Council went through an extensive public decision process to identify the loss of salmon and steelhead. The study concluded that salmon and steelhead populations had declined by seven to fourteen million and that natural salmon runs were less than five percent of historical levels. The Council concluded that the dams were responsible for five to eleven million of the fish losses. The Council set an interim goal of "doubling the runs"—increasing populations from two-and-a-half to five million salmon and steelhead. The Council said it would reevaluate a higher goal once the interim target was achieved.

In 2000, the NPCC modified the Program goal to increase total adult salmon and steelhead runs above Bonneville Dam by 2025 to an average of 5 million annually in a manner that supports tribal and non-tribal harvest. This is the goal of the Program and relates directly to the losses associated with the hydroelectric system.

BPA is not being asked to "restore all of the fish and wildlife affected by the development of any hydroelectric project."<sup>16</sup> Our position is based on achieving the NPCC goal of five million salmon and steelhead returning above Bonneville Dam. Doubling the salmon runs from 2.5 to five million is an increase of 2.5 million; this would mean rebuilding about half of the fish populations lost under the low end of the NPCC determination of hydro responsibility and one-quarter of the hydro related losses at the high end of the NPCC range.

Under the Northwest Power Act, the BPA, the Bureau of Reclamation, the Corps of Engineers, and the Federal Energy Regulatory Commission are responsible for implementing the Program and achieving its goal. Again, BPA is the only agency with authority to implement the off-site measures under the Program.

BPA's enclosure lists the overarching objectives of the Program and states; "that the Council recognized that achieving these broad objectives is not the sole responsibility of the 2000 Fish and Wildlife Program or BPA alone and that the focus of the 2000 Program is limited to fish and wildlife affected by the development, operation, and management of the FCRPS."<sup>17</sup> We agree that the subbasin planning effort attempted to integrate ESA and other activities. We also agree that "the focus of the 2000 Program is limited to fish and wildlife affected by the development, operation, and management of the FCRPS" and believe that the goal of the Program reflects this focus. We also believe that BPA has

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<sup>16</sup> BPA Enclosure page 1.

<sup>17</sup> Id. Page 4

misinterpreted this sentence in the 2000 Fish and Wildlife Program. This section of the Program describes the overarching objectives:

- A Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife.
- Mitigation across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem.
- Sufficient populations of fish and wildlife for abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest.
- Recovery of the fish and wildlife affected by the development and operation of the hydrosystem that are listed under the Endangered Species Act

Clearly, these objectives involve ESA biological opinions and recovery plans, the Corps of Engineers, Bureau of Reclamation, Federal Energy Regulatory Commission, and entities in Canada. Rebuilding the Columbia River ecosystem will involve everyone in the Basin. This general language does not change the fact that BPA is the only Federal agency with responsibilities to implement the off-site mitigation measures in the Program.

BPA is not being asked “to mitigate where others are required to do so.”<sup>18</sup> Other entities would be responsible for addressing rebuilding above the five million fish goal in the Program that is related to the hydropower responsibilities identified by the NPCC. For example, the CBFWA budget for the subbasin plans does not assume BPA funding for actions on federal lands; Federal land managers, not BPA are assumed to implement these actions.

Fish and wildlife managers have not determined whether full implementation of the subbasin plans would result in an increase in returns to five million salmon and steelhead. Fish and wildlife managers and the Council are currently working to aggregate the expected biological results from implementation of the plans.

The Yakama Nation believes that it is unlikely that the funding levels recommended in the CBFWA workgroup report would result in salmon and steelhead returns that exceed the Council’s goal by 2009. Therefore, these funding levels will not exceed BPA’s responsibilities under the Program.

Therefore, the Yakama Nation recommends that implementation of the subbasin plans precede with funding from BPA. If subsequent analysis or monitoring indicates that fish and wildlife populations are likely to exceed the goal for the Fish and Wildlife Program established by the Council, then the Council should initiate a rulemaking to address this issue.

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<sup>18</sup> Id. page 2.

## **B. BPA's position would shift its responsibilities to others**

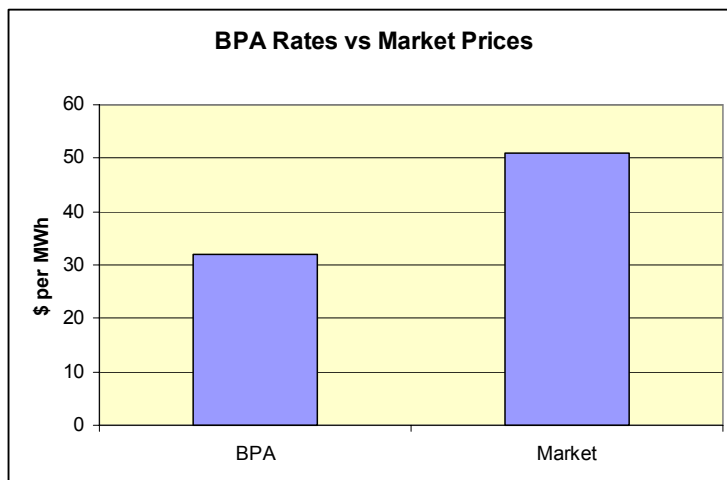
BPA's position appears to be an attempt to shift its clear legal responsibilities under the Northwest Power Act to state and local governments and private landowners. BPA appears to advocate that state and local governments should fund habitat programs or impose regulations to address the losses associated with the hydroelectric system and that landowners should fund the habitat restoration activities needed to offset the damage caused by the dams. These are the logical consequences of BPA position.

While there are good public policy reasons for partnerships in implementing the habitat provisions and for increasing salmon runs to address the other causes of their decline, we do not believe that BPA's position is consistent with the Northwest Power Act.

## **VI. BPA can meet its fish and wildlife obligations and continue to be competitive**

BPA's current electricity rates are \$31 per megawatt-hour. Based on the most recent analysis prepared by the Northwest Power and Conservation Council, the market price of electricity in the Northwest in 2005 is \$51 per megawatt-hour; therefore, BPA's rates are approximately 40 percent below the market price of electricity.

We calculated above that the increase to implement the NPCC Program and Biological Opinion would be approximately \$1.00 per megawatt-hour, even with these added costs, BPA rates would still be approximately 37 percent below market rates. Any effects on BPA's customers should be view in light of the substantial competitive advantage these customers already receive through the purchase of BPA electricity.



Finally, if utility or industrial customers believe that lower cost electricity is available, they have the option of purchasing power from other sources and reducing their reliance on BPA.

## VII. BPA cannot foreclose evidence on fish and wildlife in the rate case

BPA has stated its intention to address program funding in the Power Function Review and exclude issues such as future fish and wildlife funding from the rate case.

By making a decision at the inception of the rate proceeding to exclude information on fish and wildlife costs, BPA would prejudice the development of a full and complete record. The Act instructs that the rate case hearings are to "develop a full and complete record". 16 U.S.C. 839e(i). Moreover, "any person shall be provided an adequate opportunity by the hearing officer to offer ... rebuttal of any material... submitted by the Administrator".

The statute speaks directly to what material shall be included in the Administrative Record in a "7i" proceeding.

In addition to the opportunity to submit oral and written material at the hearings, **any written views, data, questions, and arguments** submitted by person prior to or before the close of the hearings **shall be made part of the administrative record**.

16 U.S.C. 839e (i)(3)(emphasis added). Bonneville's position to exclude issues that fundamentally affect its revenues and costs is at odds with a plain reading of the statute.

In previous rate cases, BPA has submitted information to the record on fish and wildlife funding. By statute, the Parties should be entitled to submit information to rebut BPA's position with respect to the costs associated.

Finally, decisions in the Power Function Review do not appear to fit in the list of final actions subject to judicial review under 16 USC 839g (e). Therefore, BPA cannot make a final decision on these issues and exclude these issues from the rate case. If BPA believes this is a final decision under Section 9(e) it should clearly state its reasons and prepare a record of decision that can be challenged in the Ninth Circuit Court of Appeals. BPA cannot have things both ways and shield itself from judicial challenge on its failure to meet its fish and wildlife obligations under Federal laws and Treaties.

## VIII. Improved implementation

The CBFWA workgroup also found that the work envisioned by the subbasin plans does not address all of the habitat protection and enhancement activities that are likely to be needed to meet regional fish and wildlife goals. Therefore, we recommend that federal, state, and tribal governments immediately begin to develop a comprehensive plan to protect, mitigate, and enhance fish and wildlife in the Columbia Basin.

This process should address funding from BPA and other sources. It should include biological analysis to determine whether the actions are likely to achieve the fish and wildlife goals and obligations under the Endangered Species Act, Northwest Power Act, and treaty and trust responsibilities. This effort should result in a detailed workplan and budget for future fish and wildlife activities in the Columbia Basin.

The subbasin plans include biological objectives and identify limiting factors and strategies to achieve the objectives. The Yakama Nation has been working with BPA, the NPCC, and other fish and wildlife managers to integrate the subbasin plans into a coordinated plan for the Columbia Basin. This work needs to coordinate the efforts under the NPCC Program and the NOAA Fisheries Service recovery plans.

The Yakama Nation recommends that federal, state, and tribal governments immediately begin an effort to integrate subbasin and recovery planning. This work should include:

- Coordination of planning and analysis to address the biological objectives in the recovery plans and the Council's Program.
- Biological analysis of the expected results of the actions in achieving goals and biological objectives.
- A roll-up of all the plans to determine the expected contribution toward the NPCC goal and revision of the plans if necessary.
- Development of a detailed three-year workplan and budget for implementing a basin-wide fish and wildlife plan that integrates the NPCC Program and the FCRPS Biological Opinions, and a more general ten year workplan and budget for this integrated basin-wide plan.
- Federal, state, and tribal discussions on the appropriate pace for the basin-wide plan.
- Monitoring of results and revision of the plans as necessary.

## **IX. Other Comments**

### **A. BPA should use its borrowing authority for land and water acquisition**

The CBFWA workgroup assumed that BPA will use its borrowing authority for land and water acquisitions. This would allow Bonneville to implement more habitat work while minimizing the effects on rates. To avoid prejudicing any determination of allowable types of fish and wildlife investments that can be capitalized, BPA should clearly and broadly define allowable fish and wildlife investments to include land and water interests. Alternately BPA could deem all of its fish and wildlife capital investment as revenue producing, since Bonneville's share of such investments include only those costs that are directly attributable to the development and operation of the power purposes and to federal dams. In this regard, the capital investments are inextricably linked to maintaining power generation marketed by BPA.

Bonneville’s current policy has allowed capitalization of investment in land acquisition for fish and wildlife if it meets the requirements of exceeding \$1 million and providing a creditable /quantifiable benefit against a defined obligation for BPA. We continue to be concerned that Bonneville is restricting the use of capitalization for habitat acquisitions.

First, limiting access to projects over \$1 million is a misinterpretation of section 4(h)(10)(B) of the Act. That section requires or directs Bonneville to capitalize the construction costs of facilities when those costs exceed \$1 million and have an expected life of greater than 15 years. That is, this section of the act says that when securing an asset that fits this very specific definition, it must capitalize it. However, this section of the Act does not broadly constrain the Administrator’s financing options when an asset does not fit the definition of a facility that costs at least \$1 million and has at least a 15 year life. In all instances where the asset does not meet the definition of the class described in 4(h)(10)(B), the Administrator is free to choose the method of financing—capitalization or the Bonneville fund. Bonneville should clarify its policy to ensure that access to capital for fish and wildlife land acquisitions is available even in instances where the costs are less than \$1 million.

Second, we believe that the Administrator has broad discretion to decide what may be capitalized. Neither applicable law nor FAS 71 requires that a specific “crediting” system be agreed upon before Bonneville provides access to the capital funds. We are concerned that Bonneville’s language requiring a “crediting system” introduces an unnecessary impediment to implementing the Biological Opinions and Fish and Wildlife Program.

Third, we are concerned that Bonneville’s proposed criteria will limit its ability to fully utilize the \$36 million of capital borrowing that is assumed in the proposal. We hope Bonneville will correct these issues. Failure to do so could constrain Bonneville’s ability to capitalize needed habitat acquisition. If these critical activities are expensed it will increase the impact on rates or limit the amount of fish and wildlife protection that will take place.

## **B. BPA should fully implement the Biological Opinion**

Several utilities have recommended that BPA should not assume implementation of the in-river transportation study that is called for in the FCRPS Biological Opinion. BPA should assume full implementation of the Biological Opinion.

## **C. Risk Mitigation**

BPA has proposed to address this issue as part of the rate case. We urge BPA to review the analysis provided by the Yakama Nation and CRITFC during the last rate case on this issue. We provided unrefuted evidence that BPA had eliminated spill and flow protective measures for fish and wildlife rather than defer payments to the Treasury. BPA needs robust risk mitigation strategies in the next rate case. Fish and wildlife protection must not be sacrificed if BPA experiences financial difficulties.



## **D. Conservation**

The Yakama Nation supports the comments and concerns of the Northwest Power and Conservation Council on this issue. It is essential for BPA to provide adequate funding to secure at least its share of the NPCC conservation targets. Implementing cost-effect will reduce long-term costs and reduce the need for additional fossil-fired resources that damage the environment.

We also support proposals to increase programs to improve the efficiency of irrigation systems. Such programs provide win-win solutions that can reduce costs and leave more water in tributaries and rivers for fish.

## **E. Renewable Resources**

We also support adequate funding for renewable resource development; these resources will also reduce the need for other resources that damage the environment. Again, it is essential for BPA to provide adequate funding to secure at least its share of the NPCC renewable resources target.

## **F. BPA should not provide benefits to the Direct Service Industries**

BPA has proposed to provide approximately \$40 million in benefits to the Direct Service Industries. We oppose this proposal. BPA has no legal obligation to serve the DSI's, yet it proposes significant funding at the same time it proposes inadequate funding for fish and wildlife protection, mitigation, and enhancement that is required under the Northwest Power Act. This proposal is contrary to law, and inconsistent with the equitable treatment requirements of the Northwest Power Act.

## **X. Yakama Nation Recommendations**

**BPA needs to include adequate funds for fish and wildlife in its next rate case.**

- Implementation of the NPCC subbasin plans and including wildlife mitigation over a ten-year period will cost between \$1.5 and \$2 billion.
- The total cost to implement the Fish and Wildlife Program and associated ESA needs is estimated to be about \$240 million per year.
- Carrying out the subbasin plans would only accomplish between one-quarter and one-half of the habitat work needed in the tributaries of the Columbia and Snake Rivers.
- At the current BPA Integrated Program funding rate of \$139 million per year, it would take about 100 years to implement the NPCC Fish and Wildlife Program.

**Therefore, BPA should increase the amount of funds available for fish and wildlife activities to approximately \$240 million per year.**

**The fish and wildlife managers have developed realistic and reasonable cost estimates for the rate case period.**

- It takes some time to increase the rate of implementation.
- The 2002 rate case set BPA revenues with the intent of providing a fish and wildlife budget of \$186 million per year.

**Therefore, BPA should ramp up its Integrated Fish and Wildlife Program budget:**

- \$186 million in FY 2006;
- \$200 million in FY 2007;
- \$225 million in FY 2008;
- \$240 million in FY 2009.

**BPA should develop a more flexible capitalization policy to facilitate land and water acquisitions.**

- BPA's current policy on capitalization is unclear regarding the use of its borrowing authority to purchase land and water.
- BPA's interpretation of its policies has inhibited the implementation of the Fish and Wildlife Program.
- If BPA uses its borrowing authority for these kinds of purchases, the rate impacts of our recommendations are significantly reduced.

**Therefore, BPA should modify its capitalization policy to set up mechanisms to allow borrowing funds or the use of its borrowing authority to purchase land and water.**

**BPA should address the uncertainties in fish and wildlife costs in its rate case.**

- The fish and wildlife managers note that with the intent of providing these estimates of future budget needs, that these estimates do not incorporate numerous factors that may increase the needs, and that these budget targets are likely to be under-estimates of actual needs.
- In the previous rate case BPA used two means to address uncertainties: Cost Recovery Adjustment Clauses and revenue collection to meet more than the minimum need.

**Therefore, BPA should work with others to ensure its rates provide adequate fish and wildlife funding. BPA's rate provisions must ensure that it can adequately fund future additional fish and wildlife costs.**

**BPA must meet the goals of the Fish and Wildlife Program.**

- After considerable analysis, the NPCC adopted in 1987 an interim estimate of the hydropower (BPA) responsibility to fish and wildlife of 5 million returning adult salmon and mitigation for resident fish and wildlife.
- The Program also identifies specific goals for resident fish and wildlife mitigation to address the operation and construction of dams and inundation by reservoirs.

- The NPCC reaffirmed these responsibilities in adopting its amended Fish and Wildlife Program in 2000.
- Current numbers of returning salmon are approximately the same as they were when the NPCC adopted the interim goal 18 years ago.

**Therefore, the funding recommended by the fish and wildlife managers through FY 2009 is not likely to exceed costs necessary to achieve the Fish and Wildlife Program goals.**

**The Columbia Basin needs an Implementation Plan for fish and wildlife.**

- The subbasin plans do not, in many cases, identify clear numerical objectives or specific actions, schedules, or costs.
- Such information would provide a statement by those responsible for the fish and wildlife resources of how the resources might be more productively managed and would provide consistent guidance in a variety of decision processes, such as NPCC amendment processes, ESA recovery planning, annual budget development, activities on Federal lands, local land use planning, etc.

**Therefore, fish and wildlife managers, BPA, and the NPCC should work together to develop an implementation plan detailing the actions, schedule and costs needed to implement the Fish and Wildlife Program, and are committed to that effort.**

**Full implementation of the F&W Program and ESA activities will create economic benefits in tribal and rural areas.**

- Most of the fish and wildlife activities would be implemented in rural areas east of the Cascade Mountains creating jobs and additional economic activity.
- As fish and wildlife populations increase as a result of these BPA investments, east-side rural areas will experience increased fishing, hunting and related activities, also creating additional jobs and invigorating local economies.
- For those (residential) customers served by utilities purchasing all of their power from BPA the recommended budget levels would result in about a \$1 per month increase in their electric bill. The impact to those served by utilities that purchase less than their full requirements from BPA would be less.

**Therefore, BPA should recognize the benefits to rural and tribal communities from its investments in fish and wildlife.**



# **Affiliated Tribes of Northwest Indians 2005 Spring Conference**

## **RESOLUTION #05 -057**

### **“THE BONNEVILLE POWER ADMINISTRATION FY 2007 TO FY 2009 PROPOSAL FOR FISH AND WILDLIFE FUNDING IS INADEQUATE, AND ATNI REQUESTS FULL FUNDING FOR FISH AND WILDLIFE PROTECTION, MITIGATION AND ENHANCEMENT”**

## **PREAMBLE**

We, the members of the Affiliated Tribes of Northwest Indians of the United States, invoking the divine blessing of the Creator upon our efforts and purposes, in order to preserve for ourselves and our descendants rights secured under Indian treaties, executive orders and the federal Trust Responsibility, and benefits to which we are entitled under the laws and Constitution of the United States and several states, to enlighten the public toward a better understanding of the Indian people, to preserve Indian cultural values, and otherwise promote the welfare of the Indian people, do hereby establish and submit the following resolution:

**WHEREAS**, the Affiliated Tribes of Northwest Indians (ATNI) are representatives of and advocates for national, regional, and specific tribal concerns; and

**WHEREAS**, the Affiliated Tribes of Northwest Indians is a regional organization comprised of American Indians in the states of Washington, Idaho, Oregon, Montana, Nevada, Northern California, and Alaska; and

**WHEREAS**, the health, safety, welfare, education, economic and employment opportunity, and preservation of cultural and natural resources are primary goals and objectives of Affiliated Tribes of Northwest Indians; and

**WHEREAS**, the Bonneville Power Administration (BPA) has a Trust Responsibility to the Columbia Basin tribes; BPA funds measures to protect, mitigate and enhance fish and wildlife under the Northwest Power Act and recovery efforts under the Endangered Species Act (ESA); BPA is developing fish and wildlife costs for Fiscal Years 2007, 2008 and 2009 for inclusion in its next rate case, in which BPA will establish the rates it will charge for the electricity that it markets from the federal dams; and

**WHEREAS**, the Northwest Power and Conservation Council (NWPPCC) has determined that the federal hydropower system was responsible for the loss of five to eleven million salmon and steelhead in the Columbia River, the loss of resident fish and resident fish habitat, and the

loss of wildlife and wildlife habitat that were damaged by the construction, inundation and operation of the Federal Columbia River Power System (FCRPS); and

**WHEREAS**, the NWPCC has set a goal to increase salmon and steelhead returning above Bonneville Dam to five million fish a year by 2005 and set goals to mitigate for wildlife and resident fish losses caused by the construction, inundation and operation of the FCRPS; and

**WHEREAS**, the NWPCC has adopted specific policies and recommendations for resident fish substitution for areas where salmon and steelhead runs are completely blocked by federal dams; and

**WHEREAS**, the NWPCC has adopted specific loss assessments and mitigation goals for wildlife and wildlife habitat losses caused by Federal dams; and

**WHEREAS**, Columbia Basin fish and wildlife managers worked with the NWPCC and BPA to develop subbasin plans for the entire Columbia Basin to address the goals, biological objectives, and other requirements of the NWPCC's 2000 Fish and Wildlife Program, and have developed cost estimates for implementing these subbasin plans; and

**WHEREAS**, the heads of NOAA Fisheries, BPA, the U.S. Army Corps of Engineers and the Bureau of Reclamation have asserted their "firm commitment to ensure the survival of Columbia Basin salmon" and other fish and wildlife, and written approvingly of these subbasin plans, stating that ". . . a remarkable collaboration of local citizens, landowners, tribes and state and federal agencies has produced draft fish and wildlife plans for 58 Columbia River sub-basins"; and

**WHEREAS**, an aggressive schedule to implement subbasin plans will result in efficient and cost-effective protection, mitigation and enhancement of fish and wildlife, while delayed implementation will result in greater actual costs and increase the probability that more salmon and steelhead populations will go extinct; and

**WHEREAS**, federal actions to address the protection, mitigation and enhancement of fish and wildlife impacted by the FCRPS have thus far been inadequate; and

**WHEREAS**, Improving habitat is the only way to rebuild to sustainable, harvestable levels those wild runs that presently constrain tribal fisheries; and

**WHEREAS**, aggressively implementing subbasin plans will address federal laws and the federal Trust Responsibility and Environmental Justice and equity issues, and will result in significant progress toward achieving the goals of the Northwest Power Act, the ESA, and the United States' treaty obligations and Trust Responsibility to Columbia Basin Indian tribes; and

**WHEREAS**, implementing the subbasin plans will support rural and tribal economies, provide thousands of construction and recreation jobs, benefit tribal and non-tribal fisheries, and improve environmental quality; and

**WHEREAS**, implementation of subbasin plans is consistent with, and will further, the goals of the NWPCC's 2000 Fish and Wildlife Program;

**WHEREAS**, BPA has proposed funding levels of \$143 million per year for FY 2007 through FY 2009 for the Integrated Fish and Wildlife Program that are actually a \$17 million reduction from the FY 2001 to FY 2006 level of effort when adjusted for inflation;

**WHEREAS**, BPA has assumed unrealistic cuts in research, monitoring, evaluation, information management, coordination, and administration;

**WHEREAS**, using more realistic assumptions about BPA costs and inflation means that the habitat work for fish and wildlife identified in the subbasin plans will not be completed for more than 80 years and the production measures will never be completed at the funding levels that BPA has proposed;

**NOW THEREFORE BE IT RESOLVED**, that the Affiliated Tribes of Northwest Indians formally notify BPA that its proposed funding levels are not adequate to implement the NWPCC Program and the FCRPS Biological Opinions and meet BPA's Trust responsibilities; and

**BE IT FURTHER RESOLVED**, that the Affiliated Tribes of Northwest Indians supports the budget developed by the Columbia River Inter-Tribal Fish Commission for FY 2006 and the rate case period FY 2007 through FY 2009; the CRITFC budget is \$186 million in FY 2006, \$200 million in FY 2007, \$225 million in FY 2008, and \$240 million in FY 2009; and

**BE IT FURTHER RESOLVED**, that the Affiliated Tribes of Northwest Indians support the ten year budget and regional allocation strategy proposed by the members of the Upper Columbia United Tribes for implementation of subbasin plans in the Upper Columbia Ecoregion.

**BE IT FINALLY RESOLVED**, that these funding commitments must be directed to address the impacts to fish and wildlife in the Columbia Basin above Bonneville Dam as a first priority, that such funding must be directed to measures that complement the tribes' existing and future fish and wildlife management and that such funding will only support those projects that are wholly consistent with the federal government's treaty, trust, and other obligations to the Basin's tribes.

#### **CERTIFICATION**

The foregoing resolution was adopted at the 2005 Spring Conference of the Affiliated Tribes of Northwest Indians, held in Tacoma, Washington on May 19, 2005, with a quorum present.

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Ernest L. Stensgar, President

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Norma Jean Louie, Secretary

# **Rate Case Cost Report:**

**An Analysis of Future Fish and Wildlife Budget Needs in Support of the BPA Rate Case for FY2007 – FY2009.**

April 25, 2005 Consent DRAFT



## Summary

The staff of the Columbia Basin Fish and Wildlife Authority (CBFWA) has developed fish and wildlife costs for implementing the subbasin plans that were developed during the recent Northwest Power and Conservation Council (NPCC) effort. This effort is intended to identify future costs that BPA may need to include in its upcoming rate case. It should be noted that NOAA Fisheries and U.S. Fish and Wildlife Service did not participate in developing these estimates and neither endorse nor dispute the cost estimates and related materials.

This staff effort focused on identifying additional habitat and production costs to implement the subbasin plans. Staff has also compiled costs in the other categories of BPA's Integrated Program fish and wildlife efforts. The fish and wildlife managers recognize the considerable uncertainty in these estimates and may not be in consensus regarding the specific actions or locations implied in the subbasin cost estimates. An example of subbasins with detailed information used to develop cost estimates can be found in the Upper Columbia United Tribes (UCUT) proposal. In the Intermountain Province and Okanogan and Kootenai subbasins, UCUT compiled detailed budget estimates for 10 years based on specific management objectives and biological outcomes.

Current spending for fish and wildlife has averaged about \$134 million per year over the last four years. Staff estimates that the needs for additional monitoring and evaluation, research, information management coordination and administration, and mainstem work may increase by about \$9 million annually over the next several years. In addition, we have identified the ten-year costs of implementing the habitat and production strategies in the subbasin plans and wildlife plans at roughly \$1.9 billion. These funds would purchase: 13 additional or major enhancements to fish hatcheries in 11 subbasins; protection for more than 48,000 acres of habitat; improvements to more than 1300 miles of streams; almost 1600 miles of fence; enhancement activities on more than 75,000 acres of habitat; and, correcting passage problems at more than 1200 diversions and culverts.

The cost estimates, including the current program costs, equate to about \$240 million annually if the subbasin plans were implemented over a ten year period, \$170 million if implemented over 25 years, or about \$135 million if the region took 100 years to implement the draft subbasin plans. If BPA were not to use its borrowing authority, it would increase these annual costs to about \$310 million, \$200 million, or \$143 million, respectively. These estimated costs make no provision for inflation. Including inflation, FY2009 costs could be \$333 million. The region will need to determine the pace of implementation to determine the annual costs for these fish and wildlife actions. These are significant amounts of money; however, for perspective it is important to note that the Columbia River Basin encompasses 269,000 square miles—about the size of France. Human activity has degraded most of this habitat over the past 150 years. The fish and wildlife managers share a continuing interest with BPA in seeking efficiencies in mitigation efforts to maximize on-the-ground benefits to fish and wildlife.

This paper describes the assumptions and methodology used to develop the fish and wildlife costs. The costs provided by the Upper Columbia United Tribes and others represent only those that they believe are the responsibility of the Bonneville Power Administration and were developed in a deliberative manner among the UCUT member staff.

## **Cost Methodology and Assumptions**

**Estimating Future Costs of the Fish and Wildlife Program.** Staff divided the current Fish and Wildlife Program projects among six broad categories of activities or budget “compartments” (see Table 1) and compiled the average spending over the last four Fiscal Years (FY2001 – FY2004). Based on the assumption that current spending is appropriate, these estimates of the current Fish and Wildlife Program spending form the basis of the estimates of future funding needs. Staff reviewed each budget category in Table 1 and identified future changes and work that might drive future budgets up or down. Approximate annual budget increases and decreases that might result from the “drivers” were estimated. The column, “Annual Net Change” in Table 1 summarizes the results. For the “Habitat” budget category staff assumed that future budget needs would be driven by the draft subbasin plans. The draft subbasin plans may identify additional fish production needs, as well. Additional discussion of the development of Table 1 is provided in Appendix A.

**Costs to Implement the Draft Subbasin Plans.** The work group compiled the estimated ten-year costs to implement the draft subbasin plans based on subbasin cost estimates from two sources: 26 submitted by subbasin planners and one from NPCC staff. The costs cover activities that might reasonably be accomplished over a ten-year period. Most of the cost estimates are based on detailed unit costs to carry out specific strategies on designated amounts of acreage or stream miles. The fish and wildlife managers recognize the considerable uncertainty in these estimates and may not be in consensus regarding the all of the specific actions or locations implied in the subbasin cost estimates. In total, the subbasins for which, staff has received detailed cost estimates cover about one-half of the area of the entire Columbia River Basin. Table 2 summarizes the sources and status of the subbasin plan cost estimates.

For each subbasin, staff assigned the detailed cost estimates received to the categories identified in Table 1. As expected, habitat and fish production are the major costs to implement the draft subbasin plans. Summaries of the detailed costs submitted for each subbasin plan are provided in Appendix B.

Staff compiled subbasin plan costs for each province and extrapolated the cost to encompass the entire province on an approximate area basis when necessary to account for subbasins lacking estimates (Table 3). The extrapolation factors used are shown in Table 3. We assumed that the other (non-habitat and production) costs were included elsewhere in Table 1 and were not included here. Approximately \$325 million in costs from the draft subbasin plans (largely for additional assessments, research and coordination) were assumed to be covered by the annual net changes in Table 1 and were

not included in this analysis. Because this analysis extrapolated the costs over each entire province, we expect this estimated cost to increase only moderately with the incorporation of additional subbasin plan costs in future drafts of this analysis.

To help provide a context for the estimated costs to implement subbasin plans, staff compiled a rough estimate of the cost to treat habitat problems throughout the entire Columbia River Basin. The methodology and assumptions for this estimate of the larger problem are provided in Appendix C.

**Upper Columbia United Tribes' Proposal.** Costs submitted by the Upper Columbia United Tribes' members and others represent only those that they believe to be a BPA responsibility (as identified in the NW Power Act) and are part of a complete package of subbasin plan implementation costs (see Appendix D), including:

- Specific biological milestones based on measures in subbasin plans;
- A reasonable pace of implementation considering fiscal and institutional capacity;
- Costs estimated over 10 years with internal prioritization and flexibility; and,
- An understanding that *some* BPA obligations will sunset if requested levels of funding is provided over the ten-year implementation period.

**Wildlife Cost Estimates.** The CBFWA Wildlife Committee estimated the ten-year cost for mitigation of wildlife losses due to the construction of the Federal Columbia River Power System (FCRPS) and the resulting inundation. Assumptions include:

- Mitigation for 80 percent of the construction and inundation loss at a ratio of 1 acre lost: 1 acre of mitigation;
- \$10 million annually for operations and maintenance (and some enhancement) on mitigation lands;
- Focus future mitigation efforts in three areas;
  - \$114 million for Albeni Falls and Chief Joseph/Grand Coulee mitigation;
  - \$26 million in southwest Idaho; and,
  - \$60 million in the Willamette.

The overall wildlife mitigation cost includes wildlife efforts identified in the subbasin plans. Appendix E has a detailed discussion of the wildlife costs. Wildlife cost estimates imbedded in the CBFWA cost estimates do not distinguish:

- Assessments of HUs gained and where they have been credited;
- Unresolved issues of HU accounting methodology in the Willamette Basin; and,
- Hydro-allocation differentials among federal dams.

If these factors are addressed, the \$300M wildlife portion of the cost estimates may be reduced or reprioritized.

The cost estimates associated with completing mitigation for wildlife losses do not include the Confederated Salish and Kootenai Tribes (CSKT) due to their dispute with BPA over wildlife mitigation for Hungry Horse and Libby Dams. If the CSKT receive wildlife mitigation in the future, these costs will need to be adjusted accordingly.

In Table 8 the analysis attempts to estimate the physical results from implementing the subbasin plans by compiling the extent of various activities proposed by the plans.

**Analysis of Total Costs.** To examine the effects that the pace of implementation, and other assumptions, has on the annual costs, staff developed a spread sheet for converting estimates of total and annual costs in the Table 1 budget categories into annual costs over differing periods of implementation. This model allows scenarios with different assumptions to be examined and compared in terms of their annual costs. Tables 4 through 7 provide one example of such an analysis. Table 4 shows the input assumptions, in this case, those annual costs summarized in Table 1 and the estimated cost of implementing the draft subbasin plans from Table 1 and 3. The CBFWA Wildlife Committee estimate of the cost to complete mitigation of wildlife losses due to the construction of the FCRPS is in Table 4 also. Tables 5, 6, and 7 show the first ten years of annual costs for implementation over different time periods, in this case, ten years, 25 years, and 100 years, respectively. In these analyses the effect of inflation is also shown, assuming a six percent inflation rate for riparian land and water and a three percent rate for other goods and services.

Table 1. Future Fish and Wildlife Program Cost Assumptions

F&W Program Categories	Recent Spending (FY01-04 Ave.)	Budget Drivers (UP)	Budget Drivers (DOWN)	Annual Net Change	Estimated Ten-Year Cost (\$M)
Info. Mgmt., Coordination & Administration (IMCA)	\$11.7	Watershed coordination support (~\$2M); Regional data mgmt. (~\$2M); Harv/Hab/Prod integration (~\$0.5)	Little opportunity	Increase (+\$4.5M)	
Monitoring & Evaluation	\$30.0	Bi-Op driven large-scale monitoring; Mainstem evaluations; Future subbasin planning; Fall chinook monitoring (?)	Efficiencies in project scale monitoring from regional M&E plan; Reprogramming short-term assessments	No net change	
Research	\$11.0	Bi-Op life-stage research; NPCC Research Plan; Innovative category	Better focus, less opportunistic research; Emerging issues (e.g.,)	Minor Reduction	
Mainstem Programs	\$6.0	BiOp increases in predator control (~\$1M); Lamprey work (~\$1M)	Little opportunity	Increase (+\$2M)	
Fish Production	\$39.6	O&M for new facilities (Chief Joe, NEOH, Klickitat, Mid-C coho, Walla Walla, Klickitat), not including capital, (~\$3M); Bi-Op hatchery improvements (~\$2M)	Efficiencies in project-scale operations; Completion of some construction		
Habitat	\$35.8	Subbasin plans; BiOp off-site mitigation	Reprogramming based on subbasin plans	Increase (+\$3M)	\$291
Land Protection					\$404
Instream Flow Improvement					\$34
Enhancement & Restoration					\$626
Additional "Small" Tributary Passage (Expense)					\$187
Additional "Major" Tributary Passage (Capital)					\$21
Wildlife					\$300
<b>Total</b>	\$134.1			+\$9M (without Habitat)	\$1,864

**Table 2. Status of Subbasin Plan Cost Estimates**

Subbasin	Source	Status	SB-Province Factor
<b>Mtn Columbia Province</b>			<b>X1</b>
Kootenai - Idaho	UCUT	Included	
Kootenai - Montana	SKT/MDFWP	Included	
Flathead	SKT/MDFWP	Included	
<b>Intermountain Province</b>			<b>X1</b>
Coeur D'Alene	UCUT	Included	
Columbia/L. Roosevelt	UCUT	Included	
Pend Oreille	UCUT	Included	
Spokane	UCUT	Included	
<b>Mountain Snake Province</b>			<b>X1.5**</b>
Clearwater	NPT	Included	
Lo/Little Salmon	NPT	Included	
<b>Blue Mountain Province</b>			<b>X1</b>
Grande Ronde	NPT	Included	
Asotin	NPT	Included*	
Imnaha	NPT	Included	
Snake-HellsCanyon	NPT	Included	
<b>Upper &amp; Middle Snake Province</b>			<b>X2**</b>
Malheur	BPT	Included	
Owyhee	SBT	Included	
<b>Columbia Cascade Province</b>			<b>X1</b>
Wenatchee	YN	Included	
Entiat	YN	Included	
Methow	YN	Included	
Okanogan	UCUT	Included	
<b>Plateau Province</b>			<b>X2**</b>
Umatilla	NPCC staff	Included	
Tucannon	NPT	Included*	
Yakima	YN	Included	
Rock Creek	YN	Included	
Walla Walla	CTUIR	Included	
<b>Columbia Gorge Province</b>			<b>X1.5**</b>
Hood	NPCC staff	Included	
White Salmon	YN	Included	
Klickitat	YN	Included	
<b>Lower Columbia &amp; Estuary Province</b>			<b>X0</b>
WA Subbasins	LCFRB		

Others - Non-Tribal subbasin planners

\* Less land acquisition costs

\*\* Facility capital costs not extrapolated.

Table 3. Estimated Additional Costs to Implement Subbasin Plans

	Mtn		Mtn		Blue Mtn	U&M		Columbia		Columbia		Total Habitat		
	Columbia	Inter Mtn	Snake	Mtn		Snake	Snake	Cascade	Plateau	Gorge	Lo. Col. & Estuary	/Prod Costs (X1.1)	Prod Costs (X1.1)	Additional Costs (X1.1)
<b>SUBBASIN PLAN COST</b>														
<u>IMCA</u> - Regional Data Management	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<u>IMCA</u> - Watershed Coordination	\$2.0	\$2.0	\$5.0	\$5.0	\$0.4	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$10.5	\$0.0
M&E - Programmatic M&E	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$11.0	\$9.8	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$22.9	\$0.0
M&E - Mainstem Evaluations	\$0.0	\$1.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	\$0.0
M&E - Subbasin Planning	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.6	\$0.0
<u>Research</u>	\$0.0	\$2.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.9	\$0.0
Production - New Facilities (Capital)	\$22.8	\$37.8	\$0.0	\$0.0	\$10.8	\$5.6	\$68.8	\$21.6	\$7.6	\$0.0	\$0.0	\$0.0	\$192.4	\$192.4
Production - FWP facilities O/M	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Production - BiOp Improvements	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Production - Other Costs (Expenses)	\$1.3	\$11.9	\$24.6	\$3.4	\$15.0	\$4.9	\$10.0	\$18.5	\$0.0	\$0.0	\$0.0	\$0.0	\$98.5	\$98.5
Habitat - Land Protection Cost	\$34.7	\$52.0	\$84.8	\$2.7	\$24.0	\$6.2	\$62.8	\$102.7	\$3.7	\$0.0	\$0.0	\$0.0	\$404.2	\$404.2
Habitat - Instream Flow Cost	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$6.5	\$6.5	\$10.0	\$8.2	\$0.0	\$0.0	\$0.0	\$34.0	\$34.0
Habitat - Enhancement & Restoration Cost	\$52.2	\$76.3	\$240.3	\$37.0	\$46.8	\$37.3	\$37.3	\$73.3	\$5.8	\$0.0	\$0.0	\$0.0	\$625.8	\$625.8
Habitat - Wildlife Mitigation Cost	\$0.0	\$70.9	\$0.0	\$0.0	\$21.9	\$27.6	\$27.6	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$132.5	\$132.5
Habitat - Additional Assessment	\$6.8	\$33.1	\$34.3	\$10.2	\$10.2	\$11.5	\$11.5	\$37.8	\$4.5	\$0.0	\$0.0	\$0.0	\$163.2	\$163.2
Habitat - Additional "Small" Tributary Passage (Expense)	\$1.1	\$0.0	\$117.2	\$9.3	\$17.0	\$7.2	\$7.2	\$18.1	\$0.5	\$0.0	\$0.0	\$0.0	\$187.4	\$187.4
Habitat - Additional "Major" Tributary Passage (Capital)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$6.5	\$6.5	\$9.0	\$3.8	\$0.0	\$0.0	\$0.0	\$21.2	\$21.2
Habitat - Other Costs	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Total Province Additional</b>	\$120.8	\$287.7	\$506.1	\$73.7	\$157.8	\$243.2	\$282.8	\$52.8	\$0.0	\$0.0	\$1,897.4	\$1,897.4	\$1,563.6	\$1,563.6
Total Habitat and Production Costs (from Subbasin Plans)														
Total 10 year Additional Costs														

**Assumptions**

Information Management, Coordination & Administration (IMCA)		Monitoring & Evaluation	
Continuing Cost	\$11.7	Continuing Cost	\$17.6
Regional Data Management (additional \$M/yr)	\$2.0	Programmatic M&E (additional \$M/yr)	\$10.0
Production/Habitat Integration (additional \$M/yr)	\$0.5	Additional mainstem evaluations (additional \$M/yr)	\$1.0
Watershed Coordination Support (additional \$M/yr)	\$2.0	Future subbasin planning (additional \$M/yr)	\$2.0
Research		Mainstem Program Expenses	
Continuing Cost	\$7.4	Continuing Cost	\$6.0
BiOp life-stage research (additional \$M/yr)	\$1.0	Additional Predator Control (additional \$M/yr)	\$1.0
NPCC Research Plan work (additional \$M/yr)	\$4.0	Additional Lamprey work (additional \$M/yr)	\$1.0
Innovative category (additional \$M/yr)	\$0.0		
Fish Production (Anadromous & Resident)			
Continuing Cost	\$39.6		
BiOp hatchery improvements (\$M/yr)	\$2.0		
Total New Facilities Cost (Capital) (\$M Total)	\$192.4		
Total Additional Costs & O/M (Expense) (\$M Total)	\$98.5		
Habitat			
Continuing Cost	\$12.1		
Land Protection Cost (\$M Total)	\$404.2		
Instream Flow Improvement Cost (\$M Total)	\$34.0		
Enhancement & Restoration Cost (\$M Total)	\$625.8		
Additional "Small" Tributary Passage (Expense) (\$M Total)	\$187.4		
Additional "Major" Tributary Passage (Capital) (\$M Total)	\$21.2		
Wildlife Mitigation (\$M Total)	\$300.0		
Other Assumptions			
Total Annual Continuing Cost	\$94.4		
Total Annual Additions	\$26.5		
Total 10-Year Wildlife Mitigation Cost	\$300.0		
Total 10-Year Additional Costs from Subbasin Plans	\$1,563.6		
Total Cost of 10-Year Effort	\$3,072.8		
Land Cost Inflation Rate	6%		
Other Items Inflation Rate	3%		
Other Items Inflation Rate Input	Inflation Rate	Weight	
Labor	0.0%	0.5	
Materials	0.0%	0.5	



Table 5. Estimated Fish and Wildlife

Cost Item (\$Millions/year)	Assume	Duration of Implementation (Years)										Ten Year Cost	
		FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16		
<b>Information Management, Coordination &amp; Administration</b>													
Continuing Cost	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	\$117.0
Regional Data Management	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
Production/Habitat Integration	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	\$5.0
Watershed Coordination Support	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
<b>Monitoring &amp; Evaluation</b>		\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$162.0
Continuing Cost	17.58	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	\$175.8
Programmatic M&E	10	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	\$100.0
Additional mainstem evaluations	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
Future subbasin planning	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
<b>Research</b>		\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$305.8
Continuing Cost	7.44	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	\$74.4
BiOp life-stage research	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
NPCC Research Plan	4.00	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	\$40.0
Innovative category	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
<b>Mainstem Program Expense</b>		\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$124.4
Continuing Cost	6.00	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	\$60.0
Additional Predator Control	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
Additional Lamprey work	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
<b>Fish Production</b>		\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$80.0
Continuing Cost	\$39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	\$396.0
Additional O&M on completed FWP facilities	3.0	1.0	1.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	\$24.0
BiOp hatchery improvements	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
Total New Facilities Cost (Capital)	\$192.4	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	\$192.4
Total Additional Costs & O/M (Expense)	\$98.5	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	\$98.5
<b>Fish Production Total</b>		\$71.7	\$71.7	\$72.7	\$72.7	\$73.7	\$73.7	\$73.7	\$73.7	\$73.7	\$73.7	\$73.7	\$730.9
Continuing Cost	\$12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	\$121.0
Land Protection Cost	\$404.2	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	\$404.2

Table 5. Estimated Fish and Wildlife

Duration of Implementation (Years) **10**

Cost Item (\$Millions/year)	Assume	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	Ten Year Cost
Instream Flow Improvement Cost	\$34.0	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	\$34.0
Enhancement & Restoration Cost	\$625.8	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6	62.6	\$625.8
Annual Habitat O&M	0.00%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Assessments	\$0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Additional "Small" Tributary Passage (Expense)	\$187.4	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	18.7	\$187.4
Additional "Major" Tributary Passage (Capital)	\$21.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	\$21.2
Additional Tributary Passage O&M	0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Additional Wildlife Mitigation	\$300.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	\$300.0
Additional Wildlife O&M	0.00%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
<b>Habitat Total</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$169.4</b>	<b>\$1,693.7</b>
Land & Water Cost Inflation Rate	6%											
Other Items Inflation Rate	3%											
compound L&W %		1.0000	1.0600	1.1236	1.1910	1.2625	1.3382	1.4185	1.5036	1.5938	1.6895	
compound other %		1.0000	1.0300	1.0609	1.0927	1.1255	1.1593	1.1941	1.2299	1.2668	1.3048	
total L&W		73.8	73.8	73.8	73.8	73.8	73.8	73.8	73.8	73.8	73.8	738.2
total other		234.5	234.5	235.5	235.5	236.5	236.5	236.5	236.5	236.5	236.5	2358.7
inflated L&W		73.8	78.2	82.9	87.9	93.2	98.8	104.7	111.0	117.7	124.7	
inflated other		234.5	241.5	249.8	257.3	266.1	274.1	282.4	290.8	299.5	308.5	
<b>TOTAL Cost without Borrowing (\$M/yr)</b>	<b>\$3,096.8</b>	<b>\$308.3</b>	<b>\$308.3</b>	<b>\$309.3</b>	<b>\$309.3</b>	<b>\$310.3</b>	<b>\$310.3</b>	<b>\$310.3</b>	<b>\$310.3</b>	<b>\$310.3</b>	<b>\$310.3</b>	<b>\$3,096.8</b>
Capital Cost w/o borrowing		\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$706.6
Percent capitalized	100%	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7	\$70.7
expensed		\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
Revenue Required for borrowed		\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$71.1
Capital Cost with borrowing		\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$7.1	\$71.1
Annual cost less capital		\$237.6	\$237.6	\$238.6	\$238.6	\$239.6	\$239.6	\$239.6	\$239.6	\$239.6	\$239.6	\$2,396.6
<b>TOTAL Cost with Borrowing (\$M/yr)</b>	<b>\$2,460.9</b>	<b>\$244.7</b>	<b>\$244.7</b>	<b>\$245.7</b>	<b>\$245.7</b>	<b>\$246.7</b>	<b>\$246.7</b>	<b>\$246.7</b>	<b>\$246.7</b>	<b>\$246.7</b>	<b>\$246.7</b>	<b>\$2,460.9</b>
<b>TOTAL Costs with inflation</b>												
with BPA Borrowing		\$308.3	\$319.7	\$332.7	\$345.2	\$359.3	\$372.9	\$387.1	\$401.8	\$417.2	\$433.2	\$0.0
without BPA Borrowing												

Table 6. Estimated Fish and Wildlife

Duration of Implementation (Years) 25

Cost Item (\$Millions/year)	Assume	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	Ten Year Cost
<b>Information Management, Coordination &amp; Administration</b>												
Continuing Cost		11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	\$117.0
Regional Data Management	<span style="border: 1px solid black; padding: 2px 5px;">2</span>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
Production/Habitat Integration	<span style="border: 1px solid black; padding: 2px 5px;">0.5</span>	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	\$5.0
Watershed Coordination Support	<span style="border: 1px solid black; padding: 2px 5px;">2</span>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
<b>IMCA Total</b>		<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$16.2</b>	<b>\$162.0</b>
<b>Monitoring &amp; Evaluation</b>												
Continuing Cost		17.58	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	\$175.8
Programmatic M&E	<span style="border: 1px solid black; padding: 2px 5px;">10</span>	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	\$100.0
Additional mainstem evaluations	<span style="border: 1px solid black; padding: 2px 5px;">1</span>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
Future subbasin planning	<span style="border: 1px solid black; padding: 2px 5px;">\$2</span>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
<b>M&amp;E Total</b>		<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$30.6</b>	<b>\$305.8</b>
<b>Research</b>												
Continuing Cost		7.44	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	\$74.4
BiOp life-stage research	<span style="border: 1px solid black; padding: 2px 5px;">1</span>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
NPCC Research Plan	<span style="border: 1px solid black; padding: 2px 5px;">4.00</span>	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	\$40.0
Innovative category	<span style="border: 1px solid black; padding: 2px 5px;">0</span>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
<b>Research Total</b>		<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$12.4</b>	<b>\$124.4</b>
<b>Mainstem Program Expense</b>												
Continuing Cost		6.00	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	\$60.0
Additional Predator Control	<span style="border: 1px solid black; padding: 2px 5px;">1</span>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
Additional Lamprey work	<span style="border: 1px solid black; padding: 2px 5px;">1</span>	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
<b>Mainstem Total</b>		<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$8.0</b>	<b>\$80.0</b>
<b>Fish Production</b>												
Continuing Cost		\$39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	\$396.0
Additional O&M on completed FWP facilities	<span style="border: 1px solid black; padding: 2px 5px;">\$3.0</span>	1.0	1.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	\$24.0
BiOp hatchery improvements	<span style="border: 1px solid black; padding: 2px 5px;">\$2.0</span>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0

Table 6. Estimated Fish and Wildlife

Duration of Implementation (Years) 25

Cost Item (\$Millions/year)	Assume	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	Ten Year Cost
Total New Facilities Cost (Capital)	\$192.4	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	
Total Additional Costs & O/M (Expense)	\$98.5	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	\$39.4
<b>Fish Production Total</b>	<b>\$54.2</b>	<b>\$54.2</b>	<b>\$55.2</b>	<b>\$56.2</b>	<b>\$56.2</b>	<b>\$56.2</b>	<b>\$56.2</b>	<b>\$56.2</b>	<b>\$56.2</b>	<b>\$56.2</b>	<b>\$56.2</b>	<b>\$556.4</b>
<b>Habitat</b>												
Continuing Cost	\$12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	\$121.0
Land Protection Cost	\$404.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	\$161.7
Instream Flow Improvement Cost	\$34.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	\$13.6
Enhancement & Restoration Cost	\$625.8	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	\$250.3
Annual Habitat O&M	0.00%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Assessments	\$0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Additional "Small" Tributary Passage (Expense)	\$187.4	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	\$75.0
Additional "Major" Tributary Passage (Capital)	\$21.2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	\$8.5
Additional Tributary Passage O&M	0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Additional Wildlife Mitigation	\$300.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	\$120.0
Additional Wildlife O&M	0.00%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
<b>Habitat Total</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$75.0</b>	<b>\$750.1</b>
<b>TOTAL Cost without Borrowing (\$M/yr)</b>	<b>\$1,978.6</b>	<b>\$196.5</b>	<b>\$196.5</b>	<b>\$197.5</b>	<b>\$198.5</b>	<b>\$198.5</b>	<b>\$198.5</b>	<b>\$198.5</b>	<b>\$198.5</b>	<b>\$198.5</b>	<b>\$198.5</b>	<b>\$1,978.6</b>
<b>TOTAL Cost with Borrowing (\$M/yr)</b>	<b>\$1,724.3</b>	<b>\$171.0</b>	<b>\$171.0</b>	<b>\$172.0</b>	<b>\$173.0</b>	<b>\$173.0</b>	<b>\$173.0</b>	<b>\$173.0</b>	<b>\$173.0</b>	<b>\$173.0</b>	<b>\$173.0</b>	<b>\$1,724.3</b>
<b>TOTAL with inflation</b>	<b>\$196.5</b>	<b>\$203.2</b>	<b>\$211.3</b>	<b>\$218.7</b>	<b>\$227.4</b>	<b>\$235.4</b>	<b>\$243.6</b>	<b>\$252.2</b>	<b>\$261.1</b>	<b>\$270.3</b>	<b>\$270.3</b>	<b>\$2,319.7</b>

Table 7. Estimated Fish and Wildlife

Cost Item (\$Millions/year)	Assume	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	Ten Year Cost
		100										
<b>Information Management, Coordination &amp; Administration</b>												
Continuing Cost	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	\$117.0
Regional Data Management	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
Production/Habitat Integration	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	\$5.0
Watershed Coordination Support	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
<b>IMCA Total</b>		\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$16.2	\$162.0
<b>Monitoring &amp; Evaluation</b>												
Continuing Cost	17.58	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	\$175.8
Programmatic M&E	10	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	\$100.0
Additional mainstem evaluations	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
Future subbasin planning	2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0
<b>M&amp;E Total</b>		\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$30.6	\$305.8
<b>Research</b>												
Continuing Cost	7.44	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	\$74.4
BiOp life-stage research	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
NPCC Research Plan	4.00	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	\$40.0
Innovative category	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
<b>Research Total</b>		\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$12.4	\$124.4
<b>Mainstem Program Expense</b>												
Continuing Cost	6.00	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	\$60.0
Additional Predator Control	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
Additional Lamprey work	1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$10.0
<b>Mainstem Total</b>		\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$8.0	\$80.0
<b>Fish Production</b>												
Continuing Cost	\$39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	39.6	\$396.0
Additional O&M on completed FWP facilities	3.0	1.0	1.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	3.0	\$24.0
BiOp hatchery improvements	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	\$20.0

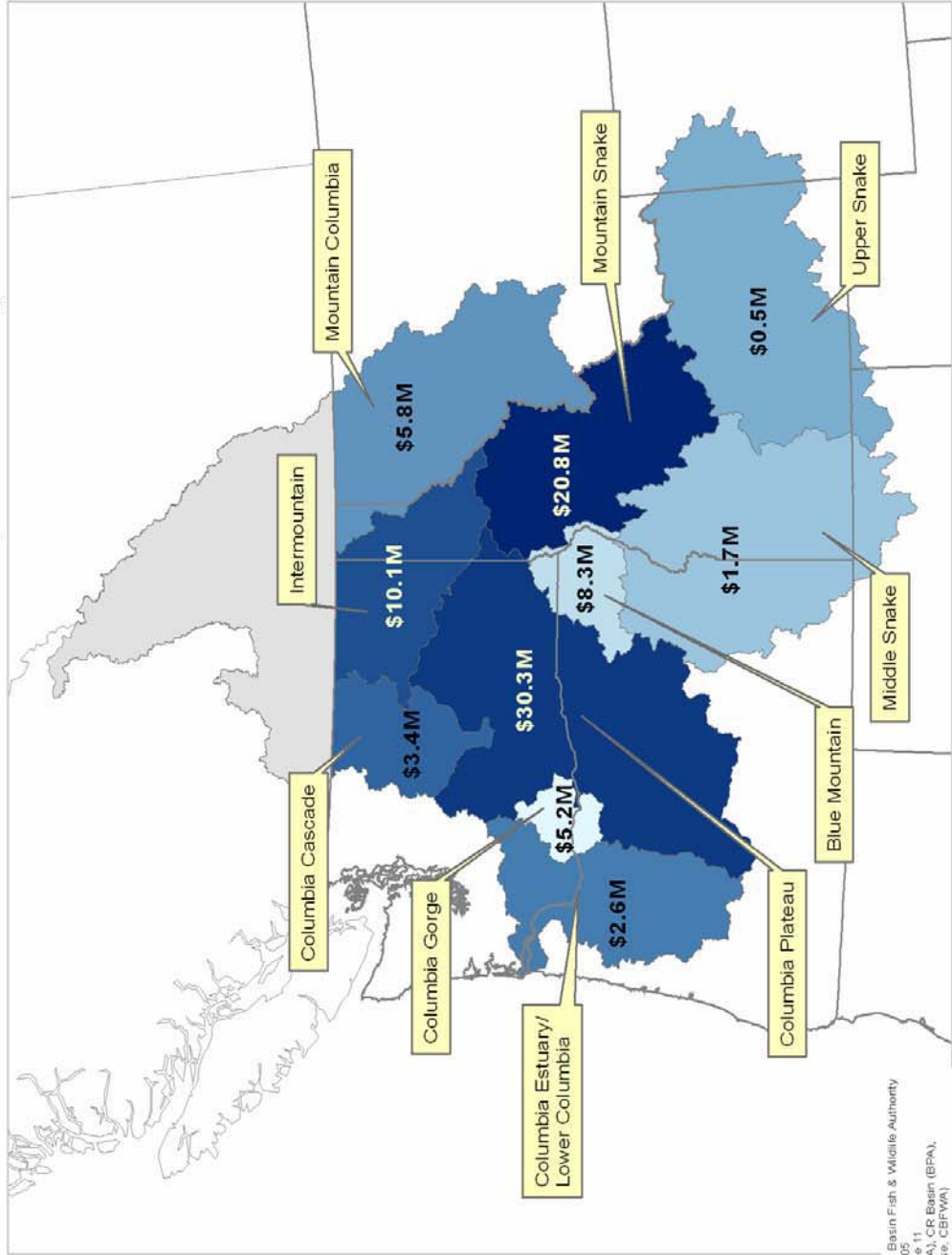
Table 7. Estimated Fish and Wildlife

Cost Item (\$Millions/year)	Assume	Duration of Implementation (Years)										Ten Year Cost			
		FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16				
Total New Facilities Cost (Capital)	\$192.4	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	\$9.9
Total Additional Costs & O/M (Expense)	\$98.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	\$469.1
<b>Fish Production Total</b>	<b>\$45.5</b>	<b>\$45.5</b>	<b>\$45.5</b>	<b>\$46.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$47.5</b>	<b>\$469.1</b>
<b>Habitat</b>															
Continuing Cost	\$12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	\$121.0
Land Protection Cost	\$404.2	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	\$40.4
Instream Flow Improvement Cost	\$34.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	\$3.4
Enhancement & Restoration Cost	\$625.8	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	\$62.6
Annual Habitat O&M	0.00%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Assessments	\$0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Additional "Small" Tributary Passage (Expense)	\$187.4	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	\$18.7
Additional "Major" Tributary Passage (Capital)	\$21.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	\$2.1
Additional Tributary Passage O&M	0%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
Additional Wildlife Mitigation	\$300.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	\$30.0
Additional Wildlife O&M	0.00%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	\$0.0
<b>Habitat Total</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$27.8</b>	<b>\$278.3</b>
<b>TOTAL Cost without Borrowing (\$M/yr)</b>	<b>\$1,419.6</b>	<b>\$140.6</b>	<b>\$140.6</b>	<b>\$141.6</b>	<b>\$141.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$142.6</b>	<b>\$1,419.6</b>
<b>TOTAL Cost with Borrowing (\$M/yr)</b>	<b>\$1,356.0</b>	<b>\$134.2</b>	<b>\$134.2</b>	<b>\$135.2</b>	<b>\$135.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$136.2</b>	<b>\$1,356.0</b>
<b>TOTAL with inflation</b>	<b>\$140.6</b>	<b>\$145.0</b>	<b>\$150.6</b>	<b>\$155.4</b>	<b>\$161.5</b>	<b>\$166.6</b>	<b>\$171.9</b>	<b>\$177.3</b>	<b>\$183.0</b>	<b>\$188.8</b>	<b>\$194.3</b>	<b>\$200.0</b>	<b>\$205.9</b>	<b>\$212.0</b>	<b>\$218.3</b>

Table 8. Achievement Target from the Draft Subbasin Plans

ACHIEVEMENT TARGETS (10 Year)	Mtn Columbia		Inter Mtn		Mtn Snake		Blue Mtn		U&M Snake		Columbia Cascade		Columbia Gorge		Lo. Col. & Estuary		Basin Totals		
	1	3	40	10,000	0	7,000	4,000	3,000	45	1	13								
<b>New Production Facilities</b>																			
Number per Province	1	3	40	10,000	0	7,000	4,000	3,000	45	1	13								
<b>Habitat</b>																			
Acres purchased	4,000	0	0	1,300	500	2,000	4,500	11,140	1,040	0	20,480								
Acres leased	80	0	0	660	100	580	35	68	73	0	1,596								
Miles of fence	0	0	0	0	0	0	18	50	0	0	68								
Acre-Feet of Water Purchased	40	0	0	3,010	500	30,400	90	177	357	0	34,574								
Acres planted	60	0	0	2,820	400	20	20	30	93	0	3,443								
Miles of Road Obliterated	0	0	0	31,370	10,500	0	0	0	0	0	41,870								
Acres Treated for Weeds	30	38	630	780	100	410	30	57	21	0	1,316								
Miles of Instream Improvements	10	0	0	780	85	140	7	61	10	0	1,093								
Number of Barriers Removed	15	0	0	0	4	70	23	10	0	0	122								
Number of Diversions Screened	117	50	0	0	0	20	5	50	0	0	242								
Number of Sites Monitored																			

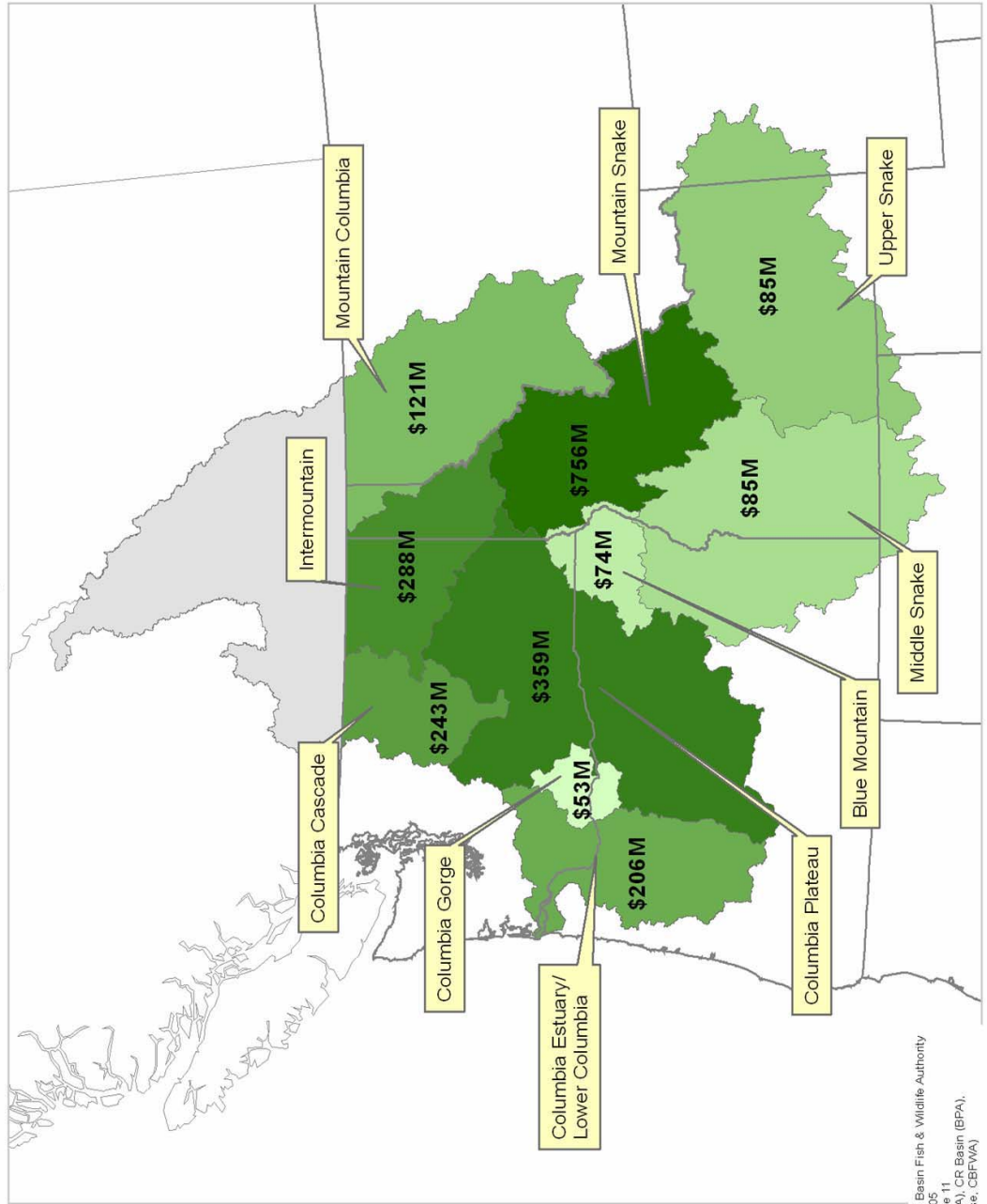
Figure 1. BPA Fish and Wildlife Average Investment (FY2001-04)



Map Created by: Columbia Basin Fish & Wildlife Authority  
Create Date: March 15, 2005  
Projection: NAD 1983, Zone 11  
Data Layers: Province (BPA), CR Basin (BPA),  
Financial Data (Tom Giese, CBFWA)



Figure 2. Estimated Future Fish and Wildlife Investment to Implement Subbasin Plans



Map Created by: Columbia Basin Fish & Wildlife Authority  
 Project: Columbia Basin Fish and Wildlife Authority  
 Project No. 1983-7-008-11  
 Data Layers: Province (BPA), CR Basin (BPA),  
 Financial Data (Tom Giese, CBFWA)

## Results and Discussion: Future Fish and Wildlife Costs

Formulating and evaluating all of the factors necessary to estimate fish and wildlife costs is a difficult task. We approached this analysis by examining various categories of costs for the BPA Integrated Fish and Wildlife Program, with particular attention to the costs of implementing programs and projects proposed by one or more parties during their subbasin planning process and implementing certain wildlife provisions. The resulting cost estimates are based on a variety of assumptions. These assumptions and any specific projects or actions that are included in the estimates still must be reviewed by the NPCC and undergo a project selection process. The list of projects also has not been thoroughly reviewed by the fish and wildlife managers. As such, specific projects may or may not be supported by individual managers.

Despite the caveats listed above, we think that the overall cost estimates that we have produced are a valuable indicator of the level of funding that is needed. The cost categories included:

- Subbasin plans - the development of subbasin plans did not include detailed project proposals and budgets. To overcome this problem, various subbasin planners were contacted to provide additional information about the resources needed to implement their plan. The estimates were expanded to cover subbasins where these estimates were not available.
- We undertook a similar process for wildlife mitigation costs. Some specific high interest areas were identified as priorities for the rate case. Estimates from the managers in the area were developed and included in the estimates.
- Our analysis does not include a comprehensive assessment of costs for mainstem measures beyond those contemplated in the Updated Proposed Action or the NPCC Program. However it is clear that additional mainstem measures are necessary to protect, recover, and restore anadromous fish impacted by the federal hydrosystem and need to be funded.

As we noted above these cost estimates and the specific projects that would be implemented need further review. We anticipate that they will become better defined as they pass through the regional decision-making processes. Nonetheless, we continue to believe that the overall estimates are an accurate reflection of the resources that are necessary to make progress for fish and wildlife in the basin.

The analysis summarized in Table 3 indicates that draft subbasin plans will cost about \$1.5 billion to implement. This is probably a minimum estimate and their implementation cost will likely increase as more subbasin estimates are incorporated. In addition, the full costs to improve tributary passage facilities in the Salmon and John Day subbasins have not been included and their addition will increase subbasin plan costs. The costs of implementing the subbasin plans below Bonneville dam have been estimated by extrapolation and have probably been underestimated.

Figures 1 and 2 show the geographic distribution of current (FY 2003 and 2004) BPA spending for fish and wildlife and estimated future investments needed to implement the subbasin plans, respectively. Past investments have been largest in the Plateau and Mountain Snake Provinces with a smaller emphasis on the Upper Columbia and Blue Mountain Provinces. Generally, the subbasin plans continue that emphasis. The fish and wildlife managers are mindful of the economic benefits that accrue to rural communities both as a result of the direct investment of BPA funds in these communities and as a result of increased fishing and hunting opportunities as fish and wildlife populations increase.

This preliminary analysis of the costs of the draft subbasin plans indicate that the subbasin planners anticipate considerably more fish production facilities are needed than assumed in the BPA/NPCC staff analysis in Table 1. That initial analysis assumed no additional production facilities, while this analysis estimates more \$304 million in additional production costs. In addition, the costs of changes to existing fish production facilities that may be anticipated from the NPCC Artificial Production Review and Evaluation process and the Biological Opinions are not included in these costs, but will fall largely in the Reimbursed Expenses portion of the BPA budget.

Table 4 summarizes the overall costs of continuing to carry out the NPCC Fish and Wildlife Program (and associated Biological Opinion actions) and to implement the subbasin plans. At the bottom of Table 4, is a summary of these annual costs (continuing and additional) and the ten-year costs of wildlife mitigation and the subbasin plan implementation. These add to about \$3.1 billion over ten years or a little more than \$300 million per year. If BPA uses its borrowing authority, these annual costs could be reduced to about \$240 million per year (see Table 5), the annual amount for which CBFWA recommends that BPA budget.

The analyses shown in Tables 5 through 7 demonstrate the major effects in reducing annual costs by spreading the implementation costs over longer periods. The current examples assume about \$24 million per year (or a ten-year total of \$240 million) in current habitat spending being re-programmed to cover implementation of the subbasin plans. These analyses indicated that spending at current levels will take about 100 years to implement the draft subbasin plans.

Table 8 summarizes the physical accomplishments that form the basis of the subbasin cost estimates. Implementing the subbasin plans would accomplish: 13 additional or major enhancements to fish hatcheries in 11 subbasins; protection for more than 48,000 acres of habitat; improvements to more than 1300 miles of streams; enhancement activities on more than 75,000 acres of habitat; and, correcting passage problems at more than 1200 diversions and culverts. These estimated achievements are an underestimate because not all achievements are included, only those that fit within the categories used to aggregate them. Further, the material submitted for many of the subbasins was not sufficiently detailed to estimate the physical accomplishments expected. It must be noted

that the achievements reported here do not directly represent increases in fish and wildlife populations (the ultimate objective of implementing the subbasin plans).

While these are large costs, they are consistent with earlier estimates of BPA costs to meet its obligations to fish and wildlife. For example, CBFWA has developed two previous fish and wildlife cost estimates. The first was in 1998 as part of the Multi-Year Implementation Plan. This effort developed costs for implementing all of the elements of the Council Program and FCRPS Biological Opinion. The annual costs were estimated to be \$200 to \$225 million in 1998 dollars, or about \$240 to \$265 million per year in current dollars.

In 2000, CBFWA and the Council conducted the Provincial Review to determine the costs of implementing projects that had been approved by the fish and wildlife managers, the Council, and the Independent Scientific Review Panel. The Provincial Review identified BPA revenue requirements for the Direct Program budget of \$310 million per year for FY 2003 through FY 2006, or about \$350 million per year in current dollars. The history of BPA's F&W spending is included Appendix F.

## **Uncertainty and Risk Management**

Although this analysis provides the most accurate estimate available of the costs to implement the NPCC Fish and Wildlife Program and associated ESA activities, there are other factors that create uncertainty about the ultimate cost of the BPA Integrated Program. This uncertainty derives from numerous sources.

1. Our analysis assumed that other branches of the federal government would provide contributions. For example, the costs for implementing plans in several subbasins (notably those in the Intermountain Province) assume funding from the federal land management agencies that may or may not be forthcoming. If additional Federal appropriations are not available, the region will need to address how to accomplish this work.
2. The analysis of budget “drivers” in Table 1 is based on several assumptions about the ability to reallocate current program expenditures and reduce the need for future budget requirements. These assumptions are untested. For example, Table 1 assumes that BPA and NPCC will reduce current project-scale monitoring and evaluation to make funds available to conduct increased programmatic M&E. How this will be accomplished is unclear, consequently any savings are uncertain.
3. NOAA Fisheries staff has indicated on several occasions that implementing the subbasin plans may not address all of the activities in the forthcoming recovery plans.
4. Pending litigation on the current Biological Opinions may result in significant changes in required fish and wildlife activities, and may increase costs or affect revenues.
5. Implementation of the “Mainstem Amendment” to the NPCC Fish and Wildlife Program may increase costs or affect revenues also.

6. When the currently favorable ocean conditions deteriorate, BPA may be called upon to fund additional activities to address weak-stock survival or productivity.
7. The NPCC Artificial Production Review and Evaluation and the Hatchery Genetic Management Plans call for changes in the operation of many hatcheries built as mitigation for the hydropower system. These costs are not presently reflected in the BPA draft costs for the upcoming rate case and costs for the Reimbursable and the Integrated Program budgets may increase.
8. The prospect of shifting the cost of the Mitchell Act hatcheries to BPA is a substantial uncertainty, considering Congress's previous interest in this issue and increasing pressures on the federal budget.
9. Inflation is not considered in our recommendation, and funding to provide for inflationary costs is often necessary to achieve individual project milestones as scheduled. A three percent inflation rate could result in a \$25 million increase in annual budget needs by the end of the rate period in FY 2009.

All of these uncertainties increase the probability that BPA's Integrated Program budget needs will be higher than the budget levels we recommend. BPA should accommodate these uncertainties explicitly when it sets its rates and when it designs rate adjustment mechanisms. BPA's rate provisions must ensure that it can adequately fund future additional fish and wildlife costs.

## **Economic Impacts**

The budget levels recommended here would result in customers served by utilities purchasing all of their power from BPA paying about \$1.00 per month more. The impact to those served by utilities that purchase less than their full requirements from BPA would be less.

As a rule of thumb, BPA assumes that every \$85 million represents 1 mill or \$0.001 per kilowatt hour on BPA's wholesale power rates for full requirements customers. The CBFWA recommendations for FY 2007 through FY 2008 average \$80 million more than current spending or approximately \$0.001 per kilowatt-hour. The average residential consumer uses about 1,100 kilowatt-hours per month; therefore the fish and wildlife cost increase represents about \$1 per month for the average residential customer served by a utility that purchases all of its power from BPA. BPA provides approximately 40 percent of the electricity used in the Pacific Northwest; the impacts for 60 percent of the region's residential consumers would be less than \$1 per month.

Most of the fish and wildlife activities would be implemented in rural areas east of the Cascade Mountains (Figures 1 and 2). Figure 1 shows the geographic distribution of BPA average annual fish and wildlife spending from its Integrated Program budget for the Fiscal Years 2001 through FY 2004. These investments pay salaries and purchase materials creating additional jobs and economic activity. Figure 2 shows the geographic distribution of estimated ten-year investments in implementing the NPCC subbasin plans. The effects of these investments can be expected to ripple through the tribal and rural economies, creating additional jobs and economic activity.

As fish and wildlife populations increase as a result of these BPA investments, east-side tribal and rural areas will experience increased spending by fishers, hunters, and recreationalists creating additional jobs and economic benefits. For example, in 2001, as a result of previous investments in salmon mitigation and improvements in ocean conditions, salmon runs increased sufficiently for Idaho to open a recreational fishing season on salmon. The Idaho Department of Fish and Game examined the economic benefits of the 2001 salmon season and found that the increased fish opportunity was responsible for almost \$90 million in expenditures. These expenditures were split evenly between the local river communities and the rest of the state. However, impacts were more significant in the smaller local economies. Angler expenditures in Riggins, Idaho (on the Salmon River) during the salmon fishing season stimulated 23 percent of the town's annual sales.

Therefore, the fish and wildlife managers recommend that BPA also consider the important benefits to rural economies of its investments in fish and wildlife while considering the costs of the actions.

## Conclusions and Recommendations

Based on the analysis in this report, the fish and wildlife managers make the following conclusions and recommendations.

### **BPA needs to include adequate funds for fish and wildlife in its next rate case.**

- Implementation of the NPCC subbasin plans and including wildlife mitigation over a ten-year period will cost between \$1.5 and \$2 billion.
- The total cost to implement the Fish and Wildlife Program and associated ESA needs is estimated to be about \$240 million per year.
- Carrying out the subbasin plans would only accomplish between one-quarter and one-half of the habitat work needed in the tributaries of the Columbia and Snake Rivers.
- At the current BPA Integrated Program funding rate of \$139 million per year, it would take about 100 years to implement the NPCC Fish and Wildlife Program.
- *Therefore, the fish and wildlife managers recommend that BPA increase the amount of funds available for fish and wildlife activities to approximately \$240 million per year.*

### **The fish and wildlife managers have developed realistic and reasonable cost estimates for the rate case period.**

- It takes some time to increase the rate of implementation.
- The 2002 rate case set BPA revenues with the intent of providing a fish and wildlife budget of \$186 million per year.
- *Therefore, the fish and wildlife managers recommend that BPA ramp up its Integrated Fish and Wildlife Program budget to meet the these targets:*
  - \$186 million in FY 2006;
  - \$200 million in FY 2007;

- \$225 million in FY 2008; and,
- \$240 million in FY 2009.

**BPA should develop a more flexible capitalization policy to facilitate land and water acquisitions.**

- BPA's current policy on capitalization is unclear regarding the use of its borrowing authority to purchase land and water.
  - BPA's interpretation of its policies has inhibited the implementation of the Fish and Wildlife Program.
  - If BPA uses its borrowing authority for these kinds of purchases, the rate impacts of our recommendations are significantly reduced.
- *Therefore, BPA should modify its capitalization policy to set up mechanisms to allow borrowing funds or the use of its borrowing authority to purchase land and water.*

**BPA should address the uncertainties in fish and wildlife costs in its rate case.**

- The fish and wildlife managers note that with the intent of providing these estimates of future budget needs, that these estimates do not incorporate numerous factors that may increase the needs, and that these budget targets are likely to be under-estimates of actual needs.
  - In the previous rate case BPA used two means to address uncertainties: Cost Recovery Adjustment Clauses and revenue collection to meet more than the minimum need.
- *Therefore, the fish and wildlife managers urge BPA to work with others to ensure its rates provide adequate fish and wildlife funding. BPA's rate provisions must ensure that it can adequately fund future additional fish and wildlife costs.*

**BPA must meet the goals of the Fish and Wildlife Program.**

- After considerable analysis, the NPCC adopted in 1987 an interim estimate of the hydropower (BPA) responsibility to fish and wildlife of 5 million returning adult salmon and mitigation for resident fish and wildlife.
  - The Program also identifies specific goals for resident fish and wildlife mitigation to address the operation and construction of dams and inundation by reservoirs.
  - The NPCC reaffirmed these responsibilities in adopting its amended Fish and Wildlife Program in 2000.
  - Current numbers of returning salmon are approximately the same as they were when the NPCC adopted the interim goal 18 years ago.
- *Therefore, the funding recommended by the fish and wildlife managers through FY 2009 is not likely to exceed costs necessary to achieve the Fish and Wildlife Program goals.*

**The Columbia Basin needs an Implementation Plan for fish and wildlife.**

- The subbasin plans do not, in many cases, identify clear numerical objectives or specific actions, schedules, or costs.
- Such information would provide a statement by those responsible for the fish and wildlife resources of how the resources might be more productively managed and

would provide consistent guidance in a variety of decision processes, such as NPCC amendment processes, ESA recovery planning, annual budget development, activities on Federal lands, local land use planning, etc.

- *Therefore, the fish and wildlife managers strongly recommend development of an implementation plan detailing the actions, schedule and costs needed to implement the Fish and Wildlife Program, and are committed to that effort.*

**Full implementation of the F&W Program and ESA activities will create economic benefits in tribal and rural areas.**

- Most of the fish and wildlife activities would be implemented in rural areas east of the Cascade Mountains creating jobs and additional economic activity.
  - As fish and wildlife populations increase as a result of these BPA investments, east-side rural areas will experience increased fishing, hunting and related activities, also creating additional jobs and invigorating local economies.
  - For those (residential) customers served by utilities purchasing all of their power from BPA the recommended budget levels would result in about a \$1 per month increase in their electric bill. The impact to those served by utilities that purchase less than their full requirements from BPA would be less.
- *Therefore, the fish and wildlife managers recommend that BPA examine the benefits to rural economies from its investments in fish and wildlife.*



# **APPENDICES to the Rate Case Cost Report**

April 22, 2005 Draft

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## **Appendix A. Framework of Analysis for Future Program Implementation Costs** (NPCC Staff Explanation, December 7, 2004)

The staff has reviewed current program costs to estimate needs for Bonneville's next rate period that begins in Fiscal Year 2007. Bonneville's rate case will provide a funding level for program implementation to determine the revenue requirements it must set its rates to collect. The purpose of this analysis is to examine the components of current program costs and describe influences on future program funding needs. This analysis is still under development. Council staff is seeking input on these initial concepts and assumptions.

The staff consulted with Bonneville in this analysis. Both Bonneville and Council staff agreed to use project funding data and categorizations compiled by CBFWA staff (see attachments).

- In each program budget category, an average of actual project spending from FY 2001 to FY 2004 was established. Some additional verification of this information is needed but the Council and Bonneville agreed that the CBFWA staff categorization of costs and the accounting of annual project spending is appropriate for this analysis.
- The Council and Bonneville staff classified certain project costs as established long term funding responsibilities by virtue of specific Program measures, NEPA requirements, written agreement or other specific commitment of Bonneville funding for the projects. This exercise was called the "Appraisal". While the costs of these projects may change after further review (e.g., if they could be done more cost effectively; refocus of scope to better align with current needs) the staff's opinion is that these projects are likely to continue as long term Bonneville funding responsibilities during the next rate period.
- The staff defined program scale "drivers" that are likely to significantly influence the program cost categories during the next rate period. Such drivers include Biological Opinion requirements, current direction of Program implementation and the objectives of subbasin plans. The analysis considers likely sources of increased costs for Program implementation as well as potential areas where current program costs could decline for specific reasons. This memorandum describes those drivers. Inflation in project costs and labor is a program-wide issue that needs to be considered, but was not separately estimated in any of the program budget categories.

The intended use for this analysis is to move the regional discussion of potential future program costs into more specific assumptions of the cost elements for future program funding. The discussions between Bonneville and Council staff reached general agreement on the basic framework of program cost categories, the current costs that are

likely to remain specific project funding requirements (the Appraisal) and the utility of estimating future costs by specific “drivers” grounded in known assumptions about program implementation.

It’s important to understand that this analysis does not propose actual allocations of future program budgets. It is intended to inform the Council about the relative size of current program commitments and the likely influences on their costs in the next rate case. Actual program allocations across subbasins and provinces will be determined through future project selection and budgeting decisions.

If this framework is acceptable, then the analysis of potential costs would benefit from regional review of the assumptions of factors defined in the project cost categories.

## **Program Categories and Assumptions**

### Monitoring and Evaluation

The monitoring and evaluation category of the Fish and Wildlife Program includes mainstem passage monitoring, hatchery monitoring and evaluation, habitat and watershed assessments, and habitat inventories. Examples of currently funded projects in this category are the Coded Wire Tag Recovery project, the Salmon River Habitat Monitoring and Evaluation Project and the Umatilla Basin Natural Production Monitoring and Evaluation Project. The average annual program spending from 2001 through 2004 in the monitoring and evaluation category was approximately \$30 million. Approximately \$9.3 million were identified as explicit long-term funding commitments costs in the Council/Bonneville staff program appraisal. Staff expects future monitoring and evaluation needs will be reviewed and prioritized by the Pacific Northwest Aquatic Monitoring Program (PNAMP) and the Collaborative Systemwide Monitoring and Evaluation Program (CSMEP).

Potential drivers of cost increases:

- Biological Opinion requirements for large-scale population and habitat monitoring
- Mainstem evaluations
- Fall chinook monitoring

Potential drivers of cost reductions:

- Finding efficiencies in project scale monitoring
- Reprogramming funds from short term assessments
- Consolidating monitoring and evaluation at a regional scale
- More rigorous cost sharing where there is a shared responsibility and/or if the M&E isn’t directly related to accomplishing the objectives of the program

The net assumption for change in the monitoring and evaluation category is that funding needs will stay at the same level as current funding or decrease. This assumption relies on successfully prioritizing monitoring and evaluation needs across the region, including

modifications to current projects to better align with priorities and associated management/policy needs.

<b>2001-2004 average expenditure</b>	<b>Appraisal estimate</b>	<b>Net conclusion of “drivers”</b>
\$30 million	\$9.3 million	Same or decrease

Research

The research category of the Fish and Wildlife Program includes studies that collect and analyze new information. Examples of currently funded research projects include projects such as Ocean Survival of Salmonids, Avian Predation of Juvenile Salmonids in the Lower Columbia and Salmon and understanding the effects of summer flow augmentation on fall chinook through Lower Granite Reservoir. The average annual program spending in this category from 2001 through 2004 was approximately \$11 million. Approximately \$2.1 million was identified as explicit program commitments in the Council staff program appraisal. Most of this amount is committed to long term supplementation evaluations in Idaho Rivers.

Potential drivers of cost increases:

- Life-stage research needs based on recent biological information, including that identified in the Biological Opinion
- The Council’s research plan, which calls for some new and better coordinated research, and continued interest in the funding “Innovative” projects

Potential drivers of cost reductions:

- Reduction of the funding for ad hoc research as regional coordination improves
- Potential for other entities to fund or provide a significant cost share if not a program responsibility (i.e., NOAA-Fisheries, the Corps AFEP program, etc).

The net assumption for change in this category is that the need for funding may be reduced from current levels by implementation of a coordinated research strategy that emphasizes focus on information needs for management/policy decisions.

<b>2001-2004 average expenditure</b>	<b>Appraisal estimate</b>	<b>Net conclusion of “drivers”</b>
\$11 million	\$2.1 million	Same or decrease

Information Management, Coordination and Administration (IMCA)

The IMCA category includes coordination and data management and administration projects. Examples of these projects are the Fish and Wildlife Program Implementation through the Columbia Basin Fish and Wildlife Authority (CBFWA), Streamnet and the funding of the Fish Passage Center. The average annual spending for this category of

the Fish and Wildlife Program from 2001 through 2004 was approximately \$11.7 million. Approximately \$10.9 million was identified as a fixed or infrastructure program cost in the Council staff program appraisal.

Potential drivers of cost increases:

- Watershed coordination support (post subbasin planning)
- Regional data management needs

Potential drivers of cost reductions:

- Efficiencies may be found in the current work that is likely to continue into the next funding period. Updating of roles and responsibilities and associated tasks needs to occur.
- Greater cost sharing/co-funding

The net assumption for change in this category is that the need for funding may increase somewhat over current funding levels. (Again this category is similar to M&E and may also require a policy decision on the appropriate level or percentage of the total program).

<b>2001-2004 average expenditure</b>	<b>Appraisal estimate</b>	<b>Net conclusion of “drivers”</b>
\$11.7 million	\$10.9 million	Same or increase

Production

The Production category includes the operation and maintenance of resident and anadromous hatchery projects. Examples are the Yakima-Klickitat Fisheries Project, the Umatilla Fish Hatchery Operations and Maintenance and the Kootenai River White Sturgeon Studies and Conservation Aquaculture project. The average annual spending in this category from 2001 through 2004 was approximately \$39.6 million. Approximately \$32.5 million was identified as a fixed program cost in the Council staff program appraisal.

Potential drivers of cost increases:

- O&M requirements for new production facilities/programs that may be approved by the Council and Bonneville in the near future. These include: Chief Joe Hatchery, Northeast Oregon Hatchery project, Klickitat Hatchery, Mid-Columbia Coho program and others
- Conceptual and preliminary design now accounted for in expense (used to be capitalized)

Potential drivers of cost reductions:

- Efficiencies in project scale operations
- The completion of some construction activities

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The net assumption for change in this category is that the costs of the work in this category would increase over the current level, given the new facilities that are on the horizon.

<b>2001-2004 average expenditure</b>	<b>Appraisal estimate</b>	<b>Net conclusion of “drivers”</b>
\$39.6 million	\$32.5 million	Increase

Mainstem

The mainstem category includes predator control and mainstem passage improvements. Examples are the Northern Pikeminnow Management Program, law enforcement projects and the evaluation of live-capture harvest methods for commercial fisheries project. The average annual spending in the mainstem category from 2001 through 2004 was approximately \$6 million. Approximately \$4.6 million was identified as a fixed program cost in the Council staff program appraisal.

Potential drivers of cost increases:

- Increase predator control funding as called for in the Biological Opinion
- Lamprey passage improvements

Potential drivers of cost reductions:

- Staff analysis did not forecast reductions in program requirements in this area unless funding responsibility is transferred to the Corps and/or shared with other parties.

The net assumption for change in this category is that the cost of the funding projects in the mainstem would increase.

<b>2001-2004 average expenditure</b>	<b>Appraisal estimate</b>	<b>Net conclusion of “drivers”</b>
\$6 million	\$4.6 million	Increase

Habitat

The habitat category includes habitat restoration and protection projects such as land acquisitions, irrigation screening, tributary passage improvement and riparian protection projects. Examples include the Fifteenmile Creek Riparian Fencing project, the Pend Oreille Wetlands Wildlife Mitigation project and the Clearwater Focus Program. The average annual spending in this category from 2001 through 2004 was approximately \$36 million. Approximately \$12 million was identified as a fixed program cost in the Council staff program appraisal. Significant new initiatives that may drive the costs of this category higher include the implementation of subbasin plans and the revised biological opinion. Council staff will continue to solicit input from the region regarding the “drivers” for the habitat category and the pace of implementation of new habitat restoration and protection work.

DRAFT—FOR CBFWA REVIEW—DRAFT  
April 22, 2005, 2005 Draft

Considerations:

- Should focus be on habitat restoration or protecting high quality habitat?
- What is the role of conservation easements?
- Leveraging use of CREP program funding and other funding sources through cost sharing.
- Roll-up of subbasin goals & objectives may yield a sharper focus on priorities for target populations and hence may help stabilize overall cost increases.

<b>2001-2004 average expenditure</b>	<b>Appraisal estimate</b>	<b>Net conclusion of “drivers”</b>
\$36 million	\$12 million	Increase level

Potential drivers of cost increases:

- Implementation of subbasin plans
- Implementation of Biological Opinion UPA

Potential drivers of cost decreases:

- Refocus of efforts through roll-up of subbasin plan objectives
- Cost-sharing with other similar programs
- Increased use of Conservation Easements rather than fee acquisition for habitat protection



DRAFT Appendix B - Subbasin Cost Summaries **Table 3. Status of Subbasin Plan Cost Estimates**

Subbasin	Source	Status	SB-Province Factor
<b>Mtn Columbia Province</b>			<b>X1</b>
Kootenai - Idaho	UCUT	Included	
Kootenai - Montana	SKT/MDFWP	Included	
Flathead	SKT/MDFWP	Included	
<b>Intermountain Province</b>			<b>X1</b>
Coeur D'Alene	UCUT	Included	
Coeur D'Alene	Others	Included	
Columbia/L. Roosevelt	UCUT	Included	
Columbia/L. Roosevelt	Others	Included	
Pend Oreille	UCUT	Included	
Pend Oreille	Others	Included	
Spokane	UCUT	Included	
Spokane	Others	Included	
<b>Mountain Snake Province</b>			<b>X1.5**</b>
Clearwater	NPT	Included	
Lo/Little Salmon	NPT	Included	
<b>Blue Mountain Province</b>			<b>X1</b>
Grande Ronde	NPT	Included	
Asotin	NPT	Included*	
Imnaha	NPT	Included	
Snake-HellsCanyon	NPT	Included	
<b>Upper &amp; Middle Snake Province</b>			<b>X2**</b>
Malheur	BPT	Included	
Owyhee	SBT	Included	
<b>Columbia Cascade Province</b>			<b>X1</b>
Wenatchee	YN	Included	
Entiat	YN	Included	
Methow	YN	Included	
Okanogan	UCUT	Included	
<b>Plateau Province</b>			<b>X2**</b>
Umatilla	NPCC staff	Included	
Tucannon	NPT	Included*	
Yakima	YN	Included	
Rock Creek	YN	Included	
Walla Walla	CTUIR	Included	
<b>Columbia Gorge Province</b>			<b>X1.5**</b>
Hood	NPCC staff	Included	
White Salmon	YN	Included	
Klickitat	YN	Included	
<b>Lower Columbia &amp; Estuary Province</b>			<b>X0</b>
WA Subbasins	LCFRB	Next Draft	

Number of Subbasins Included 27  
 Number in Next Draft 32(?)

Others - Non-Tribal subbasin planners  
 \* Less land acquisition costs  
 \*\* Facility capital costs not extrapolated.

**PRELIMINARY**

**Estimated Additional Costs to Implement Subbasin Plans**

**PRELIMINARY**

	Mtn		Mtn		Blue Mtn		U&M Snake		Columbia Cascade		Plateau		Columbia Gorge		Lo. Col. & Estuary		Total Habitat /Prod Costs (X1.1)		Total Additional Costs (X1.1)	
	Columbia	Inter Mtn	Snake	Mtn	Blue Mtn	Snake	U&M Snake	Columbia Cascade	Plateau	Columbia Gorge	Lo. Col. & Estuary	Total Habitat /Prod Costs (X1.1)	Total Additional Costs (X1.1)							
<b>SUBBASIN PLAN COST</b>																				
<u>IMCA</u> - Regional Data Management	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<u>IMCA</u> - Watershed Coordination	\$2.0	\$2.0	\$5.0	\$0.4	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$10.5	\$10.5
<u>M&amp;E</u> - Programmatic M&E	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$11.0	\$9.8	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$22.9	\$22.9
<u>M&amp;E</u> - Mainstem Evaluations	\$0.0	\$1.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$1.1	\$1.1
<u>M&amp;E</u> - Subbasin Planning	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.3	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.6	\$0.6
<u>Research</u>	\$0.0	\$2.7	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$2.9	\$2.9
<u>Production</u> - New Facilities (Capital)	\$22.8	\$37.8	\$0.0	\$10.8	\$5.6	\$68.8	\$21.6	\$7.6	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4	\$192.4
<u>Production</u> - FWP facilities O/M	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<u>Production</u> - BiOp Improvements	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<u>Production</u> - Other Costs (Expenses)	\$1.3	\$11.9	\$24.6	\$3.4	\$15.0	\$4.9	\$10.0	\$18.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5	\$98.5
<u>Habitat</u> - Land Protection Cost	\$34.7	\$52.0	\$84.8	\$2.7	\$24.0	\$62.8	\$102.7	\$3.7	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2	\$404.2
<u>Habitat</u> - Instream Flow Cost	\$0.0	\$0.0	\$0.0	\$0.0	\$6.2	\$6.5	\$10.0	\$8.2	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0	\$34.0
<u>Habitat</u> - Enhancement & Restoration Cost	\$52.2	\$76.3	\$240.3	\$37.0	\$46.8	\$37.3	\$73.3	\$5.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8	\$625.8
<u>Habitat</u> - Wildlife Mitigation Cost	\$0.0	\$70.9	\$0.0	\$0.0	\$21.9	\$27.6	\$0.0	\$0.0	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5	\$132.5
<u>Habitat</u> - Additional Assessment	\$6.8	\$33.1	\$34.3	\$10.2	\$10.2	\$11.5	\$37.8	\$4.5	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2	\$163.2
<u>Habitat</u> - Additional "Small" Tributary Passage (Expense)	\$1.1	\$0.0	\$117.2	\$9.3	\$17.0	\$7.2	\$18.1	\$0.5	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4	\$187.4
<u>Habitat</u> - Additional "Major" Tributary Passage (Capital)	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$6.5	\$9.0	\$3.8	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2	\$21.2
<u>Habitat</u> - Other Costs	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Total Province Additional</b>	\$120.8	\$287.7	\$506.1	\$73.7	\$157.8	\$243.2	\$282.8	\$52.8	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6	\$1,563.6

Total Additional Costs (from Subbasin Plans) \$1,564

Total 10 year Additional Habitat & Production Costs (from Subbasin Plans) \$1,897.4

<b>MOUNTAIN COLUMBIA</b>	<b>Kootenai-UCUT Total Cost (\$M)</b>	<b>Kootenai-CSKT/MD Total Cost (\$M)</b>	<b>Flathead-CSKT/MD Total Cost (\$M)</b>	<b>Province Cost 10Yr Totals (\$M)</b>
<u>IMCA</u> - Regional Data Management				
<u>IMCA</u> - Watershed Coordination	\$2.0			\$2.0
<u>M&amp;E</u> - Programmatic M&E				
<u>M&amp;E</u> - Mainstem Evaluations				
<u>M&amp;E</u> - Subbasin Planning Research				
<u>Production</u> - New Facilities (Capital)	\$20.2		\$2.6	\$22.8
<u>Production</u> - FWP facilities O/M				
<u>Production</u> - BiOp Improvements				
<u>Production</u> - Other Subbasin Costs		\$1.3		\$1.3
<u>Habitat</u> - Land Protection Cost	\$6.0	\$6.5	\$22.2	\$34.7
<u>Habitat</u> - Instream Flow Cost				
<u>Habitat</u> - Enhancement & Restoration Cost	\$32.6	\$7.0	\$12.6	\$52.2
<u>Habitat</u> - Wildlife Mitigation Cost				
<u>Habitat</u> - Additional Assessment	\$3.0	\$1.2	\$2.6	\$6.8
<u>Habitat</u> - Additional Tributary				
"Small" Passage (Expense)		\$0.4	\$0.7	\$1.1
<u>Habitat</u> - Additional "Major" Tributary Passage (Capital)				
<u>Habitat</u> - Other Costs				
<b>Total Subbasin Additional</b>	\$63.8	\$15.1	\$42.0	\$120.8
<b>Total Province Additional</b>		\$120.8		\$120.8

Source: UCUT CSKT/MDFWP

<b>INTERMOUNTAIN</b>	<b>Coeur D'Alene-Other Total Cost (\$M)</b>	<b>Columbia/L. Roosevelt-Other Total Cost (\$M)</b>	<b>Intermtn General-Other Total Cost (\$M)</b>	<b>Pend Oreille-Other Total Cost (\$M)</b>	<b>Spokane-Other Total Cost (\$M)</b>	<b>10Yr Totals (\$M)</b>
IMCA - Regional Data Management			\$2.0			\$2.0
IMCA - Watershed Coordination						\$0.0
M&E - Programmatic M&E		\$1.0				\$1.0
M&E - Mainstem Evaluations						\$2.7
M&E - Subbasin Planning Research				\$2.7		\$2.7
Production - New Facilities	\$8.2	\$21.1			\$8.6	\$37.8
Production - FWP facilities O/M						
Production - BiOp Improvements			\$1.0	\$4.0	\$3.0	\$11.9
Production - Other Subbasin Costs	\$15.0	\$3.9		\$12.5	\$19.1	\$52.0
Habitat - Land Protection Cost		\$5.4				
Habitat - Instream Flow Cost	\$16.9	\$21.1	\$17.2	\$13.0	\$8.1	\$76.3
Habitat - Enhancement & Restoration Cost	\$12.4	\$27.6	\$4.1	\$19.1	\$7.8	\$70.9
Habitat - Wildlife Mitigation Cost		\$15.5	\$11.4	\$5.5	\$0.8	\$33.1
Habitat - Additional Assessment						
Habitat - Additional Tributary "Small" Passage (Expense)						
Habitat - Additional "Major" Tributary Passage (Capital)						
Habitat - Other Costs						\$0.0
<b>Total Subbasin Additional</b>	<b>\$52.4</b>	<b>\$95.6</b>	<b>\$35.7</b>	<b>\$56.8</b>	<b>\$47.2</b>	<b>\$287.7</b>

\*Includes UCUT costs, Ron Peters 1/27/05  
 Source A. Squier\* A. Squier A. Squier A. Squier A. Squier

MOUNTAIN SNAKE	Clearwater		Lo/Little Salmon		Province Cost (X1.5)
	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	
<u>IMCA</u> - Regional Data Management				\$0.0	
<u>IMCA</u> - Watershed Coordination	\$3.3			\$3.3	\$5.0
<u>M&amp;E</u> - Programmatic M&E					
<u>M&amp;E</u> - Mainstem Evaluations					
<u>M&amp;E</u> - Subbasin Planning					
<u>Research</u>					
<u>Production</u> - New Facilities					
<u>Production</u> - FWP facilities O/M					
<u>Production</u> - BiOp Improvements					
<u>Production</u> - Other Subbasin Costs	\$20.6	\$4.0		\$24.6	\$24.6 **
<u>Habitat</u> - Land Protection Cost	\$50.0	\$6.5		\$56.5	\$84.8
<u>Habitat</u> - Instream Flow Cost					
<u>Habitat</u> - Enhancement & Restoration Cost	\$125.6	\$34.6		\$160.2	\$240.3
<u>Habitat</u> - Wildlife Mitigation Cost					
<u>Habitat</u> - Additional Assessment	\$12.0	\$10.9		\$22.9	\$34.3
<u>Habitat</u> - Additional "Small"					
Tributary Passage (Expense)	\$48.1	\$30.0		\$78.1	\$117.2
<u>Habitat</u> - Additional "Major"					
Tributary Passage (Capital)					
<u>Habitat</u> - Other Costs					
<b>Total Subbasin Additional</b>	<b>\$259.6</b>	<b>\$86.0</b>		<b>\$345.6</b>	<b>\$506.1</b>
<b>Total Province Additional</b>	<b>\$506.1</b>				

Source: NPT NPT NPT

NPT = +\$150 million Clearwater land purchase

\*\* No extrapolation for capital production facilities included.

	Grande Ronde	Asotin	Imnaha	Snake-HellsCanyon	Total Province
	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Ten Yr Cost
<b>BLUE MOUNTAIN</b>					
IMCA - Regional Data Management					\$0.0
IMCA - Watershed Coordination	\$0.1	\$0.2		\$0.1	\$0.4
M&E - Programmatic M&E					
M&E - Mainstem Evaluations					
M&E - Subbasin Planning					
Research					
Production - New Facilities	\$10.8				\$10.8
Production - FWP facilities O/M					
Production - BiOp Improvements					
Production - Other Subbasin Costs	\$1.7			\$1.7	\$3.4
Habitat - Land Protection Cost	\$0.8	\$1.3	\$0.6		\$2.7
Habitat - Instream Flow Cost					
Habitat - Enhancement & Restoration Cost	\$16.0	\$5.0	\$16.0		\$37.0
Habitat - Wildlife Mitigation Cost					
Habitat - Additional Assessment	\$4.5	\$2.5	\$2.6	\$0.6	\$10.2
Habitat - Additional "Small" Tributary Passage (Expense)	\$3.9	\$2.0	\$3.5		\$9.3
Habitat - Additional "Major" Tributary Passage (Capital)					
Habitat - Other Costs					
<b>Total Subbasin Additional</b>	<b>\$37.7</b>	<b>\$10.9</b>	<b>\$22.7</b>	<b>\$2.3</b>	<b>\$73.7</b>

**Total Province Additional** \$73.7

Source:

NPT=+\$50M Asotin land purchase

NPT

NPT

NPT

NPT

<b>Upper &amp; Middle SNAKE</b>	<b>Malheur Total Cost (\$M)</b>	<b>Owyhee Total Cost (\$M)</b>	<b>Total Ten Yr Cost</b>	<b>Province Total (X2)</b>
IMCA - Regional Data Management				
IMCA - Watershed Coordination				
M&E - Programmatic M&E		\$5.5	\$5.5	\$11.0
M&E - Mainstem Evaluations				
M&E - Subbasin Planning				
Research				
<u>Production - New Facilities (Capital)</u>	\$5.6		\$5.6	\$5.6 **
<u>Production - FWP facilities O/M</u>				
<u>Production - BiOp Improvements</u>				
<u>Production - Other Costs (Expense)</u>		\$7.5	\$7.5	\$15.0
<u>Habitat - Land Protection Cost</u>	\$6.0		\$6.0	\$24.0
<u>Habitat - Instream Flow Cost</u>	\$3.1		\$3.1	\$6.2
<u>Habitat - Enhancement &amp; Restoration Cost</u>	\$18.1	\$5.3	\$23.4	\$46.8
<u>Habitat - Wildlife Mitigation Cost</u>	\$5.1	\$5.9	\$11.0	\$21.9
<u>Habitat - Additional Assessment</u>	\$0.1	\$5.0	\$5.1	\$10.2
<u>Habitat - Additional "Small" Tributary Passage (Expense)</u>	\$4.5	\$4.0	\$8.5	\$17.0
<u>Habitat - Additional "Major" Tributary Passage (Capital)</u>				
<u>Habitat - Other Costs</u>				
<b>Total Subbasin Additional</b>	<b>\$42.5</b>	<b>\$39.2</b>	<b>\$81.7</b>	<b>\$157.8</b>

**Total Province Additional** **\$157.8**

Source: L. Schwabe SBP p.38\*

\* Updated by Tim Dykstra, 4/6/05

\*\* No extrapolation for capital production facilities included.

	Wenatchee Total Cost (\$M)	Okanogan Total Cost (\$M)	Methow Total Cost (\$M)	Entiat Total Cost (\$M)	Province Cost Total 10 Yr Cost (\$M)
<b>COLUMBIA CASCADE</b>					
<u>IMCA</u> - Regional Data Management					
<u>IMCA</u> - Watershed Coordination					
<u>M&amp;E</u> - Programmatic M&E		\$9.8			\$9.8
<u>M&amp;E</u> - Mainstem Evaluations					
<u>M&amp;E</u> - Subbasin Planning Research	\$0.3				\$0.3
<u>Production</u> - New Facilities (Capital)	\$1.5	\$55.3	\$12.0		\$68.8
<u>Production</u> - FWP facilities O/M					
<u>Production</u> - BiOp Improvements					
<u>Production</u> - Other Subbasin Costs (Expense)		\$2.4	\$2.5		\$4.9
<u>Habitat</u> - Land Protection Cost	\$24.3				\$24.3
<u>Habitat</u> - Instream Flow Cost	\$4.7			\$8.0	\$62.8
<u>Habitat</u> - Enhancement & Restoration Cost	\$13.4		\$8.8	\$5.7	\$6.5
<u>Habitat</u> - Wildlife Mitigation Cost		\$27.6			\$37.3
<u>Habitat</u> - Additional Assessment	\$0.7	\$2.7	\$5.0	\$3.2	\$27.6
<u>Habitat</u> - Additional "Small" Tributary Passage (Expense)	\$3.4		\$1.5	\$0.5	\$11.5
<u>Habitat</u> - Additional "Major" Tributary Passage (Capital)	\$1.1	\$1.9	\$2.5	\$1.0	\$7.2
<u>Habitat</u> - Other Costs		\$1.9			\$6.5
<b>Total Subbasin Additional</b>	\$49.4	\$120.4	\$54.8	\$18.7	\$243.2
<b>Total Province Additional</b>	\$243.2				

Sources: B. Rose UCUT YN YN



COLUMBIA PLATEAU	Umatilla	Tucannon	Yakima	Rock Creek	Deschutes	Walla Walla	John Day	Ten Year	Total
	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Total Cost (\$M)	Cost	Province (X2)
IMCA - Regional Data Management		\$0.1						\$0.1	\$0.20
IMCA - Watershed Coordination									
M&E - Programmatic M&E	\$2.0					\$2.0			
M&E - Mainstem Evaluations									
M&E - Subbasin Planning									
Research									
Production - New Facilities			\$15.0			\$6.6		\$21.6	\$21.60 **
Production - FWP facilities O/M									
Production - BiOp Improvements									
Production - Other Subbasin Costs			\$5.0					\$5.0	\$10.00
Habitat - Land Protection Cost	\$12.9	\$1.3	\$35.2	\$2.1		*		\$51.4	\$102.72
Habitat - Instream Flow Cost			\$5.0			*		\$5.0	\$10.00
Habitat - Enhancement & Restoration Cost	\$18.0	\$5.2	\$13.0	\$0.5		*		\$36.7	\$73.34
Habitat - Wildlife Mitigation Cost									
Habitat - Additional Assessment	\$7.5	\$2.5	\$8.0	\$1.0		*		\$18.9	\$37.83
Habitat - Additional "Small" Tributary Passage (Expense)	\$4.5	\$2.0	\$2.5	\$0.1		*		\$9.1	\$18.10
Habitat - Additional "Major" Tributary Passage (Capital)			\$5.0					\$9.0	\$9.00 **
Habitat - Other Costs									
<b>Total Subbasin Additional</b>	\$44.9	\$11.0	\$88.6	\$3.6	\$0.0	\$12.6		\$156.7	\$282.8
<b>Total Province Additional</b>	<b>\$282.8</b>								

Source: CTUIR NPT YN YN CTUIR

NPT=+\$50M Tucannon land purchase  
 \* Walla Walla habitat costs are included in "Total Province" extrapolation.  
 \*\* Facility capital costs not extrapolated.

COLUMBIA GORGE	Hood		15Mile	Wind	B&L White Salmon	Klickitat	Province Cost
	Total Cost (\$M)	Total Cost (\$M)					
IMCA - Regional Data Management							
IMCA - Watershed Coordination							
M&E - Programmatic M&E	\$0.2						\$0.3
M&E - Mainstem Evaluations							
M&E - Subbasin Planning							
Research							
Production - New Facilities						\$7.6	\$7.6*
Production - FWP facilities O/M							
Production - BOp Improvements							
Production - Other Subbasin Costs						\$12.3	\$18.5
Habitat - Land Protection Cost	\$0.1				\$1.7	\$0.7	\$3.7
Habitat - Instream Flow Cost	\$5.5						\$8.2
Habitat - Enhancement & Restoration Cost	\$1.7				\$0.4	\$1.8	\$5.8
Habitat - Wildlife Mitigation Cost							
Habitat - Additional Assessment					\$1.4	\$1.6	\$4.5
Habitat - Additional "Small" Tributary							
Passage (Expense)	\$0.3				\$0.1		\$0.5
Habitat - Additional "Major" Tributary							
Passage (Capital)	\$3.8						\$3.8*
Habitat - Other Costs							
<b>Total Subbasin Additional</b>	\$11.5	\$0.0	\$0.0	\$0.0	\$3.5	\$24.0	\$39.0
<b>Total Province Additional</b>	\$52.8						\$52.8

Source: K. Wiest

YN YN

\* Facility capital costs not extrapolated.

<b>Lower Columbia &amp; Estuary</b>	<b>Grays Total Cost (\$M)</b>	<b>Lewis Total Cost (\$M)</b>	<b>Cowlitz Total Cost (\$M)</b>	<b>Willamette Total Cost (\$M)</b>	<b>Ten Yr Cost</b>	<b>Province Total (X )</b>
<u>IMCA</u> - Regional Data Management						
<u>IMCA</u> - Watershed Coordination						
<u>M&amp;E</u> - Programmatic M&E						
<u>M&amp;E</u> - Mainstem Evaluations						
<u>M&amp;E</u> - Subbasin Planning						
<u>Research</u>						
<u>Production</u> - New Facilities						
<u>Production</u> - FWP facilities O/M						
<u>Production</u> - BiOp Improvements						
<u>Production</u> - Other Subbasin Costs						
<u>Habitat</u> - Land Protection Cost						
<u>Habitat</u> - Instream Flow Cost						
<u>Habitat</u> - Enhancement & Restoration Cost						
<u>Habitat</u> - Wildlife Mitigation Cost						
<u>Habitat</u> - Additional Assessment						
<u>Habitat</u> - Additional "Small" Tributary Passage (Expense)						
<u>Habitat</u> - Additional "Major" Tributary Passage (Capital)						
<u>Habitat</u> - Other Costs						
<b>Total Subbasin Additional</b>	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0	\$0.0
<b>Total Province Additional</b>						

Source:

## Appendix C – Methodology and Assumptions to Calculate Total Cost to Restore Columbia Basin Habitat

**Costs to Protect and Restore All Columbia River Basin Habitat.** Staff assumed that the overall costs to improve the habitat are comprised of three components: the cost to protect riparian lands along perennial streams; the cost to improve instream flows; and, the cost to repair or restore damaged habitat. Table 1 lists the subbasins evaluated and the values used.

Human use of lands adjacent to streams, whether for agriculture, grazing, logging, transportation, mining, etc. have degraded virtually all streams not in Wilderness Areas or parks. We assumed that land protection consists of purchasing the lands, the cost of which we estimated as the product of an assumed land cost, the number of miles of perennial (250k scale) streams, and an average buffer width of 660 feet (1/8<sup>th</sup> mile) on each side. We assumed that outright purchase of buffer strips would be less expensive than the more politically viable alternative of long-term conservation easements with fencing.

Streamflows throughout the basin are over-appropriated contributing to serious degradation of habitat quality during the summer when demands for out-of-stream uses are highest. Staff assumed that the purchase of senior rights to currently diverted water during the low-flow months of July, August, and September would relieve limits due to temperature, pollution, and habitat quantity and quality. This cost was estimated by calculating the number of acre-feet of water required to increase the average August streamflow in the lower reaches of the subbasin by some percentage (often 20%, but see Table 1). We assumed that this number of acre-feet of water would be needed for three months at an assumed cost per acre-foot (see Table 1). We assumed that the cost of retiring senior water rights would be less expensive than alternative approaches such as improving fish passage at the diversion and improving irrigation efficiencies. This approach is also based on the assumption that state law allows instream uses to prevail over out-of-stream uses.

Degraded habitat in many situations will recover through natural process if the disturbance ceases. However, in badly damaged areas recover can take decades and to speed the process, restoration or enhancement actions, such as native plantings, weed control, stream bank stabilization or road obliteration are often done. We assumed that stream habitat in “poor” or “fair” condition would need restoration and that on average such activities would cost \$1000 per acre (Table1).

Further, we assumed that land protection, flow improvement, and restoration efforts would have continuing costs to maintain the benefits. These annual costs were estimated as one percent of the land protection or flow improvement costs and two percent of the restoration cost (Table 1).

In each province with evaluated subbasins, the estimated costs to “fix” the habitat were extrapolated for the entire province on an approximate area basis. In other words, if the evaluated subbasins covered about 80 percent of the province area, the total cost for the province was assumed to be 1.5 times the total costs of the evaluated subbasins in the province. Similarly, the costs estimated for the five provinces evaluated were assumed to represent roughly two-thirds of the entire Columbia River Basin, and were multiplied by 1.5 to estimate the total cost over the entire basin. Table 2 summarizes the provincial costs and their compilation to an overall cost of about \$12 billion to “fix” the habitat throughout the Columbia River Basin.

**Appendix D – Detailed UCUT Proposal (submitted to NPCCC, May? 2004)**

**INTERMOUNTAIN PROVINCE**

MOAII Category - HABITAT AQUATIC	FY06	FY07	FY08	FY09	FY10	FY 11-15	TOTAL
CdA Resident Priority Tributary Habitat Enhancement (includes M&E, Education, and Conservation Easements)	\$1.25	\$1.25	\$1.30	\$1.35	\$1.40	\$7.00	\$13.55
Spokane Subbasin Habitat Protection (Hangman Restoration)	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$7.50	\$15.00
Spokane Subbasin Habitat O&M	\$0.30	\$0.30	\$0.30	\$0.30	\$0.35	\$1.75	\$3.30
CdA Subbasin Habitat Protection (Coeur d'Alene Wetlands)	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$7.50	\$15.00
CdA Subbasin Habitat O&M	\$0.30	\$0.30	\$0.30	\$0.30	\$0.35	\$1.75	\$3.30
Spokane (Hangman Watershed Habitat Protection and Enhancement, Includes M&E, Education and Conservation Easements)	\$0.30	\$0.75	\$0.80	\$0.85	\$0.90	\$4.50	\$8.10
Riparian & Island Hab Protection - LR, San Poil, Etc.	\$0.50	\$0.50	\$0.50	\$0.53	\$0.60	\$2.80	\$5.43
Native Origin Kokanee Habitat Enhancement	\$0.40	\$0.40	\$0.40	\$0.40	\$0.40	\$2.00	\$4.00
Bull Trout & Westslope Cutthroat Enhancement (includes O&M & M&E)	\$0.50	\$0.50	\$0.50	\$0.53	\$0.60	\$2.80	\$5.43
Bass Winter Cover	\$0.05	\$0.05	\$0.05	\$0.05	\$0.05	\$0.25	\$0.50
PendOreille Watershed Habitat Protection & Enhancement #1	\$1.25	\$1.25	\$1.25	\$1.25	\$1.25	\$6.25	\$12.50
Lake Roosevelt rainbow trout habitat restoration	\$0.35	\$0.40	\$0.40	\$0.45	\$0.45	\$1.80	\$3.85
Lake Roosevelt White Sturgeon hab restor/enhancement	\$0.00	\$0.00	\$0.50	\$0.50	\$0.50	\$2.00	\$3.50
Lake Roosevelt Kokanee Habitat Enhancement	\$0.18	\$0.18	\$0.18	\$0.18	\$0.18	\$0.88	\$1.75
Native Origin Kokanee Habitat Enhancement	\$0.40	\$0.40	\$0.40	\$0.40	\$0.40	\$1.80	\$3.80
Rufus Woods habitat restoration & enhancement	\$0.00	\$0.00	\$0.00	\$0.85	\$0.90	\$3.00	\$4.75
San Poil hab restor & enhancmt	\$0.40	\$0.60	\$0.80	\$0.85	\$0.90	\$2.00	\$5.55
Implement strobe-light entrainment prevention, incl. M&E	\$0.20	\$1.50	\$1.50	\$0.50	\$0.50	\$1.00	\$5.20
Spokane Reservation Lakes & Streams Protection & Enhancement	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.38	\$0.75
<b>SUBTOTAL HABITAT AQUATIC</b>	<b>\$9.45</b>	<b>\$11.45</b>	<b>\$12.25</b>	<b>\$12.36</b>	<b>\$12.80</b>	<b>\$56.95</b>	<b>\$115.26</b>

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**INTERMOUNTAIN PROVINCE**

<b>MOAII Category - HABITAT UPLAND/TERRESTRIAL</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY 11-15</b>	<b>TOTAL</b>
Albeni Falls Complete Habitat Protection	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$15.00	\$40.00
Albeni Falls O&M	\$1.70	\$1.70	\$1.70	\$2.00	\$2.00	\$10.00	\$19.10
CdaA Lake Creek Habitat Protection	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$5.00	\$10.00
CdA Lake Creek Habitat O&M	\$0.20	\$0.20	\$0.20	\$0.25	\$0.25	\$1.25	\$2.35
CCT Habitat Protection	\$4.50	\$1.50	\$1.50	\$1.50	\$1.50	\$10.00	\$20.50
CCT O&M, M&E	\$0.50	\$0.50	\$0.50	\$0.80	\$0.80	\$4.00	\$7.10
Multi-Agency Sharp-Tailed Grouse Regional Brood-rear (includes habitat assessment)	\$0.50	\$0.50	\$0.50	\$0.50	\$0.50	\$0.00	\$2.50
STOI Habitat Protection	\$1.50	\$1.50	\$1.50	\$0.00	\$0.00	\$0.00	\$4.50
STOI O&M, M&E	\$0.28	\$0.25	\$0.25	\$0.25	\$0.25	\$1.00	\$2.28
STOI Sharp-Tailed Grouse Reintroduction	\$0.15	\$0.15	\$0.10	\$0.10	\$0.10	\$0.38	\$0.98
<b>SUBTOTAL HABITAT UPLAND/TERRESTRIAL</b>	<b>\$15.33</b>	<b>\$12.30</b>	<b>\$12.25</b>	<b>\$11.40</b>	<b>\$11.40</b>	<b>\$46.63</b>	<b>\$109.30</b>

<b>MOAII Category - PROGRAM SUPPORT</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY11-15</b>	<b>TOTAL</b>
Albeni Falls Operational Loss Assessment	\$0.00	\$0.50	\$0.50	\$0.00	\$0.00	\$0.00	\$1.00
CCT burbot, whitefish assessment	\$0.00	\$0.50	\$0.50	\$0.50	\$0.00	\$0.00	\$1.50
Grand Coulee Operational Loss Assessment	\$0.00	\$0.50	\$0.50	\$0.00	\$0.00	\$0.00	\$1.00
Lake Roosevelt White Sturgeon Assessment	\$0.27	\$0.27	\$0.29	\$0.29	\$0.31	\$0.00	\$1.42
Lake Roosevelt White Sturgeon Feasibility Study	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.50
Resident Fish Stock Assessment (add CDA and IDFG)	\$1.00	\$1.00	\$1.03	\$1.06	\$1.09	\$5.50	\$10.68
US-Canada Transboundary Water Quality Evaluation & Monitoring	\$0.08	\$0.08	\$0.08	\$0.08	\$0.38		\$0.68
Lake Roosevelt Evaluation Program	\$1.00	\$1.03	\$1.06	\$1.09	\$1.12	\$5.50	\$10.80
Spokane Resident Tributaries and Lake Roosevelt Evaluation	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	\$0.38	\$0.76
Rufus Woods fish/habitat assessment	\$0.35	\$0.40	\$0.50	\$0.00	\$0.00	\$0.00	\$1.25
Sage Grouse Re-introduction Evaluation Study	\$0.25	\$0.25	\$0.08	\$0.00	\$0.00	\$0.00	\$0.58
Pronghorn Antelope Feasibility Study	\$0.25	\$0.25	\$0.00	\$0.00	\$0.00	\$0.00	\$0.50
Regional Coordination / Participation	\$0.20	\$0.21	\$0.20	\$0.20	\$0.20	\$1.00	\$2.01
<b>SUBTOTAL PROGRAM SUPPORT</b>	<b>\$3.97</b>	<b>\$5.06</b>	<b>\$4.81</b>	<b>\$3.29</b>	<b>\$3.17</b>	<b>\$12.38</b>	<b>\$32.67</b>

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**INTERMOUNTAIN PROVINCE**

<b>MOAll Category - HARVEST</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY11-15</b>	<b>TOTAL</b>
Brook trout and Lake Trout removal (for bull trout)	\$0.30	\$0.30	\$0.30	\$0.30	\$0.30	\$1.50	\$3.00
<b>SUBTOTAL HARVEST</b>	<b>\$0.30</b>	<b>\$0.30</b>	<b>\$0.30</b>	<b>\$0.30</b>	<b>\$0.30</b>	<b>\$1.50</b>	<b>\$3.00</b>

<b>MOAll Category - ARTIFICIAL PRODUCTION</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY 11-15</b>	<b>TOTAL</b>
CDA and Spokane Subbasin Interim Production	\$0.30	\$0.30	\$0.30	\$0.30	\$0.30	\$1.50	\$3.00
Westslope Cutthroat Production Facility	\$2.00	\$2.00	\$0.55	\$0.55	\$0.55	\$2.50	\$8.15
CCT Native-origin kokanee Supplementation	\$0.50	\$0.50	\$0.50	\$0.50	\$0.50	\$0.00	\$2.50
CCT trout hatchery	\$0.90	\$0.93	\$0.95	\$0.97	\$1.00	\$5.50	\$10.25
White Sturgeon Stoppag, Rufus Woods	\$0.03	\$0.03	\$0.05	\$0.05	\$0.05	\$0.00	\$0.21
White Sturgeon Stoppag, Lake Roosevelt	\$0.03	\$0.03	\$0.05	\$0.05	\$0.05	\$0.00	\$0.21
Conservation Aquaculture	\$0.00	\$0.00	\$0.00	\$0.25	\$0.25	\$0.50	\$1.00
Sturgeon Hatchery	\$0.00	\$0.00	\$0.25	\$0.25	\$0.50	\$0.00	\$1.00
Sherman Creek Hatchery	\$0.90	\$0.91	\$0.91	\$0.92	\$0.93	\$4.00	\$8.56
Lake Roosevelt & Banks Lake Substitution (includes hatchery and net pens)	\$1.00	\$1.05	\$1.10	\$1.15	\$1.12	\$6.00	\$11.42
Lake Rufus Woods Net Pen, rainbow trout	\$0.15	\$0.15	\$0.20	\$0.20	\$0.25	\$1.30	\$2.25
Kalispel bass hatchery O&M (repair, maintenance, etc.)	\$0.19	\$0.19	\$0.20	\$0.20	\$0.20	\$1.00	\$1.97
<b>SUBTOTAL ARTIFICIAL PRODUCTION</b>	<b>\$6.00</b>	<b>\$6.09</b>	<b>\$5.06</b>	<b>\$5.39</b>	<b>\$5.70</b>	<b>\$22.30</b>	<b>\$50.52</b>

<b>TOTAL ALL CATEGORIES - INTERMOUNTAIN PROVINCE</b>	<b>\$35.04</b>	<b>\$35.20</b>	<b>\$34.66</b>	<b>\$32.74</b>	<b>\$33.37</b>	<b>\$139.76</b>	<b>\$310.75</b>
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**KOOTENAI RIVER SUBBASIN**

<b>MOAll Category - HABITAT AQUATIC</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY11-15</b>	<b>TOTAL</b>
Kootenai floodplain hab protect & enhcmt. Incl. O&M, M&E	\$0.00	\$0.00	\$1.50	\$1.50	\$1.50	\$7.50	\$12.00
Kootenai ecosystem restor., incl. O&M, M&E	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$7.50	\$15.00
Transboundary nutrient program	\$0.50	\$0.50	\$0.50	\$0.50	\$0.50	\$2.50	\$5.00
Kootenai floodplain reconnection	\$0.50	\$0.50	\$0.50	\$0.30	\$0.30	\$1.50	\$3.60
Enhance white sturgeon habitat, incl. O&M, M&E	\$0.50	\$0.50	\$0.25	\$0.25	\$0.25	\$1.25	\$3.00
<b>SUBTOTAL HABITAT AQUATIC</b>	<b>\$3.00</b>	<b>\$3.00</b>	<b>\$4.25</b>	<b>\$4.05</b>	<b>\$4.05</b>	<b>\$20.25</b>	<b>\$38.60</b>

**MOAll Category - PROGRAM SUPPORT**

Kootenai floodplain loss assessment	\$0.50	\$0.50	\$0.00	\$0.00	\$0.00	\$0.00	\$1.00
Kootenai sturgeon and burbot research	\$0.20	\$0.20	\$0.20	\$0.20	\$0.20	\$1.00	\$2.00
Regional and community coordination and outreach	\$0.90	\$0.20	\$0.20	\$0.20	\$0.20	\$1.00	\$2.00
<b>SUBTOTAL PROGRAM SUPPORT</b>	<b>\$1.60</b>	<b>\$0.90</b>	<b>\$0.40</b>	<b>\$0.40</b>	<b>\$0.40</b>	<b>\$2.00</b>	<b>\$5.00</b>

**MOAll Category - Artificial Production**

Sturgeon and burbot	\$1.80	\$3.50	\$3.00	\$1.70	\$1.70	\$8.50	\$20.20
<b>SUBTOTAL ARTIFICIAL PRODUCTION</b>	<b>\$1.80</b>	<b>\$3.50</b>	<b>\$3.00</b>	<b>\$1.70</b>	<b>\$1.70</b>	<b>\$8.50</b>	<b>\$20.20</b>

**TOTAL ALL CATEGORIES - KOOTENAI R. SUBBASIN**

	<b>\$6.40</b>	<b>\$7.40</b>	<b>\$7.65</b>	<b>\$6.15</b>	<b>\$6.15</b>	<b>\$30.75</b>	<b>\$63.80</b>
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**OKANOGAN SUBBASIN & UPPER MAINSTEM**

<b>MOAll Category - HABITAT AQUATIC</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY11-15</b>	<b>TOTAL</b>
Salmon Cr. Restore & enhancement	\$0.35	\$0.45	\$3.85	\$4.35	\$0.40	\$1.50	\$10.90
Omak Cr. Habitat restoration & protection	\$0.25	\$0.70	\$1.00	\$0.80	\$0.30	\$1.20	\$4.25
Okanogan basin anadromous Fish hab. restoration & protect	\$0.40	\$0.60	\$0.35	\$0.40	\$0.50	\$1.50	\$3.75
Okanogan R. and anadormous Fish passage/screening	\$0.30	\$0.50	\$1.20	\$0.35	\$0.35	\$1.00	\$3.70
<b>SUBTOTAL HABITAT AQUATIC</b>	<b>\$1.30</b>	<b>\$2.25</b>	<b>\$6.40</b>	<b>\$5.90</b>	<b>\$1.55</b>	<b>\$5.20</b>	<b>\$22.60</b>

**MOAll Category - PROGRAM SUPPORT**

Okanogan Basin M&E	\$0.90	\$0.95	\$0.95	\$1.00	\$1.00	\$5.00	\$9.80
Col. R. anadromous fish habitat assessments	\$0.35	\$0.40	\$0.40	\$0.00	\$0.00	\$0.00	\$1.15
Fishery Conservation Enforcement	\$0.40	\$0.20	\$0.20	\$0.20	\$0.20	\$1.20	\$2.40
<b>SUBTOTAL PROGRAM SUPPORT</b>	<b>\$1.65</b>	<b>\$1.55</b>	<b>\$1.55</b>	<b>\$1.20</b>	<b>\$1.20</b>	<b>\$6.20</b>	<b>\$13.35</b>

**MOAll Category - ARTIFICIAL PRODUCTION**

Okanogan River steelhead hatchery	\$0.80	\$0.15	\$0.15	\$0.20	\$0.25	\$1.30	\$2.85
CCT spring chinook hatchery, Chief Joe	\$0.00	\$0.00	\$2.80	\$3.20	\$0.40	\$2.00	\$8.40
CCT summer chinook hatchery, Chief Joe	\$1.80	\$1.70	\$8.70	\$9.00	\$1.60	\$8.50	\$31.30
<b>SUBTOTAL ARTIFICIAL PRODUCTION</b>	<b>\$2.60</b>	<b>\$1.85</b>	<b>\$11.65</b>	<b>\$12.40</b>	<b>\$2.25</b>	<b>\$11.80</b>	<b>\$42.55</b>

**TOT. ALL CATEGORIES OKANOGAN & UPPER MAINSTEM**

	<b>\$5.55</b>	<b>\$5.65</b>	<b>\$19.60</b>	<b>\$19.50</b>	<b>\$5.00</b>	<b>\$23.20</b>	<b>\$78.50</b>
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**GRAND TOTAL ALL CATEGORIES - IMP, KOOTENAI R., OKANOGAN & UPPER MAINSTEM**

	<b>\$46.99</b>	<b>\$48.25</b>	<b>\$61.91</b>	<b>\$58.39</b>	<b>\$44.52</b>	<b>\$193.71</b>	<b>\$453.05</b>
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**UCUT Upper Columbia Ecoregion “Roll Up” Summary Table  
 Biological Objectives, Strategies/Actions, and Estimated Costs**

Fish & Wildlife Focus	Biological/ Environmental Objective	Strategy	Estimated Cost in Millions												
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015			
<b>IMP</b>															
<b>Wildlife - C&amp;I @ 1:1</b>	<b>HU's</b>														
Albeni Falls	18,000	<ul style="list-style-type: none"> <li>O&amp;M</li> </ul>	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5	\$12.5
Grand Coulee	40,000	<ul style="list-style-type: none"> <li>Habitat Protection</li> </ul>													
Chief Joseph	12,000	<ul style="list-style-type: none"> <li>Habitat Enhancement</li> </ul>													
Sharp-tailed Grouse (STG) Restoration	Re-Introduce STG to the Spokane Indian Reservation Establish at least a min. of 20 breeding females	<ul style="list-style-type: none"> <li>Monitoring &amp; Evaluation</li> <li>Monitor &amp; Evaluate STG Productivity</li> </ul>													
<b>Resident Fish Substitution</b>															

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Fish & Wildlife Focus	Biological/ Environmental Objective	Strategy	Estimated Cost in Millions										
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Native Trout Populations & Habitat	Assess 300 miles of tributary habitat	<ul style="list-style-type: none"> <li>• Artificial Production Fish Habitat Protection</li> <li>• Habitat Restoration/enhancement</li> <li>• Water rights</li> <li>• Predator Management</li> <li>• Monitoring and Evaluation</li> </ul>	\$15.1	\$15.15	\$15.15	\$15.15	\$15.15	\$15.15	\$15.15	\$15.15	\$15.15	\$15.15	\$15.15
	Protect 40 miles of tributary habitat												
	Enhance/Restore 38 miles of in-stream tributary habitat												
	Enhance at least 300 miles of riparian habitat												
	Introduce beaver into tributary habitats												
	Remove exotic species from 75 miles of tributaries												
	Monitor/evaluate 50 miles of tributary enhancements												
Feasibility of conservation and production aquaculture													

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Fish & Wildlife Focus	Biological/ Environmental Objective	Strategy	Estimated Cost in Millions																	
			2006	2007	2008	2009	2010	2011	2012	2013	2014	2015								
	facilities (e.g., cutthroat/bull trout, burbot, white sturgeon)  Provide for harvest opportunities (e.g., put and take fisheries)  Produce at least 20,000 white sturgeon and 500,000 redband rainbow trout  Monitor fish populations and habitat  Assess 848 miles of tributaries for genetic distribution of redband trout  Address habitat accessibility in at least 1,500 miles of tributaries																			

# **Appendix E – Draft Wildlife Funding Options and Cost Estimates for Short and Long-term Mitigation for the FY 2007-2009 BPA Rate Case and Beyond**

3/21/05

## **EXECUTIVE SUMMARY**

In preparation for the upcoming Bonneville Power Administration FY 2007-2009 Rate Case, the Columbia Basin Fish Wildlife Authority (CBFWA) has been developing a funding needs proposal for wildlife concerns. This funding package will cover costs for maintaining existing wildlife mitigation sites and implementing new and ongoing projects to mitigate for construction and inundation losses of wildlife based on the Northwest Power and Conservation Council's (NPCC) Columbia River Basin 2000 Fish and Wildlife Program (Program). This proposed funding package is a subset of the broader CBFWA funding recommendation for the development of the FY 2007-2009 Rate Case funding proposal that is expected to be determined in 2005.

In developing this funding package the CBFWA has considered two primary components. The first is the funding necessary for the operations, maintenance and enhancement of existing wildlife mitigation projects. This funding will maintain existing mitigation sites in their current condition and insure that a "reasonable" level of restoration of the habitat values commensurate with the identified losses per dam is included. The second is the need to continue progress towards fulfilling the unmet mitigation requirements identified in the Program. Both of these components are important to insure the success of the wildlife mitigation component of the Program. This proposal is intended to provide mitigation opportunities across the entire basin, but has a focus on areas that have the largest deficit in achieving mitigation for construction and inundation losses. These include the Willamette, Inter-mountain and the Southern Idaho areas.

CBFWA's primary wildlife mitigation funding interests are summarized as follows:

1. Maximizing the use of the limited funds available for on-the-ground projects, while minimizing expenditure on process.
2. Adequate funding for a reasonable level of OME for existing mitigation sites.
3. Predictable funding for long-term OME to allow efficient use of funds and assure continuity of programs and personnel.
4. Predictable long-term funding to allow for effective and efficient habitat protection program, which is not possible with current accrual based annual funding.

For the FY 2007-2009 Rate Case \$10.4M is needed to adequately fund operations, maintenance and enhancement on existing wildlife mitigation areas, while an additional \$23.1M is needed to fund a habitat protection program for a total of \$33.4M needed annually.

In preparation for the upcoming Bonneville Power Administration (BPA) FY 2007-2009 Rate Case, the Columbia Basin Fish Wildlife Authority (CBFWA) has been developing a funding needs proposal for wildlife concerns. This funding package will cover costs for maintaining existing wildlife mitigation sites and implementing new and ongoing projects to mitigate for construction and inundation losses of wildlife based on the Northwest Power and Conservation Council's (NPCC) Columbia River Basin 2000 Fish and Wildlife Program (Program). This proposed funding package is a subset of the broader CBFWA funding recommendation for the development of the FY 2007-2009 BPA Rate Case funding proposal that is expected to be determined in 2005. Under the Pacific Northwest Electric Power Planning and Conservation Act of 1980, BPA has an obligation to provide funding to protect, mitigate, and enhance fish and wildlife to the extent affected by the development and operation of the Columbia River Federal Hydropower System. CBFWA is uniquely positioned to develop the strategy for fish and wildlife resources because of its experience and the authority of its members for wildlife management and stewardship in the region.

In developing this funding package the WC has considered two primary components. The first is the funding necessary for the operations and maintenance (O&M) and monitoring and evaluation (M&E) of existing wildlife mitigation projects. This funding will maintain existing mitigation sites in their current condition and insure that a "reasonable" level of restoration of the habitat values commensurate with the identified losses per dam is included. The second is the need to continue progress towards fulfilling the unmet mitigation requirements identified in the Program. Both of these components are important to insure the success of the wildlife mitigation component of the Program. Existing wildlife mitigation sites/projects represent a down payment towards fulfilling BPA's mitigation obligation. The lands purchased or otherwise protected provide places where the habitat values that were lost due to dam construction and inundation can be maintained in perpetuity. However, habitat condition from past land use, and the current threats from noxious weed invasions, wildfires, livestock trespass, adjoining human uses, urban encroachment, and other factors require continuing inputs of staff time, equipment, and materials to maintain and improve the productivity of the mitigation site. Without these resources the lands will decline in productivity and the mitigation obligations to replace lost habitat functions will no longer be met. In addition, the projected habitat values which were to accrue over time in the majority of the mitigation sites were based on enhancements to the baseline productivity that have yet to be accomplished.

Wildlife resources are unique in the Columbia Basin in that specific wildlife losses due to each federal hydropower project have been defined and quantified. These losses have been quantified in terms of Habitat Units (HUs)<sup>1</sup> tied to indicator species associated with each hydropower project (dam). The habitat losses/gains for each facility are defined in the Program and are reflected in Table 11-4. As a result there is an accounting of HUs acquired as based on each project implemented for wildlife mitigation purposes, which is then credited against BPA's ultimate HU debt. An accounting of projects implemented relative to HU "credits" have been estimated by BPA and are available at:

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<sup>1</sup> HUs are the number of acres multiplied by a habitat quality factor.

<http://www.cbfwa.org/committees/Meetings.cfm?CommShort=WC&meeting=all>.

Comparison of Table 11-4 and BPA's accounting of HUs gained demonstrates that there is still a large mitigation debt to be offset with future mitigation activities. Review of the spatial distribution of existing mitigation efforts also shows that activities were not evenly distributed across the impact areas of incurred losses. Some hydropower project impact areas have received a greater level of mitigation than others, with some projects having very little mitigation. This proposal is intended to provide mitigation opportunities across the entire basin, but has a focus on areas that have the largest deficit in achieving mitigation for construction and inundation losses. These include the Willamette, Inter-mountain and the Southern Idaho areas. Progress in achieving compensation for lost habitat values over the past 70 years has not advanced at a pace that would achieve full compensation within a reasonable time frame (next 20 years). Failure to meet the mitigation requirements simply increases the cumulative loss of the benefits of wildlife populations to the citizens of the northwest.

Table 1 provides estimates of ongoing needs for OME for existing wildlife mitigation projects. These estimates assume the application of basic maintenance practices to maintain existing wildlife values, limited enhancements necessary to restore the habitat values commensurate with the identified losses, and limited monitoring. This table reflects all existing acquisition sites, including those acquisitions which were funded under the Washington Wildlife Mitigation Agreement, which are scheduled to transition into the expense budget category this fiscal year. These 39 projects cover over 300,000 acres in Oregon, Washington, and Idaho. Estimated total costs for the combined projects are approximately \$10.4 million per year. This is an increase over current expenditures due to additional acreage, insufficient past funding to maintain baseline habitat condition on some sites, transition of Washington Agreement projects from funding that is ending, and the need to include an inflation factor to maintain basic services and habitat function.

Tables 2 through 4 reflect an interim funding strategy for identified focus areas where funding priority for habitat protection, restoration, and enhancement activities will be given. Funding estimates were developed by:

- Reviewing the habitat units that remain to be mitigated for each project in accordance with BPA current accounting tables. (Note: Both BPA and the Wildlife Managers recognize the need to update these accounts and reconcile the distribution of credits in certain hydro-project areas).
- Developing acreage estimates that would make significant progress in meeting the mitigation requirements.
- Applying reasonable or historic cost per acre estimates to the identified acres. These historic cost per acre estimates are likely to under-estimate current market value, since they are dated in some cases and in some areas land values are increasing rapidly.
- Comparing the figures with similar draft estimates from BPA staff.

Tables 2-4 provide the basis for a short-term annual funding stream of approximately \$20.1 Million per year to insure reasonable progress in achieving some level of

compensation for lost habitat values in those areas that have historically been under-mitigated. The proposed strategy is to give priority for accomplishable protection and restoration/enhancement activities within the three identified focus areas over a ten-year period until a long-term strategy for insuring

- 1) funding certainty for the mitigation land base is achieved and
- 2) BPA's construction and inundation debt obligation is extinguished.

The average projected yearly cost for the Intermountain Area is estimated at \$10.9 million, for the Willamette Area at \$6.6 million, and for Southern Idaho Area at \$2.6 million. To accommodate for mitigation opportunities outside of the three focus areas, an additional \$3.0 million per year is included in the total projected allocation, approximately \$23.1 million per year.

Several approaches are proposed for consideration as a basis for negotiations between Bonneville and the Wildlife Managers to determine how both short-term and an eventual long-term funding mechanism for wildlife mitigation can be achieved.

1. Year to year contract – this is the current approach. It has the advantage that the system is set up in this fashion and no significant changes are needed.
2. Multi-year contract for Rate Case
3. Multi-year agreement (similar to Washington Wildlife Agreement approach)
4. Settlement (similar to the Wildlife Mitigation Agreement for Dworshak Dam, the Wildlife Mitigation Agreement for Libby and Hungry Horse Dams -Montana, and the Northeast Oregon Wildlife Agreement)

Each of these approaches has pros and cons. Year to year contracts are the current way of doing business and require the least change in how business is done. However, the year-to-year approach places a much greater administrative burden on the NPCC, BPA, and the contracting agencies. Each year new contracts must be solicited, written, managed and closed. This requires a commitment of resources that might better be used in on-the-ground work. Another problem with year-to-year contracting is the lack of ability to plan for the future, since there is a certain level of uncertainty. This funding uncertainty severely limits the ability to purchase mitigation lands from private parties.

Long term funding agreements including trust funds, guaranteed funding streams and/or some combination of the two, have inherent advantages over annual funding that benefit the implementing agency or tribe, BPA and the regional rate payers. It is recognized that any long term agreement would be tailored to meet the financial and legal limitations of BPA while maximizing the inherent values of such an agreement to all the parties. This document does not propose to discuss all the various options for such an agreement. Rather, the intent is to provide a summary and establish a foundation for discussions.

With the intent of meeting the interests of fish, wildlife and power and recognizing the financial realities of all of the stakeholders, Table 5 below characterizes some of BPA's and the Wildlife Manager's interests and values. The qualifying symbols (+ and O) are generalizations that are clearly debatable from various aspects of a given interest and value element. Such a debate should serve to clarify the issues of interested parties and



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appropriately elevate key values and interests associated with negotiation for agreement. The list of interests and values is not intended to be comprehensive, but is expected to generate common understanding for crafting a solution that meets each stakeholder need.

Table 5.	INTERESTS/VALUES	BPA	Manager
1.	Provides increased funding certainty and stability.	+	+
2.	Can assure funding available to continue to meet BPA’s obligations even if BPA funding is no longer available (trust fund)	+	+
3.	Resolution of crediting disagreements between BPA and NPCC, BPA and Signatory managers.	+	+
4.	Reduces obligations in expense budget. Free up funding from the direct budget for new start fish projects.	+	+
5.	Moves expense costs to capital budget where it has limited exposure temporally.	+	o
6.	May provide closure on losses for a particular hydro facility or group of facilities perpetually or for a designated period and provide indemnity to BPA for those losses.	+	o
7.	Increases liability to Agency or Tribe as they take on full responsibility and indemnify BPA for a percentage of the hydro-system mitigation debt.	+	-
8.	Reduces resources spent on process: (Annual regional funding prioritization; annual contract and budget review and approval by BPA; duplicative or multi agency procedural reviews; COTR/CO time managing contracts and project activities; etc.)	+	+
9.	Inherently changes the role of the funding agency in providing input to project implementation. Focus moves from contract administration and oversight to technical support and insight.	+	+
10.	Provides more local control of budgetary issues and focuses decision making at the grass roots (local) level.	o	+
11.	Improves responsiveness and flexibility of implementation: (streamline acquisition process; increases responsiveness to changing opportunities; accommodate for stochastic events such as wildfire; accommodate adaptive management; etc)	+	+
12.	Trust Fund money is more easily matched with other funding opportunities as “Non-federal”.	+	+
13.	Rate of implementation may be negatively impacted by below target market/return on investments.	o	-
14.	May require significant “front loading” to establish trust funds that could have short term impacts to other budgetary needs.	-	-
15.	May require a slower more self disciplined approach to mitigation	-	-

+ = Positive Value, - = Negative Value, 0 = Neutral Value		
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Another key issue that needs to be addressed is the OME funding necessary to insure that the benefits of BPA's investment in the mitigation sites and the credits applied for the habitat units gained are maintained and that adaptive management practices are applied as necessary in response to monitoring results that verify desired outcomes. As such, it is unproductive to treat the OME as simply another short-term project. It makes sense to look at longer-term funding approaches.

Three potential approaches are suggested and differ in the length of time, the level of preparation needed, and how risk is apportioned. Multi-year approaches are designed to offset many of the problems that result with the current year-to-year approach. They reduce the amount of administrative overhead in developing proposals, scoring and prioritizing proposals, creating multiple contract documents and closing multiple contracts. They allow the contracting agency a greater chance to plan ahead due to the consistent access to funding. The other advantage of multi-year contracts is the ability to explore alternative funding schemes. Longer term contracts lend themselves to using the capital budget, rather than the expense budget, thereby reducing competition with Endangered Species Act requirements.

Another approach uses multi-year contracts for the term of the rate case. This has the advantage of not requiring a commitment of funds beyond the planning horizon of the funding stream. It requires less preparation since there is the opportunity to regroup at the end of the rate case period and make sure that the allocated budget has met its projected expenditure rate.

An approach similar to the Washington Wildlife Mitigation Agreement could be used as a template for a longer time horizon, possibly up to 20 years. This approach provides even greater potential savings of administrative overhead. There is also much more flexibility in the timing and management of the spending for the contracting agencies. However, this requires more preparation and thought, because small problems with the package can magnify over the longer time period.

The last approach (settlement) described above has many of the same benefits of the prior approach, but shifts the fiscal risk and compensatory mitigation responsibility to the managing entity. In return for a much greater level of autonomy, flexibility, and predictability the contracting agencies would hold BPA harmless for mitigation for a period of time and take on a greater level of responsibility and the administrative burden of insuring that the HUs gained as compensation for lost values are maintained and improved over time. This approach requires the greatest level of preparation and thought. All of the parties must be convinced that the proposed solution is in their best interest and truly fulfills the mitigation responsibility. This requires a much greater analysis and understanding of what needs to be done for mitigation and the appropriate investment and management structure to achieve it.

The Fish and Wildlife managers propose that, at a minimum, the funding for this next rate case be a multi-year contract for the length of the rate case. During the period of the

rate case we propose that all of the affected parties pursue negotiations on a longer-term approach, up to and including a complete settlement.

<i><b>Table 11-4 Estimated Losses Due to Hydropower Construction (losses are preceded by a “-”, gains by a “+”)</b></i>	
<b>Species</b>	<b>Total Habitat Units</b>
<b>Albeni Falls</b>	
• Mallard Duck	-5,985
• Canada Goose	-4,699
• Redhead Duck	-3,379
• Breeding Bald Eagle	-4,508
• Wintering Bald Eagle	-4,365
• Black-Capped Chickadee	-2,286
• White-tailed Deer	-1,680
• Muskrat	-1,756
• Yellow Warbler	+171
<b>Lower Snake Projects</b>	
• Downy Woodpecker	-364.9
• Song Sparrow	-287.6
• Yellow Warbler	-927.0
• California Quail	-20,508.0
• Ring-necked Pheasant	-2,646.8
• Canada Goose	-2,039.8
<b>Anderson Ranch</b>	
• Mallard	-1,048
• Mink	-1,732
• Yellow Warbler	-361
• Black Capped Chickadee	-890
• Ruffed Grouse	-919
• Blue Grouse	-1,980
• Mule Deer	-2,689
• Peregrine Falcon	-1,222 acres*
* Acres of riparian habitat lost. Does not require purchase of any lands.	
<b>Black Canyon</b>	
• Mallard	-270
• Mink	-652
• Canada Goose	-214
• Ring-necked Pheasant	-260
• Sharp-tailed Grouse	-532
• Mule Deer	-242
• Yellow Warbler	+8
• Black-capped Chickadee	+68
<b>Deadwood</b>	
• Mule Deer	-2080
• Mink	-987
• Spruce Grouse	-1411

**Table 11-4 Estimated Losses Due to Hydropower Construction**

*(losses are preceded by a “-”, gains by a “+”)*

<b>Species</b>	<b>Total Habitat Units</b>
• Yellow Warbler	-309
• Yellow-rumped Warbler	-2,626
<b>Palisades</b>	
• Bald Eagle	-5,941 breeding
	-18,565 wintering
• Yellow Warbler/	-718 scrub-shrub
• Black Capped Chickadee	+1,358 forested
• Elk/Mule Deer	-2,454
• Mink	-2,276
• Mallard	-2,622
• Canada Goose	-805
• Ruffed Grouse	-2,331
• Peregrine Falcon*	-1,677 acres of
	-832 acres of scrub-
	shrub wetland
* Acres of riparian habitat lost. Does not require purchase of any lands.	+68 acres of
	emergent wetland
<b>Willamette Basin Projects</b>	
• Black-tailed Deer	-17,254
• Roosevelt Elk	-15,295
• Black Bear	-4,814
• Cougar	-3,853
• Beaver	-4,477
• River Otter	-2,408
• Mink	-2,418
• Red Fox	-2,590
• Ruffed Grouse	-11,145
• California Quail	-2,986
• Ring-necked Pheasant	-1,986
• Band-tailed Pigeon	-3,487
• Western Gray Squirrel	-1,354
• Harlequin Duck	-551
• Wood Duck	-1,947
• Spotted Owl	-5,711
• Pileated Woodpecker	-8,690
• American Dipper	-954
• Yellow Warbler	-2,355
• Common Merganser	+1,042
• Greater Scaup	+820
• Waterfowl	+423
• Bald Eagle	+5,693
• Osprey	+6,159
<b>Grand Coulee</b>	
• Sharp-tailed Grouse	-32,723

**Table 11-4 (cont.) Estimated Losses Due to Hydropower Construction  
 (losses are preceded by a “-”, gains by a “+”)**

<b>Species</b>	<b>Total Habitat Units</b>
• Ruffed Grouse	-16,502
• Mourning Dove	-9,316
• Mule Deer	-27,133
• White-tailed Deer	-21,362
• Riparian Forest	-1,632
• Riparian Shrub	-27
• Canada Goose Nest Sites	-74
<b>McNary</b>	
• Mallard (wintering)	+13,744
• Mallard (nesting)	-6,959
• Western Meadowlark	-3,469
• Canada Goose	-3,484
• Spotted Sandpiper	-1,363
• Yellow Warbler	-329
• Downy Woodpecker	-377
• Mink	-1,250
• California Quail	-6,314
<b>John Day</b>	
• Lesser Scaup	+14,398
• Great Blue Heron	-3,186
• Canada Goose	-8,010
• Spotted Sandpiper	-3,186
• Yellow Warbler	-1,085
• Black-capped Chickadee	-869
• Western Meadowlark	-5,059
• California Quail	-6,324
• Mallard	-7,399
• Mink	-1,437
<b>The Dalles</b>	
• Lesser Scaup	+2,068
• Great Blue Heron	-427
• Canada Goose	-439
• Spotted Sandpiper	-534
• Yellow Warbler	-170
• Black-capped Chickadee	-183
• Western Meadowlark	-247
• Mink	-330
<b>Bonneville</b>	
• Lesser Scaup	+2,671
• Great Blue Heron	-4,300
• Canada Goose	-2,443
• Spotted Sandpiper	-2,767
• Yellow Warbler	-163
• Black-capped Chickadee	-1,022
• Mink	-1,622

**Table 11-4 (cont.) Estimated Losses Due to Hydropower Construction  
 (losses are preceded by a “-”, gains by a “+”)**

<b>Species</b>	<b>Total Habitat Units</b>
<b>Dworshak</b>	
• Canada Goose-(breeding)	-16
• Black-capped Chickadee	-91
• River Otter	-4,312
• Pileated Woodpecker	-3,524
• Elk	-11,603
• White-tailed Deer	-8,906
• Canada Goose (wintering)	+323
• Bald Eagle	+2,678
• Osprey	+1,674
• Yellow Warbler	+119
<b>Minidoka</b>	
• Mallard	+174
• Redhead	+4,475
• Western Grebe	+273
• Marsh Wren	+207
• Yellow Warbler	-342
• River Otter	-2,993
• Mule Deer	-3,413
• Sage Grouse	-3,755
<b>Chief Joseph</b>	
• Lesser Scaup	+1,440
• Sharp-tailed Grouse	-2,290
• Mule Deer	-1,992
• Spotted Sandpiper	-1,255
• Sage Grouse	-1,179
• Mink	-920
• Bobcat	-401
• Lewis' Woodpecker	-286
• Ring-necked Pheasant	-239
• Canada Goose	-213
• Yellow Warbler	-58

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**Table 1. Wildlife Project Annual OME Needs for FY 2007- 2009 Rate Case**

ProjectID	ProjectTitle	OM&E Needs	Acres	Province	Cost/Acre
199004401	Windy Bay (CDAT)	200,000		InterMt	
199009200	Protect and Enhance the Wanaket Wildlife Mitigation Area (CTUIR)	200,000	2817	ColPlat	71
199106000	Pend Oreille Wetlands Wildlife Mitigation Project - Kalispel (KT)	100,000	600	InterMt	167
199106100	Swanson Lakes Wildlife Area (WDFW)	250,000	19000	InterMt	13
199107800	Burlington Bottoms Wildlife Mitigation Project (ODFW)	125,000		LwrCol	
199204800	Hellsgate Big Game Winter Range Operation and Maintenance Project (CCT)	750,000	42000	InterMt	18
199205900	Amazon Basin/Eugene Wetlands Phase Two (TNC)	70,000		LwrCol	
199206100	Albeni Falls Wildlife Mitigation Project (Umbrella project)			InterMt	
199206100	Albeni Falls (KTOI)	217,000	211	InterMt	1028
199206100	Albeni Falls (IDFG)	485,000	2347	InterMt	207
199206100	Albeni Falls (CDAT)	262,000	2273	InterMt	115
199206100	Albeni Falls (KT)	454,000	6,000	InterMt	76
199404400	Enhance, Protect, and Maintain Shrubsteppe Habitat on the Sagebrush Flat Wildlife Area (WDFW)	280,000	8775	InterMt	32
199505700	Southern Idaho Wildlife Mitigation Program (Parent Project)				
199505700	SIWM Rice Property (IDFG)	125,000	1361	UprSnk	92
199505700	SIWM Quarter Circle O Property (IDFG)	22,000	712	UprSnk	31
199505700	SIWM Deer Parks Complex (IDFG)	341,000	3207	UprSnk	106
199505701	SIWM Administration (IDFG) (includes Krueger Property)	81,000	166	MidSnk	
199505702	SIWM (Parent Project) (SBT)			UprSnk	
199505702	SIWM Soda Hills (SBT)	215,000	2563	UprSnk	84
199505702	SIWM Rudeen (SBT)	215,000	2450	UprSnk	88
199506001	Protect and Enhance Wildlife Habitat in Iskuulpa (Squaw Creek) Watershed (CTUIR)	225,000	17600	ColPlat	13
199608000	NE Oregon Wildlife Mitigation Project—"Precious Lands" (NPT)	426,000	15325	BlueMt	28
199609401	Scotch Creek Wildlife Area (WDFW)	290,000	15469	InterMt	19
199800300	Spokane Tribe of Indians Wildlife Operations and Maintenance (STOI)	250,000		InterMt	

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199802200	Pine Creek Ranch (CTWSRO)	350,000	33557	ColPlat	10
200000900	Logan Valley Wildlife Mitigation Project/ O&M (BPT)	150,000	1760	MidSnk	85
200001600	Protect and Enhance Tualatin River National Wildlife Refuge Additions (USFWS)	37,000	230	LwrCol	161
200002100	Securing Wildlife Mitigation Sites - Oregon, Ladd Marsh WMA Additions (ODFW)	75,000		BlueMt	
200002600	Rainwater Wildlife Area (CTUIR)	300,000	8441	ColPlat	36
200002700	Malheur Wildlife Mitigation Project (BPT)	285,000	6385	MidSnk	45
200103300	Implement Wildlife Habitat Protection and Restoration on the Coeur d'Alene Indian Reservation: Hangman Watershed (CDAT)	300,000		InterMt	
200200800	Flood Plain Reconnection (KTOI)	250,000		MtCol	
200201400	Protect, Enhance, and Maintain Habitat on the Sunnyside Wildlife Area to Benefit Wildlife and Fish Assemblages (WDFW)	250,000	10538	InterMt	24
200201100	Flood Plain Operational Loss Assessment and Implementation (KTOI)	500,000		InterMt	
	Schlee Property (WDFW)	280,000	8500	InterMt	33
200001500	Oxbow Ranch (CTWSRO)	40,000	1002	ColPlat	40
200104101	Forrest Ranch (CTWSRO)	65,000	4295	ColPlat	15
200301200	Shillapoo (Vancouver Lowlands) (WDFW)	250,000	2552	LwrCol	98
W-MOA	Desert Wildlife Area (WDFW)	350,000	34920	InterMt	10
W-MOA	Wenas Wildlife Area (WDFW)	300,000	7000	InterMt	43
W-MOA	WDFW Operations (WDFW)	150,000		InterMt	
Totals		10,365,000	257,225		

**Table 2. Mitigation Implementation Costs/Acre for Intermountain Province Wildlife Projects in Millions**

<b>MOAII Category - HABITAT UPLAND/TERRESTRIAL</b>	<b>FY06</b>	<b>FY07</b>	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>FY 11-15</b>	<b>TOTAL</b>
Albeni Falls Complete Habitat Protection	\$5.00	\$5.00	\$5.00	\$5.00	\$5.00	\$15.00	\$40.00
Albeni Falls O&M	\$1.70	\$1.70	\$1.70	\$2.00	\$2.00	\$10.00	\$19.10
CdaA Lake Creek Habitat Protection	\$1.00	\$1.00	\$1.00	\$1.00	\$1.00	\$5.00	\$10.00
CdA Lake Creek Habitat O&M	\$0.20	\$0.20	\$0.20	\$0.25	\$0.25	\$1.25	\$2.35
CCT Habitat Protection	\$4.50	\$1.50	\$1.50	\$1.50	\$1.50	\$10.00	\$20.50
CCT O&M, M&E	\$0.50	\$0.50	\$0.50	\$0.80	\$0.80	\$4.00	\$7.10
Multi-Agency Sharp-Tailed Grouse Regional Brood-rear (includes habitat assessment)	\$0.50	\$0.50	\$0.50	\$0.50	\$0.50	\$0.00	\$2.50



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STOI Habitat Protection	\$1.50	\$1.50	\$1.50	\$0.00	\$0.00	\$0.00	\$4.50
STOI O&M, M&E	\$0.28	\$0.25	\$0.25	\$0.25	\$0.25	\$1.00	\$2.28
STOI Sharp-Tailed Grouse Reintroduction	\$0.15	\$0.15	\$0.10	\$0.10	\$0.10	\$0.38	\$0.98
<b>SUBTOTAL HABITAT UPLAND/TERRESTRIAL</b>	<b>\$15.33</b>	<b>\$12.30</b>	<b>\$12.25</b>	<b>\$11.40</b>	<b>\$11.40</b>	<b>\$46.63</b>	<b>\$109.30</b>

O&M line item includes M&E and enhancements

<b>Key Assumptions:</b>	<b>Albeni Falls</b>	<b>STOI</b>
<b>CCT</b>	Price per acre of \$3,000	Price per acre of \$1,000
Price per acre of \$500	O&M costs at \$90/acre now reducing over time to \$50/acre	O&M costs at \$100/acre reducing over time to about \$50/acre
O&M costs at \$20/acre	M&E at \$2,000/point reducing over time at per point price	M&E costs at \$2,000/point
M&E at \$2,000/point	Enhancements averaging about \$500/acre	Enhancements not paid for by BPA

Table3. Willamette Basin wildlife mitigation funding needs

Habitat Units Lost	94,275
Habitat Units Gained	14,137
Habitat Units Previously Mitigated	1,957
Acres Needed	28,535
Cost per acre	2,342
Total	\$66,829,000

Table 4. Southern Idaho wildlife mitigation funding needs

Habitat Units Lost	61,704
Habitat Units Previously Mitigated	18,845
Habitat Units Needed	42,859
Cost per habitat unit	\$621
Total	\$26,600,000

## Appendix F – Review of BPA Spending for Fish and Wildlife

**BPA’s Role in Fish and Wildlife Funding:** BPA funds a significant portion of the fish and wildlife restoration work in the Columbia Basin. Since 1981, BPA’s total fish and wildlife funding has averaged \$132 million per year. During Fiscal Years 2002 through FY 2006, BPA projected that these costs would average \$255 million per year.

Under the Northwest Power Act, BPA funds measures to protect, mitigate, and conserve fish and wildlife damaged by the hydroelectric development and operations in the Columbia River Basin<sup>2</sup>. These costs are part of Bonneville’s total system costs.

The revenues for fish and wildlife and other BPA functions come from the sale of electricity from the Federal Columbia River Power System (FCRPS). This system includes the federal dams in the Columbia Basin, one nuclear power plant, and other small generating resources that have been acquired by BPA. As part of the process for setting rates, BPA must project its future costs and future sales of electricity. It also must address the uncertainties associated with these projections to ensure that its rates are sufficient to meet its costs and repay the U.S. Treasury for the money BPA borrowed to build the dams, transmission system, and other capital investments.

**History of BPA Fish and Wildlife Funding:** In 1995, the Departments of the Army, Commerce, Energy and Interior entered into a MOA for fish and wildlife funding for FY 1996 through FY 2001. The MOA was not renewed; however, BPA has continued divide its fish and wildlife funding into categories established by the MOA. This section summarizes the capital, reimbursable, and direct budgets and the recent funding history. Table 1 shows the total funding for these categories from 1996 to 2003.

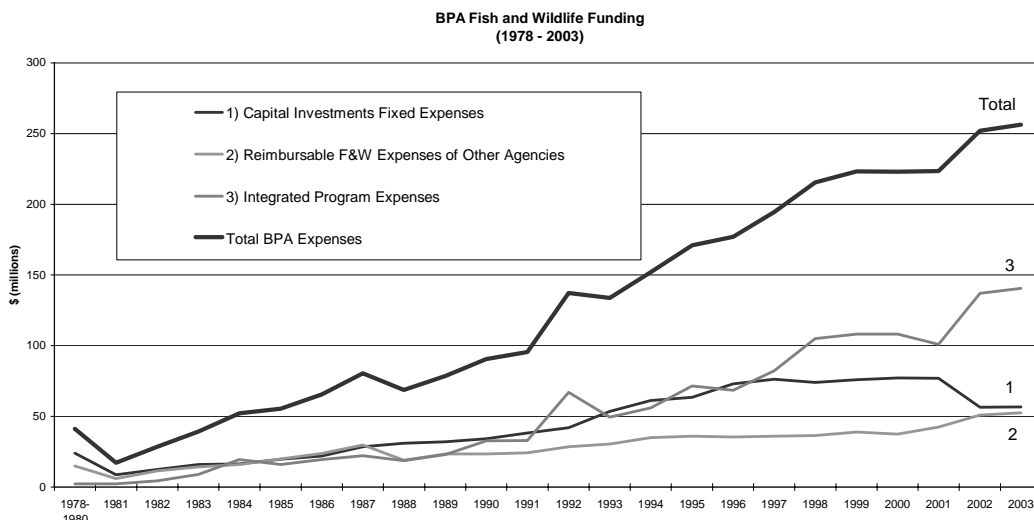


Figure 1: Total BPA Fish and Wildlife Funding

<sup>2</sup> 16 U.S.C. 839b(h)(8), 839b(h)(10).

The Capital Budget: BPA repays the U.S. Treasury amortization, depreciation, and interest on capital investments in fish facilities at dams built and operated by the Corps of Engineers and Bureau of Reclamation. BPA's capital budget also repays funds borrowed to construct numerous hatcheries built as partial mitigation for the FCRPS. Other investments include salmon transport barges and improvements at the FCRPS dams for fish collection, passage and, as well as planning, design, monitoring and research studies. The amounts for each of the major funding categories, including the amount that Congress authorized the COE and BOR to borrow each year is shown in Table 1.

The costs for capital investments have remained fairly steady since the adoption of the 1996-2001 Memorandum of Agreement. The MOA set targets for capital investment of \$107 million annual average. BPA's investments in this area under-ran the targets significantly, averaging \$76 million annually, for a total under-investment of more than \$188 million. For the past eight years, the annual appropriation for fixes at mainstem dams has averaged approximately \$83.5 million. Since the adoption of the 2000 Biological Opinions, average annual spending has remained fairly constant with only a slight decrease.

In 1985, BPA began capitalizing projects in the Integrated (Direct) Fish and Wildlife Program. The 1996-2001 MOA set \$27 million as the annual target for capitalized projects in the Integrated Program. The line "Integrated Program" under Capital Investments in Table 2 shows the trend in this amount. Under the MOA, BPA capitalized an average of \$20.2 million annually, under-spending the target by about \$40.8 million over the term of the MOA (Figure 2).

Please note that the amount borrowed is different than the annual repayment costs that drive BPA's revenue requirements. The amount borrowed is usually booked in the year construction starts, while repayment does not start until the facility is completed. As a general "rule of thumb," the annual repayment costs are about one-tenth of the amount capitalized.

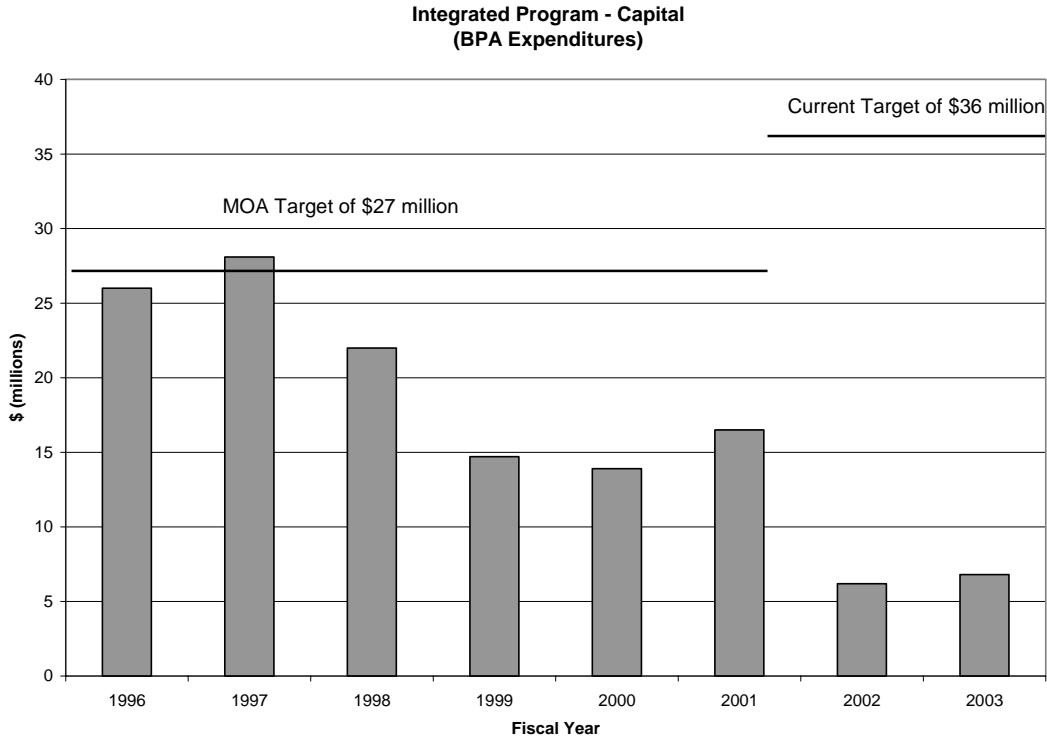


Figure 2. Actual capital investments in the Integrated program from 1996-2003.

Reimbursed Expenses of Other Agencies: BPA repays the U.S. Treasury for the hydroelectric share of operation and maintenance budgets and other authorized non-capital expenditures for fish and wildlife activities by the U.S. Corps of Engineers (COE), U.S. Bureau of Reclamation (BOR) and U.S. Fish and Wildlife Service. These costs include the Lower Snake River Compensation Plan implementation and numerous hatcheries built to mitigate for FCRPS. BPA also funds half of the Northwest Power and Conservation Council's budget (currently \$4.5 million annually) under this portion of its budget.

This category of the budget averaged \$37.8 million annual under the MOA, close to the MOA annual budget target of \$40 million. The operation and maintenance budgets have increased by more than one-third since the end of the MOA. Most of the increase appears to be related to an increase in COE and BOR budgets (Figure 3, Table 1).

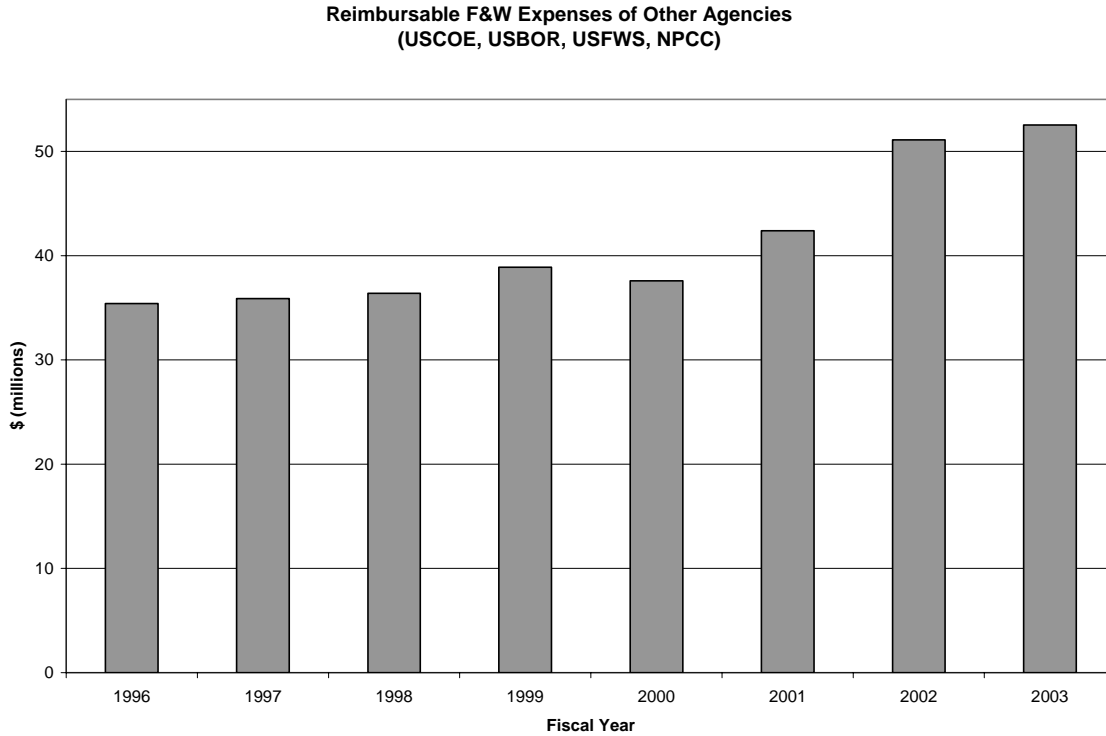


Figure 3. Reimbursable fish and wildlife expenses of other federal agencies.

Integrated (Direct) Program: The Integrated Program budget has two categories: Capital (discussed above) and Expense. The Expense portion of the Integrated Program has increased steadily since 1978. The MOA set an annual budget target of \$100 million, with BPA spending averaging \$95.5 million annually, a shortfall of \$26.9 million over the term of the MOA. During the current rate case, the target for the Expense portion of the Integrated Program was set at \$150 million and reduced to \$139 million annually in 2003. Actual spending during the current rate period has averaged \$139 million per year.

Although this appears to be an increase in funding of \$39 million annually since the MOA, the program funding had not been adjusted for inflation for eight years. Further, BPA has rolled contracted obligations forward each year without shifting the associated funding, creating a “bow-wave” of unfunded obligations. A change in accounting practices in FY 2003 required elimination of \$40 million worth of these carry-over obligations. In essence, BPA cut \$40 million in obligations from the Integrated Program in FY 2003. BPA is now considering cutting an additional \$15 million from the Integrated Program over the period 2005-2006.

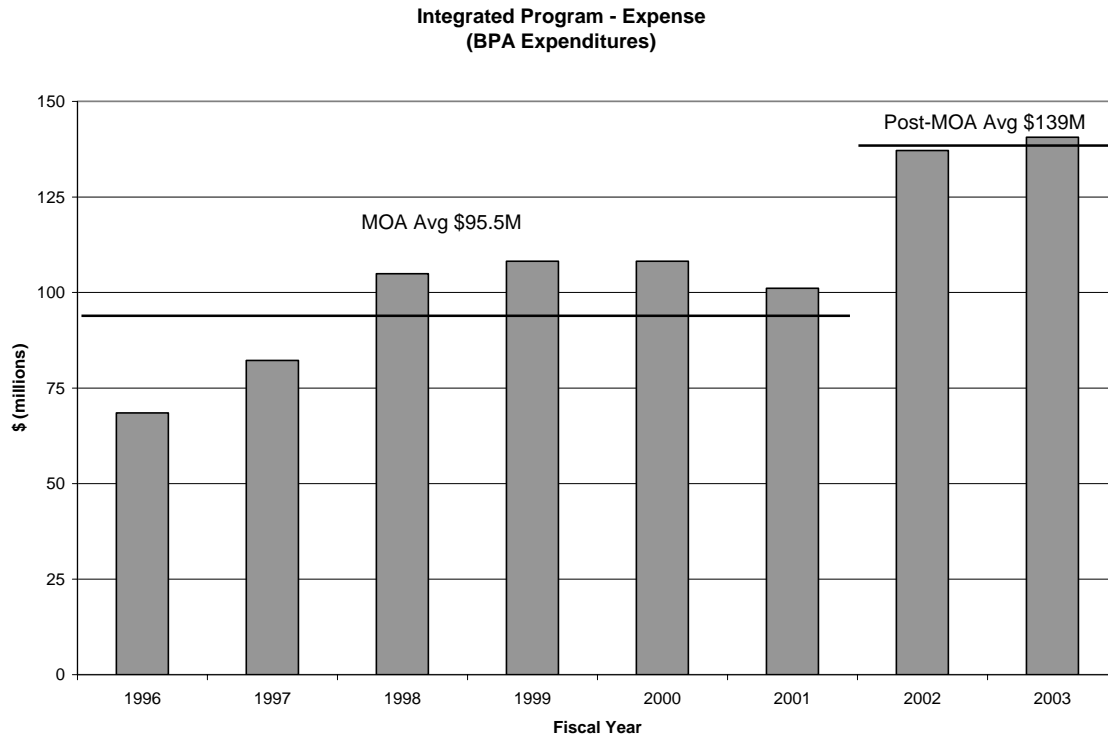


Figure 4. BPA spending in the Integrated Program from 1996-2004.

## The 2002 BPA Rate Case

**Power and Fish and Wildlife Decisions:** BPA began its last rate case process in 1999, before decisions were made on the measures that would be included in the 2000 Biological Opinion for the FCRPS. These rate decisions addressed BPA’s revenues for FY 2002 through FY 2006. Fish and wildlife managers raised concerns that BPA’s rate case decisions could foreclose fish and wildlife decisions, including the implementation of the Biological Opinion and Council Program by limiting funding. Federal, state, and tribal governments worked to develop 13 alternatives for future fish and wildlife funding through 2011; the costs for these alternatives averaged \$438 to \$721 million per year. BPA assured the managers that it would “keep the options open” by including the range of costs in its rates. BPA also committed that it would adjust its rates, if necessary, to accommodate future funding needs.

**Problems with 2002 Rate Case Process:** BPA states that it gave equal weight to the 13 alternatives in setting its rates and assumed an average for the direct program of \$139 million per year. In the initial rate proposal, BPA stated that these assumptions would not limit actual funding.

The Columbia River Inter-Tribal Fish Commission and the Yakama Nation were parties to the rate case. They raised concerns that BPA had actually assumed a one per cent probability that costs would be at the high end of the range. They also raised concerns that BPA had changed the methodology in calculating direct fish and wildlife costs.

Rather than weighting 12 of the alternatives at \$179 million per year and one alternative at \$100 million, consistent with the alternatives developed by the Federal, state, and tribal process and arriving at an equally weighted estimate of \$173 million per year, BPA averaged the high and low alternatives and assumed \$139 million per year. This assumption lowered the direct costs by \$170 million during the rate period.

BPA finalized its rates in 2001, and then immediately reopened its rate process to address higher costs associated with supplying power to its customers. BPA had committed to serve 3,300 megawatts of power beyond its available resources. The manipulation of the California electricity markets caused prices to soar. BPA estimates that the cost of serving these additional commitments was \$3.9 billion during the current rate period. These added costs were included as part of a Cost Recovery Adjustment Clause known as the load-based and financial-based CRACs.

In 2003, BPA faced additional costs associated with its own operations, the operations of the federal dams and the nuclear plant. As a result, BPA conducted a Safety Net Cost Recovery Adjustment Clause (SN-CRAC) process to address these additional costs. During that process, CBFWA provide analysis that the cost of implementing the Provincial Review would add \$100 million per year above BPA's current fish and wildlife funding. The Review was conducted by CBFWA and the Council and based on measures that had gone through the project review process and been approved by the Independent Science Review Panel. BPA did not address these additional fish and wildlife costs as part of the SN-CRAC. BPA has subsequently set a cap on the direct fish and wildlife program of \$139 million. In 2001, BPA and the Corps of Engineers eliminated fishery spill and flow provisions to ensure BPA's ability to make its payment to the U.S. Treasury.

## **Developing Fish and Wildlife Costs for the Next BPA Rate Case**

**Coordinating Power and Fish and Wildlife Decision Processes:** Given the problems of the 2002 rate case, fish and wildlife managers began discussions in 2003 on ways to coordinate the next BPA rate case with fish and wildlife decisions. They wanted to ensure that BPA decisions regarding its revenues after 2006 would not foreclose fish and wildlife recovery under the Northwest Power Act or the Endangered Species Act. It appeared that the Subbasin Planning Process being conducted by the Council and BPA could provide the information needed for the next rate case.

The Council's 2000 Program included a framework for fish and wildlife in the Columbia Basin and called for the development of subbasin plans that would include subbasin assessments, an inventory of existing activities, and a management plan. The management plan was required to have a vision, biological objectives for fish and wildlife, strategies that will be employed to meet the vision and biological objectives, a projected budget (including both a three-year implementation budget and more general

10-15 year budget), a monitoring and evaluation plan, and additional steps necessary to comply with the Endangered Species Act and the Clean Water Act<sup>3</sup>.

NOAA Fisheries had indicated that it could use these subbasin plans as the basis for recovery plans under the Endangered Species Act. Therefore, it appeared that these subbasin plans, scheduled for completion by May 2004, could provide detailed budgets for the BPA rate case that would begin in early 2005.

Unfortunately, when the Council contracted with various entities to develop the subbasin plans, it did not include detailed and long-term budgets in the list of tasks it would fund. To further complicate things, the Council is proceeding to adopt some of the subbasin plans while additional work continues on other plans. NOAA Fisheries is working to develop recovery plans under the ESA; however, final adoption of all the subbasin and the NOAA recovery plans will not be completed prior the initiation of the BPA rate case.

The Biological Opinion for the FCRPS also creates uncertainty for future fish and wildlife funding. CBFWA estimates that 75 percent of BPA's fish and wildlife funding goes to implement the Biological Opinion. NOAA Fisheries adopted a new Biological opinion on November 30, 2004. [CHECK ON BiOp BUDGET]. Several parties have filed law suits against the new Biological Opinion; the briefing schedule for this case could result in a decision in March of 2005.

BPA and the Council have been meeting for several months to review the major budget categories and identify the factors that may increase or decrease costs in the future. The latest draft (December 7, 2004) of that analysis is included as Attachment 1.

In November of 2004, CBFWA formed a workgroup to coordinate the development of fish and wildlife costs for the next BPA rate case. The workgroup reported to the Members Management Group in December and made the following recommendations:

1. The fish and wildlife managers should review the assumptions made by the Council and BPA about future fish and wildlife costs.
2. The fish and wildlife managers should prepare fish and wildlife costs based on the subbasin plans. The primary focus of this work would be in the areas of habitat and production.
3. The fish and wildlife managers should work with BPA to design ways to provide flexibility to adjust fish and wildlife funding as information on the Biological Opinion, subbasin plans and recovery plans becomes available to ensure that BPA can fully implement these important plans.

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<sup>3</sup> See Columbia River Basin Fish and Wildlife Program, document 2000-19, pages 39-41.



# **APPENDIX 2: BPA Fish and Wildlife Program: Twenty-six Years of Funding (1978-2003)**

[CBFWA Draft April 27, 2004]

## **Introduction**

The purpose of this paper is to describe the Bonneville Power Administration's (BPA) historic funding for fish and wildlife. The Fiscal Year (FY) 2003 budget is the twenty-sixth since BPA started to include fish and wildlife costs in their operations budget. This paper is intended to provide a comprehensive, consistent view of past spending and serve as a basis for discussing future fish and wildlife budget needs. Generally, the paper relies on information provided by BPA with references presented to specific sources.

## **A Brief History**

In 1978, the BPA hired its first fish and wildlife staff and started funding fish and wildlife activities. Prior to then, BPA paid for fish facilities at Federal Columbia River Hydropower System (FCRPS) dams, such as fish ladders, screens and bypass facilities, and mitigation facilities, such as fish hatcheries. These payments were to the U.S. Treasury for fish facility expenditures by the Army Corps of Engineers (COE), the Bureau of Reclamation (BOR), and the Fish and Wildlife Service (USFWS)

In December of 1980, Congress passed the Northwest Power Planning and Electric Conservation Act (NW Power Act) that established an additional obligation on BPA to pay for more extensive mitigation for the FCRPS. The NW Power Act established the Northwest Power Planning Council (later called the Northwest Power and Conservation Council or NPCC). The NW Power Act directed the NPCC to adopt a fish and wildlife program to guide BPA fish and wildlife mitigation funding. As the budgets became more complex, BPA began dividing their Fish and Wildlife Program costs into four categories:

- 1) Capital Investments;
- 2) Reimbursed Expenses of Other Agencies;
- 3) Integrated (Direct) Program Expenses; and,
- 4) River Operations.

On March 2, 1995, the National Oceanic and Atmospheric Administration (NOAA) Fisheries issued the 1995 FCRPS Biological Opinion. In that opinion, NOAA Fisheries determined that the proposed operation of the FCRPS would jeopardize the continued existence of threatened and endangered Snake River spring/summer chinook, fall chinook, and sockeye salmon and would adversely affect their critical habitat. The 1995 FCRPS Biological Opinion, therefore, established a set of Reasonable and Prudent Alternatives (RPA) for the operation and configuration of the hydrosystem to satisfy ESA

Section 7(a)(2) requirements. The RPA prescribes measures to increase the survival of listed salmonids and initiated the development of long-term system configuration plan.

Faced with increasing fish and wildlife costs and the prospect of further increases resulting from the implementation of the 1995 Biological Opinion, BPA and its federal partners entered into a Memorandum of Agreement (MOA) governing BPA's fish and wildlife budgets. The MOA set targets for the four BPA budget categories, for Fiscal Years 1996 through 2001. The MOA also set procedures for managing the budget in a more publicly accessible process.

On May 14, 1998, NOAA Fisheries issued the 1998 Supplemental FCRPS Biological Opinion. That ESA Section 7 consultation evaluated the effects of configuration and operations of the FCRPS on newly listed threatened and endangered steelhead in the Upper Columbia River, Snake River, and Lower Columbia River Ecologically Significant Units.

In the 1998 Supplemental FCRPS Biological Opinion, NOAA Fisheries determined that operating the FCRPS in accordance with the Action Agencies' proposed plan, including the measures specified in the RPA of the 1995 FCRPS Biological Opinion (the 1995 RPA), would not jeopardize the continued existence of the newly listed steelhead. The 1998 Supplemental FCRPS Biological Opinion established spring flow objectives at Priest Rapids Dam to protect juvenile fish and expanded the spill program at many mainstem hydro projects, but otherwise left the decision-making process and timing for the long term as described in the 1995 FCRPS Biological Opinion.

The NOAA Fisheries issued a last supplemental biological opinion on February 4, 2000. That opinion considered the effects of the FCRPS operations on the six species that NOAA Fisheries listed as threatened or endangered in March 1999. The NOAA Fisheries determined that implementation of the 1995 RPA, as modified by the 1998 proposed action and combined with a few additional interim measures, would not jeopardize the continued existence of any of the newly listed species for the rest of the interim period. The decision-making process and timing for the long-term, again, remained consistent with the 1995 FCRPS Biological Opinion.

The NOAA Fisheries based its 2000 FCRPS Biological Opinion on the premise that the operation of the hydroelectric dams jeopardized the listed anadromous salmonids and recommended a strategy of "aggressive offsite mitigation" to avoid a jeopardy finding and to put off a decision on breaching the lower four Snake River dams pending further study. Under this biological opinion, BPA could avoid provision of additional spill and flow for fish, as identified in previous biological opinions, by funding offsite habitat improvement projects.

In 2001, BPA set new rates for power sales in FY 2002-2006 that increased funding available for fish and wildlife from \$252 million under the MOA to \$352 million annually. This included \$186 Million for the Integrated Program (combining \$150 million in Expense and \$36 million for Capital or borrowing authority), \$62 million for

Reimbursed Expenses, and \$104 for mainstem capital repayment. However, drought and the West Coast energy markets impacted BPA’s budget and, with NPCC’s concurrence, BPA reduced its Integrated Program budget target from \$150 million for Expense to \$139 million annually, where it remains today.

Figure 1 and Table 1 summarize the amounts that BPA has spent on its fish and wildlife program expenses from FY 1978 through FY 2003. (Table 1 is located at the end of this document.)

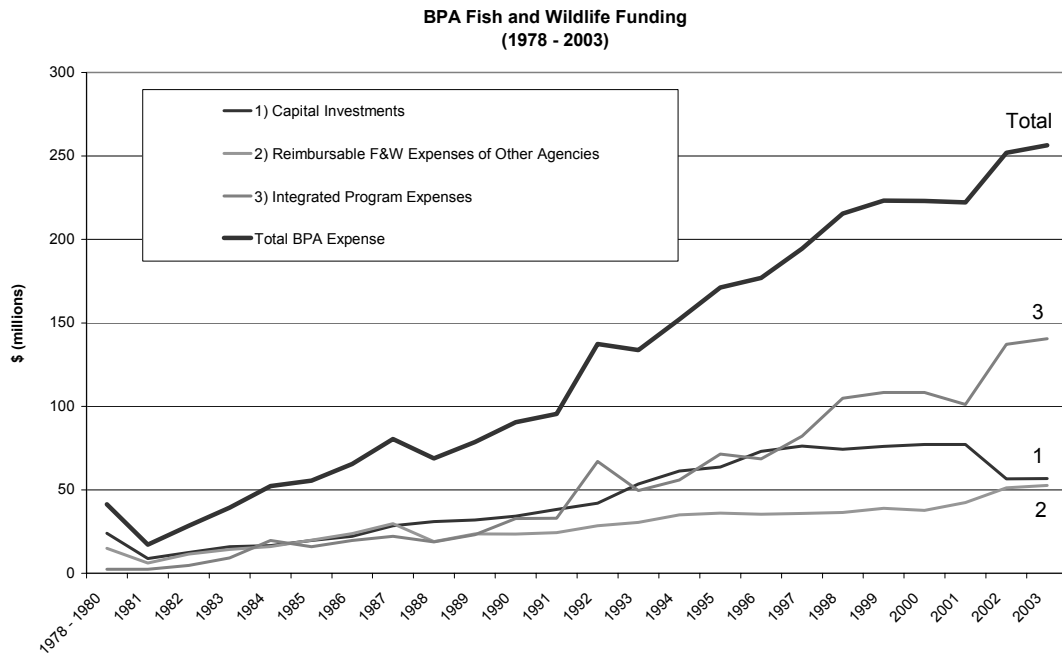


Figure 1. BPA fish and wildlife spending from 1978-2003 (in nominal dollars).

## BPA Annual Expenditures

### 1) Capital Investments

BPA is obligated to repay the U.S. Treasury amortization, depreciation, and interest on funds borrowed by the COE and BOR for capital investments in fish facilities at dams built and operated by them. BPA’s capital budget also repays funds borrowed to construct numerous hatcheries built as partial mitigation for the FCRPS. Other investments include salmon transport barges and improvements at the FCRPS dams for fish collection and passage, as well as planning, design, monitoring and research studies. The amount that Congress authorized the COE and BOR to spend each year is shown in Table 1 as is BPA’s actual repayment amount.

Note that there is a distinction, often obscured, between the amount authorized and borrowed from the U.S. Treasury (analogous to the “mortgage”) and the actual repayment cost (analogous to an annual “mortgage” payment). The amount borrowed is usually booked in the year construction starts, while repayment does not start until the facility is completed. As a general rule-of-thumb, the fixed costs of repayment are about one-tenth of the amount capitalized. The operation and maintenance costs of these facilities are generally included in category 2) Reimbursed Expenses of Other Agencies.

The costs for capital investments have remained steady since the adoption of the 1996-2001 Memorandum of Agreement. The MOA set targets for capital investment of \$107 million annual average. The BPA’s investments in this area under-spent the targets significantly, averaging \$76 million annually, for a total under-investment of more than \$188 million. For the past eight years, the annual appropriation for fixes at mainstem dams has averaged approximately \$83.5 million. Since the adoption of the 2000 biological opinions, average annual spending has remained fairly constant with only a slight decrease.

Since 1985, BPA has identified the amounts to be capitalized in implementing its Integrated (Direct) Fish and Wildlife Program. Apparently in the early years of the program, BPA chose to pay this cost from revenues, rather than borrowing. The 1996-2001 MOA set \$27 million as the annual target for capitalized projects in the Integrated Program. The line “Integrated Program” under Capital Investments in Table 1 shows the trend in this amount. Under the MOA, BPA capitalized an average of \$20.2 million annually, under spending the target by about \$40.8 million over the life of the MOA (Figure 2).

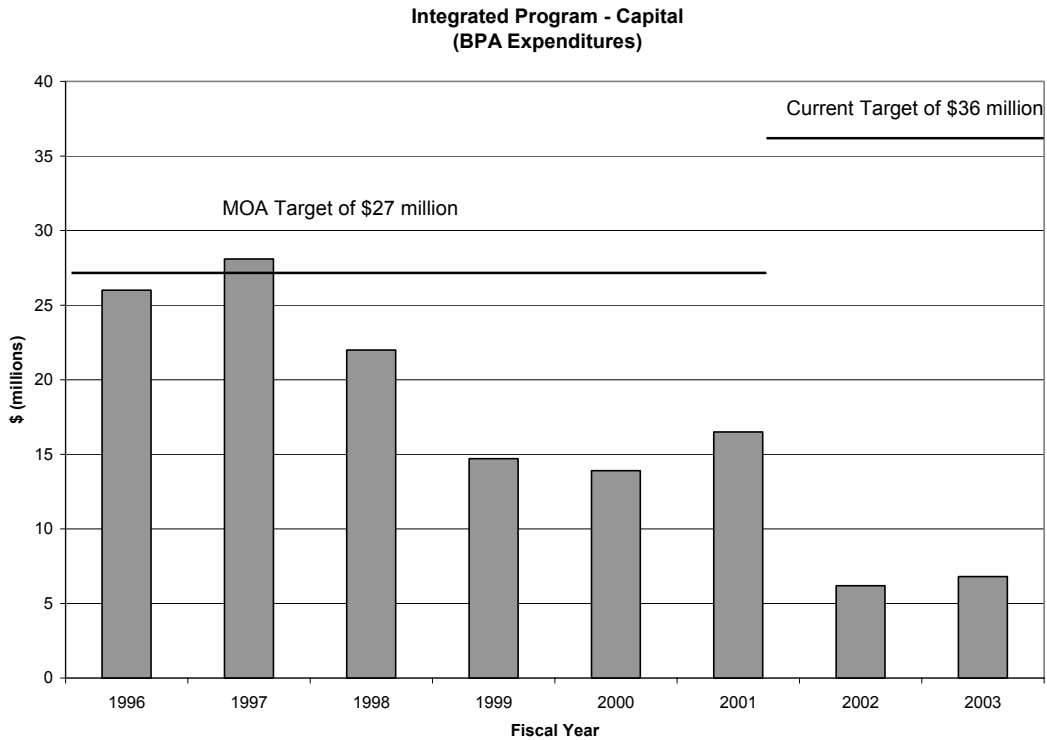


Figure 2. Actual capital borrowing in the Integrated Program from 1996-2003.

Capitalized amounts for the Integrated Program generally increased through 1997 when they reached \$28.1 million. Since Congress granted BPA an additional \$770 million in borrowing authority in 2001, BPA has capitalized an average of \$6.5 million (Figure 2), even though its annual budget target has apparently increased to \$36 million. This represents a \$59 million shortfall in the two years since the expiration of the MOA.

Since adoption of the 2000 biological opinions, there has been an average decrease in capital borrowing for the Integrated Program of almost \$15 million per year (Figure 2). Also, BPA’s actual repayment costs dropped significantly since the end of the MOA (Table 1).

## 2) Reimbursed Expenses of Other Agencies

BPA repays the U.S. Treasury for the hydroelectric share of operation and maintenance budgets and other authorized non-capital expenditures for fish and wildlife activities by the COE, BOR and USFWS. These costs include those of the Lower Snake River Compensation Plan implementation and numerous hatcheries built to mitigate for the FCRPS. These facilities are often operated by the state fisheries management agencies. BPA also funds half of the NPCC’s budget (currently \$4.5 million annually) under this portion of its budget. BPA has relatively little control over these expenses, reimbursing the U.S. Treasury directly.

The Reimbursable category of the budget averaged \$37.8 million annually under the MOA, close to the MOA annual budget target of \$40 million. The operation and maintenance budgets have increased by more than one-third since the end of the MOA. Most of the increase appears to be related to a greater than 50 percent increase in COE and BOR operating budgets (Figure 3, Table 1).

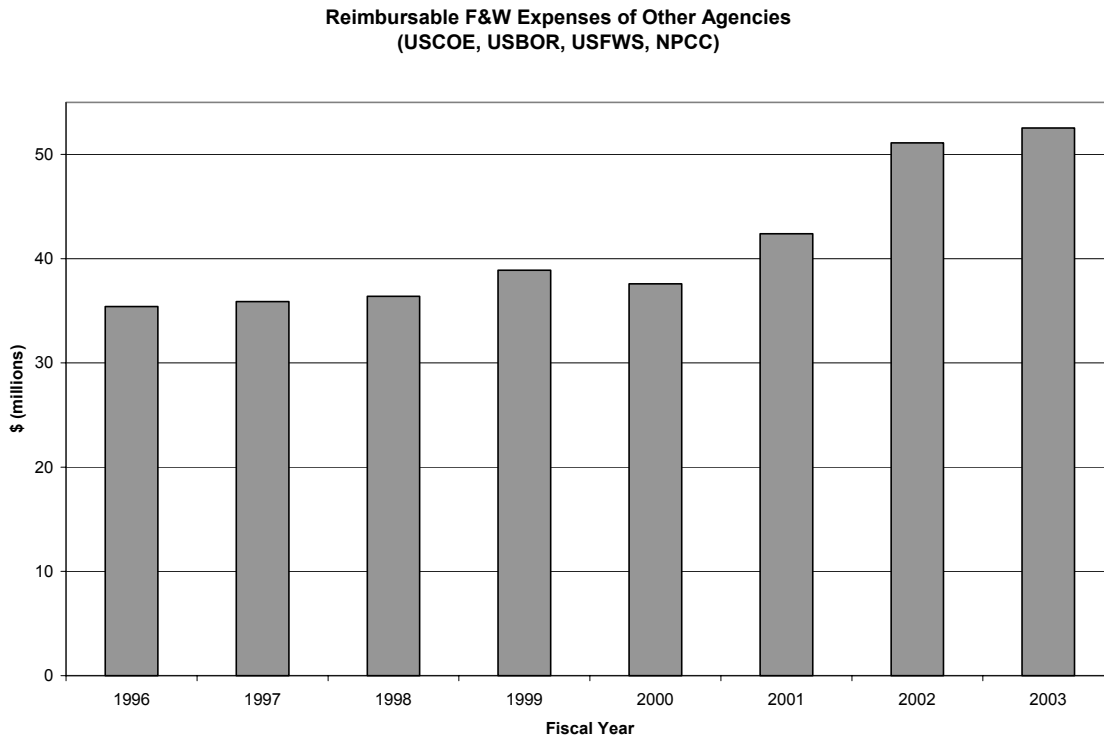


Figure 3. Reimbursable fish and wildlife expenses of other federal agencies.

### 3) Integrated (Direct) Program

The Integrated Program budget has two categories: Capital (discussed above) and Expense. The Expense portion of the Integrated Program has increased steadily since 1978. The MOA set an annual budget target of \$100 million, with BPA spending averaging \$95.5 million annually, a shortfall of \$26.9 million. During the current rate period, the target for the Expense portion of the Integrated Program was set at \$150 million and reduced to \$139 million annually in 2003. Actual spending during the current rate period has averaged \$139 million per year.

Although this appears to be an increase in funding of \$39 million annually since the conclusion of the MOA, the program funding has not been adjusted for inflation for eight years exaggerating the true benefit of the additional funding. Further, BPA has rolled contracted obligations forward each year without shifting the associated funding, creating a “bow-wave” of unfunded obligations. A change in accounting practices in FY 2003 required elimination of \$40 million worth of these carry-over obligations. In essence, BPA cut \$40 million in obligations from the Integrated Program in FY 2003. BPA is

now considering cutting an additional \$15 million from the Integrated Program over the period FY 2005-2006.

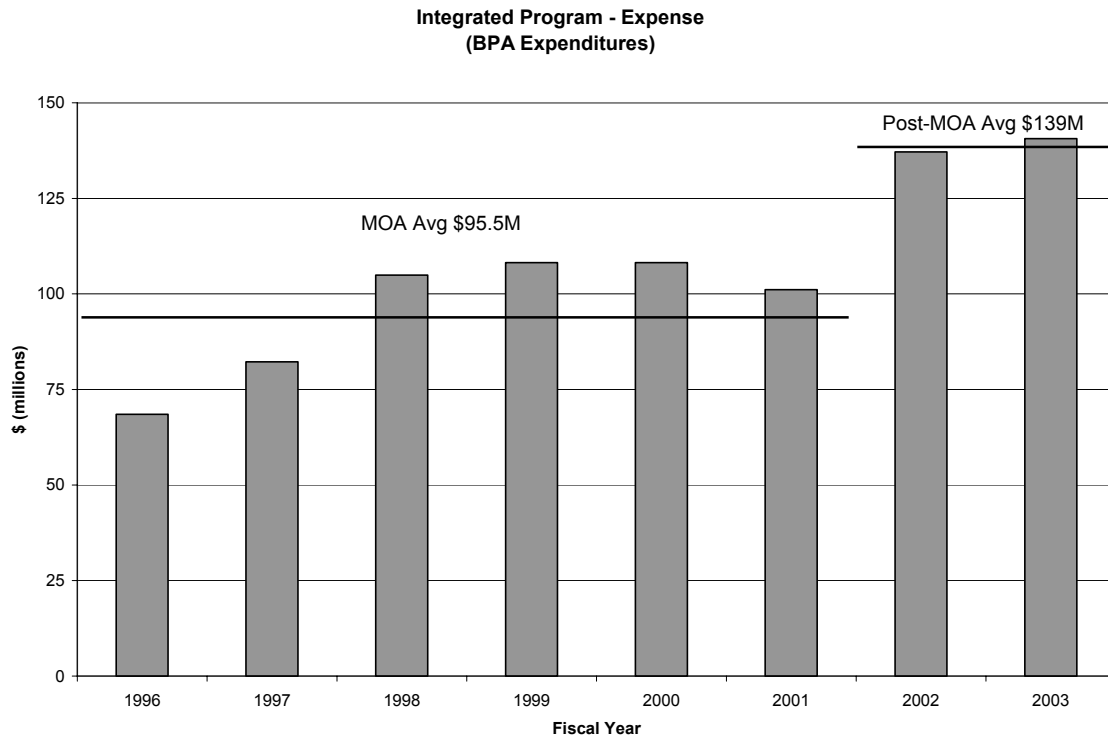


Figure 4. BPA spending in the Integrated Program from 1996-2004.

#### 4) High Priority/Action Plan Funding

In addition to the regular funding of the Integrated Fish and Wildlife Program, BPA announced that it would augment its budget in 2001 by \$10-20 million to partially offset the impacts from BPA’s elimination of summer spill during the drought and to provide a boost in funding for projects that met immediate needs identified in the 2000 biological opinions. BPA held two separate solicitations, titled “High Priority” and “Action Plan” and received about 108 project proposals. The fish and wildlife managers (CBFWA), independent scientists (ISRP), NOAA, and the public reviewed the proposals and the NPCC recommended funding approximately 30 proposals for a total of approximately \$38 million. BPA spent \$15.1 million, over three years, to fund 25 projects in this category of funding (Table 1).

#### River Operations

The fish and wildlife costs associated with operating the hydropower system are of a fundamentally different nature than those discussed above. Operational costs represent the value of electricity that might have been generated by water provided as spill or power purchased to replace or provide flows for fish. This is very different from actual

cash outlays to pay for fish and wildlife investments or expenses. The operational “costs” are derived in two ways, depending on the circumstances: revenue foregone and power purchases. BPA calculates revenue foregone by estimating the difference between a base-case value of power that might have been generated absent operational changes to benefit fish and that which was actually generated.

BPA estimates power purchases as the cost of power purchased to meet BPA contracts when hydro-operations are reduced by fish requirements and the system is not able to meet contract needs. Power purchases result from BPA contracting to sell more power than the hydro-system can reliably provide. BPA does not de-rate the hydro power system to fully account for required fish constraints, as they do for other operational constraints such as irrigation, navigation, municipal water supplies and recreation. When river flows are not adequate to meet all of the demands of the river, BPA in essence “charges” the salmon for power purchases necessary to meet its hydro-electricity contracts.

Table 2 and Figure 5 detail BPA’s estimates of these “lost opportunity” costs and shows that over the last 26 years they total more than \$3.7 billion with almost 40 percent of the total occurring in 2001.

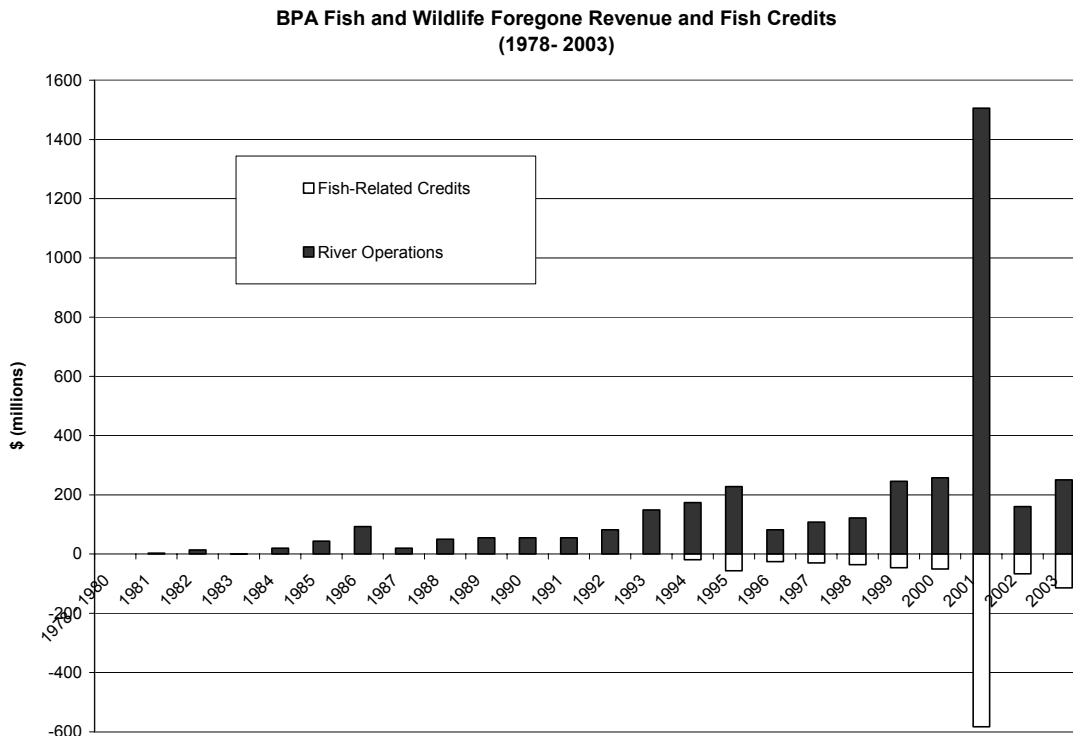


Figure 5. BPA estimated cost of river operations and benefits of fish credits from 1978 – 2003.



In Figure 5 and Table 2, fiscal year 2001 appears to be an anomaly. The operational costs were based on reduced reservoir levels at the start of the 2001 water year combined with wildly inflated electricity prices in the second quarter of the 2001 during the West Coast energy crisis. Essentially no river operations for fish occurred during 2001. BPA declared a financial emergency and shut off summer spill, opting to generate power valued at approximately \$500 million, to help pay for its financial crisis. Yet in BPA's accounting for the costs of meeting its fish and wildlife obligations, it does not credit the revenue benefits back to the fish and wildlife program.

Two aspects of these lost (power) opportunity costs should be kept in mind. First, other mandated uses of the river also limit hydropower generation. For example, BPA recently estimated in their sounding board discussions that irrigation use costs BPA about \$180 million annually in revenue foregone and power purchase costs. Similar estimates could be made for the costs of lost opportunities to generate power as a result of flood control, navigation, or operations to benefit the annual Richland Washington hydroplane races. The spill and flow requirements for salmon were set by the 1995 and 2000 biological opinions and the 1994 Fish and Wildlife Program, and are not discretionary except in emergencies. BPA does not consider implementation of flow and spill for fish as a cost of doing business and has not de-rated the generating capability of the FCRPS accordingly, as they have done to account for other constraints to generation.

Second, it is argued that these other uses of the river provide real (monetary) benefits that outweigh the costs of lost generation. Fish and wildlife provide real (and monetary) benefits, as well. One calculation (CBFWA, 2003), based on the 1987 NPCC Fish and Wildlife Program assumptions, estimates that the presence and operation of hydropower system results in about 8 million salmon that do not return, in essence, salmon "foregone." At a value to local economies of about \$400 per fish caught, this would result in about \$1 billion in revenue foregone each year from the salmon based industry of the Pacific Northwest.

## **Fish Credits**

BPA estimates the costs of salmon operations in detail because the NW Power Act allows BPA to take credits towards their annual U.S. Treasury repayment (currently equal to 27 percent of the calculated power generation impacts). When it passed the NW Power Act, Congress realized that "equitable treatment" of fish and wildlife with power generation would reduce generation and established two crediting mechanisms to reduce the rate impacts. Table 2 and Figure 5 provide the fish credits that BPA has used to partially offset its operational costs each year. Since BPA started taking these credits in 1994, it has reduced its U.S. Treasury repayments by more than \$1 billion, more than half of it in 2001 to offset the impacts of the chaotic Western energy market and the drought.

## Conclusions

- Over the last 26 years, BPA has spent about \$2 billion (\$79 million per year or 2.4% of BPA’s annual budget) to meet fish and wildlife obligations (Table 1). This includes:
  - \$1,071 million in repayment to the U.S. Treasury for funds borrowed to build fish passage facilities at the FCRPS and tributary dams and numerous salmon hatcheries to partially mitigate for the dams;
  - \$687 million to reimburse the U.S. Treasury for the operation of these facilities;
  - \$1,313 million expenses of the Integrated (Direct) F&W Program; and
  - \$1,025 million in Treasury payment credits.
- Since adopting the 2000 FCRPS biological opinions, BPA’s spending for fish and wildlife has increased from an annual average of \$207 million during the preceding five years to an annual average of \$244 million.
  - This apparent 18 percent increase is tempered by unaccounted-for inflation, a \$12 million per year increase in COE and BOR operations costs at existing facilities, and an accounting write-off of about \$40 million in Integrated Program obligations.
  - While BPA’s spending for Integrated Program expenses has increased almost 34 percent since the adoption of the 2000 Biological Opinion, this is partially offset by a 53 percent decline in capital investments.
- BPA has estimated the opportunity costs of system operations to meet fish and wildlife mitigation obligations at about \$3.77 billion over the last 26 years. Forty percent of this lost opportunity occurred as a result of the extraordinary conditions in 2001.
  - These opportunity costs have been offset by \$1.03 billion in credits against its Treasury repayments effectively shifting 27 percent of this “cost” to the U.S. taxpayers. Further, during 2001, BPA generated about \$500 million in power instead of providing spill required by the 2000 Biological Opinion. This should be credited as a foregone spill offset to its opportunity costs. Thus, using the above assumptions, BPA’s net opportunity costs from fish and wildlife obligations is about \$2.25 billion over the last 26 years, or less than \$90 million annually.
- The MOA specified rules that provided for any unspent funds within the MOA to be carried forward each year and made available for fish and wildlife projects, even after the MOA expired, stating: “*Any funds remaining in these accounts after the close of Fiscal Year 2001 will not be re-programmed for any non-fish and wildlife use, but will remain available for expenditure for the benefit of fish and wildlife*” (MOA Section VIII(h)).
  - However, when the MOA expired, BPA failed to carry forward or continue to make available \$226 million of unspent funds, including

\$188.4 million in the Capital category and \$37.6 million from the Integrated (Direct) Program Expenses.

Table 1. Bonneville Power Administration (BPA) Fish and Wildlife Expenditures from 1978-2003<sup>1</sup> (\$ in millions).

	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Total		
	1978-																					1978-		
Fiscal Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>1) Capital Investments Fixed Expenses</b>																								
<i>Federal appropriated dollars</i>	30.0	17.9	61.7	55.1	9.0	46.4	9.1	78.6	7.6	5.3	4.5	12.0	4.7	162.0	63.0	48.0	86.9	82.4	102.2	72.3	74.9	94.1	73.2	82.3
<i>Integrated Program</i>	0.0	0.0	0.0	0.0	0.0	10.2	8.0	4.7	7.7	8.3	16.2	17.7	11.2	17.3	20.5	32.5	26.0	28.1	22.0	14.7	13.9	16.5	6.2	6.8
<b>Actual</b>	<b>24.0</b>	<b>8.8</b>	<b>12.4</b>	<b>15.9</b>	<b>16.6</b>	<b>19.7</b>	<b>22.1</b>	<b>28.5</b>	<b>31.0</b>	<b>31.9</b>	<b>34.3</b>	<b>38.2</b>	<b>41.9</b>	<b>53.6</b>	<b>61.3</b>	<b>63.6</b>	<b>73.0</b>	<b>76.3</b>	<b>74.2</b>	<b>76.1</b>	<b>77.2</b>	<b>77.1</b>	<b>56.6</b>	<b>56.7</b>
<b>2) Reimbursable F&amp;W Expenses of Other Agencies</b>																								
<b>Actual</b>	<b>15.0</b>	<b>6.1</b>	<b>11.5</b>	<b>14.2</b>	<b>16.0</b>	<b>19.9</b>	<b>23.7</b>	<b>29.7</b>	<b>19.0</b>	<b>23.6</b>	<b>23.4</b>	<b>24.3</b>	<b>28.4</b>	<b>30.5</b>	<b>34.9</b>	<b>36.1</b>	<b>35.4</b>	<b>35.9</b>	<b>36.4</b>	<b>38.9</b>	<b>37.6</b>	<b>42.4</b>	<b>51.1</b>	<b>52.5</b>
<b>3) Integrated Program Expenses</b>																								
<b>Actual</b>	<b>2.3</b>	<b>2.3</b>	<b>4.6</b>	<b>9.1</b>	<b>19.6</b>	<b>15.9</b>	<b>19.6</b>	<b>22.2</b>	<b>18.8</b>	<b>23.0</b>	<b>32.8</b>	<b>33.0</b>	<b>67.0</b>	<b>49.6</b>	<b>55.9</b>	<b>71.4</b>	<b>68.5</b>	<b>82.2</b>	<b>104.9</b>	<b>108.2</b>	<b>108.2</b>	<b>101.1</b>	<b>137.1</b>	<b>140.6</b>
<b>4) High Priority/Action Plan Expenses</b>																								
<b>Actual</b>																								
<b>Total BPA Expenses</b>	<b>41.3</b>	<b>17.2</b>	<b>28.5</b>	<b>39.2</b>	<b>52.2</b>	<b>55.5</b>	<b>65.4</b>	<b>80.4</b>	<b>68.8</b>	<b>78.5</b>	<b>90.5</b>	<b>95.5</b>	<b>137.3</b>	<b>133.7</b>	<b>152.1</b>	<b>171.1</b>	<b>176.9</b>	<b>194.4</b>	<b>215.5</b>	<b>223.2</b>	<b>223.0</b>	<b>222.1</b>	<b>251.9</b>	<b>256.3</b>
Total 1,297.9																								

Table 2. Bonneville Power Administration (BPA) River Operations and Fish Credits from 1978-2003<sup>1</sup> (\$ in millions).

	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Total	
	1978-																						1978-	
Fiscal Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<b>River Operations</b>																								
Power Purchases	0.0	0.0	0.0	0.0	12.0	17.0	74.0	11.0	40.0	40.0	40.0	40.0	59.0	104.0	111.7	114.0	0.0	0.0	5.4	47.6	64.8	1,389.6	147.8	171.1
Foregone Revenues	0.0	3.0	14.0	1.0	8.0	27.0	19.0	9.0	10.0	15.0	15.0	15.0	23.0	45.0	62.0	114.0	81.7	107.8	116.5	197.8	193.1	115.9	12.6	79.2
<b>Actual</b>	<b>0.0</b>	<b>3.0</b>	<b>14.0</b>	<b>1.0</b>	<b>20.0</b>	<b>44.0</b>	<b>93.0</b>	<b>20.0</b>	<b>50.0</b>	<b>55.0</b>	<b>55.0</b>	<b>55.0</b>	<b>82.0</b>	<b>149.0</b>	<b>173.7</b>	<b>228.0</b>	<b>81.7</b>	<b>107.8</b>	<b>121.9</b>	<b>245.4</b>	<b>257.9</b>	<b>1,505.5</b>	<b>160.4</b>	<b>250.3</b>
<b>Fish-Related Credits</b>																								
NPA 4(f)(1)(C)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-18.7	-56.3	-25.5	-29.7	-35.7	-46.0	-50.4	-336.6	-66.4	-35.4
Fish Cost Contingency Fund	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-78.7
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>-18.7</b>	<b>-25.5</b>	<b>-29.7</b>	<b>-35.7</b>	<b>-46.0</b>	<b>-50.4</b>	<b>-583.1</b>	<b>-66.4</b>	<b>-114.1</b>
Total -1,025.9																								

1 - Data for these tables was obtained from the following web links and from Val Lefler, BPA, and John Kranda, USCOE, personal communications (<http://www.efw.bpa.gov/EWF/FISCAL/congressional.budgets.1978-95.pdf> and <http://www.efw.bpa.gov/EWF/FISCAL/MOAFinal2001.pdf>).

The Yakama Nation Comments on  
Bonneville Power Administration's Power Function Review



April 28, 2005

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## Summary

The Yakama Nation is providing comments to BPA on the Power Function Review (PFR). This process is intended to determine the costs of BPA programs for the BPA rate case that will determine BPA revenues for Fiscal Years 2007 through 2009.

The Yakama Nation has been working with other fish and wildlife managers through a workgroup of the Columbia Basin Fish and Wildlife Authority to develop the costs to fully implement the Council Program and the Federal Columbia River Power System (FCRPS) Biological Opinions.

Working with CBFWA, we have developed the most detailed budgets ever prepared for this kind of effort. Those budgets clearly show that implementing the subbasin plans, wildlife program, and other ongoing activities will require a significant increase in BPA funding. That should not come as any surprise. Restoring the habitat in the Columbia Basin—an area the size of France—will require a major effort.

As these comments are due, the CBFWA report is going through consent review; it has been approved by the state fish and wildlife agencies in Idaho, Montana, Oregon, and Washington and all of the Columbia Basin Indian tribes, except the Coeur d'Alene and Kalispell tribe. It is our understanding that CBFWA is working with these tribes to address suggested changes.

The Yakama Nation endorses the CBFWA workgroup recommendation that BPA ramp up its funding during the next rate case from \$186 million in FY 2006 to \$240 million in FY 2009:

\$186 million in FY 2006,  
\$200 million in FY 2007,  
\$225 million in FY 2008,  
\$240 million in FY 2009.

**Benefits from fully implementing the Council Program:** These funding levels will put BPA on a path to complete implementation of most of the Council's Program during the next ten years. This is an essential first step in meeting the Council's rebuilding goals for salmon and steelhead.

Implementing the subbasin plans would result in significant accomplishments:

- Protection for more than 48,000 acres of habitat;
- Improvements to more than 1300 miles of streams;
- Construction of almost 1600 miles of fence
- Enhancement activities on more than 75,000 acres of habitat;
- Correcting passage problems at more than 1200 diversions and culverts; and,
- Additions or major enhancements to fish production facilities in 11 subbasins.

An aggressive implementation schedule has the lowest biological risk. There are a number of listed species that are declining and at risk of extinction; improving habitat is critical for their survival. Implementing these actions quickly will save money in the long run. The costs of acquiring land or easements for riparian habitat are going up very fast in Eastern Washington.

The Council Fish and Wildlife Program and the FCRPS Biological Opinions rely heavily on improving habitat as off-site mitigation for the dams. These efforts are especially important to us. For at least the past four decades, the Columbia Basin Treaty tribes have voluntarily imposed severe restrictions on their treaty-reserved fisheries to assist in rebuilding wild populations of salmon and steelhead. This action was taken based on the expectation that other relevant parties would also take actions to share the burden of wild stock conservation. The tribes are still waiting for these actions, particularly in the area of habitat protection and improvement. Improving habitat is the only way to rebuild to sustainable, harvestable levels those wild runs that presently constrain treaty fisheries.

Implementing the subbasin plans will also provide thousand of jobs in rural and tribal communities in eastern Washington and Oregon and in Idaho and Montana. This is an important issue for us. In recent years, unemployment on our reservation was about 70 percent outside of the fishing season. We have worked very hard to bring that down to about 40 percent. Providing jobs to restore habitat and rebuilding our tribal fishery are really important to the Yakama Nation.

We are also ratepayers. The Yakama Nation is in the process of forming Yakama Power—a tribal utility that will buy power from BPA. We calculate that the increased costs of implementing the Program and ESA represents about \$1 per month for the average residential consumer served by utilities that buy all of their power from BPA. The costs would be more for large energy users such as Yakama Forest Enterprise, our casino, Yakama Juice and other tribal enterprises. The impacts on customers served by utilities that don't buy all of their power from BPA would be smaller.

**BPA's funding alternatives are inadequate:** Our comments also address the funding alternatives that BPA has developed. First we would note that these alternatives appear to be ignore the costs developed by the CBFWA workgroup and therefore are not based on the best information available. We are also disappointed that BPA has not provided any comments to date on the CBFWA detailed cost report. We met with BPA and utility staffs over the last four months, shared drafts of the detailed report, and sought comments.

Under BPA's low alternative, it would take 70 years to implement the subbasin plans and other parts of the Council's Program. This is unacceptable to the Yakama Nation—it would mean the extinction of a number of salmon runs.

Under BPA's high case, at \$174 million per year, it would take 40 years to implement the subbasin plans and other measures in the Council Program. This is also unacceptable and



does not come close to meeting the goals of the Columbia River Basin Fish and Wildlife Program.

BPA says that it is looking for clear objectives. The Council set a goal in the 2000 Fish and Wildlife Program to rebuild salmon and steelhead to five million fish returning above Bonneville Dam by 2025. The current runs are less than 2.5 million fish—about the same levels as when the Council originally set its goal in 1987.

Under BPA’s high case, you won’t implement the Council’s current subbasin plans until 2045! BPA will not come close to meeting the Council goal.

**Summary recommendations:** Based on the detailed analysis conducted by the CBFWA workgroup, the Yakama Nation has developed a number of recommendation (see page 25); in summary:

1. BPA should incorporate the cost estimates and recommendations developed by the Columbia Basin Fish and Wildlife Authority into the next rate case. These are the best estimates available. A copy of the report and recommendations are incorporated as Attachment 1.
2. The CBFWA estimates are based on the assumption that BPA will use its borrowing authority for land and water acquisition. BPA should modify its capitalization policy to set up mechanisms to allow borrowing funds or the use of its borrowing authority to purchase land and water.
3. BPA must meet the goals of the Fish and Wildlife Program to rebuild salmon and steelhead returns above Bonneville Dam to five million by 2025. The funding recommended by the fish and wildlife managers through FY 2009 is not likely to exceed the Fish and Wildlife Program goal.
4. The Columbia Basin needs an Implementation Plan for fish and wildlife. We strongly recommend development of an implementation plan detailing the actions, schedule and costs needed to implement the Fish and Wildlife Program, and are committed to that effort.
5. Full implementation of the F&W Program and ESA activities will create economic benefits in tribal and rural areas.
6. BPA should address the fact that there are a number of events that could significantly increase fish and wildlife funding. For example:
  - The current lawsuit against the FCRPS biological opinion could result in higher costs.
  - CBFWA assumed that other Federal agencies will fund habitat restoration on federal land. Given the tight federal budget, these costs could fall on BPA.

- The BPA and Council have assumed that monitoring and evaluation costs will decrease. These assumptions are untested and the ESA may require more monitoring.
  - NOAA fisheries Service has said recently that the recovery plans under the ESA may go well beyond the actions called for in the subbasin plans in the Council's Program. This would add to costs.
  - When the currently favorable ocean conditions deteriorate, BPA may be called upon to fund additional activities to address weak-stock survival or productivity.
  - The costs for hatchery reforms are not addressed in the BPA estimates.
  - None of the estimates adequately address the effects of inflation. The fish and wildlife program has been flat funded for the last four year.
  - During the last rate case, BPA promised the Yakama Nation that it would increase its rates if necessary to meet fish and wildlife costs. What BPA actually did was reduce fish and wildlife costs over the five year rate period and eliminated spill and flow protections in 2001.
7. BPA needs an effective cost recovery mechanism that will ensure that it makes adequate progress in meeting the Council's goal of five million returning salmon and steelhead by 2025.

The Yakama Nation wants to work with other fish and wildlife managers, the Council, and BPA to resolve these issues in the region. However, if BPA goes forward with its current alternatives, we will have no alternative but to nationalize the issue.

## Introduction

In November of 2004, the Columbia Basin Fish and Wildlife Authority (CBFWA) formed a workgroup to develop fish and wildlife costs for the BPA rate case. The focus of this effort has been developing costs for the BPA Integrated Fish and Wildlife Program for the next rate case that incorporate the habitat and production measures in the subbasin plans. Based on the detailed analysis conducted by the CBFWA workgroup of the costs of implementing the Northwest Power and Conservation Council's Columbia Basin Fish and Wildlife Program pursuant to the Northwest Power Act and the Federal Columbia River Power System Biological Opinions pursuant to the Endangered Species Act, the Yakama Nation recommends that BPA increase its fish and wildlife funding for the Integrated Program to:

- \$186 million in FY 2006,
- \$200 million in FY 2007,
- \$225 million in FY 2008,
- \$240 million in FY 2009.

These budgets assume that BPA will use its borrowing authority to capitalize production facilities and land and water acquisitions for habitat measures. These amounts would put BPA on a path to implement most of the subbasin plans that have been included in the NPCC Fish and Wildlife Program within ten years.

To size the overall level of effort needed to implement the subbasin plans, the CBFWA workgroup developed detailed estimates of the cost to implement the subbasin plans. These costs total \$1.8 billion. The CBFWA workgroup also identified additional wildlife mitigation costs totaling \$300 million. The current budgets provide sufficient detail to size the effort. The costs will be refined through Council Program amendments and the project selection process.

Implementing most of the work in the subbasin plans and the wildlife actions, and the other parts of the Integrated BPA Fish and Wildlife Program would average \$240 million per year. If BPA decides that it will not capitalize the cost of land and water acquisitions, then the average cost would be \$310 million per year.

The workgroup also found that the work envisioned by the subbasin plans does not address all of the habitat protection and enhancement activities that are likely to be needed to meet regional fish and wildlife goals. Therefore, we recommend that federal, state, and tribal governments immediately begin to develop a comprehensive plan to protect, mitigate, and enhance fish and wildlife in the Columbia Basin. This process should address funding from BPA and other sources. It should include biological analysis to determine whether the actions are likely to achieve the fish and wildlife goals and obligations under the Endangered Species Act, Northwest Power Act, and treaty and trust responsibilities. This effort should result in a detailed workplan and budget for future fish and wildlife activities in the Columbia Basin.

The Yakama Nation recommends that federal, state, and tribal governments work to develop biological analysis of the expected results from the subbasin plans and to monitor those results. The Council has set a goal for the Fish and Wildlife Program of five million salmon and steelhead returning above Bonneville Dam by 2025. This biological analysis would help determine whether the actions in the current Fish and Wildlife Program would exceed this goal. The Council has also set goals to address the wildlife losses associated with the construction of the dams and inundation of the reservoirs.

## **Background**

### **The Yakama Nation's interest in the BPA PFR and rate case**

The Yakama Nation is the largest Indian tribe in the Northwest. We are also the largest employer in Central Washington, with over 4,600 jobs in our tribal government and tribal enterprises.

The Yakama Nation also has the largest number of tribal fishermen on the Columbia River. The Nation signed a Treaty with the United States in 1855 that guaranteed our rights to fish and hunt to support our culture, religion, and tribal economy. The loss of salmon has had a devastating effect on the Yakama Nation.

Over the last forty years the United States and several of the Northwest states have asked the Yakama Nation and other tribes with similar treaties to reduce our tribal harvest as part of an effort to rebuild salmon runs. These governments promised to restore salmon habitat to rebuild health salmon runs.

We voluntarily stopped our commercial harvest of spring chinook in 1965 and summer chinook in 1975. More recently, our salmon harvest has been further constrained to protect salmon listed under the Endangered Species Act. The Federal government developed a biological opinion that left the dams in place and promised aggressive efforts to restore habitat. We had a couple of good years recently where there was some commercial harvest on spring and summer chinook, but this year is looking very tough.

We have a lot of promises from the Federal government and the states, but very little action that has improve habitat or migration survival.

That is why the Yakama Nation was a party in the last BPA rate case. We spent considerable resources trying to convince BPA to include sufficient funding to fully implement the Council's Fish and Wildlife Program and the Biological Opinion.

We were not very successful in that rate case and we are currently suing BPA in the Ninth Circuit. We believe BPA violated the Northwest Power Act because its rates were not sufficient to meet its costs, including fish and wildlife costs, and assure repayment to the Treasury as required by the Act. That case is pending.

Now BPA is starting a new rate case. We need to ensure that BPA provides adequate funding to implement the Council's Program, the ESA, and fulfill its treaty and trust obligations to our tribe.

## **BPA's Role in Fish and Wildlife Funding**

BPA funds a significant portion of the fish and wildlife restoration work in the Columbia Basin. Since 1981, BPA's total fish and wildlife funding has averaged \$132 million per year. During Fiscal Years 2002 through FY 2006, BPA projected that these costs would average \$255 million per year.

Under the Northwest Power Act, BPA funds measures to protect, mitigate, and enhance fish and wildlife damaged by the hydroelectric development and operations in the Columbia River Basin<sup>1</sup>. These costs are part of Bonneville's total system costs.

The revenues for fish and wildlife and other BPA functions come from the sale of electricity from the Federal Columbia River Power System (FCRPS). This system includes the federal dams in the Columbia Basin, one nuclear power plant, and other small generating resources that have been acquired by BPA. As part of the process for setting rates, BPA must project its future costs and future sales of electricity. It also must address the uncertainties associated with these projections to ensure that its rates are sufficient to meet its costs and repay the U.S. Treasury for the money BPA borrowed to build the dams, transmission system, and other capital investments.

## **History of BPA Fish and Wildlife Funding**

In 1995, the Departments of the Army, Commerce, Energy and Interior entered into a MOA for fish and wildlife funding for FY 1996 through FY 2001. The MOA was not renewed; however, BPA has continued to divide its fish and wildlife funding into categories established by the MOA. This section summarizes the capital, reimbursable, and direct budgets and the recent funding history. BPA now refers to the direct budget as the integrated fish and wildlife budget. Table 1 in Appendix 2 shows the total funding for these categories from 1996 to 2003, that information is summarized in Figure 1 below.

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<sup>1</sup> 16 U.S.C. 839b(h)(8), 839b(h)(10).

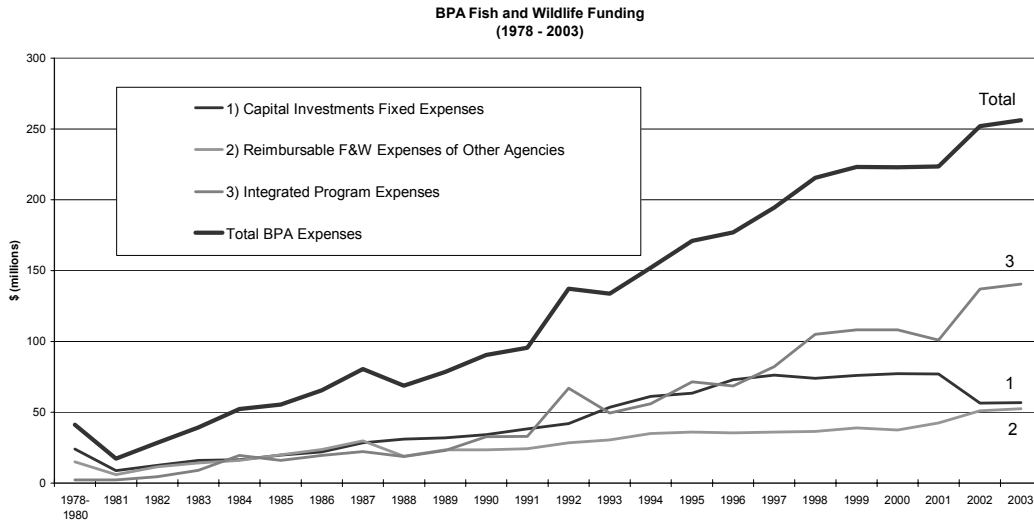


Figure 1: Total BPA Fish and Wildlife Funding

The Capital Budget: BPA repays the U.S. Treasury amortization, depreciation, and interest on capital investments in fish facilities at dams built and operated by the Corps of Engineers and Bureau of Reclamation. BPA’s capital budget also repays funds borrowed to construct numerous hatcheries built as partial mitigation for the FCRPS. Other investments include salmon transport barges and improvements at the FCRPS dams for fish collection, passage and, as well as planning, design, monitoring and research studies. The amounts for each of the major funding categories, including the amount that Congress authorized the COE and BOR to borrow each year is shown in Figure 1.

The costs for capital investments have remained fairly steady since the adoption of the 1996-2001 Memorandum of Agreement. The MOA set targets for capital investment of \$107 million annual average. BPA’s investments in this area under-ran the targets significantly, averaging \$76 million annually, for a total under-investment of more than \$188 million. For the past eight years, the annual appropriation for fixes at mainstem dams has averaged approximately \$83.5 million. Since the adoption of the 2000 Biological Opinions, average annual spending has remained fairly constant with only a slight decrease.

In 1985, BPA began capitalizing projects in the Integrated (Direct) Fish and Wildlife Program. The 1996-2001 MOA set \$27 million as the annual target for capitalized projects in the Integrated Program. The line “Integrated Program” under Capital Investments in Table 1 in Appendix 2 shows the trend in this amount. Under the MOA, BPA capitalized an average of \$20.2 million annually, under-spending the target by about \$40.8 million over the term of the MOA (see Figure 2).

It is important to note that the amount borrowed is different than the annual repayment costs that drive BPA’s revenue requirements. The amount borrowed is usually booked in the year construction starts, while repayment does not start until the facility is completed.

As a general “rule of thumb,” the annual repayment costs are about one-tenth of the amount capitalized or borrowed.

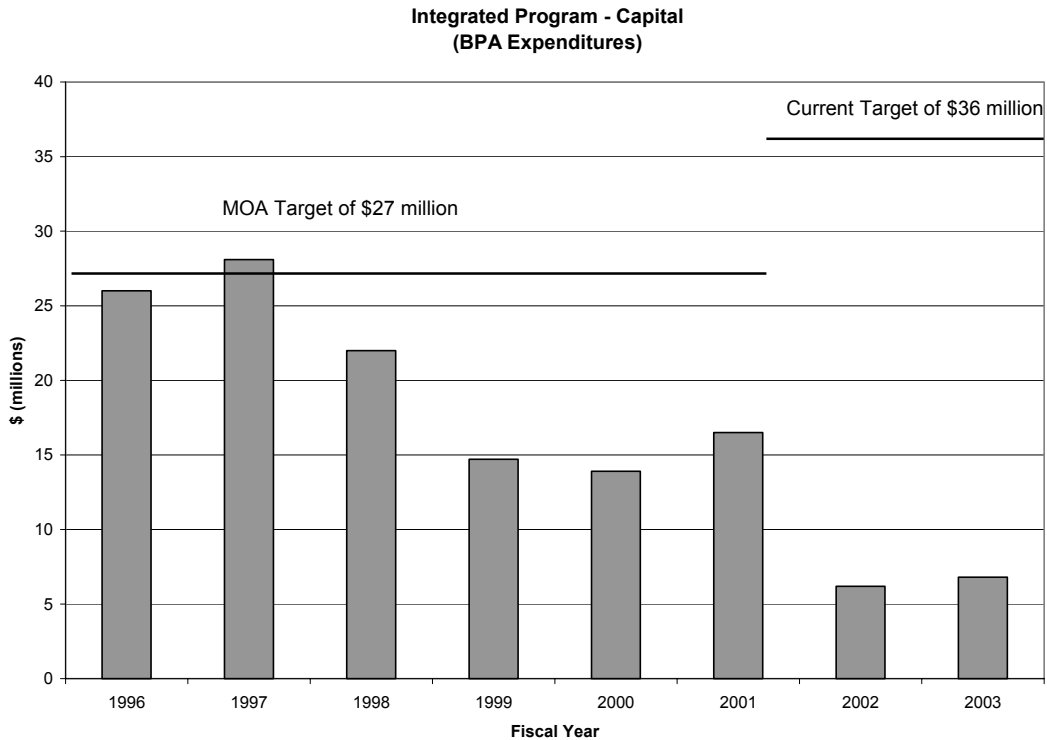


Figure 2. Actual capital investments in the Integrated program from 1996-2003.

Reimbursed Expenses of Other Agencies: BPA repays the U.S. Treasury for the hydroelectric share of operation and maintenance budgets and other authorized non-capital expenditures for fish and wildlife activities by the U.S. Corps of Engineers (COE), U.S. Bureau of Reclamation (BOR) and U.S. Fish and Wildlife Service. These costs include the Lower Snake River Compensation Plan implementation and numerous hatcheries built to mitigate for FCRPS. BPA also funds half of the Northwest Power and Conservation Council’s budget (currently \$4.5 million annually) under this portion of its budget.

This category of the budget averaged \$37.8 million annual under the MOA, close to the MOA annual budget target of \$40 million. The operation and maintenance budgets have increased by more than one-third since the end of the MOA. Most of the increase appears to be related to an increase in COE and BOR budgets (Figure 3 and Table 1 Appendix 2).

**Reimbursable F&W Expenses of Other Agencies  
(USCOE, USBOR, USFWS, NPCC)**

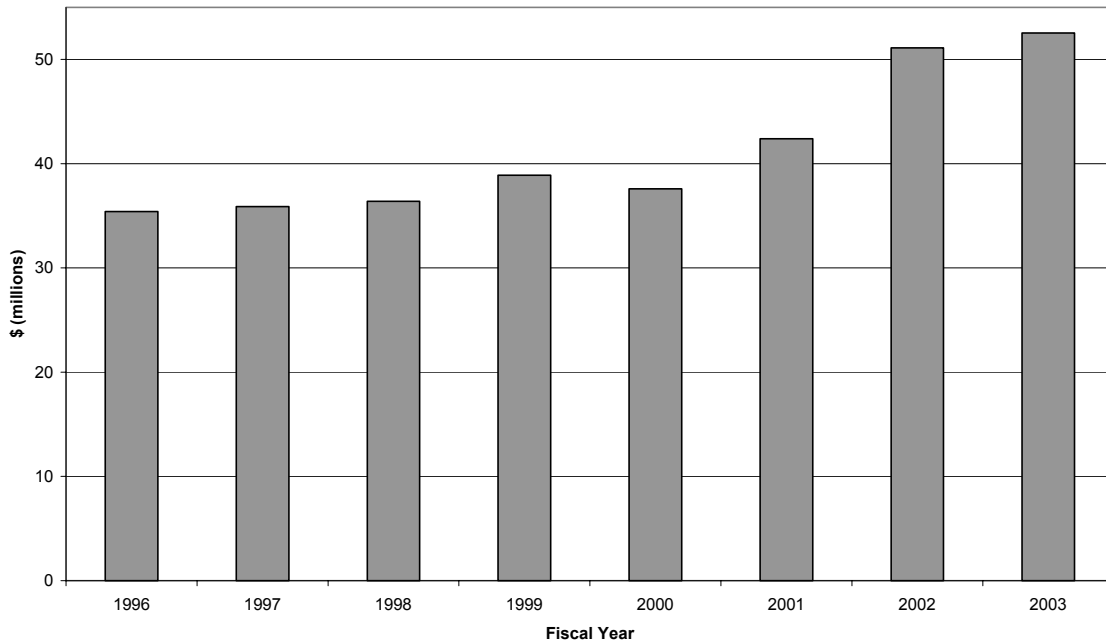


Figure 3. Reimbursable fish and wildlife expenses of other federal agencies.

Integrated (Direct) Program: The Integrated Program budget has two categories: Capital (discussed above) and Expense. The Expense portion of the Integrated Program has increased steadily since 1978. The MOA set an annual budget target of \$100 million, with BPA spending averaging \$95.5 million annually, a shortfall of \$26.9 million over the term of the MOA. During the current rate case (FY 2002 through FY 2006), the target for the Expense portion of the Integrated Program was set at \$150 million and reduced to \$139 million annually in 2003. Actual spending during the current rate period has averaged \$139 million per year.

Although this appears to be an increase in funding of \$39 million annually since the MOA, the program funding had not been adjusted for inflation for eight years. Further, BPA has rolled contracted obligations forward each year without shifting the associated funding, creating a “bow-wave” of unfunded obligations. A change in accounting practices in FY 2003 required elimination of \$40 million worth of these carry-over obligations. In essence, BPA cut \$40 million in obligations from the Integrated Program in FY 2003. BPA is now considering cutting an additional \$15 million from the Integrated Program over the period 2005-2006.



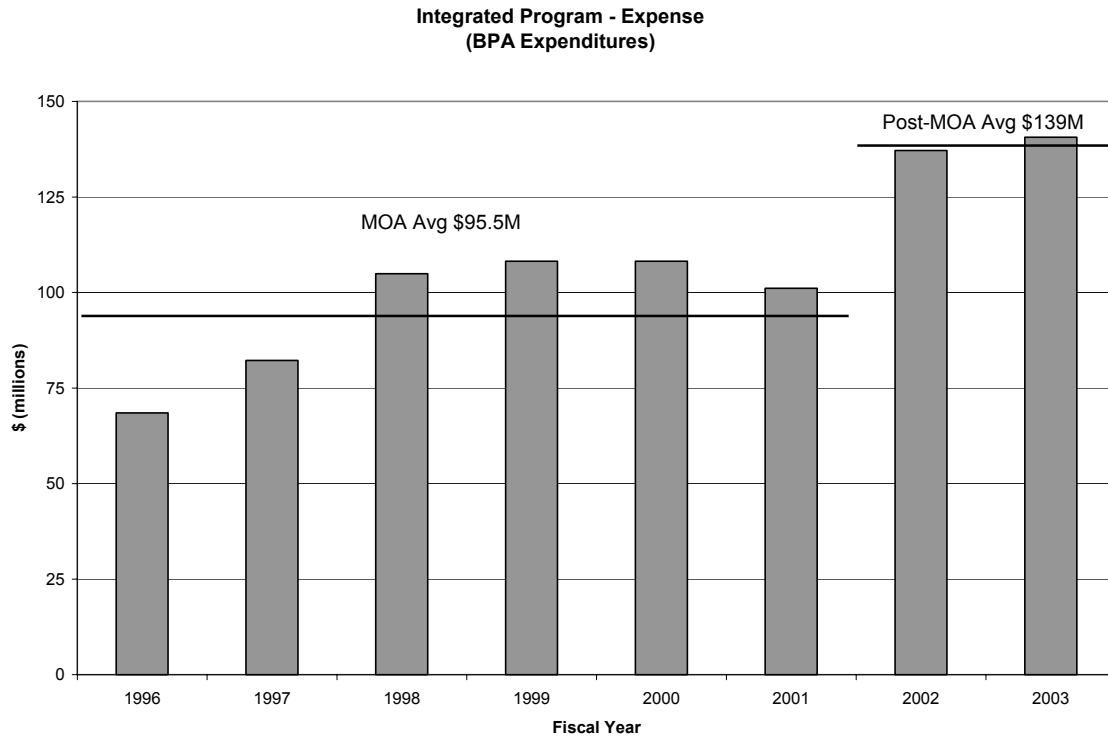


Figure 4. BPA spending in the Integrated Program from 1996-2004.

## The 2002 BPA Rate Case

### Power and Fish and Wildlife Decisions

BPA began its last rate case process in 1999, before decisions were made on the measures that would be included in the 2000 Biological Opinion for the FCRPS. These rate decisions addressed BPA's revenues for FY 2002 through FY 2006. Fish and wildlife managers raised concerns that BPA's rate case decisions could foreclose fish and wildlife decisions, including the implementation of the Biological Opinion and Council Program by limiting funding. Federal, state, and tribal governments worked to develop 13 alternatives for future fish and wildlife funding through 2011; the costs for these alternatives averaged \$438 to \$721 million per year. BPA assured the fish and wildlife managers that it would "keep the options open" by including the range of costs in its rates. BPA also committed that it would adjust its rates, if necessary, to accommodate future funding needs.

### Problems with 2002 Rate Case Process

BPA states that it gave equal weight to the 13 alternatives in setting its rates and assumed an average for the direct program of \$139 million per year. In the initial rate proposal, BPA stated that these assumptions would not limit actual funding.

The Columbia River Inter-Tribal Fish Commission and the Yakama Nation were parties to the rate case. We raised concerns that BPA's methodology had actually assumed a one per cent probability that costs would be at the high end of the range. We also raised concerns that BPA had changed the methodology in calculating direct fish and wildlife costs. Rather than weighting 12 of the alternatives at \$179 million per year and one alternative at \$100 million, consistent with the alternatives developed by the Federal, state, and tribal process and arriving at an equally weighted estimate of \$173 million per year, BPA averaged the high and low alternatives and assumed \$139 million per year. This assumption lowered the direct costs by \$170 million during the rate period. BPA did not dispute any of the CRITFC and Yakama contentions in the rate case.

BPA finalized its rates in 2001, and then immediately reopened its rate process to address higher costs associated with supplying power to its customers. BPA had committed to serve 3,300 megawatts of power beyond its available resources. When the manipulation of the California electricity markets caused prices to soar, BPA estimated that the cost of serving these additional commitments was \$3.9 billion during the current rate period. These added costs were included as part of a Cost Recovery Adjustment Clause known as the load-based and financial-based CRACs.

In 2003, BPA faced additional costs associated with its own operations, the operations of the federal dams and the nuclear plant. As a result, BPA conducted a Safety Net Cost Recovery Adjustment Clause (SN-CRAC) process to address these additional costs. During that process, CBFWA provide analysis that the cost of implementing the Provincial Review would add \$100 million per year above BPA's current fish and wildlife funding. The Review was conducted by CBFWA and the NPCC and based on measures that had gone through the project review process and been approved by the Independent Science Review Panel. BPA did not address these additional fish and wildlife costs as part of the SN-CRAC. BPA has subsequently set a cap on the direct fish and wildlife program of \$139 million. In 2001, BPA and the Corps of Engineers eliminated fishery spill and flow provisions to ensure BPA's ability to make its payment to the U.S. Treasury.

## **Developing Fish and Wildlife Costs for the Next BPA Rate Case**

### **Coordinating Power and Fish and Wildlife Decision Processes**

Given the problems of the 2002 rate case, fish and wildlife managers began discussions in 2003 on ways to coordinate the next BPA rate case with fish and wildlife decisions. They wanted to ensure that BPA decisions regarding its revenues after 2006 would not foreclose fish and wildlife recovery under the Northwest Power Act or the Endangered Species Act. It appeared that the Subbasin Planning Process being conducted by the NPCC and BPA could provide the information needed for the next rate case.

The NPCC's 2000 Program included a framework for fish and wildlife in the Columbia Basin and called for the development of subbasin plans that would include subbasin assessments, an inventory of existing activities, and a management plan. The

management plan was required to have a vision, biological objectives for fish and wildlife, strategies that will be employed to meet the vision and biological objectives, a projected budget (including both a three-year implementation budget and more general 10-15 year budget), a monitoring and evaluation plan, and additional steps necessary to comply with the Endangered Species Act and the Clean Water Act<sup>2</sup>.

NOAA Fisheries had indicated that it could use these subbasin plans as the basis for recovery plans under the Endangered Species Act. Therefore, it appeared that these subbasin plans, scheduled for completion by May 2004, could provide detailed budgets for the BPA rate case that would begin in early 2005.

Unfortunately, most of the subbasin plans did not include budgets. To further complicate things NOAA Fisheries is working to develop recovery plans under the ESA; however, final adoption of all of the subbasin and the NOAA recovery plans will not be completed prior the initiation of the BPA rate case.

The Biological Opinion for the FCRPS also creates uncertainty for future fish and wildlife funding. CBFWA estimates that 75 percent of BPA's fish and wildlife funding goes to implement the Biological Opinion. NOAA Fisheries adopted a new Biological opinion on November 30, 2004. Several parties have filed law suits against the new Biological Opinion; the briefing schedule for this case could result in a decision in the spring of 2005.

BPA and the Council began meeting in the fall of 2004 to review the major budget categories and identify the factors that may increase or decrease costs in the future. In November of 2004, CBFWA formed a workgroup to coordinate the development of fish and wildlife costs for the next BPA rate case. The workgroup reported to the Members Management Group in December and made the following recommendations:

1. The fish and wildlife managers should review the assumptions made by the Council and BPA about future fish and wildlife costs.
2. The fish and wildlife managers should prepare fish and wildlife costs based on the subbasin plans. The primary focus of this work would be in the areas of habitat and production.
3. The fish and wildlife managers should work with BPA to design ways to provide flexibility to adjust fish and wildlife funding as information on the Biological Opinion, subbasin plans and recovery plans becomes available to ensure that BPA can fully implement these important plans.

### **Previous Fish and Wildlife Cost Estimates**

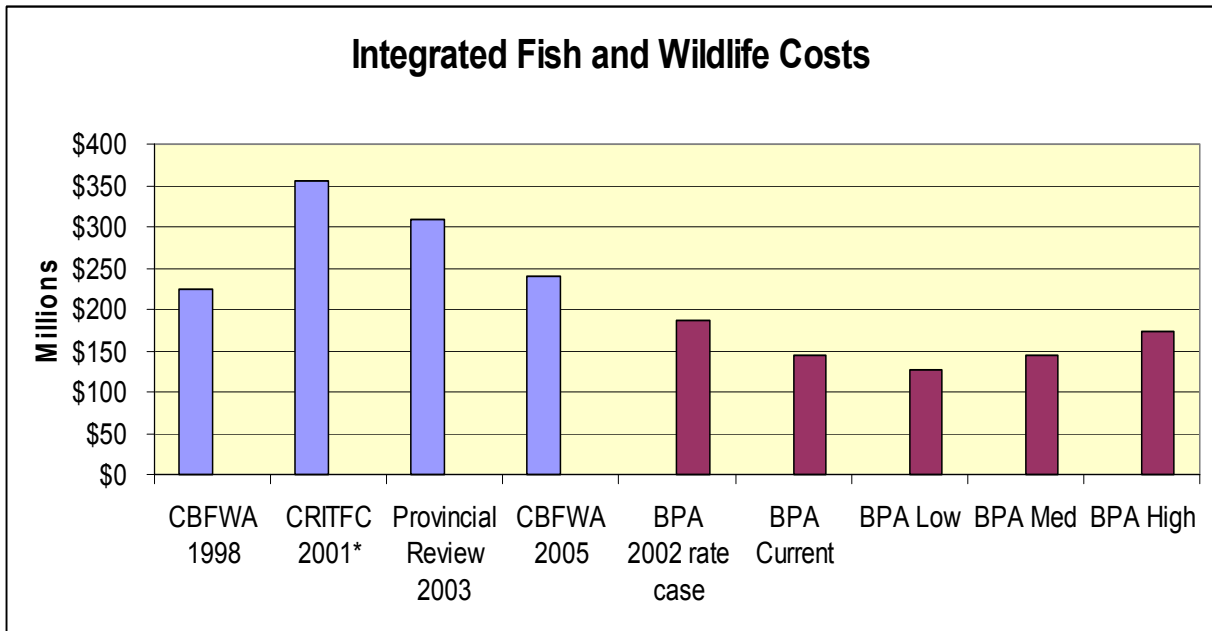
CBFWA has developed two previous fish and wildlife cost estimates. The first was in 1998 as part of the Multi-Year Implementation Plan. This effort developed costs for implementing all of the elements of the Council Program and FCRPS Biological Opinion. The annual costs were \$200 to \$225 million.

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<sup>2</sup> See Columbia River Basin Fish and Wildlife Program, document 2000-19, pages 39-41.

In 2003, CBFWA and the Council conducted the Provincial Review to determine the costs of implementing projects that had been approved by the fish and wildlife managers, the Council, and the Independent Science Review Panel. The Provincial Review identified BPA revenue requirements (capital, reimbursable costs, and direct program) of \$310 million per year for FY 2003 through FY 2006.

CRITFC, the Oregon NPCC office, and the Yakama Nation also developed estimates of the costs of implementing the 2000 FCRPS Biological Opinion and NPCC Program in January of 2001. This estimate was based on more aggressive habitat restoration activities to implement the “Aggressive Non-Breach Alternative” in the Biological Opinion and had an annual cost of \$356 million. This figure assumed that all of the costs would be expensed; if CRITFC had assumed that some of the costs would be capitalized, the estimate would be similar to the recent CBFWA costs. The tribes consulted with other fish and wildlife managers on these estimates and sought comments from BPA, and utilities.



## Analysis

### The Importance of Habitat Restoration

The Council Fish and Wildlife Program and the FCRPS Biological Opinions rely heavily on improving habitat as off-site mitigation for the dams. These efforts are especially important for the Columbia Basin Treaty tribes. For at least the past four decades, the tribes have voluntarily imposed severe restrictions on their treaty-reserved fisheries to assist in rebuilding wild populations of salmon and steelhead. This action was taken

based on the expectation that other relevant parties would also take actions to share the burden of wild stock conservation. The tribes are still waiting for these actions, particularly in the area of habitat protection and improvement. Improving habitat is the only way to rebuild to sustainable, harvestable levels those wild runs that presently constrain treaty fisheries.

The Yakama Nation has been waiting a long time for the United States to fulfill this commitment in our Treaty. The federal government has repeatedly asked us to reduce our harvest and promised to restore habitat to promote long-term rebuilding of salmon runs. The failure by the United States to exercise all of its authorities and powers to improve wild salmon runs has deprived the Columbia River treaty tribes of vast numbers of harvestable salmon that were guaranteed by the federal government in the treaties of 1855. It is time for the United States to start living up to this commitment.

Implementing the subbasin plans in the Council Program would provide protection for more than 48,000 acres of habitat; improvements to more than 1,300 miles of streams; enhancement activities on more than 75,000 acres of habitat; and, correcting passage problems at more than 1,200 diversions and culverts.

An aggressive implementation schedule has the lowest biological risk. There are a number of listed species that are declining and at risk of extinction; improving habitat is critical for their survival. Implementing these actions quickly will save money in the long run. The costs of acquiring land or easements for riparian habitat are going up very fast in Eastern Washington. These efforts will also provide thousands of jobs in rural and tribal communities.

## **BPA Alternatives**

BPA has developed three alternatives for funding levels for the integrated fish and wildlife budget for FY 2007 through FY 2009. A fourth alternative would defer the funding level until there is more regional discussion. BPA's low, medium, and high case are not based on the CBFWA analysis of the cost of implementing the NPCC Program and the Biological Opinions. These three alternatives will not meet the goal of the NPCC Program. The low, medium, and high alternatives increase the risk of extinction for salmon and steelhead listed under the ESA.

**Low Case:** This option reduces funding levels to support ESA driven priorities while meeting only minimum Power Act requirements except for those ESA mitigation projects that also have benefits to non-ESA listed anadromous, resident fish and wildlife species. This alternative assumes annual costs of \$126 million per year—\$19 million less than the current level of \$145 million. Adjusting for inflation this alternative would be \$47 million less than the current level. This alternative assumes very low funding for new habitat and production work. This alternative would take approximately 49 years to implement the subbasin plans in the NPCC program assuming BPA changes its policy and capitalizes land and water acquisition costs, it also assumes no inflation. Under BPA's current capitalization policy, this funding level would not implement the habitat

work in the subbasin plans for 71 years; of course inflation would extent implementation even further.

**2. Medium Case:** This option is slightly greater than Integrated Program in the current rate case to meet subbasin plan and BiOp requirements through redirecting of some RM&E and IMCA funds to on the ground actions. This alternative assumes annual costs of \$144 million per year—about the same as the current level. Adjusting for inflation this alternative would be \$29 million less than the current level. This alternative assumes \$46 million per year for funding for new habitat and production work. Under BPA’s current capitalization policy, this funding level would not implement the subbasin plans for 46 years assuming no inflation. This alternative would take approximately 32 years to implement the subbasin plans in the NPCC program assuming BPA capitalized land and water acquisition costs and no inflation.

**3. High Case:** Option greater than that for the Program in the current rate case and provides additional funding to cover new BiOp and Subbasin Plan requirements. This alternative assumes annual costs of \$174 million per year—\$29 million more than the current level. Adjusting for inflation this alternative would be about the same as the current level. This alternative assumes \$52 million per year for funding for new habitat and production work. Under BPA’s current capitalization policy, this funding level would not implement the subbasin plans for 40 years; again, assuming no inflation. This alternative would take approximately 28 years to implement the subbasin plans in the NPCC program assuming BPA changes its current policy and uses its borrowing authority to capitalize land and water acquisition costs, it also assumes no inflation.

**4. Rationale Only/Costs TBD:** In describing this alternative BPA states: “May be the best incentive for regional parties to take more time to collaborate in discussions leading to a new Program level based upon clear priorities and objectives that the region can support. This may push Program funding level discussions into the same time frame as the formal Rate Case (i.e., fall 2005).”

**Comparison to NPCC Program goal:** The 2000 Columbia Basin Fish and Wildlife Program sets a goal to increase salmon and steelhead populations above Bonneville Dam to five million returning adults by 2025. BPA’s low, medium, and high alternatives would not come close to meeting this goal.

**Yakama Nation Recommendation:** BPA should adopt the funding level in the CBFWA workgroup cost report of \$186 million in FY 2006, \$200 million in FY 2007, \$225 million in FY 2008, and \$240 million in FY 2009. This funding level would put the region on a path to implement the subbasin plans in about ten years. This pace of implementation would have much lower biological risk to listed species and offers some hope of progress on restoring the treaty fisheries of the Columbia Basin Indian tribes.

The region’s goal should be to minimize biological risk to species in the Columbia River Basin; therefore, BPA should implement actions to provide the habitat conditions that these species need to survive as soon as possible. The majority of the ESUs listed under

the ESA have lambdas that are less than 1.0; that means these populations are not replacing themselves and will continue to decline toward extinction.

The costs of acquiring or leasing land and water to protect and enhance habitat will continue to increase as human population grows. We project that these costs will increase significantly faster than inflation, especially the acquisition of land in riparian areas to protect habitat.

Therefore, we conclude that a ten-year implementation schedule for the subbasin plans has the lowest biological risk and the lowest long-term costs. We also note that implementation of the subbasin plans represents a small portion of the habitat protection and enhancements needs in the Basin. The CBFWA workgroup did a course grain analysis of the total habitat work needed to protect and enhance habitat and found that this effort would be significantly larger than the work identified in the subbasin plans. Completing the subbasin plans as quickly as possible will provide a good start to the long-term habitat work that is likely to be needed to meet our goals.

BPA's low, medium, and high alternatives are unacceptable. If BPA is not prepared to adopt the CBFWA workgroup analysis, it should take more time on this issue.

## **BPA Assumptions**

BPA's Low alternative assumes a five percent reduction in RM&E, Production, Mainstem, and Habitat through improved efficiencies. This is unlikely to occur because there is no mechanism or criteria to further reduce the existing programs. The years of flat funding have forced significant improvements in efficiencies. In many cases, further reductions in individual programs will reduce on-the-ground work.

The fish and wildlife managers support the concept of putting a higher percentage of the funding on-the-ground. BPA has proposed that 70 percent of the funding go to on-the-ground projects, 25 percent to research, monitoring and evaluation, and five percent to coordination activities. This allocation will be difficult to reach without either: making difficult cuts to specific programs or eliminating them: or, increasing funding for on-the-ground activities. The CBFWA workgroup budget would put 80 percent of the funds on-the-ground.

BPA proposes cutting Information Management, Coordination, and Administration costs from about \$10 million/year to about \$6 million per year in the Low and Medium scenarios. This assumption appears to be unrealistic when we examine the current funding levels under this category. Currently StreamNet has a budget of \$2.4 million. The PIT tag info system has a budget of \$2.1 million. CBFWA has a budget of \$1.7 million. The Fish Passage Center's budget is \$1.3 million. The ISRP budget is \$1.1 million. Together, these activities account for \$9.7 million. Cutting 60 percent of these activities is not realistic.

The 10-year implementation of the production activities proposed in the subbasin plans will cost at least an additional \$290 million. BPA's High scenario would provide about \$12 million annually for new initiatives and at that rate (assuming no new O&M or M&E costs) it would take at least 20 years to accomplish.

The analysis of budget "drivers" is based on several assumptions about the ability to reallocate current program expenditures and reduce the need for future budget requirements. These assumptions are untested. For example, BPA assumes that current project-scale monitoring and evaluation will be reduced to make funds available to conduct increased programmatic monitoring and evaluation. How this will be accomplished is unclear, consequently any savings are uncertain.

NOAA Fisheries staff has indicated on several occasions that implementing the subbasin plans may not address all of the activities in the forthcoming recovery plans. Therefore, the costs could be higher than the CBFWA estimates and much higher than the BPA funding alternatives.

Pending litigation on the current FCRPS Biological Opinions may result in significant changes in required fish and wildlife activities, and may increase costs or affect revenues.

Implementation of the "Mainstem Amendment" to the NPCC Fish and Wildlife Program may increase costs or affect revenues.

When the currently favorable ocean conditions deteriorate, BPA may be called upon to fund additional activities to address weak-stock survival or productivity.

The NPCC Artificial Production Review and Evaluation and the NOAA Fisheries Hatchery Genetic Management Plans call for changes in the operation of many hatcheries built as mitigation for the hydropower system. These costs are not presently reflected in the BPA draft costs for the upcoming rate case and costs for the Reimbursable and the Integrated Program budgets may increase.

Inflation, especially increased costs for acquiring habitat and water, is not adequately addressed in the BPA alternatives. A three percent inflation rate will result in a \$25 million increase in annual budget needs by the end of the rate period in FY 2009.

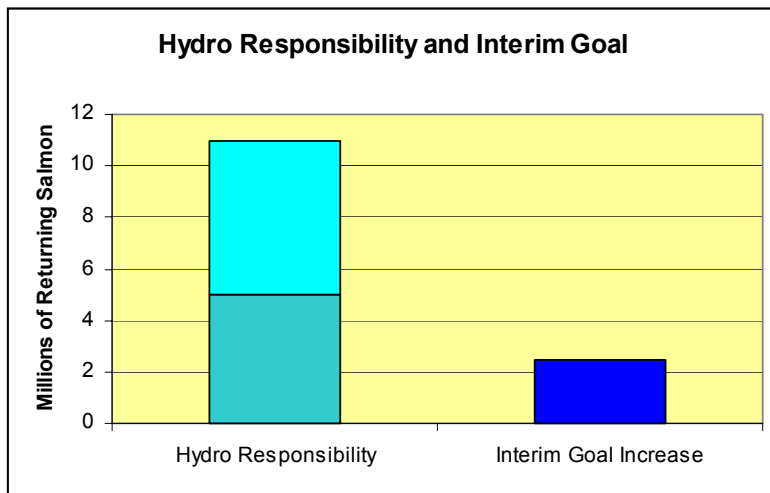
## **BPA Responsibility**

In the mid 1980s, the Northwest Power Planning Council (now called the NPCC) conducted an exhaustive study of the historical size and current status of salmon and steelhead populations. The Council also made policy decisions on what share of the losses were the responsibility of the hydroelectric system. The Council also set a goal for the Fish and Wildlife Program. BPA is the only Federal agency with statutory responsibility under the Northwest Power Act for funding the off-site measures to implement the NPCC Program.

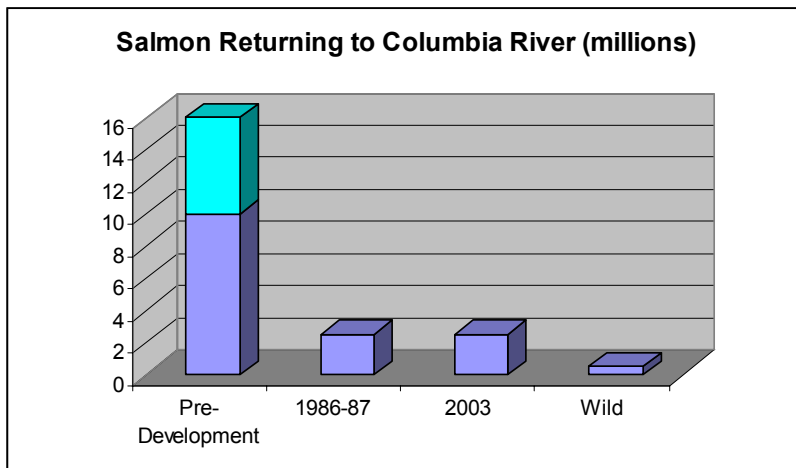


The study examined all of the historical information on salmon runs and concluded that ten to fourteen million salmon and steelhead used to return to the mouth of the Columbia River every year. In 1986, about two and a half million fish were returning to the Columbia, five hundred thousand were naturally spawning fish—eighty percent of the runs came from hatcheries.

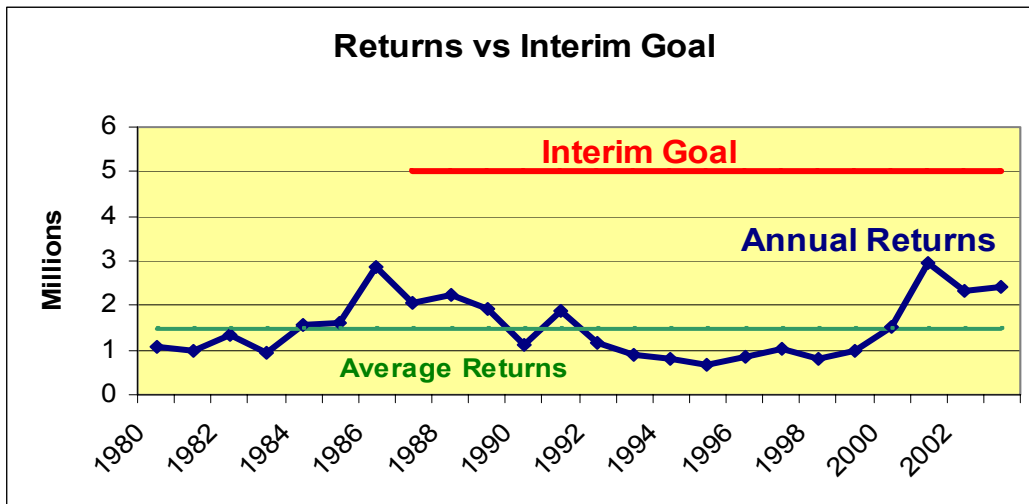
The study concluded that salmon and steelhead populations had declined by seven to fourteen million and that natural salmon runs were less than five percent of historical levels. The Council concluded that the dams were responsible for five to eleven million of the fish losses. As part of the rationale for the conclusion, the study found that about four million fish had used the habitat that had been blocked by the dams and that the operations of the dams accounted for the loss of another four million salmon. The Council set an interim goal of “doubling the runs”—increasing populations from two-and-a-half to five million salmon and steelhead. The Council said it would reevaluate a higher goal once the interim target was achieved.



The total returns in 2003 were about two and a half million salmon and steelhead—the same as 1986. About eighty percent of these fish came from hatcheries.



To put things in further perspective, 1986—the base year for the goal—was a good year for salmon. Many populations actually declined in the 1990—the average during the past twenty years was 1.5 million fish. So with conditions in the Pacific Ocean providing excellent feeding conditions for Columbia Basin salmon, we have seen the total salmon runs return to about where they were twenty years ago and wild stocks continue to decline.



The Yakama Nation viewed the Program’s 1987 doubling goal as a compromise that would allow BPA to focus on an achievable interim goal and leave BPA’s ultimate responsibility to a future decision process.

In the NPCC 2000 Program the goal was revised. The 2000 goal is to increase returning salmon and steelhead to five million adults returning above Bonneville Dam by 2025<sup>3</sup>. Under the Northwest Power Act, BPA must use its fund consistent with the Council Program. BPA, the Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission must also take the Program into account at each relevant stage of decision making to the maximum extent practicable.

The NPCC Fish and Wildlife Program relies heavily on off-site habitat and production strategies to partially offset the mortality associated with mainstem passage and the loss of habitat caused by the dams. BPA is the only Federal agency with authority to fund these off-site mitigation activities under the Northwest Power Act.

The CBFWA workgroup could not determine whether full implementation of the subbasin plans would result in an increase in returns to five million salmon and steelhead. Some of the plans do not include biological analysis. Fish and wildlife managers and the Council are currently working to revise some of the subbasin plans and to aggregate the expected biological results from implementation of the plan.

<sup>3</sup> See page 17 of the 2000 Columbia River Basin Fish and Wildlife Program

The Yakama Nation believes that it is unlikely that the funding levels recommended in the CBFWA workgroup report would result in salmon and steelhead returns that exceed the Council's goal by 2009. Therefore, these funding levels will not exceed BPA's responsibilities under the Program.

BPA has argued that it is not responsible for all of the activities in the subbasin plans. We believe that under the Northwest Power Act, BPA is responsible for implementing the off-site actions necessary to achieve the NPCC Program goal. There are no other Federal agencies that have this responsibility.

BPA's position appears to be an attempt to shift its clear legal responsibilities under the Northwest Power Act to state and local governments and private landowners. Does BPA believe that state and local governments should fund habitat programs or impose regulations to address the losses associated with the hydroelectric system? Does BPA advocate that landowners fund the habitat restoration activities needed to offset the damage caused by the dams? These are the logical consequences of BPA position. BPA should clearly state these consequences of its position and be prepared for the negative comments it will receive.

We would note for the record that the CBFWA budget for the subbasin plans do not assume BPA funding for actions on federal lands; Federal land managers, not BPA are assumed to implement these actions.

The Yakama Nation recommends that implementation of the subbasin plans precede with funding from BPA. If subsequent analysis or monitoring indicates that fish and wildlife populations are likely to exceed the goal for the Fish and Wildlife Program established by the Council, then the Council should initiate a rulemaking to address this issue.

## **Clear Objectives**

BPA and regional utilities have repeatedly said that they want clear objectives for BPA's fish and wildlife activities. The NPCC Program provides a very clear goal: five million salmon and steelhead returning above Bonneville Dam by 2025.

The ultimate goal for the Federal government should be to address the requirements of the Endangered Species Act, the Northwest Power Act, and the Treaties, Executive Orders, and other commitments made to Indian tribes in the Columbia Basin. In the case of salmon and steelhead, we seek to implement the dual goals of recovery and delisting of salmonids listed under provisions of the ESA and the restoration of salmon populations, over time, to levels that provide a sustainable harvest sufficient to allow for a meaningful exercise of tribal fishing rights.

The Columbia River Basin Fish and Wildlife Program states:

The vision for this program is a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and

wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing the benefits from fish and wildlife valued by the people of the region. This ecosystem provides abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest and the conditions that allow for the recovery of the fish and wildlife affected by the operation of the hydrosystem and listed under the Endangered Species Act.

Wherever feasible, this program will be accomplished by protecting and restoring the natural ecological functions, habitats, and biological diversity of the Columbia River Basin. In those places where this is not feasible, other methods that are compatible with naturally reproducing fish and wildlife populations will be used. Where impacts have irrevocably changed the ecosystem, the program will protect and enhance the habitat and species assemblages compatible with the altered ecosystem. Actions taken under this program must be cost-effective and consistent with an adequate, efficient, economical and reliable electrical power supply<sup>4</sup>.

The Program also established a number of scientific principles<sup>5</sup>, biological objectives<sup>6</sup>, and strategies<sup>7</sup> to guide fish and wildlife restoration.

The subbasin plans include biological objectives and identify limiting factors and strategies to achieve the objectives. The Yakama Nation has been working with BPA, the NPCC, and other fish and wildlife managers to integrate the subbasin plans into a coordinated plan for the Columbia Basin. This work needs to coordinate the efforts under the NPCC Program and the NOAA Fisheries Service recovery plans.

The Yakama Nation recommends that federal, state, and tribal governments immediately begin an effort to integrate subbasin and recovery planning. This work should include:

- Coordination of planning and analysis to address the biological objectives in the recovery plans and the Council's Program.
- Biological analysis of the expected results of the actions in achieving goals and biological objectives.
- A roll-up of all the plans to determine the expected contribution toward the NPCC goal and revision of the plans if necessary.
- Development of a detailed three-year workplan and budget for implementing a basin-wide fish and wildlife plan that integrates the NPCC Program and the FCRPS Biological Opinions, and a more general ten year workplan and budget for this integrated basin-wide plan.

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<sup>4</sup> Program, page 13.

<sup>5</sup> Program, page 15.

<sup>6</sup> Program, page 16-18

<sup>7</sup> Program, pages 19-33.

- Federal, state, and tribal discussions on the appropriate pace for the basin-wide plan.
- Monitoring of results and revision of the plans as necessary.

## **Yakama Nation Recommendations**

### **BPA needs to include adequate funds for fish and wildlife in its next rate case.**

- Implementation of the NPCC subbasin plans and including wildlife mitigation over a ten-year period will cost between \$1.5 and \$2 billion.
- The total cost to implement the Fish and Wildlife Program and associated ESA needs is estimated to be about \$240 million per year.
- Carrying out the subbasin plans would only accomplish between one-quarter and one-half of the habitat work needed in the tributaries of the Columbia and Snake Rivers.
- At the current BPA Integrated Program funding rate of \$139 million per year, it would take about 100 years to implement the NPCC Fish and Wildlife Program.

**Therefore, BPA should increase the amount of funds available for fish and wildlife activities to approximately \$240 million per year.**

### **The fish and wildlife managers have developed realistic and reasonable cost estimates for the rate case period.**

- It takes some time to increase the rate of implementation.
- The 2002 rate case set BPA revenues with the intent of providing a fish and wildlife budget of \$186 million per year.

### **Therefore, BPA should ramp up its Integrated Fish and Wildlife Program budget:**

- \$186 million in FY 2006;
- \$200 million in FY 2007;
- \$225 million in FY 2008;
- \$240 million in FY 2009.

### **BPA should develop a more flexible capitalization policy to facilitate land and water acquisitions.**

- BPA's current policy on capitalization is unclear regarding the use of its borrowing authority to purchase land and water.
- BPA's interpretation of its policies has inhibited the implementation of the Fish and Wildlife Program.
- If BPA uses its borrowing authority for these kinds of purchases, the rate impacts of our recommendations are significantly reduced.

**Therefore, BPA should modify its capitalization policy to set up mechanisms to allow borrowing funds or the use of its borrowing authority to purchase land and water.**

**BPA should address the uncertainties in fish and wildlife costs in its rate case.**

- The fish and wildlife managers note that with the intent of providing these estimates of future budget needs, that these estimates do not incorporate numerous factors that may increase the needs, and that these budget targets are likely to be under-estimates of actual needs.
- In the previous rate case BPA used two means to address uncertainties: Cost Recovery Adjustment Clauses and revenue collection to meet more than the minimum need.

**Therefore, BPA should work with others to ensure its rates provide adequate fish and wildlife funding. BPA's rate provisions must ensure that it can adequately fund future additional fish and wildlife costs.**

**BPA must meet the goals of the Fish and Wildlife Program.**

- After considerable analysis, the NPCC adopted in 1987 an interim estimate of the hydropower (BPA) responsibility to fish and wildlife of 5 million returning adult salmon and mitigation for resident fish and wildlife.
- The Program also identifies specific goals for resident fish and wildlife mitigation to address the operation and construction of dams and inundation by reservoirs.
- The NPCC reaffirmed these responsibilities in adopting its amended Fish and Wildlife Program in 2000.
- Current numbers of returning salmon are approximately the same as they were when the NPCC adopted the interim goal 18 years ago.

**Therefore, the funding recommended by the fish and wildlife managers through FY 2009 is not likely to exceed costs necessary to achieve the Fish and Wildlife Program goals.**

**The Columbia Basin needs an Implementation Plan for fish and wildlife.**

- The subbasin plans do not, in many cases, identify clear numerical objectives or specific actions, schedules, or costs.
- Such information would provide a statement by those responsible for the fish and wildlife resources of how the resources might be more productively managed and would provide consistent guidance in a variety of decision processes, such as NPCC amendment processes, ESA recovery planning, annual budget development, activities on Federal lands, local land use planning, etc.

**Therefore, fish and wildlife managers, BPA, and the NPCC should work together to develop an implementation plan detailing the actions, schedule and costs needed to implement the Fish and Wildlife Program, and are committed to that effort.**

**Full implementation of the F&W Program and ESA activities will create economic benefits in tribal and rural areas.**

- Most of the fish and wildlife activities would be implemented in rural areas east of the Cascade Mountains creating jobs and additional economic activity.
- As fish and wildlife populations increase as a result of these BPA investments, east-side rural areas will experience increased fishing, hunting and related activities, also creating additional jobs and invigorating local economies.
- For those (residential) customers served by utilities purchasing all of their power from BPA the recommended budget levels would result in about a \$1 per month increase in their electric bill. The impact to those served by utilities that purchase less than their full requirements from BPA would be less.

**Therefore, BPA should recognize the benefits to rural and tribal communities from its investments in fish and wildlife.**



## COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 N.E. Oregon, Suite 200, Portland, Oregon 97232

Telephone (503) 238-0667

Fax (503) 235-4228

April 28, 2005

Steve Wright  
Administrator and CEO,  
Bonneville Power Administration  
P.O. Box 3621  
Portland, OR 97208-3621

Dear Mr. Wright:

The Columbia River Inter-Tribal Fish Commission and its member tribes have been working diligently with other fish and wildlife co-managers through the Columbia Basin Fish and Wildlife Authority (CBFWA) process to develop costs for implementing the Biological Opinions under the ESA and the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program, developed pursuant to the Northwest Power Act.

We have worked in good faith to develop detailed cost estimates for implementing both of these activities. The report developed by the CBFWA workgroup represents the best information available on BPA's future fish and wildlife costs. CRITFC endorses the attached CBFWA report. The CBFWA workgroup recommended that BPA ramp up its funding during the next rate case from \$186 million in FY 2006 to \$240 million in FY 2009.

The Council Fish and Wildlife Program and the FCRPS Biological Opinions rely heavily on improving habitat as off-site mitigation for the dams. These efforts are especially important for the Columbia Basin Treaty tribes. Our tribes have voluntarily imposed severe restrictions on their treaty-reserved fisheries to assist in rebuilding wild populations of salmon and steelhead. This action was taken based on the expectation that other relevant parties would also take actions to share the burden of wild stock conservation. The tribes are still waiting for these actions, particularly in the area of habitat protection and improvement. Improving habitat is the only way to rebuild to sustainable, harvestable levels those wild runs that presently constrain treaty fisheries.

Implementing the subbasin plans in the Council Program would provide protection for more than 48,000 acres of habitat; improvements to more than 1,300 miles of streams; enhancement activities on more than 75,000 acres of habitat; and, correcting passage problems at more than 1,200 diversions and culverts.

An aggressive implementation schedule has the lowest biological risk. There are a number of listed species that are declining and at risk of extinction; improving habitat is critical for their survival. Implementing these actions quickly will save money in the long run. The costs of acquiring land or easements for riparian habitat are going up very



fast in Eastern Washington. These efforts will also provide thousands of jobs in rural and tribal communities.

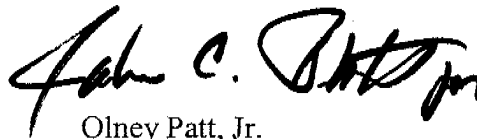
Our analysis shows that at the current funding levels, it would take more than 70 years to implement the Council's Program and Biological Opinions. Even BPA high case would take more than forty years to implement this habitat work. This is unacceptable to us. It means the extinction of salmon and steelhead runs and further losses to tribal culture and religion. The BPA alternatives would make it impossible to meet the Council's goal of rebuilding salmon and steelhead to five million fish returning above Bonneville Dam by 2025.

We calculate that the increased costs of fully implementing the Program and ESA represents about \$1 per month for the average residential consumer served by utilities that buy all of their power from BPA. If BPA does not use its borrowing authority for land and water acquisitions the impacts would be \$1.60 per month. The impacts on customers served by utilities that don't buy all of their power from BPA would be smaller.

We have also attached detailed comments on implementing the Council Program and the FCRPS Biological Opinions. CRITFC also endorses the comments by the Yakama Nation on providing adequate funding for fish and wildlife. We have also attached the resolution adopted by the Affiliated Tribes of Northwest Indians that calls for fully funding the Council Program and FCRPS Biological Opinion. If you have questions, please contact Mr. Rob Lothrop at 503-731-1291.

The Federal government plays an important role as the Trustee for the tribes under our treaties with the United States. It is critically important that you provide adequate funding to meet the federal government's responsibilities.

Sincerely,

A handwritten signature in black ink, appearing to read "Olney C. Patt, Jr.", written in a cursive style.

Olney Patt, Jr.  
Executive Director

# Columbia River Inter-Tribal Fish Commission Comments on BPA's Power Function Review

April 29, 2005

## **Summary**

CRITFC is providing comments to BPA on the Power Function Review (PFR). This process is intended to determine the costs of BPA programs for the BPA rate case that will determine BPA revenues for Fiscal Years 2007 through 2009.

CRITFC has been working with other fish and wildlife managers through a workgroup of the Columbia Basin Fish and Wildlife Authority to develop the costs to fully implement the Council Program and the Federal Columbia River Power System (FCRPS) Biological Opinions.

As these comments are due, the CBFWA report is going through consent review; it has been approved by the state fish and wildlife agencies in Idaho, Montana, Oregon, and Washington and all of the Columbia Basin Indian tribes, except the Coeur d'Alene and Kalispell tribe. It is our understanding that CBFWA is working with these tribes to address suggested changes.

CRITFC endorses the CBFWA workgroup recommendation that BPA ramp up its funding during the next rate case from \$186 million in FY 2006 to \$240 million in FY 2009:

- \$186 million in FY 2006,
- \$200 million in FY 2007,
- \$225 million in FY 2008,
- \$240 million in FY 2009.

## **Benefits from fully implementing the Council Program**

These funding levels will put BPA on a path to complete implementation of most of the Council's Program during the next ten years. This is an essential first step in meeting the Council's rebuilding goals for salmon and steelhead.

Implementing the subbasin plans in the Council Program would provide protection for more than 48,000 acres of habitat; improvements to more than 1,300 miles of streams; enhancement activities on more than 75,000 acres of habitat; and, correcting passage problems at more than 1,200 diversions and culverts.

An aggressive implementation schedule has the lowest biological risk and save money. There are a number of listed species that are currently declining; some are at risk of extinction. Improving habitat is critical for their survival. Implementing these actions quickly will save money in the long run. The costs of acquiring land or easements for riparian habitat are going up very fast in Eastern Washington.

Implementing the subbasin plans will also provide thousand of jobs in rural and tribal communities in eastern Washington and Oregon and in Idaho and Montana.

**BPA's funding alternatives are inadequate:**

Under BPA's low alternative, it would take 71 years to implement the subbasin plans and other parts of the Council's Program. This is unacceptable to CRITFC—it would mean the extinction of a number of salmon runs.

Under BPA's high case, at \$174 million per year, it would take 40 years to implement the subbasin plans and other measures in the Council Program. This is also unacceptable and does not come close to meeting the goals of the Columbia River Basin Fish and Wildlife Program.

The Council's goal is to increase total adult salmon and steelhead runs above Bonneville Dam by 2025 to an average of 5 million annually in a manner that supports tribal and non-tribal harvest. At the pace BPA is proposing, it won't implement the Council's current subbasin plans until 2045!

**Specific Comments**

**CBFWA Cost Estimates**

The CBFWA workgroup has developed the most detailed estimates available on the costs of implementing the NPCC Fish and Wildlife Program and the FCRPS Biological Opinions. No other organization has developed cost estimates for implementing these responsibilities under the Northwest Power Act and the Endangered Species Act. The workgroup sought comments from all of the interested parties. The NPCC staff provided questions and sought clarification of issues; these have been addressed in the final report. BPA and utilities provided no alternative assumptions or costs.

In BPA's response to CBFWA dated April 22, 2005, Greg Delwiche wrote:

Let me first acknowledge the considerable effort invested by Columbia Basin Fish & Wildlife Authority (CBFWA) members and staff to develop an estimate of future program implementation costs based on subbasin plans. Your input will be among the many comments BPA will receive during the Power Function Review (PFR), convened by the Power Business Line, to examine BPA's program levels and discuss the policy choices that will influence future agency program costs.

We question why the only detailed cost estimate for implementing BPA's responsibilities will be treated as "input" among the many comments BPA receives.

## **BPA Responsibility**

In the same letter BPA contends that it is not responsible for the full implementation of the subbasin plans in the NPCC Fish and Wildlife Program:

Because the causes of fish and wildlife decline within individual subbasins go well beyond the impacts of the existence and operation of the federal hydrosystem, it is inappropriate to sum-up all future potential subbasin mitigation strategy costs and attribute these to a category of potential BPA "offsite mitigation" responsibilities. Consequently, we believe the funding estimates you have provided perpetuate a point-of-view: that the fundamental function of subbasin plans is to guide only BPA spending.

CRITFC views this issue in the context of the Northwest Power Act. Under Section 4(h)(10) of the Act, BPA must use its fund consistent with the Council Program. The Act also requires that BPA, the Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission must also take the Program into account at each relevant stage of decision making to the maximum extent practicable.

The NPCC Fish and Wildlife Program relies heavily on off-site habitat and production strategies to partially offset the mortality associated with mainstem passage and the loss of habitat caused by the dams. BPA is the only Federal agency with authority to fund these off-site mitigation activities under the Northwest Power Act.

In the mid-1980's the Council went through an extensive public decision process to identify the loss of salmon and steelhead. The study concluded that salmon and steelhead populations had declined by seven to fourteen million and that natural salmon runs were less than five percent of historical levels. The Council concluded that the dams were responsible for five to eleven million of the fish losses. The Council set an interim goal of "doubling the runs"—increasing populations from two-and-a-half to five million salmon and steelhead. The Council said it would reevaluate a higher goal once the interim target was achieved.

In 2000, the NPCC modified the Program goal to increase total adult salmon and steelhead runs above Bonneville Dam by 2025 to an average of 5 million annually in a manner that supports tribal and non-tribal harvest. This is the goal of the Program and relates directly to the losses associated with the hydroelectric system.

We have just received BPA's enclosure to the letter and have not completed a detailed review; however, it appears there is a misunderstanding about our position. BPA is not being asked to "restore all of the fish and wildlife affected by the development of any hydroelectric project."<sup>1</sup> Our position is based on achieving the NPCC goal of five million salmon and steelhead returning above Bonneville Dam. Doubling the salmon runs from 2.5 to five million is an increase of 2.5 million; this would mean rebuilding

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<sup>1</sup> Enclosure page 1.

about half of the fish populations lost under the low end of the NPCC determination of hydro responsibility and one-quarter of the hydro related losses at the high end of the NPCC range.

Under the Northwest Power Act, the BPA, the Bureau of Reclamation, the Corps of Engineers, and the Federal Energy Regulatory Commission are responsible for implementing the Program and achieving its goal. Again, BPA is the only agency with authority to implement the off-site measures under the Program.

BPA is not being asked “to mitigate where others are required to do so.”<sup>2</sup> Other entities would be responsible for addressing rebuilding above the five million fish goal in the Program. For example, the CBFWA budget for the subbasin plans does not assume BPA funding for actions on federal lands; Federal land managers, not BPA are assumed to implement these actions.

BPA’s enclosure lists the broad objectives of subbasin planning and states; “that the Council recognized that achieving these broad objectives is not the sole responsibility of the 2000 Fish and Wildlife Program or BPA alone and that the focus of the 2000 Program is limited to fish and wildlife affected by the development, operation, and management of the FCRPS.”<sup>3</sup> We agree that the subbasin planning effort attempted to integrate ESA and other activities. We also agree that “the focus of the 2000 Program is limited to fish and wildlife affected by the development, operation, and management of the FCRPS’ and believe that the goal of the Program reflects this focus.

The CBFWA workgroup could not determine whether full implementation of the subbasin plans would result in an increase in returns to five million salmon and steelhead. Fish and wildlife managers and the Council are currently working to aggregate the expected biological results from implementation of the plans.

CRITFC believes that it is unlikely that the funding levels recommended in the CBFWA workgroup report would result in salmon and steelhead returns that exceed the Council’s goal by 2009. Therefore, these funding levels will not exceed BPA’s responsibilities under the Program.

Therefore, CRITFC recommends that implementation of the subbasin plans precede with funding from BPA. If subsequent analysis or monitoring indicates that fish and wildlife populations are likely to exceed the goal for the Fish and Wildlife Program established by the Council, then the Council should initiate a rulemaking to address this issue.

### **Shifting BPA’s Responsibilities to Others**

BPA’s position appears to be an attempt to shift its clear legal responsibilities under the Northwest Power Act to state and local governments and private landowners. BPA appears to advocate that state and local governments should fund habitat programs or

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<sup>2</sup> Id. page 2.

<sup>3</sup> Id. Page 4

impose regulations to address the losses associated with the hydroelectric system and that landowners should fund the habitat restoration activities needed to offset the damage caused by the dams. These are the logical consequences of BPA position. While there are good public policy reasons for partnerships in implementing the habitat provisions and for increasing salmon runs to address the other causes of their decline, we do not believe that BPA's position is consistent with the Northwest Power Act.

### **Prioritization**

BPA's April 22<sup>nd</sup> letter appears to argue that BPA, the NPCC, and the fish and wildlife managers need to prioritize the activities in the subbasin plans before determining BPA's costs.

Clearly, the prioritization process is important. The region invests significant resources in this process. However, this work is not needed to size the overall level of effort needed to put BPA on the path to fully implement the NPCC Program.

### **Uncertainties in Fish and Wildlife Costs**

BPA expresses concerns about the uncertainties described in the CBFWA letter to BPA. Most of the uncertainties that BPA referred to reflect the fact that the subbasin plans did not include detailed management plans and three-year budgets. Fish and wildlife managers would welcome comments from BPA on better assumptions and costs that should be included.

We also urge BPA to review the attached detailed report developed by the CBFWA workgroup. The section on uncertainties lists a number of factors that could significantly increase BPA's costs during the next rate period.

### **Costs and Rate Impacts**

The BPA enclosure appears to be based on an early version of the CBFWA workgroup cost analysis. For example, BPA cites a cost of \$460 million per year with no BPA borrowing; the current report has costs of \$309 million during the rate period. We would like to discuss these issues once BPA has had an opportunity to review the attached report.

### **Hatchery Reform**

BPA has assumed approximately \$250,000 per year to implement the hatchery reforms identified in the HGMP and APRE processes. This issue has not received much attention in the Power Function Review.

We have developed an initial cost estimate based on the mid-point of the cost range indicated for the "reform" action.

### Estimated Costs for Hatchery Reform (\$millions)

Province	Expense	Capital
Estuary	\$11.825	\$24
Lower Columbia	\$42.125	\$114
Gorge	\$37.125	\$43
Plateau	\$7.500	\$ 74
Blue Mountain	\$5.775	\$ 26
Mountain Snake	\$15.175	\$ 56
Columbia Cascade	\$10.350	\$ 3
	\$123	\$340

This estimate assumes:

- Facilities that cost less the \$1 million are considered Capital.
- The reform plans assume that recommended actions must have general agreement.
- We have attempted to remove duplicate actions.
- As a general observation, O&M costs of new facilities are not fully represented and in many cases are not even included. Thus, the expense portion is low.

### Foregone Revenue

As part of the Power Function Review, BPA has estimated the costs of foregone revenue associated with the operation of the FCRPS. This estimate has been included in what the utility customers now refer to as “the river of costs”.

CRITFC has objected to BPA characterization of these costs in the past and our concerns continue. The Federal action agencies are required to operate the FCRPS to meet the Biological Opinion under the Endangered Species Act. BPA’s position to count foregone revenues is comparable to a private company reporting foregone profits because it had to follow Federal safety or environmental regulations.

### Foregone Salmon

The NPCC found that 5 to 11 million of the salmon lost each year (compared to the predevelopment period) were attributable to the hydroelectric system. Based on this estimate, the Columbia River Indian tribes and others have “foregone” 340 to 750 million salmon and steelhead since the dams were built.

Salmon and steelhead are invaluable to tribal culture and religion—we would not put a price on this loss. Non-tribal economists, on the other hand, would probably value the annual losses in the billions and the cumulative losses in the trillions of dollars.

We offer this observation to provide perspective and to reinforce the importance of the Federal government in honoring its treaty and trust obligations to the tribes.

## **CRITFC Recommendations**

CRITFC supports the recommendations in the CBFWA Fish and Wildlife Cost Report.

### **BPA needs to include adequate funds for fish and wildlife in its next rate case.**

- Implementation of the NPCC subbasin plans and including wildlife mitigation over a ten-year period will cost between \$1.5 and \$2 billion.
- The total cost to implement the Fish and Wildlife Program and associated ESA needs is estimated to be about \$240 million per year.
- Carrying out the subbasin plans would only accomplish between one-quarter and one-half of the habitat work needed in the tributaries of the Columbia and Snake Rivers.
- At the current BPA Integrated Program funding rate of \$139 million per year, it would take about 100 years to implement the NPCC Fish and Wildlife Program.

**Therefore, BPA should increase the amount of funds available for fish and wildlife activities to approximately \$240 million per year.**

### **The fish and wildlife managers have developed realistic and reasonable cost estimates for the rate case period.**

- It takes some time to increase the rate of implementation.
- The 2002 rate case set BPA revenues with the intent of providing a fish and wildlife budget of \$186 million per year.

### **Therefore, BPA should ramp up its Integrated Fish and Wildlife Program budget:**

- \$186 million in FY 2006;
- \$200 million in FY 2007;
- \$225 million in FY 2008;
- \$240 million in FY 2009.

### **BPA should develop a more flexible capitalization policy to facilitate land and water acquisitions.**

- BPA's current policy on capitalization is unclear regarding the use of its borrowing authority to purchase land and water.
- BPA's interpretation of its policies has inhibited the implementation of the Fish and Wildlife Program.
- If BPA uses its borrowing authority for these kinds of purchases, the rate impacts of our recommendations are significantly reduced.

**Therefore, BPA should modify its capitalization policy to set up mechanisms to allow borrowing funds or the use of its borrowing authority to purchase land and water.**

**BPA should address the uncertainties in fish and wildlife costs in its rate case.**



- The fish and wildlife managers note that with the intent of providing these estimates of future budget needs, that these estimates do not incorporate numerous factors that may increase the needs, and that these budget targets are likely to be under-estimates of actual needs.
- In the previous rate case BPA used two means to address uncertainties: Cost Recovery Adjustment Clauses and revenue collection to meet more than the minimum need.

**Therefore, BPA should work with others to ensure its rates provide adequate fish and wildlife funding. BPA's rate provisions must ensure that it can adequately fund future additional fish and wildlife costs.**

**BPA must meet the goals of the Fish and Wildlife Program.**

- After considerable analysis, the NPCC adopted in 1987 an interim estimate of the hydropower (BPA) responsibility to fish and wildlife of 5 million returning adult salmon and mitigation for resident fish and wildlife.
- The Program also identifies specific goals for resident fish and wildlife mitigation to address the operation and construction of dams and inundation by reservoirs.
- The NPCC reaffirmed these responsibilities in adopting its amended Fish and Wildlife Program in 2000.
- Current numbers of returning salmon are approximately the same as they were when the NPCC adopted the interim goal 18 years ago.

**Therefore, the funding recommended by the fish and wildlife managers through FY 2009 is not likely to exceed costs necessary to achieve the Fish and Wildlife Program goals.**

**The Columbia Basin needs an Implementation Plan for fish and wildlife.**

- The subbasin plans do not, in many cases, identify clear numerical objectives or specific actions, schedules, or costs.
- Such information would provide a statement by those responsible for the fish and wildlife resources of how the resources might be more productively managed and would provide consistent guidance in a variety of decision processes, such as NPCC amendment processes, ESA recovery planning, annual budget development, activities on Federal lands, local land use planning, etc.

**Therefore, fish and wildlife managers, BPA, and the NPCC should work together to develop an implementation plan detailing the actions, schedule and costs needed to implement the Fish and Wildlife Program, and are committed to that effort.**

**Full implementation of the F&W Program and ESA activities will create economic benefits in tribal and rural areas.**

- Most of the fish and wildlife activities would be implemented in rural areas east of the Cascade Mountains creating jobs and additional economic activity.

- As fish and wildlife populations increase as a result of these BPA investments, east-side rural areas will experience increased fishing, hunting and related activities, also creating additional jobs and invigorating local economies.
- For those (residential) customers served by utilities purchasing all of their power from BPA the recommended budget levels would result in about a \$1 per month increase in their electric bill. The impact to those served by utilities that purchase less than their full requirements from BPA would be less.

**Therefore, BPA should recognize the benefits to rural and tribal communities from its investments in fish and wildlife.**



March 16, 2005

Stephen J. Wright, Administrator  
Bonneville Power Administration  
905 NE 11th Avenue  
Portland, Oregon 97208-3621

Melinda Eden, Chair  
Northwest Power and Conservation Council  
851 SW 6th Avenue, Suite 1100  
Portland, Oregon 97204

Dear Mr. Wright and Ms. Eden:

The Members of the Columbia Basin Fish and Wildlife Authority (CBFWA) are writing to support adequate funding for fish and wildlife in the next Bonneville Power Administration (BPA) rate case. This letter provides a status report on our efforts and a request that BPA increase the level of funding for BPA's Integrated Fish and Wildlife Program (BPA's Integrated Program) over that provided the past several years. We are providing this letter now to inform BPA's upcoming workshops on this issue. The NOAA Fisheries and U.S. Fish and Wildlife Service abstain from consideration of this letter.

Some Members have been working with BPA and the Northwest Power and Conservation Council (NPCC) over the past few months to develop cost estimates for BPA's Integrated Program. To inform these discussions, CBFWA formed a working group to estimate costs to meet the goals and biological objectives in the NPCC Fish and Wildlife Program. The intent was to determine how implementing all the measures in the NPCC Program will affect future funding needs and to size the overall level of effort over the next ten years. The working group subsequently shared drafts of its analysis with BPA and NPCC staffs as well as representatives of BPA's utility and industrial customers.

While CBFWA Members are continuing to review the detailed costs, the analysis completed to date provides a strong basis for increasing the funding for BPA's Integrated Program in the next rate case period to at least \$240 million per year. This figure assumes that BPA would use its borrowing authority for new production facilities and the acquisition of land and water to protect habitat. It also does not include a comprehensive assessment of costs for mainstem measures beyond those contemplated in the Updated Proposed Action or the NPCC Program. Additional mainstem measures are necessary to

S. Wright, BPA  
M. Eden, NPCC  
March 16, 2005  
Page 2

protect, recover, and restore anadromous fish impacted by the federal hydrosystem. Consistent with recommendations the Members have made in the past, the analysis supports the need for BPA to begin to ramp up efforts by returning to the funding levels originally assumed in the 2002 rate case. BPA set its rates and has been collecting revenues on the assumption that funding for the Integrated Program would be \$186 million per year. It is important to increase funding in FY 2006 to at least this level.

Based on our work to date, it is clear that the current spending levels are inadequate to protect, mitigate, and enhance fish and wildlife under the Northwest Power Act. Our analysis shows that at the current spending levels, it would take over 100 years to implement all the measures contemplated in the NPCC Program.

We invite BPA and the NPCC to work with CBFWA as we refine our analysis. CBFWA will be approaching your staff within the next week to explore ways we can best involve you in our effort. Our goal is to complete our analysis by the end of April as part of BPA's Power Function Review.

The NPCC and BPA have invested significant time, effort and money to develop the current Program, including the development of the mainstem amendment and subbasin plans. It is important that the region build on this investment by all the people in the Columbia Basin. The CBFWA Members will be working with you over the next two months to ensure that future fish and wildlife funding needs are adequately addressed in the next rate case.

Sincerely,



for

Tony Nigro, Chair  
Columbia Basin Fish & Wildlife Authority

Cc: CBFWA Members  
Greg Delwiche, BPA  
Doug Marker, NPCC

TODD D. TRUE (WSB #12864)  
ttrue@earthjustice.org  
STEPHEN D. MASHUDA (MSB #4231)  
smashuda@earthjustice.org  
Earthjustice  
705 Second Avenue, Suite 203  
Seattle, WA 98104  
(206) 343-7340  
(206) 343-1526 [FAX]

THE HONORABLE JAMES A. REDDEN

DANIEL J. ROHLF (OSB #99006)  
rohlf@lclark.edu  
Pacific Environmental Advocacy Center  
10015 S.W. Terwilliger Boulevard  
Portland, OR 97219  
(503) 768-6707  
(503) 768-6642 [FAX]  
*Attorneys for Plaintiffs*

UNITED STATES DISTRICT COURT  
DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, et al.,

Civ. No. CV 01-00640-RE

Plaintiffs,

and

THIRD DECLARATION OF  
GRETCHEN OOSTERHOUT, Ph.D.

STATE OF OREGON,

Intervenor-Plaintiff,

v.

NATIONAL MARINE FISHERIES SERVICE,

Defendants,

and

NORTHWEST IRRIGATION UTILITIES, PUBLIC  
POWER COUNCIL, WASHINGTON STATE FARM  
BUREAU FEDERATION, FRANKLIN COUNTY  
FARM BUREAU FEDERATION, GRANT COUNTY  
FARM BUREAU FEDERATION, STATE OF  
WASHINGTON, and STATE OF IDAHO,

Intervenor-Defendants.

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I, GRETCHEN OOSTERHOUT, declare and state as follows:

1. I am a system analyst by training and experience, and the principal of Decision Matrix, Inc. (DMI), a small consulting firm in the areas of decision analysis and risk assessment. I received a B.S. in 1985 and an M.S. in Mechanical Engineering in 1992 from Portland State University, with a specialty in diffusion process computer modeling. I received my Ph.D. in Systems Science, also from Portland State University, in 1996. My doctoral dissertation was on the use of computer simulation methods in public resource management decision making. I have taught graduate-level experimental design and reliability engineering courses and published over 50 formal reports on computer modeling and risk analysis in fields ranging from fisheries, ecology, reliability engineering, and diffusion processes to diabetes, cardiovascular disease, health care services, system failure analysis and reliability, game theory, and using models to prioritize research and monitoring plans. Attached to this Declaration as Exhibit A is a copy of my curriculum vitae.

2. Most of my professional work since I started my business has been in the area of fisheries and fish habitat risk assessment and decision analysis. For example, from 1998 – 2003 I provided decision structuring, modeling, and experimental design consulting to the Fisheries Technical Subcommittee working on Federal Energy Regulation Commission hydropower project relicensing on the Deschutes River. I led the committee through the process of developing a complex multi-attribute decision structure which is being used to prioritize fish passage alternatives and data needs. I also developed for this committee stochastic models of spring chinook and sockeye salmon populations to use in conjunction with the decision structure to analyze risks associated with re-introduction and restoration of spring chinook and sockeye populations, and to prioritize research efforts. These decision analysis and risk assessment

products have been widely peer reviewed, extensively validated, and user-tested as part of Fish and Wildlife Department coursework at Oregon State University.

3. Since 2001 I have provided similar modeling analysis, review, and decision assistance to groups working to resolve Klamath basin fish, wildlife, and agricultural issues. In the past several years I have also developed a variety of decision analyses for Columbia River InterTribal Fish Commission focused on ESA issues and equitable treatment. I developed the approach being used for decision analysis, monitoring, and model development for a management team that is designing a long-term monitoring, research, and modeling program for the Gulf of Alaska (the Gulf of Alaska Ecosystem Management Program, GEM: Exxon Valdez Oil Spill Trustee Council and Alaska Department of Fish and Game). I have also provided technical analyses and recommendations to this group on pink salmon, herring, and bioenergetics models applied to Prince William Sound. The chapter I wrote for that program has been reviewed and accepted for the GEM program monitoring and modeling plan by the National Research Council.

4. I have developed numerous decision analysis and computer modeling tools for habitat restoration efforts. I served for several years as a technical model validation expert for the World Forestry Center, helping the Umpqua Land Exchange Project (ULEP) consulting science team validate landscape-based habitat suitability models for the ULEP pilot study and EIS development. As part of this effort, I developed sensitivity analyses on multiple levels and scales, with the overall goal of achieving and communicating a better understanding of how model parameters, data sources, assumptions, error sources, and functional relationships interact and influence model performance and output. I also helped develop decision-structuring tools for use in an adaptive management approach to a Habitat Conservation Plan being developed for

Louisiana Pacific holdings in California. Similarly, I have developed multi-attribute GIS decision models for Clark County, Washington's watershed, which were used to prioritize data needs and research opportunities for fish passage improvements. I also have developed multi-attribute, GIS-based decision-analytic models of Oregon's coastal watersheds, emphasizing characteristics important to salmon such as species status and distributions, road densities, geomorphology, fire history, and precipitation.

5. In preparing this declaration, I have reviewed a number of documents including:

- BRT (Biological Review Team) 2003. Draft Report of Updated Status of Listed ESUs of Salmon and Steelhead – chinook. Draft report on stock status by the Biological Review Team, posted for public review on the Internet ([http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)).
- BRT (Biological Review Team) 2003. Draft Report of Updated Status of Listed ESUs of Salmon and Steelhead – steelhead. Draft report on stock status by the Biological Review Team, posted for public review on the Internet ([http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)). NOAA Fisheries, Seattle.
- Biological Review Team 2003c. Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead. Co-manager review draft downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml). West Coast Salmon Biological Review Team, NOAA Fisheries.
- Cooney, T. 2004. Updated\_BRT\_population\_and\_dam\_counts\_Interior\_ESUs\_TCooney\_1020041.xls, downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml).
- Fisher, T., and R. Hinrichsen 2004. Preliminary Abundance-Based Trend Results for Columbia Basin Salmon and Steelhead ESUs. BPA, Portland.
- Lohn, D. R. 2004. Memorandum listing NOAA Fisheries' responses to comments received on Sept. 2004 draft Biological Opinion. NOAA Fisheries, Seattle. Downloaded from [http://www.salmonrecovery.gov/R\\_biop\\_final.shtml](http://www.salmonrecovery.gov/R_biop_final.shtml).
- NMFS 2004. Endangered Species Act – Section 7 Consultation Biological Opinion. Consultation on Remand for Operation of the Columbia River Power System and 19 Bureau of Reclamation Projects in the Columbia Basin (Revised and reissued pursuant to court order, NWF v. NMFS, Civ. No. CV 01-640-RE (D. Oregon)). NOAA's National Marine Fisheries Service, Seattle.
- NWFSC 2003. Final Report on the Technical Workshop on Population Trends and Extinction Metrics. Northwest Fisheries Science Center, NOAA Fisheries, Seattle. Downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml).
- Toole, C. 2003. Preliminary Estimates of Updated "Indicator Metrics" Applied in the 2000 FCRPS Biological Opinion. Hydro Division, NOAA Fisheries Northwest Region, 500 N.E. Oregon Street, Portland, Oregon 97232-2737. Downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml).



This declaration includes a number of footnotes that cite these and other source materials and also quote them in many cases. While the quotations in these footnotes make the declaration somewhat cumbersome in form, they provide an easier way to view the actual text of the source materials I cite.

## I. CURRENT STATUS OF ESA-LISTED SALMON AND STEELHEAD

6. Even with adult returns for the past few years that are higher than recent averages for most (but not all) listed stocks, Columbia and Snake River salmon and steelhead still face an immediate and substantial threat to their continued existence. NMFS' scientists' most recent assessments of the long-term trends for Snake River steelhead<sup>1</sup>, spring chinook<sup>2</sup>, and fall Chinook,<sup>3</sup> and Upper Columbia River chinook<sup>4</sup> and steelhead<sup>5</sup> (the upper basin ESUs) are

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<sup>1</sup> "Population growth rate ( $\lambda$ ) estimates showed a corresponding pattern. The median long-term  $\lambda$  estimate across the nine series was .998 assuming that natural returns are produced only from natural origin spawners and .733 if both hatchery and wild potential spawners are assumed to have contributed to production" (Biological Review Team 2003b, p. 9). Lambda ( $\lambda$ ) is a measure of (in this case) the median long-term rate of change. A Lambda of 0.733 means the population is declining at a median rate of 26.7% per year.

<sup>2</sup> "The BRT reported that, through 2001, most populations experienced long-term declines, but short-term trends were positive for many populations. The short-term productivity trends for the majority of the natural production areas in the ESU are at or above replacement. Dam counts and preliminary spawner surveys also indicate higher than average abundance in 2002 and 2003. The recent 10-year average is approximately twice the previous 10-year average for combined hatchery and wild adults passing Lower Granite Dam. The BRT concluded that the natural component of the ESU had moderately high risk in the abundance and productivity VSP categories and comparatively low risk for spatial structure and diversity." (NMFS 2004, p. 8-5 to 8-9) (emphasis added).

<sup>3</sup> "If hatchery spawners have been equally as effective as natural-origin spawners in contributing to brood year returns, the long-term  $\lambda$  estimate is 0.899 and the associated probability that  $\lambda$  is less than 1.0 is estimated as 98.7%. If hatchery returns over Lower Granite Dam are not contributing at all to natural production, the long-term estimate of  $\lambda$  is 1.024. The associated probability that  $\lambda$  is greater than 1.0 is 25.7%, under the assumption that hatchery effectiveness is 0." (Biological Review Team 2003a, p. 5).

<sup>4</sup> "Most factors indicate high risk for the UCR spring chinook ESU, both range-wide and in the action area. Because there is only a single major population group and because its poor status both range-wide and in the action-area is caused largely by the effects of the FCRPS and USBR

discouraging. Although some ESUs have experienced short-term increases in adult returns, all ESA-listed ESUs are still experiencing a long-term population decline and remain at significant risk, especially in terms of abundance (number of adults) and productivity (reproductive success rate) (see Table 1) (attached) (see especially “BRT findings” column). The 2004 FCRPS BiOp itself shows that upper basin ESUs have fallen to such seriously low levels that only one major population group still exists for four of the 6 upper basin ESUs, and only one population exists for the other two.<sup>6</sup>

7. In NMFS’ last published report on the status of Upper Columbia River Steelhead before it issued the 2004 FCRPS BiOp, NMFS found that the level of survival improvement still required to achieve recovery targets was “high” and that “...the natural survival rate would have to increase nearly seven-fold to meet the indicator criteria under all assumptions and for all spawning aggregations” (Toole 2003, p. 8). NMFS’ assessment of this ESU in the 2004 FCRPS BiOp is no more encouraging (NMFS 2004, section 8.8). “Although its status has been improving recently, most factors indicate high risk for the UCR steelhead, both range-wide and in the action area. Because of the single major population group and poor action-area status, caused largely by effects of the FCRPS and USBR projects that are included in the hydro portion

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projects that are included in the hydro portion of the environmental baseline (represented by the reference operation), tolerance for additional risk to this ESU is ‘low.’” (NMFS 2004, p. 8-16)

<sup>5</sup> “[T]he natural survival rate would have to increase nearly seven-fold to meet the indicator criteria under all assumptions and for all spawning aggregations.” (Toole 2003, p. 8)

<sup>6</sup> “Only one major population group exists for four ESUs: UCR spring chinook, UCR steelhead, SR sockeye, and SR fall chinook. The two UCR ESUs have only three or four populations each, and, with so few, a reduction in numbers, reproduction, or distribution of any one population is likely to represent a reduction for the major population group as a whole. Because there is only one major population group, the same effect is experienced by the ESU. The case is even more dramatic with SR sockeye and SR fall chinook, ESUs for which there is only one population, so the population, the major population group, and the ESU are equivalent.” (NMFS 2004, pp. 6-8 to 6-9)

of the environmental baseline (represented by the reference operation), tolerance for additional risk to this ESU is low.” (NMFS 2004, p. 8-25).

8. Only one major population of UCR steelhead remains, and although the last few years have seen higher adult returns, its long-term trajectory is still a fairly dramatic decline (population growth rates for sub-populations of 0.63 to 0.93, depending on assumptions, with a mean of 0.76 – or a 24% long-term decline since 1980) (Toole 2003, Table 13). Based on calculations I have made using current NMFS data (discussed more fully in section II), the long-term population growth rate ( $\lambda$ ) calculated from 1980 – 2003 for this ESU overall is currently about 13% lower than when NMFS calculated it in the 2000 FCRPS BiOp.

9. The Snake River steelhead ESU faces a similarly serious decline. NMFS recently estimated an aggregate population growth rate of 0.73 to 0.87 (Toole 2003, Table 9), or a decline of 13% to 27% per year. This continued decline (which is approximately the same as the rate of decline NMFS calculated in 2000, see 2000 FCRPS BiOp at 9-221) is particularly discouraging since other ESUs have seen at least some improvement in long-term population trajectories from recent improved ocean survival. For the Snake River Steelhead ESU, I have calculated  $\lambda$  including the two years of data since NMFS’ last estimate. The population’s serious decline remains essentially unchanged (discussed more fully in section II) even with the most up-to-date data available.

## II. UPDATED SURVIVAL IMPROVEMENTS NECESSARY TO AVOID JEOPARDY USING THE 2000 FCRPS BIOP FRAMEWORK.

10. In my previous declaration, I provided a set of calculations to show that the total survival improvements that would be necessary to avoid jeopardy were quite large for the 8 up-river “jeopardy” ESUs addressed in the 2000 FCRPS BiOp. Declaration of Gretchen Oosterhout, Ph.D. at ¶¶ 35-37, 39-45, Appendix & Table 1 (filed Sept. 23, 2002). Depending on

assumptions about the performance of hatchery fish, these needed survival improvements ranged from 72.4% for Snake River fall chinook to 440.0% for Snake River steelhead. Id. I also showed that the fraction of this survival improvement that would have to come from offsite mitigation measures, after taking into account the survival improvements NMFS calculated for the hydrosystem measures of the RPA in the 2000 FCRPS BiOp, ranged from 0% for one ESU (Snake River fall chinook) with the most favorable hatchery assumption, to 92.6% for Mid-Columbia steelhead with the least favorable hatchery fish assumption.<sup>7</sup> Id.

11. I have updated those analyses from my earlier declaration using the most recent data available from the Remand website (<http://www.salmonrecovery.gov>). In order to be sure I was using the most current data, I recalculated the 1980-1999 growth rates that were reported in the 2000 FCRPS BiOp because the BRT revised some populations.<sup>8</sup> I then used the “running sum” methods for calculating lambda as reported in the 2000 FCRPS BiOp Appendix A (p. A-2, referring to McClure et al. 2000c<sup>9</sup> and Holmes in review)<sup>10</sup> (also used in BRT 2003a, b, c). I

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<sup>7</sup> My declaration showed that the lowest estimates of the fraction of total survival improvement needed from offsite mitigation were: Snake River spring chinook 62.6%, Snake River fall chinook 0%; Upper Columbia River spring chinook 47.7%, Snake River steelhead 60.5%, Upper Columbia River steelhead 41.2%, and Mid-Columbia River steelhead 82.1%. Highest estimates of the fraction of total survival improvement needed from offsite mitigation were: Snake River spring chinook 79.4%, Snake River fall chinook 57.2%; Upper Columbia River spring chinook 68.7%, Snake River steelhead 88.6%, Upper Columbia River steelhead 87.3%, and Mid-Columbia River steelhead 92.6%. See Oosterhout Dec. ¶¶ at 39-45, Appendix & Table 1.

<sup>8</sup> It was not always clear how the BRT defined spawner counts when it calculated  $\lambda$ , or which populations the BRT lumped together or how. My results, therefore, may be slightly different from those others obtained from different population definitions. However, the overall conclusions should not be very different. I used Cooney, T. 2004. Updated trend data sets for Interior Columbia basin ESUs. [http://www.salmonrecovery.gov/remand/analysis\\_reports/updated\\_interior\\_brt\\_trend\\_data.pdf](http://www.salmonrecovery.gov/remand/analysis_reports/updated_interior_brt_trend_data.pdf) October 14.

<sup>9</sup> McClure, M. M., B. L. Sanderson, E. E. Holmes, and C. E. Jordan. 2000c. A large-scale, multi-species risk assessment: anadromous salmonids in the Columbia River basin. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington. Submitted to Ecological Applications as of the date of the BiOp, then published in 2003, vol. 13:964-989.

then calculated the most current population growth rates ( $\lambda$ s) using the most recent years' data (generally 1980-2003, Cooney 2004). I calculated the percent survival change between  $\lambda$ s calculated from 1980-1999 data, compared to  $\lambda$ s calculated from 1980-2003 data, using the equation to convert from  $\lambda$ s to survival ratios on page A-3 of the 2000 FCRPS BiOp. I then used these updated survival increases to adjust the total "% necessary change" in survival targets shown in the 2000 FCRPS BiOp (p. A-20) so that the total survival increase needed (per the 2000 FCRPS BiOp) would reflect all the most recent data available through the Remand website.

12. Finally, I adjusted the survival increases expected from hydrosystem actions described for the Updated Proposed Action ("UPA") to account for survival increases due to additional years of data, and in order to estimate how much of the survival increase still needed to achieve the standards employed in the 2000 FCRPS BiOp would have to come from something other than hydrosystem actions. In order to do this, I had to make some assumptions about how much survival improvement to expect from the hydro portion of the new UPA as compared to the hydro portion of the 2000 RPA. The 2004 FCRPS BiOp states in several places that the hydro portion of the UPA is essentially the same as the hydrosystem measures of the 2000 RPA,<sup>11</sup> so I used survival improvements NMFS expected from the hydrosystem portion of

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<sup>10</sup> Cited there as: Holmes, E. E. In review. Estimating risks for declining populations: salmonids as an example. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington. Submitted to Ecological Applications. Eventually published as: Holmes, E. E. 2001. Estimating risks in declining populations with poor data. Proceedings of the National Academy of Sciences 98:5072-5077, except without the formulas for dealing with hatchery fish.

<sup>11</sup> "The differences in flow rates between the reference operations and UPA were not significant. Therefore, the effect on water temperature or other water quality parameters was not expected to be large" (Lohn 2004, p. 1-31). "The UPA continues most of the uncompleted and ongoing actions in the 2000 Biological Opinion. It refines the actions of the RPA into a new set of Federal actions based on adaptive management principles" (NMFS 2004, p. 3-1). "To a large extent, the UPA continues the implementation of many of the actions contained in the 2000

the 2000 RPA to represent survival improvements expected to come from the hydrosystem portion of the UPA.

13. Finally, I had to assume something about what has caused survival increases reflected in the growth rates calculated with 1980-2003 data. If I assumed increased trends all came from hydrosystem measures, that assumption would not be consistent with the available scientific evidence (which suggests survival improvements have been significantly affected by recent improved ocean conditions)<sup>12</sup> and also would not be consistent with the fact that many of the hydrosystem measures in the 2000 RPA have not been implemented because they were not proposed for completion until 2010.<sup>13</sup>

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Biological Opinion.” (NMFS 2004, p. 3-1). “Proposed hydro operations are expected to have only a minor effect on the quantity and quality of juvenile migration and rearing habitat in the Columbia River estuary and plume during the spring, when SR spring/summer chinook salmon are in these areas. Again, this is because the proposed hydro operation will result in only slightly lower spring flows than in the reference operation, and water quality is unlikely to be affected.” (NMFS 2004, p. 6-57). “As NOAA Fisheries progressed into comparisons with potential future system configurations, many of the passage and survival estimates were by necessity based on best professional judgments for which there are no confidence interval estimates. Recognizing that this may be a weakness, since the confidence intervals for these point estimates sometimes varies widely, NOAA Fisheries used the same passage route point estimates for both the reference and the 2004 proposed operation. In this base case analysis (which established the initial gap), the degree of uncertainty regarding any particular point estimate was common to both sides of the operational comparisons. These survival or passage parameter point estimates were adjusted upward in the gap analyses of future 2010 and 2014 configurations of the proposed operations. These departures from common data points may add to the uncertainty associated with these future condition gap analyses.” (NMFS 2004, p. D-6). “The spring transport operation specified in the reference operation is similar to the UPA proposal.” (NMFS 2004, p. D-16)

<sup>12</sup> “In the last decade, evidence has shown recurring, decadal-scale patterns of ocean-atmosphere climate variability in the North Pacific Ocean. These oceanic productivity ‘regimes’ have correlated with salmon population abundance in the Pacific Northwest and Alaska. Survival rates in the marine environment are strong determinants of population abundance for Pacific salmon and steelhead.” (NMFS 2004, p. 4-3)

<sup>13</sup> The 2000 FCRPS BiOp analyses nonetheless did assume all these improvements had occurred (see, e.g., 2000 FCRPS BiOp at 9-202) (“The simple analytical approach used in this biological opinion assumes that all survival changes are instantaneous”) (statement for Snake River spring/summer chinook, similar language for other ESUs), even while acknowledging most had

14. Despite these countervailing facts, if I assumed all survival increases that NMFS “expected” to come from the hydrosystem as a result of hydro measures in the 2000 FCRPS BiOp could still be attributed to the hydro action in the UPA, then it gave the UPA the benefit of the doubt and minimized the amount of survival improvement that would have to come from something other than hydrosystem measures. To err on the side of favoring the effectiveness of the UPA, I chose this approach.

15. The improvements in  $\lambda$  between the 1980-1999 dataset NMFS used in the 2000 FCRPS BiOp, and the 1980-2003 dataset I used for this analysis, correspond to an average change in life-cycle survival of about 30%, ranging from a decrease of 14% (Upper Columbia River steelhead) to an increase of 90% (Methow steelhead).

16. My re-calculation of survival improvements needed to avoid jeopardy using the analytic approach and standards of the 2000 FCRPS BiOp and the most up-to-date information available for salmon returns (generally through 2003) is summarized in Table 2 (attached). After including survival improvements attributable to the hydrosystem measures of the UPA as described above, when the survival increases seen in 2000-2003 are included in population growth rate calculations ( $\lambda$ ), some ESUs do not require as large an improvement in survival rates to avoid jeopardy as NMFS calculated in 2000 would be necessary.

17. However, the survival improvements for even these ESUs – and certainly for other ESUs – that still would be necessary to avoid jeopardy under the analytic framework of the 2000 FCRPS BiOp, after taking into account survival improvements from the proposed hydrosystem measures of the UPA, would still be quite large. Assuming that ocean conditions

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not (*see, e.g.*, BSRS, Vol. 2 at 6) (addressing flow, passage and diversions for 15 priority subbasins within 10-16 years), 81 (implementing hydrosystem measures by 2010); *id.*, Vol. 1 at 48 to 53 (implementing various “immediate” measures “over the course of 10 years”).

continue to be as good for another 43 years as they have been in recent years, and that any survival increases achieved through hydrosystem improvements are sustained, and that spawning and rearing habitat conditions do not further degrade, Wenatchee chinook still need a sustained life-cycle survival increase of 162% - 183% (more than double to nearly triple); UCR steelhead need 115% - 321.3% (more than double to more than quadruple the current survival); SR steelhead need 131% - 424% (more than double to more than quintuple the current survival). SRFC and SRSSC are in relatively better shape, assuming recent survival rates can be sustained as noted.

18. Since there is no precedent for ocean survival rates to continue as high as they have been, and even extraordinary efforts could not halt freshwater habitat declines for many years, it is quite likely that the total survival increases required to meet the standard of the 2000 FCRPS BiOp for avoiding jeopardy, even using the most recent survival information, are substantially more than even the doubling to more than quintupling indicated by the current long-term trends of my revised calculations.

19. The stocks that will need the largest overall survival improvements are the ones for which the hydrosystem measures will provide the smallest portion of that improvement and for which the largest portion of survival improvement will have to come from non-hydrosystem mitigation measures – about 80% of the near-tripling in survival for Wenatchee spring chinook, 58% to 86% of the doubling to quintupling for Snake River steelhead, and 59% to 83% of the doubling to more than quadrupling for Upper Columbia River steelhead.

20. Moreover, under the analytic framework and assumptions employed in the 2000 FCRPS BiOp and employed in my re-calculation using the most up-to-date data, these increases would have to be achieved immediately and sustained through 2048 – even assuming the



hydrosystem measures were fully implemented and work as well as hoped, and that current excellent ocean survival rates persist another four decades.

21. My purpose in preparing and presenting these calculations of survival improvements using the most recent salmon return data is to provide a perspective on, and background information about, recent salmon and steelhead survival rates. This information is useful in understanding the scientific differences between the jeopardy analysis and framework NMFS employed in the 2000 FCRPS BiOp, and the analysis and framework it employs in the 2004 FCRPS BiOp. What my analyses show is that if NMFS had employed the same approach and framework in the 2004 FCRPS BiOp that it employed in 2000 for estimating the survival improvements necessary to avoid jeopardy, and if it had taken into account all of the available information on recent salmon and steelhead returns, such an analysis would show:

- (1) the survival improvements necessary to avoid jeopardy to the ESA-listed ESUs under the 2000 FCRPS BiOp analytic framework are still very large for most ESUs;
- (2) the fraction of these survival improvements that would be provided by the hydrosystem measures of the UPA is small for almost all of the ESUs and smallest for the ESUs that would require the largest overall survival improvement; and
- (3) because the 2004 FCRPS BiOp does not employ the analytic framework of the 2000 FCRPS BiOp, it is not possible to determine whether the off-site mitigation actions included in the UPA of the 2004 FCRPS BiOp are likely to provide the remaining survival improvements necessary to meet the jeopardy standard of the 2000 FCRPS BiOp.

### III. NMFS USE OF MODELS IN THE 2004 FCRPS BIOP

22. NMFS employed two models in the 2004 FCRPS BiOp, one used by Fisher and Hinrichsen to estimate “current” population growth rates (Fisher & Hinrichsen 2004; NMFS 2004, p. 4-5), and the other the SIMPAS model employed to calculate the “gap” between the effects of the hydrosystem portions of the agency’s hypothetical reference operation and the effects of the hydrosystem portion of the UPA (NMFS 2004, Appendix D). The Fisher and

Hinrichsen method essentially fits a line through transformed abundance data from 1994 to 1999 and again from 2000 to 2003 in order to estimate and compare population growth trends over these brief periods (Fisher & Hinrichsen 2004, p. 1; NMFS 2004, p. 4-5). The SIMPAS model calculates point estimates for hydrosystem passage survival in terms of specific numbers of fish and NMFS uses these numbers to compare the differences in survival between the UPA and reference operation hydrosystem measures (NMFS 2004, Appendix D). NMFS calls this its “gap analysis” (NMFS 2004, e.g. 6-6).

A. NMFS’ Use of the SIMPAS Model Has Been Criticized.

23. NMFS uses the SIMPAS model in the 2004 FCRPS BiOp to determine whether the hydrosystem measures of the UPA will have a negative effect on any ESU as compared to the effects of the hypothetical hydrosystem reference operation. As NMFS acknowledges, the SIMPAS model has been widely criticized:

“A number of reviewers commented on the shortcomings of the SIMPAS model. For example, commenters stated that the model: is too simple; is not a life cycle model; was designed to be used in a qualitative rather than relative sense; used only point estimates of survival and passage efficiencies; did not use a time step function; underestimated spill passage at some dams; or overestimated survival for low flow conditions. To answer these concerns, NOAA Fisheries would first point out that the SIMPAS model is a deterministic analytical tool for use in comparing two or more system (or project) operations or system configuration changes to obtain relative differences in juvenile survival between the head of Lower Granite Pool and the head of the estuary. It is not a life cycle model, nor does it need to be to serve its intended purpose. The differential delayed survival factor “D” for fish transportation is used in the model only as a weighting mechanism to allow a fair recombination of in-river and transported juveniles in the reach below Bonneville Dam. The model is not typically used to determine absolute numbers of surviving juveniles below Bonneville Dam and is not used to estimate the absolute number of returning adults to the Columbia River.” (2004 FCRPS BiOp at D-5)

24. This paragraph generally captures most of the well-established criticisms of

SIMPAS (e.g., NMFS),<sup>14</sup> and these criticisms have been extensively documented by, among others, the ISAB,<sup>15</sup> CRITFC,<sup>16</sup> IDFG, Nez Perce, ODFW, Shoshone Bannock Tribe, USFWS, and WDFW.<sup>17</sup> The paragraph also captures NMFS' response to these criticisms. Table 3 (attached) lists the major substantive criticisms of the model (identifying their source), and identifies and summarizes NMFS' response to each.

25. The criticism that SIMPAS is too simple (#1 in Table 3) has been raised because SIMPAS is a very simple Excel table that does not account for complex, variable season-to-season and year-to-year impacts that are largely due to climate and the FCRPS. Inputs to SIMPAS are only seasonal averages<sup>18</sup> often based on data from only a few years or even only one year (NMFS 2004, p. D-4). In the real world, impacts on fish vary greatly over days, months, and years, and accumulate as the fish move through the system. When a model restricts inputs to single-estimate parameters lumped across time periods, the cumulative impacts of, say, two bad years in a row, which can be substantial for such vulnerable populations, are effectively omitted, and can minimize the calculated impacts on fish.

26. The rationale NMFS offers for employing SIMPAS despite its limitations is that it

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<sup>14</sup> See the 2000 FCRPS BiOp Appendix on SIMPAS. (NMFS 2000 at D-2, D-9)

<sup>15</sup> For example, ISAB 2001. Executive Summary Re: ISAB consultation recommendations on Council Staff's Draft Issue Paper: "Analysis of 2001 Federal Columbia River Power System Operations on Fish Survival." (ISAB 2001)

<sup>16</sup> For example, CRITFC June 14, 2004 comments on the COE's and BPA's June 8, 2004 Amended Proposal for Federal Columbia River Power System Summer Juvenile Bypass Spill Options, as well as the June 14 comments by the State, Federal and Tribal Fishery Agencies Joint Technical Staff.

<sup>17</sup> For a summary of state, federal, and tribal comments see June 14 comments on the COE's and BPA's June 8, 2004 Amended Proposal (Joint Technical Staff 2004b).

<sup>18</sup> "For each species, model input includes: • Seasonal average flows and spill levels • Pool survival estimates including a predation adjustment factor • Average spill, sluiceway, and bypass guidance efficiency estimates • Average survival rates through various passage routes and reservoirs." (NMFS 2004, p. D-3)

is supposed to be a simple model because:

“NOAA Fisheries’ goal was to use the model as an analytical tool to provide reasonable relative survival differences between proposed operations or configuration changes and a reference, or baseline, operation, while maintaining a high degree of transparency to reviewers. Incorporating a large number of functional response curves (or submodels) to try to express temperature, predation, or dissolved gas functions defeats the purpose of a simple modeling approach and would have significantly increased the complexity and decreased the transparency of the model.” (NMFS 2004, p. D-5)

27. NMFS’ response identifies transparency and the need for a large number of functional response curves as reasons to use SIMPAS despite its simplicity. Providing transparency is important, but it does not require relying on a model that is too simple to appropriately address the questions (Hilborn and Mangel 1997). NMFS does not provide supporting documentation for its statement that it used SIMPAS in the 2004 FCRPS BiOp because it needed “a large number of functional response curves (or submodels).”

28. The criticism that SIMPAS is not a stochastic or life-cycle model (#2 in Table 3) is related to the “too simple” criticism #1. This concern has been raised repeatedly<sup>19</sup> because stochastic life-cycle models allow inputs that represent the range of variability over the entire life-cycle that are characteristic of a complex system like the Columbia River and FCRPS, and they provide outputs in terms of probability distributions, not point estimates. Probabilistic output is the standard in conservation biology (e.g., Burgman et al. 1993; NRC 1995) because the question at hand in this field – and under the ESA – is often risk: the likelihood of a particular reduction in a species’ prospects of survival and recovery for example. The single point prediction (without even confidence intervals to indicate the range of results) produced by a deterministic model like SIMPAS sheds virtually no light on this fundamental question.

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<sup>19</sup> For example, just in the most recent draft BiOp, these concerns were raised by the Nez Perce Tribe, Colville Tribe, and State of Idaho (Lohn 2004, p. 1-29); State of Oregon (Lohn 2004, p. 1-33), Fish Passage Center and CRITFC (Lohn 2004, p. 1-34).

29. NMFS did conduct some sensitivity analyses to help address this concern, but sensitivity analyses for point estimates are not the scientific equivalent of incorporating ecological, climate, and seasonal variability into the analysis itself as stochastic models do.

30. In the paragraph quoted above (in my paragraph 23) where NMFS responds to this concern, NMFS says that SIMPAS is not deterministic, it is used to obtain relative differences, it is not a life-cycle model and does not need to be, that “D” is used only as a weighting mechanism, and it is not used to determine absolute numbers of juvenile or adult survivors (NMFS 2004, p. D-5).

31. NMFS states that it is acceptable to use the simpler model structure of SIMPAS because the question is about *relative* differences. But as CRITFC showed,<sup>20</sup> calculated differences (or non-differences) between scenarios using SIMPAS can be very sensitive to small changes in parameters and thus to even small variabilities that SIMPAS does not and cannot incorporate. Using a stochastic life-cycle model as reviewers suggested, rather than SIMPAS, would allow for more accurate and informative comparisons of “two or more system (or project) operations or system configuration changes to obtain relative differences in juvenile survival” because such a model can incorporate relevant factors about fish survival over the whole life-cycle, including their response to variability in hydrosystem operations and the environment as well as providing probability distributions representing ranges of responses to that variability, and thus probabilities of various outcomes.

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<sup>20</sup> As I explained in an earlier declaration, CRITFC showed that “...making one small change to the SIMPAS analysis presented by NMFS (increasing reservoir mortality at the Dalles from 2% to 3%, a change within the bounds of uncertainty for just that one reservoir), resulted in a 37% (561 fish) additional loss of Snake River fall chinook migrants above the Action Agencies’ Snake River fall chinook loss estimates (Joint Technical Staff 2004b at 3).” Second Declaration of Gretchen Oosterhout, Ph.D. (“Oosterhout Spill Dec.”) at ¶ 52 (filed July 16, 2004).

32. Criticism #3 in Table 3 (that the benefits assumed for RSWs in SIMPAS modeling are too speculative) is based on concerns that there is very little data about survival rates for RSWs, that current data show spill is as effective or more effective than RSWs, that the limited data for RSWs at Lower Granite Dam cannot be used to extrapolate to other projects because migrant behavior changes the further the fish get downstream, and that overall, the assumed benefits of RSW installations are speculative. These concerns were expressed by the Fish Passage Center, the State of Alaska, and CRITFC (see footnote 46). NMFS responds to this concern by stating that it "...calls on the Action Agencies to 'evaluate juvenile project-specific passage survival both before and after configuration and/or operational modifications'" (see footnote 46). This statement is not an analysis or statement of reasons for assuming the survival improvements from RSWs will occur as NMFS' gap analysis does.

33. Finally, the most substantive issue raised in Table 3 is #4, the overall failure of SIMPAS to take uncertainty and errors into account. As I said in my spill declaration, Oosterhout Spill Dec. at ¶¶ 50-53, SIMPAS includes no accounting for uncertainty and produces no estimate of uncertainty, which is contrary to the prevailing practice in conservation biology modeling (Burgman et al. 1993, NRC 1995). Research has repeatedly shown that predictions based on point estimates of historical averages tend to produce overly optimistic conclusions because they underestimate the impacts of uncertainty, ignore the potential for errors, and fail to take into explicit account the well-documented unexpectedness and variability of natural systems (Burgman et al. 1993; Glickman and Gough 1990; Hilborn and Walters 1992).

34. As I also said in my spill declaration, Oosterhout Spill Dec. at ¶ 65, because SIMPAS does not incorporate uncertainty or variability it cannot provide conservative estimates of risk without a credible external correction factor. I quoted the ISAB (ISAB 2001 at 2):

“...it is not appropriate to develop a long-range management plan just on the basis of results from assuming that these uncertain estimates are true. “Best science” under these circumstances would explore the results from a range of assumptions corresponding to the range of the uncertainty. “Best professional judgment” under these circumstances would recommend a course of action that was predicted to perform acceptably throughout the range of predicted possible outcomes. “Precautionary” best professional judgment would be sensitive to plausible worst cases within the range of predicted possible outcomes.”

35. I also pointed out in paragraph 66 of my spill declaration that the Action Agencies agreed, quoting COE and BPA 2004, Appendix A at 3:

“Risk and uncertainty can be mitigated further by erring on the side of fish in the offset calculations and in the extent of biological offsets that are implemented. For instance, implementing offsets that are estimated to increase survival by 10,000 adult returns can alleviate the risk and uncertainty of implementing an operation that is estimated to decrease survival by 5,000 adult returns.”

In the 2004 FCRPS BiOp, NMFS also acknowledges uncertainty and appears to recognize a responsibility to err on the side of the fish:

“Available science is unable to resolve significant uncertainty in all parts of this analysis. NOAA Fisheries must identify and acknowledge the full range of scientific uncertainty in reaching its final conclusion. Where scientific gaps remain, NOAA Fisheries is expected to provide the benefit of the doubt to the listed species (ESA Section 7 Consultation Handbook, p. 1-6). A key question is whether or not the uncertainty is greater in the analysis of the presumed positive effects of non-hydro offsets compared to presumed negative effects of hydro operations, or if the level of uncertainty is comparable. Therefore, NOAA Fisheries has taken a conservative approach to estimate the benefit of the proposed action.” (NMFS 2004, p. 8-3)

36. One rationale offered by NMFS for not using modeling that account for uncertainty is that the point estimates in SIMPAS are based on a wide range of data (NMFS 2004, p. D-4). The SIMPAS model, however, cannot use *ranges* of data because it relies entirely on *average* values. Even if these average values are derived from a “wide range of data” once the data are averaged, the *range* of the data is lost. NMFS says that “To address these limitations, the NOAA Fisheries staff used all the most recent empirical passive integrated transponder (PIT)-tag reach survival information collected from 1994 through 2003 to evaluate a

wide range of fish passage and environmental conditions for yearling and subyearling chinook and steelhead. Because water conditions during this 10-year period ranged from low flow (in 2001) to high flow (1997), this approach demonstrated the modeled variation in juvenile passage survival resulting from different environmental (and the resulting operational) conditions” (NMFS 2004, p. D-2). SIMPAS, however, does not model the “wide range of fish passage and environmental conditions,” it can only model the *average* values calculated from of those ranges. Modeling an average value and modeling a range of values are scientifically different: the former provides a single number with no indication of the range that single number represents, whereas the latter provides, for example, high and low end results, and can be used to provide much more, e.g., seasonal and cumulative effects of seasonal and year-to-year variability.

B. NMFS Use of the New Fisher and Hinrichsen Model in the 2004 FCRPS BiOp.

37. The SIMPAS model was not, and could not be, used to evaluate the current growth rates of ESA-listed salmon and steelhead populations. Instead, NMFS relied on the 2004 Status Review (which analyzed data through 2001),<sup>21</sup> an update of that review that included data through 2003 (Cooney 2004<sup>22</sup>), and the Fisher and Hinrichsen analyses of most recent year

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<sup>21</sup> A citation is not provided in this section of the 2004 FCRPS BiOp to clarify which BRT report is referred to, but the only BRT report cited in the “Literature cited” chapter of the opinion is “BRT (Biological Review Team) 2003 Draft status review update for West Coast steelhead from Washington, Idaho, Oregon, and California. National Marine Fisheries Service, West Coast Steelhead BRT, Seattle, WA.” This appears to be a reference to a report on NMFS’ website entitled “Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead,” 2/19/03, from <http://www.nwfsc.noaa.gov/trt/brtrpt.htm>, specifically the chapter on steelhead (Biological Review Team 2003. Draft Report of Updated Status of Listed ESUs of Salmon and Steelhead – steelhead. Draft report on stock status by the Biological Review Team posted for public review on the Internet ([http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)).

<sup>22</sup> The only reference provided in the 2004 FCRPS BiOp for this update was to an Excel workbook that did not have trend or other population growth rate analysis but did have abundance and age structure data in it (“Cooney, T. 2004. Updated trend data sets for Interior Columbia basin ESUs”).



returns (NMFS 2004, p. 4-3). Although the BRT status review did include analyses of population growth trends and performance measures as laid out in the 2000 FCRPS BiOp to track progress under the 2000 FCRPS BiOp RPA (Biological Review Team 2003a, b, c), the numerical population growth trends reported in the 2004 FCRPS BiOp are not from these BRT reports.

38. Instead, although NMFS refers to the 2004 Status Review's trend calculations (through 2001) as being generally "increasing" or "decreasing," the only productivity trend estimates the 2004 FCRPS BiOp actually reported were calculated using a method that NMFS states has not been reviewed,<sup>23</sup> and using a different set of data. This analysis, the Fisher and Hinrichsen analysis, is discussed below. NMFS represents this new method as being the same as that used by the BRT ("Their [Fisher and Hinrichsen] methods were taken from those used by NOAA Fisheries' BRT (2003)" (NMFS 2004, p. 4-5)). A comparison of the Fisher and Hinrichsen methods<sup>24</sup> and the BRT methods section<sup>25</sup> shows that these two reports did not use the same methods.

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[http://www.salmonrecovery.gov/remand/analysis\\_reports/updated\\_interior\\_brt\\_trend\\_data.pdf](http://www.salmonrecovery.gov/remand/analysis_reports/updated_interior_brt_trend_data.pdf) October 14).

<sup>23</sup> "Neither the BRT nor the Interior TRT has reviewed Fisher and Hinrichsen (2004) or Fisher (2004)" 2004 FCRPS BiOp at 4-5.

<sup>24</sup> "Fisher and Hinrichsen (2004) provided a preliminary evaluation of the effects of recent natural-origin spring chinook returns on past geometric mean abundance levels and population trends. The latter were calculated as the slope of the regression line for the (log transformed) index of abundance over time." (NMFS 2004, p. 4-5)

<sup>25</sup> The BRT draft status review, like other BRT analyses since the 2000 FCRPS BiOp, did not use the Fisher and Hinrichsen geometric mean method, but instead used  $\lambda$ : "A multi-step process based on methods developed by Holmes (2001), Holmes and Fagan (2002) and described in McClure et al. (in press) was used to calculate estimates for  $\lambda$ , its 95% confidence intervals, and its probability of decline [ $P(\lambda < 1)$ ]" (Biological Review Team 2003c, p. 17).

1. *NMFS' Prior Assessment of the Methods Used in the 2000 FCRPS BiOp.*

39. As NMFS scientists have explained, statistical and simulation models, ranging from various methods for fitting lines through spawner or recruits/spawner data, to relatively more complex life-cycle models, are widely used for quantifying current population trends in order to inform decisions about current and future risk (CRI 2000; Holmes 2000; 2001; 2004; McClure et al. 2000; Burgman et al. 1993; NRC 1995). When employed properly, models can be the best available science; when employed improperly, they are useless at best and can be misleading.

40. NMFS scientists have provided a considerable volume of analysis to support using the methodology discussed in paragraphs 10-21 above and employed in the 2000 FCRPS BiOp jeopardy analysis as the best practical indicator of population growth trends and risk.<sup>26</sup>

The multitude of papers towards this end includes white papers or other “grey” literature such as:

Appendix A from the 2000 FCRPS BiOp,

CRI 1999. CRI assessment of management actions aimed at Snake River salmonids. Cumulative Risk Initiative, Northwest Fisheries Science Center NMFS - NOAA, Seattle, WA.

Biological Review Team 2003. Draft Report of Updated Status of Listed ESUs of Salmon and Steelhead - chinook. Draft report on stock status by the Biological Review Team posted for public review on the Internet ([http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)). NOAA Fisheries.

Biological Review Team 2003. Draft Report of Updated Status of Listed ESUs of Salmon and Steelhead - steelhead. Draft report on stock status by the Biological Review Team posted for public review on the Internet ([http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)). NOAA Fisheries.

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<sup>26</sup> Even though the methods themselves have been widely reviewed, some of the scientific criticisms that have been raised about these methods have not been fully addressed (for example, see NWFSC 2003, in particular sections by Hinrichsen (pp. 3.1 – 3.9), Paulsen (pp. 3.10-3.14), Ryding (pp. 3.15-3.23). In addition, of course, these models still may be put to uses for which they are not scientifically appropriate.

Toole, C. 2003. Preliminary Estimates of Updated “Indicator Metrics” Applied in the 2000 FCRPS Biological Opinion. Hydro Division, NOAA Fisheries Northwest Region, 500 N.E. Oregon St., Portland, Oregon 97232-2737, Portland.

Holmes, E. E. 2004. Beyond theory to application and evaluation: diffusion approximations for population viability analysis. In press in *Ecological Applications*.

And peer-reviewed publications such as:

Fagan, W. F., E. E. Holmes, J. J. Rango, A. Folarin, J. A. Sorensen, J. E. Lippe, and N. E. McIntyre. 2003. Cross-validation of quasi-extinction risks from real time series: an examination of diffusion approximation methods. Pre-print.

McClure, M., E. Holmes, B. Sanderson, and C. Jordan. 2003. A large-scale, multi-species risk assessment: anadromous salmonids in the Columbia River Basin. *Ecological Applications* 13: 964-989.

Holmes, E. E. and W. F. Fagan. 2002. Validating population viability analysis for corrupted data sets. *Ecology* 83: 2379-2386.

Holmes, E. E. 2001. Estimating risks in declining populations with poor data. *Proceedings of the National Academy of Science* 98: 5072-5077.

41. NMFS scientists have argued that the methods used in the 2000 FCRPS BiOp, and for tracking population growth rates and changes in these since then (up to the 2004 FCRPS BiOp), are appropriate because:

“Diffusion approximation approaches for estimation of risk metrics are grounded in theoretical work on stochastic population processes (reviewed in Holmes and Fagan 2002 and Holmes 2004). These methods are one of the basic quantitative tools in population viability analysis and are featured in two current books on quantitative methods for analyzing population data (Lande et al. 2003, Morris and Doak 2003). The long-term rate of population growth is termed  $\lambda$  and is one of the most commonly used risk metrics within the field of conservation biology.” (NWFSC 2003, p. 2.14)

Others agreed. Independent reviewers commissioned by NMFS to evaluate different methods for estimating current population trends and extinction metrics stated that:

“Our conclusions are that the DA<sup>27</sup> approach has been rigorously evaluated, has undergone better scientific peer review than any current methods used for threatened species assessment, and provides the best available approach for objectively estimating and comparing population status for salmonids. Although some further work may still be helpful, these methods are very strong and should be accepted as the current standard.” (Deutschman and Heppell in NWFSC 2003, p. 4.3)

2. *NMFS Uses Different Methods to Assess Population Trends in the 2004 FCRPS BiOp.*

42. NMFS did not use the above methods to calculate the current long-term salmon and steelhead ESU growth rates using the most up-to-date data in the 2004 FCRPS BiOp, even though the 2004 Status Review cited there did report results using these methods for data available through 2001. (Biological Review Team 2003a, e.g., p. 5 for Snake River fall chinook or p. 10 for Snake River spring chinook, or p. 21 for Upper Columbia River spring chinook).

43. NMFS’ explanation for limiting or eliminating its reliance on the methods for evaluating current population trends it has been using appears to be that: “[t]he previous analysis depended upon a prospective, range-wide evaluation of the likelihood of survival and recovery, projecting species survival rates up to 100 years in the future under reasonable scenarios of activities that would affect survival and recovery. This analysis required an estimation of the beneficial and harmful effects of future Federal and non-Federal actions.” (NMFS 2004, p. 1-5)

44. NMFS use of the methods in the 2000 FCRPS BiOp for calculating current population trends is laid out clearly in Appendix A to that Opinion. (NMFS 2000). Appendix A indicates that step 1 consisted of “1) Define the recent population trend, based on adult returns from 1980 through the most recent year available.” (NMFS 2000, p. A-4). A later step required NMFS to “Compare the change in survival resulting from the proposed action with the necessary

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<sup>27</sup> “DA” is Diffusion Approximation, the method used by NMFS to estimate current population growth rates in the 2000 BiOp and for status reviews since then (e.g., Biological Review Team 2003a, b; NWFSC 2003; Toole 2003).

change defined in step 2.” (NMFS 2000, p. A-4) It is important to recognize that the metric which was the focus of the modeling in appendix A,  $\lambda$ , is only an estimate of current population trends.

45. As lines fit through spawner counts (albeit using sophisticated statistical techniques), current trend estimates do not and could not represent future activities. Expressing future risks if the current population trend continues is simply a mathematical projection of the current population growth rate (or rate of decline) into the future (NMFS 2000 p. A-7), and does not require or involve any assumption about actions that *specifically* will or won't occur in the future. Without assessing future risk based on current conditions, efforts to identify and conserve threatened and endangered species would be scientifically almost impossible.

46. In the 2000 FCRPS BiOp NMFS compared its calculation of current population growth rates to a growth target that NMFS concluded would be sufficient to avoid jeopardy (see, for example, the table headings summarizing the analysis of effects for each ESU in the 2000 BiOp, e.g., p. 9-201 for Snake River spring chinook, 9-206 for Snake River fall chinook, etc.: “1980-to-current  $\lambda$ ,” “Additional change in survival needed to achieve 50% recovery in 48 years”). Setting this growth rate target also did not require a “prospective” analysis of future conditions. It simply required NMFS to select a target that it believed would avoid an appreciable reduction in both survival and recovery.

47. NMFS also evaluated whether the RPA and other offsite measures it considered in the 2000 FCRPS BiOp would change (improve) the current population growth rates for each ESU enough to meet the targets it set as the survival and recovery components of its jeopardy standard. At this step NMFS undertook an analysis that was “ultimately qualitative,” (e.g., NMFS 2000 p. 9-15: “NMFS has determined that the offsite measures described in this RPA, as

enhanced and modified through the 1- and 5-year planning process, and together with the measures identified in the Basinwide Recovery Strategy, are sufficient to achieve the biological requirements of the listed ESUs and, thus, sufficient to avoid jeopardy and adverse modification of critical habitat. This determination is made with full consideration of the additional increments of improvement needed, as reported in Table 9.2-4. However, NMFS determination is ultimately qualitative, informed (to the extent possible) by this standardized quantitative analysis.). This step – assessing the likely future impacts of a proposed action quantitatively or qualitatively – is required for any evaluation of the effects of any action that has not yet occurred. Moreover, only the portion of this analysis in the 2000 FCRPS BiOp that evaluated the expected future benefits of the hydrosystem measures of the RPA involved NMFS’ methods for calculating long-term population growth rates, and then only to translate survival improvements NMFS had calculated for these hydrosystem measures using other analytic tools into a change in growth rates.

C. NMFS Employs a Short Time-Series of Survival Data in a New Study It Cites in the 2004 FCRPS BiOp.

48. NMFS scientists also have put considerable effort into providing a scientific basis for the use of 1980-to-most-recent-year data in evaluating current population status until the 2004 FCRPS BiOp where the agency places significant emphasis on the recent unreviewed analysis by Fisher and Hinrichsen (identified above) that employs a much shorter time series (NMFS 2004, p. 4-5).

49. Spawner and redd count data tends to exhibit trends that look more or less cyclic, for reasons believed by most researchers (including NMFS) to do primarily with climate,

especially ocean cycles (e.g., p. 4-3<sup>28</sup> and 5-50<sup>29</sup>). Because of this, calculated or apparent trends are sensitive to the start and end points of quantitative or qualitative analysis. Therefore, as NMFS scientists and others have pointed out,<sup>30</sup> it is widely recognized that the choice of time period to use for assessing current status is an important factor. The 2004 FCRPS BiOp itself acknowledges that it is the periods of low survival that will constrain recovery.<sup>31</sup> In order to assess the most current trends, however, NMFS emphasizes in the 2004 FCRPS BiOp an analysis

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<sup>28</sup> “In the last decade, evidence has shown recurring, decadal-scale patterns of ocean-atmosphere climate variability in the North Pacific Ocean. These oceanic productivity ‘regimes’ have correlated with salmon population abundance in the Pacific Northwest and Alaska. Survival rates in the marine environment are strong determinants of population abundance for Pacific salmon and steelhead.” (NMFS 2004, p. 4-3)

<sup>29</sup> “For example, large-scale climatic regimes, such as El Niño, affect changes in ocean productivity. Much of the Pacific Coast was subject to a series of very dry years during the first part of the 1990s and since 2000. In the latter 1990s, severe flooding adversely affected some stocks. For example, the low return of Lewis River bright fall chinook salmon in 1999 is attributed to flood events during 1995 and 1996. Among the known variations in ocean conditions are the phenomena termed El Niño and the Pacific Decadal Oscillation (PDO).” (NMFS 2004, p. 5-50)

<sup>30</sup> One of NWFSC’s leading modelers has said that “. . . selection of a reasonable time frame is very important. The following considerations should generally be kept in mind when selecting the time frame to use: a) more data is better, b) the time frame should be representative of historical trends, i.e. not be dominated by ‘good’ or ‘bad’ conditions and not dominated by an isolated perturbation and c) for the sake of uniformity and comparison, the time frame should be consistent across stocks... My initial analysis suggested that 1976-present would generally be a better time frame to use, although this does suffer from dam effects in the early years for some stocks. The 1984-present data could also be used to avoid the 1978-82 period, however, a strong argument can be made that this overly emphasizes a period characterized by bad ocean conditions” (Eli Holmes in NWFSC 2003, p. 2-18). Another NWFSC scientist developed some examples of how sensitive  $\lambda$  is to choice of time period, concluding that “These generally indicate that the shorter the time period, the greater the uncertainty regarding the estimate of  $\lambda$ .” (Toole 2003, p. 8)

<sup>31</sup> “Recent evidence suggests that marine survival of salmonids fluctuates in response to the PDO’s 20- to 30-year cycles of climatic conditions and ocean productivity (Cramer et al. 1999). Ocean conditions that affect the productivity of Northwest salmonid populations appear to have been in a low phase of the cycle for some time and to have been an important contributor to the decline of many stocks. The survival and recovery of these species will depend on their ability to persist through periods of low natural survival” (NMFS 2004, p. 5-52).

by Fisher and Hinrichsen that uses a time frame that is much shorter than the 1980 to present time-series NMFS has used in the past.<sup>32</sup> The Fisher and Hinrichsen analysis models a shorter time period that begins in the worst period of adult returns (1990s) and ends in the best period (2001-2003).

50. NMFS says that the Fisher and Hinrichsen analyses are intended to show how recent higher returns affect previous population estimates.<sup>33</sup> The Fisher and Hinrichsen analysis does not do this because it only focuses on the most recent years (1990 at the earliest), which constitute at most half a climate cycle, and hence it is not comparable to the previous NMFS estimates using a longer time series that more likely covered a full climate cycle.

51. NMFS also relies on the Fisher and Hinrichsen analyses as the basis for statements such as “The slope of the trend for the natural-origin population increased 17% (from 0.97 to 1.14) when the data for 2001-2003 were added to the 1990-2000 series, reversing the decline and indicating that, at least for the short-term, the natural-origin population has been increasing” (NMFS 2004, p. 4-5 for Snake River spring chinook, similar statements for fall chinook and steelhead ESUs). Similarly, “However, recent adult returns and short-term productivity trends that are at or above replacement indicate reduced range-wide risk, at least in the short term, and thus some tolerance for additional short-term risk” (NMFS 2004, p. 8-7) for

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<sup>32</sup> “Fisher and Hinrichsen (2004) provided a preliminary evaluation of the effects of recent natural-origin spring chinook returns on past geometric mean abundance levels and population trends. The latter were calculated as the slope of the regression line for the (log transformed) index of abundance over time. They assessed whether the geomean was greater when calculated from the most recent data (beginning in 2001) compared to a base period (1996-2000) and whether the trend was greater when counts for 2001-2003 were added to the 1990-2000 data series” (NMFS 2004, p. 4-5).

<sup>33</sup> “Fisher and Hinrichsen (2004) provided a preliminary evaluation of the effects of recent natural-origin spring chinook returns on past geometric mean abundance levels and population trends” (NMFS 2004, p. 4-5 for Snake River spring chinook, similar statements for fall chinook and steelhead ESUs).



Snake River spring chinook, similar statements for other ESUs}.

52. These statements about what the Fisher and Hinrichsen analyses show are not scientifically accurate because their analysis does not actually capture changes to long-term population growth trends. This is because, while returns in 2000-2003 were up for most ESUs, and the 1990s saw some of the worst returns on record, analyses that compare the last four years, to even the last 14 years, are strongly affected by the nonstationarity<sup>34</sup> characteristic of these shorter data sets. This nonstationarity is due to the apparent climate regime shift around 1998-2000 (NWFSC 2003, p. 4.10). Basing an analysis on a comparison of data from the trough at the start point and the peak at the end point of this short period will show a maximum increase, whereas a line fit through the longer period of data capturing a whole cycle will tend to capture more accurately the long-term population trend and thus the population risk this trend poses.

#### IV. NMFS' "NET EFFECTS ANALYSIS" IN THE 2004 FCRPS BIOP

53. NMFS "net effects" analysis in the 2004 FCRPS BiOp, which first attempts to identify the difference in effects between the hydrosystem measures of the UPA and those of the "reference operation," and then to determine whether any negative effects of the UPA can be mitigated to have no net effects or a positive effect on the ESA-listed ESUs, is the central scientific analysis of effects in the 2004 FCRPS BiOp. It proceeds as follows. First, NMFS uses the SIMPAS model to determine quantitatively whether the hydrosystem elements of the UPA will have a net negative effect on any ESU as compared to the effects of the hypothetical hydrosystem reference operation (NMFS 2004, Appendix D). Second, for any ESU for which

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<sup>34</sup> Stationarity in a dataset requires that the average stock-recruitment relationship be constant over time, or that "one must assume that no underlying change occurred while the data were collected" (Hilborn and Walters 1992). Short datasets that are part of longer term repetitive cycles may look stationary, but when longer term cyclic behavior is apparent, to truly be stationary, a longer dataset is generally needed to represent the whole cycle rather than just an increasing or decreasing subset of it.

NMFS finds a net negative effect from the hydro measures of the UPA, it then assesses qualitatively whether the UPA's offsite measures in tributaries and the estuary can, over time, mitigate the net negative effect of the UPA's hydrosystem measures to the point of "no net effect" or a beneficial effect by 2014 (NMFS 2004, Appendix E and Chapter 6).

54. This second step relies on the mathematically simple assumption that an adverse effect on survival in one life stage can be offset by a comparable increase in survival in another life stage.<sup>35</sup> Based on this assumption, NMFS assesses qualitatively whether the off-site measures of the UPA can compensate for the negative effects of the UPA's hydro measures and concludes for each ESU that they can – at least by 2014. (NMFS 2004, p. 6-99, 6-109, 6-116, etc.)

55. I have described above at paragraphs 23-36 criticism of NMFS' use of the SIMPAS model to determine the gap between the hydrosystem effects of the UPA and the reference operation, NMFS' response to this criticism, and the relationship between the criticism and the response. In this section, I explain that the second step of NMFS' analysis of net effects is not consistent with established methods for making comparisons among measures, and that its key assumption for making these tradeoffs does not appear to take into account basic features of population dynamics.

A. NMFS' Methods for Evaluating Whether Negative Hydrosystem Impacts Could Be Offset by Offsite Measures.

56. The method that NMFS developed for evaluating whether negative impacts from

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<sup>35</sup> "For the jeopardy analysis, the underlying assumption in the net effects determination is that a relative (i.e., proportional) change in a factor relevant to VSP characteristics in one life stage can be offset by a comparable proportional change in another life stage. This can be demonstrated quantitatively for survival rates, as shown in Tables 6.2a and 6.2b, since cumulative survival through successive life stages is multiplicative. NOAA Fisheries also assumes that it can be applied to qualitative assessments of the benefits of habitat modifications affecting different life stages." (NMFS 2004, p. 6-6)

the hydrosystem measures of the UPA could be offset by offsite tributary mitigation is described as follows:

“The question of whether there is potential to improve anadromous salmonid population status through improvements to habitat conditions in tributary environments was considered in the context of the four Viable Salmon Population (VSP) criteria: abundance, productivity, diversity, and distribution. To address this question by ESU, NOAA Fisheries qualitatively evaluated trends in population status and associated tributary habitat condition and considered the potential to address identified habitat limitations sufficiently to elicit a response in population status. NOAA Fisheries also considered changes in population distributions within ESUs. As a first cut, NOAA Fisheries ascribed qualitative rankings (very high, high, medium, low, and very low) to population and habitat parameters, based on the magnitude of the observed or potential change. NOAA Fisheries coarsely translated qualitative rankings in order to compare habitat improvement potential against quantitative estimates of hydropower mortality. Staff derived the conversions qualitatively from both the observed declines in population status from the reference period to the present and from the estimated potential to improve population status from tributary non-hydro offsets.” (NMFS 2004, p. E3-1)

57. Specifically, the steps in producing these rankings for tributary habitat were

(NMFS 2004, p. E3-1 to E3-3):

1. Evaluate population abundance and distribution trends by comparing current counts to historical counts.
2. Evaluate habitat conditions relative to historical conditions.
3. Evaluate limiting factors and ranked according to relative impacts on populations.
4. Integrate first three steps to evaluate relative restoration potential, taking into account “legal, social, political, or economic constraints.”
5. Coarsely translate those qualitative rankings to compare to proportional estimates of hydropower survival increases, based on observed declines and potential for improvement.

58. The specific steps were a little different for estuary habitat, but the overall

approach of ranking and rating different limiting factors and translating estuary rankings to proportional estimates of hydropower survival increases is similar.<sup>36</sup>

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<sup>36</sup> “To rate the importance of each limiting factor, the Science Center developed a simple rating system that ranked each factor as having a high, medium, or low ability to improve the status of anadromous salmon populations. Inferences were drawn regarding how each limiting factor affects an ESU, based upon the life history type of that ESU and how staff believed the factor

59. Both the tributary and the estuary analyses use a combination of “rankings” and “ratings,” and absolute and relative estimates of both. *Rankings* – which order a list of things compared to each other – by definition are always relative, and are subject to well-known cognitive biases (see, for example (Russo & Shoemaker 1989; von Winterfeldt & Edwards 1986)). *Ratings* assign scores or points to attributes (Anderson 2002; Keeney 1992; Keeney & Raiffa 1976; von Winterfeldt & Edwards 1986). Ratings can be additive and independent, so that it is possible to add up scores across attributes in order to evaluate tradeoffs in formal decision analysis. Rankings are not additive and independent and thus cannot be used to evaluate tradeoffs between, for example, one set of one kind of actions according to their rankings, and another set of another kind of actions according to their rankings (Keeney 1992; von Winterfeldt & Edwards 1986).

60. NMFS’ approach to determining whether the offsite measures of the UPA will mitigate the negative effects of the hydrosystem measures of the UPA involves making tradeoffs between incommensurable rankings, not equivalent ratings. An example that illustrates how relative rankings were used is:

“For example, if some portion of the tern’s predation consists of salmonids predestined to die as a result of illness or poor condition, the survival improvements modeled above would need to be reduced accordingly to better estimate the survival improvements from tern relocation. Toxics and habitat were ranked low relative to tern predation. Since tern predation converted to a medium tributary rank, it is reasonable to assume that these lower relative estuary ranks of habitat and toxics would carry through conversion to tributary ranking and result in tributary ranks of low (~2%).” (NMFS 2004, p. E3-11)

61. Then NMFS mixes these relative ranking methods with rating methods.

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would affect the life history strategies that characterized that life history type. Thus, the limiting factors for all stream type ESUs were ranked similarly, while those for ocean-type ESUs were ranked similarly. Ratings were developed by considering each factor relative to other estuarine factors within an ESU.” (NMFS 2004, p. E3-7)

“Therefore, potential survival improvement to ocean-type ESUs from eliminating tern predation would scale to a tributary low (~2%), while potential improvement from addressing habitat and toxics would scale to tributary ratings of medium and low, respectively. Survival improvements from estuary non-hydro offsets would not exceed a value comparable to tributary ranks of L (tern predation) + M (toxics) + M (habitat).” (NMFS 2004, p. E3-12)

NMFS ultimately combines this mix of rankings and ratings to support offsetting hydrosystem impacts with offsite mitigation measures.

62. NMFS also uses absolute and relative measures of effects interchangeably. For example, the “rankings” applied to population abundance (step 1) were absolute,<sup>37</sup> whereas the “rankings” applied to the effectiveness of various habitat and hydrosystem measures were relative to each other.<sup>38</sup> This approach uses different scales that are not interchangeable (Keeney 1992; von Winterfeldt & Edwards 1986). Whenever different scales are used to represent multiple attributes, and then used to evaluate tradeoffs, it is crucial that the functions used are indeed equivalent (Keeney 1992; von Winterfeldt & Edwards 1986). If they are not, then the analysis produces an often-overlooked apples-to-oranges comparison problem.

63. For example, some measures discussed in the 2004 FCRPS BiOp involve absolute ratings (with no reference scale, e.g., 586 adult spawners for population abundance (NMFS 2004, p. E3-2)) and others are relative (e.g., a qualitative ranking of “high” indicates that some estuary limiting factor is relatively more limiting than a “medium” ranking). These rankings are then scaled to very broad ranges of juvenile survival increases relative to current survival rates (NMFS 2004, p. E3-10). Because the absolute and relative scales are fundamentally different,

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<sup>37</sup> “Estimates of low, medium, and high potential were based on absolute, rather than relative, differences between current and historical population status for NOAA Fisheries’ preliminary analysis.” (NMFS 2004, p. E3-2)

<sup>38</sup> “Qualitative estimates of estuary potential were derived from the relative impact of each limiting factor on each VSP parameter relative to other limiting factors at the ESU scale.” (NMFS 2004, p. E3-10)

tradeoffs based on comparing these measures would be inconsistent with the body of science discussed above.

64. The most obvious problems for using ranking methods to justify offsetting one kind of action with another is that a ranking only indicates that one thing is better or worse than another within a category; it does not indicate how much worse a ranking of “low” is than a ranking of “medium;” and rankings of “low” and “medium” in one category will generally be on different scales than similar rankings in another category; only ratings can be made comparable through weighting methods (Keeney 1992; von Winterfeldt & Edwards 1986).

65. NMFS did attempt to deal with the relationship between its rankings for habitat attributes and its quantitative assessment of measures affecting hydrosystem survival by defining a “translation” table (see footnote 40). As NMFS acknowledges, such translations do not reconcile the conflicts between all of the relative and absolute ratings and rankings defined in Appendix E.<sup>39</sup> The complex descriptions of the multiple relative and absolute ratings and rankings methods applied to many different kinds of measures in different ways that NMFS uses can hide the fact that the different rating and ranking systems are incompatible.

66. The way NMFS translates the tributary habitat rankings into potential hydropower effects (and hence offsets) is to assign substantial hydropower benefits to relatively much smaller tributary or estuary habitat “offsets.”<sup>40</sup> There is, for example, such a broad range in these

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<sup>39</sup> “Professional judgment is required to determine the net effect, because it is not possible to evaluate the effects of all activities quantitatively or in identical units (e.g., quantitative survival estimates for the effects of hydro operations for some ESUs must be compared with qualitative changes in habitat condition for off-site actions). Not all actions will occur over identical time periods, so the timing of effects must also be considered.” (NMFS 2004, p. 6-5)

<sup>40</sup> “As described previously, qualitatively derived estimates of tributary potential were converted into categorical rankings in order to compare against hydropower mortality. The categorical rankings define the potential to increase the % survival of juveniles in each population as follows:

“rankings” that a habitat action expected to eventually deliver a 2.1% increase in survival (presumably relative to current survival at some life stage, but the reference frame is not defined) could, in theory, be traded off for a hydrosystem action expected to immediately decrease survival (presumably relative to current survival at some life stage, but the reference frame is not defined) by 24%; a habitat action expected to deliver only an eventual 25% increase in survival could be traded off for a hydrosystem action expected to immediately change the population by 100%. Defining “low,” “high,” etc. quantitatively does not resolve this problem because the scales across categories of actions are inconsistent, the relative framework is undefined, and the ranges of survival changes are very broad. Finally, changes to hydrosystem operations can have immediate impacts on survival, while changes in habitat can take many years to provide benefits and the effects are much more difficult to predict.

B. NMFS Assumes in Its “Net Effects” Analysis Is That Tradeoffs Between Salmon Life Stages Are Equivalent.

67. Once NMFS calculates the negative effects of the hydrosystem measures of the UPA for each ESU as compared to the reference operation using the SIMPAS model, and defines a method for calculating tradeoffs between hydrosystem and offsite mitigation, it evaluates qualitatively whether the off-site measures of the UPA can mitigate these negative effects so that by 2014 there is at least no net negative effect from the UPA. The fundamental assumption behind this analysis is that survival at each salmon life stage can be multiplied with survival at any other life stage, so that a 2% decrease in survival in one life stage can be offset by a 2%

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“Very Low (VL) - ~0% change in survival

“Low (L) -  $> 0 < 2\%$

“Medium (M) - 2 – 24%

“High (H) - 25- 100%

“Very High (VH) -  $> 100\%$ ” (NMFS 2004, p. E3-1).

increase in survival in another.<sup>41</sup>

68. This assumption necessarily is based on the view that survival rates across all stages of the salmon lifecycle are additive and independent. Spawner-recruit data illustrates a problem with this assumption: if this offset reasoning were valid, substantial reductions in harvest should have increased populations proportionately, but instead the populations continued to plummet.<sup>42</sup> Even recognizing that over-harvesting has been one of the factors leading to ESA listing, and that reducing harvest impacts probably helped prevent even steeper declines, greatly reducing harvest rate impacts on wild fish did not produce dramatic population increases because there are multiple factors affecting salmon survival rates that are not independent from one another and that operate on different life stages.

69. The mathematical offset assumption that NMFS employs to determine whether off-site mitigation can compensate for hydrosystem impacts is not consistent with principles of population dynamics and ecology (e.g., Burgman et al. 1993; Hilborn 1997; Hilborn & Walters 1992; Ludwig et al. 1993; NRC 1995). Population growth is not linear, particularly at very small and very large densities: at its most simplistic, it is exponential with carrying capacity

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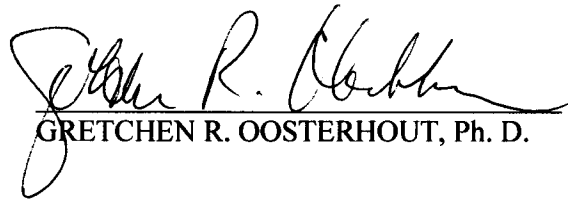
<sup>41</sup> “This can be demonstrated quantitatively for survival rates, as shown in Tables 6.2a and 6.2b, since cumulative survival through successive life stages is multiplicative” (NMFS 2004, p. 6-6). The tables illustrate the assumption that reducing the number of adults due to FCRPS operations by 10% can be offset by increasing the number of smolts from their offspring by 10%.

<sup>42</sup> NMFS’ offset analysis assumes that the population will respond proportionately and directly over its life-cycle to any change in survival at any life stage, but the data don’t show such linearity (additivity). For example, Upper Columbia River spring chinook wild harvest rates were cut around 1974 from a 1960-1973 average of 48% to a 1974-1987 average of 9%, a proportional survival increase of 75% (Updated\_BRT\_population\_and\_dam\_counts\_Interior\_ESUs\_TCooney\_1020041.xls, downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)). Instead of populations increasing by 75% as the offset analysis assumption would require, the average returns decreased by 58%.



limitations, as represented by the familiar Ricker or Beverton-Holt recruitment equations so widely used for simple modeling of exploited fish populations (e.g., Deriso et al. 2001; Eggers 1993; Jensen 1996; Myers et al. 1998; Piorkowski 1997; Ricker 1954, 1975; Ricker 1976; Schnute & Kronlund 1996; Walters 1990). There is no basis in these or other recognized textbooks for using a simple additive formula to model populations small enough to be at risk under the ESA that does not account for density dependence (particularly for decompensation effects that accelerate population declines at low population densities, which are by definition a feature of threatened or endangered populations), compensatory or decompensatory growth mechanisms, and ecological relationships between upstream and downstream survival rates.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge. Executed this 10 day of February, 2005, at Eagle Point, Oregon.

  
GRETCHEN R. OOSTERHOUT, Ph. D.

**Table 1. Comparison of BRT, Status Review, and Fisher & Hinrichsen status estimates (from beginning of 2004 BiOp, pp. 4-3 to 4-23).**

ESU	BRT findings status (VSP range-wide biological requirements)	2004 status review (indicator of current range-wide status: spawners returning to natural production areas)	Recent counts status (Fisher and Hinrichsen)
SRSSC	<p>"...moderately high risk that the abundance and productivity criteria were not currently being met and a low risk that the spatial structure and diversity criteria were not currently being met" (4-4).</p>	<p>"Due to the severe declines in the populations since the 1960s and the short-term nature of the recent high returns, long-term productivity trends remain below replacement for all natural production areas, despite the recent increases. However, the short-term productivity trends for the majority of the natural production areas in the ESU are at or above replacement, which is a positive sign." (4-4).</p>	<p>"The slope of the trend for the natural-origin population increased 17% (from 0.97 to 1.14), when the data for 2001-2003 were added to the 1990-2000 series, reversing the decline and indicating that, at least for the short-term, the natural-origin population has been increasing. Hatchery fish constituted 69% of the return during the recent period compared to an average of 60% during 1990-2000 (Fisher 2004)" (4-5).</p>
SRFC	<p>"moderately high risk for all VSP categories" (4-6).</p>	<p>"Depending upon the assumption made about the likelihood of the progeny of hatchery fish returning as productive adults, long- and short-term trends in productivity are at or above replacement. Thus, NOAA Fisheries proposed to retain the current listing of this species as threatened (i.e., likely to become an endangered species within the foreseeable future) even though it is not likely to go extinct in the near future" (4-6).</p>	<p>Geometric mean abundance of naturally-produced 3,462 during 2001-2003, compared to 694 in 1996-2000 (a 398% increase). The slope of the population trend increased 8.0% (from 1.16 to 1.24) when the data for 2001-2003 were added to the 1990-2000 series. For the short-term, the population has been increasing. Approximately 64% of the aggregate run at Lower Granite Dam was hatchery fish in 2001-2003, compared to 67% during 1990-2000 (4-7, not a quote).</p>

Upper  
Columbia River  
spring chinook

"BRT's assessment of risk for the four VSP categories reflects strong concerns regarding abundance and productivity and comparatively less concern for ESU spatial structure and diversity" (4-7).

"...the within-ESU hatchery programs do not substantially reduce the extinction risk of the ESU in-total (NMFS 2004b). Protective efforts...did not alter NOAA Fisheries' assessment that the ESU is in danger of extinction or likely to become so in the foreseeable future. Actions under the 2000 FCRPS Biological Opinion...do not as yet substantially reduce the ESU's extinction risk. Artificial propagation practices within the geographic range of the ESU do not fully support the conservation and recovery of UCR spring-run chinook. In particular, NOAA Fisheries is concerned that the non-ESU Entiat National Fish Hatchery has compromised the genetic integrity of the native natural population of spring-run chinook in the Entiat basin" (4-8).

"...at least in the shortterm, the aggregate population and the natural-origin populations in the Entiat and Wenatchee subbasins have been increasing" (4-8).

UWR chinook

"...moderately high risks for all VSP categories" (4-9).

"Collectively, artificial propagation programs in the ESU have a slight beneficial effect on ESU abundance and spatial structure but neutral or uncertain effects on ESU productivity and diversity. Protective efforts, as evaluated pursuant to the PECE, did not alter the assessments of the BRT and the Artificial Propagation Evaluation Workshop participants that the ESU is "likely to become endangered within the foreseeable future."" (4-9).

"geometric mean aggregate abundance of UWR chinook salmon in the Clackamas and McKenzie rivers is equal to 12,530 for 2001-2003 compared to 3,041 in 1996-2000, a 312% increase. The slope of the aggregate population trend increased 15.2% (from 0.89 to 1.02) when the data for 2001-2003 were added to the 1990-2000 series, reversing the decline and indicating that, at least in the short-term, the aggregate population has been increasing." (4-10).

LCR Chinook

"moderately high risk for all VSP categories" (4-10).

"hatchery programs do not substantially reduce the risk of the ESU in-total" (4-11).

"Fisher and Hinrichsen (2004) compared the aggregate abundance of 41,450 during 2001 to a geometric mean of 11,135 for the years 1996-2000, a 272% increase. The slope of the aggregate population trend increased 6.6% (from 0.76 to 1.03) when the count for 2001 was added to the 1990-2000 data series, reversing the decline and indicating that, at least in the short-term, the aggregate population is increasing" (4-12).

Snake River steelhead	"moderate risk for the abundance, productivity, and diversity VSP categories and comparatively lower risk in the spatial structure category" (4-13)	"The majority of long-term population growth rate estimates for the nine available series were below replacement. The majority of short-term population growth rates (through 2001) were marginally above replacement or well below replacement, depending upon the assumption made regarding the effectiveness of hatchery fish in contributing to natural production" (4-13)	"at least in the short term, the natural-origin run has been increasing" (4-14).
Upper Columbia River steelhead	"high risk for productivity and comparatively lower risk for abundance, diversity, and spatial structure" (4-15)	"recent 5-year mean abundances (through 2001) for naturally spawned populations in this ESU were 14 to 30% of their interim recovery target abundance levels" (4-15), but "hatchery programs collectively mitigate the immediacy of extinction risk for the UCR steelhead ESU in-total in the short term, but the contributions of these programs to the long-term survival and recovery of the species is uncertain" (4-16)	"Fisher and Himrichsen's (2004) preliminary estimate of the geometric mean of natural-origin UCR steelhead was 3,643 during 2001-2003 compared to 1,146 in 1996-2000, a 218% increase. The slope of the natural-origin population trend increased 9.2% (from 0.97 to 1.06,) when the data for 2001-2003 were added to the 1990-2000 series, reversing the decline and indicating, at least in the short term, that the run size has been increasing" (4-16).

Mid-Columbia  
River steelhead

"the relatively abundant and widely distributed resident fish in the ESU reduce risks to overall ESU abundance but provide an uncertain contribution to ESU productivity, spatial structure, and diversity" (4-17).

"NOAA Fisheries' assessment of the effects of artificial propagation on ESU extinction risk concluded that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total" (4-17).

"In their preliminary report, Fisher and Hinrichsen (2004) estimated a geometric mean of natural origin MCR steelhead equal to 17,553 during 2001-2002 compared to 7,228 in 1996-2000, a 143% increase. The slope of the population trend for natural-origin fish increased 6.2% (from 0.99 to 1.05) when the data for 2001-2002 were added to the 1990-2000 series, reversing the decline and indicating that, at least in the short run, the natural-origin population has been increasing" (4-18).

UWR steelhead

"moderate risks for each of the VSP categories" (4-18).

Ambiguous

"In their preliminary report, Fisher and Hinrichsen (2004) estimated a geometric mean of natural origin UWR steelhead at Willamette Falls equal to 9,541 during 2001-2004 compared to 3,961 in 1996-2000, a 141% increase. The slope of the population trend increased 10.4% (from 0.93 to 1.02) when the data for 2001-2004 were added to the 1990-2000 series, reversing the decline and indicating that, at least in the short run, the natural-origin population has been increasing" (4-19).

LCR steelhead

"moderate risks in each of the VSP categories" (4-19).

"some anomalous populations in the LCR steelhead ESU, particularly summer-run steelhead populations, had shown encouraging increases in abundance in the 2 to 3 years ending 2001. However, population abundance levels remained small (no population had a recent 5-year mean abundance greater than 750 spawners)... hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total" (4-20)

"In their preliminary report, Fisher and Hinrichsen (2004) estimated that the aggregate abundance of LCR steelhead was equal to 4,429 during 2001 compared to 6,333 during the period 1996- 2000, a 30% decrease in abundance. The slope of the aggregate population trend declined by 0.8% (from 0.93 to 0.92) when the 2001 count was added to the 1990-2000 data series" (4-20).

LCR chum

"high risks for each of the VSP categories" (4-21)

"that these hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total" (4-21).

"In their preliminary report, Fisher and Hinrichsen (2004) estimated a geometric mean of the aggregate number of CR chum salmon in two index areas (Grays River and Hamilton and Hardy creeks) equal to 1,776 during 2001-2003 compared to 2,114 in 1996-2000, a 16% decrease. The slope of the aggregate population trend decreased 1.5% (from 1.02 to 1.00) when the data for 2001-2003 were added to the 1990-2000 series" (4-21).

Snake River  
sockeye

"extremely high risks for all four  
VSP categories" (4-23).

"The consideration of artificial  
propagation does not substantially  
mitigate the BRT's assessment of  
extreme risks to ESU abundance,  
productivity, spatial structure, and  
diversity" (4-23).

"In their preliminary report, Fisher  
and Hinrichsen (2004) estimated a  
geometric mean of aggregate  
numbers of SR sockeye salmon  
equal to 14 during 2001-2004  
compared to 4 in 1996- 2000, a  
211% increase. However, because  
returns were higher in 2001 and  
2002 than in 2003, the slope of the  
aggregate population trend  
decreased 3.7% (from 1.26 to 1.22)  
when the data for 2001-2004 were  
added to the 1990-2000 series" (4-  
23).



**Table 2. Summary of Recalculations of survival improvements needed to avoid jeopardy using methods of 2000 BiOp.**

	% survival increase needed as of 2000		% survival increase needed, adjusted as of 2004		Fraction total change expected, RPA		Fraction total change expected, other	
	Low <sup>a</sup>	High	Low <sup>b</sup>	High	Low	High	Low	High
SRSSC								
Bear	15.75	15.75	0	0	1.00	1.00	0.00	0.00
Imnaha	102.14	114.99	85.61	105.92	0.39	0.33	0.61	0.67
Johnson	7.61	7.61	0	0	1.00	1.00	0.00	0.00
Marsh	45.19	45.19	2.59	2.56	1.00	1.00	0.00	0.00
Minam	36.83	65.36	26.51	51.56	1.00	0.64	0.00	0.36
Poverty	11.51	16.41	11.89	18.82	1.00	1.00	0.00	0.00
Flats								
Suphur	13.26	13.26	0	0	1.00	1.00	0.00	0.00
Aggregate	72.42	114.13	36.18	77.71	1.00	0.75	0.00	0.25
UCRSC								
Wenatchee	233.6	247.3	161.82	182.60	0.17	0.21	0.83	0.79
Methow	155.9	176.5	69.88	86.92	0.90	0.61	0.10	0.39
Entiat	142.6	199.3	93.09	154.95	0.49	0.32	0.51	0.68
SRSSteel								
Aggregate	154.40	440.00	130.62	423.45	0.42	0.14	0.58	0.86
UCRSteel <sup>c</sup>	100.30	307.30	114.57	321.27	0.41	0.17	0.59	0.83
Ave or GM	83.96	135.62	53.16	109.67	0.75	0.63	0.25	0.37
Min	7.61	7.61	0	0	0.17	0.14	0.00	0.00
Max	233.64	440.00	161.82	423.45	1.00	1.00	0.83	0.86

Note a. “Low” and “High” are defined in footnotes to the tables for these ESUs taken from the 2000 FCRPS BiOp, Chapter 9.7.

Note b. “Low” corresponds to  $\lambda$  calculated consistent with the 2000 FCRPS BiOp (see Appendix A) assuming hatchery fish effectiveness = 0.2, and “high” assumes hatchery fish effectiveness = 0.8.

Note c. The fraction “wild” was not provided for 1980-1985 in the source data used to perform these calculations (Updated\_BRT\_population\_and\_dam\_counts\_Interior\_ESUs\_TCooney\_1020041.xls, downloaded from Remand website). Thus, I used the average of 1985-2003 after determining that there was no significant trend in fraction “wild.”

**Table 3. Summary of major criticisms of SIMPAS Model, and NMFS’ responses**

Criticism	Example sources	Response
(1) SIMPAS is too simple to capture the complexities it is being used to quantify	CRITFC, Fish Passage Center, State of Oregon <sup>1</sup>	It is simple on purpose. <sup>2</sup>
(2) It is not a stochastic or life-cycle model	State of Oregon (See footnote 1).	SIMPAS does not need to be a life-cycle model. <sup>3</sup>
(3) The benefits assumed for RSWs in SIMPAS modeling are too speculative	CRITFC, Fish Passage Center, state of Alaska, SOS <sup>4</sup>	NMFS “calls on” Action Agencies to evaluate passage survival (see footnote 4).
(4) It does not take uncertainty or error into account appropriately	CRITFC, <sup>5</sup> Oregon, Fish Passage Center <sup>6</sup>	SIMPAS does not take uncertainty or error into account <sup>7</sup> .

<sup>1</sup> “SIMPAS was designed to compare alternatives in a qualitative sense, not a relative sense. [49] • SIMPAS is too simple to capture the complexities it is being used to quantify. [8, 14, 49] • SIMPAS is not stochastic system-wide or life-cycle-wide and provides no measure of error or uncertainty surrounding its parameters. [32] • The model needs a time-step component to capture the variability across the migration season. [49].

“Response: See Section 1.2.2 of Appendix D in the final Opinion for a discussion of these Concerns” (Lohn 2004, p. 1-33). Section 1.2.2 in Appendix D is cited further here.

<sup>2</sup> “NOAA Fisheries would first point out that the SIMPAS model is a deterministic analytical tool for use in comparing two or more system (or project) operations or system configuration changes to obtain relative differences in juvenile survival between the head of Lower Granite Pool and the head of the estuary” (NMFS 2004, p. D-5).

<sup>3</sup> “It is not a life cycle model, nor does it need to be to serve its intended purpose” (NMFS 2004, p. D-5).

<sup>4</sup> “3.7.12 Comments: • Additional studies are needed to validate input and output on survival rates for RSWs vs. spill. (Current data show spill is better). [49] • Results for RSWs at Lower Granite Dam cannot be used to extrapolate for other projects, because migrant behavior changes the further the fish get downstream. [49] • Benefits of RSW installations are speculative. [8, 27, 30, 49].

Response: In response to these comments and concerns, NOAA Fisheries has included a term and condition in Section 10.5.2.1 of the Incidental Take Statement that calls on the Action Agencies to “evaluate juvenile project-specific passage survival both before and after configuration and/or operational modifications [at mainstem FCRPS projects] to ensure that these modifications result in improved passage survival.” (Lohn 2004, p. 1-36).

<sup>5</sup> “Point estimates imply data are precise, but there is high uncertainty around each input parameter. [49] Response: This comment is addressed in the Opinion in Appendix D, Section 1.2.2” (Lohn 2004, p. 1-34).

“Comment: • Many inputs are based on numbers that showed no statistical difference when evaluated against a control. [49] Response: NOAA Fisheries addressed this comment in the Opinion in Section 1.2.2 of Appendix D. NOAA Fisheries used the best available data for model input fish passage and survival data. If several years of passage data were available, the average of those years was used. If only one year of data was available, NOAA Fisheries used the point estimate for test condition of the study” (Lohn 2004, p. 1-34).

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<sup>6</sup> “3.10.10 Comment: • Variability associated with estimates of exploitation rates, consumption rates, changes in size structure, and estimates of relative predation likely preclude statistical differences between current and proposed actions. At best, benefits will not occur for years. [32].

Response: NOAA Fisheries concurs with this comment and included this concern in Sections 5.3.1.2 and 6.3.2.4 of the Opinion” (Lohn 2004, p. 1-45).

“Comment: • Survival through the estuary is unknown, so survival benefits to be gained from estuary improvements are highly speculative. [8].

“Response: NOAA Fisheries acknowledges the uncertainty surrounding salmonid survival through the estuary. However, NOAA Fisheries believes that it used the best available science to approach the effect of the action on salmonid survival in the estuary. This approach is described in Appendix E” (Lohn 2004, p. 1-46).

<sup>7</sup> “The juvenile survival rates shown, as well as the input passage parameters, are point estimates, i.e., confidence intervals are not calculated or implied” (NMFS 2004, p. D-4). “Although there may be some uncertainty about the accuracy of the resulting pool and dam survival estimates, NOAA Fisheries determined that the model output for 1994 through 2003 was reasonable and produced useful pool survival estimates” (NMFS 2004, p. D-5). “NOAA Fisheries concurs with this comment and included this concern in Sections 5.3.1.2 and 6.3.2.4 of the Opinion” (Lohn 2004, p. 1-45).

## REFERENCES CITED

- Anderson, B. F. 2002. The three secrets of wise decision making. Single Reef Press, Portland, OR.
- Biological Review Team 2003a. Draft Report of Updated Status of Listed ESUs of Salmon and Steelhead - chinook. Draft report on stock status by the Biological Review Team posted for public review on the Internet ([http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)). NOAA Fisheries.
- Biological Review Team 2003b. Draft Report of Updated Status of Listed ESUs of Salmon and Steelhead - steelhead. Draft report on stock status by the Biological Review Team posted for public review on the Internet ([http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml)). NOAA Fisheries.
- Biological Review Team 2003c. Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead. Co-manager review draft downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml). West Coast Salmon Biological Review Team, NOAA Fisheries.
- Burgman, M. A., S. Ferson, and H. R. Akcakaya 1993. Risk Assessment in Conservation Biology. Chapman and Hall, UK.
- COE and BPA 2004. Final Proposal for Federal Columbia River Power System (FCRPS) Summer Juvenile Bypass Operations. US Army Corps of Engineers/Bonneville Power Administration.
- Cooney, T. 2004. Updated\_BRT\_population\_and\_dam\_counts\_Interior\_ESUs\_TCooney\_1020041.xls, downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml).
- CRI 2000. A standardized quantitative analysis of risks faced by salmonids in the Columbia River Basin. Cumulative Risk Initiative, Northwest Fisheries Science Center NMFS - NOAA, Seattle, WA.
- Deriso, R., D. Marmorek, and I. Parnell. 2001. Retrospective Patterns of Differential Mortality and Common Year Effects Experienced by Spring Chinook of the Columbia River. Canadian Journal of Fisheries and Aquatic Sciences **58**:2419-2430.
- Eggers, D. M. 1993. Robust harvest policies for Pacific salmon fisheries. Pages 85-106. Proceedings of the International Symposium on Management Strategies for Exploited Fish Populations. University of Alaska Sea Grant College Program, Fairbanks, Alaska.
- Fisher, T., and R. Hinrichsen 2004. Preliminary Abundance-Based Trend Results for Columbia Basin Salmon and Steelhead ESUs. BPA, Portland.
- Glickman, T. S., and M. Gough, editors. 1990. Readings in Risk. Resources for the Future, Washington, DC.
- Hilborn, R. 1997. Statistical hypothesis testing and decision theory in fisheries science. Fisheries **22(10)**:19-20.
- Hilborn, R., and C. J. Walters 1992. Quantitative fisheries stock assessment. Chapman and Hall, New York. Mendenhall, W. 1987. Introduction to probability and statistics. Duxbury Press, Boston.
- Hilborn, R., and C. J. Walters 1992. Quantitative fisheries stock assessment. Chapman and Hall, New York.
- Hilborn, R., and M. Mangel 1997. The ecological detective: confronting models with data. Princeton University Press, Princeton.

- Holmes, E. E. 2000. Methods for population viability analyses when data are corrupted. Cumulative Risk Initiative, Northwest Fisheries Science Center, National Marine Fisheries Service, Seattle, WA.
- Holmes, E. E. 2001. Estimating risks in declining populations with poor data. Proceedings of the National Academy of Sciences **98**:5072-5077.
- Holmes, E. E. 2004. Beyond theory to application and evaluation: diffusion approximations for population viability analysis. Ecological Applications **14**:1271-1293.
- ISAB 2001. ISAB consultation recommendations on Council Staff's Draft Issue Paper: "Analysis of 2001 Federal Columbia River Power System Operations on Fish Survival". NWPPC document ISAB 2001-4, Portland, OR.
- Jensen, A. L. 1996. Beverton and Holt life history invariants result from optimal trade-off of reproduction and survival. Canadian Journal of Fisheries and Aquatic Sciences **53**:820-822.
- Joint Technical Staff (State, Federal and Tribal Fishery Agencies Joint Technical Staff) 2004b. Comments on June 8, 2004 Corps of Engineers and Bonneville Power Administration (Action Agencies) proposal to reduce summer spill for fish passage in the Snake and Columbia rivers. Columbia River Inter-Tribal Fish Commission, Idaho Department of Fish and Game, Nez Perce Tribe, Oregon Department of Fish and Wildlife, Shoshone Bannock Tribe, US Fish and Wildlife Service, Washington Department of Fish and Wildlife.
- Keeney, R. 1992. Value-Focused Thinking. Harvard University Press, London.
- Keeney, R. L., and H. Raiffa 1976. Decisions with Multiple Objectives: Preferences and Value Tradeoffs. John Wiley and Sons, New York.
- Lohn, D. R. 2004. Memorandum listing NOAA Fisheries' responses to comments received on Sept. 2004 draft Biological Opinion. NOAA Fisheries. Downloaded from [http://www.salmonrecovery.gov/R\\_biop\\_final.shtml](http://www.salmonrecovery.gov/R_biop_final.shtml), Seattle.
- Ludwig, D., R. Hilborn, and C. Walters. 1993. Uncertainty, resource exploitation, and conservation: lessons from history. Science **260**(2):17, 36.
- McClure, M., B. Sanderson, E. Holmes, C. Jordan, P. Kareiva, and P. Levin 2000. Revised Appendix B of standardized quantitative analysis of the risks faced by salmonids in the Columbia River basin. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle.
- McClure, M., E. E. Holmes, B. L. Sanderson, and C. E. Jordan. 2003. A large-scale, multi-species status assessment: anadromous salmonids in the Columbia River basin. Ecological Applications **13**:964-989.
- Myers, R. A., G. Mertz, J. M. Bridson, and M. J. Bradford. 1998. Simple dynamics underlie sockeye salmon (*Oncorhynchus nerka*) cycles. Canadian Journal of Fisheries and Aquatic Sciences **55**:2355-2364.
- NMFS 2000. Endangered Species Act - Section 7 Consultation: Biological Opinion: Reinitiation of Consultation on Operation of the Federal Columbia River Power System, Including the Juvenile Fish Transportation Program, and 19 Bureau of Reclamation Projects in the Columbia Basin. Consultation conducted by National Oceanic and Atmospheric Administration Fisheries, Northwest Fisheries Science Center; agencies are: U.S. Army Corps of Engineers Bonneville Power Administration, Bureau of Reclamation, National Oceanic and Atmospheric Administration Fisheries, Seattle.

- NMFS 2004. Endangered Species Act – Section 7 Consultation Biological Opinion. Consultation on Remand for Operation of the Columbia River Power System and 19 Bureau of Reclamation Projects in the Columbia Basin (Revised and reissued pursuant to court order, NWF v. NMFS, Civ. No. CV 01-640-RE (D. Oregon)). NOAA’s National Marine Fisheries Service, Seattle.
- NRC 1995. Science and the Endangered Species Act. National Academy Press, Washington, D.C.
- NWFSC 2003. Final Report on the Technical Workshop on Population Trends and Extinction Metrics. Northwest Fisheries Science Center, NOAA Fisheries, downloaded from [http://www.salmonrecovery.gov/R\\_Analysis.shtml](http://www.salmonrecovery.gov/R_Analysis.shtml), Seattle.
- Piorkowski, R. J. 1997. Ecological effects of spawning salmon on several southcentral Alaskan streams. Page 177. Fish and Wildlife. University of Alaska, Fairbanks.
- Ricker, W. E. 1954. Stock and recruitment. Journal fisheries Research Board of Canada **11**:559-623.
- Ricker, W. E. 1975. Computation and Interpretation of biological statistics of fish populations. Bulletin of the Fisheries Research Board of Canada **191**:1-382.
- Ricker, W. E. 1976. Review of the rate of growth and mortality of Pacific salmon in salt water and noncatch mortality caused by fishing. Journal of the fisheries Research Board of Canada **11**:1483-1524.
- Russo, J. E., and P. J. H. Shoemaker 1989. Decision traps: the ten barriers to brilliant decision-making and how to overcome them. Fireside Books, New York.
- Schnute, J. T., and A. R. Kronlund. 1996. A management oriented approach to stock recruitment analysis. Canadian Journal of Fisheries and Aquatic Sciences **53**:1281-1293.
- Toole, C. 2003. Preliminary Estimates of Updated “Indicator Metrics” Applied in the 2000 FCRPS Biological Opinion. Hydro Division, NOAA Fisheries Northwest Region, 500 N.E. Oregon St., Portland, Oregon 97232-2737, Portland.
- von Winterfeldt, D., and W. Edwards 1986. Decision Analysis and Behavioral Research. Cambridge University Press, Cambridge.
- Vose, D. 2000. Risk analysis: a quantitative guide. John Wiley and Sons, Chichester.
- Walters, C. J. 1990. A partial bias correction factor for stock-recruitment parameter estimation in the presence of auto-correlated environmental effects. Canadian Journal of Fisheries and Aquatic Science **47**:516-519.