environmental protection as a "primary mission" of the Corps. However, Congress also stated that environmental protection should not interfere with the Corps' pre-existing duties of navigation improvements and flood control.[86] Finally, in 1992, Congress passed the Reclamation Projects Reauthorization and Adjustment Act,[87] which requires the Bureau to consider environmental protection and water quality at its water resource development projects.

2.3.2.3 Current Policies—Conflicting Priorities

The preceding sections have referenced the primary Federal statutes and implementing regulations; the variety of Federal agencies with interests in fish and wildlife mitigation and recovery efforts and with natural resource management in the Pacific Northwest; and the conflicts that have arisen as mandates change, as new information about species survival emerges, and as competition for project funding increases.

Some of the most critical inconsistencies or conflicts are shown in Table 2.3-2. These conflicts are further complicated by judicial rulings and changes in policy regarding federally-recognized Indian tribes and Indian resources, water resources, state harvest and hatchery policies, and the ESU policy of identifying endangered salmon species by stocks. Also part of the complication are international treaties and other agreements regarding Pacific salmon, and the requirement to consider funding as a resource that must also be managed in the growing era of deregulated energy supply.

Table 2.3-2: Conflicting Priorities

Policy Conflicts		
Policies that encouraged settlement and taking of tribal land	*Versus*	Tribal treaties to preserve certain land for tribes
Policies that allowed depletion of fish habitat and fish runs		Tribal treaty fishing rights
Policies that encouraged resource extraction and production—mining, hydropower development, USFS multiple use, BLM grazing, and homesteading		Later policies for environmental protection, including the ESA and CWA
Acts that define the purposes and priorities of the Corps, Bureau, USFS, BLM, and BPA (in BPA's case, the Regional Act)		The ESA, which requires Federal agencies to operate to protect endangered species
Federal treaties and state policies that allow harvest or indirect take of endangered species		The ESA, which prohibits take
Policies that recognize private property rights		ESA take and critical habitat provisions that may limit private property rights

[86] 33 U.S.C. § 2316(b).
[87] 43 U.S.C. § 371.

Policy Conflicts		
Policies to reduce costs and increase market forces in the power industry	*Versus*	Environmental policies (ESA, FERC, CWA) that increase costs and limit the flexibility of power producers and transmission providers to respond to market forces
Policies that support hatcheries for mitigation and lost harvest opportunity		Policies that discourage hatchery production that may compete with native fish
CWA dissolved gas standards		Spill to move fish down river
Protection of endangered species (e.g., salmon)		Protection of marine mammals (e.g., sea lions or seals)

Judicial Impact on Natural Resource Policy

The judicial branch of the Federal government occasionally renders opinions that dramatically shape and define resource management policy. One notable example is Judge Malcolm Marsh's 1994 opinion in *Idaho Department of Fish and Game v. National Marine Fisheries Service*. The Idaho Department of Fish and Game brought suit, claiming that NMFS BiOp was arbitrary and capricious. At issue was the way in which NMFS had prepared and issued its 1993 BiOp on FCRPS operations. Ultimately, Judge Marsh ruled that NMFS was arbitrary and capricious in the way it constructed its 1993 BiOp on FCRPS operations.

Perhaps as important, Judge Marsh observed that "the underlying root of the litigation problem is the feeling of these parties that the Federal government is simply not listening to them."[88] In subsequent cases, Judge Marsh has continued to remind the Federal defendants of the need to coordinate more effectively with the state and tribal resource managers. Since then, the Federal agencies in the Region have engaged in numerous cooperative efforts with regional states and tribes, including: the Forum, the Council's Framework Process, the Council's Program amendment process, the Conceptual Plan/Basinwide Strategy, and solicitation of comments from states and tribes on the draft 2000 hydrosystem BiOp (see Section 2.3.2.4). The success of these efforts has often been perceived differently by different participants.

In response to Judge Marsh's 1994 characterization of the NMFS' BiOp as simply tinkering, when the hydrosystem "cried out for a major overhaul,"[89] NMFS rewrote the Opinion, laying the groundwork for significant and far-reaching changes. These changes can be credited, at least in part, to Judge Marsh's ruling:

- Fish First – Operational Improvements
  - While maintaining all flood control requirements, the priority of FCRPS operations (e.g., flow management, spill, operations and maintenance [O&M])

[88] 850 F. Supp. 886, 900 (D. Or. 1994).
[89] 850 F. Supp. 886, 900 (D. Or. 1994).

has shifted to fish protection. Power production is now secondary, except in the cases of declared emergencies.

- Structural Improvements
  - Substantial investments have been made in structural modifications at the dams that have significantly improved fish passage and survival.
- Operations
  - On a 50-water-year average basis, 7.2 Maf of flow augmentation is provided to enhance fish passage. This equates to approximately one-and-one-half times the storage capacity at Grand Coulee Dam.
  - On a 50-water-year average basis, about 1000 average megawatts (aMW) of energy are not generated, and are instead spilled during the April–August migration period to improve fish passage. This is equivalent to 10% of annual average Federal generation, and almost enough energy to serve the city of Seattle for a year.
- Configurations
  - From 1996 - 1999, several hundred million dollars were invested in actual structural modifications at the dams to improve passage conditions, as well as in studies and planning to support additional modifications that are underway, under development, or are currently under consideration.
  - The cumulative effect of these structural changes is a 30% decrease in turbine passage, which equates roughly to a 5% increase in fish survival at each dam.
  - Future configuration and survival improvements draw from the strategies outlined in the Basinwide Strategy paper.[90] Performance standards leading to recovery are used to guide these efforts.
- Predation Management
  - Predator control actions throughout the FCRPS and the estuary save approximately 3.8 million smolts per year. This represents about 2% of the overall population.[91]
- Juvenile Survival Improvements from Operations and Configurations
  - NMFS Draft White Papers provide PIT-tag survival data that illustrate an upward trend in juvenile fish hydro system survival.[92] Pit-tag survival estimates for Snake River spring/summer chinook have increased from 31% in 1993 to 59% in 1998—the highest measured direct survival on record. Since

[90] Federal Caucus 2000b.

[91] NMFS 2000e; USDOE/BPA 2001e, p. 2; Friesen, Thomas A., and David L. Ward 1999, 19:406-420.

[92] "PIT" tags, or "Passive Integrated Transponder" tags, enable researchers to track individual fish. NMFS 2000c; NMFS 2000a.

1995, direct juvenile fish survival levels approach those levels observed in the 1960s[93] (before the Snake River dams were built).

Another example of judicial influence on resource management policy is the ongoing litigation concerning NMFS' listings of certain salmon populations in the Pacific Northwest as threatened and endangered under its ESU and hatchery salmon policies. (These policies are described in Problems in Defining and Applying Listings later in this section.) Application of these policies by NMFS in its listing decision for the Oregon Coast coho salmon ESU was challenged in a lawsuit filed in 1999 in the U.S. District Court for the District of Oregon. The suit challenged NMFS' 1998 final rule that listed only "naturally spawned" Oregon Coast coho salmon as threatened. In its final rule, NMFS had concluded that hatchery-spawned Oregon Coast coho salmon were considered part of the same ESU as the naturally spawned coho salmon. However, the hatchery-spawned salmon were not included in the listing by NMFS because NMFS did not consider these salmon to be "essential to recovery" of the ESU. In September 2001, Judge Michael Hogan ruled in *Alsea Valley Alliance v. Evans* that this approach to listing was arbitrary and capricious, and thus invalidated the NMFS' listing of the Oregon Coast coho salmon ESU.[94] Judge Hogan's decision also remanded the matter to NMFS for further consideration. However, various intervenors subsequently appealed Hogan's decision to the Ninth Circuit Court of Appeals, which has stayed the decision (and thus the invalidation of NMFS' listing) pending its ruling on the appeal.

While interveners appealed the Hogan decision, NMFS did not. Instead, NMFS decided to conduct a public review of its hatchery salmon policy for how hatchery-spawned salmon factor into listing decisions. In July 2002, NMFS provided a pre-decisional working draft of its listing policy for review and comment to tribal and state natural resource agencies in the Region, the USFWS, and the U.S. Department of Justice (referred to by NMFS as "co-managers"). Once NMFS has received comments from the co-managers and made revisions to the draft, NMFS will formally propose and publish the policy as a notice in the *Federal Register*.[95] As of August 2002, NMFS intended to formally propose its listing policy by October 2002, and to complete the policy and publish it in the *Federal Register* as a final rule in April 2003.[96]

In addition to reviewing its hatchery salmon listing policy, NMFS is in the process of reviewing listing decisions that were based in part on this policy. Immediately following the *Alsea* decision, NMFS indicated that interpretive issues raised by this decision had the potential to affect nearly all of the agency's West Coast salmon and steelhead listing determinations made to date.

In February 2002, NMFS officially concluded that the delisting petitions it had received in 2001 contained enough substantial scientific and commercial information to suggest that delisting may be warranted for 14 of the 15 petitioned Pacific salmon and steelhead

[93] NMFS 2000c; NMFS 2000a.
[94] 161 F. Supp. 2d 1154, 1161 (D. Or. 2001).
[95] Lohn, D. Robert 2002.
[96] NMFS 2002.

stocks currently listed as threatened or endangered under the ESA; thus, NMFS is in the process of conducting status reviews for these 14 stocks.[97] In addition, NMFS is reviewing the status of 10 other listed salmon and steelhead stocks, and will update the status of one candidate stock.[98] In December 2002, NMFS decided to also conduct status review updates for two additional listed salmon and steelhead stocks because it has been several years since the status of these ESUs has been updated.[99] As a result, NMFS is now reviewing its listing decisions for all 26 listed Pacific salmon and steelhead stocks. NMFS expects to propose updated listing determinations for these stocks in June 2003 and, following a public comment period, to make final updated listing determinations by June 2004.[100]

Federal Indian and Indian Resource Policies

The judiciary played an important role in shaping Federal resource policy in a series of opinions in the Indian treaty right fishing cases, culminating with *U.S. v. Oregon* and *U.S. v. Washington.* Beginning with decisions in the early 20th century, courts found that the Columbia River treaty tribes had reserved rights, including the following:

- the right of access to usual and accustomed fishing stations,
- immunity from state license requirements,
- up to half of the harvestable surplus of fish,
- restriction on when tribal fishing could be curtailed by states for conservation purposes, and
- recognition and enforcement of tribal water rights to flows for preservation of tribal fisheries.

Buttressed with these holdings, the Federal government has taken the next steps to establish a policy that Indian treaty fishing rights should take precedence over other competing uses that adversely affect treaty fisheries.

Federal policy related to Native American fish and wildlife issues in the Columbia Basin was greatly clarified during the 1990s. This clarification became possible, in part, with the issuance of an Executive Order in 1994 that directed all agencies to establish government-to-government relationships with federally recognized tribes for the purpose of consulting on plans, projects, programs, and activities the agencies might make that could affect tribal trust resources.[101]

When BPA adopted its tribal policy in 1996,[102] it was the first for which tribal participation had occurred prior to such adoption. Fundamental principles in the policy

[97] 67 Fed. Reg. 6215, 6216-17 (Feb. 11, 2002).
[98] 67 Fed. Reg. 6217 (Feb. 11, 2002).
[99] 67 Fed. Reg. 79898, 79899 (Dec. 31, 2002).
[100] NMFS 2002.
[101] The White House 1994.
[102] USDOE/BPA 1996b.

include the recognition of the unique character of each tribe, as a sovereign, and a commitment to government-to-government consultations to ensure consideration of tribal concerns before BPA takes actions that might affect tribal resources.

In 1997, the Departments of Interior and Commerce jointly issued a Secretarial Order on American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act.[103] In that order, the Departments recognized:

> [T]hat Indian lands, whether held in trust by the United States for the use and benefit of Indians or owned exclusively by an Indian tribe, are not subject to the controls or restrictions set forth in Federal public land laws. Indian lands are not Federal public lands or part of the public domain ….
>
> The Departments shall conduct government-to-government consultations to discuss the extent to which tribal resource management plans for tribal trust resources outside Indian lands can be incorporated into actions to address the conservation needs of listed species ….
>
> At the earliest indication that the need for Federal conservation restrictions is being considered for any species, the Departments, acting in their trustee capacities, shall promptly notify all potentially affected tribes, and provide such technical, financial, or other assistance as may be appropriate, thereby assisting Indian tribes in identifying and implementing tribal conservation and other measures necessary to protect such species. In the event that the Departments determine that conservation restrictions are necessary in order to protect listed species, the Departments, in keeping with the trust responsibility and government-to-government relationships, shall consult with affected tribes and provide written notice to them of the intended restriction as far in advance as practicable. If the proposed conservation restriction is directed at a tribal activity that could raise the potential issue of direct (directed) take under the Act, then meaningful government-to-government consultation shall occur, in order to strive to harmonize the Federal trust responsibility to tribes, tribal sovereignty and the statutory missions of the Departments. In cases involving an activity that could raise the potential issue of an incidental take under the Act, such notice shall include an analysis and determination that all of the following conservation standards have been met: (i) the restriction is reasonable and necessary for conservation of the species at issue; (ii) the conservation purpose of the restriction cannot be achieved by reasonable regulation of non-Indian activities; (iii) the measure is the least restrictive alternative available to achieve the required conservation purpose; (iv) the restriction does not discriminate against Indian activities, either as stated or applied; and, (v) voluntary tribal measures are not adequate to achieve the necessary conservation purpose.

The last part of the directive quoted is called the *Conservation Necessity Principle Analysis*. Derived from judicial decisions in the *U.S. v. Oregon* and *U.S. v. Washington*

[103] USDOI/USFWS 1997.

series of cases, the conservation principles outline how, when, and why the government may limit tribal treaty fisheries. Appreciating that the Basinwide Strategy Paper might include proposals that could affect these fisheries, NMFS performed a draft Conservation Necessity Principle Analysis on the Federal Conceptual Plan. The analysis addresses each listed stock. The Basinwide Strategy paper acknowledged that a conservation argument can be made for lowering or eliminating harvest of all but one of the listed ESUs in the Columbia and Snake rivers. However, it does not recommend this action because it is important to maintain at least some tribal harvest pursuant to treaties and the Federal trust obligation.[104]

The Administration clarified its current policy with regard to the treaties and fisheries of the Columbia Basin tribes in a 1998 letter from NMFS that stated:

> It is our policy that the recovery of salmonid populations must achieve two goals:
>
> 1) the recovery and delisting of salmonids listed under the provisions of the ESA;
> 2) the restoration of salmonid populations, over time, to a level to provide a sustainable harvest sufficient to allow for the meaningful exercise of tribal fishing rights. We see no conflict between the statutory goals of the ESA and the Federal trust responsibility to Indian tribes.[105]

Harvest Policies

Under production-focused fisheries management, many runs of anadromous fish were purposefully harvested to extinction.[106] State and Federal fishery management agencies are now shifting from being production- and harvest-oriented to being more conservation-minded. As noted in Washington's Draft Wild Salmonid Policy, "We know that in order to be successful, the resource must be our exclusive client."[107] Initially, in its draft policy, Washington concluded:

> We do not honestly believe that salmonid resource management can be successful in the future without recognizing our true client [wild salmonids], stopping deliberate overfishing, marking all hatchery-origin anadromous salmonids released in state waters, curbing high peak flood flows, establishing higher spawning escapement objectives, correcting fishery selectivity, and markedly improving our delivery of viable wild salmonids to the spawning grounds.[108]

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[104] NMFS 2000d, pp. 5-6.

[105] Garcia, Terry D. 1998.

[106] "Many wild chinook and coho salmon populations carry the nomenclature tag of "secondary protection." What this means in plain language is deliberate, planned overfishing designed to harvest co-mingled hatchery fish. The logical end point is genetic extinction of wild fish—the same result already achieved in fact for lower Columbia River coho salmon. In their case, heavy overfishing began in the early 1960's." State of Washington 1997, p. 3.

[107] State of Washington 1997, p. 3.

[108] State of Washington 1997, p. 7. The Washington Fish and Wildlife Commission adopted a final policy on December 5, 1997.

A conflict in current fisheries management is whether to manage for native or non-native species. With the creation of reservoirs on the Snake and Columbia rivers has come the introduction and adaptation of non-native fish, particularly walleye and bass. These exotics not only compete with salmonids: they prey upon them. Oregon, Washington, and Idaho all must resolve the policy dilemma presented by the need to improve conditions for anadromous fish and the public desire to retain these newly established fisheries that hinder recovery efforts.

Reflecting a willingness to consider a change in policy direction, NMFS has now required BPA and the other Action Agencies to explore alternative harvest technologies that would permit the selective catching of non-listed stocks while avoiding take of listed stocks.[109]

Catching fish has done more than just reduce overall numbers. Large mesh sizes in nets may have eliminated the largest, strongest, most fecund members of many salmon races.[110] Similarly, minimum length requirements for troll and sport fishers resulted in the largest fish being kept, leaving the smaller fish to reproduce.[111] Fish managers have begun to adopt more of a role of resource trustees or conservators, but the transition is incomplete. They are still subject to interest group pressure to fish where fishing, by some measures, should not occur. Even sport fisheries, where unmarked fish must be released, have significant hooking mortalities ranging from 14% up to nearly 30%.[112]

Pacific Salmon Treaty

Since 1985, the United States and Canada have had a treaty to conserve Pacific salmon in order to achieve optimum production and to divide the harvests so that each country reaps the benefits of its investment in salmon management. The effectiveness of this coordination to date is somewhat questionable. A recently re-negotiated treaty has been completed by the United States and Canada: it will shift harvest from quota-based fishing to "abundance"-based fishing. The abundance approach is intended to give more protection to weaker, naturally produced stocks than did the previous harvest agreement.

Hatchery Policies

Historically, hatcheries were inseparable from harvest. Until the last decade, hatcheries in the Pacific Northwest produced fish only for sport, commercial, and tribal harvest. More recently, hatcheries have become tools for conservation and supplementation.[113] BPA implements a number of conservation hatchery programs, some of which (e.g., the

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[109] NMFS 2000b, Section 9.6.3.

[110] In 1980, Ricker found the that average size of Chinook salmon was decreasing and had been decreasing since at least 1930. He reported average weights as being less than or equal to half those weights documented 50 years prior. Ricker, W.E. 1980.

[111] State of Washington 1997, Appendix E, p. E-5.

[112] Pacific Fishery Management Council 2001.

[113] Supplementation – Artificial propagation intended to reestablish a natural population or increase its abundance. (Federal Caucus 1999b, Glossary, p. 100.)

program for Snake River Sockeye Salmon) keep the genomes alive in stocks that are extinct in the wild.[114]

There are several clear movements in hatchery management: (1) greater mitigation for tribal trust and treaty resources, which has moved some lower Columbia River hatchery fish production to up-river locations; (2) greater concern with fish health protocols and management of genetic traits affected by hatcheries; and (3) less emphasis on production purely for harvest and more concern about preserving weak populations. However, the Region is still struggling about where and how to use hatcheries. Tribes, local governments, and industries tend to want wider use of hatchery fish in order to boost spawning in the wild,[115] but state and Federal fish managers want to further limit the use of the surplus upriver hatchery fish because in some instances they may be the progeny of distant downriver genomes.[116]

In the Council's Program process, tribes continue seeking BPA implementation of mitigation through supplementation projects. The Nez Perce Hatchery, for instance, began construction in the summer of 2000. The Yakama Nation is seeking to expand its Yakima Fisheries Project to include permanent production facilities for coho, in addition to the facilities already existing for spring chinook. The Umatilla Tribes are lead proponents of the Northeastern Oregon Hatchery Project undergoing planning and NEPA review. Most state and Federal hatchery managers throughout the Basin are also now looking to BPA to help them implement changes to reduce the adverse effects their existing facilities have on listed species.

However, NMFS' Final FCRPS BiOp places BPA in a particularly difficult position regarding hatcheries. On the one hand, BPA cannot avoid jeopardizing the ESUs listed under the ESA without providing mitigation with conservation and supplementation hatcheries. On the other hand, NMFS believes that naturally spawning fish of hatchery origin can reduce the reproductive success of wild, naturally spawning fish. Thus, it is possible that the more BPA succeeds with supplementation hatcheries, the more it will reduce the reproductive success of ESA-listed fish. Technical and policy decisions are needed to resolve this inherent conflict between hatcheries and wild fish survival. Resolution of this conflict may also be driven by judicial interpretation of the ESA, as discussed in Judicial Impact on Natural Resource Policy earlier in this section and in the following subsection.

Problems in Defining and Applying Listings

The ESA allows listing of "distinct population segments" of vertebrates as well as named species and subspecies. However, the ESA provided no specific guidance for determining what constitutes a distinct population. For Pacific salmon, NMFS has determined that a population (or group of populations) will be considered "distinct" (and

[114] A detailed history and current status of hatcheries, emphasizing their roles for mitigation and production, can be found in Federal Caucus 2000b, pp. 56-59, and in the associated Hatchery Appendix.

[115] Northwest Fishletter 2000a.

[116] Northwest Fishletter 1998.

hence eligible for protection) for purposes of the ESA if it represents an ESU of the biological species. A population must satisfy two criteria to be considered an ESU: it must be reproductively isolated and it must represent an "important component" in the evolutionary legacy of the species.[117] Application of this concept is flexible. Where detailed information is available on a run of salmon, it may often be "split" into many stocks for management purposes; however, where information is lacking, a run may be comprised of several stocks that are "lumped" together. The stock concept, in theory, makes no allowance for the size of the actual local breeding population (also called a "metapopulation structure"), in which populations consist of locally reproducing groups connected by some gene flow within a larger geographic area.[118]

Between the local breeding population—such as the Red Fish Lake Sockeye—and the overall species—such as sockeye—is the realm in which the Region must make its policy choices because while no *species* of salmon is near extinction, many wild *populations* are nearly so.[119] In essence, Pacific Northwest fisheries managers have taken a biologically cautious approach to ESA listings. Small populations of fish within a species have been listed for Federal protection when, under a broader definition, the overall species itself is in no danger of extinction.

In addition, there is considerable disagreement in the Region concerning how hatchery-spawned salmon should be considered in listing decisions for salmon. As discussed above, the ESA allows for the listing of any species, subspecies, or distinct population segment of a species as threatened or endangered, and NMFS has defined "distinct population segments" in terms of ESUs. In 1993, NMFS issued a policy for the consideration of hatchery-spawned salmon when making listing decisions for Pacific salmon ESUs.[120] This hatchery salmon policy provides that when hatchery-spawned salmon are part of the same ESU as naturally spawned salmon proposed for listing, the hatchery salmon are not to be included as part of the listed ESU, unless these salmon are considered essential to recovery of the ESU. This approach reflects NMFS' interpretation of the ESA as requiring NMFS to focus its recovery efforts on "natural populations" of species.

Not everyone in the Region agrees with NMFS' listing policies for the Pacific salmon. The controversy over these policies is perhaps best exemplified by two lawsuits filed by organizations that disagree with NMFS' approach to listing under the ESA. More specifically, these organizations have alleged that NMFS, when making listing decisions for individual ESUs, does not have the authority under the ESA to distinguish between hatchery-spawned salmon and naturally spawned salmon that are part of the same ESU.

One lawsuit, filed by the Alsea Valley Alliance, is discussed under Judicial Impact on Natural Resource Policy earlier in this section. As indicated in this earlier discussion,

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[117] Waples, R. 1991.
[118] NRC 1996, pp. 70, 138-140.
[119] Lackey, R.T. 1999a.
[120] NMFS 1993.

Judge Hogan's order in *Alsea* has resulted in NMFS revisiting its hatchery salmon policy, as well as approximately 20 listing decisions that were based in part on this policy and conducting status review updates for 24 of the 26 listed Pacific salmon and steelhead stocks (with NMFS recently deciding to also review the status of the remaining two listed stocks).[121] In addition to the *Alsea* case, a complaint was filed in 1999 by Common Sense Salmon Recovery against NMFS in the U.S. District Court for the District of Columbia. This complaint alleges, among other things, that NMFS' listings by ESU violate both the ESA and the Administrative Procedures Act, and that NMFS' decision to exclude hatchery-spawned salmon from the listings violates the ESA.[122] Final decisions in these cases may assist in resolving problems and controversies concerning the definition and application of salmon listings in the Region.

Problems in Working with Existing Water Policy

No resource is more critical in the West than water. The history of water use and development is, in many respects, the economic history of the West. In a significant respect, the settlement of the Columbia Basin did not end until 1993, when the state water agencies of Oregon, Washington, and Idaho closed the Basin's salmon streams to new water diversions.[123]

The effect of water policy on the environment in the Pacific Northwest cannot be overstated. Prior appropriation, which is still the guiding principle of water law in Oregon, Washington, Idaho, and Montana, allows the first person who puts water to a beneficial use to then claim a right to that water as long as it continues to be used in the same time, place, and manner. Prior appropriation is the law regardless of whether new or subsequent beneficial uses of the same water might have greater social, economic, or cultural benefits. Consequently, traditional water uses and water law dating from the mid-19th century continue to dictate water law and policy today.

Water use and management policy is in flux. Many waters of the Pacific Northwest are over-appropriated—there are more rights to use water than there is water available to use. Tribes, such as the Nez Perce in Idaho, are suing to have their reserved water rights recognized and quantified. State courts are now adjudicating the rights of water users in two critical subbasins: the Yakima and the Snake river basins. Oregon, Washington, and Idaho are all operating under consent decrees with the EPA to establish TMDL levels for the thousands of water bodies throughout the Region that fail to meet CWA water quality standards. Economists and environmental organizations call for realigning water use policy more closely with economic value, but their efforts are still largely in the formative or experimental stages. While Oregon and Washington have now included instream flows for fish and wildlife as a statutory beneficial use, Idaho has not. The doctrine of prior appropriation still reigns in the Pacific Northwest, leaving those with the earliest recognized water rights largely in control of how that water will be used. Attempts by government entities to compel changes in water use by law are often

[121] NMFS 2002.

[122] Washington Farm Bureau Service Company Inc., Common Sense Salmon Recovery 1999.

[123] Volkman, J. 1997, p. 1.

countered with litigation and claims of unlawful takings that must be compensated for, as required by the Fifth Amendment of the United States Constitution.

Water management is primarily a matter of state jurisdiction. Nothing has yet brought the states of the Pacific Northwest together in a concerted effort to address water issues comprehensively. Consequently, at best, water issues are addressed on a subbasin level through court-administered adjudications or local planning efforts such as those seen on the Deschutes and Yakima rivers. At worst, water issues fester, falling into an abyss of multiple rights and overlapping jurisdictions such that no one entity, save the courts, can effectively resolve them. But even the courts can only address one basin or issue at a time, as their jurisdiction and the claims before them allow. There is no widely accepted forum for getting all interested parties in one place at the same time to consider improvements to create coordinated regional water policy.[124]

Managing the Money Resource

Current Provisions

Under the provisions of the Council's Columbia River Basin Fish and Wildlife Program and the BiOps for the FCRPS, BPA funds a substantial portion of the fish and wildlife mitigation and recovery efforts in the Basin. BPA's funds—the ratepayers' funds—are the centerpiece of the world's largest, most expensive mitigation and recovery effort.

Before the passage of the Regional Act in 1980, BPA used its broad general funding authorities to fund over $40 million in mitigation projects. Since the passage of the Act and its express provisions requiring BPA to mitigate fish and wildlife, BPA has incurred costs over $6 billion.[125] During the six-year period from fiscal year 1996-2001, BPA's fish and wildlife costs—including direct program expenses, reimbursable expenses for other agencies, capital investment fixed expenses, and river operations costs—were, on average, about $610 million annually or about $3.7 billion. For the five-year period from fiscal year 2002-2006, BPA estimates its costs will be over several billion dollars.[126]

As noted, these costs are not just direct expenditures such as those incurred through funding measures consistent with the Council's Program. BPA currently funds fish and wildlife activities under four categories:

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[124] Governance issues are discussed in more detail in Chapter 6.

[125] Council 2002, p. 3. Of the $6 billion in costs accrued from 1978-2001, $2.17 billion was for power purchases in response to reduced hydropower generation; $1.27 billion was in forgone revenues for required river operations to improve fish survival; $1.02 billion was to implement the Council's Fish and Wildlife Program; $957.7 million was for fixed expenses for debt service on capital investments at the dams; and, $582.9 million was to reimburse the Federal Treasury for the power share of other Federal agency efforts primarily for fish passage improvements at Federal dams and Federal hatcheries.

[126] USDOE/BPA 2002c (actual amounts will fluctuate based on market prices).

Program	Expenses
(1) Integrated Program	Direct expenses (not including capital debt service) of Council Fish and Wildlife Program measures and actions under the NMFS and USFWS BiOps.
(2) Reimbursables	The money paid to the United States Treasury after-the-fact for fish and wildlife actions by other Federal agencies. Reimbursables include fish and wildlife expenses of other Federal agencies (Corps, Bureau, USFWS) that are to be repaid to the Treasury from power revenues. These expenses include O&M expenses assigned to power, and a portion of the Council's annual expenses.
(3) River Operations	Foregone revenues and increased power purchases that occur as a result of operating the Federal hydrosystem to enhance migration and habitat conditions for fish.
(4) Capital Investments	Interest, amortization, and depreciation costs of borrowing for capital improvements made on behalf of the fish and wildlife mitigation and recovery program. These costs are incurred by BPA, the Corps, and the Bureau associated with the hydroelectric system.

In 1996, the Department of the Army (for the Corps), the Department of Energy (for BPA), the Department of Interior (for USFWS and the Bureau) and the Commerce Department (for NMFS)—five Federal agencies involved in salmon and other fish and wildlife restoration activities in the Columbia River Basin—executed a *Memorandum of Agreement (MOA).* The MOA represented an effort to balance the dramatically escalating costs of fish and wildlife restoration with the need to provide BPA with a degree of financial stability in a competitive energy market. It lasted only through 2001. The MOA also committed the Federal agencies to collaborate much more closely with the Region in developing Federal funding requests. It incorporated an annex in which the parties agreed to collaborate in Federal budget matters and in monitoring and evaluating fish and wildlife mitigation and recovery. Table 2.3-3 shows BPA's costs under the MOA from 1996 through 2001.

Table 2.3-3: MOA Fish and Wildlife Program Expenses, 1996–2001

MOA Fish and Wildlife Program Expenses, 1996–2001, Million $						
	Year					
	1996	1997	1998	1999	2000	2001
Category						
Direct Program	68.5	82.2	104.9	108.2	108.2	101.1
Reimbursable	35.4	35.9	36.4	38.9	37.6	42.4
Expenses Assoc. with Capital Investments	73.1	76.3	74.1	76.1	77.2	77.1

MOA Fish and Wildlife Program Expenses, 1996–2001, Million $						
	Year					
Hydro Operations	83.3	110.2	120.0	251.3	337.0	1505.5
TOTAL	**260.3**	**304.6**	**335.4**	**474.5**	**560.0**	**1726.1**

Source: USDOE/BPA 2002c.

After the MOA expired, BPA issued a letter explaining how it would integrate funding for its fish and wildlife obligations for offsite actions, as described in the Program and the BiOps. The letter clarified that BPA's spending estimates were for planning purposes during fiscal years 2002 through 2006. It showed that, with the integration of off-site ESA actions and the direct Council program funding, BPA adopted a planning level substantially higher than the previous period covered by the MOA. This amount was consistent with the funding range assumed in the power rate case and with the Fish and Wildlife Funding Principles (Appendix A) that projected an annual average of $139 million in accruals for purposes of setting BPA's revenue requirement. On a planning basis, BPA estimated an annual average of $36 million—up from $27 million in the previous rate period—of funding for future capital investments funded directly through BPA borrowing for offsite mitigation and recovery actions. Under its direct funding agreements with the Corps, Bureau, and the USFWS (for its Lower Snake River Compensation Plan hatcheries), BPA will cover the hydroelectric share of operations and maintenance and other non-capital expenditures for fish and wildlife-related activities that Congress previously funded with appropriations and that BPA then reimbursed. BPA will also continue to repay the hydroelectric share of capital expenditures for past fish and wildlife investments by the Corps and the Bureau and their future capital investments for fish and wildlife made with appropriations.[127]

BPA is continually working to collectively and collaboratively demonstrate to all interested parties in the Region that ratepayers' funds are being efficiently and effectively used to benefit the Region's fish and wildlife. Recently, BPA has been working closely with the Council to prioritize projects in the integrated program to ensure that spending for expense accruals in FY 2003 do not exceed $139 million and accruals throughout the remainder of the rate period, through FY 2006, are at $139 million or below. Prioritizing program spending is important if Bonneville is to continue to fully meet its obligations to fish and wildlife, especially those needed to meet the requirements of the various biological opinions that apply to Bonneville and preserve previous important investments of the Fish and Wildlife Program.

Funding these costs is made increasingly difficult as BPA incurs net costs from fish mitigation and recovery operations as the operations either: (1) change the timing of energy production within the year, or (2) reduce the total annual energy production from the Federal hydroelectric projects. It has been estimated that the BiOps have resulted in a loss of about 1000 MW or 10% of the capability of the system.[128] The analyses estimated

[127] USDOE/BPA 2001g.
[128] USDOE/BPA 2000b.

the 50-year annual average fish operation cost of the 1998 BiOp to be about $180 million. This cost was based on a flat market price of $20/MWhr.[129] However, prices typically fluctuate as markets change. For example, the 2000 BiOp estimates costs of over $330 million based on a market with prices of $39/MWhr.[130] Figure 2-3 shows monthly average spot prices in regional power markets over a recent 6-year period. The price over the long term is expected to be lower than recent highs, but much higher than the 1998 price.

Actual costs in any future year will also depend on hydrologic conditions. Typically in lower water years, the net costs are due primarily to purchases of energy required to offset the loss of generating capability as water is stored. In higher water years, the net costs are the result of revenues foregone, because the nonfirm energy could not be sold.

BPA tracks the monetary cost of purchasing replacement power and electric power losses resulting from implementation of the Council's Fish and Wildlife Program. The Act requires BPA to recoup the amounts in excess of the power share of mitigation costs. Relative to the conditions before the Act, foregone revenues resulting from fish operations that reduce energy production represent an additional cost to ratepayers. Also, BPA may need to raise its rates later to cover costs. Furthermore, reduced revenues lessen BPA's ability to pay its debt, maintain reserves, and fund public benefits such as fish and wildlife mitigation and energy conservation programs. Foregone revenues have environmental costs as well: as less hydroelectric energy is available from the FCRPS, utilities must obtain their energy from other resources, most likely gas-fired combustion turbines. These resources have environmental impacts such as depletion of non-renewable fuels and air pollution (see map Figure 2.6 at the end of this chapter and Appendix E).

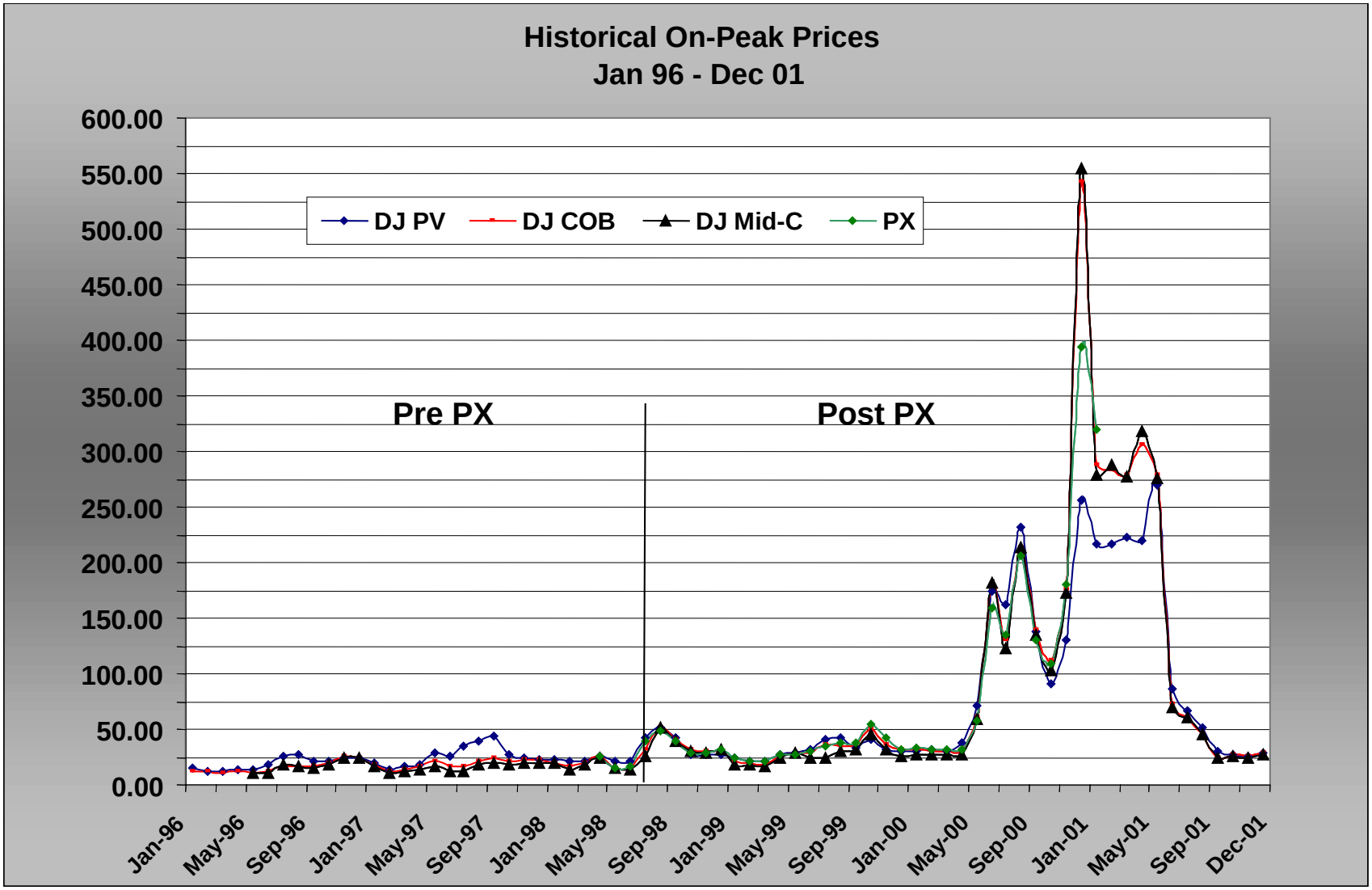
BPA is an unusual Federal agency in that it typically receives no annual appropriations from Congress. Instead, Congress created the BPA Fund within the United States Treasury and gave BPA borrowing authority. This borrowing authority is a sort of credit card based on an indefinite revolving appropriation that lets BPA borrow from the Treasury, repay the debt with interest, and borrow against the balance again. BPA deposits the revenues from its power marketing activities into the Fund. BPA collects these funds from its customers—the ratepayers. BPA uses its revenue from ratepayers to repay the Treasury—the taxpayers—for the nation's financing of the construction and operation of the FCRPS and other capital programs such as transmission and energy conservation programs. Where this EIS refers to ratepayer dollars, it means the money generated by BPA through its power marketing activities. Where it refers to taxpayer dollars, it means dollars appropriated by Congress that will not ultimately be repaid to the Treasury by BPA: i.e., a cost borne by the taxpayers.

Fish and Wildlife Program costs paid by ratepayers and hydropower losses are not the only fish and wildlife funding in the Region. Other fish and wildlife mitigation and

[129] USDOE/BPA 2000b.
[130] USDOE/BPA 2000b.

recovery costs are paid by Federal taxpayers. Some of these fish and wildlife costs are difficult to estimate because the Federal programs from agencies such as EPA, the Corps, and the Bureau include purposes other than fish and wildlife. Still, informal studies have found that these other Federal costs may range into hundreds of millions of dollars annually. Additional costs are paid by state and local taxpayers, and state and local funds are provided by lottery revenues, hunting and fishing licenses, user fees, and other sources.

Figure 2-3: Monthly Average Spot Market On-Peak Prices, January 1996 to December 2001, Four Markets



Regulatory costs are paid by businesses and their customers, and additional losses are incurred by uses of public and private resources such as grazing and forestry, when use is restricted to help fish and wildlife. Still more costs are paid by tribes and by citizens as monetary contributions or as the value of time and resources contributed. The extent of these costs is unknown.

Challenges to Funding

For many years, the rates for BPA hydropower were modest in comparison to those for other sources. Still, hydropower revenues were sufficient to repay the Federal debt from building the dams. Revenues have increased over time with demand, but so has the share of revenue allocated to purposes other than repayment. Especially, fish and wildlife costs have increased dramatically.

In the past, BPA was able to increase firm power rates to cover cost increases. Customers may not have welcomed rate increases, but the cost of BPA power even with rate increases was well below the cost of power from other suppliers. BPA's rate increases, therefore, did not significantly affect BPA power sales (see Maximum Sustainable Revenue (MSR) definition, below). More recently, however, a more competitive market has emerged for electric power, and non-BPA suppliers have begun to offer power products at prices comparable to BPA's rates.

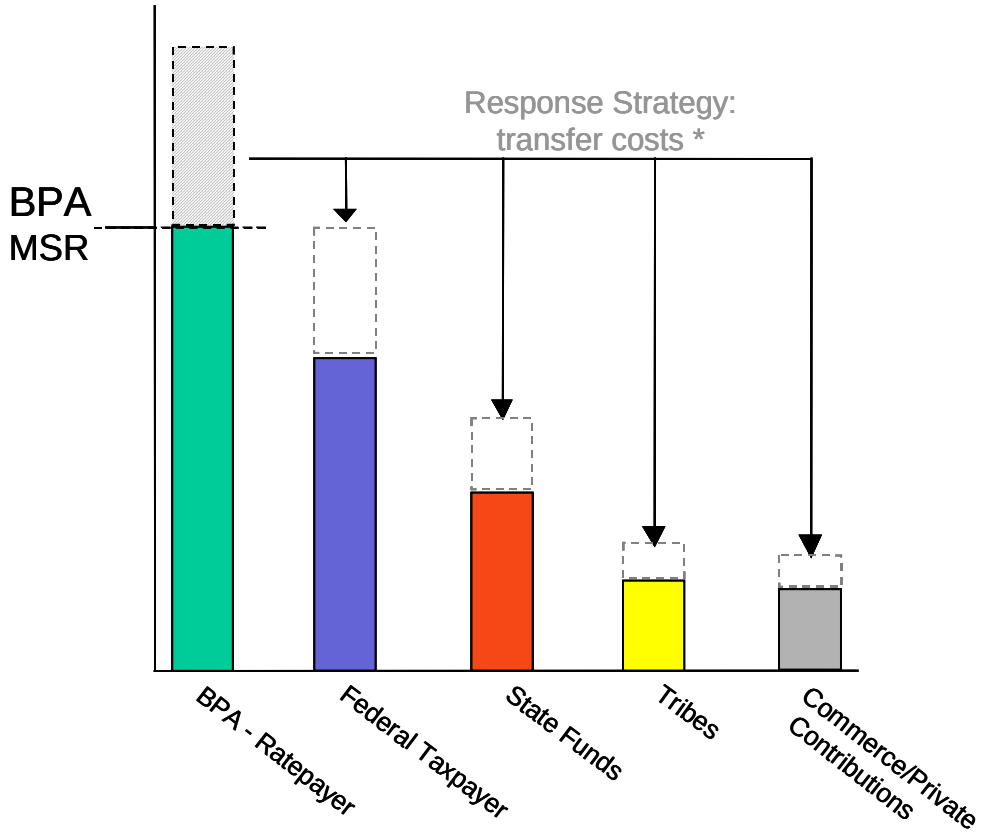
In the BPA Business Plan EIS (DOE/EIS-0183, Sec. 2.6.1 and 4.4.1.2)[131], BPA explained how a highly competitive power market affects its rates. BPA was concerned that its rates, increased to cover costs of fish and wildlife and other public benefit programs, would become noncompetitive. If this were to occur, the agency would find it difficult to meet all of its power, financial, and environmental responsibilities. BPA would be forced to implement one of its potential Response Strategies to continue meeting its obligations. These response strategies generally fall into three categories: to increase revenues, reduce costs, or transfer costs. Since BPA would already be at MSR, increasing revenues would be difficult. In addition, BPA had been cost-cutting over the past several years, so reducing costs much further would have adverse consequences.

> ***Maximum Sustainable Revenue (MSR).*** *When BPA's rates are close to the cost of alternative power supplies, there is a point at which an increase in BPA rates will* not *increase revenues. This is because the potential increase in revenues from the higher rate is affected by load loss as customers look elsewhere for cheaper power or a higher degree of certainty. The maximum sustainable revenue (MSR) occurs when the percent increase in BPA rates equals the percent reduction in quantity sold. The BPA rate at which MSR occurs and the amount of revenue at MSR are both positively related to power market conditions. If the market price for power drops below BPA's firm power rate, BPA will lose loads, revenues will decline, and BPA must reduce its rates to maximize revenue.*

[131] USDOE/BPA 1995a.

BPA works to ensure that fish and wildlife funds are spent efficiently and costs are controlled. Still, fish and wildlife costs are expected to increase. Therefore, and depending on future power market conditions, some of the additional fish and wildlife costs may need to be transferred to others. Figure 2-4 illustrates this situation.

Figure 2-4: Illustration of a BPA Response Strategy When Reaching Maximum Sustainable Revenues (MSR)



* NOTE: For purposes of this illustration, the incremental differences are proportional to the pre-existing cost shares. In practice, the transfer costs increments may be affected by funding limitations, political considerations, and the Policy Direction ultimately selected.

In addition, BPA is concerned about its customers' *perceptions* of BPA's costs. In numerous forums, customers have said that if BPA's responsibilities lead to unpredictable rates, they will find other power supplies. The uncertainty regarding BPA's rates occurred partially because BPA's ultimate responsibility for fish and wildlife funding is not quantified. Without an end-point, the MSR problem becomes more likely.

BPA revenues, wholesale power prices, and growing demand also affect BPA's ability to pay fish and wildlife costs. Starting in October 2001, BPA's total commitments to firm

loads exceeded the firm output of the FCRPS. To meet these loads, BPA is augmenting low-cost hydro with power purchases from the market. Because the cost of hydropower is consistently less than the cost of power from other sources, BPA's average cost is likely to be substantially lower than the prices of power from alternative suppliers. In fact, because BPA's low-cost hydro brings down the average cost of BPA's firm power, the higher the market price goes, the more attractive BPA's averaged cost power will become. If customers have a choice as to whether to take power from BPA, the higher the market price, the higher BPA's loads will be.

In recent years, the risk of driving BPA customers to other sellers is less than it was when the concept of Maximum Sustainable Revenues was first introduced. A more immediate concern is market volatility, which threatens the stability of the market and the financial health of participating buyers and sellers. As studies for BPA's 2001-2006 rate case have shown, volatility in the price of purchased power can dramatically alter BPA's financial prospects, from accumulating significant reserve funds to completely depleting previously accumulated reserves. If BPA's financial reserves become depleted, BPA might be unable to make its annual Treasury payment in full or on time, or to meet other financial obligations (including fish and wildlife implementation costs). Recent agreements with customers provide innovative terms that allow rate adjustments twice a year, based on BPA's actual costs of power purchased to serve firm loads.

Deregulation, conditions in California and the western states, and uncertainty regarding the response of power producers and consumers add another layer of uncertainty to BPA's revenues and ability to cover costs. Capacity shortages and increased volatility in West Coast electric power markets from the summer of 2000 through the summer of 2001 resulted in unprecedented price levels throughout the western United States. In California, high wholesale power prices, in conflict with statutory limits on retail prices, left Investor-Owned Utilities (IOUs) with billions of dollars in unrecovered costs. These deficits led to defaults by those IOUs on payments due the California Power Exchange (PX) and the California Independent System Operator (ISO), which in turn were unable to make full payments to power marketers, including BPA. Since the summer of 2001, the combined effects of reduced demand, increased generation, higher streamflows, and mild weather have brought prices down to pre-crisis levels. Ironically, lower-than-expected market prices are also problematic, because they reduce the revenue BPA can receive from sales of surplus power (bringing maximum sustainable revenues down), and therefore increase uncertainty about whether BPA can cover its costs.

The lack of creditworthy buyers to purchase power for California loads during the market crisis in later 2000 and early 2001 amplified the financial and operational crisis. The State of California intervened to authorize the California Department of Water Resources (CDWR) to purchase power on behalf of the insolvent IOUs starting in January 2001. Short- and long-term purchases by CDWR secured power supplies for California consumers, but at the same time created billions of dollars in power costs that ratepayers or taxpayers must ultimately pay. During the winter of 2000-2001, one of the driest winter periods on record, BPA was called upon to provide power to California. As a result, when the weather was coldest in the Pacific Northwest, under the terms of the

Biological Opinion, requirements for Columbia River flows or elevations of FCRPS hydro projects were modified. To the extent that these modifications conflicted with achieving the goals of fish and wildlife implementation, they were a consequence of market conditions arising from the breakdown of the California restructured electric power market. Due to continuing concerns over creditworthiness, BPA has been reluctant to market power to the California ISO.

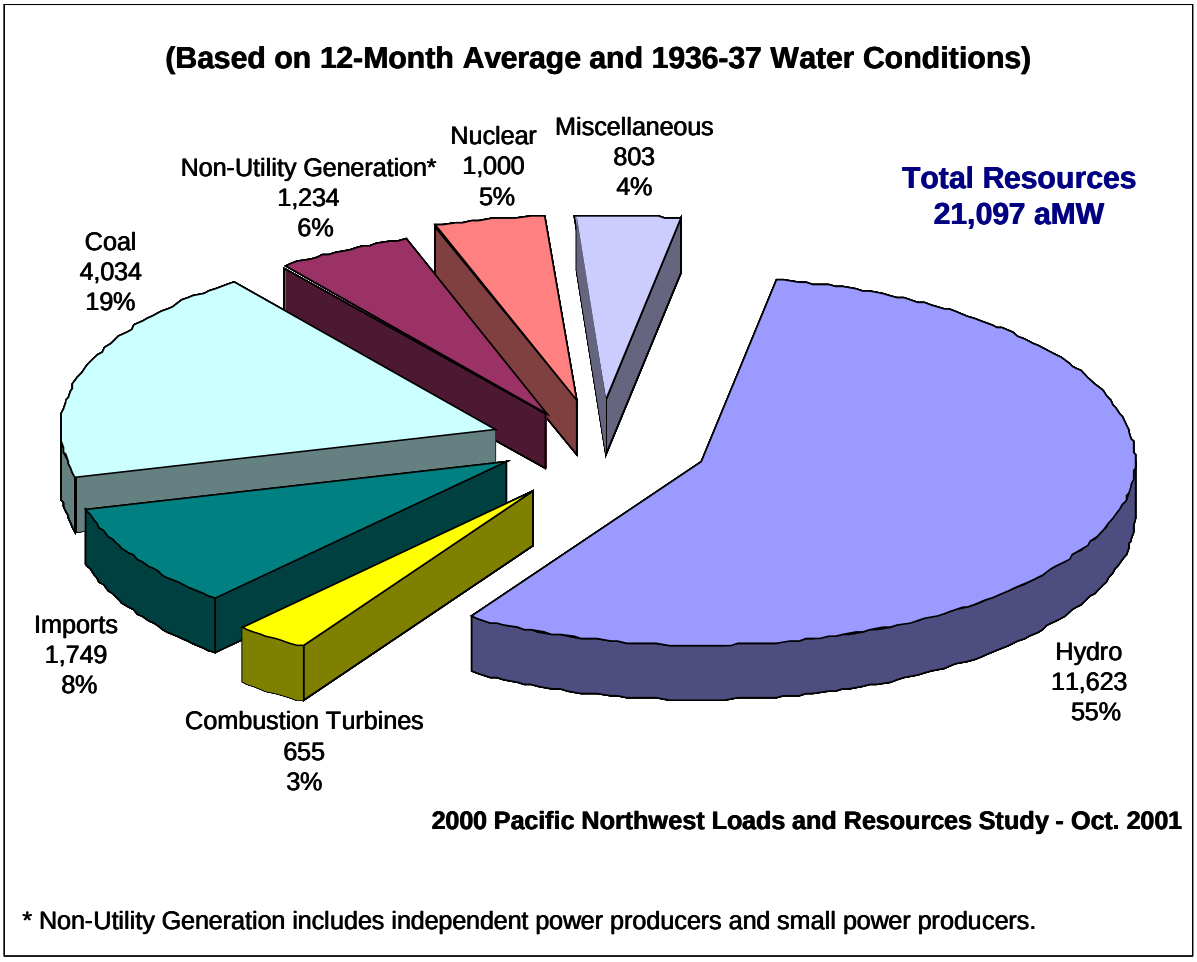
In summary: extreme high or low prices for power may impair BPA's ability to manage the FCRPS for fish and wildlife or finance implementation of mitigation and recovery actions. Price volatility adds uncertainty about BPA's financial health. Extreme power demands or shortages may lead to modifications of fish and wildlife operations. Unprecedented conditions arising from generation shortages and high prices in California created new risks and uncertainties for BPA and the FCRPS, but converse conditions of normal flows and low prices may also threaten BPA's financial stability.

How did a regional power supply deficit appear to materialize overnight in 2000 and 2001? Since the early 1990s, growth in demand averaged 1% annually, without any significant increase in generation or transmission capacity. Pending deregulation dampened infrastructure investment both by utilities, which saw uncertain future loads, and by independent developers, who didn't know when they could begin competing for retail customers. Also, between October 1994 and September 1999, the Pacific Northwest experienced water conditions that were 26% higher than average of the last 61 years on record, masking the gap between available power supply and growing demand. In fall/winter 2000, water conditions abruptly reversed, and the year 2001 was the second driest water year on record. The Region's heavy reliance on hydropower and the dearth of generation became all too apparent. Figure 2-5 shows how much of the Region's firm resources are from hydropower.

Early in 2001, BPA declared several power emergencies when the agency was unable to purchase enough power to meet demand. Water normally stored for spring fish migration was used for power. On March 29, 2001, the Acting BPA Administrator sent a letter to the Region about the extreme conditions facing the agency: a near-record low water year, a tight West Coast power supply, and an extreme market. In April 2001, extraordinary weather and market conditions forced BPA to declare a power system emergency under the terms of the 2000 Biological Opinion. That emergency was called based on the Council's estimates of power system reliability problems for spring and summer of 2001 and the impact of spill for fish passage on West Coast prices and reliability. There was simply not enough water available to meet both regional power needs and fish spill.[132] BPA, working with other Federal agencies, drafted principles that described the circumstances for emergency FCRPS power operations through 2001, as well as actions that must be taken before declaring an emergency. These principles were shared with the Region. As a result of the extreme conditions in 2001, BPA is developing a dry-year strategy to support decisions when precipitation is low and prices are high.

[132] USDOE/BPA 2001f.

Figure 2-5: Projected Regional Firm Resources
Operating Year 2001-2002



Even though in 2002, there was nearly average precipitation and streamflows, the surplus power for BPA to market was limited by the increased hydroelectric supply and falling prices, which again reduced BPA's anticipated revenues. This is just another demonstration of how the water conditions and market prices can influence BPA's ability to generate revenues to cover costs.

Lastly, just as BPA's MSR ultimately limits its ability to collect revenues, other funding sources such as those from Federal taxpayer appropriations, tribal contributions, and other commercial and private contributions have similar limits on their ability to acquire such funds. This also impacts the fish and wildlife mitigation and recovery effort in the Region.

2.3.2.4 Initiatives to Modify the Current State

Despite the burgeoning environmental movement that began in the second half of the twentieth century, the statutes passed and regulations enacted, the programs undertaken,