

**Eighth Annual Report to the Northwest Governors  
On Fish and Wildlife Expenditures  
of the Bonneville Power Administration**

**Including the Columbia River Basin Fish and Wildlife Program  
Of the Northwest Power and Conservation Council**

**1978 - 2008**



August 2009  
Council Document 2009-06



## Overview

The Pacific Northwest Electric Power Planning and Conservation Act of 1980, the federal law that authorized the states of Idaho, Montana, Oregon, and Washington to form the Northwest Power and Conservation Council, directs the Council to prepare a program to protect, mitigate and enhance fish and wildlife, and related spawning grounds and habitat, of the Columbia River Basin that have been affected by hydroelectric development. This program, known as the Columbia River Basin Fish and Wildlife Program, is part of the Council's Northwest Power Plan. The Power Act directs the Council to prepare the Power Plan to assure the Pacific Northwest an adequate, efficient, economical, and reliable power supply.

As explained further in this report, the Fish and Wildlife Program includes flow and passage measures for anadromous fish, including salmon, steelhead, sturgeon, and lamprey, that alter hydroelectric system operations and reduce power production. The Power Plan must take Program measures into account in its development of a resource strategy to provide the region an adequate, efficient, economical, and reliable power supply while also delivering the operations specified for fish and wildlife – in essence, helping to assure that operations for fish and wildlife are similarly reliable.

The administrator of the Bonneville Power Administration is required to make decisions about future electricity supplies and energy conservation that are consistent with the Power Plan and also to use the Bonneville fund -- revenue from the sale of electricity -- to finance the Fish and Wildlife Program. Bonneville, a division of the federal Department of Energy, is the region's largest electricity supplier, selling the output of 31 federal dams and one non-federal nuclear plant.

In Fiscal Year 2008, Bonneville reported total fish and wildlife costs of \$875.8 million. This amount includes:

- Direct program expenditures (\$148.9 million)<sup>1</sup>
- Reimbursements to the federal Treasury for Corps of Engineers and Bureau of Reclamation investments in fish passage and fish production, including direct

funding of operations and maintenance expenses of federal fish hatcheries (\$62.2 million)

- Interest, amortization, and depreciation (these are called “fixed expenses”) on capital investments in facilities such as hatcheries and fish-passage facilities at dams (\$116.2 million)
- Forgone hydropower revenue from sales of surplus power that results from dam operations that benefit fish but reduce hydropower generation (\$273.5 million), and
- Power purchases during periods when dam operations to protect migrating fish, such as storing water in winter months in anticipation of required water spills in the spring, reduce hydropower generation (\$274.9 million).

The \$875.8 million total does not include new capital investments in 2008 totaling \$64.1 million. The total also does not reflect a credit of \$100.5 million from the federal Treasury related to fish and wildlife expenditures in 2008. Effectively, electricity ratepayers of Bonneville-customer utilities paid \$775.3 million of the total. The credit is explained in the section of this report entitled “Expenditures by Category.”

Figures 1A and 1B and Table 1 of this report detail Bonneville's total spending since 1978 on fish and wildlife protection and mitigation. Figure 1C provides a breakdown of Bonneville's total power expenditures in Fiscal Year 2008 to show the direct-program budget and power purchases in the context of other expenditures. Figures 2, 3, 4, 4A, 5, 6A, 6B, 7A, 7B, and Tables 3B and 8 provide categorical breakdowns of the expenditures in Fiscal Year 2008.

In Fiscal Year 2008, the Council's Fish and Wildlife Program (\$174.4 million) accounted for 19.9 percent of the costs Bonneville attributed to fish and wildlife (\$875.8 million). These costs accounted for 37.2 percent of Bonneville's total 2008 power expenditures -- reported in Figure 1C of this report -- of \$2.35 billion. The Fish and Wildlife Program accounted for 7.4 percent of the total.

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<sup>1</sup> In Table 1 of this report, which is the source of Figures 1A and 1B, the sum of fish and wildlife capital investments (\$26.8 million) and direct expenditures (\$148.9 million) for 2008 is \$175.7 million. This amount is \$1.3 million more than the total direct-program expenditures reported by Bonneville and shown in Figures and Tables 2, 3, and 4 (\$174.4 million). The difference is the cost of software improvements for Bonneville's Fish and Wildlife Division. Until the improvements are installed and operating, they are not included in the Fish and Wildlife Division expenditures but are assigned to the Division by Bonneville's financial office, which provided Table 1 of this report.

## Impacts of fish and wildlife costs

Looking ahead, Bonneville's electricity rate analysts estimated the preference rate, the rate Bonneville charges its utility customers, for 2010 and 2011 with and without the fish and wildlife costs. The difference is about one-third, or about \$10 per megawatt-hour. That is, \$10 of the approximately \$27-per-megawatt-hour preference rate can be attributed to fish and wildlife costs, according to Bonneville. The effect on the rate Bonneville charges its industrial customers is about \$7 per megawatt-hour (the industrial rate is \$34 per megawatt-hour). Bonneville also estimated that Residential Exchange Program benefits, primarily to the residential and small-farm customers of investor-owned utilities, will be \$75 million per year lower in 2010 and 2011 than they would be without fish and wildlife costs.

Separately, the Council staff calculated the average cost of the Fish and Wildlife Program over the next five years at \$720 million per year<sup>2</sup>. Using current information provided by Bonneville for calculating rates, the Council staff estimated that the \$720 million annual average translates to a cost of \$134.86 per year (\$11.24 per month) for a typical customer of a public utility served by Bonneville.<sup>3</sup> This is 14.4 percent of the typical monthly bill of \$77.72.

## Background

### The 2009 Report

This is the eighth consecutive annual report prepared by the Council to explain Bonneville's fish and wildlife mitigation expenditures. A portion of these expenditures is directed to the Council's Columbia River Basin Fish and Wildlife Program. The reports

respond to a July 1999 request by the governors of Idaho, Oregon, Montana, and Washington -- the four states represented on the Council -- to report annually on Bonneville's expenditures for fish and wildlife mitigation.

In this eighth annual report, the Council provides an update of Bonneville's funding through Fiscal Year 2008. The report also includes information about salmon and steelhead in the Columbia River Basin. Financial information was provided by Bonneville in response to requests from the Council and was not independently verified by the Council or its staff. Information about salmon and steelhead was compiled from reports by the Fish Passage Center, U.S. Army Corps of Engineers, NOAA Fisheries, the states of Washington and Oregon through the Columbia River Compact, and the University of Washington Joint Institute for the Study of the Atmosphere and Oceans.

### The Northwest Power and Conservation Council

The Northwest Power Act of 1980, a federal law, authorized the states of Idaho, Montana, Oregon, and Washington to form the Northwest Power and Conservation Council (it was known until 2003 as the Northwest Power Planning Council). The Act directs the Council to prepare a program to protect, mitigate, and enhance fish and wildlife of the Columbia River Basin that have been affected by hydropower. The Act also directs the Administrator of the Bonneville Power Administration, the federal agency that sells electricity generated at federal dams in the Columbia River Basin, to use the Bonneville fund in a manner consistent with the Council's program to protect, mitigate and enhance fish and wildlife affected by hydropower in the Columbia River Basin. The Act affords equitable

<sup>2</sup> The \$720-million annual average comprises 1) the average annual cost to the federal hydropower system of dam operations in the Biological Opinion and the Council's Program that reduce hydropower generation by an average of 1,170 average-megawatts (\$434 million); 2) Bonneville's anticipated annual amount of capital investments for projects in the Program over the next five years (\$56 million); and 3) Bonneville's anticipated average annual cost of direct-program expenditures over the next five years (\$231 million). The \$720 million figure does not include fixed expenses for depreciation, amortization, or interest on capital investments; the annual average amount of new capital investment for the direct program and associated federal projects, or reimbursable and direct-funded expenses and so is not directly comparable to Bonneville's total fish and wildlife costs reported for Fiscal Year 2008 and shown in Table 1 and Figures 1A and 1B of this report. By way of comparison, however, as shown in Table 1, Bonneville's total Program expenses in Fiscal Year 2008 were \$875.8 million (this total does not include new capital investments but does include fixed expenses on existing investments). Included in this total are reimbursable/direct-funded expenses of \$62.2 million and Program-related fixed expenses of \$116.2 million. Subtracting these amounts from the \$875.8 million total yields a comparable Program cost of \$697 million in 2008. The \$720-million average for the next five years reflects the increasing cost of the direct program, which was \$148.9 million in direct expenditures and \$26.8 million in new capital investments in 2008, and which the Council's staff estimates will average \$231 million (expense) and \$56 million (capital) per year over the next five years.

<sup>3</sup> The Council staff's calculation is based on a Bonneville analysis of the effect of fish and wildlife costs on the Preference Rate, which is the rate Bonneville charges public utilities for electricity (approximately \$27 per megawatt-hour). The calculation is based on Bonneville's current rate-case models and includes the following assumptions: Fiscal Year 2010 forecasted total sales of 55,765,707 megawatt-hours (adjusted for losses); a cost of \$10 per megawatt-hour for the Fish and Wildlife Program; and average residential electricity consumption of 13.5 megawatt-hours per year.



treatment to fish and wildlife as to other authorized purposes of hydropower dams in the Columbia River Basin.

## **The Columbia River Basin Fish and Wildlife Program**

The Council is a planning, policy-making, and reviewing body. Consistent with the Northwest Power Act, the Council develops the Fish and Wildlife Program and monitors its implementation. The Program is implemented primarily by Bonneville but also by the region's fish and wildlife agencies and tribes, the U.S. Army Corps of Engineers, the Bureau of Reclamation, and the Federal Energy Regulatory Commission and its licensees. The Program addresses hydropower impacts on anadromous fish, resident fish, and wildlife. Anadromous fish are those that spawn in freshwater, migrate to the Columbia River estuary as juveniles, spend their adult lives in the Pacific Ocean, and then return to their freshwater birthplaces to spawn and die. Resident fish are those that live and migrate within freshwater rivers, streams, and lakes.

The Program includes scientific research; habitat acquisitions and easements<sup>4</sup>; and construction projects to improve habitat and fish passage and to build and operate hatcheries. The Program also recommends certain reservoir elevations and flow requirements to protect anadromous and resident fish and their habitat. Other measures call for using stored water to maintain appropriate water temperatures and protect streambeds. The Program focuses most of the mitigation activities on anadromous fish, consistent with language in the Northwest Power Act. Section 2.6 of the Act states that anadromous fish “are of significant importance to the social and economic well-being of the Pacific Northwest and the Nation” and that these fish “are dependent on suitable environmental conditions substantially obtainable from the management and operation” of dams on the Columbia River and its tributaries. Primarily these are salmon and steelhead, but anadromous Pacific lamprey and sturgeon also are found in the Columbia system. These species also are targeted in the Council's Program.

The Act directs the Council to oversee, with the assistance of the Independent Scientific Review Panel

(ISRP), a process to review projects proposed for funding by Bonneville. The ISRP reviews proposed projects and makes recommendations to the Council as to whether these proposals are based on sound scientific principles, benefit fish and wildlife, have a clearly defined objective and outcome with provisions for monitoring and evaluation of results, and are consistent with the priorities in the Program. The ISRP also reviews the results of prior-year expenditures. The Council allows for public review and comment on the ISRP's recommendations. The Council then makes final recommendations to Bonneville on projects to be funded. In doing so, the Council must fully consider the ISRP's recommendations, explain in writing its reasons for not accepting ISRP recommendations, consider the impact of ocean conditions on fish and wildlife populations, and determine whether the projects employ cost-effective measures to achieve Program objectives.

The Program takes an “All-H” approach to mitigating the impacts of hydropower dams on fish and wildlife. That is, the Program includes measures that address habitat, hydropower, hatcheries, and harvest. Of these, the greatest emphasis in the program is on habitat. As noted elsewhere in this report, habitat expenditures totaled \$60.7 million in Fiscal Year 2008, or 34 percent of the direct-program expenditures.

In February 2009, following more than a year of work including extensive public participation, the Council adopted a revision of the Program, the first revision since 2004 and 2005 when locally developed subbasin plans were added. Key themes of the 2009 Program include:

- Emphasizing implementation of fish and wildlife projects based on needs identified in the subbasin plans and also on actions described in federal biological opinions on hydropower operations, hatcheries, and harvest, Endangered Species Act recovery plans, and the 2008 and 2009 Columbia Basin Fish Accords signed by federal agencies, Indian tribes, and the states of Idaho, Montana, and Washington.
- Continuing the Council's commitment to independent scientific review of all projects proposed for funding through the program, including those actions

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<sup>4</sup>Habitat acquisitions are credited against identified habitat losses attributable to the construction of hydropower dams. The crediting unit is called a “Habitat Unit,” which is a measure of both the quantity and quality of the acquired site and, thus, its suitability for targeted species.

described in the biological opinions and the 2008 Fish Accords<sup>5</sup>

- Further review of specific issues such as the impacts of global climate change, toxic substances, and invasive species on fish, wildlife, and habitat

Thus, in the revised Program, the Council's focus turns from planning to implementation and performance. The program:

- Increases project performance and fiscal accountability by establishing reporting guidelines and using adaptive management to guide decision-making
- Commits to a periodic and systematic exchange of science and policy information
- Emphasizes a more focused monitoring and evaluation framework coupled with a commitment to use the information obtained to make better decisions
- Calls for a renewed regional effort to develop quantitative biological objectives for the program
- Retains an interim objective recommended by the region's fish and wildlife managers of increasing salmon and steelhead runs to 5 million fish by 2025 and achieving smolt-to-adult return rates of 2 to 6 percent
- Addresses passage problems for lamprey and sturgeon at the mainstem dams
- Proposes changes in some hatchery practices to create a more balanced, ecological approach to fish production
- Retains a crediting formula for wildlife losses of two new units of habitat for each lost habitat unit

Also in 2009, the Council is working with project-recommending entities, Bonneville, and others to shape the measures for all areas of the Program into multiyear action plans similar to those implementation plans in the 2008 Biological Opinion and the Accords. The Council will then work with Bonneville and relevant entities to estimate multi-year implementation

budgets and secure funding commitments that ensure adequate funding for these action plans.

## Summary of Expenses, 1978-2008

The 2008 expenditures bring the grand total of Bonneville's fish and wildlife spending, from 1978, when the expenditures began, through 2008 to \$11.9 billion.<sup>6</sup> Here, in descending order, is a breakdown by major categories:

- \$3.30 billion for power purchases to meet electricity-demand requirements in response to required river operations that reduce hydropower generation.
- \$2.33 billion in forgone revenue. Bonneville calculates the value of hydropower that could not be generated (revenue that is forgone) because of required river operations to assist fish passage and improve fish survival, such as water spills at the dams when salmon and steelhead are migrating to or from the ocean.
- \$1.99 billion for the Council's direct program. This amount does not include annual obligations in the separate capital-investment budget for projects in the direct program, such as construction of fish hatcheries (like a mortgage, an amount of capital is obligated to a project like construction of a hatchery in a particular year, but the actual annual payments of that obligation are smaller -- the debt service on the investment; the actual work of fish production is financed with annual expenditures from the direct-program budget). With capital expenditures added, the total for the direct program for the period 1978-2008 is \$3.63 billion.<sup>7</sup>
- \$1.64 billion for capital investments, discussed above, such as the construction costs of facilities like fish hatcheries and fish-passage facilities at the dams.
- \$1.60 billion in fixed expenses for interest, amortization, and depreciation on the capital investments.

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<sup>5</sup>In the 2008 Fish Accords, Bonneville and other federal agencies committed to extensive, 10-year implementation plans, with associated actions and funding commitments, based on the foundation built by the Council's program over the last 26 years. This foundation includes water management and fish-passage measures (in the original, 1982 Program), mainstem and off-site mitigation measures (1987 and subsequent program amendments), the program framework (2000 amendment), and the subbasin plans (2004-2005 amendment). With the additional funding commitments in the 2008 Fish Accords, funding of projects through the Council's program likely will total about \$230 million per year beginning this year.

<sup>6</sup>The total includes expenditures for wildlife habitat, which Bonneville reported through the end of March 2009, six months after the end of Fiscal Year 2008. Other expenditures are totaled through September 2008, the end of Fiscal Year 2008.

<sup>7</sup>For the period 2001-2004, direct program expenditures included a total of \$16,000,000 in one-time expenditures for "high priority" and "action plan" projects. These are included in the calculation of 1978-2008 total spending. The high-priority projects were intended to bring immediate benefits to all species listed for protection under the Endangered Species Act in advance of subbasin planning (subbasin plans were submitted to the Council in 2004 and adopted into the fish and wildlife program in 2004 and 2005). The "action plan" projects were intended to bring immediate benefits to ESA-listed salmon and steelhead that were affected by altered hydropower dam operations in the spring and early summer of 2001, when the flow of the Columbia River was at a near-record low.

- \$984.7 million to: 1) directly fund fish and wildlife projects undertaken by the U.S. Army Corps of Engineers or the Bureau of Reclamation that predate the 1980 Northwest Power Act and for which Bonneville pays the hydropower share, consistent with the Power Act. These expenditures include, for example, operations and maintenance costs of certain fish-production facilities, fish-passage facilities at dams, and research activities. 2) reimburse the U.S. Treasury for the hydropower share of major dam modifications by the Corps of Engineers, such as installing spillway weirs, bypass systems, fish-deflection screens in front of the turbine entrances, and spillway modifications to reduced dissolved gas.

## Expenditures by Category

### Program Expenditures

Bonneville uses a comprehensive approach to implementation described as “integrated,” meaning that requirements of biological opinions prepared under the federal Endangered Species Act are incorporated with the broad fish and wildlife mitigation requirements of the Northwest Power Act. Thus, expenditures under this integrated Council Program fall into four broad categories: 1) the direct program; 2) supplemental mitigation expenses, which include the Action Plan and High-Priority projects described in footnote 7 of this report; 3) capital expenditures, which are in excess of \$1 million and directed to projects such as fish hatcheries and large-scale land purchases; and 4) reimbursable and direct-funded expenditures, which constitute the portion of costs Bonneville pays to the federal Treasury and, in a few instances, directly to the Corps of Engineers and the Bureau of Reclamation for operations and maintenance of facilities such as fish hatcheries. For projects such as fish ladders and bypass systems at the federal Columbia and Snake river dams, the Power Act

obligates Bonneville to pay an amount equal to the amount that hydropower is an authorized purpose of the dams. Currently, that amount averages 77.7 percent for the Federal Columbia River Power System dams, and so Bonneville reimburses the federal Treasury 77.2 percent of the cost of those projects.

For Fiscal Year 2008, Bonneville reported direct-program expenditures of \$174.4 million. The total includes obligations to program-related capital construction projects of \$26.8 million<sup>8</sup> and reimbursable project costs of \$62.2 million.<sup>9</sup> Bonneville’s spending for anadromous fish totaled \$102.7 million. For resident fish, the amount was \$31 million. For wildlife, the amount was \$16.6 million. Expenditures for anadromous fish projects amounted to 58 percent of direct-program spending. Resident fish projects accounted for 18 percent of direct-program spending, and wildlife expenditures accounted for 10 percent.<sup>10</sup> The remaining 14 percent, or \$23.9 million, was for Bonneville’s program support (also called program administration). These costs are illustrated in Figure 2 and Tables 1A and 3B. Bonneville reported systemwide fish and wildlife program support expenditures of \$12.4 million in 2008. These include costs such as data management that supports all programs. Internal program support (\$11.5 million in 2008) includes contracted tasks such as program review and independent analysis, as well as Bonneville’s internal overhead such as personnel costs.

This report also includes information on Bonneville’s expenditures for wildlife habitat. This includes total expenditures from 1978 through March 2009 and breakdowns of the expenditures by ecological province, entities receiving funding, acres purchased, and habitat units acquired (a habitat unit is the amount of habitat necessary to support a single individual of a species and varies in size by species; wildlife losses caused by the hydropower system are measured in lost habitat units).

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<sup>8</sup>Capital projects are financed over time with appropriated debt. These projects include construction of fish hatcheries, fish and wildlife habitat improvements, and land purchases for wildlife. Capital investments also include the “Associated Federal Projects” category, which includes Bonneville’s share of the cost of the projects in the U.S. Army Corps of Engineers’ Columbia River Fish Mitigation Program. These projects include, among others, fish-passage improvements at the federal dams, barge transportation of juvenile salmon and steelhead, research in the Columbia River estuary, and the effort to relocate Caspian tern nesting areas from the estuary to other locations in the Northwest.

<sup>9</sup>Reimbursable and direct-funded expenses in Fiscal Year 2008 include: Lower Snake River hatcheries operations and maintenance, \$19.4 million; Bonneville’s share of Corps of Engineers hydropower projects operations and maintenance costs, \$34.49 million; Bonneville’s share of Bureau of Reclamation hydropower projects operations and maintenance, \$4.3 million; and one half of the Power Council’s budget, \$4.1 million (Bonneville assigns the other half of the Council’s budget to its Power Business Line).

<sup>10</sup>Wildlife expenditures are treated differently than expenditures for anadromous fish and resident fish. Wildlife projects address habitat losses that have been calculated, by species, for each federal dam (or groups of dams within tributary subbasins). The identified losses only address the impacts of dam construction; losses attributable to dam operations have not been quantified. The Council, Bonneville,

## Power System Costs

The Council's Program and the Biological Opinions on Federal Columbia River Power System operations issued by NOAA Fisheries and the U.S. Fish and Wildlife Service specify hydropower dam operations for fish that also affect power generation. These measures include river and dam operations to protect spawning and rearing areas for both anadromous and resident fish and to improve passage conditions at dams for juvenile salmon and steelhead. Sometimes these operations require Bonneville to purchase power to meet loads while at other times Bonneville simply forgoes a revenue-making opportunity. Regardless of how Bonneville handles the reduced generation, fish operations to comply with these federal requirements affect Bonneville rates for utility customers. Purchasing power to meet regional use adds to customer rates for use of this power. Also, compliance with these legal requirements, and others, limits the amount of revenue possible from an unrestricted operation of the hydropower system. For reporting purposes, on an annual basis Bonneville determines both the power purchases and forgone revenues caused by fish operations and reports them as mitigation costs for impacts to fish and wildlife from operation of the hydrosystem. The Council recognizes there is debate over the reporting of these costs. Nevertheless, this report includes forgone revenues and power purchases as reported by Bonneville.

### How Bonneville calculates forgone revenues and power purchases

During some months of the year (most notably spring), the hydrosystem generates sufficient power, even with fish operations, to both meet firm loads and generate surplus power. During these months, the fish operations often reduce so-called "secondary" revenues from sales of surplus power. Bonneville calls these revenue reductions "forgone revenues." Among the many factors Bonneville considers in setting rates, one is the assumption of a lower amount of secondary revenue because of how the river is operated for fish.

During other months of the year, and under low water conditions, the hydrosystem does not generate enough power to meet firm loads and Bonneville must supplement through purchasing electricity from other suppliers. When fish operations necessitate these additional power purchases to meet firm loads, Bonneville identifies this increment as "power purchases for fish enhancement" in the fish and wildlife budget.

To calculate the annual power-generation share of forgone revenue and power purchases attributable to fish operations at the dams, Bonneville conducts two studies of hydropower generation for the relevant fiscal year. One study includes all dam-operating requirements, including those for fish, and the other has no fish-enhancement requirements. The differences for each month are calculated and applied to the corresponding monthly actual Mid-Columbia Dow Jones wholesale electricity market prices. Combined with assumptions of the monthly power-demand load, this provides monthly estimates of the forgone revenue and power purchases resulting from the fish-enhancement operations.

In Fiscal Year 2008, the overall annual average difference between the two studies was 1,070 average-megawatts. Of this, about 563 average-megawatts contributed to the estimated \$273.5 million in forgone revenue, and about 510 average megawatts contributed to the estimated \$274.9 million in power purchases. Bonneville receives a credit under Section 4(h)(10)(C) of the Northwest Power Act<sup>11</sup> as reimbursement for the non-power share of fish and wildlife expenditures, including these power purchases. Non-power purposes such as irrigation, navigation, and flood control comprise 22.3 percent of the authorized purposes of the federal dams. The credit to Bonneville is based on this percentage. Table 1A of this report includes the history of these credits; the 2008 amount was \$100.5 million. The effect of the credit is to reduce the share of fish and wildlife costs paid by electricity ratepayers. Table 1A also shows the grand total of program expenses, forgone revenue, and power purchases as \$875.8 million. Applying the 4(h)(10)(C) credit effectively reduces the total program expenses, meaning

<sup>11</sup>Section 4(h)(10)(C) of the Northwest Power Act directs the Bonneville Administrator to allocate expenditures attributable to fish and wildlife mitigation and enhancement among the various power and nonpower purposes in accordance with the accounting procedures used for the Federal Columbia River Power System (FCRPS). Since 1995, Bonneville has taken credits for the portion of the expenditures allocated to non-power purposes as a way to ensure that Bonneville's customers pay only the power share of the fish and wildlife mitigation costs, as required by the Power Act. Essentially, 4(h)(10)(C) is a "true-up" between Bonneville's broader funding obligations and its narrower rate directives. That is, the credits are treated as revenues and appear in Bonneville's financial statements as revenues. Bonneville applies the credit by reducing its annual payment to the U.S. Treasury by the amount of the credit. Source: BPA and 4(h)(10)(C) "Fish" Credits factsheet, Bonneville Power Administration.



that ratepayers were responsible for \$775.8 million and the federal government was responsible for \$100.5 million in Fiscal Year 2008.

## Fish Runs and Fisheries

This report also includes data about salmon and steelhead runs in the Columbia River Basin in 2008, including a graphic depiction of the Pacific Decadal Oscillation (PDO), a shifting temperature regime in the Pacific Ocean that is believed to affect the survival of salmon and steelhead.<sup>12</sup>

The Council collected information on fish runs and fisheries for this report from reports prepared by the Washington and Oregon departments of fish and wildlife, NOAA Fisheries, the U.S. Army Corps of Engineers, the University of Washington, and the Fish Passage Center.

Some of the figures and tables are presented differently in this version of the report than in past versions, reflecting changes in how the state and federal agencies compile and report the information. Additionally, some information that was reported in past versions of this report no longer is available.

More information about Columbia River Basin fish runs and fisheries can be found at the following locations:

- The “Columbia Basin Fish & Wildlife Program Projects and Portfolios” site managed by Bonneville: [www.cbfish.org](http://www.cbfish.org)
- The “Status of Fish and Wildlife Resources” website managed by the Columbia Basin Fish and Wildlife Authority: [www.cbfgwa.org/sotr/](http://www.cbfgwa.org/sotr/)
- The website of the Oregon Plan for Salmon and Watersheds, which includes a link to the 2005-2007 Biennial Report: [www.oregon.gov/OWEB/](http://www.oregon.gov/OWEB/)

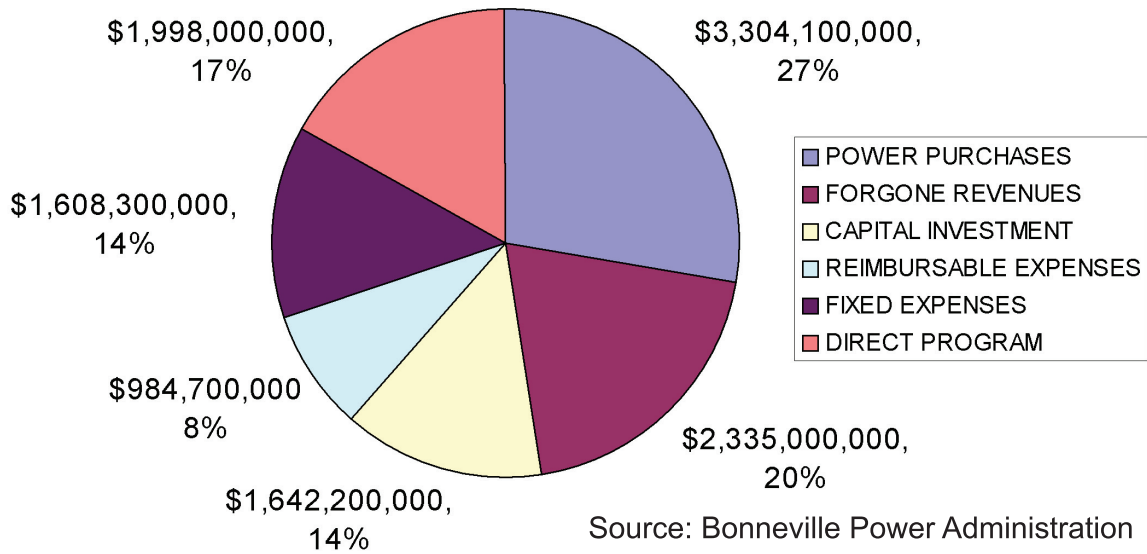


- The website of the Pacific Coastal Salmon Recovery Fund: [www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/](http://www.nwr.noaa.gov/Salmon-Recovery-Planning/PCSRF/)
- The website of the Washington Governor’s Salmon Recovery Office: [www.governor.wa.gov/gstro/](http://www.governor.wa.gov/gstro/)
- The website of the Northwest Forest Plan, 10-year report: [www.reo.gov/monitoring/reports/10yr-report/watershed/index.shtml](http://www.reo.gov/monitoring/reports/10yr-report/watershed/index.shtml)

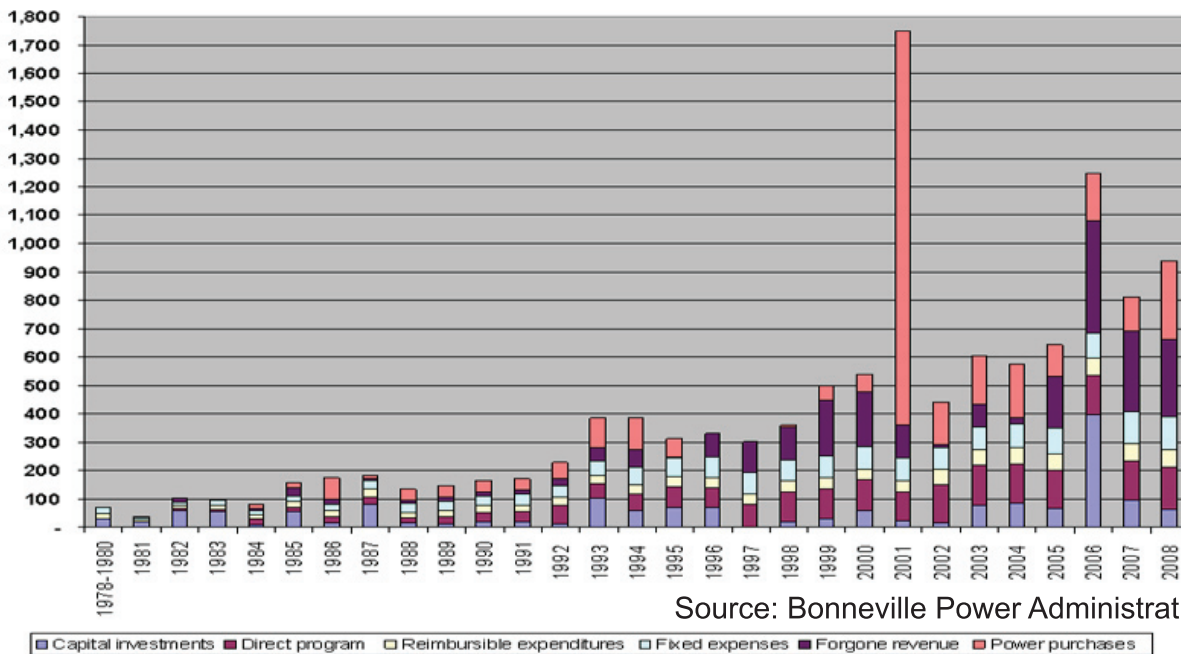
<sup>12</sup>The PDO is a long-lived El Niño-like pattern of Pacific Ocean climate variability. Major changes in Northeast Pacific marine ecosystems have been correlated with phase changes in the PDO; warm eras have seen enhanced coastal ocean biological productivity in Alaska and inhibited productivity off the West Coast of the contiguous United States, while cool PDO eras have seen the opposite north-south pattern of marine ecosystem productivity -- better conditions off the West Coast and poorer conditions in Alaska. Cool periods tend to correspond with increased salmon and steelhead returns to the Columbia River Basin. A time sequence of PDO shifts is shown graphically in Figure 12. In the last decade or so, a cool PDO phase has dominated. This may have contributed to the good salmon and steelhead returns of the early 2000s, and the sizable 2008 return, which was an improvement over the returns of 2005-2007.

**Figure 1A: Total Expenditures, 1978-2008\***

\*Total of \$11.87 billion does not reflect approximately \$1.4 billion in credits

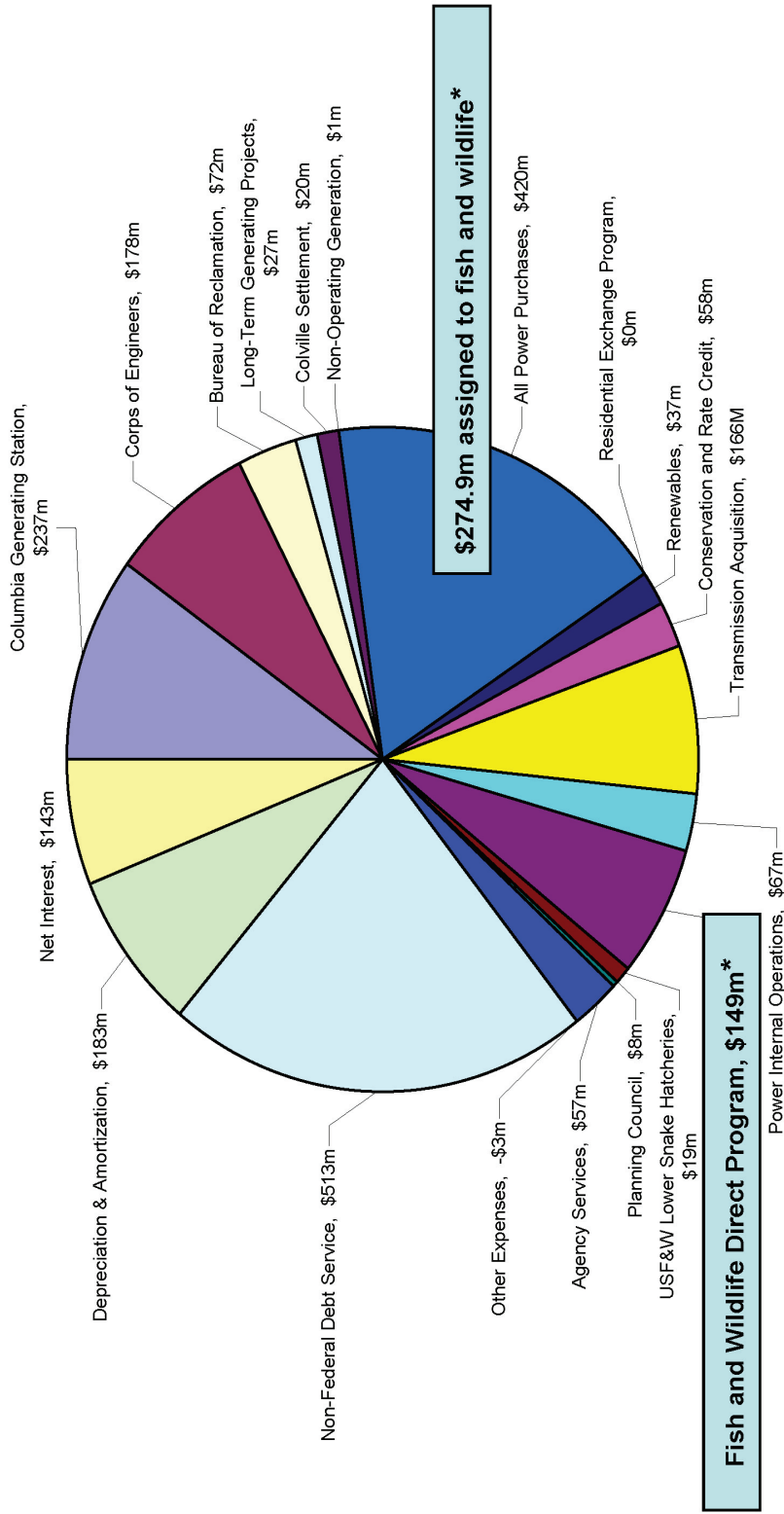


**Figure 1B: Fish and Wildlife Expenditures By Category, 1978-2008  
In Millions of Dollars**



# Figure 1C: BPA Power Expenditures By Category, Fiscal Year 2008

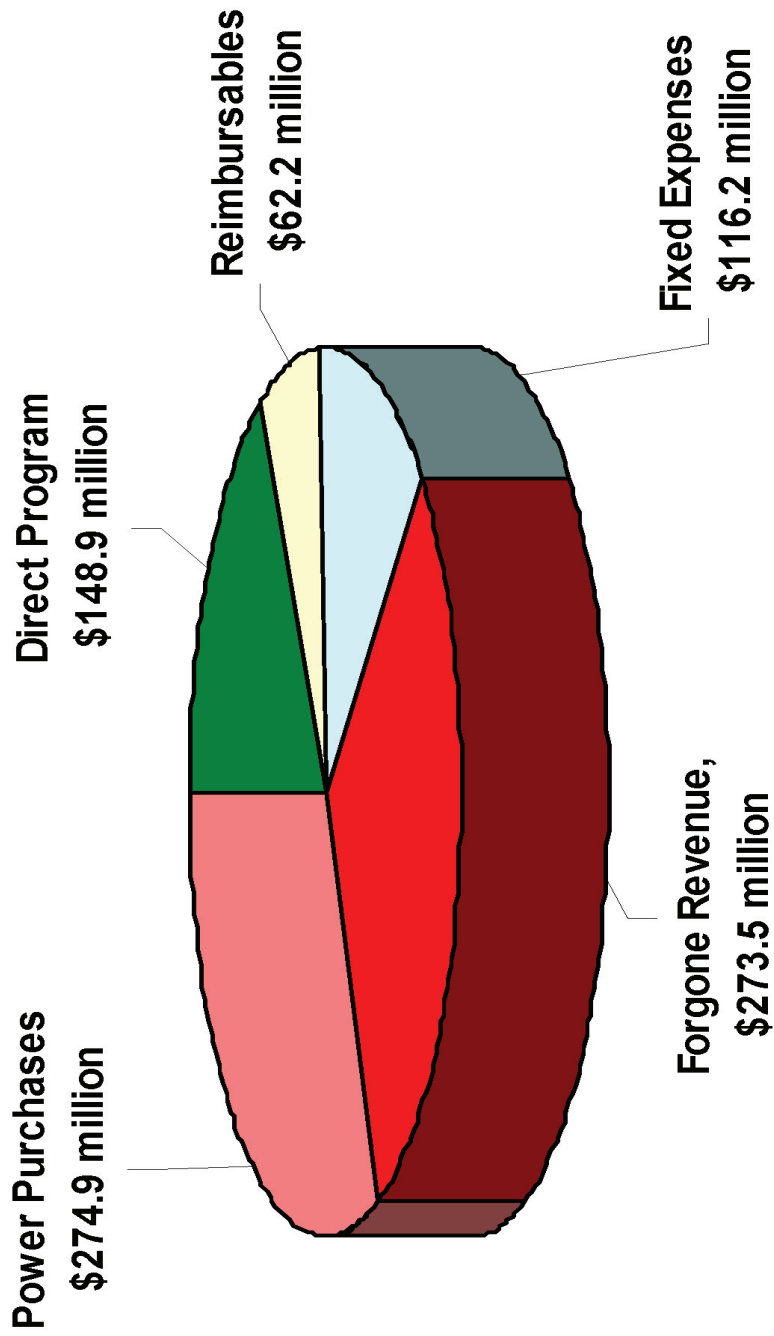
Total: \$2.35 billion (costs reported in millions)



\* BPA calculated a credit against it U.S. Treasury payment of \$100.5 million for these fish and wildlife costs. The financial information in this figure, which is consistent with audited financial statements for FY 2008, was provided by BPA on May 27, 2009.

Source: Bonneville Power Administration

**Figure 1D: BPA Fish and Wildlife Spending, 2008,  
By Major Category  
Total: \$875.8 million**

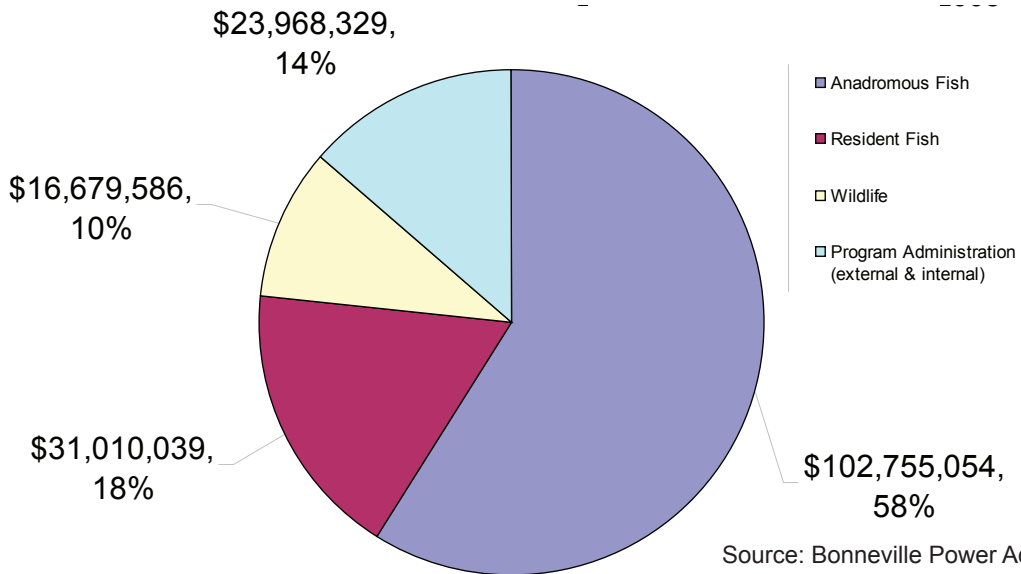


•The total does not include capital investments of \$64.1 million (\$26.8 million for projects in the direct program, and \$37.3 million for projects at the federal dams).



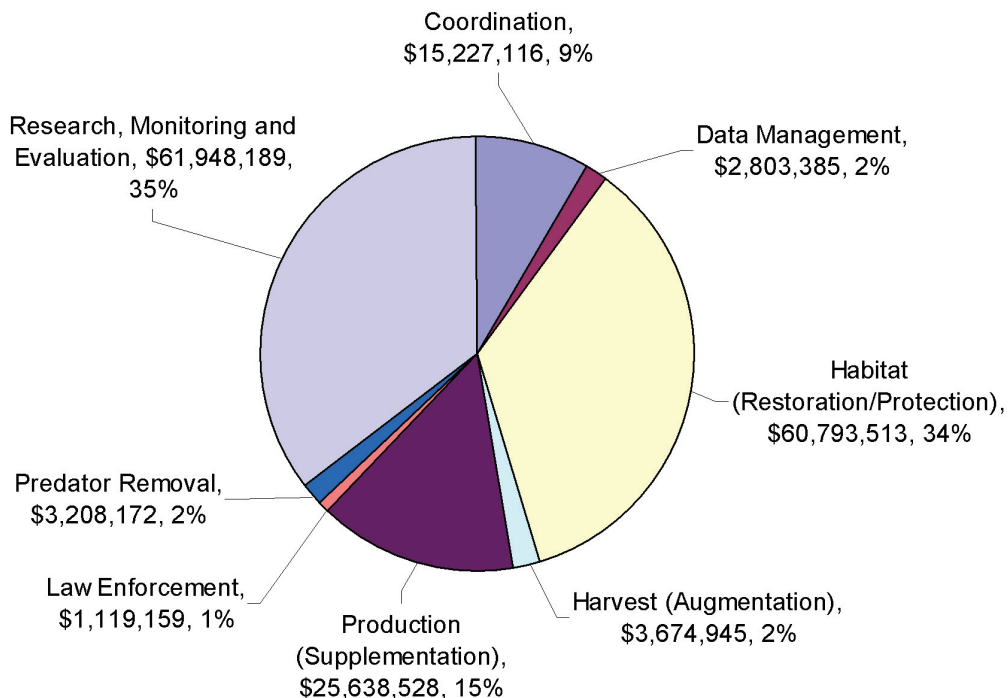
**Figure 2: Direct Program Expenditures by Species, 2008**

**Total: \$174.4 million**

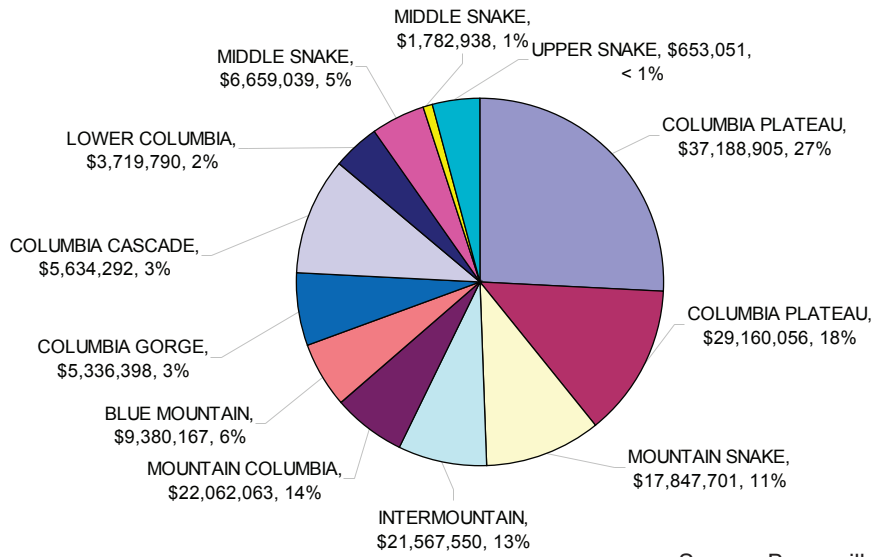


**Figure 3: Expenditures by Category 2008**

**Total: \$174.4 million**

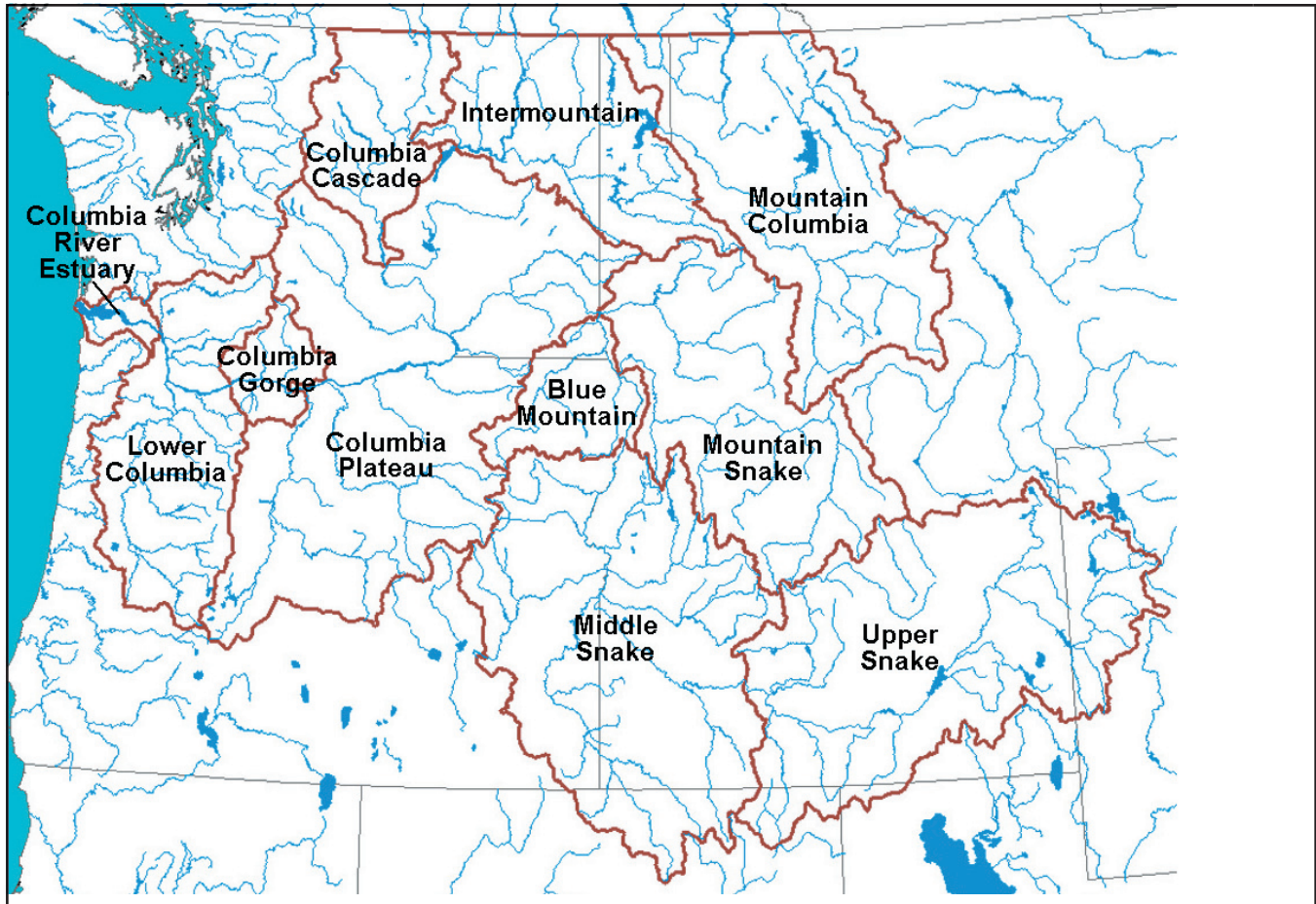


**Figure 4: Expenditures by Province, 2008**  
**Total: \$174.4 million**



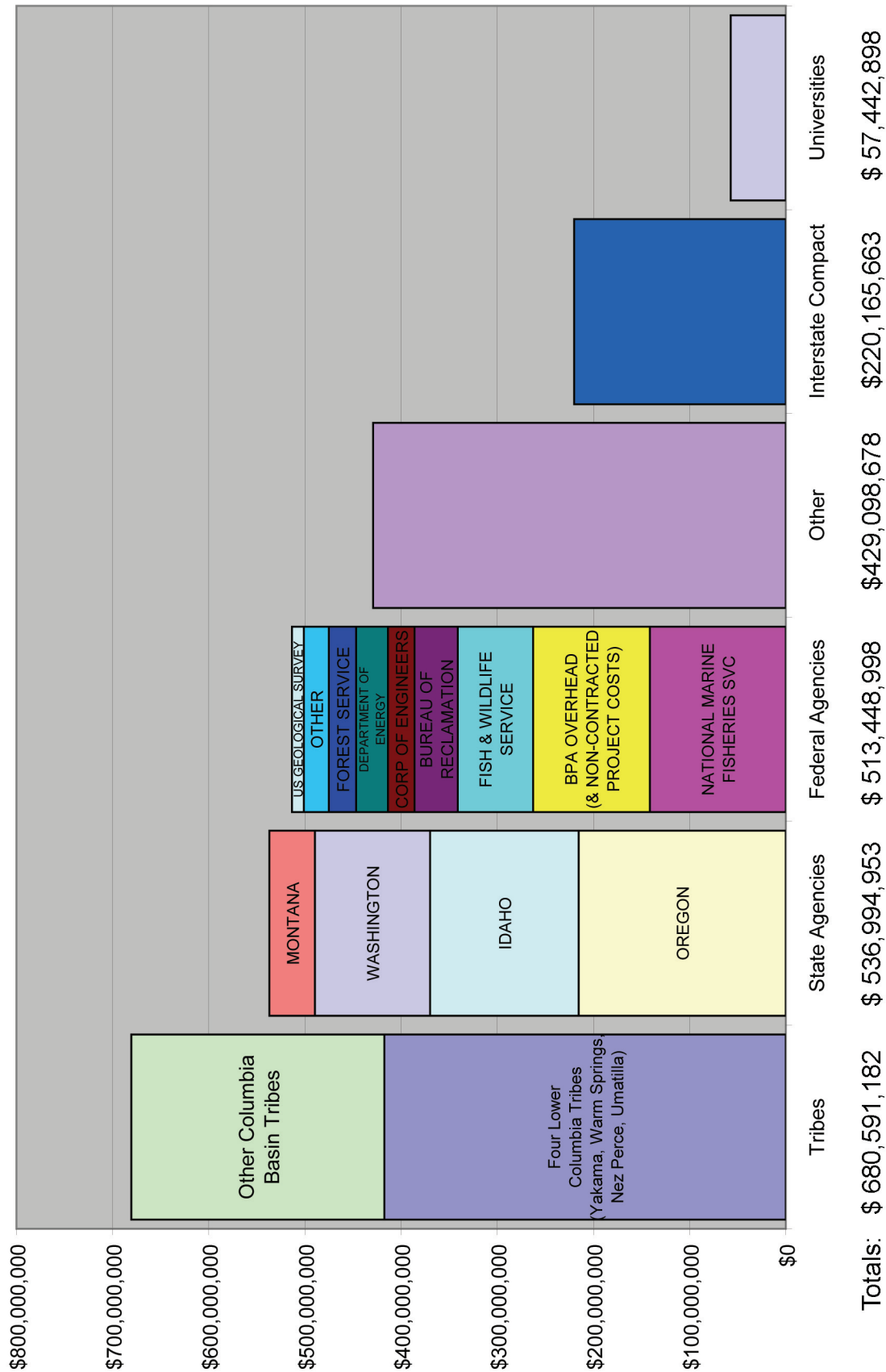
Source: Bonneville Power Administration

**Figure 4A: Ecological Provinces of the Columbia River Basin**



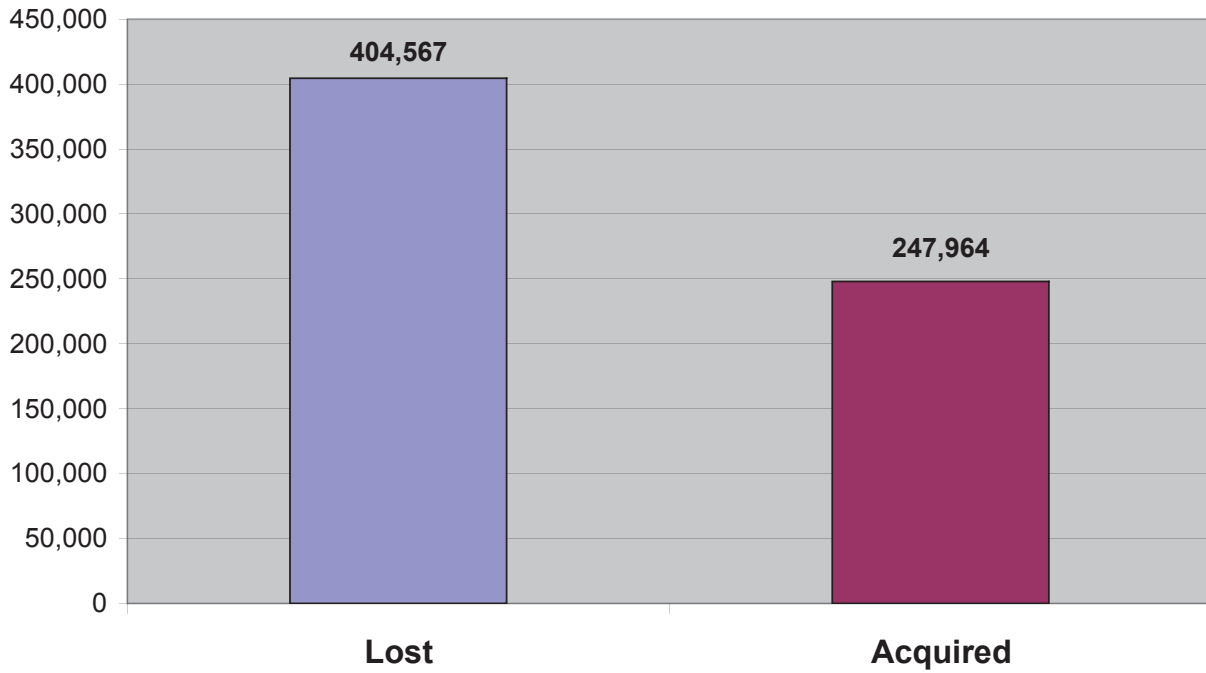
**Figure 5: Contractors by Type, 1978-2008\***

\*See Details, Table 5



Source: Bonneville Power Administration

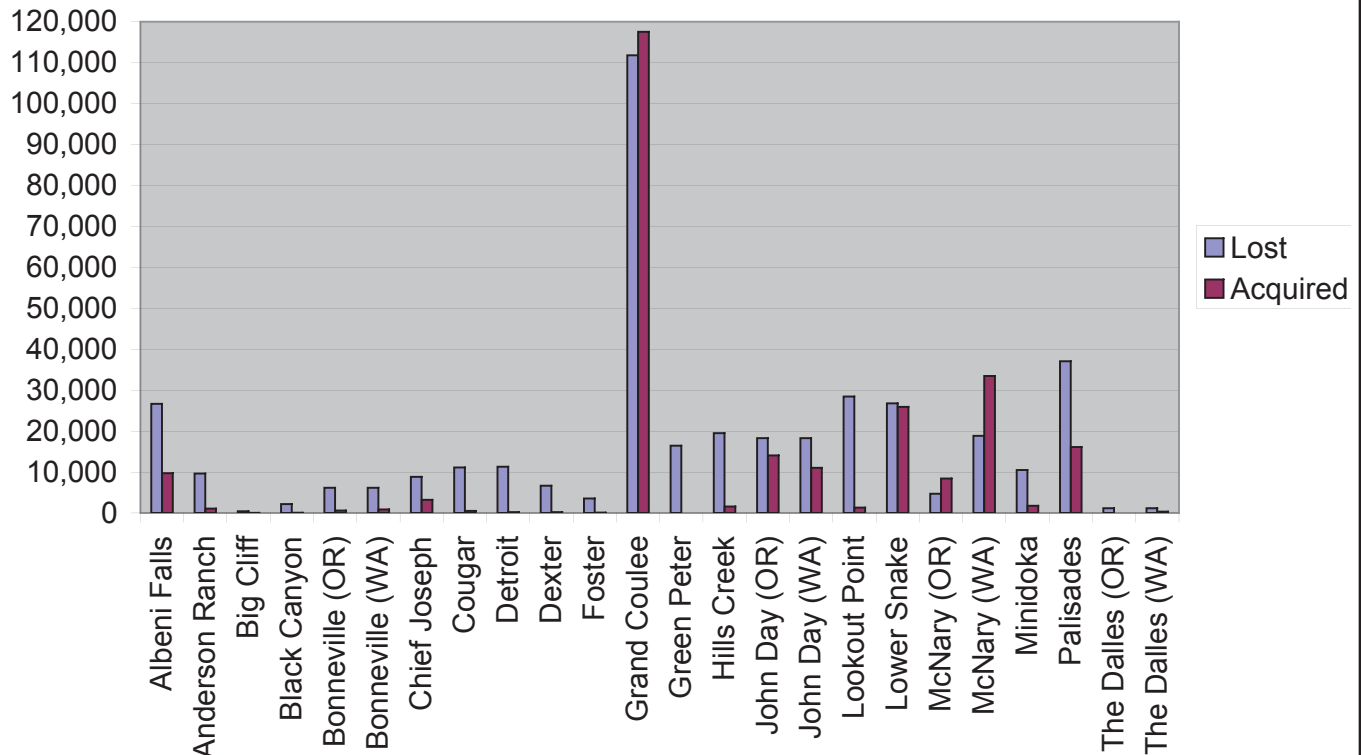
**Figure 6A: Grand Total  
Habitat Units Acquired 1978-2008, Compared to Losses**



Source: Bonneville Power Administration

**Figure 6B: Habitat Units Acquired, By Dam, Compared to losses, 1978-2008**

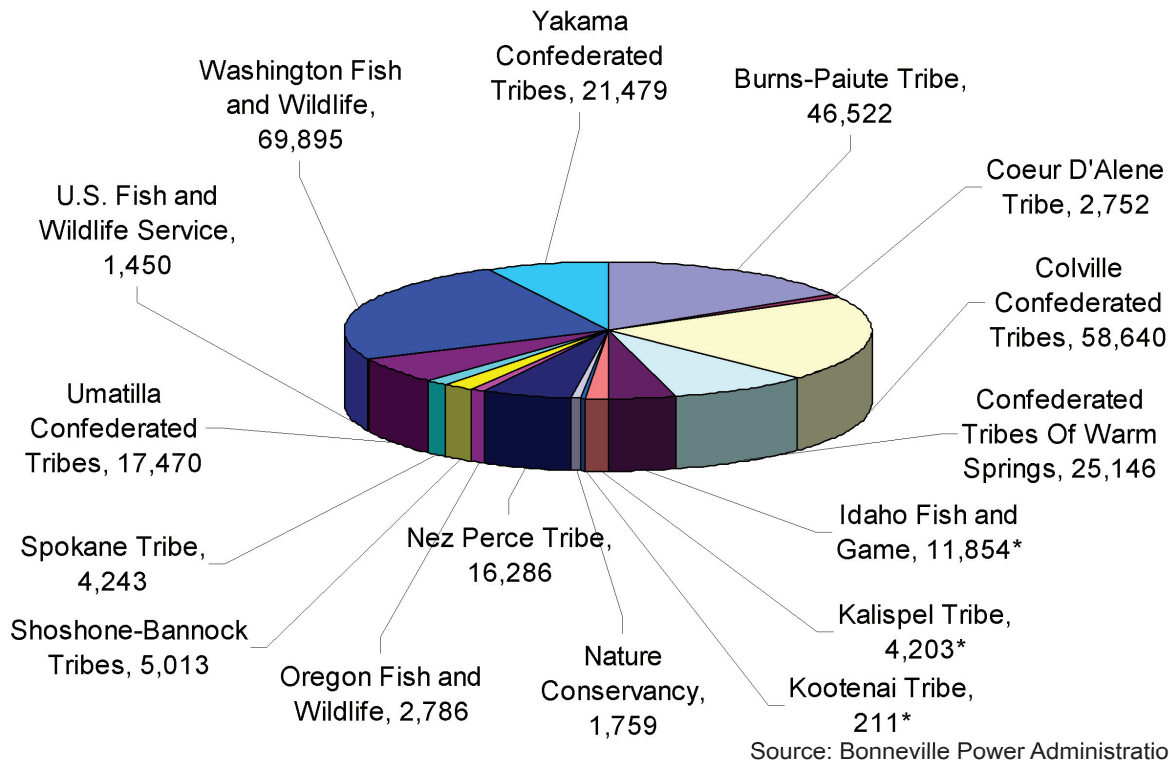
See Table 6 for totals



Source: Bonneville Power Administration

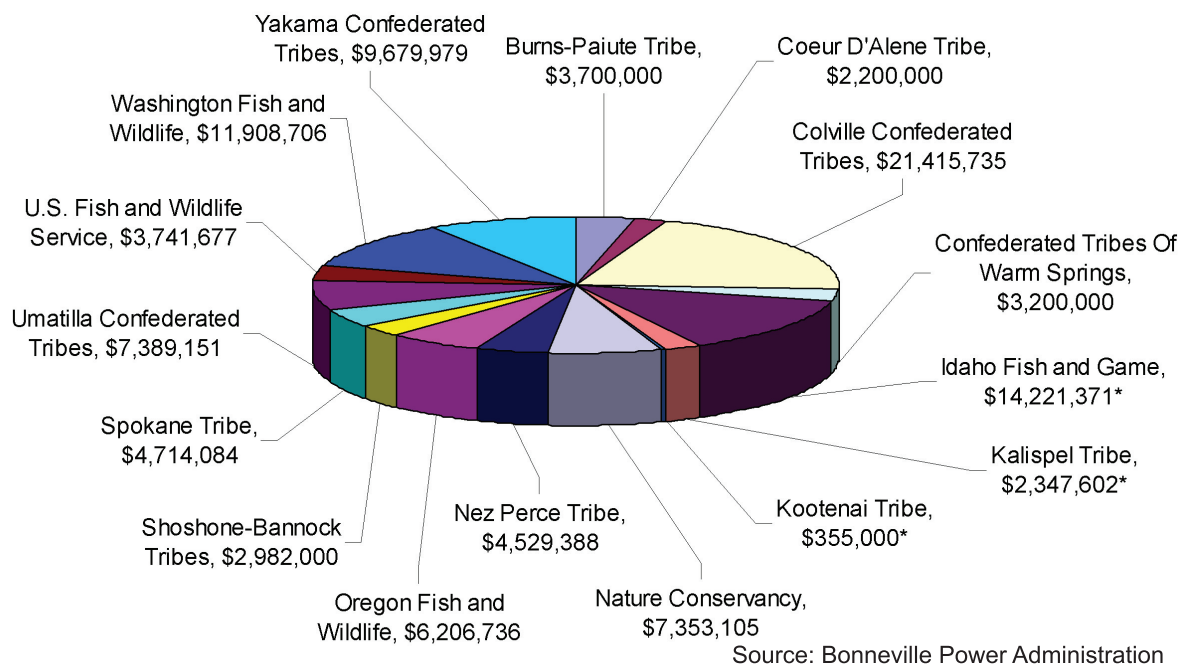


**Figure 7A: Wildlife Acres Protected by Agency, 1978 - March 2009. Total: 289,709 acres.**

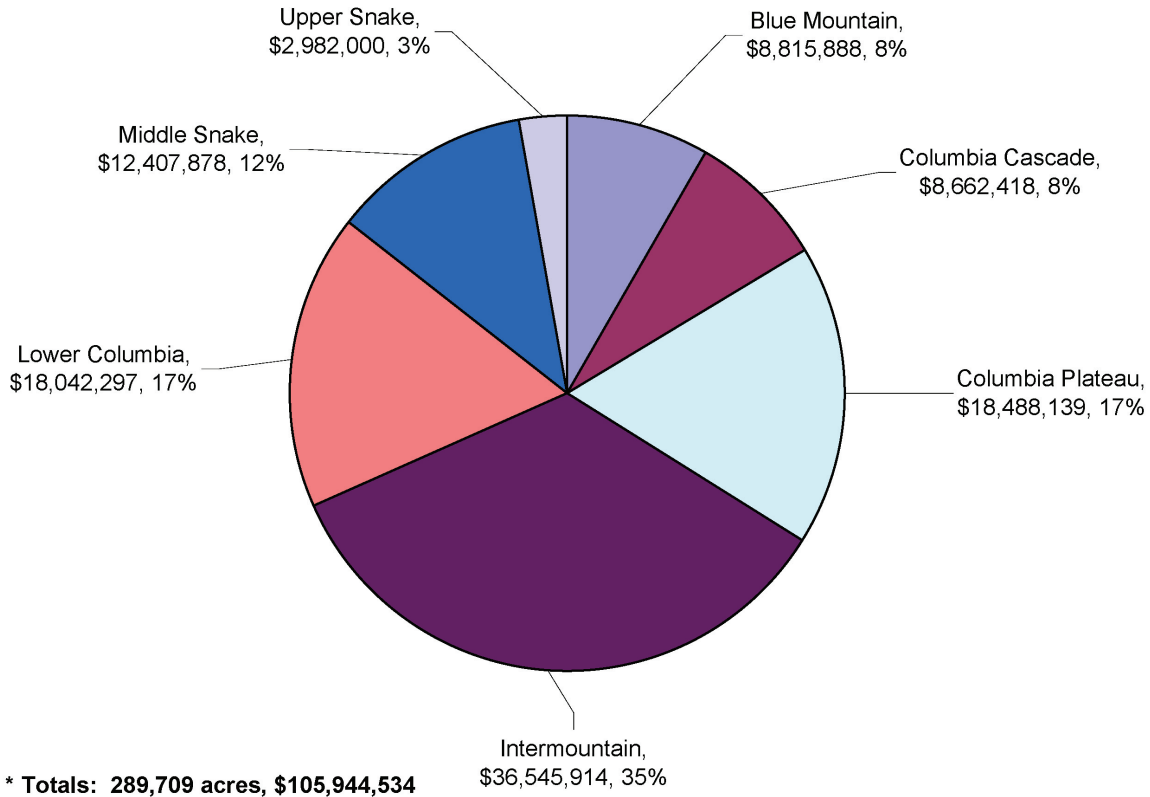


\* In Figures 7A and 7B, the amounts for Idaho Department of Fish and Game (IDFG), the Kootenai Tribe of Idaho, and the Kalispel Tribe have been adjusted from the amounts we reported in 2007. This is because a software improvement at Bonneville allows for multiple sponsors of a single project to be reported separately rather than lumped together. In this year's report, the three sponsors of the Albeni Falls Dam mitigation project are reported separately rather than collectively under IDFG. Thus, the IDFG amounts in both figures are smaller in this year's report than in last year's report, and the amounts for the Kootenai and Kalispel tribes are larger.

**Figure 7B: Wildlife Acquisition Costs by Agency, 1978 - March 2009. Total: \$105,944,534**



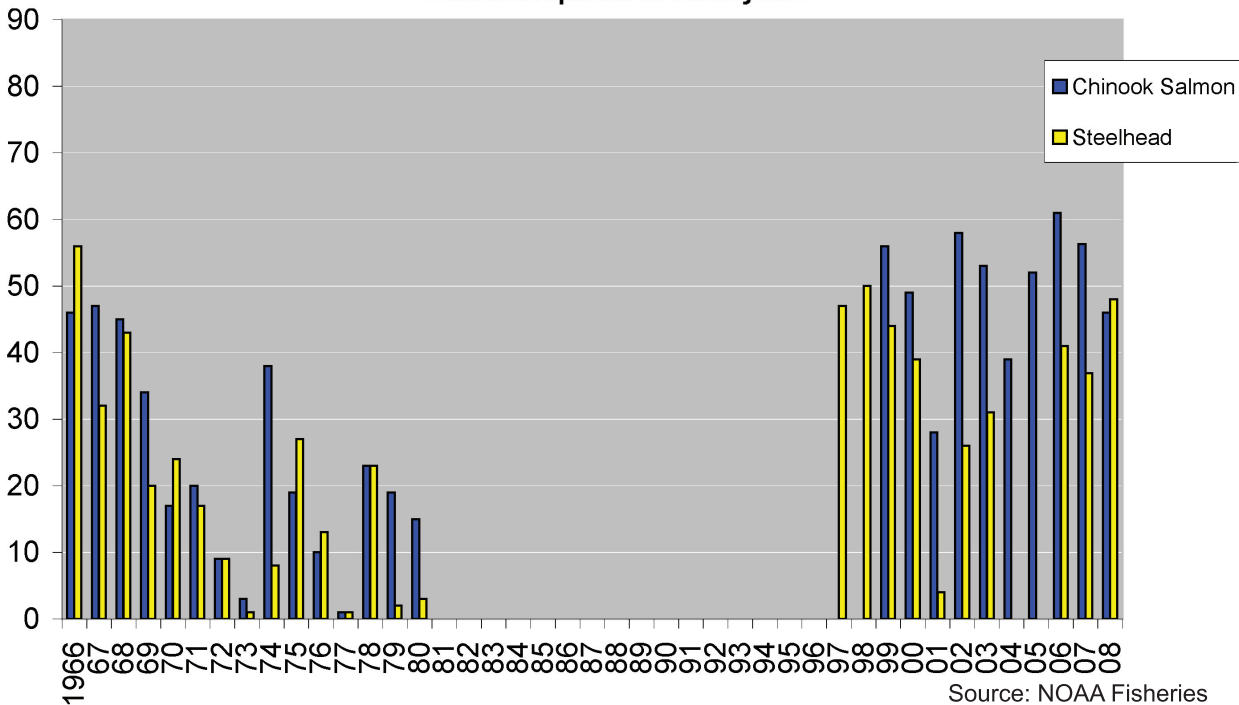
**Figure 8: Wildlife Acquisition Costs, 1978-March 2009, By Province\***



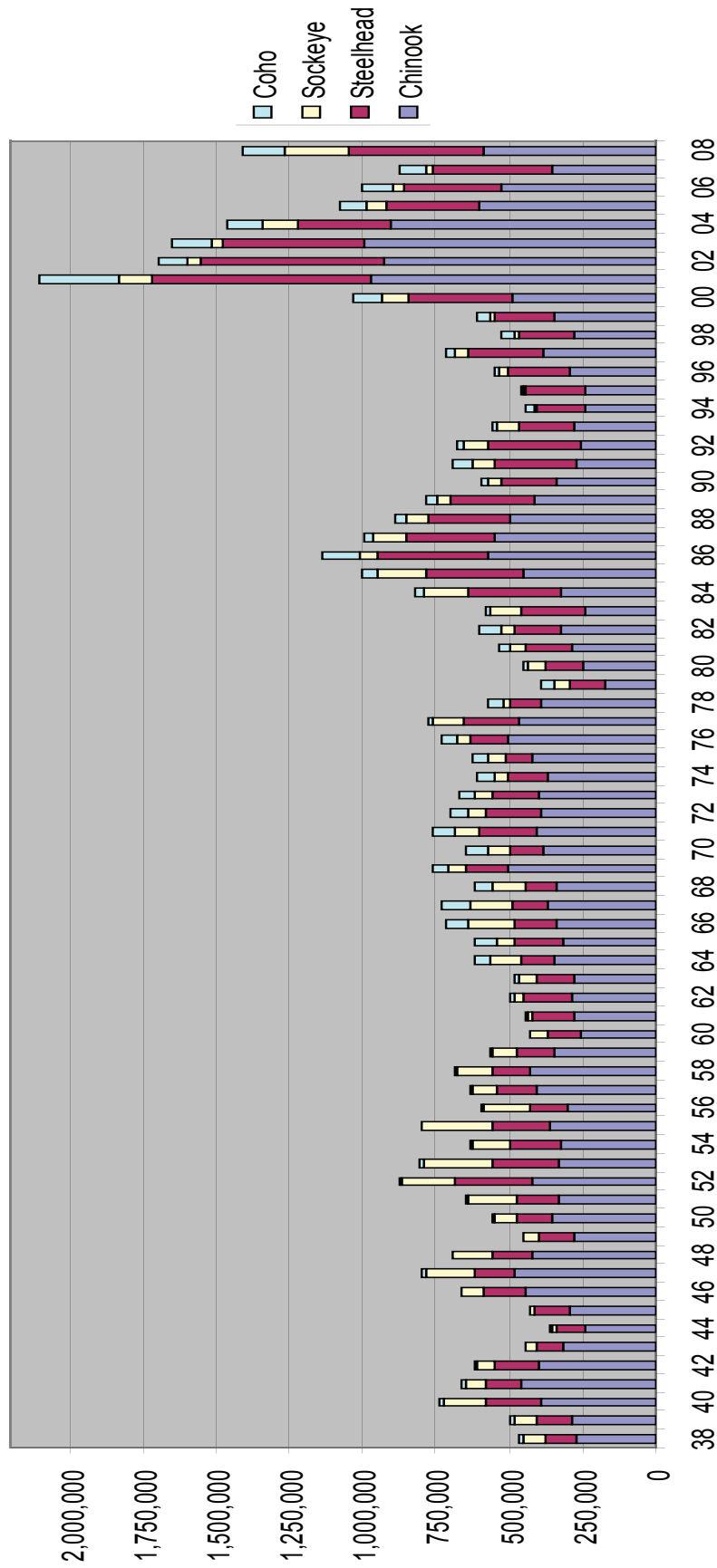
Source: Bonneville Power Administration

**Figure 9: Juvenile Salmon and Steelhead Survival Percentage, Lower Granite Dam to Bonneville Dam, by Year of Release, 1966-2008\***

\*Data not reported in some years

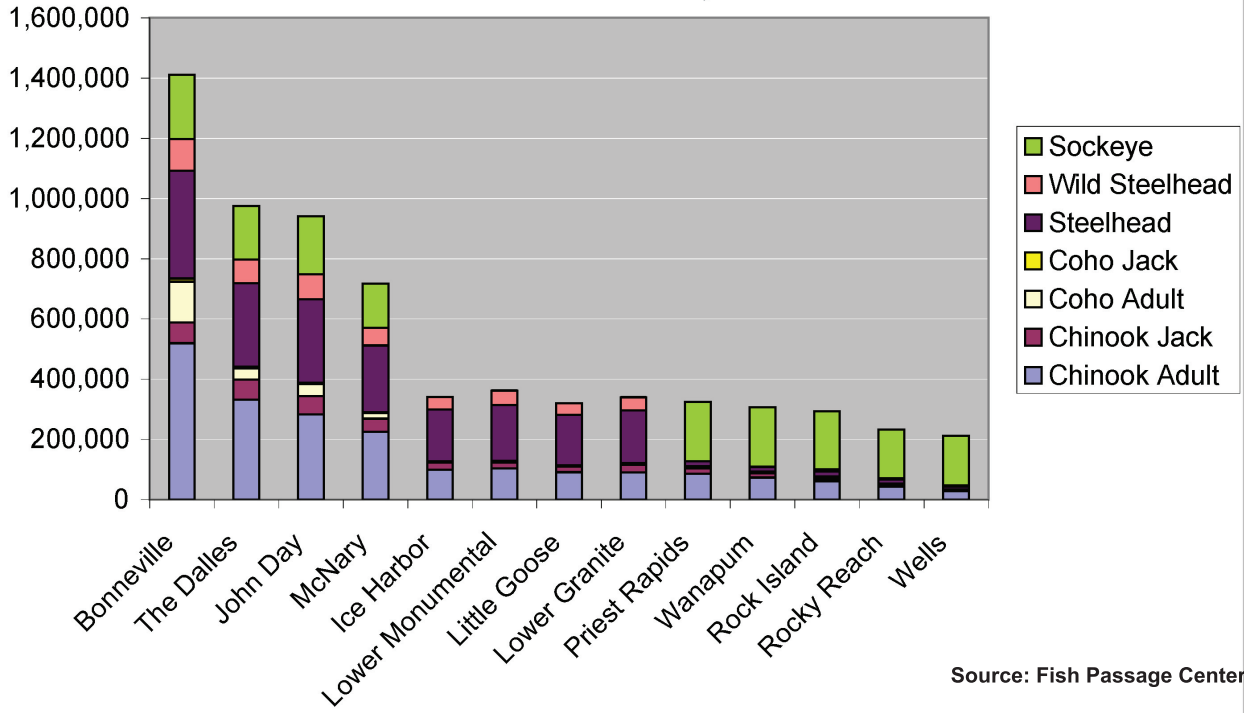


**Figure 10: Salmon and Steelhead Passing Bonneville Dam, 1938-2008**



Source: Fish Passage Center

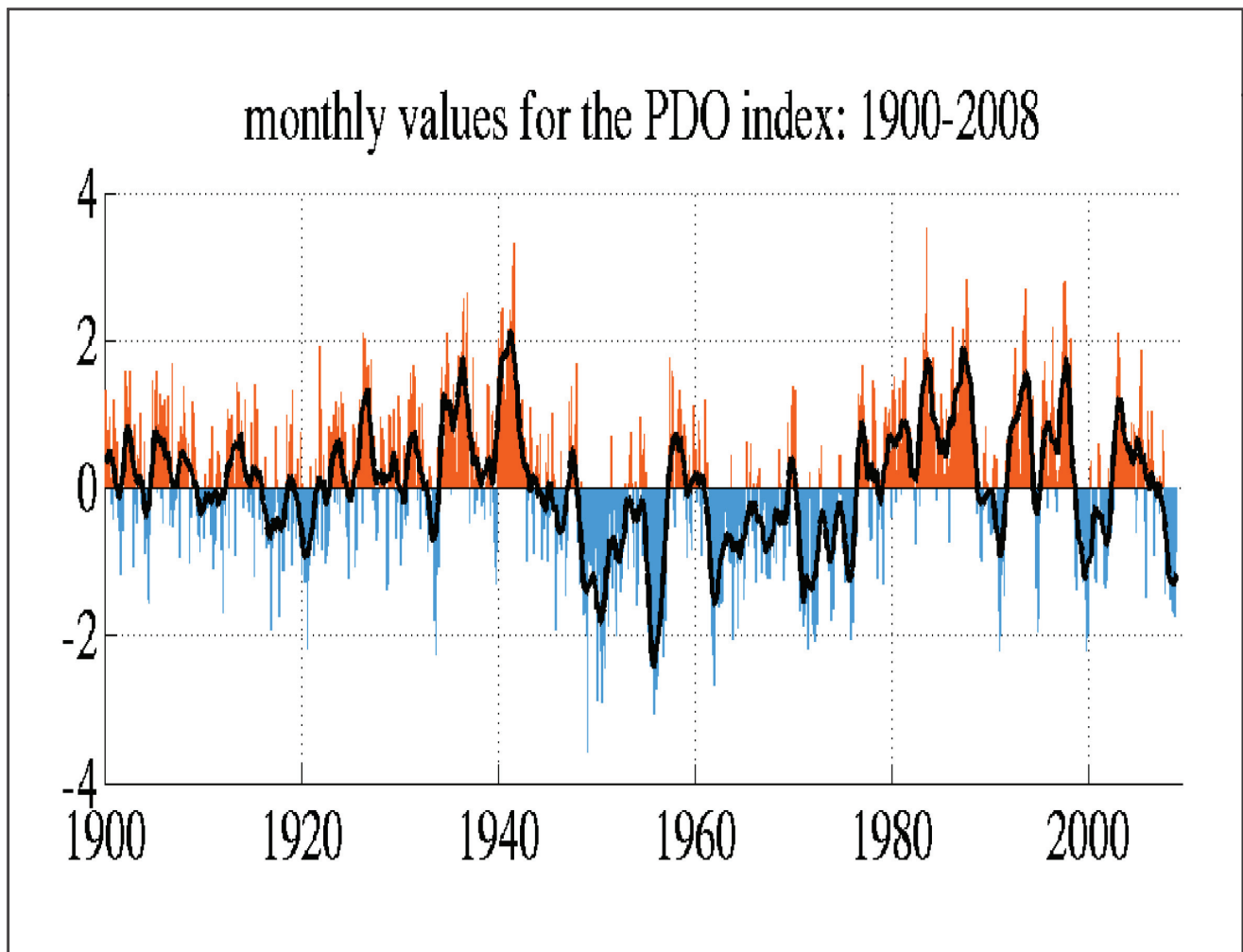
**Figure 11: Fish Counted at Columbia and Snake River Mainstem Dams, 2008**



Source: Fish Passage Center



Figure 12: Ocean Temperature Cycles, January 1900 through December 2008  
Source: University of Washington Joint Institute for the Study of the Atmosphere and Ocean



According to researchers at the University of Washington, the "Pacific Decadal Oscillation" (PDO) depicted in this figure is a long-lived El Niño-like pattern of Pacific Ocean climate variability. The PDO is different from El Niño, however, in two important ways. First, the 20th Century PDO "events" persisted for 20-30 years, while typical El Niño events persisted for six to 18 months. Second, the PDO appears to affect primarily the northern Pacific Ocean, while El Niño appears to affect primarily the southern Pacific. Major changes in Northeast Pacific marine ecosystems have been correlated with phase changes in the PDO; warm eras have seen enhanced coastal ocean biological productivity in Alaska and inhibited productivity off the West Coast of the contiguous United States, while cold PDO eras have seen the opposite north-south pattern of marine ecosystem productivity -- better conditions off the West Coast and poorer conditions in Alaska. Currently, the North Pacific is in a cool period, one that researchers at the University of Washington believe will last through the spring and into the summer of 2010, at least.

# Tables

## Table 1 Total Expenditures 1978-2008, in \$ millions.

COST ELEMENT	1978-1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
<b>CAPITAL INVESTMENTS 1/</b>																															
BPA FISH AND WILDLIFE																															
BPA SOFTWARE DEVELOPMENT COSTS 2/																															
ASSOCIATED PROJECTS (FEDERAL HYDRO) 3/																															
<b>TOTAL CAPITAL INVESTMENTS</b>	30.0	17.9	61.7	55.1	9.0	46.4	9.1	78.6	7.6	5.3	4.5	4.0	0.9	88.8	39.4	39.3	45.1	(42.6)	-	14.1	47.0	6.2	8.8	68.4	75.9	53.8	36.0	64.4	37.3		
<b>PROGRAM EXPENSES</b>	30.0	17.9	61.7	55.1	9.0	35.6	17.1	83.3	15.3	13.6	20.7	21.7	12.1	103.1	59.9	71.8	71.1	(14.5)	22.0	28.8	60.9	22.7	14.9	80.0	84.4	66.0	39.6	96.6	64.1		
BPA DIRECT FISH AND WILDLIFE PROGRAM	2.3	2.3	4.6	9.1	19.6	15.9	19.6	22.2	18.8	23.0	32.8	33.0	67.0	49.6	56.9	71.4	68.5	82.2	104.9	108.2	108.2	101.1	137.1	140.7	137.9	138.8	137.9	139.5	148.9		
SUPPLEMENTAL MITIGATION PROGRAM EXPENSES 4/																															
REIMBURSABLE/DIRECT-FUNDED PROJECTS 5/																															
O & M LOWER SHAKE RIVER HATCHERIES	-	0.5	1.0	2.2	3.6	5.4	4.9	5.8	5.1	7.6	8.3	8.7	11.2	11.2	12.4	12.7	11.5	11.8	11.4	13.0	12.4	12.7	14.9	15.1	17.3	17.2	20.1	19.3	19.4		
O & M CORPS OF ENGINEERS	15.0	5.4	7.6	9.1	10.0	11.4	15.8	20.7	10.5	12.3	11.5	11.8	13.3	14.0	16.9	17.8	18.2	18.9	18.5	19.9	19.7	23.1	28.2	30.3	32.3	32.9	31.8	32.9	34.4		
O & M BUREAU OF RECLAMATION	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.3	1.3	1.5	2.7	2.6	1.8	3.0	3.8	3.1	3.8	3.9	4.5	3.9	4.3		
OTHER (NW POWER AND CONSERVATION COUNCIL)	-	0.2	2.9	2.9	2.4	3.1	3.0	3.2	3.4	3.7	3.6	3.8	3.9	4.1	4.3	4.3	4.2	3.7	3.7	3.4	3.7	3.7	4.0	4.0	3.7	4.3	4.3	4.4	4.1		
<b>SUBTOTAL (REIMB/DIRECT-FUNDED)</b>	15.0	6.1	11.5	14.2	16.0	19.9	23.7	29.7	19.0	23.6	23.4	24.3	28.4	30.5	34.9	36.1	35.4	35.9	36.4	38.9	37.6	42.5	50.9	52.6	57.2	57.9	60.7	60.3	62.2		
<b>TOTAL OPERATING EXPENSES</b>	17.3	8.4	16.1	23.3	35.6	35.8	43.3	51.9	37.8	46.6	56.2	57.3	95.4	80.1	90.8	107.5	103.9	118.1	141.3	147.1	145.8	146.5	195.1	199.8	202.9	193.7	198.6	199.7	211.1		
<b>PROGRAM RELATED FIXED EXPENSES 6/</b>																															
INTEREST EXPENSE	15.0	6.4	9.2	12.1	12.7	15.3	17.1	22.2	24.3	24.5	26.0	29.2	31.4	40.6	46.1	44.9	51.1	52.4	48.9	49.4	48.4	49.1	48.5	49.9	53.8	56.4	53.4	76.0	76.9		
AMORTIZATION EXPENSE 6/	-	-	-	-	-	0.1	0.5	0.8	1.1	1.7	2.4	3.6	4.8	5.5	6.6	8.5	10.6	12.4	14.1	15.3	16.1	16.8	17.2	17.4	17.9	17.4	17.4	22.9	24.4		
DEPRECIATION EXPENSE 6/	9.0	2.4	3.2	3.8	3.9	4.3	4.5	5.5	5.6	5.7	5.9	5.4	5.7	7.5	8.4	10.2	11.4	11.5	11.4	11.4	11.8	12.3	12.5	13.2	14.8	15.9	16.7	14.0	14.9		
<b>TOTAL FIXED EXPENSES</b>	24.0	8.8	12.4	15.9	16.6	19.7	22.1	28.5	31.0	31.9	34.3	38.2	41.9	53.6	61.3	63.6	73.1	76.3	74.1	76.1	76.3	78.2	78.2	80.5	85.4	89.7	87.5	112.9	116.2		
<b>GRAND TOTAL PROGRAM EXPENSES</b>	41.3	17.2	28.5	39.2	52.2	55.5	65.4	80.4	68.8	78.5	90.5	95.5	137.3	133.7	152.1	171.1	177.0	194.4	215.4	223.2	222.1	224.7	273.3	280.3	288.3	283.4	286.1	312.6	327.3		
<b>FOREGONE REVENUES AND POWER PURCHASES</b>																															
FOREGONE REVENUES	-	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	71.1	81.7	107.8	116.5	197.8	193.1	115.9	12.6	79.2	21.7	182.1	397.4	282.6	273.5		
BPA POWER PURCH. FOR FISH ENHANCEMENT 6/	-	-	-	-	12.0	17.0	74.0	11.0	40.0	40.0	40.0	40.0	59.0	104.0	111.7	63.5	-	-	5.4	47.6	64.8	1,389.6	147.8	171.1	191.0	110.8	168.2	120.7	274.9		
<b>TOTAL FOREGONE REVENUES AND POWER PURCHASES</b>	-	3.0	14.0	1.0	20.0	44.0	93.0	20.0	50.0	55.0	55.0	64.0	82.0	149.0	173.7	70.6	81.7	107.8	121.9	245.4	257.9	1,505.5	160.4	250.3	212.7	292.9	585.6	403.3	548.5		
<b>TOTAL PROGRAM EXPENSES, FOREGONE REVENUES, &amp; POWER PURCHASES</b>	41.3	20.2	42.5	40.2	72.2	99.5	118.4	100.4	118.8	133.5	145.5	150.5	219.3	282.7	325.8	241.7	258.7	302.2	337.3	468.6	480.0	1,730.2	433.7	530.6	500.0	576.3	851.7	715.9	875.8		
<b>CREDITS</b>																															
4010(D)(C)																															
FISH COST CONTINGENCY FUND																															
<b>TOTAL CREDITS</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(45.2)	(25.5)	(35.7)	(46.0)	(50.4)	(66.4)	(66.4)	(86.2)	(77.6)	(57.7)	(76.4)	(66.1)	(100.5)		
<b>FISH COST CONTINGENCY FUND</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(46.2)	(26.5)	(35.7)	(46.0)	(50.4)	(66.4)	(66.4)	(86.2)	(77.6)	(57.7)	(76.4)	(66.1)	(100.5)		
<b>TOTAL CREDITS</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(46.2)	(26.5)	(35.7)	(46.0)	(50.4)	(66.4)	(66.4)	(86.2)	(77.6)	(57.7)	(76.4)	(66.1)	(100.5)		
<b>FISH COST CONTINGENCY FUND</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(46.2)	(26.5)	(35.7)	(46.0)	(50.4)	(66.4)	(66.4)	(86.2)	(77.6)	(57.7)	(76.4)	(66.1)	(100.5)		

This information has been made publicly available by BPA on 03/01/2007. The figures shown are consistent with audited actuals that contain Agency approved financial information, except for Foregone Revenues and Power Purchases which are estimates and do not contain Agency approved financial information. Notes appear on next page and are an integral part of this information.

1/ Capital investments include both BPA's direct Fish and Wildlife Program capital investments, funded by BPA's Treasury borrowing and "Associated Projects" which include capital investments at Corps of Engineers and Bureau of Reclamation projects, funded by appropriations and lead by BPA. The negative amount in FY 1997 reflects a decision to reverse "plant-in-place" treatment that was never actually placed into service. The annual expenses associated with these investments are included in "Program-Related Fixed Expenses" below.

2/ Capitalization of FISIES development costs. These costs were previously reflected in the "BPA DIRECT FISH AND WILDLIFE PROGRAM" in years prior to 2005.

3/ 2008 figure includes \$300 million for the CRHM study costs FAS 71 asset.

4/ Includes High Priority and Action Plan Expenses and other supplemental programs including PBL contribution to Pleimorrow rewild program.

5/ Reimbursable/Direct-Funded Projects includes the portion of costs BPA pays to or on behalf of other entities that is determined to be for fish and wildlife.

**Table 2 Expenditures by Species 1978-2008**

Expenditures by Species, 1978-2008				
Fiscal Year	Anadromous Fish	Resident Fish	Wildlife	Total
1978	\$400,000	\$0	\$0	\$400,000
1979	\$979,628	\$0	\$0	\$979,628
1980	\$1,232,775	\$0	\$0	\$1,232,775
1981	\$1,512,801	\$251,000	\$0	\$1,763,801
1982	\$5,349,333	\$335,930	\$0	\$5,685,263
1983	\$7,222,161	\$1,441,440	\$789,026	\$9,452,627
1984	\$16,675,925	\$1,263,895	\$589,066	\$18,528,886
1985	\$19,945,958	\$3,571,308	\$553,022	\$24,070,288
1986	\$22,208,357	\$3,779,463	\$1,009,667	\$26,997,487
1987	\$26,560,517	\$591,182	\$1,149,655	\$28,301,354
1988	\$15,848,972	\$6,389,391	\$1,040,601	\$23,278,964
1989	\$25,225,428	\$3,016,827	\$2,053,497	\$30,295,752
1990	\$27,737,779	\$7,795,641	\$1,058,418	\$36,591,838
1991	\$38,973,827	\$2,028,859	\$2,530,970	\$43,533,656
1992	\$53,119,662	\$3,550,209	\$12,847,109	\$69,516,980
1993	\$51,129,495	\$5,457,600	\$8,936,699	\$65,523,794
1994	\$51,044,466	\$7,072,137	\$16,090,951	\$74,207,554
1995	\$49,894,315	\$8,692,253	\$10,206,415	\$68,792,983
1996	\$83,789,352	\$7,962,544	\$14,815,773	\$106,567,669
1997	\$66,524,626	\$12,944,597	\$16,615,431	\$96,084,654
1998	\$85,533,382	\$20,991,620	\$12,675,870	\$119,200,872
1999	\$82,415,426	\$14,850,466	\$13,443,429	\$110,709,321
2000	\$80,591,738	\$15,808,570	\$6,022,069	\$102,422,377
2001	\$86,707,688	\$12,348,834	\$12,117,092	\$111,173,614
2002	\$103,474,620	\$17,568,123	\$9,413,746	\$130,456,489
2003	\$105,384,293	\$22,764,723	\$7,670,918	\$135,819,935
2004	\$96,206,585	\$18,899,368	\$10,659,908	\$125,765,860
2005	\$101,172,351	\$20,236,591	\$13,278,339	\$134,687,281
2006	\$106,630,937	\$25,688,291	\$26,842,908	\$173,276,548
2007	\$105,122,394	\$21,444,665	\$33,363,535	\$174,656,855
2008	\$102,755,054	\$31,010,039	\$16,679,586	\$150,444,679
<b>Total</b>	<b>\$1,621,369,846</b>	<b>\$297,755,565</b>	<b>\$252,453,700</b>	<b>\$2,049,975,105</b>

**Table 3A Expenditures by Category**

Category	2003	2004	2005	2006	2007	2008**
Coordination	\$6,403,568	\$5,760,114	\$6,594,675	\$7,126,067	\$7,393,717	\$15,227,116
Data Management	\$236,896	\$558,731	\$906,578	\$160,439	\$206,545	\$2,803,385
Habitat (Restoration/Protection)	\$39,500,655	\$40,306,108	\$44,898,740	\$67,288,171	\$65,391,135	\$60,793,513
Harvest Augmentation	\$1,957,396	\$2,666,015	\$1,611,232		\$447,385	\$3,674,945
Mainstem Survival	\$3,639,242	\$3,228,871	\$4,112,685	\$2,865,380	\$4,164,020	-
Monitoring	\$20,930,630	\$17,189,343	\$18,008,894	\$22,117,979	\$22,794,198	-
Production (Supplementation)	\$34,939,205	\$32,185,286	\$33,085,526	\$36,003,557	\$36,296,240	\$25,638,528
Research and Evaluation	\$32,672,718	\$33,890,947	\$27,683,912	\$28,087,509	\$26,811,186	-
BPA Program Support	\$12,041,388	\$10,648,717	\$10,990,758	\$9,627,446	\$11,152,430	\$12,141,926
Other			158,184.00			-
Law Enforcement						\$1,119,159
Predator Removal						\$3,208,172
Research, Monitoring and Evaluation						\$61,948,189
<b>Total</b>	<b>\$ 152,323,700</b>	<b>\$ 146,436,134</b>	<b>\$ 148,053,191</b>	<b>\$173,276,548</b>	<b>\$174,656,855</b>	<b>\$174,413,007</b>

\* Excludes Action Plan and High Priority

\*\* Starting in 2008, as part of an effort to improve how BPA manages Fish and Wildlife Program data and reporting, the agency updated some of its project categories. The new project categories are called "Purpose" and "Emphasis," where purpose describes the general goal or purpose of the project and emphasis describes the primary types of work being employed by the project. BPA program support is included within Coordination, Data Management, and RM&E emphasis types.

This information has been made publicly available by BPA in March 2009 and does not contain BPA-approved Agency Financial Information.

**Table 3B Program Support and Area for FY 2008**

Area	Emphasis Type	BPA Program Support	Total Program
Basinwide	Coordination	\$10,507,829	\$14,115,862
	Data Management	\$16,000	\$2,803,385
	Law Enforcement		\$631,370
	Predator Removal		\$3,208,172
	Restoration/Protection		\$4,417,344
	RM and E	\$1,618,097	\$28,054,364
	Supplementation		\$645,400
<b>Basinwide Total</b>		<b>\$12,141,926</b>	<b>\$53,875,897</b>
Basinwide, Mainstem	RM and E		\$76,400
<b>Basinwide, Mainstem Total</b>			<b>\$76,400</b>
Mainstem	Law Enforcement		\$487,788
<b>Mainstem Total</b>			<b>\$487,788</b>
Provincial	Coordination		\$1,111,254
	Harvest Augmentation		\$3,674,945
	Restoration/Protection		\$56,376,169
	RM and E		\$33,817,425
	Supplementation		\$24,993,129
<b>Provincial Total</b>			<b>\$119,972,922</b>
<b>Grand Total</b>			<b>\$174,413,007</b>

This information has been made publicly available by BPA in March 2009 and does not contain BPA-approved Agency Financial Information.



**Table 4 Expenditures by Province**

Province	1978-2006	2003	2004	2005	2006	2007	2008
SYSTEMWIDE	\$626,006,378	\$41,021,491	\$42,375,167	\$39,508,689	40,907,651	\$40,015,709	n/a
COLUMBIA PLATEAU	\$ 500,030,897	\$28,530,634	\$25,395,810	\$27,057,099	\$29,160,056	\$28,768,912	\$37,188,905
MOUNTAIN SNAKE	\$ 246,919,228	\$20,023,083	\$17,908,414	\$17,157,162	\$17,847,701	\$16,791,815	\$19,398,012
INTERMOUNTAIN	\$ 126,081,336	\$12,884,976	\$13,116,278	\$18,225,072	\$21,567,550	\$25,281,129	\$14,497,055
MOUNTAIN COLUMBIA	\$ 111,152,129	\$8,040,476	\$6,897,321	\$7,004,651	\$22,062,063	\$9,497,889	\$11,347,198
BLUE MOUNTAIN	\$ 106,773,307	\$9,399,860	\$6,895,057	\$8,236,701	\$9,380,167	\$9,489,802	\$9,336,015
COLUMBIA GORGE	\$ 59,460,106	\$6,487,780	\$4,947,368	\$5,103,954	\$5,336,398	\$4,993,260	\$8,354,049
COLUMBIA CASCADE	\$ 47,055,061	\$3,454,315	\$5,153,736	\$4,548,526	\$5,634,292	\$7,340,355	\$9,192,920
LOWER COLUMBIA	\$ 43,294,983	\$4,205,860	\$6,006,986	\$3,374,505	\$3,719,790	\$13,533,874	\$14,744,699
COLUMBIA ESTUARY	\$ 33,851,395	\$3,289,408	\$5,008,417	\$4,295,766	\$4,323,443	\$5,229,672	\$6,075,054
MIDDLE SNAKE	\$ 22,891,457	\$1,877,824	\$1,735,608	\$1,565,370	\$1,782,938	\$1,782,913	\$6,659,039
UPPER SNAKE	\$ 20,244,652	\$1,064,601	\$345,252	\$659,919	\$653,051	\$701,439	\$1,184,634
OTHER							\$6,167,509
Subtotal	\$1,943,760,929	\$140,280,309	\$135,785,413	\$136,737,413	162,375,100	163,426,769	\$144,145,089
Program Support (BPA Overhead)	\$ 74,710,414	\$12,041,388	\$10,648,717	\$10,990,758	\$10,901,449	\$11,230,086	\$11,545,771
Program Administration							\$18,722,147
Total	\$2,018,471,343	\$152,321,697	\$146,434,130	\$147,728,172	\$173,276,549	\$174,656,855	\$174,413,007

1) Starting in 2008, spending by province is tracked in Pisces based on where the contractor explicitly identified work location.

2) Other includes "Undetermined" locations such as Ocean, Canada; and provinces not recognized by NPCC.

3) Program Administration includes spending that cannot be traced back to a contract that has at least one work element requiring location (e.g. coordination contracts); contracts without any work elements at all; or program level spending not mapped to a specific project (e.g. Environmental Compliance).

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**Table 5 Expenditures by Contractor Types**

<b>Contractor</b>	
PACIFIC STATES MARINE FISHERIES COMMISSION (PSMFC)	\$167,043,656.89
NEZ PERCE TRIBE	\$137,324,680.22
CONFEDERATED TRIBES OF THE YAKAMA NATION	\$130,673,936.46
OREGON DEPARTMENT OF FISH & WILDLIFE- HQ	\$125,534,605.31
IDAHO DEPARTMENT OF FISH & GAME	\$105,018,227.35
WASHINGTON DEPARTMENT OF FISH & WILDLIFE	\$81,747,194.05
NATIONAL MARINE FISHERIES SERVICE	\$80,612,517.12
UMATILLA CONFEDERATED TRIBES (CTUIR)	\$60,588,312.00
COLVILLE CONFEDERATED TRIBES	\$47,093,364.99
CONFEDERATED TRIBES OF WARM SPRINGS	\$41,754,820.00
KOOTENAI TRIBE OF IDAHO	\$35,432,809.00
COLUMBIA BASIN FISH & WILDLIFE FOUNDATION	\$30,710,625.48
NORTHWEST POWER PLANNING COUNCIL	\$26,857,744.67
SPOKANE TRIBE OF INDIANS	\$26,574,159.69
COEUR D'ALENE TRIBE	\$19,521,451.73
CONFEDERATED SALISH-KOOTENAI TRIBES	\$18,648,450.25
NATIONAL FISH & WILDLIFE FOUNDATION	\$18,491,274.89
US DOE RICHLAND OPERATIONS OFC	\$18,085,851.44
UNIVERSITY OF WASHINGTON	\$17,292,635.76
US DOI FISH & WILDLIFE SERVICE	\$17,094,950.73
SUPPORT	\$16,848,350.00
KALISPEL TRIBE OF INDIANS	\$16,796,170.53
NATT MCDUGALL COMPANY	\$15,876,408.00
US FISH AND WILDLIFE SERVICE - PORTLAND REGION	\$15,120,270.65
NATIONAL MARINE FISHERIES SERVICE - PORTLAND OFFICE	\$14,860,289.00
MWH AMERICAS INC	\$14,676,129.24
SHOSHONE-BANNOCK TRIBES	\$14,408,456.35
COLUMBIA RIVER INTERTRIBAL FISH COMMISSION (CRITFC)	\$13,863,143.62
MONTANA FISH, WILDLIFE & PARKS	\$12,668,108.65
BONNEVILLE POWER ADMINISTRATION - TRANSMISSION BUSINESS LIN	\$11,860,217.00
FISHPRO, INC.	\$11,461,930.06
US DOI BUREAU OF RECLAMATION	\$11,390,662.19
SHOSHONE-PAIUTE TRIBES	\$10,756,918.00
IMPERO CONSTRUCTION COMPANY	\$10,716,321.00
BURNS-PAIUTE TRIBE	\$10,121,136.08
NATIONAL BIOLOGICAL SERVICE / US FISH AND WILDLIFE SERVICE - NATION	\$9,844,736.00
US DOI GEOLOGICAL SURVEY	\$9,454,714.42
US ARMY CORE OF ENGINEERS - PORTLAND DISTRICT	\$8,908,415.00
CUSTER SOIL & WATER CONSERVATION DISTRICT	\$8,747,259.39
OREGON STATE UNIVERSITY	\$8,024,802.54
LOWER COLUMBIA RIVER ESTUARY PARTNERSHIP	\$7,514,204.77
UMATILLA ELECTRIC COOP ASSOCIATION	\$7,397,688.59
WASHINGTON DEPT OF ECOLOGY	\$6,390,553.89
MONTANA DEPARTMENT OF FISH & WILDLIFE - HELEN	\$5,697,907.00
DIGITAL ANGEL CORPORATION	\$5,233,128.84
USDA FOREST SERVICE	\$5,179,695.57
CH2MHILL - NORTHWEST INC.	\$5,090,081.00
CANADA DEPARTMENT OF FISHERIES & OCEANS	\$5,082,694.00
WESTLAND IRRIGATION DISTRICT	\$4,903,649.22
IDAHO SOIL & WATER CONSERVATION COMMISSION	\$4,443,157.07
KINTAMA RESEARCH CORPORATION	\$3,650,861.00

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Table 6A: Habitat Units Acquired, by dam , 1978-2008

<b>Lost</b>	<b>Acquired</b>
404,567	247,964

Table 6B: Habitat Units Acquired, by dam, compared to losses, 1978-2008

	<b>Lost</b>	<b>Acquired</b>
Albeni Falls	26,658	9,709
Anderson Ranch	9,619	1,063
Big Cliff	413	32
Black Canyon	2,170	57
Bonneville (OR)	6,159	590
Bonneville (WA)	6,159	871
Chief Joseph	8,833	3222
Cougar	11,124	511
Detroit	11,298	200
Dexter	6,648	196
Foster	3,544	96
Grand Coulee	111,785	117,540
Green Peter	16,432	0
Hills Creek	19,498	1,565
John Day (OR)	18,280	14,057
John Day (WA)	18,280	11,019
Lookout Point	28,454	1,296
Lower Snake	26,775	25,919
McNary (OR)	4,710	8,406
McNary (WA)	18,834	33,449
Minidoka	10,503	1,744
Palisades	37,070	16,093
The Dalles (OR)	1,165	0
The Dalles (WA)	1,165	329

**Table 7A BPA Wildlife Acres Protected by Agency, 1978 through March, 2009**

Agency Name	Acres Protected
Burns-Paiute Tribe	46,522
Coeur D'Alene Tribe	2,752*
Colville Confederated Tribes	58,640
Confederated Tribes Of Warm Springs	25,146
Idaho Department of Fish and Game (IDFG)	11,854*
Kalispel Tribe	4,203*
Kootenai Tribe	211 *
Nature Conservancy	1,759
Nez Perce Tribe	16,286
Oregon Department Of Fish and Wildlife (ODFW)	2,786
Shoshone-Bannock Tribes	5,013
Spokane Tribe	4,243
Umatilla Confederated Tribes (CTUIR)	17,470
US Fish and Wildlife Service (USFWS)	1,450
US Forest Service (USFS)	0
Washington Department of Fish and Wildlife (WDFW)	69,895
Yakama Confederated Tribes	21,479
<b>Grand Total</b>	<b>289,709</b>

**Table 7B BPA Wildlife Acquisition Costs by Agency, 1978 through March, 2009**

Agency Name	Cost
Burns-Paiute Tribe	\$3,700,000
Coeur D'Alene Tribe	\$2,200,000 *
Colville Confederated Tribes	\$21,415,735
Confederated Tribes Of Warm Springs	\$3,200,000
Idaho Department of Fish and Game (IDFG)	\$14,221,371*
Kalispel Tribe	\$2,347,602 *
Kootenai Tribe	\$355,000 *
Nature Conservancy	\$7,353,105
Nez Perce Tribe	\$4,529,388
Oregon Department Of Fish and Wildlife (ODFW)	\$6,206,736
Shoshone-Bannock Tribes	\$2,982,000
Spokane Tribe	\$4,714,084
Umatilla Confederated Tribes (CTUIR)	\$7,389,151
US Fish and Wildlife Service (USFWS)	\$3,741,677
US Forest Service (USFS)	\$0
Washington Department of Fish and Wildlife (WDFW)	\$11,908,706
Yakama Confederated Tribes	\$9,679,979
<b>Grand Total</b>	<b>\$105,944,534</b>

\* Amount reflects pro-rated share as one of four co-sponsors of the Albeni Falls mitigation project.

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**Table 8: Wildlife Acquisition and Costs by Province, 1978 Through March, 2009**

*Province / Subbasin	WL Site	Acres Protected	Purchase Cost	Purchase Type	Purchase Fiscal Year
Blue Mountain / Asotin	Schlee	8,459	\$3,000,000	Fee Title	2004
Blue Mountain / Asotin	Bickford	1,646	\$0	No purchase (enhancement only)	2006
Blue Mountain / Asotin	Schlee (WDFW portion)	1,218	\$300,000	Fee Title	2004
Blue Mountain / Grande Ronde	ODL #1	760	\$228,486	Fee Title	2005
Blue Mountain / Grande Ronde	ODL #2	201	\$50,378	Fee Title	2005
Blue Mountain / Grande Ronde	Precious Lands - Beach	1,541	\$628,254	Fee Title	1999
Blue Mountain / Grande Ronde	Precious Lands - Gram	5	\$11,360	Fee Title	1999
Blue Mountain / Grande Ronde	Precious Lands - Helm Tract	10,306	\$2,625,657	Fee Title	1999
Blue Mountain / Grande Ronde	Precious Lands - Jackman	3,473	\$985,253	Fee Title	2000
Blue Mountain / Grande Ronde	Conley Lake	160	\$149,500	Fee Title	2001
Blue Mountain / Grande Ronde	North City	75		Fee Title	2001
Blue Mountain / Grande Ronde	Simonis	375	\$539,000	Fee Title	2001
Blue Mountain / Grande Ronde	Wallender	309	\$298,000	Fee Title	2002
Columbia Cascade / Columbia Upper Middle	Chester Butte (MJM Ranch)	2,206	\$285,887	Fee Title	1978
Columbia Cascade / Columbia Upper Middle	Dezellem Lake	469	\$0	Fee Title	2004
Columbia Cascade / Columbia Upper Middle	Dormaier	320	\$100,545	Fee Title	1978
Columbia Cascade / Columbia Upper Middle	JoJaCo-Smith 2	2,638	\$0	Fee Title	2004
Columbia Cascade / Columbia Upper Middle	McClain Lake	469	\$0	Fee Title	2004
Columbia Cascade / Columbia Upper Middle	North Bridgeport	321	\$0	Fee Title	2004
Columbia Cascade / Columbia Upper Middle	SBF Middle	162	\$0	Fee Title	2004
Columbia Cascade / Columbia Upper Middle	West Foster (Smith)	1,974	\$671,154	Fee Title	1978
Columbia Cascade / Columbia Upper Middle	Pygmy Rabbit CRMP - DNR	3,500	\$421,637	Fee Title	1978
Columbia Cascade / Columbia Upper Middle	Sagebrush Flat (Douglas County Pygmy Rabbit)	240	\$0	None/unknown	1978
Columbia Cascade / Columbia Upper Middle	West Foster Creek Expansion	3,756		No purchase (enhancement only)	2005
Columbia Cascade / Okanogan	Eder	3,337	\$3,033,832	Fee Title	2007
Columbia Cascade / Okanogan	Happy Hill (Brown)	61	\$63,813	Fee Title	1978
Columbia Cascade / Okanogan	Tunk (Fisher, Crawfish Lake, and A&M Northland)	320	\$0	None/unknown	1978
Columbia Cascade / Okanogan	Scotch Creek - WDFW	15,084	\$0	No purchase (enhancement only)	1996
Columbia Cascade / Okanogan	Sunnyside - WDFW	0		None/unknown	
Columbia Cascade / Okanogan	Wenas - BPA	0		None/unknown	
Columbia Cascade / Okanogan	Wenas - WDFW	0		None/unknown	
Columbia Cascade / Okanogan	Rainwater Ranch	8,768	\$4,085,550	Fee Title	1998
Columbia Gorge / Columbia Gorge	Headstart Program	80		No purchase (enhancement only)	2001
Columbia Plateau / Crab	Swanson Lakes - BPA	14,840	\$0	None/unknown	1978
Columbia Plateau / Crab	Swanson Lakes - WDFW	5,225	\$0	None/unknown	1978
Columbia Plateau / Crab	Kaniksu Addition	706	\$313,000	Fee Title	2000
Columbia Plateau / Crab	Weir	200	\$275,707	Fee Title	1998
Columbia Plateau / Crab	Bliss	9	\$110,000	Fee Title	1996
Columbia Plateau / Crab	Burlington Northern	27	\$139,000	Fee Title	1999
Columbia Plateau / Crab	James	90	\$594,000	Fee Title	1996
Columbia Plateau / Crab	Straub	191	\$872,852	Fee Title	1995
Columbia Plateau / Crab	Desert - WDFW	1,000	\$0	No purchase (enhancement only)	2006
Columbia Plateau / John Day	Pine Creek	25,146	\$3,200,000	Fee Title	1999
Columbia Plateau / Umatilla	Wanaket (Conforth Ranch)	2,765	\$1,042,976	Fee Title	1993
Columbia Plateau / Umatilla	Iskuulpa	5,937	\$2,260,625	Fee Title	1997
Columbia Plateau / Yakima	Bailey	40	\$239,620	Fee Title	1978
Columbia Plateau / Yakima	Buena	157	\$107,425	Mix	1978
Columbia Plateau / Yakima	Campbell	360	\$561,170	Mix	1978
Columbia Plateau / Yakima	Carl	160	\$830,000	Fee Title	2006
Columbia Plateau / Yakima	Dry Creek	160	\$8,750	Lease	1978
Columbia Plateau / Yakima	East 80 Pumphouse	78	\$58,875	Easement	1978
Columbia Plateau / Yakima	Garcia	82	\$4,500	Lease	1978
Columbia Plateau / Yakima	Graves	140	\$750,000	Fee Title	2006
Columbia Plateau / Yakima	Island Road	243	\$0	None/unknown	1978
Columbia Plateau / Yakima	L. Satus Creek	409	\$0	None/unknown	1978
Columbia Plateau / Yakima	Lawrence	81	\$0	None/unknown	1978
Columbia Plateau / Yakima	Lawrence I (J. Lawrence)	61	\$0	None/unknown	1978
Columbia Plateau / Yakima	Lawrence II	40	\$0	None/unknown	1978
Columbia Plateau / Yakima	Lower Satus	3,694	\$1,003,150	Mix	1978
Columbia Plateau / Yakima	Meninick	428	\$713,875	Mix	1978
Columbia Plateau / Yakima	Meninick North	1,052	\$0	None/unknown	1978
Columbia Plateau / Yakima	Meninick South	68	\$0	None/unknown	1978
Columbia Plateau / Yakima	Mill Creek North	159	\$256,450	Mix	1978
Columbia Plateau / Yakima	Mill Creek South	165	\$256,450	Easement	1978
Columbia Plateau / Yakima	Mosebar Pond	432	\$321,142	Mix	1978

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**Table 8: Wildlife Acquisition and Costs by Province, 1978 Through March, 2009**

*Province / Subbasin	WL Site	Acres Protected	Purchase Cost	Purchase Type	Purchase Fiscal Year
Columbia Plateau / Yakima	North Satus	722	\$193,100	Mix	1978
Columbia Plateau / Yakima	Old Goldendale	184	\$175,075	Easement	1978
Columbia Plateau / Yakima	Olney Drain	451	\$122,875	Easement	1978
Columbia Plateau / Yakima	Parker	36	\$8,450	Lease	1978
Columbia Plateau / Yakima	Plank	685	\$0	None/unknown	1978
Columbia Plateau / Yakima	Plank Road (East Plank)	168	\$129,425	Mix	1978
Columbia Plateau / Yakima	Satus	4,474	\$1,202,705	Mix	1978
Columbia Plateau / Yakima	Satus Corridor	2,718	\$127,200	Lease	1978
Columbia Plateau / Yakima	Shuster Road	667	\$315,250	Mix	1978
Columbia Plateau / Yakima	South Barkes Rd.	75	\$45,000	Lease	1978
Columbia Plateau / Yakima	Sunnyside Dam	22	\$62,500	Lease	1978
Columbia Plateau / Yakima	T 2126	95	\$0	None/unknown	1978
Columbia Plateau / Yakima	T 3669	116	\$0	None/unknown	1978
Columbia Plateau / Yakima	T 4433	44	\$0	None/unknown	1978
Columbia Plateau / Yakima	T 565	80	\$0	None/unknown	1978
Columbia Plateau / Yakima	T 570	73	\$0	None/unknown	1978
Columbia Plateau / Yakima	Tillman	79	\$130,338	Fee Title	1978
Columbia Plateau / Yakima	Toppenish Creek Pumphouse	1,236	\$785,904	Mix	1978
Columbia Plateau / Yakima	Wanily Slough	361	\$218,250	Mix	1978
Columbia Plateau / Yakima	Wapato	770	\$227,500	Mix	1978
Columbia Plateau / Yakima	South Lateral A (Zimmerman)	414	\$825,000	Fee Title	1978
Intermountain / Columbia Upper	Agency Butte (Colville Tribal Lands)	2,388		No purchase (enhancement only)	1999
Intermountain / Columbia Upper	Hinman	770	\$139,608	Fee Title	1999
Intermountain / Columbia Upper	Agency Butte (Colville Tribal Land)	2,388	\$0	No purchase (enhancement only)	1999
Intermountain / Columbia Upper	Berg	5,672	\$2,000,000	Easement	1995
Intermountain / Columbia Upper	Bill Kuenhe	4,805	\$2,275,000	Fee Title	1993
Intermountain / Columbia Upper	Colville Allotments	80	\$0	No purchase (enhancement only)	2000
Intermountain / Columbia Upper	Covington	129	\$68,000	Fee Title	2000
Intermountain / Columbia Upper	Friedlander	60	\$47,116	Fee Title	
Intermountain / Columbia Upper	Graves	2,730	\$657,403	Fee Title	2000
Intermountain / Columbia Upper	Henry Kuehne	4,800	\$3,000,000	Fee Title	1994
Intermountain / Columbia Upper	Hinman	770	\$139,608	Fee Title	1998
Intermountain / Columbia Upper	Jacobson	1,457	\$1,022,000	Fee Title	2007
Intermountain / Columbia Upper	Nespelem Bend	516	\$95,000	Fee Title	1997
Intermountain / Columbia Upper	Rattlesnake	10,293	\$5,600,000	Fee Title	2006
Intermountain / Columbia Upper	Redford Canyon	215	\$175,000	Fee Title	1997
Intermountain / Columbia Upper	Redthunder	1,355	\$1,022,000	Easement	2007
Intermountain / Columbia Upper	Sand Hills	1,400	\$675,000	Fee Title	1995
Intermountain / Columbia Upper	Tumwater (Joy)	18,812	\$4,600,000	Easement	2005
Intermountain / Pend Oreille	Beaver Lake	252	\$0	Fee Title	2003
Intermountain / Pend Oreille	North Eaton Lake	90	\$325,837	Fee Title	2005
Intermountain / Pend Oreille	South Eaton Lake	80	\$0	Fee Title	2006
Intermountain / Pend Oreille	West Beaver Lake	40	\$176,265	Fee Title	2004
Intermountain / Pend Oreille	Boundary Creek	1,405	\$672,885	Fee Title	1999
Intermountain / Pend Oreille	Deep Creek	40	\$0	No purchase (enhancement only)	2005
Intermountain / Pend Oreille	Smith Creek	620	\$0	No purchase (enhancement only)	2007
Intermountain / Pend Oreille	Calispell Creek - Northeast	170	\$0	None/unknown	2004
Intermountain / Pend Oreille	Calispell Creek - Northwest	418	\$0	None/unknown	2007
Intermountain / Pend Oreille	Carey Creek	117	\$450,500	Fee Title	2002
Intermountain / Pend Oreille	Cougar Creek	163	\$0	None/unknown	2006
Intermountain / Pend Oreille	Gambin Lake	156	\$0	None/unknown	2003
Intermountain / Pend Oreille	Trout Creek Peninsula	112	\$155,000	Fee Title	2002
Intermountain / Pend Oreille	Windy Bay	148	\$0	None/unknown	2002
Intermountain / Pend Oreille	Perkins Lake	99	\$200,000	Fee Title	2002
Intermountain / Pend Oreille	Flying Goose Ranch	436	\$0	None/unknown	1992
Intermountain / Pend Oreille	Flying Goose Ranch II	156	\$0	None/unknown	1997
Intermountain / Pend Oreille	Albeni Cove	70	\$126,208	Fee Title	2000
Intermountain / Pend Oreille	Carter's Island	96	\$288,000	Fee Title	1997
Intermountain / Pend Oreille	Cocolalla Lake	98	\$290,500	Fee Title	2000
Intermountain / Pend Oreille	Denton Slough	17	\$44,000	Fee Title	1997
Intermountain / Pend Oreille	Derr Creek	240	\$511,000	Fee Title	1997
Intermountain / Pend Oreille	Ginter 1	101	\$0	None/unknown	2007
Intermountain / Pend Oreille	Gold Creek	310	\$2,325,000	Fee Title	2005
Intermountain / Pend Oreille	Lower Pack River	30	\$42,500	Fee Title	2000
Intermountain / Pend Oreille	Lower St. Joe	62	\$0	None/unknown	2007
Intermountain / Pend Oreille	Lui Lot	1	\$0	None/unknown	2007
Intermountain / Pend Oreille	Rapid Lightening	110	\$219,900	Fee Title	1999
		289,709	\$105,944,534		

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**Table 9: Juvenile Salmon and Steelhead Survival Percentage, Lower Granite Dam to Bonneville Dam, 1966 Through 2008**

	<b>Chinook Salmon</b>	<b>Steelhead</b>
<b>1966</b>	46.00	56.00
<b>67</b>	47.00	32.00
<b>68</b>	45.00	43.00
<b>69</b>	34.00	20.00
<b>70</b>	17.00	24.00
<b>71</b>	20.00	17.00
<b>72</b>	9.00	9.00
<b>73</b>	3.00	1.00
<b>74</b>	38.00	8.00
<b>75</b>	19.00	27.00
<b>76</b>	10.00	13.00
<b>77</b>	1.00	1.00
<b>78</b>	23.00	23.00
<b>79</b>	19.00	2.00
<b>80</b>	15.00	3.00
<b>81</b>	NA	NA
<b>82</b>	NA	NA
<b>83</b>	NA	NA
<b>84</b>	NA	NA
<b>85</b>	NA	NA
<b>86</b>	NA	NA
<b>87</b>	NA	56.00
<b>88</b>	NA	32.00
<b>89</b>	NA	43.00
<b>90</b>	NA	20.00
<b>91</b>	NA	24.00
<b>92</b>	NA	17.00
<b>93</b>	NA	NA
<b>94</b>	NA	NA
<b>95</b>	NA	NA
<b>96</b>	NA	NA
<b>97</b>	NA	47.00
<b>98</b>	NA	50.00
<b>99</b>	56.00	44.00
<b>00</b>	49.00	39.00
<b>01</b>	28.00	4.00
<b>02</b>	58.00	26.00
<b>03</b>	53.00	31.00
<b>04</b>	39.00	NA
<b>05</b>	52.00	NA
<b>06</b>	61	41
<b>07</b>	56.30	36.90
<b>08</b>	46.00	48.00

Source: NOAA Fisheries

**Table 10 Salmon and Steelhead Passing Bonneville Dam, 1938-2008 (continued on next page).**

**Table 10: Salmon and Steelhead passing Bonneville Dam, 1938-2008**

population size without evaluating and quantifying the effects of facility modifications,

Yearly Totals of all Fish passing Bonneville Dam 1938-2008, includes jackas and adults

	<b>Chinook</b>	<b>Steelhead</b>	<b>Sockeye</b>	<b>Coho</b>	<b>Total</b>
<b>38</b>	271,799	107,003	75,040	15,185	469,027
<b>39</b>	286,236	121,922	73,382	14,383	495,923
<b>40</b>	391,573	185,161	148,805	11,870	737,409
<b>41</b>	461,443	118,087	65,741	17,911	663,182
<b>42</b>	401,998	151,345	55,464	12,401	621,208
<b>43</b>	313,123	92,131	39,845	2,547	447,646
<b>44</b>	240,763	100,521	15,071	4,207	360,562
<b>45</b>	297,488	120,144	9,501	791	427,924
<b>46</b>	445,743	142,548	74,354	3,897	666,542
<b>47</b>	480,377	135,444	171,139	11,174	798,134
<b>48</b>	419,555	139,062	131,541	4,081	694,239
<b>49</b>	277,697	119,285	51,444	1,004	449,430
<b>50</b>	357,375	114,087	77,993	10,151	559,606
<b>51</b>	331,788	140,689	169,428	5,201	647,106
<b>52</b>	420,879	260,990	184,645	7,768	874,282
<b>53</b>	332,479	223,914	235,215	13,018	804,626
<b>54</b>	320,947	176,260	130,107	4,062	631,376
<b>55</b>	359,853	198,411	237,748	3,725	799,737
<b>56</b>	300,917	131,116	156,418	6,127	594,578
<b>57</b>	403,286	139,183	82,915	4,675	630,059
<b>58</b>	426,419	131,437	122,389	3,673	683,918
<b>59</b>	345,028	129,026	86,560	2,695	563,309
<b>60</b>	256,049	113,676	59,713	3,268	432,706
<b>61</b>	281,980	139,719	17,111	3,456	442,266
<b>62</b>	286,625	164,025	28,179	14,788	493,617
<b>63</b>	278,560	129,418	60,319	12,658	480,955
<b>64</b>	344,422	117,252	99,856	53,602	615,132
<b>65</b>	317,957	166,453	55,125	76,032	615,567
<b>66</b>	340,111	143,661	156,661	71,891	712,324
<b>67</b>	366,237	121,872	144,158	96,488	728,755
<b>68</b>	341,154	106,974	108,207	63,488	619,823
<b>69</b>	507,543	140,782	59,636	49,378	757,339
<b>70</b>	384,780	113,510	70,762	80,116	649,168
<b>71</b>	405,702	193,966	87,447	75,989	763,104
<b>72</b>	394,456	185,886	56,323	65,932	702,597
<b>73</b>	398,635	157,823	58,979	54,609	670,046
<b>74</b>	366,759	137,054	43,837	60,955	608,605
<b>75</b>	425,566	85,540	58,212	58,307	627,625
<b>76</b>	507,773	124,177	43,611	53,150	728,711
<b>77</b>	464,865	193,437	99,829	19,408	777,539
<b>78</b>	394,590	104,431	18,436	52,590	570,047
<b>79</b>	176,292	114,010	52,627	45,328	388,257
<b>80</b>	245,518	129,254	58,882	22,052	455,706
<b>81</b>	285,650	159,270	56,037	30,510	531,467
<b>82</b>	322,809	157,640	50,219	73,832	604,500

**Source: Fish Passage Center**



**Table 10 Salmon and Steelhead Passing Bonneville Dam, 1938-2008 (continued).**

population size without evaluating and quantifying the effects of facility modifications,

Yearly Totals of all Fish passing Bonneville Dam 1938-2008, includes jackas and adults

	<b>Chinook</b>	<b>Steelhead</b>	<b>Sockeye</b>	<b>Coho</b>	<b>Total</b>
<b>83</b>	244,476	218,419	100,542	15,178	578,615
<b>84</b>	323,346	315,795	152,540	29,332	821,013
<b>85</b>	454,753	326,194	165,928	55,529	1,002,404
<b>86</b>	571,189	376,752	58,099	130,786	1,136,826
<b>87</b>	547,409	300,335	116,956	27,628	992,328
<b>88</b>	494,028	279,277	79,721	39,617	892,643
<b>89</b>	416,170	287,802	41,884	39,243	785,099
<b>90</b>	340,798	183,011	49,581	24,764	598,154
<b>91</b>	274,644	274,535	76,482	65,508	691,169
<b>92</b>	256,271	314,963	84,993	18,151	674,378
<b>93</b>	277,657	188,377	80,182	11,732	557,948
<b>94</b>	243,450	161,978	12,678	22,795	440,901
<b>95</b>	240,017	202,478	8,771	12,034	463,300
<b>96</b>	296,635	205,213	30,252	18,747	550,847
<b>97</b>	383,133	258,385	47,008	27,267	715,793
<b>98</b>	280,944	185,094	13,218	49,920	529,176
<b>99</b>	343,176	206,488	17,875	45,152	612,691
<b>00</b>	491,928	351,493	93,398	97,127	1,033,946
<b>01</b>	970,774	748,011	114,946	266,307	2,100,038
<b>02</b>	925,452	624,248	49,610	95,289	1,694,599
<b>03</b>	996,660	478,644	39,291	133,874	1,648,469
<b>04</b>	906,197	313,378	123,291	119,851	1,462,717
<b>05</b>	600,415	315,560	72,971	88,791	1,077,737
<b>06</b>	525,948	333,250	37,066	109,007	1,005,271
<b>07</b>	354,666	403,923	24,376	92,374	875,339
<b>08</b>	587,428	463,488	213,607	146,059	1,410,582

**Table 11: Fish Counted at Columbia River Mainstem Dams, 2008**

	<b>Chinook Adult</b>	<b>Chinook Jack</b>	<b>Coho Adult</b>	<b>Coho Jack</b>	<b>Steelhead</b>	<b>Wild Steelhead</b>	<b>Sockeye</b>	<b>Total</b>
<b>Bonneville</b>	518,942	68,486	135,535	10,524	357,820	105,668	213,607	<b>1,410,582</b>
<b>The Dalles</b>	331,468	66,298	37,982	4,700	277,460	78,849	177,984	<b>974,741</b>
<b>John Day</b>	282,164	60,788	39,975	4,923	277,162	82,851	193,409	<b>941,272</b>
<b>McNary</b>	224,684	43,295	18,756	3,050	221,310	58,748	146,924	<b>716,767</b>
<b>Ice Harbor</b>	98742	24265	2889	114	172453	42015	539	<b>341017</b>
<b>Lower Monumental</b>	102788	20240	4143	370	186058	48264	722	<b>362585</b>
<b>Little Goose</b>	90279	18674	3440	366	168105	38997	594	<b>320455</b>
<b>Lower Granite</b>	89386	26246	3458	1312	175481	43678	909	<b>340470</b>
<b>Priest Rapids</b>	85,330	18,636	5,579	430	16,722	0	196,835	<b>323,532</b>
<b>Wanapum</b>	72,352	14,719	4,389	227	16,434	0	197,711	<b>305,832</b>
<b>Rock Island</b>	60,056	8,019	6,736	1,657	16,288	6,194	193,739	<b>292,689</b>
<b>Rocky Reach</b>	41,933	6,202	2,944	782	13,871	4,712	161,343	<b>231,787</b>
<b>Wells</b>	27,731	4,261	1,191	5	9,808	3,803	165,334	<b>212,133</b>

Source: Fish Passage Center





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