Northwest Power and Conservation Council

Briefing Book

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Northwest Authors Comment on the Council

Charged with bringing new order to Columbia River management, the Council has generally drawn praise for its efforts at promoting energy conservation but has had a more difficult time gaining consensus on saving salmon.

— William Dietrich, *Northwest Passage: The Great Columbia River,* 1995, page 290.

The 1980 Northwest Power Act seemed positively prescient in reducing the utility industry's role in the region's energy planning and in placing policy-making into the hands of the Power Planning Council. The Council would be appointed by the governors of the states of Oregon, Washington, Idaho and Montana. The law seemed as responsive to the needs of the public for its time as the construction of the hydropower system itself had seemed during the New Deal two generations before.

— Joseph Cone, *A Common Fate: Endangered Salmon and the People of the Pacific Northwest,* 1995, Page 30.

[The Council, under the Northwest Power Act] gave priority to the runs above the Bonneville Dam. And for the first time, they tried to change the operation of the river rather than just mitigate the effects of management. Their plans regulated flows to help push the salmon downstream, and some dams were retrofitted with juvenile bypass systems to keep the smolts out of the turbines. But given the gravity of the [salmon] situation, the changes were modest; they failed to achieve their goals.

— Richard White, *The Organic Machine: The Remaking of the Columbia River*, 1995, Page 103.

The Northwest Power Act, in theory, spelled out a revolution in western water management. It put longtime inmates of the engineered river — Indian tribes and fish agencies — in a position of power. To administer the revolution, the Power Act created a novel bureaucratic creature. Not quite a federal agency, not a state agency, the Northwest Power Planning Council was made up of two gubernatorial appointees from each of the four states in the Northwest. The Council had powers (rather vaguely defined powers, as it turned out) to change the behavior of the federal agencies that managed the hydrosystem.

— Blaine Harden, *A River Lost: The Life and Death of the Columbia,* 1996, Page 216.

… the Northwest Power Act forged a link between regional energy development and fish and wildlife recovery. At a conceptual level, the Act aimed for a power system that would meet energy demands through measures that impose the least economic and environmental cost on the region, while taking pressure off Columbia River fish and wildlife. For the power system, moving ahead would require modified operation of the Columbia River dams and financing for measures to offset the dams' effects on fish and wildlife. For fish and wildlife interests, mitigation would require a healthy hydropower system capable of generating sufficient revenues to finance energy and fish and wildlife conservation measures. Perhaps neither fish nor power interests perceived the connection clearly, but it is apparent in hindsight: Under the terms of the Northwest Power Act, neither fish and wildlife conservation nor power development could proceed without the other.

— John Volkman, *A River in Common: The Columbia River, The Salmon Ecosystem and Water Policy, A Report to the Western Water Policy Commission,* 1997, Page IV-20 (68).

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Background

The Federal Columbia River Power System

The development of the Federal Columbia River Power System in the Pacific Northwest began in the 1930s under a program of regional cooperation to meet the needs of electric power production, land reclamation, flood control, navigation, recreation, and other river uses.

From the beginning, the federal government has played a major role in the development of one of the largest multiple-use river systems in the world. The U.S. Army Corps of Engineers and the Bureau of Reclamation built 31 multi-purpose dams on the Columbia River and its tributaries. Investor-owned and publicly owned utilities also built a major system of dams and generating facilities, beginning in the late 1800s.

Congress directed the Bonneville Power Administration, in the Bonneville Project Act of 1937, to build and operate transmission lines to deliver the power from dams, and to market electricity from federal generating projects on the river at rates set only high enough to repay the federal investment over a reasonable period of time.

Today, the Federal Columbia River Power system includes these dams:

Name	River, State	In-service year	Capacity
Albeni Falls	Pend Oreille, ID	1955	43 MW
Anderson Ranch	Boise, ID	1950	40 MW
Big Cliff	Santiam, OR	1953	18 MW
Black Canyon	Payette, ID	1925	10 MW
Boise River Diversion	Boise, ID	1912	3 MW
Bonneville	Columbia, OR/WA	1938	1,077 MW
Chandler	Yakima, WA	1956	12 MW
Chief Joseph	Columbia, WA	1958	2,458 MW
Cougar	McKenzie, OR	1963	25 MW
Detroit	Santiam, OR	1953	100 MW
Dexter	Willamette, OR	1954	15 MW
Dworshak	Clearwater, ID	1973	400 MW
Foster	Santiam, OR	1967	20 MW
Grand Coulee	Columbia, WA	1942	6,779 MW
Green Peter	Santiam, OR	1967	80 MW
Green Springs	Emigrant Crk, OR	1960	16 MW
Hills Creek	Willamette, OR	1962	30 MW
Hungry Horse	Flathead, MT	1953	428 MW
Ice Harbor	Snake, WA	1962	603 MW
John Day	Columbia, OR/WA	1971	2,160 MW
Libby	Kootenai, MT	1975	525 MW
Little Goose	Snake, WA	1970	810 MW
Lookout Point	Willamette, OR	1953	120 MW
Lost Creek	Rogue, OR	1977	49 MW

Name	River, State	In-service year	Capacity
Lower Granite	Snake, WA	1975	810 MW
Lower Monumental	Snake, WA	1969	810 MW
McNary	Columbia, OR/WA	1952	980 MW
Minidoka	Snake, ID	1909	28 MW
Palisades	Snake, ID	1958	176 MW
Roza	Yakima, WA	1958	11 MW
The Dalles	Columbia, OR/WA	1957	1,808 MW

Total: 31 dams, 20,444 megawatts of capacity. The U.S. Army Corps of Engineers operates 21 of the dams, and the Bureau of Reclamation operates 10.

The Columbia River Treaty with Canada

As demand for power grew, the United States and Canadian governments recognized a need for development of water storage sites in the upper reaches of the Columbia River Basin. The governments of both nations negotiated a treaty in the early 1960s for the cooperative use of dams that would be built by both countries. Four dams were built under the treaty. Three are on the Columbia River or a tributary in Canada — Keenleyside, Duncan and Mica — and the fourth, Libby, is on a major Columbia tributary, the Kootenai River, in Montana. The Canadian dams were completed by 1973, and Libby was completed in 1975.

The Canadian dams provide flood control and water storage for the purpose of additional power generation at dams downstream in the United States. The power-generating capability of downstream dams increased by the following percentages as a result of the treaty storage: Grand Coulee, 13 percent; Chief Joseph, 14 percent; the five mid-Columbia public utility district dams, 18 percent; and dams farther downstream on the Columbia, 11 percent collectively In return, Canada received two payments: one from the U.S. Treasury for flood control benefits and the other a cash lease payment for the first 30 years of the additional power generation. Known as the downstream benefits, the additional power is divided equally between Canada and the United States. Following the 30-year lease/sale by Canada to U.S. parties, in the late 1990s Canada's share of the downstream benefits were returned to Canada.

Interties between the Northwest and Southwest

Also in the 1960s, Congress authorized construction of three major power lines linking the Columbia River hydropower dams with power markets in California and the rest of the Pacific Southwest. The interties benefit the Pacific Northwest in several ways. They allow the sale of hydropower from the Columbia when it is not needed here and would otherwise be lost in the form of water spilled over dams without generating electricity, and they permit this region to buy power from California when power is needed here during shortages and periods of heavy use. In the first instance, sales of surplus Northwest hydropower to California has saved the equivalent of some 200 million barrels of oil. In the second case, California utilities sold power to Pacific Northwest utilities in the drought years of 1973, 1977, 1979, 1992, 1993, 1994 and 2001.

To protect Northwest access to the federal hydropower, Congress authorized regional preference provisions in 1964. Bonneville must offer any surplus power to

utilities in the Northwest before selling it to California. Sales to California can be called back if the power is needed in the Northwest. Sales of firm energy can be recalled with 60 days notice, sales of peaking capacity can be recalled in five years.

The Hydro-Thermal Power Program

With the dams developed in Canada as well as the United States, the river system provided virtually all the electricity needed by the region until the early 1970s. But by that time, all dam sites on the mainstem of the Columbia that were economically feasible and environmentally acceptable were either developed or under development, and the region was looking for other ways to meet electric load growth. Bonneville and the region's utilities were predicting shortages of electricity unless thermal generating plants were brought on line in response to increasing demand.

The region's publicly owned utilities and investor-owned utilities turned mainly to coal-fired and nuclear plants to meet growth throughout the Pacific Northwest. Utilities believed the development of such plants was the most economic and environmentally acceptable option available at the time. Bonneville helped the utilities respond to these needs by participating in a Hydro-Thermal Power Plan for the continued development of electricity resources in the Pacific Northwest.

Under the plan, Bonneville agreed to acquire electricity by entering into “net billing" agreements with its utility customers. These agreements made it possible for the publicly owned utilities, which owned shares of power plants, to sell to Bonneville all or part of the generating capacity of thermal projects. Bonneville credited, and continues to credit, the wholesale power bills of these utilities in amounts sufficient to cover the costs of their shares in these plants. Bonneville then sells the output of these plants, melding the higher costs of this thermal power with the lower costs of hydropower, for the benefit of all customers. The plants were cooperative efforts of both publicly owned and investor-owned utilities, but Bonneville purchased only the shares of generating capacity owned by publicly owned utilities.

Under the Hydro-Thermal Power Program (Phase I), Pacific Power & Light Company and other investor-owned utilities built the twin Centralia, Washington, coal-fired plants with the co-ownership of several publicly owned utilities. Portland General Electric Company built the Trojan nuclear power plant, with 30 percent co-ownership by Eugene Water and Electric Board (EWEB) covered by a net-billing agreement. And the Washington Public Power Supply System (WPPSS), under net-billing agreements, completed one nuclear plant (WNP 2) and partially constructed two other nuclear plants (WNP 1 and 3) in Washington state. The Hanford N-reactor turbine generator, built by WPPSS, also came on line just prior to the formal initiation of the Hydro-Thermal Power Program, and before its closure in 1987 was considered a part of the overall effort. Bonneville became the agent for integrating these resources so the consumers of the region could benefit from the greatest efficiency and lowest costs from operation of the regional electric system. Under the plan, the thermal power plants would run continuously to meet the base, or constant, power needs. The hydroelectric dams would be operated to follow the fluctuation of energy needs throughout the day.

In spite of the efforts of utilities and Bonneville to continue developing the region's generating resources in a systematic way, the region continued to lose ground to rapidly growing demands for electricity. The Hydro-Thermal Power Program failed to meet the region's expectations for two basic reasons. A revision of regulations by the Internal Revenue Service denied tax exempt status to bonds sold by publicly owned utilities to finance their plants if power from the facilities was sold to Bonneville, a federal agency. And, Bonneville's financial ability to participate in net-billing agreements reached its limit far sooner than expected because of the climbing costs of new thermal plants.

In 1973, Bonneville and the region's utilities initiated Phase II of the Hydro-Thermal Power Program, in which the utilities would finance their own plants without net-billing participation by Bonneville. Thus, WPPSS nuclear units 4 and 5, now terminated, were not covered by net-billing contracts. Nonetheless, Bonneville expected to provide electric load management and power integration services and to supply peaking power and reserves from federal facilities in order to bring about the most efficient mix of resources possible. Bonneville's participation in this program was enjoined by a federal court in 1975. The court required that Bonneville complete an environmental impact statement on the impact of the Hydro-Thermal Power Program.

The environmental impact statement, which was not completed until 1980, found that fluctuation in the use of hydroelectric dams would have to be limited to protect shore structures along the river. Bonneville put the Hydro-Thermal Power Program on hold while the impact statement was being prepared, and during those five years a number of events occurred that led to the demise of plants 4 and 5. These included construction delays at all five of the WPPSS nuclear plants, cost increases for those plants as the result of overruns and mismanagement, decreasing regional demand for power, growing public interest in energy conservation as a low-cost alternative to the extraordinarily expensive nuclear plants, and court decisions that relieved the participating utilities of their obligation to pay for the plants. Bonneville continues to pay for the net-billed plants, even though construction was suspended on plants 1 and 3 in 1983 and never restarted.

Public power preference

The Bonneville Project Act of 1937 directed that the electric cooperatives and other publicly owned utilities of the region be given first call on available federal resources. They consequently came to be called “preference customers.” In 1964, Congress authorized the Pacific Northwest Consumer Power Preference Act, which directed that only surplus energy from the Columbia River system could be sold outside the Northwest. Firm power from the system was reserved for the Northwest, except under conditions specified in the Act. Until the 1970s, the legal preference of public customers was unchallenged, largely because there had been enough electricity for everyone. In 1973, when Bonneville's firm-power contracts with investor-owned utilities expired, Bonneville could not offer new ones if preference customers were to continue to have first call on federal resources. So the firm power contracts with the investor-owned utilities were not renewed.

However, Bonneville continues to sell some peaking power to the investor-owned utilities — power the utilities need during periods of heavy use in the winter heating season. Bonneville also sells "non-firm" power to the investor-owned utilities and utilities outside the region when electricity surplus to the needs of the preference customers is available.

In 1976, Bonneville's power demand and supply projections showed that federal power supplies were running short for preference customers, and that Bonneville would no longer be able to guarantee preference customers that their load growth could be met beyond 1983. Bonneville issued a notice of insufficiency to the utilities in June of 1976. The following month, 88 public utilities signed contracts with WPPSS to build nuclear plants 4and 5. The WPPSS nuclear construction program proved to be a debacle, but it also prompted changes in regional energy policy. Mismanagement and cost overruns at the five WPPSS plants were at the root of the financial problems, but the WPPSS debacle also was a failure of electricity demand forecasting. The impetus for the nuclear construction effort lay in demand forecasts produced by the region's utilities, through the Pacific Northwest Utilities Conference Committee, and Bonneville. The forecasts proved to be too high.

Rate disparities

With PNUCC and Bonneville warning of future power shortages, with the investor-owned utilities relying on their own hydro and thermal resources to meet the demand of their customers, and with the prices of federal hydropower remaining much lower than that of new thermal generation, a divisive struggle developed for access to the limited federal hydropower. Sixty percent of the residential and farm customers of the region were served by investor-owned utilities. These customers were paying, on average, twice as much for electricity as customers of publicly owned utilities receiving wholesale power from Bonneville. The city of Portland sued Bonneville, claiming a right to a share of hydropower resources for its residents. The Oregon Legislature passed a law authorizing formation of a statewide public utility — the Domestic and Rural Power Authority — to seek service as a preference customer from Bonneville so that all residential customers of private utilities could receive the rate benefits of federal resources. Elected officials of other states talked of forming their own statewide public utilities.

Stimulated by rate disparities, the public power movement also experienced a renaissance. A strong public power move to buy out investor-owned utility service areas by means of elections in accordance with state law was revived in Oregon. All votes to form new PUDs failed in the November 1980 elections, but one long inactive PUD, the Columbia Peoples Utility District west of Portland won voter approval for issuing bonds to buy out utility properties in Columbia County.

Meanwhile, planning for more resources to meet demand was hamstrung by uncertainty over the allocation of low-cost federal power among competing claimants, existing and new. For example, Bonneville's contracts with its direct service industries, which are large industrial firms that purchase power directly from Bonneville, were to expire in the 1980s. The power sold to these industries would have to be sold to public

utilities under the preference clause. If they were to survive in the Northwest, these industries needed an assured source of electricity.

Declining salmon runs

Finally, by the late 1970s it became clear that our regional prosperity, which resulted in large measure from inexpensive hydropower from the federal dams, had extracted a price on fish and wildlife in the Columbia River Basin. Just a century earlier, for example, between 10 million and 16 million salmon and steelhead returned to the Columbia each year. But by the late 1970s the annual returns had dwindled to about 2.5 million fish, and most of those returned to hatcheries. Environmental groups and other advocates for fish and wildlife considered filing petitions to protect dwindling fish populations under the federal Endangered Species Act.

These pressures on our regional electric power supply, which once seemed inexhaustible, caused Pacific Northwest residents to question the institutions governing the development, sale, and distribution of generating resources. Should new preference agencies be formed to replace private companies in given areas? How would the supply needs of new preference customers be met? Should private utilities undertake new generating projects in a hostile atmosphere of rapidly rising rates and the threatened shift to public power? How would large industrial customers in the region be served? How should the public, and their elected representatives, participate in decisions that were critical to the region's economy and environment? Who ultimately would be responsible for planning and acquiring new resources to avoid impending electricity shortages? How would our region protect the fish and wildlife that had been damaged over the years by the construction and operation of hydropower dams? The region continued to work for a cooperative solution that preserved local options while obtaining regional efficiencies of an integrated electric system. Several alternatives were explored, but no agreement was reached. To avoid a court battle over allocation issues, the region turned to Congress for a solution.

Toward a Congressional solution

Revisions to the Bonneville Project Act were considered as early as 1975. The legislation was prompted by Bonneville's Notice of Insufficiency in June 1976, coupled with the threat posed by Oregon's Domestic and Rural Power Authority. However, it was not until 1977 that Bonneville and its customers, through the Pacific Northwest Utilities Conference Committee (PNUCC), drafted legislation to solve the region's energy problems. U.S. Senator Henry M. Jackson of Washington introduced the PNUCC bill in September 1977, but neither that bill, nor a less complex successor drafted a year later, managed to progress very far by the time the 95th Congress adjourned in late 1978.

When the 96th Congress convened in 1979, a coalition of Bonneville customers was solidly behind a legislative solution to the Northwest's power crisis. Neither Bonneville nor its customers wanted an administrative allocation of limited power supplies, although Bonneville did propose an allocation scheme in October of 1979. Bonneville and its customers, however, maintained that such an allocation would be subjected to protracted litigation. They alleged that Congress could avoid the uncertainties accompanying administrative allocation by devising a legislative allocation

scheme and equipping Bonneville with the authority to purchase power from non-federal sources on a long term basis. Supplying Bonneville with purchase authority was, they claimed, the key to implementing any legislative allocation scheme. Congress apparently agreed. The Senate passed the regional legislation on August 3, 1979; the House passed an amended bill on November 17, 1980, which the Senate agreed to two days later. On December 5, 1980, President Carter signed the Pacific Northwest Electric Power Planning and Conservation Act into law as Public Law 96-501.

Northwest Power Act

After four years of deliberation, Congress devised methods for protecting the preference that existing federal law gives publicly owned utilities, while at the same time providing the benefits of federal hydropower to residential and small farm customers of private utilities. It should be noted that the Act passed largely because it seemed to benefit all the interest groups that lobbied for it.

The Act directs that Bonneville should continue its traditional role of transmitting and marketing power, but also carry out additional responsibilities. Under the Act, Bonneville must acquire all necessary energy resources to serve utilities that choose to apply to Bonneville for wholesale power supplies. The Act contains checks and balances to insure that all customers of Bonneville are treated equitably.

Bonneville remains accountable to the people of the Pacific Northwest for the actions it takes to meet the needs of residents and industry. By creating a regional planning council consisting of two members from each of the four Northwest states to develop a regional plan, Congress provided a regional decision-making system. It emphasizes local control of resource development and power planning.

Here are some of the major provisions of the Act:

- The states of Idaho, Montana, Oregon, and Washington were authorized to form the Council (in the Act, Section 4.(a)(2)(A), it is called the Pacific Northwest Electric Power and Conservation Planning Council) with two representatives from each state, appointed by the governors. The Act directed the Council to draw up a plan for meeting the electrical needs of the region at the lowest possible cost. The plan must give highest priority to cost-effective conservation to meet future demand for electricity. Renewable sources of energy must be given next-highest priority in the region's power planning, to the extent that they are cost-effective, ranking ahead of conventional thermal generating resources. Among thermal options, fuel-efficient methods of producing energy, such as cogeneration, must be given priority.

- Bonneville became responsible for meeting loads of customers and managing the regional electrical system to achieve the purposes of the Act relating to fish and wildlife, system efficiency, and experimental projects. The plan adopted by the Council, which is amended periodically, is the basis for Bonneville’s actions in meeting loads of its customers. Congress exercises budget review of all proposed Bonneville expenditures. If Bonneville decides

to acquire resources not consistent with the Council's plan, specific Congressional approval is required prior to any commitment by Bonneville. Bonneville must give priority to cost-effective conservation and renewable resources in meeting the region's needs. Bonneville may also purchase the generating capabilities of new thermal projects, but only after determination that they are required in addition to all cost-effective conservation and renewables that can be achieved or developed in time. Such projects must also be found reliable and compatible with the regional electric system. Bonneville must spread the benefits and the costs of resources among all of its customers through its rates.

- The supply preference and resulting price advantage to co-ops and publicly owned utilities by federal law was protected and enhanced. Bonneville was given the responsibility of meeting the full future requirements of preference customers — something Bonneville was not previously authorized to do.

- Residential and farm customers of investor-owned utilities received rate relief. The utilities sell to Bonneville, at the average cost of their power, an amount of electric energy equal to their residential and farm loads. Bonneville sells to them, in return, enough energy at Bonneville standard rates to cover these residential and farm loads. The rate advantages cannot enhance company profits, but must be passed on directly to the customers.

- Direct service industries received new 20-year contracts for power from Bonneville, but at a higher price than they paid under previous contracts. In effect, they paid the cost of rate relief to residential and small farm customers of investor-owned utilities during the first four years, and a substantial portion thereafter, which they agreed to do in exchange for assurances of long-term supplies.

- Bonneville sells electricity at a rate that reflects the melded cost of federal hydropower and more expensive thermal resources, conservation, and renewable sources of energy. The Act contains incentives, as well, to encourage conservation and renewables. Bonneville may credit utilities for their individual actions to implement conservation and renewables.

- The Council is to prepare, and periodically amend, a program to protect, mitigate, and enhance fish and wildlife, and related spawning grounds and habitat, that have been affected by the construction and operation of any hydroelectric project on the Columbia River or its tributaries. This applies to anadromous (ocean-going) fish as well as resident (non-ocean-going) fish, and terrestrial and aquatic wildlife. The Act directs the Bonneville administrator to use the Bonneville fund to protect, mitigate, and enhance fish and wildlife affected by hydropower dams in a manner consistent with the program developed by the Council. A 1996 amendment of the Power Act authorized the Council to create the Independent Scientific Review Panel to review projects proposed for funding by Bonneville through the Council's program.

The ISRP is discussed in the section of this briefing book that addresses fish and wildlife planning.

- All planning for electric resources and fish protection must involve the public. State and local control of land use and water rights is protected under the Act and the decision to allow construction of new resources is left with utilities and state siting authorities.

- The Council must provide a method for balancing environmental protection and the energy needs of the region. For each new energy resource, the provisions of the National Environmental Policy Act must be complied with.

- The Council is required to seek the recommendations of the region's tribal, state and federal fish and wildlife agencies. In addition, the Council's measures must be consistent with the legal rights of the region's tribes.

Challenges for the future

Since 1996, the electricity industry in the United States has been in the midst of a significant restructuring. This restructuring is the product of many factors, including national policy to promote a competitive electricity generation market and state initiatives in California, New York, New England, Wisconsin and elsewhere to open retail electricity markets to competition. This transformation is moving the industry away from the regulated monopoly structure of the past 75 years. Today we are served by individual utilities, many of which control everything from the power plant to the delivery of power to our homes or businesses. In the future, we may have a choice among power suppliers that deliver their product over transmission and distribution systems that are operated independently as common carriers.

There is much to be gained in this transition, as electricity consumers can benefit from competition, but also much to lose from volatile wholesale power markets and illegal marketing activities, as the region learned during the energy crisis of 2000/2001. On the optimistic side, not too many years ago competition in the natural gas industry helped lower the cost of electricity produced by gas-fired generating plants. On the negative side, completion of a new pipeline linking the gas fields of northern Alberta with the American Midwest increased competition between that region and the Northwest and contributed to higher gas prices here in the early 2000s. During the energy crisis of 2000/2001, natural gas prices tripled in a year, and then subsided as the electricity supply rebounded. Competition among manufacturers and developers of combustion turbines contributed to the availability of less expensive, more efficient power plants that can be built relatively quickly, and many new plants were added to the Northwest and West Coast power supply during the energy crisis, when stratospheric prices — well over $200 per megawatt-hour — meant that construction debt for the plants could be paid down quickly. Generally speaking, surplus generating capacity on the West Coast, combined with increasing competition among wholesale suppliers, reduces the price utilities must pay for power on the open market, as long as supplies are adequate. Broad competition in the electricity industry can result in lower prices and more choices about the sources,

variety and quality of their electrical service, but competition also can lead to price escalations, as the region learned during the energy crisis.

Electricity markets can be benign as long as supply and demand remain somewhat aligned. But as the experience of 2000/2001 made abundantly clear, competitive markets can be volatile. In a competitive energy marketplace, prices can explode to unheard-of levels in a matter of months when demand increases and the supply decreases. Coupled with rapidly increasing costs for natural gas, the advantages of competition can turn quickly to disadvantages.

If nothing else, the absurdly high West Coast prices for wholesale electricity in late 2000 and the first five months of 2001 showed there are risks inherent in the transition to more competitive electricity services. Merely declaring that a market should become competitive will not necessarily achieve the full benefits of competition or ensure that they will be broadly shared — particularly when the weather, power plant outages, regulatory rules and natural gas prices don't cooperate.

It is entirely possible to have deregulation without true competition. Similarly, the reliability of our power supply could be compromised if care is not taken to ensure that competitive pressures do not override the incentives for reliable operation. How competition is structured is important.

It is also important to recognize the limitations of competition. Competitive markets respond to consumer demands, but they do not necessarily accomplish other important public policy objectives. The Northwest has a long tradition of energy policies that support environmental protection, energy-efficiency, renewable resources, affordable services to rural and low-income consumers, and fish and wildlife restoration. These public policy objectives remain important and relevant. Given the enormous economic and environmental implications of energy, these public policy objectives need to be incorporated in the rules and structures of a competitive energy market, and not abandoned in the face of escalating demand and tight supplies of power.

In some respects, the transition to a competitive electricity industry is more complicated in the Northwest than elsewhere in the country because of the presence of the Bonneville Power Administration. Bonneville is a major factor in the region's power industry, supplying, on average, 40 percent of the power sold in the region and controlling more than 70 percent of the region's high-voltage transmission. Bonneville benefits from the fact that it markets most of the region's low-cost hydropower. It is hampered by the fact that it has comparatively high fixed costs, including the cost of past investments in nuclear power and the majority of the cost of fish and wildlife recovery in the Columbia River Basin.

As a wholesale power supplier, Bonneville is already fully exposed to competition, and Bonneville struggles when market prices are above its own cost-based rates. The transition to a competitive electricity industry raises many issues for Bonneville and the region. For example, can Bonneville continue to meet its financial and environmental obligations in the face of intense competitive pressure? When market prices rise and some of Bonneville's debt obligations have been retired, how can the

Northwest retain the economic benefits of its low-cost hydroelectric power when the rest of the country is paying market prices? And finally, what is the appropriate role of a federal agency in a competitive market? The question is not only whether Bonneville can compete in the near term, but also, should it be a competitor?

In the mid 1990s, Bonneville struggled in a low-cost market. During the energy crisis of 2000 and 2001, when wholesale market prices shot up to 10 times the usual price, and higher at times, federal power was the envy of every utility facing marketplace sticker shock. The drought of 2001, which reduced Columbia River runoff to the second-lowest level in 73 years of record-keeping, reduced the region's hydropower capacity by 4,000 megawatts, and Bonneville, which must purchase about 3,000 megawatts in the market in order to meet its customers' demand, spent nearly $3 billion on power in a single year, 2001.

Largely because of Bonneville's experiences in 2001, a group of Bonneville customers proposed a fundamental change in Bonneville's power marketing role in the future, a proposal to limit Bonneville to selling only the output of the federal Columbia River Power System, essentially ending its role in the marketplace and making its customers responsible for meeting their own load growth beyond their guaranteed share of the federal system, which Bonneville would supply. That proposal, known as the Joint Customer Proposal (JCP), initiated a multiple-year-long process by Bonneville to define its future role in power supply. That process, known as the Regional Dialogue, was completed in 2006. It is discussed elsewhere in this Briefing Book.

The federal power system in the Pacific Northwest has conferred significant benefits on the region for more than 60 years. The availability of inexpensive, cost-based electricity has supported strong economic growth and helped provide for other uses of the Columbia River, such as irrigation, flood control and navigation. The renewable and non-polluting hydropower system has helped maintain a high quality environment in the region.

But while the power system has produced significant benefits, these benefits came at a substantial cost to the fish and wildlife resources of the Columbia River Basin. Salmon and steelhead populations have been reduced to historic lows, and 12 populations of salmon and steelhead, plus bull trout and Kootenai River white sturgeon, are listed for protection under the federal Endangered Species Act. Resident fish and wildlife populations also have been affected. Native Americans and fishery-dependent communities, businesses and recreationists have suffered substantial losses due in significant part to construction and operation of the power system.

It is important that the region sustain its core industries, support conservation and renewable resources, and restore salmon runs. As John Volkman comments in his book on Columbia River water policy, excerpted at the beginning of this document, fish and wildlife mitigation requires a healthy hydropower system capable of generating sufficient revenues to finance energy and fish and wildlife conservation measures — neither fish and wildlife conservation nor power development can proceed without the other.

Power Planning

1. The Northwest Conservation and Electric Power Plan

The Northwest Power Act directs the Council to prepare a plan to assure the Pacific Northwest region an adequate, efficient, economical and reliable power supply. The Council adopted its first power plan in January 1983 and has revised it five times since then.

The current version of the plan, adopted by the Council in December 2004, is a much different document than the Fourth Northwest Power Plan, adopted by the Council in 1998. The Fourth Plan was, in essence, a blueprint for how the electricity industry of the Northwest should be restructured to accommodate increasing competition. The Fourth Plan followed on the 1996 Comprehensive Review of the Northwest Energy System, an effort convened by the four Northwest governors to develop recommendations for changes in the institutional structure of the region's electric utility industry "…to protect the region's natural resources and distribute equitably the costs and benefits of a more competitive marketplace, while at the same time assuring the region of an adequate, efficient, economical and reliable power system."

The Fifth Power Plan provides additional recommendations for dealing with the impacts of competition, particularly the dilemma of how to ensure an adequate supply of affordable electricity in a competitive marketplace where price competition among power suppliers discourages investments in new generating and conservation resources. The Fifth Plan responds to the problem of high prices and reduced supply of power that prompted the West Coast electricity crisis of 2000/2001. The plan recommends aggressive energy conservation and demand-reduction investments through about 2010 and, after that, investments in new generating resources.

The 2000/2001 crisis was the result of several adverse trends and events: uncertainty created by efforts to deregulate the power industry; a corresponding de-emphasis on planning; several years of under-investment in generation and conservation; a deeply flawed electricity market design in California; unethical and illegal actions by some of the participants in that market; and the second-worst water year in the Northwest's hydrological record. While the causes were different, the results of this crisis were much the same as the one preceding the first Council plan – skyrocketing retail rates that struck a major blow to the regional economy.

The key theme of the Fifth Plan is that the future is uncertain. Therefore, plans and policies must be developed that allow the region to manage uncertainty and the risks it entails. Many of the uncertainties the region now faces are familiar – uncertainty about demand for electricity, hydropower conditions, and forced outages of major power plants. Other uncertainties are new or have greater importance. The increased role of natural gas-fired generation and changes in the nature of the natural gas industry mean gas price uncertainty and volatility is a significant factor. Increasing concerns about global climate change pose new uncertainties for resource choices. The wholesale electric power market is still important, but it also is uncertain and volatile. In short, major changes have

occurred, and are occurring, in the energy environment. The region's electricity supply no longer is provided solely by the Bonneville Power Administration and regulated public and investor-owned utilities. It is now provided by a mix of regulated and unregulated utilities and private businesses.

From a physical standpoint, in 2007 the region has a modest generation surplus under critical water conditions. That surplus is the result of reduced demand that has not yet returned to pre-2001 levels and a significant amount of new generation, most of which was built by independent power producers (IPPs). But in terms of generation owned by or contracted to the region's utilities, the region is deficit. The IPP generation is available to the region but, unless purchased long-term, it will be sold at market prices and subject to market risk. The role the IPPs will play in the region's electricity future is unclear.

In addition, those making resource decisions may be a more varied group than in the past. If proposed changes to Bonneville's role in power supply go forward, many smaller public utilities may be making resource decisions in addition to Bonneville, the investor-owned utilities, and the larger publics. However, until those changes are in place, there is uncertainty regarding who will acquire new resources for many public utility customers.

The Fifth Plan describes a robust and flexible resource strategy that can perform well under the expanded and intensified range of future uncertainties. Second, the plan addresses key policy issues that affect the ability to assure an adequate, efficient, economical, and reliable power system. These include issues such as standards for resource adequacy; how the region plans, pays for, and operates transmission; the interaction of fish and wildlife and hydropower; and the future role of the Bonneville Power Administration in power supply. The plan assesses these issues and proposes to work with regional entities to resolve them.

The power plan comprises a resource development strategy to ensure the region's future power supply is characterized by least-cost and least-risk resources. The plan includes the following recommendations on issues that affect the power system.

Conservation

The plan recommends that the region increase and sustain its efforts to secure cost-effective conservation immediately. The Council's analysis shows that improved energy efficiency is a resource that is lower cost than new generating options and provides a hedge against market, fuel, and environmental risks. Although conservation may result in small rate increases in the short-term, it can reduce both cost and risk in the long-term. The targets are ambitious but doable: 700 average megawatts between 2005 and 2009; and 2,500 average megawatts over the 20-year planning period.

Conservation acquisition is discussed in more detail in a separate section.

Demand Response

The plan recommends developing demand response programs—agreements between utilities and customers to reduce demand for power during periods of high prices

and short supply. The Council recommends developing 500 megawatts of demand response between 2005 and 2009 and larger amounts thereafter. Demand response has proven helpful in stabilizing electricity prices and in preventing outages. The Council's analysis shows that although demand response probably will be used infrequently, it reduces both cost and risk compared to developing additional generation.

Wind

The plan incorporates almost 1,100 megawatts of wind generation capacity between 2005 and 2014 from state system benefits charge programs and current utility integrated resource plans. Beyond that, additional wind generation figures prominently in the next decade. The plan calls for construction of up to 6,000 megawatts of new wind capacity by 2024.

Meanwhile, wind power development accelerated at a faster rate than the Council anticipated in the power plan. By late 2006, more than 970 megawatts had been placed in operation or was under construction in the Northwest. That is nearly as much as the Council anticipated would be built by 2014.

While wind is a popular resource, its popularity depends in some part on factors that could change over time and make the resource less attractive. These include: a federal production tax credit that may or may not continue, possible future controls on greenhouse gas emissions, decreasing production costs, the ability to integrate wind, an intermittent resource, into the existing power system at reasonable costs, and the availability of large areas for development with access to transmission at moderate costs. The plan takes these factors into account but also recognizes that they could change over time.

The plan calls for gathering more experience and information between 2004 and 2009 about wind resources and their performance and cost within the regional power system. To be most useful, these projects would be sited in geographically diverse wind resource areas. In addition, project developers and operators will need to be willing to share information about the projects. This can be done in ways that do not adversely affect their commercial interests.

Prepare for new power plants

The plan defines a schedule of "options" for generating resource development. By options we mean completed siting and permitting for the amounts and types of power generation identified in the plan. Optioning is a risk-management strategy. With siting and permitting completed, actual construction can be undertaken with a minimum of lead-time when the conditions warrant. Conversely, if the projects prove not to be needed, the sunk costs are relatively small.

The Council believes the region should secure options (sites and permits) to be able to begin constructing new wind generating resources as early as 2010, with up to 5,000 megawatts of capacity to be developed through the end of the 20-year planning period. Options for 425 megawatts of coal generation should be in place by January of 2012. In light of concerns about global climate change and recent industry developments, the Council recommends that Integrated Gasified Coal technology be used. Later in the 20-year planning period, some additional gas-fired generation may be needed. Needed transmission upgrades should be identified so all these resources can be built and brought

on line quickly when required. If major transmission upgrades are needed, pre-construction planning, siting, and permitting will have to begin well before actual construction of the power plants.

Key Policy Issues

Along with the recommended resource development plan—the least risk, least cost development plan according to the Council's analysis—the power plan includes recommendations on key policy issues confronting the region. These include transmission operation and planning issues, the establishment of resource adequacy standards, improving the coordination between fish and wildlife and power planning and operations, and the future role of the Bonneville Power Administration in power supply.

With respect to Bonneville's role, the plan recommended that the agency sell the electricity from the existing Federal Columbia River Power System to eligible customers at cost. Customers that request more power than the existing system can provide should be required to pay the additional cost of acquiring that power. The Council recommended that Bonneville implement this change through new long-term contracts to be offered by 2007. The Council also believes that Bonneville must continue its commitment to support conservation, renewable energy, and fish and wildlife mitigation.

The Council's two main responsibilities, fish and wildlife mitigation and power planning, are closely linked. The Council's power plan and fish and wildlife program attempt to meet the requirements of both the power system and fish and wildlife recovery as effectively and efficiently as possible. For the region to achieve these objectives, it is important that planning for both power and fish and wildlife are coordinated. Outside of the Council, however, no clear process exists for integrated long-term planning. In the power plan, the Council proposed the establishment of a process to improve the coordination between fish and wildlife and power planning and decisionmaking.

An adequate power system has a high probability of being able to maintain service when the region experiences a poor water year, unexpected load growth, or the failure of new resources to be developed as planned. The power plan includes analysis that evaluates alternative regional adequacy standards and how they would interact with standards that are in place for the Western power system. The Council is committed to working with regional utilities and regulators to develop a standard that will assure an adequate power supply while being fair and equitable to all parties.

Adequate transmission is key to any of the new generating resources identified in the plan. The move toward deregulation and the opening up of wholesale electricity markets, along with changes in technology, altered the character of the traditional transmission system. Questions of how to effectively plan for, build, pay for, and manage the region's transmission system are becoming critically important. Efforts to establish an organization to assess the long-term requirements of the transmission system and a mechanism to encourage investments to meet those requirements have been pursued for several years with little success. The Council supports, and is an active participant in, the regional efforts to resolve these problems. But it believes the time for resolving these issues is growing dangerously short. If current efforts do not succeed in the near future,

the Council is committed to seeking alternative means of resolving these transmission issues.

Recommended action items, 2004-2009

The power plan will be reviewed and revised at least every five years. The actions that the region takes between 2004 and 2009 will determine the success of this plan. The key actions identified in the plan are:

1) Develop resources now that can reduce cost and risk to the region
- 700 average megawatts of conservation, 2005 - 2009
- 500 megawatts of demand response, 2005 - 2009
- Secure cost-effective cogeneration and renewable energy projects
- Develop cost-effective generating resources when needed

2) Prepare to construct additional resources
- Develop and maintain an inventory of ready-to-construct projects
- Resolve uncertainties associated with large-scale wind development
- Encourage use of state-of-the-art generating technology when siting and permitting projects
- Plan for needed transmission
- Improve utilization of available transmission capacity

3) Confirm the availability and cost of additional resources that promise cost and risk mitigation benefits
- Oil sands cogeneration in northern Alberta, Canada
- Integrated coal gasification
- Carbon sequestration
- Energy storage technologies
- Demonstration of renewable and high efficiency generation with Northwest potential

4) Establish the policy framework to ensure the ability to develop needed resources
- Carry out a process to establish adequacy targets for the Northwest and the rest of the Western system
- Work through the Grid West, Regional Representatives Group process to address emerging transmission issues within the next two years. If necessary, pursue alternative approaches to resolve issues
- Revise the role of the Bonneville Power Administration in power supply, consistent with the Council's May 2004 recommendations

5) Monitor key indicators that could signal changes in plans
- Periodically report on the regional load-resource situation and indicate whether there is a need to accelerate or slow resource development activities
- Monitor conservation development and be prepared to intensify efforts or develop alternative resources, if necessary

- Monitor efforts to resolve uncertainties regarding the cost and availability of wind generation, and prepare to develop alternatives, if necessary
- Monitor climate change science and policy for developments that would affect resource choices
- Revise elements of the power plan as necessary

2. Conservation acquisition

Since the adoption of the Council's first power plan in 1983 the region has made significant progress in acquiring conservation. The Council's first power plan stated that the acquisition of cost-effective conservation should be used to reduce year 2002 loads by 5 to 17 percent depending upon the rate of economic growth experienced in the region. The plan called on Bonneville and region's utilities to develop and implement a wide array of conservation programs. The plan also called on state and local governments to adopt more energy-efficient building codes. It called on the federal government to adopt national energy efficiency standards for appliances and to upgrade existing efficiency standards for new manufactured homes.

In response to the Council's first power plan, the Bonneville Power Administration and the region's utilities initiated conservation programs across all economic sectors. Between 1980 and 2002, it is estimated these programs acquired 1,425 average megawatts of electricity savings. Overall, the region's conservation achievements have been impressive. Between 1980 and 2005, demand for power in the Northwest has been reduced by about 3,100 average megawatts through Bonneville programs, state energy codes, and federal standards. Converted to generation, that would be enough electricity for the entire state of Idaho plus western Montana.

The Fifth Power Plan requires biennial reviews of implementation of the plan. In December 2006, Council staff issued its first biennial report on conservation achievements since the plan was adopted in December 2004. The plan established a regional target of 700 average megawatts for conservation resource acquisition from 2005 through 2009, as well as other actions designed to support attainment of that target. Overall, staff reported the region appeared to be making significant progress toward accomplishing the goals, although not all utilities appeared to be accomplishing their share of the savings.

Bonneville, the region's utilities, and system benefits administrators have accelerated, or are accelerating, the pace of their conservation programs. Based on preliminary returns to the Regional Technical Forum's (RTF) survey of regional conservation achievements in 2006, it appeared the Fifth Plan's goal of 130 average megawatts for 2005 likely would be accomplished. From the survey returns received by the end of November 2006, the region acquired approximately 125 average megawatts of savings in 2005. The total Bonneville, utility, and system benefits charge administrator expenditures for conservation were just under $160 million, or about 1.7 percent of total retail revenues collected in 2005. The average utility cost of these savings was approximately $1.3 million per average megawatt.

Table 1 on the next page summarizes the annual savings and expenditures for Bonneville, the Northwest Energy Efficiency Alliance (Alliance),[1] and the Energy Trust of Oregon[2] and individual utilities that have responded to the RTF's survey.

Table 1. Summary of Conservation Achievements (Preliminary)[3]

Program Administrator	2005		Projected 2006	
	Expenditures (million $)	Savings (MWa)	Expenditures (million $)	Savings (MWa)
Utility Conservation	96.2	72.4	112.5	61.8
Bonneville Conservation (ConAug)	15.2	13.1	15.0	15.6
Bonneville Conservation (C&RD)	20.7	9.4	12.0	6.9
Bonneville Low Income Weatherization	3.8	0.4	2.8	0.2
Utility Low-Income Weatherization	3.6	0.7	3.5	0.8
Northwest Energy Efficiency Alliance	19.7	28.9	20.6	24.5
Total (Expenditures and MWa)	**159.2**	**124.9**	**166.4**	**109.8**

Savings reported by the Northwest Energy Efficiency Alliance decreased from 29 average megawatts in 2005 to 25 average megawatts in 2006. This reduction was due largely to changes in federal standards for residential clothes washers that were a target of

[1] Perhaps the most visible, broadest-ranging market-transformation effort in support of energy-efficient appliances and equipment is being undertaken by the Alliance. The Alliance, based in Portland, is a non-profit association of electric utilities, state governments, public interest groups, and industry representatives committed to bringing affordable, energy-efficient products and services to the marketplace. The Council played a major role in founding the Alliance in 1996, and several Council staff members now sit on the Alliance board of directors. The Alliance executive director, Margaret Gardner, is a former Council employee. At any one time, the Alliance implements around 30 market transformation projects. The projects are quite diverse and cover many different market sectors: residential, commercial, industrial, and agricultural. Some of the priority market segments the Alliance has identified include lighting, appliances, commercial buildings, industrial motors, and motor systems.

There are different ways to achieve efficient use of electricity. The Alliance relies on a method called market transformation, which encourages the marketplace to adopt energy-efficient products and services as the norm. Alliance projects work to remove barriers that prevent a targeted product or service from being naturally accepted and offered by a market and educate consumers and businesses about why they should choose these higher efficiency products and services.

Because the Alliance is a regional organization, it can follow markets across utility service territories and state boundaries to achieve the biggest impact. Projects work within established market chains and focus on strategic leverage points to bring about lasting increases in the market share for higher efficiency products and services.

At any one time, the Alliance implements around 30 market transformation projects. The projects are quite diverse and cover many different market sectors: residential, commercial, industrial and agricultural. Some of the priority market segments the Alliance has identified include lighting, appliances, commercial buildings, industrial motors and motor systems.

For more information about the Alliance, its staff and the projects it funds, visit the website at www.nwalliance.org.

[2] Energy Trust of Oregon, Inc., began operation in March 2002, charged by the Oregon Public Utility Commission (OPUC) with investing in cost-effective energy conservation, helping to pay the above-market costs of renewable energy resources, and encouraging energy market transformation in Oregon. Energy Trust funds come from a 1999 energy restructuring law that requires Oregon's two largest investor-owned utilities — Pacific Power and Portland General Electric — to collect a three percent "public purposes charge" from their customers. The law also dedicated a separate portion of the public-purpose funding to energy conservation efforts in low-income housing energy assistance and K-12 schools.

[3] Not all of the region's utilities have responded to the RTF's survey. However, the expenditures and savings shown in Table 1 represent 31 entities including Bonneville and the Energy Trust of Oregon and approximately 84 percent of the region's load.

one of the Alliance's initial market transformation programs. The Alliance now is targeting even higher-efficiency machines beyond the federal standards.

Savings from Bonneville programs remained roughly constant between 2005 and 2006, producing just over 40 average megawatts each year (in the table above, some of Bonneville's savings are included in programs operated by the Northwest Energy Efficiency Alliance). Bonneville believes that it has met its share of the region's conservation goal of 52 average megawatts in each of these years because it exceeded its conservation targets in 2003 and 2004. Bonneville believes it is appropriate to count these prior savings towards the Fifth Plan's 2005 and 2006 targets. Regardless of whether this action is appropriate, Bonneville must increase its savings from 40 average megawatts to 52 average megawatts in 2007 if it is to stay on pace to meet the Fifth Plan's five year goals. Bonneville implemented its 2007 programs prior to the end of Fiscal Year 2006 in order to sustain utility program activities.

Although Table 1 shows the quantitative results of conservation implementation in the region, it does not fully capture the changes in national, state and utility policies and activities since the adoption of the Council's Fifth Plan. At the national level, the Energy Policy Act of 2005 (EPACT 2005) established new federal efficiency standards for 15 new products and requires the U.S. Department of Energy (USDOE) to adopt new or updated standards for nine additional products. Perhaps just as significantly, EPACT 2005 also requires the USDOE to update more than 20 existing federal standards and testing procedures that were long overdue for revision — some by as much as 15 years. USDOE committed to Congress that it will accomplish this task within the next five years.[4]

At the state level, Oregon and Washington adopted new equipment efficiency standards for 12 of the 15 products covered by the new EPACT 2005 standards. Some of these standards are scheduled to take effect prior to the EPACT 2005 standards. Washington recently adopted revisions to its residential energy code. These revisions are expected to improve the efficiency of new single-family and multifamily dwellings by 7 - 14 percent depending on whether the home is located east or west of the Cascades. In early 2007 Oregon will be considering changes to its residential energy code. Governor Kulongoski has set a 15-percent savings goal for these revisions. Both Idaho and Montana were considering updates to their residential and commercial energy codes as part of their normal code revisions cycles.

Since the adoption of the Fifth Plan, most of the region's investor-owned utilities and several of the larger public utilities have completed integrated resource planning (IRP) processes. Council staff review of these plans indicates that efficiency investments are increasing. For example, Avista Utilities, based in Spokane, increased its conservation target by 20 percent between 2005 and 2006. Idaho Power Company's IRP, issued in 2006, anticipates nearly doubling its annual investment in energy efficiency. In 2006 Washington voters passed Initiative 937 (I-937), which calls on that state's larger utilities to acquire all conservation resources in their service territories that they find to be cost-effective using the Council's methodology. This requirement does not take effect

[4] See: http://www.eere.energy.gov/buildings/appliance_standards/pdfs/congressional_report_013106.pdf

until 2010. However, it is anticipated that those utilities covered by I-937 will begin modifying their programs before 2010. The Council staff believes that the overall impact of I-937 will be to increase local utility conservation acquisitions.

In Oregon, the Energy Trust has had to restrict participation in its programs due to funding limitations. As a result, in 2007 the Oregon Public Utility Commission and Portland General Electric are discussing the feasibility of increasing Energy Trust conservation funding. Such funding would be made available from investor-owned utilities in the state if their integrated resource planning processes find that additional conservation investments would be justified. It was anticipated that legislation concerning this matter would be introduced during the 2007 session.

Fish and Wildlife Planning

The Columbia River Basin Fish and Wildlife Program

The Northwest Power Act requires 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, and to review the program at least every five years.[5] The last review led to a revision of the fish and wildlife program in October 2000.

The 2000 Program marks a significant departure from past versions, which consisted primarily of a collection of measures directing specific activities. The 2000 Program establishes a basinwide vision for fish and wildlife — the intended outcome of the program — along with biological objectives and action strategies that are consistent with the vision. The program is implemented through subbasin plans that were developed locally in the tributary subbasins of the Columbia and then amended into the program by the Council in 2004 and 2005. Subbasin plans are consistent with the basinwide vision and objectives in the program, and its underlying foundation of ecological science.

The 2000 Program addresses all of the "Four Hs" of impacts on fish and wildlife — hydropower, habitat, hatcheries and harvest:

- It recommends that resources and energy be directed away from breaching the four federal dams on the lower Snake River. Instead, the program recommends actions to improve dam-passage survival that are biologically sound and economically feasible — actions that benefit the range of species in the river and fit natural fish behavior patterns.

- It directs significant attention to rebuilding healthy, naturally producing fish and wildlife populations by protecting and restoring habitats and the biological systems within them.

- It requires that fish hatcheries funded through the program operate consistent with reforms recommended to Congress by the Council in 1999, reforms that would shift hatchery production away from a primary focus on providing fish for harvest to also providing fish to rebuild naturally spawning populations.

- It promotes increased fish harvest, consistent with sound biological management practices, recognizing that harvest provides significant cultural and economic benefits to the region.

In preparing the 2000 Fish and Wildlife Program, the Council solicited recommendations from the region's fish and wildlife agencies, Indian tribes, and others,

[5] The Act considers the power plan and the fish and wildlife program as a single plan, and so when one is reviewed the other must be, also. Before the Council's 2000 revision of the fish and wildlife program, the previous revision was completed in 1995; the last power plan revision was in 1998. Having revised the fish and wildlife program in 2000, in 2001 the Council began a review and revision of the 1998 Power Plan. The new Power Plan, the Council's fifth, was completed in December 2004.

as required by the Northwest Power Act. The agencies and tribes responded, and the Council also received proposals from other interested parties. In all, the Council received more than 50 recommendations totaling more than 2,000 pages. After reviewing the recommendations, the Council prepared a draft and then conducted an extensive public comment period before finalizing the program in December 2000.

The 2000 Program is the fifth revision since the Council adopted its first program in November 1982. Unlike past versions of the program, which were criticized by scientists for consisting primarily of a number of measures that called for specific actions without a clear, programwide foundation of scientific principles, the 2000 Program expresses goals and objectives for the entire basin based on a scientific foundation of ecological principles. In 2003 and 2004 the Council, working with watershed councils, state and federal agencies and Indian tribes, developed 58 plans for tributary subbasins of the Columbia River to guide future implementation of the program. The draft plans were submitted to the Council in May 2004 and reviewed by the public and by the Independent Scientific Review Panel (the origin and purpose of the ISRP are described in the following section of the Briefing Book) during the summer. The Council adopted the plans into the fish and wildlife program in late 2004 and early 2005.

With the subbasin plans in place, the program is organized in three levels: 1) a basinwide level that articulates objectives, principles, and coordination elements that apply generally to all fish and wildlife projects, or to a class of projects, that are implemented throughout the basin; 2) an ecological province level that addresses the 11 unique ecological areas of the Columbia River Basin, each representing a particular type of terrain and corresponding biological community; and 3) a level that addresses the subbasins.

The Council believes this unique program structure, goal-oriented and science-based, will result in a more carefully focused, scientifically credible and publicly accountable program that will direct the region's substantial fish and wildlife investment to the places and species where it will do the most good.

The program's goals, objectives, scientific foundation, and actions are structured in a "framework," an organizational concept for fish and wildlife mitigation and recovery efforts that the Council introduced in the 1994-95 version of the program. The 2000 Program, organized with the framework concept, is intended to bring together, as closely as possible, Endangered Species Act requirements, the broader requirements of the Northwest Power Act, and the policies of the states and Indian tribes of the Columbia River Basin into a comprehensive program that has a solid scientific foundation. The program also states explicitly what the Council is trying to accomplish, links the program to a specific set of objectives, describes the strategies to be employed and establishes a scientific basis for the program. Thus, the program guides decision-making and provides a reference point for evaluating success.

The fundamental elements of the program are:

The ***vision***, which describes what the program is trying to accomplish with regard to fish and wildlife and other desired benefits from the river;

The ***biological objectives***, which describe the ecological conditions needed to achieve the vision; and

The implementation ***strategies, procedures and guidelines***, which guide or describe the actions leading to the desired ecological conditions.

In other words, the vision implies biological objectives that set the strategies. In turn, strategies address biological objectives and fulfill the vision. The scientific foundation links the components of the framework, explaining why the Council believes certain kinds of management actions will result in particular physical habitat or ecological conditions of the basin, or why the ecological conditions will affect fish and wildlife populations or communities.

In the 2000 revision, the Council adopted the following vision for the program:

> *The vision for this program is a Columbia River ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and providing the benefits from fish and wildlife valued by the people of the region. This ecosystem provides abundant opportunities for tribal trust and treaty right harvest and for non-tribal harvest and the conditions that allow for the recovery of the fish and wildlife affected by the operation of the hydrosystem and listed under the Endangered Species Act. Wherever feasible, this program will be accomplished by protecting and restoring the natural ecological functions, habitats, and biological diversity of the Columbia River Basin. In those places where this is not feasible, other methods that are compatible with naturally reproducing fish and wildlife populations will be used. Where impacts have irrevocably changed the ecosystem, the program will protect and enhance the habitat and species assemblages compatible with the altered ecosystem. Actions taken under this program must be cost-effective and consistent with an adequate, efficient, economical and reliable electrical power supply.*

Primary strategies in the 2000 Program

Here is a brief summary of the primary, basinwide strategies in the 2000 Program:

Habitat:

Identify the current condition and biological potential of the habitat, and then protect or restore it to the extent described in the biological objectives.

Artificial production:

Artificial production can be used, under the proper conditions, to (1) complement habitat improvements by supplementing native fish populations up to the sustainable carrying capacity of the habitat with fish that are as similar as possible, in genetics and behavior, to wild native fish, and (2) replace lost salmon and steelhead in blocked areas.

Harvest:

Assure that subbasin plans are consistent with harvest management practices and increase opportunities for harvest wherever feasible.

Hydrosystem passage and operations:

Provide conditions within the hydrosystem for adult and juvenile fish that most closely approximate the natural physical and biological conditions, provide adequate levels of survival to support fish population recovery based in subbasin plans, support expression of life history diversity, and assure that flow and spill operations are optimized to produce the greatest biological benefits with the least adverse effects on resident fish while assuring an adequate, efficient, economical, and reliable power supply. The program called for development of a mainstem coordination plan similar to the subbasin plans. The mainstem coordination plan is discussed in the next section of this briefing book.

Wildlife:

Complete the current mitigation program for construction and inundation losses and include wildlife mitigation for all operational losses as an integrated part of habitat protection and restoration.

Ocean conditions:

Identify the effects of ocean conditions on anadromous fish and use this information to evaluate and adjust inland actions.

Research, monitoring and evaluation:

(1) Identify and resolve key uncertainties for the program, (2) monitor, evaluate, and apply results, and (3) make information from this program readily available.

Project selection, independent scientific review, program budget

Measures implementing the program are funded by the Bonneville Power Administration through revenues collected from electricity ratepayers. Under the Northwest Power Act, the Council is responsible for recommending projects to Bonneville for funding to implement the program. This responsibility is relatively new in the history of the Act.

In a 1996 amendment to the Act adding Section 4(h)(10)(D), Congress added to the Council's responsibilities a review of the projects annually proposed for funding by Bonneville to implement the Council's program. The Council is to conduct this review with the assistance of an Independent Scientific Review Panel appointed by the Council (members are nominated by the National Academy of Sciences). The panel is to "review a sufficient number of projects to adequately ensure that the list of prioritized projects recommended is consistent with the Council's program," and then to make project recommendations to the Council "based on a determination that projects: are based on sound scientific principles; benefit fish and wildlife; and have a clearly defined objective and outcome with provisions for monitoring and evaluation of results." The statute requires the Council to release the panel's findings for public review and comment. The Council is to "fully consider" the recommendations of the panel.

After considering the panel's recommendations, and the recommendations and comments of other entities and the public, the Council completes the review process by deciding on its project-funding recommendations to Bonneville to implement the program. If the Council decides not to accept a recommendation of the ISRP, the Council must explain in writing its reasons. The Council is also to "consider the impact of ocean conditions on fish and wildlife populations" and "determine whether the projects employ cost-effective measures to achieve program objectives" when deciding on its project-funding recommendations. The Act provides that "[t]he Council, after consideration of the recommendations of the Panel and other appropriate entities, shall be responsible for making the final recommendations of projects to be funded through BPA's annual fish and wildlife budget."

Although Bonneville has fish and wildlife responsibilities under both the Endangered Species Act and the Northwest Power Act, in many cases, these responsibilities can be met in the same set of actions. Therefore, in recommending projects to Bonneville for funding under the program, the Council addresses both sets of responsibilities wherever feasible. Knowledge of the plans and activities of other regional participants is essential for the Council to be able to assure that the projects it recommends for funding are coordinated with, and do not duplicate, the actions of others.

Until 2000, the Council and the ISRP annually reviewed all projects in the program — there are more than 200 — plus proposals for new projects. This proved to be burdensome, and so to provide for a more detailed review the Council initiated a three-year sequential provincial review process in 2000 that solicits project proposals by ecological province (there are 11 provinces in the Columbia River Basin) and provides three-year project funding recommendations to Bonneville. The initial round was completed in 2003 when the Council adopted recommendations for the Mainstem/Systemwide projects. In 2006, the Council completed the first full project-selection and recommendation process based on subbasin plans. Projects were recommended for funding for three years, Fiscal Years 2007-2009.

The program budget averages $143 million per year (Fiscal years 2007-2009). This is for the direct, or "expense" funding portion of the program. In addition, Bonneville makes available up to $36 million per year (Fiscal Years 2007-2009) for capital investments, borrowed from the U.S. Treasury. This latter amount, often referred to as "capital" funding, is subject to particular rules and standards prescribed by Bonneville in its "Fish and Wildlife Capitalization Policy," last reviewed in August 2005. Bonneville and the Council agreed that for the Fiscal Years 2007-2009 period, the Council could use an annual average planning budget of $153 million — $10 million more than the annual average — in formulating the project-funding recommendations, in recognition of the fact that not all recommended projects likely will be funded fully in each year.

With this budget commitment from Bonneville for the 2007-2009 period, the Council established budget allocation planning targets for the different categories of the program to allow for organized and productive review of project proposals. This included a budget target for each of the 11 ecological provinces, a similar planning budget target

for basinwide research, monitoring, and evaluation projects, and coordination activities not linked to a particular province, and a separate budget target for that group of projects consisting of the few mainstem on-the-ground and multi-province projects. The Council also recognized that the budget would have to cover the cost of Bonneville's internal program support and the cost of the independent science panels (the ISRP, discussed above, and the Independent Scientific Review Board (ISAB), which advises the Council and NOAA Fisheries). These were subtracted from the total commitment up front. Finally, the Council reserved an unallocated placeholder of $2 million per year.

The tables below display how the Council recommended (in October 2006) allocating the expense-funding commitment across the program. (Note: Not factored into the allocation tables were the amounts unspent from Fiscal Years 2003-06 that are added to the budget for Fiscal Years 2007-09)

Table 2. Annual Program Planning Budget for FY 2007-09

Budget Step	**$ Amount/step**	**Balance**
(Planning budget beginning amount total)		$153,000,000
Bonneville Program Support	$11,000,000	$142,000,000
ISRP/ISAB	$1,050,000	$140,950,000
Placeholders (planning estimate)	$2,000,000	$138,950,000
Province allocation	$92,894,502	$46,055,498
Mainstem On the Ground/Multi-Province allocation	$13,411,338	$32,644,160
Total (Province + Mainstem)	**$106,305,840**	**$32,644,160**
Basinwide projects allocation	$32,644,160	$0

Table 3. Province and mainstem/multi-province allocation

Province	**Percent of Allocation**	**Allocation**
Blue Mountain	6.7	$7,127,528
Columbia Cascade	2.8	$3,001,663
Columbia Gorge	5.0	$5,312,554
Columbia Plateau	20.5	$21,748,203
Intermountain	14.3	$15,248,105
Lower Columbia	2.3	$2,492,862
Estuary	3.4	$3,662,490
Middle Snake	3.2	$3,374,079
Mountain Columbia	11.8	$12,590,537
Mountain Snake	15.8	$16,761,459
Upper Snake	1.5	$1,575,022
Multi-province	6.3	$6,709,515
Mainstem	6.4	$6,701,823
Total:	**100**	**$106,305,840**

The Council based these allocations on historical Council funding recommendations, starting from the average of the Council recommendations for Fiscal Years 2004-06. That is, the Council surveyed how it, along with Bonneville, the fish and wildlife managers, and others, has traditionally committed funding under the program. These patterns are the legacy of management emphases and legal and policy

considerations and might not continue unaltered into the future. The Council also premised the expense funding allocations on consistency with the provisions of the Council's 2000 Fish and Wildlife Program intended to assure that Bonneville funds are committed to all areas of a basinwide mitigation and protection program. The Council thus made certain adjustments to the historically derived allocations of expense funding to reflect the program provisions that call for distributing Bonneville funding so that 70 percent is spent on projects benefiting anadromous fish, 15 percent resident fish and 15 percent wildlife. The Council noted in its final recommendations to Bonneville that while in recent years the resident fish distribution has come close to 15 percent of program funding, the wildlife component has lagged behind. The Council's intent in this upfront allocation was to provide an opportunity for both of these program areas to approach their 15-percent allocation goal.

Bonneville stated a goal during its 2006 "Power Function Review," the process leading to Bonneville's determination of projected program funding levels for the Fiscal Years 2007-2009 rate period, of committing at least 70 percent of its annual fish and wildlife funding to "on the ground work," and no more than 25 percent to research and monitoring and evaluation activities and 5 percent to coordination actions. The Council considered these goals but decided *not* to use these targets.

Mainstem coordination plan

In the Hydrosystem Strategies section of the 2000 Program, the Council established the following strategy: "Establish and maintain a plan to assure coordination of mainstem operations and improvements." Because the mainstem plan would propose specific operating guidelines for the mainstem dams of the Federal Columbia River Power System, the Council decided to conduct a separate rulemaking to amend a mainstem plan into the program once it was amended with basinwide goals, objectives and strategies. In March 2001, the Council wrote to the region's fish and wildlife agencies and Indian tribes requesting their recommendations for the mainstem coordination plan. These were received in June and posted on the Council's website. The Council invited public comments on the recommendations and then proceeded to prepare draft amendments for public review in late 2002. Public hearings were conducted on the draft mainstem amendments in late 2002 and early 2003, and the Council adopted the mainstem coordination program in April of that year. Here are the key elements of the plan:

<u>General strategies for dam operations</u>

The U.S. Fish and Wildlife Service and NOAA Fisheries 2000 Biological Opinions on dam operations "may not be optimal" for fish and wildlife that are not listed as threatened or endangered species (the NOAA Fisheries 2000 Biop on Columbia and Snake river hydropower operations was invalidated by the U.S. District Court, and a new biological opinion is under development in 2007). Federal agencies should attempt to meet the Biological Opinion requirements *and* the operations recommended by the Council. There is sufficient flexibility in the Biological Opinions to do this.

Certain assumptions in the Biological Opinions regarding spill, flows, reservoir drafting, predator control and harvest need to be tested to assure that the highest fish-

survival benefits are being achieved through the lowest-cost operations. In some instances, these tests may require dam operations outside the limits of the Biological Opinions. Tests should be designed to:

- Determine the relationship between fish survival and various levels of water spills at dams.
- Assess new spill technologies such as removable spillway weirs.
- Determine optimum fish survival through turbines at dams.
- Evaluate the fish-survival benefits of augmenting flows.
- Measure the biological effects of steady outflows from Libby and Hungry Horse reservoirs in Montana.
- Identify the effects of shifting summer flows to later in the summer.
- Assess impacts of predation and harvest on ESA-listed species in the mainstem rivers.
- Address other scientific uncertainties.

Habitat

By means of system operations and investments in mainstem habitat improvements, increase the extent, diversity, complexity, and productivity of mainstem habitat by protecting, enhancing and connecting it to mainstem spawning, rearing and resting areas. This would benefit salmon in the lower Columbia Basin and species including ESA-listed sturgeon and bull trout, and species of concern such as burbot, in the upper basin. The amendments recommend 10 specific actions to do this, such as excavating backwater sloughs and side channels where fish spawn and connecting them to the rivers.

Spill

As a strategy, spilling water over dams for the purpose of assisting juvenile fish migration to the ocean is more benign in general than juvenile fish bypass systems or turbine passage. But excessive spill can cause gas bubble disease in fish, and spill is the most expensive fish passage strategy in terms of lost hydropower generation, particularly in summer.

To reduce the probability of dissolved gas levels reaching lethal levels, the amendments request that dam operators meet the dissolved gas limit — 110 percent total dissolved gas in the water below dams — established by the federal Environmental Protection Agency and the Northwest states.

The amendments also request a rigorous evaluation of the biological effectiveness and costs of spillway passage at each dam and requests that the resulting information be incorporated in decisions on when and how much to spill. The goal of this evaluation should be to determine if it is possible to achieve the same or greater levels of survival and biological benefit to migrating fish as currently achieved while reducing the amount of water spilled, thus decreasing the adverse impact on the region's power supply.

Water management

The amendments assert that water should be managed through the hydrosystem so that patterns of flow more closely approximate the natural hydrographic patterns and are directed at re-establishing natural river processes where feasible, and produce the highest possible survival rates for a broad range of affected fish within the physical limitations of the multiple purposes of the region's storage reservoirs and hydrosystem.

The Council proposed specific strategies, which could have been implemented within the flexibility of river operations in the 2000 Biological Opinions, to improve the survival of ESA-listed species and also nonlisted species. These included:

- Summer refill of Lake Koocanusa behind Libby dam by late July, and other storage reservoirs by the end of June, but institute a sliding scale for the actual refill based on reservoir inflow forecasts.
- Spring refill of storage reservoirs by April 10.
- No active spring flow augmentation or reservoir drafting *beyond* that in the Biological Opinions except under extraordinary conditions, and only after consultation with the Council.
- Variable flow (VarQ) and Integrated Rule Curve operations at Hungry Horse and Libby dams, but avoid the more extreme adverse effects at Lake Roosevelt that can occur from these operations in a small percentage of years. The amendments include recommendations for refining Biological Opinion flows from Libby Dam to aid spawning of ESA-listed Kootenay River white sturgeon.
- Grand Coulee Dam operations should attempt to meet minimum monthly lake level elevation targets and water retention times specified in the amendments. The Council places high priority for Grand Coulee operations on establishing and protecting fall Chinook spawning habitat in the Hanford Reach downstream and to refilling Lake Roosevelt by the end of June. The lake should be no lower than elevation 1,283 feet by the end of August, which is seven feet below full.
- Snake River dam operations consistent with the NOAA Fisheries 2000 Biological Opinion. Water releases from upriver reservoirs for downstream flow augmentation must be consistent with Idaho and federal law. The amendments note that Biological Opinion flow targets for Lower Granite Dam often are not attainable because of lack of water and that the targets do not account for differences in the characteristics or biological significance of flow augmentation sources. "Simply striving to meet flow targets regardless of the degree of biological benefit obtained is an ineffective and uneconomical strategy for salmon recovery," according to the amendments. The amendments request that the federal agencies analyze alternative strategies to flow augmentation in the Snake.
- As an interim operation to that in the Biological Opinions, limit — and evaluate — summer drafts at Hungry Horse and Libby in Montana dams to 10 feet from full pool, except in the driest 20 percent of water years when the draft could be increased to 20 feet by the end of September. These limits would protect fisheries resources in the reservoirs and rivers downstream while providing additional flow augmentation for fish immediately below the dams and in the rivers downstream. The evaluation of this operation strategy should focus on 1) assessing the relationship between river flow and fish survival in the lower Columbia, 2)

whether flow augmentation from Hungry Horse and Libby dams has any effect on fish survival in the lower river and 3) the benefits to fish that live in and below the Montana reservoirs.

- Operate Dworshak Dam in Idaho consistent with the NOAA Fisheries Biological Opinion and the Idaho Dworshak Operations Plan, which was adopted by state and federal agencies and the Nez Perce Tribe in December 2000.
- In the long-term, implement actions to reduce toxic contaminants in the water to meet state and federal standards.
- Broaden the decision-making forum for river operations to include state and tribal governments and persons with expertise in power system issues.

Fish Passage Center

The amendments reaffirmed that the Council established an oversight board for the Center, which is funded by Bonneville through the Council's program, to provide technical support for the fish and wildlife agencies and Indian tribes of the Columbia River Basin to plan and implement river flow and fish-passage operations of mainstem Columbia and Snake river dams. The amendments directed that 1) the oversight board conduct an annual review of the Center's performance; 2) the Center provide an annual report to the board and the Council; 3) that the Center manager be selected by, and report to, the Executive Director of the Columbia Basin Fish and Wildlife Authority (CBFWA); and 4) the CBFWA director and chair of the Council conduct an annual review of the Center manager's performance. The amendments also stated that the Center would continue to provide an empirical database of fish passage information for use by anyone in the region, not just fish and wildlife managers, and that an advisory committee would be created to establish technical protocols and scientific requirements for the Center and to review the scientific and technical aspects of the Center's performance.

In 2005, the United States Senate directed Bonneville to stop funding the Center. The Senate Appropriations Conference Committee report for Fiscal Year 2006 included language that said Bonneville "may make no new obligations in support of the Fish Passage Center" and that Bonneville and the Council were to "ensure that an orderly transfer of the Fish Passage Center functions . . . occurs within 120 days of enactment of this legislation." Bonneville had funded the Center for about $1.3 million per year.

In response to the Conference Report language, Bonneville announced it would stop funding the Center and transfer its work to another entity as soon as a smooth transition could be arranged. Several groups, including Fish Passage Center employees, petitioned the U.S. Ninth Circuit Court of Appeals for a stay of Bonneville's decision. In March 2006, the court granted the petition and agreed to take up the matter. The court ordered Bonneville to continue funding the Center while the matter was under review "under the existing terms and conditions." By October, when the Council made its project-funding recommendations to Bonneville for Fiscal Years 2006-2009, the litigation had not been resolved.

In its project-funding recommendations, the Council reserved $8.7 million in the Basinwide category in anticipation of projects that Bonneville may be required to fund under the new biological opinion and for fish passage science that was carried out in the

past by the Fish Passage Center. Approximately $4 million of the total is dedicated to fish passage science and analysis, a category of the program on temporary hold awaiting resolution of the Fish Passage Center litigation.

Coordinating program implementation with other entities

Under the Northwest Power Act, the Council's fish and wildlife program is not intended to address all fish and wildlife problems in the basin from all sources. But the Council adopted the vision, objectives, strategies, and scientific foundation with the belief that they will complement and help support other fish and wildlife recovery actions in the region.

The program recognizes that others besides the Council are developing plans and taking actions to address these issues. In particular, the four Northwest states and the Columbia Basin's 13 Indian tribes each have fish and wildlife initiatives under way. Many of these parties are working on subbasin and watershed planning initiatives, and are also addressing Endangered Species Act concerns.

Throughout the basin, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service are administering the Endangered Species Act, which requires information gathering, planning, and mitigation actions. In addition, the Environmental Protection Agency, in cooperation with the states and tribes, is taking actions to achieve compliance with the Clean Water Act. The Council's fish and wildlife program does not attempt to pre-empt the legal authorities of any of these parties, but it does provide an opportunity for each to coordinate information gathering, planning, and implementation of recovery actions on a voluntary basis. That is, the Council's program is designed to link to, and accommodate, the needs of other programs in the basin that affect fish and wildlife. This includes meeting the needs of the Endangered Species Act by describing the kinds of ecological change needed to improve the survival and productivity of the diverse fish and wildlife populations in the basin.

Protected Areas

In August 1988, the Council amended the fish and wildlife program with criteria that designate some 44,000 miles of Northwest streams as "protected areas" because of their importance as critical fish and wildlife habitat. The protected-areas criteria were adopted into the 2000 Program without changes.

The protected-areas amendment was a major step in the Council's efforts to protect and enhance fish and wildlife populations from the impacts of hydropower. By designating areas as protected against future hydroelectric development, the Council protects fish and wildlife habitat. Designation as a protected area does not prohibit hydropower development, but it serves as a signal and justification for proceeding with caution because of the potential impacts on intact, important fish and wildlife habitat. While the Council does not license hydroelectric projects, the Federal Energy Regulatory Commission, which grants licenses to nonfederal hydropower projects, and the Bonneville Power Administration, which can acquire and transmit electricity from FERC-licensed projects, are required to take the Council's fish and wildlife program into account when making decisions.

The Council sees protected-areas designation as playing a positive role in the efficient development of environmentally benign hydropower. New hydropower development in the region's most critical fish and wildlife habitat is likely to generate divisive, time-consuming and costly controversy. By identifying this habitat as "protected," the Council hopes to point developers to less sensitive areas, where the time and cost of development will be lower. Ratepayers should benefit from both more productive fish and wildlife investments and from reduced hydropower development costs.

The Council periodically designates new protected areas and removes the designation from other areas, based on analysis and public comment. The Council last amended the protected-areas rule in June 1992.

Legal Issues

1. What kind of legal creature is the Council?

The Northwest Power Act specifies that the Council is not a federal agency. The Council is also not a state agency in the usual meaning of the word, because it acts on behalf of more than one state. So what is it?

The Council is one of a small group of hybrid organizations known as interstate compact agencies. These multi-state organizations are created by an agreement among the participating states with the consent of Congress. The Council was authorized by Congress in December 1980, and came into being when each of the legislatures of the participating states passed a law agreeing to participate in the Council, subject to the conditions in the Northwest Power Act.

Interstate compact agencies are usually created to deal with issues or to manage resources that involve more than a single state. The Constitution gives most of the authority over matters between states to the federal government exclusively. In the Northwest Power Act, however, Congress gave back to the Northwest states some of this federal authority. In other words, although the Council is not a federal agency, it exercises certain powers granted to it by the federal government.

In particular, the Council has authority to adopt plans and programs that guide the actions of federal agencies. The Bonneville Power Administration is required to ensure that its actions are "consistent" with these plans and programs. Other federal agencies are required to take the Council's fish and wildlife program into account "at each relevant stage of decision-making processes to the fullest extent practicable." The Council also must make recommendations on Bonneville's annual expenditure of fish and wildlife funds, based on advice of an independent scientific panel. These are unique authorities. The Northwest Power Act is one of only a few instances in which Congress has granted states significant power over federal agencies.

Federal laws applicable to the Council

State agencies are governed by state law. Federal agencies are governed by federal law. For interstate compact agencies, there is no general body of governing law.

When Congress created the Council, it solved this problem by making a number of laws regulating federal agencies applicable to the Council. In Section 4(a)(4) of the Northwest Power Act, the open meetings law applicable to the Federal Energy Regulatory Commission, and federal laws applicable to Bonneville relating to contracts, conflicts of interest, financial disclosure, advisory committees, disclosure of information, judicial review, and "related matters" are made generally applicable to the Council.

However, Congress recognized that not all of these laws would fit the Council exactly and therefore gave the Council yet another unique authority, the power to adapt federal laws to fit its own circumstances. The Northwest Power Act says that the specified federal laws "shall apply to the Council to the extent appropriate." The legislative history of the Act explains that the Council is to determine when it is and is

not “appropriate” to follow the federal law, and explains that the Council has discretion to depart from the requirements of federal law where it has good reason to do so.

For the most part, the applicable federal laws have proved to be workable, and the Council has followed them as written. However, various administrative details have been modified to fit the Council. For example, financial disclosure forms are filed with the Council's General Counsel, not with the U.S. Department of Energy. When the Council has departed from the federal laws, it has usually made written findings explaining why the law as written was inappropriate, and how the adaptation was more appropriate.

There are a few rules regarding financial disclosure and ethics laws that apply to the Council. First, Council members and staff are required to file financial disclosure forms, some parts of which are public records and some parts of which are confidential. Second, Council members and staff may not participate in particular Council matters that will have a direct and predictable effect on their own financial interests, including, among others, those of their spouses and dependent children. Participation will be permitted in the case of *de minimis* holdings and/or if the individual is granted a waiver. The Council has always observed a blanket prohibition on holding a financial interest in some firms, primarily energy companies and fish and wildlife concerns doing business in the western United States. Third, Council members and staff generally cannot accept anything of more than nominal financial value from people whose interests stand to be affected by Council actions. The Council’s legal division has always advised that political activity is not disallowed, provided a member is not a candidate for partisan office and does not use the Council position for political purposes. In addition, the legal division seeks guidance from other federal laws and regulations as issues arise. The legal division is available for advice on any questions that may arise with Council members and staff.

State laws applicable to the Council

While federal laws govern most of what the Council does as a body, some state laws are still applicable to individual Council members and Council staff. In particular, Council members are officers of their respective states, and, if paid by their states, are state employees subject to the various state laws and regulations that apply to state officers and employees, including requirements governing how much time must be devoted to Council activities, state salary schedules, and the like. These state laws apply to Council members so long as they do not conflict with the federal laws that are made applicable under Section 4(a)(4).

The two Oregon Council member are Oregon state employees, and the eastern Washington Council member and the eastern Washington staff members of the Council are all employees of Eastern Washington University. All of the other Council members and staff are employees of the Council. The Council sets the salaries, benefits, employment conditions, and the retirement plans for the central office staff. In questions of labor laws and workers compensation, the Council follows the applicable laws of each state as applied to non-profit and governmental organizations.

In some instances, state and federal laws applicable to Council members may overlap or have conflicting requirements. Only rarely has such overlap resulted in a

public debate. In 1988, for example, an Oregon member who was leaving the Council was offered employment with a public utility. Under the federal conflict of interest law, the member was allowed to take the job. Under Oregon conflict of interest law, the member was not allowed to take the job. The Council took the position that the federal law preempted state law on this point. A protective lawsuit was filed by the utility based on threats of prosecution by the Oregon Attorney General. However, nothing further came of the matter, and the suit eventually was withdrawn.

Liability and indemnification

As of 1988, the attorneys general of each of the Northwest states had confirmed in writing that Council members from their state were considered state employees for liability purposes, and that each state was obligated to defend Council members and pay judgments rendered against them in the same manner as with other state employees. Thus, it is unlikely that any Council member would be subject to personal liability for an official action taken while a Council member.

The Council has also entered into an indemnification agreement with each of its members, promising to defend claims and pay judgments. The indemnification appears in Chapter 19 of the Council's bylaws.

For the first several years of its existence, the Council was able to obtain an insurance policy to cover such claims. However, as a result of the Washington Public Power Supply System (WPPSS) nuclear power plant bond default, the premiums for this type of insurance increased enormously, and the available policies contained exclusions removing coverage for decisions relating to nuclear plants and other power planning decisions. For these reasons, the Council chose to adopt an indemnification agreement rather than continue to purchase this type of insurance.

The Council continues to maintain a normal commercial liability policy, which covers such matters as personal injuries on Council premises. This policy also covers Council members and staff while driving rental cars on Council business. It is therefore not necessary for Council members to purchase the optional additional insurance offered by rental car companies when renting cars on Council business.

2. Procedures for Amending the Council's Power Plan and Fish and Wildlife Program

In developing the power plan and the fish and wildlife program, the Northwest Power Act directs the Council to observe certain procedures unique to the Power Act, the informal rulemaking procedures of the federal Administrative Procedure Act (APA) and any other procedures the Council may adopt. The Council must hold public hearings in each of the member states before adopting the plan or program or substantial, non-technical amendments to either. The Council must review the plan at least every five years.

Power plan amendments

For purposes of power plan amendments, the federal APA requires public notice of proposed amendments or a description of the subjects and issues involved, and a statement of how the public may participate in the process. The public must be given an opportunity to submit written material.

Once the period for public comment has closed, people outside the Council may be foreclosed from communicating with the staff and Council members on the subject of the rulemaking. In some rulemakings the Council has allowed limited, additional public comment up to the time of decision, although the Council must have enough time to analyze all comments before taking final action.

An agency must give a concise general statement of the basis and purpose of the rules it adopts. The Council, following an approach approved by the courts, has satisfied this requirement by publishing a Response to Comments, which briefly summarizes the major comments received and explains how the Council has dealt with them.

Fish and wildlife program amendments

The fish and wildlife program is published separately from the power plan, although it is legally an element of the plan. But the Act sets out specific procedural requirements for developing and amending the fish and wildlife program that make it quite distinct from the power plan.

In amending the fish and wildlife program, the Act requires the Council to request from the region's fish and wildlife agencies and appropriate Indian tribes recommendations for measures for fish and wildlife affected by hydropower in the Columbia and its tributaries. Section 4(h)(2) of the Act provides that recommendations must be solicited prior to the development or review of the power plan, or any major revision to the plan. Others may also make such recommendations. Once the Council has received these recommendations, along with supporting documentation, it must make them available for comment. Typically, the Council also issues its own draft fish and wildlife amendments, which reflect the Council's attempt to fit the recommendations into a systemwide context, and invites public comment. The Council must act on the recommendations within one year. The Council may reject a recommendation only for certain reasons spelled out in Section 4(h)(7) of the Act. If the Council rejects a recommendation, it must give its reasons in writing.

The role of the fish and wildlife agencies and Indian tribes is particularly important. Not only must the Council solicit their recommendations for fish and wildlife measures, but if there are conflicting recommendations, the Council must consult with the tribes and agencies and give "due weight" to "their recommendations, expertise and legal rights and responsibilities" in resolving the inconsistency. In determining which recommendations to accept, moreover, the Council must determine whether a proposed measure would: (1) "complement the existing and future activities" of the agencies and tribes, and (2) be consistent with the tribes' legal rights. In 1994, the federal appeals court said, in dicta, that the Council must give a "high degree of deference" to the fish and

wildlife agencies and tribes. The 1994 court opinion also said that the program must include sound biological objectives to structure the program and guide Council decisions.

Because the Fish and Wildlife Program must be based on recommendations submitted to the Council, and because the Council must make findings on any recommendations it rejects, program amendment processes are organized around the recommendations. Most of the comments the Council receives are directed to recommendations, and most of the Council's responses to comments are made in findings.

Petitions for rulemaking

The APA also requires administrative agencies to give interested persons the right to petition for the issuance, amendment or repeal of an administrative rule, such as changes in the power plan or fish and wildlife program. The Council has adopted a policy for how it will treat such petitions. A petition must set forth the substance or text of a proposed amendment or identify the provision to be repealed; explain the interest of the petitioner; and set forth the facts, reasons and new information that support the petitioner's request. The Council will conduct such study as it deems appropriate and within 120 days of receipt of the petition, grant or deny it. If an amendment process results from the petition process, the Council has committed to completing the process within seven months from the decision to begin the amendment process.

3. Council interpretations of the Northwest Power Act

Section 6(c)

In November 1986, the Council and Bonneville each issued complementary policy statements on the implementation of Section 6(c) of the Northwest Power Act. Section 6(c) requires Bonneville to submit certain proposals related to major resources to a public review process to determine whether they are consistent with the Council's Northwest Power Plan. The Council then has the right to make its own determination regarding consistency. If either Bonneville or the Council finds a resource inconsistent with the power plan, the resource can be acquired only after congressional action. The Act identifies as "major" resources those over 50 megawatts with more than five years' duration.

The purpose of review under Section 6(c) is to ensure that a major resource is needed and is cost-effective before the Northwest invests a great deal of money in it. The process speaks directly to the balance of power between state and federal interests. The Northwest Power Act established Bonneville's authority to acquire resources, but it also gave the states, through the Council, the right to review those acquisitions before committing ratepayers to large expenditures.

In March 1993, the Council and Bonneville completed a five-year review of their respective 6(c) policies. The region had had little experience under Section 6(c) in the years since the adoption of the original policies, and therefore, little was changed. The revised policies were expanded, however, to cover all the Bonneville proposals made subject to review under the terms of the Act. In early 1998, in light of the restructuring

occurring in the utility industry, the Council and Bonneville decided to postpone for five years further review of their 6(c) policies.

Section 5(d)

Bonneville was authorized under Section 5(d) of the Act to sign power sales contracts on special terms with existing direct service industrial customers (DSIs) for an amount of power that each customer was receiving under its earlier contract. The DSIs are customers that had industrial firm power contracts with Bonneville in 1975. The Act expressly precluded sales to new direct service industrial customers, but did permit Bonneville to sell additional power to existing DSIs, provided Bonneville and the Council made certain findings.

In late 1989, Bonneville tentatively agreed to sell additional power to an existing DSI customer without the review called for under Section 5(d), provided the customer could arrange an assignment of unused contract demand from another existing direct service customer. Bonneville took the position that Section 5(d) review was not required so long as the total amount of power it sold to the DSIs did not exceed the aggregate amount to which all the DSIs were entitled when the Act was passed. Public comment brought this proposed transaction to the Council's attention.

The Council has adopted an interpretation of Section 5(d) that requires review whenever a proposed sale to an individual DSI would result in that DSI receiving more power than it received under its initial entitlement. The Council's interpretation does not call for review if an existing DSI assigns its power sales contract to a successor in interest for use at the same location for purposes similar to those established under the original contract. Except for transfers of the sort just described, an amendment or assignment of a contract that results in the delivery of additional power to an existing DSI is a sale subject to Section 5(d) review.

4. Litigation history

Seattle Master Builders Association, et al. v. Northwest Power Planning Council

On April 10, 1986, the United States Court of Appeals for the Ninth Circuit decided this challenge to the Council's model conservation standards (MCS) brought by several construction-related organizations. The petitioners had advanced two principal lines of argument. First, with respect to the Council's model conservation standards, petitioners challenged the cost effectiveness of the measures to make new residential buildings more energy efficient, and the methodologies used by the Council to determine cost effectiveness. Petitioners also argued that the Council should have prepared an environmental impact statement regarding promulgation of the standards.

Second, petitioners challenged the constitutionality of the Council, citing the appointments clause of the U.S. Constitution, which requires officers of the United States to be appointed by the executive branch of government. Council members are officers of an interstate compact agency appointed by the governors of the four Northwest states and not by the president.

The Bonneville Power Administration intervened in the case and ultimately argued that the Council's adoption of the MCS did not violate the constitution. Bonneville said that the Council's model conservation standards did not impose a legal obligation on anyone, and therefore adoption of the standards was not the sort of exercise of significant authority over a federal agency that might require Council members to be appointed by the executive branch.

In earlier communications, however, regarding what posture the Department of Justice should adopt, the Department of Energy had taken a more aggressive position. The Secretary of Energy, Don Hodel, wrote to Justice in early 1985 and urged that if the Council were, indeed, anything more than advisory, and if it could, in fact, significantly limit Bonneville's actions, it ought to be found unconstitutional and replaced by a federal council. John Dingell, the Chairman of the House Energy and Commerce Committee, one of the committees that drafted the Northwest Power Act, wrote a strong letter in opposition to Energy's request. Mr. Dingell fully supported the view that the Council was intended to be more than an advisory body, with functions that are more significant than the Secretary of Energy had contended. He also concluded that the Council was properly formed and was operating according to the expectations of Congress.

In a two-to-one decision, the Ninth Circuit ruled for the Council on all the issues. With respect to the model conservation standards, the court held that the Council had adopted a proper approach to determining the cost effectiveness of conservation measures; that the methodology the Council used for determining conservation value was within the Council's discretion; and that the Council was not obliged to prepare an environmental impact statement on the standards, pursuant to the laws of the states that are members of the interstate compact. On the constitutional question, the court noted that the functions of the Council and Bonneville "directly overlap," and held that the Council "violates neither the compact nor appointments clauses of the United States Constitution. The Act established an innovative system of cooperative federalism under which the states, within limits provided by the Act, can represent their shared interests in maintenance and development of a power supply in the Pacific Northwest and in related environmental concerns."

The Master Builders petitioned the Ninth Circuit for rehearing en banc (before a larger panel of judges in the circuit) on the ground that the panel overlooked material laws and facts. The United States also petitioned for rehearing or for rehearing en banc, arguing that the court decided constitutional questions not presented by the case. The Ninth Circuit denied both petitions. The Master Builders' subsequent petition for certiorari was denied by the Supreme Court of the United States.

Northwest Conservation Act Coalition, et al. v. Northwest Power Planning Council

The Coalition and the Natural Resources Defense Council filed a petition for review in the Ninth Circuit challenging the model conservation standards amended in 1986, in an effort to make the requirements of the amended standards more rigorous. In particular, petitioners alleged that the Council's standards for conservation in new

commercial buildings ought to be more stringent; that a surcharge is necessary if the standards governing the energy efficiency of buildings that convert to electric space heat are to be effective; and that the Council's amended standards ought to contain standards for utility-financed incentives to conserve electricity in existing residences. Upon petitioners' request, the Council entered rulemaking to amend the standards in the respects summarized above. Petitioners then dismissed their suit in the Ninth Circuit.

Cascade Natural Gas Corp. v. Evans

In 1983, six regional natural gas companies brought suit challenging the Council's plan, arguing, among other things, that the Council had unfairly ignored natural gas as a conservation resource. The case was settled before trial and the Council agreed to modify the plan to make clear that the model conservation standards apply only to electrically heated homes. The Council also said that it would consider modifying the plan if significant fuel switching from natural gas to electricity were demonstrated. The terms of this settlement expired on April 27, 1988.

CASE, The Utility Reform Project and Michael Rose v. Northwest Power Planning Council

In May of 1986, CASE (Citizens for and Adequate Supply of Energy), The Utility Reform Project and Michael Rose filed suit in the Ninth Circuit, challenging certain portions of the 1986 model conservation standards. Petitioners also asked the Council to enter rulemaking to address the matters raised in the Ninth Circuit. In response to these two actions, the Council: Clarified that its then current MCS rulemaking addressed model standards for new residential and commercial buildings at federal agency facilities; committed to assess the conservation potential of existing buildings and other electricity uses at federal agency facilities as part of the next major plan revision; and extended the period for comment and consultation on MCS for federal agency customers beyond the deadline for the then current MCS rulemaking. The Council also agreed to defer action on the CASE petition to enter rulemaking to develop model conservation standards for the direct service industries, pending further analysis of increased interruptibility of the direct service industries, which the Council agreed to conduct before calling for Bonneville acquisition of new resources or before the next major revision of the Power Plan, whichever is first. As a result of these actions by the Council, the petitioners agreed to settle the case.

Northwest Resource Information Center, Inc., et al v. Northwest Power Planning Council; Confederated Tribes and Bands of the Yakima Indian Nation v. Northwest Power Planning Council (the "Phase Two" cases)

To act as quickly as possible to improve conditions for salmon and steelhead, which were then proposed for listing under the Endangered Species Act, beginning in August 1991 the Council began a multi-phase rulemaking on salmon and steelhead measures. In January 1992, the Council published its notice of final action on measures dealing with increased flows and drawdown of the lower Snake River. Three petitions were subsequently filed challenging the measures, one by the Northwest Resource Information Center, Trout Unlimited, the Oregon Natural Resources Council, Idaho Steelhead and Salmon Unlimited, and The Wilderness Society, represented by the Sierra

Club Legal Defense Fund; a second petition was filed by the Yakama Tribe; and a third was filed by a group of aluminum companies and other industrial customers of the Bonneville Power Administration. After the petitions had been filed, 15 to 20 additional parties intervened, including Oregon Trout, the United States government, a number of utilities and the State of Idaho.

On September 9, 1994, the Court ruled that the Council had not adequately explained its reasons for rejecting amendment recommendations because the Council's findings on the recommendations were put in a separate document, rather than in the fish and wildlife program itself. The Court also held that the Council's findings in an early phase of the amendment process were voided by findings in a later phase. While the Court's holdings were limited to these procedural matters, the opinion offered extensive interpretations (called "dicta" because they are not strictly binding) of the Northwest Power Act. Some of the dicta told the Council that it should give a "high degree of deference" to the fish and wildlife agencies' and Indian tribes' recommendations and expertise, and that the Council's discretion to reject these recommendations is narrow. The Court remanded the Strategy for Salmon for the Council to develop new findings.

A.H. Canada v. Northwest Power Planning Council

In 1994, Mr. Alfred H. Canada, a retired power engineer, sued the Council in federal District Court. Mr. Canada sought to overturn the Council's denial of a petition for rulemaking he had earlier filed. The rulemaking would have considered replacing the plan's call for conservation with an equivalent amount of solar photovoltaics. The District Court dismissed, reaffirming the established rule that suits challenging final actions of the Council are to be brought in the Ninth Circuit Court of Appeals.

Nez Perce and other tribes v. Northwest Power Planning Council

In 1997, four Indian tribes challenged the Council's recommendations pursuant to Section 4(h)(10)(D) of the Northwest Power Act regarding the Bonneville Power Administration's fish and wildlife expenditures. The petitioners and the Council agreed to withdraw the case in 2000 and asked the Ninth Circuit Court of Appeals to dismiss it.

Administrative Issues

1. Finance and Administration

Council funding

Expenses of the Council necessary for carrying out its functions and responsibilities under the Northwest Power Act are paid from funds received from the Bonneville Power Administration. Funds are advanced to the central office from Bonneville on a request basis. Each state, in turn, requests funds to be advanced from the central Council office to the state to cover the operating expenses of the state Council offices and personnel.

Costs associated with the operation of the Council's central office in Portland are paid from the central office budget. Expenses for each state Council office are paid from each state Council budget by the state agency which provides accounting/payroll services to each state Council office. In some instances, state expenses are paid directly from the central office accounting and payroll systems.

Budgets

The Council is required to develop annual (state and central office) budgets for transmittal to the Bonneville Power Administration and which are included in Bonneville's budget submittal to the Department of Energy, Office of Management and Budget, and Congress.

The Council's budget is limited to an amount equal to 0.02 mills multiplied by the kilowatt hours of firm power forecast to be sold by the Bonneville Administrator during the year to be funded. In most years, this limitation represents approximately $2 million. However, based on an annual showing by the Council that such limitation will not permit the Council to carry out its functions and responsibilities under the Act, the Administrator may raise such limit to any amount not in excess of 0.10 mills. In most years, this maximum limitation represents approximately $10 million.

The Council's annual budget process occurs between the months of March and June. Each state Council office develops its budget (usually on a biennial basis) which is approved through the state legislative process and then integrated with the Council's central office budget.

The Council's draft budget is distributed for a 30 to 60-day public review and comment period during which time consultations are held with interested parties regarding the Council's proposed funding requirements. Following final revision and adoption by the Council, the budget is transmitted to Bonneville.

In 1997 the Council agreed (with Bonneville) to plan to make budget cuts totaling approximately $5.4 million over four years — fiscal years 1998 through 2001. At that time, it was anticipated that the Council's role would diminish in power planning and fish and wildlife program development. Much of the Council's budget cuts in 1997 were based on these predictions.

Instead, the Council's role and workload have increased substantially. Electricity industry restructuring is far from being fully implemented, and as a result the Council continues to be heavily involved in regional power resource planning, hydrosystem operations analysis, energy system reliability/adequacy and conservation resource issues. In addition, the Council has increased accountability for fish and wildlife spending, implemented a new project selection process including site review at the province level by the Independent Scientific Review Panel, is guiding the development of subbasin plans throughout the region, and is amending its fish and wildlife program. In short, we have an enhanced role and new responsibilities in the region for fish and wildlife restoration.

Since 1997 the Council has worked with Bonneville to adopt budget agreements resulting in approximately $6.1 million of savings between Fiscal Year 1998 and Fiscal Year 2006. Actions taken to accomplish these savings included reductions in force, elimination of vacant FTEs, reducing travel costs, slashing contract funding, cutting administrative costs and curtailing lower-priority activities.

For the Fiscal Years 2007 - 2008 period, the Council again made a commitment to exercise fiscal restraint in developing its budget. The Council agreed to submit budgets to Bonneville that project a 3-percent increase, on average, over the three-year rate case period. In order to achieve this goal, we are freezing the number of FTEs in the Council budget while continuing to undertake additional work and responsibilities in the region.

The Council’s Fiscal Year 2007 revised budget of $9,085,000 is $385,000 (4.4 percent) higher than the current year 2006 budget of $8,700,000. This represents increased costs for updating Power Division analytical models, restoration of a portion of the IT support budget that was reduced in FY2006, and inflationary increases in the cost of personal services and benefits. The proposed Fiscal Year 2008 budget of $9,276,000 is $191,000 (2.1 percent) higher than the revised Fiscal Year 2007 budget. This increase reflects the anticipated increase in personal services and benefits costs.

Audits

The U.S. General Accounting Office (GAO) is the government entity authorized to audit the Council’s fiscal and program operations. However, the Council, through an agreement with Bonneville, engages an independent accounting firm to conduct annual financial audits of the Council’s operations. A copy of each audit is forwarded to the Portland office of the General Accounting Office and to other interested parties, as well as being included in the Council’s Annual Report to Congress. In addition, state audit agencies audit each state Council office’s fiscal operations in the course of their regular state agency audit schedules. In 1996, the GAO conducted an extensive audit of the Council’s business policies and practices. That audit resulted in a very positive finding by the GAO.

2. Council organization

The Act provides that the Council shall determine its organization and prescribe its practices and procedures for carrying out its functions and responsibilities under the Act.

State offices

Council members organize and staff their state offices based on the level of support they determine necessary. This typically includes technical assistants and/or policy analysts in the areas of power planning, fish and wildlife, and public information and public involvement. Administrative support is also provided.

Council members may also use outside contractors or the technical services of state agencies to conduct special studies and analyses regarding issues stemming from the power plan and the fish and wildlife program as they impact their respective states.

Where state staff are employees of the state, state laws, rules and regulations are applicable. There are some exceptions where state support for Council members is administered (payroll, travel and office expenses) by the central office.

Central office

The central office provides overall support to the Council in the areas of power planning, fish and wildlife, public affairs, legal matters, and finance and administration.

Staffing levels for the central office are established by the Council in its budget. All personnel actions are authorized by the executive director after consultation/approval by the Council chairman. Staff compensation plans and benefit programs are established by the Council based on recommendations by outside consultants, and are subject to periodic reviews by the consultant with the Council.

Travel rules and expense reimbursement policies for central staff are set by the Council.

Contracts to assist the Council in carrying out its responsibilities are awarded on a competitive basis. Contracts over $25,000 require approval by the full Council.

The central office also provides computing and information systems support to the state offices augmented by occasional assistance from state agencies and local vendors.

Council name change

In January 2003, the Council officially changed its name to the Northwest Power and Conservation Council to emphasize the conservation aspect of its energy and fish and wildlife responsibilities.

In the Northwest Power Act, the legal name of the agency is “Pacific Northwest Electric Power Planning and Conservation Council.” While “conservation” in the Power Act specifically refers to energy conservation, the concept of conserving natural resources is embodied in the Council’s Columbia River Basin Fish and Wildlife Program in terms of enhancing, or conserving, fish and wildlife of the Basin that have been affected by hydropower dams.

Council Staff Directory (2007)

Director's Office

Steve Crow, Executive Director
Judi Hertz, Executive Assistant

Legal Division

John Shurts, General Counsel
Bill Hannaford, Senior Counsel
Judi Hertz, Legal Assistant/Contracts

Administrative Division

Sharon Ossmann, Director
Michael Osborne, Accountant/financial specialist
Bud Decker, Information Systems Manager
Barry Richardson, Information Systems Assistant.
Tamara Fleming, Payroll/Accounting Assistant
Denise Bennett, Purchasing Agent/Spt Svcs
Beata Hartman, Office Specialist/Admin Support Assistant
Zenobia Baugh, Receptionist

Public Affairs Division

Mark Walker, Director
John Harrison, Information Officer
Stephen Sasser, Art Director
Eric Schrepel, Technical and Web Data Specialist
Carol Winkel, Senior Writer and Editor

Fish and Wildlife Division

Doug Marker, Director
Mark Fritsch, Manager, Project Implementation
Erik Merrill, ISRP/ISAB Coordinator
Patty O'Toole, Program Implementation Manager
Lynn Palensky, Subbasin Planning Project Manager
Peter Paquet, Manager, Wildlife and Resident Fish
James D. Ruff , Manager, Mainstem Passage and River Operations
Steve Waste, Manager, Program Analysis and Evaluation
Kendra Coles, Administrative Assistant

Power Planning Division

Terry Morlan, Director
Ken Corum, Senior Economist, Economic Analysis
Tom Eckman, Conservation Resources Mgr
John Fazio, Senior Power Systems Analyst
Wally Gibson, Manager, System Analysis & Generation
Charlie Grist, Senior Analyst
Massoud Jourabchi, Manager, economic analysis
Jeff King, Senior Resource Analyst
Michael Schilmoeller, Senior Power Systems Analyst
Julie Rodenberg, Administrative Assistant

Council members and state staff (2007)

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William B. Booth

Karen Dunn – Officer Manager/Administrator
Shirley Lindstrom – **Policy Analyst**
Joann Hunt – Fish and Wildlife Policy Analyst

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Bruce A. Measure

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Rhonda Whiting

Kerry Berg – Policy Analyst
John Bushnell - Economist
Pam Tyree – Administrative Secretary

Oregon

Melinda S. Eden (Bin #808)

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Ché Mortimer – Office Manager

Vice-Chair: Joan M. Dukes (Bin #809)

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Karl Weist – Fish and Wildlife Policy Analyst
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Mary Dorsey – Administrative Assistant 509-623-4386
Stacy Horton – Biologist
W. 705 First Ave. Spokane, WA 99201-3909
509-623-4376 (Bin #805)

Council Member Terms

State	Name	Term
Idaho	Chris Carlson	April 8, 1981-January 1984 (left late in 1981)
	Robert Saxvik	April 8, 1981-January 1984 January 1984-January 1987 January 1987-January 1990 January 1990-January 1993 January 1993-January 1996 (replaced by Gov. Batt December 1994)
	W. Larry Mills	November 4, 1981-January 1984 January 1984-January 1987
	James A. Goller	February 1, 1987-January 1992 January 1992-January 1995 (resigned November 1992)
	Jay Webb	February 1, 1993-January 15, 1995 (resigned December 2, 1994)
	Andy Brunelle	December 2, 1994-December 31, 1994
	Todd Maddock	January 15, 1995-January 15, 1997 (finished Andy Brunelle's term) January 15, 1997-January 15, 2000
	Mike Field	January 15, 1995-January 15, 1998 January 15, 1998 - May 13, 2001
	Judi Danielson	May 14, 2001-January 31, 2004 January 15, 2004 - January 15, 2007
	Jim Kempton	January 5, 2001-January 31, 2003 January 15, 2003-January 15, 2006 January 15, 2006-January 15, 2009
	William B. Booth	January 15, 2007-
Montana (Terms are at the pleasure of the Governor)	Keith L. Colbo	April 1981-January 1984
	Gerald Mueller	April 1981-January 1987
	Morris Brusett	January 1985-January 1989
	George Turman	January 1987-January 1989
	John Brenden	January 1989-December 1992
	Stan Grace	January 1989-September 2001
	John Etchart	January 1993-December 2000
	Leo Giacometto	January 2001 - March 2002
	Ed Bartlett	October 2001 - December 2004
	John Hines	March 2002 - December 2004
	Bruce Measure	January 2005 -

	Rhonda Whiting	January 2005 -
Oregon	Leroy Hemmingway	April 14, 1981-January 15, 1983 January 15, 1983-January 15, 1986
	Herb Schwab	April 13-1981-January 15, 1984 (left in 1982)
	Alfred Hampson	February 1, 1982-January 15, 1984
	Don Godard	January 16, 1984-January 15, 1987
	Robert Duncan	January 16, 1984-January 15, 1989 (left mid-1988)
	Norma Paulus	February 4, 1987-January 15, 1990
	Ted Hallock	June 17-1988-January 15, 1989 January 16, 1989-January 15, 1992 January 15, 1992-January 15, 1995 (replaced by Gov. Roberts with a term ending December 19, 1994)
	Angus Duncan	January 16, 1990-January 15, 1993 January 16, 1993-January 15, 1996 (resigned in September 1995)
	Joyce Cohen	December 19, 1994-January 15, 1998
	John Brogoitti	September 16, 1995-January 15,1996 January 16, 1996-January 15, 1999 January 16, 2000-January 15, 2002
	Eric Bloch	April 10, 1998(June 15)-January 15, 2001 January 16, 2001-January 1, 2003 (left January 2003)
	Gene Derfler	November 8, 2002-January 15, 2005
	Melinda Eden	January 1, 2003 January 2004 - January 2007
	Joan Dukes	January 15, 2005 - January 15, 2008
Washington	Daniel J. Evans	April 26, 1981-January 15, 1984 January 15, 1984-January 15, 1987 (left September 1983)
	Charles Collins	April 26, 1981-January 15, 1984 January 15, 1984-January 15, 1987 (left January 1986)
	Kai N. Lee	October 1983-January 15, 1987

	January 16, 1987-January 15, 1990 (left November 20, 1987)
Tom Trulove	January 31, 1986-January 15, 1989 January 9, 1989-January 15, 1992 January 15, 1992-January 15, 1995 (replaced by Gov Lowry February 28, 1994)
R. Ted Bottiger	November 2, 1987-January 15, 1990 January 15, 1990-January 15, 1993 January 15, 1993-January 15, 1996 (retired in January 1995)
Ken Casavant	February 28, 1994-January 15, 1995 January 15, 1995-January 15, 1998 (served until June 30, 1998)
Mike Kreidler	January 15, 1995-January 15, 1996 January 15, 1996-January 15, 1999 (served until July 1998)
Tom Karier	July 1, 1998- January 15, 2001 January 16, 2001 - January 15, 2004 January 15, 2004 - January 15, 2007 January 15, 2007 - January 15, 2010
Frank L. Cassidy	August 3, 1998 – January 15, 1999 January 16, 2002 - January 15, 2005 January 16, 2005 - January 15, 2008

Council Chairs, Vice Chairs, and Committee Chairs

1982 and 1983	Dan Evans (WA), Chairman Robert Saxvik (ID), Vice Chairman
1984	Keith Colbo (MT), Chairman Roy Hemmingway (OR), Vice Chairman
1985	Charles Collins (WA), Chairman Robert Saxvik (ID), Vice Chairman
1986	Robert Saxvik (ID), Chairman Kai Lee (WA), Vice Chairman
1987	Bob Duncan (OR), Chairman Morris Brusett (MT), Vice Chairman
1988	Morris Brusett (MT), Chairman Tom Trulove (WA), Vice Chairman
1989	Tom Trulove (WA), Chairman Jim Goller (ID), Vice Chairman
1990	Tom Trulove (WA), Chairman Jim Goller (ID), Vice Chairman
1991	Jim Goller (ID), Chairman Ted Bottiger (WA), Vice Chairman
1992	Ted Hallock (OR), Chairman Stan Grace (MT), Vice Chairman
1993	Stan Grace (MT), Chairman Ted Bottiger (WA), Vice Chairman
1994	Ted Bottiger (WA), Chairman Jay Webb (ID), Vice Chairman Angus Duncan (OR), Chairman (beginning November 16) John Etchart (MT), Vice Chairman
1995-1996	John Etchart (MT), Chairman (began as chairman in October 1995 when Angus Duncan left) Ken Casavant (WA), Vice Chairman *(Election changed to calendar year)* Stan Grace, chair, fish and wildlife committee Joyce Cohen, chair, power committee

1997-1998	John Etchart (MT), Chairman John Brogoitti (OR), Vice Chairman Ken Casavant, chair, fish and wildlife committee Todd Maddock, chair, power committee
1998-1999	John Etchart (MT), Chairman Todd Maddock (ID), Vice Chairman John Brogoitti, chair, fish and wildlife committee Mike Kreidler, chair, power committee
1999-2000	Todd Maddock (ID), Chairman Larry Cassidy (WA), Vice Chairman Eric Bloch, chair, fish and wildlife committee Tom Karier, chair, power committee
2000-2001	Larry Cassidy (WA), Chairman Eric Bloch (OR), Vice Chairman Mike Field, chair, fish committee Tom Karier, chair, power committee
2001-2002	Larry Cassidy (WA), Chairman Eric Bloch (OR), Vice Chairman Mike Field fish and wildlife committee chair until May 2001, then John Brogoitti; John Brogoitti until December 2002, then Ed Bartlett; Tom Karier, chair, power committee
2002-2003	Larry Cassidy (WA), Chair Judi Danielson (ID), Vice Chair John Brogoitti, chair, fish committee Tom Karier, chair, power committee Ed Bartlett named chair of fish committee in December 2002 when Brogoitti left the Council
2003-2004	Judi Danielson (ID), Chair Tom Karier (WA) Vice-Chair Ed Bartlett (MT), chair, fish committee Jim Kempton(ID), chair, power committee
2004-2005	Judi Danielson (ID), Chair Melinda Eden (OR), Vice-Chair Ed Bartlett (MT), chair, fish committee Jim Kempton (ID), chair, power committee
2005-2006	Melinda Eden (OR), Chair Jim Kempton (ID), Vice-Chair Rhonda Whiting (MT), chair, fish committee Tom Karier, (WA) chair, power committee

2006-2007	Tom Karier (WA), Chair Joan Dukes (OR), Vice-Chair Rhonda Whiting (MT), chair, fish committee Jim Kempton (ID), chair, power committee

Glossary of terms

1. In the fish and wildlife program

acclimation pond
Concrete or earthen pond or a temporary structure used for rearing and imprinting juvenile fish in the water of a particular stream before their release into that stream.

adaptive management
A scientific policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as vehicles for learning. Projects arc designed and implemented as experiments so that even if they fail, they provide useful information for future actions. Monitoring and evaluation are emphasized so that the interaction of different elements of the system are better understood.

adult equivalent population
The number of fish that would have returned to the mouth of the Columbia River in the absence of any prior harvest.

anadromous fish
Fish that hatch in freshwater, migrate to the ocean, mature there and return to freshwater to spawn. For example, salmon or steelhead.

biodiversity
The variety of and variability in living organisms, with respect to genetics, life history, behavior and other fundamental characteristics.

captive brood stock
Fish raised and spawned in captivity.

carrying capacity
The number of individuals of one species that the resources of a habitat can support.

Coordinated Information System
Still under development, this system is designed to allow interested parties to access technical information about Columbia River salmon and steelhead.

deflector screens/diversion screens
Wire mesh screens placed at the point where water is diverted from a stream or river. The screens keep fish from entering the diversion channel or pipe.

demography
The study of characteristics of human populations, especially size, density, growth, distribution, migration and vital statistics, and the effect of these on social and economic conditions.

drawdown
The release of water from a reservoir for power generation, flood control, irrigation or other water management activity.

economies of scale
Reductions in the average cost of a product that result from increased production.

ecosystem
The biological community considered together with the land and water that make up its environment.

embeddedness
The degree to which dirt is mixed in with spawning gravel.

escapement
The number of salmon and steelhead that return to a specified point of measurement after all natural mortality and harvest have occurred. Spawning escapement consists of those fish that survive to spawn.

evolutionary biology
The study of the processes by which living organisms have acquired distinguishing characteristics.

extinction
The natural or human-induced process by which a species, subspecies or population ceases to exist.

fish flows
Artificially increased flows in the river system called for in the fish and wildlife program to quickly move the young fish down the river during their spring migration period. (See "water budget.")

fish passage efficiency
The percentage of the total number of fish that pass a dam without passing through the turbine units.

flows
The rate at which water passes a given point in a stream or river, usually expressed in cubic-feet per second (cfs).

flow augmentation
Increased flow from release of water from storage dams.

gametes
The sexual reproductive cells, eggs and sperm.

gas supersaturation
The overabundance of gases in turbulent water, such as at the base of a dam spillway. Can cause a fatal condition in fish similar to the bends.

genetic conservation refuge
Reserve area whose goal is to protect genetic diversity and natural evolutionary processes within and among natural populations, while allowing varying degrees of exploitation and modification.

genetic diversity
All of the genetic variation within a species. Genetic diversity includes both genetic differences among individuals in a breeding population and genetic differences among different breeding populations.

genetic integrity
The ability of a breeding population or group of breeding populations to remain adapted to its natural environment.

genotype
The complement of genes in an individual.

glides
Stream areas with velocities generally less than one cubic foot per second and with a smooth surface. Water depth generally is less than two feet.

harvest controls
Regulations established for commercial and sport fisheries to ensure that the correct proportion of the different stocks escape to spawn.

impoundment
A body of water formed behind a dam.

imprinting
The physiological and behavioral process by which migratory fish assimilate environmental cues to aid their return to their stream of origin as adults.

mainstem
The main channel of the river in a river basin, as opposed to the streams and smaller rivers that feed into it. In the fish and wildlife program, mainstem refers to the Columbia and Snake rivers.

minimum operating pool
The lowest water level of an impoundment at which navigation locks can still operate.

mixed-stock fishery
A harvest management technique by which different species, strains, races or stocks are harvested together.

morphology
A study of the form and structure of animals and plants.

naturally spawning populations
Populations of fish that have completed their entire life cycle in the natural environment and may be the progeny of wild, hatchery or mixed parentage.

naturalization
The process by which introduced fish successfully establish a naturally spawning population.

outfall
The mouth or outlet of a river, stream, lake, drain or sewer.

PIT tags
PIT tags are used for identifying individual salmon for monitoring and research purposes. This miniaturized tag consists of an integrated microchip that is programmed to include specific fish information. The tag is inserted into the body cavity of the fish and decoded at selected monitoring sites.

plume
The area of the Pacific Ocean that is influenced by discharge from the Columbia River, up to 500 miles beyond the mouth of the river.

population
A group of organisms belonging to the same species that occupy a well-defined locality and exhibit reproductive continuity from generation to generation.

population vulnerability analysis
A systematic process for estimating species, location and time-specific criteria for persistence of a population.

redd
A spawning nest made in the gravel bed of a river by salmon or steelhead.

reproductive isolating mechanisms
Mechanisms that retain genetic diversity among populations. The primary reproductive isolating mechanism for anadromous fish is accuracy of homing, which can be reduced by improper hatchery operations. Stock transfers also reduce reproductive isolation.

resident fish
Fish that spend their entire life cycle in freshwater. For program purposes, resident fish includes land-locked anadromous fish (e.g., white sturgeon, kokanee and coho), as well as traditionally defined resident fish species.

riffle
A shallow extending across the bed of a stream over which water flows swiftly so that the surface of the water is broken in waves.

riparian habitat
Habitat along the banks of streams, lakes or rivers.

rule curves
Graphic guides to the use of storage water. They are developed to define certain operating rights, entitlements, obligations and limitations for each reservoir.

sinuosity
The amount of bending, winding and curving in a stream or river.

smolt
A juvenile salmon or steelhead migrating to the ocean and undergoing physiological changes (smoltification) to adapt its body from a freshwater to a saltwater existence.

spill
Releasing water through the spillway rather than through the turbine units.

spillway crest elevation
The point at which the reservoir behind a dam is level with the top of the dam's spillway.

stream morphology
The study of the form and structure of streams.

supplementation
The release of hatchery fry and juvenile fish in the natural environment to quickly increase or establish naturally spawning fish populations.

tailrace
The canal or channel that carries water away from the dam.

velocity
The speed of water flowing in a watercourse, such as a river.

velocity barrier
A physical structure, such as a barrier dam or floating weir, built in the tailrace of a hydroelectric powerhouse, which blocks the tailrace from further adult salmon or steelhead migration to prevent physical injury or migration delay.

water budget
A means of increasing survival of downstream migrating juvenile fish by increasing Columbia and Snake river flows during the spring migration period. The water budget was developed by the Council, which oversees its use in conjunction with the fish and wildlife agencies and Indian tribes, the U.S. Army Corps of Engineers, the Bonneville Power Administration and the Bureau of Reclamation.

watershed
The area that drains into a stream or river.

weak stock
Listed in the Integrated System Plan's list of stocks of high or highest concern; listed in the American Fisheries Society report as at high or moderate risk of extinction; or stocks the National Marine Fisheries Service has listed. "Weak stock" is an evolving concept; the Council does not purport to establish a fixed definition. Nor does the Council imply that any particular change in management is required because of this definition.

wild populations
Fish that have maintained successful natural reproduction with little or no supplementation from hatcheries.

2. In the power plan

administrative costs
Certain overhead costs related to conservation or generating resources, such as project management and accounting costs incurred by utility or contractor staff.

alternating current (AC)
An electric current in which the electrons flow in alternate directions. In North American electrical grids, this reversal of flow is governed at 60 cycles per second (Hertz). With some exceptions (see "direct current"), commercial electric generation, transmission and distribution systems operate on alternating current.

anadromous fish
Fish that hatch in freshwater, migrate to the ocean, mature there, and return to freshwater to spawn. For example, salmon or steelhead trout.

available technology
In the power plan, the term "available technology" refers to equipment or facilities for generating and conservation resources, including electrical appliances, that are currently available and are expected to be generally available in the marketplace during the 20-year planning period.

average cost pricing
A concept used in pricing electricity. The average cost price is derived by dividing the total cost of production by the total number of units sold in the same period to obtain an average unit cost. This unit cost is then directly applied as a price.

average megawatt or average annual megawatt
Equivalent to the energy produced by the continuous operation of one megawatt of capacity over a period of one year. (Equivalent to 8.76 gigawatt-hours, 8,760 megawatt-hours or 8,760,000 kilowatt-hours.)

avoided cost
An investment guideline, describing the value of conservation and generation resource investments in terms of the cost of more expensive resources that would otherwise have to be acquired.

base loaded resources
Base loaded electricity generating resources are those that generally are operated continually except for maintenance and unscheduled outages.

billing credit
Under the Northwest Power Act, a payment by Bonneville to a customer (in cash or offsets against billings) for actions taken by that customer to reduce Bonneville's obligations to acquire new resources.

Bonneville Power Administration (Bonneville)
A federal agency that markets the power produced by Federal Base System resources and resources acquired under the provisions of the Northwest Power Act of 1980. Bonneville sells power to public and private utilities, direct service industrial customers and various public agencies. The Northwest Power Act charges Bonneville with other duties, including pursuing conservation, acquiring sufficient resources to meet its contract obligations, funding certain fish and wildlife recovery efforts and implementing the Council's plan.

Btu (British thermal unit)
The amount of heat energy necessary to raise the temperature of one pound of water one degree Fahrenheit (3,413 Btus are equal to one kilowatt-hour).

Buy-back program
A conservation program that, in effect, purchases electrical energy in the form of conservation measures installed by a consumer. The consumer is paid a certain amount per kilowatt-hour of energy saved.

callback
A power sale contract provision that gives the seller the right to stop delivery of power to the buyer when it is needed to meet other specified obligations of the seller.

capacity
The maximum power that a machine or system can produce or carry under specified conditions. The capacity of generating equipment is generally expressed in kilowatts or megawatts. In terms of transmission lines, capacity refers to the maximum load a line is capable of carrying under specified conditions.

climate zone
As part of its model conservation standards, the Council has established climate zones for the region based on the number of heating degree days, as follows: Zone 1: 4,000 to 6,000 heating degree days (the mild maritime climate west of the Cascades and other temperate areas); Zone 2: 6,000 to 8,000 heating degree days (the somewhat harsher

eastern parts of the region); and Zone 3: more than 8,000 heating degree days (western Montana and higher elevations throughout the region).

coal gasification
The process of converting coal to a synthetic gaseous fuel.

cogeneration
The sequential production of electricity and useful thermal energy. This is frequently accomplished by the recovery of reject heat from an electric generating plant for use in industrial processes, space or water heating applications. Conversely, cogeneration can be accomplished by using reject heat from industrial processes to power an electricity generator.

combined-cycle power plant
The combination of a gas turbine and a steam turbine in an electric generation plant. The waste heat from the gas turbine provides the heat energy for the steam turbine.

combustion turbine
A turbine engine generator, often fired by natural gas or fuel oil, used to generate electricity. The turbine generator is turned by combustion gases rather than heat-created steam.

conductor
Wire or cable for transferring electric power.

conservation
According to the Northwest Power Act, any reduction in electric power consumption as a result of increases in the efficiency of energy use, production or distribution.

construction lead time
The length of time between a decision to construct a resource and when the resource is expected to deliver power to the grid. Generally defined for purposes of this plan as the interval between detailed engineering and equipment order to completion of start-up testing.

cost-effective
According to the Northwest Power Act, a cost-effective measure or resource must be forecast to be reliable and available within the time it is needed, and to meet or reduce electrical power demand of consumers at an estimated incremental system cost no greater than that of the least-costly, similarly reliable and available alternative or combination of alternatives.

cost of debt
The amount paid to the holders of debt (bonds and other securities) for use of their money. Generally expressed as an annual percentage in the power plan.

cost of equity
Earnings expected by a shareholder on an investment in a company. Generally expressed as an annual percentage in this plan.

critical period
The sequence of low water conditions during which the regional hydropower system's least amount of energy can be generated (see "critical water") while drafting storage reservoirs from full to empty. Under the Pacific Northwest Coordination Agreement, critical period is based on the lowest multi-month streamflow observed since 1928. Based on analysis of streamflows at The Dalles Dam, this is also the lowest streamflow since recordkeeping began in 1879.

critical water
The sequence of streamflows in the critical period under which the hydropower system will generate about 12,500 average megawatts. In an average year, the Northwest hydropower system will produce about 16,600 average megawatts.

curtailment
An externally imposed reduction of energy consumption due to a shortage of resources.

debt
Investment funds raised through the sale of securities having fixed rates of interest.

debt/equity ratio
The ratio of debt financing to equity financing used for capital investment.

demand forecast
An estimate of the level of energy that is likely to be needed at some time in the future. The Council's demand forecast contains a range of estimated consumption based on various assumptions about demographics and the state of the economy.

direct application renewable resource
Technologies that use renewable energy sources to perform a task without converting the energy into electricity. These sources and their functions may include wood for space heat, solar for space heat and drying, geothermal space and water heating, and wind machines used for mechanical drive (such as pumping).

direct current (DC)
An electrical current in which the electrons flow continuously in one direction. Direct current is used in specialized applications in commercial electric generation, transmission and distribution systems.

direct service industry
An industrial customer that buys power directly from the Bonneville Power Administration. Most direct service industries are aluminum smelting plants.

discount rate
The rate used in a formula to convert future costs or benefits to their present value.

dispatch
Operating control of an integrated electrical system involving operations such as control of the operation of high-voltage lines, substations or other equipment.

distribution
The transfer of electricity from the transmission network to the consumer. Distribution systems generally include the equipment to transfer power from the substation to the customer's meter.

drawdown
Release of water from a reservoir for purposes of power generation, flood control, irrigation or other water management activity.

economic feasibility
The Northwest Power Act requires all conservation measures to be "economically feasible" for consumers. The Act does not define this concept. In this plan, the Council considers a program or measure to be economically feasible if the measure or program results in the minimum life-cycle costs to the consumer, taking into account financial assistance made available pursuant to other provisions of the Act.

end use
A term referring to the final use of energy. In the aggregate, it is used the same as "energy demand." In a more detailed use, it often refers to the specific energy services (for example, space heating), or the type of energy-consuming equipment (for example, motors).

energy
That which does, or is capable of doing, work. Energy is measured in terms of the work it is capable of doing. Electrical energy is commonly measured in kilowatt-hours, or in average megawatts (8,760,000 kilowatt-hours per year).

Energy Northwest
The utility formerly known as the Washington Public Power Supply System (WPPSS) is a municipal corporation and joint operation agency in Washington comprising representatives of public utility districts and municipal utilities. Based on power purchase contracts of its members or other utilities, WPPSS has the power to acquire, construct and operate facilities for the generation or transmission of electric power.

energy services
The actual service energy is used to provide (for example, space heat, refrigeration, transportation).

equity
Investment funds raised through the sale of shares of company ownership.

equivalent availability
The ratio of the maximum amount of energy a generating unit can produce in a fixed period of time, after adjustment for expected maintenance and forced outage, to the maximum energy it could produce if it ran continuously over the fixed time period. This represents an upper limit for a long-run (annual or longer) capacity factor for a generating unit. For example, a unit with an equivalent availability of 70 percent and a capacity of 500 megawatts could be relied on to produce 350 average megawatts of energy over the long term, if required.

externality
Any costs or benefits of goods or services that are not accounted for in the price of the goods or services. Specifically, the term given to the effects of pollution and other environmental effects from power plants or conservation measures.

Federal Base System
The system includes the Federal Columbia River Power System hydroelectric projects, resources acquired by the Bonneville Power Administration under long-term contracts prior to the Northwest Power Act, and resources acquired to replace reductions in the capability of existing resources subsequent to the Act.

Federal Energy Regulatory Commission (FERC)
A federal agency that regulates interstate aspects of electric power and natural gas industries. It has jurisdiction over licensing of hydropower projects and setting rates for electricity sold between states. FERC was formerly the Federal Power Commission.

firm capacity
That portion of a customer's capacity requirements for which service is assured by the utility provider.

firm energy
That portion of a customer's energy load for which service is assured by the utility provider. That portion for which service is not assured is referred to as "interruptible."

firm energy load carrying capability (FELCC)
The amount of firm energy that can be produced from a hydropower system based on the system's lowest recorded sequence of streamflows and the maximum amount of reservoir storage currently available to the system.

firm surplus
Firm energy in excess of the firm load.

fuel cycle
The series of steps required to produce electricity from power plants. The fuel cycle includes mining or otherwise acquiring the raw fuel source, processing and cleaning the fuel, transporting, generating, waste management and plant decommissioning.

generation
The act or process of producing electricity from other forms of energy.

geothermal
Useful energy derived from the natural heat of the earth as manifested by hot rocks, hot water, hot brines or steam.

head
The vertical height of water in a reservoir above the turbine.

heat engines
Devices that convert thermal energy to mechanical energy. Examples include steam turbines, gas turbines internal combustion engines and Stirling engines.

heat rate
The amount of input (fuel) energy required by a power plant to produce one kilowatt-hour of electrical output. Expressed as Btu/kWh.

heating degree days
A measure of the amount of heat needed in a building over a fixed period of time, usually a year. Heating degree days per day are calculated by subtracting from a fixed temperature the average temperature over the day. Historically, the fixed temperature has been set at 65 degrees Fahrenheit, the outdoor temperature below which heat was typically needed. As an example, a day with an average temperature of 45 degrees Fahrenheit would have 20 heating degree days, assuming a base of 65 degrees Fahrenheit.

hydroelectric power (hydropower)
The generation of electricity using falling water to turn turbo-electric generators.

independent power producer (IPP)
An independent power producer is a power production facility that is not part of a regulated utility. Power production facilities that qualify under PURPA (see "qualifying facility") are considered independent power producers, together with other independent power production facilities, such as independently owned coal-fired generating plants.

infiltration control
Conservation measures, such as caulking. better windows and weatherstripping, which reduce the amount of cold air entering or warm air escaping from a building.

insolation
The rate of energy from the sun falling on the earth's surface, typically measured in watts per-square meter.

integrated resource planning See "least-cost planning."

interruptible power
Power that, by contract, can be interrupted in the event of a power deficiency.

Intertie
A transmission line or system of lines permitting a flow of electricity between major power systems.

investor-owned utility
A utility that is organized under state law as a corporation to provide electric power service and earn a profit for its stockholders.

ISAAC
A computer model used by the Council to simulate system operation, decisions to option and build resources, and the associated costs of providing power across a large number of possible load forecasts. ISAAC accounts for the effects of uncertainty on the load forecast variations in hydropower availability for analyzing various resource strategies. The Council uses the model to help choose the best mix of resources and to establish the power plan Action Plan.

kilowatt (kW)
The electrical unit of power that equals 1,000 watts.

kilowatt-hour (kWh)
A basic unit of electrical energy that equals one kilowatt of power applied for one hour.

lead time
The length of time it takes to move a resource from concept to completion.

least-cost planning
Least-cost planning or, as it is often called, "integrated resource planning," is a name given to the power planning strategy and philosophy adopted by the Council. This strategy recognizes load uncertainty, embodies an emphasis on risk management, and reviews all available and reliable resources to meet current and future loads. The term "least-cost" refers to all costs, including capital, labor, fuel, maintenance, decommissioning, known environmental impacts and difficult-to-quantify ramifications of selecting one resource over another.

levelized life-cycle cost
The present value of a resource's cost (including capital, financing and operating costs) converted into a stream of equal annual payments. This stream of payments can be converted to a unit cost of energy by dividing them by the number of kilowatt-hours produced or saved by the resource in associated years. By levelizing costs, resources with different lifetimes and generating capabilities can be compared.

life-cycle costs See "levelized life-cycle cost."

load
The amount of electric power required at a given point on a system.

load forecast
An estimate of the level of energy that must be generated to meet a need. This differs from a demand forecast in that transmission and distribution losses from the generator to the customer are included.

load path
One future scenario for electric load growth, as opposed to a range that accommodates multiple forecasts of future load growth.

lost-opportunity resources
Resources that, because of physical or institutional characteristics, may lose their cost-effectiveness unless actions are taken to develop these resources or to hold them for future use.

major resource
According to the Northwest Power Act, a resource with a planned capability greater than 50 average megawatts and, if acquired by Bonneville, acquired for more than five years.

manufactured home
A structure, such as a mobile home, that is transportable in one or more sections, and that is built on a permanent chassis and designed to be used as a dwelling, with or without a permanent foundation, when connected to the required utilities. These homes must comply with the Manufactured Home Construction and Safety Standards issued by the U.S. Department of Housing and Urban Development. This does not include other categories of homes whose components are manufactured, such as modular, sectional, panelized and pre-cut homes. These homes must comply with state and local building codes.

marginal cost
The cost of producing the last unit of energy (the long-run incremental cost of production). In the plan, “regional marginal cost” means the long-run cost of additional consumption to the region due to additional resources being required. It does not include consideration of such additional costs to any specific utility due to its purchases from Bonneville at average cost.

measure
In the power plan, a measure refers to either an individual conservation measure or action or a combination of actions.

megawatt (MW)
The electrical unit of power that equals one million watts or one thousand kilowatts.

mill
A tenth of a cent. The cost of electricity is often given in mills per kilowatt-hour.

model conservation standards
Any energy-efficiency program or standard adopted by the Council, including, but not limited to: 1) new and existing structures; 2) utility. customer and governmental

programs; and 3) other consumer actions for achieving conservation. The most well-known are the energy-efficient building standards developed by the Council for new electrically heated buildings.

Monte Carlo simulation
The mathematical simulation of uncertain events having known probability characteristics by random sampling from a known probability distribution function.

municipal solid waste (MSW)
Refuse offering the potential for energy recovery. Technically, residential, commercial and institutional discards. Also included in the definition of municipal solid waste for purposes of this plan are non-hazardous processable byproducts from manufacturing activities. Not included are combustible byproducts of the lumber, wood products, paper and allied products industries. These are considered separately as mill residue.

net billed plants

Refers to the 30 percent share of the Trojan Nuclear Plant, all of Washington Public Power Supply System's nuclear project 1 (WNP-1) and WNP-2, and 70 percent of WNP-3.

net billing
A financial arrangement that allowed Bonneville to underwrite the costs of electric generating projects. Utilities that owned shares in thermal projects, and paid a share of their costs, assigned to Bonneville all or part of the generating capability of these resources. Bonneville, in turn, credited and continues to credit the wholesale power bills of these utilities to cover the costs of their shares in the thermal resources. Bonneville then sells the output of the thermal plants, averaging the higher costs of the thermal power with lower-cost hydropower.

nominal dollars
Dollars that include the effects of inflation. These are dollars that, at the time they are spent, have no adjustments made for the amount of inflation that has affected their value over time.

non-firm energy
Energy produced by the hydropower system that is available with water conditions better than critical and after reservoir refill is assured. It is available in varying amounts depending upon season and weather conditions.

non-utility generator
A generic term for non-utility power plant owners and operators. Non-utility generators include qualifying facilities, small power producers and independent power producers.

option
As used in the power plan, a project that has been sited, licensed and designed, but not yet constructed. Options are held in inventory until new resources are clearly needed.

overnight cost
Total of all direct and indirect project construction costs, including engineering, overhead costs, fees and contingency. Exclusive of costs attributable to interest and escalation incurred during construction.

Pacific Northwest (the region)
According to the Northwest Power Act, the area consisting of Oregon, Washington, Idaho and Montana west of the Continental Divide, and those portions of Nevada, Utah and Wyoming that are within the Columbia River Basin. It also includes any contiguous areas not more than 75 miles from the above areas that are part of the service area of a rural electric cooperative served by Bonneville on the effective date of the Act and whose distribution system serves both within and outside of the region.

Pacific Northwest Coordination Agreement
An agreement between federal and nonfederal owners of hydropower generation on the Columbia River system, initially completed in 1964 and then revised in 1997. The agreement 1) determines the firm load carrying capability (FLCC) of the coordinated system and each utility assuming an optimum operation under critical water conditions; 2) creates operating criteria that if followed will enable the generation of FLCC under any low stream flow condition and assure a 95% confidence of reservoir refill before generation of nonfirm energy; 3) requires exchanges of energy among utilities to support FLCC and nonfirm energy, and 4) determines Headwater Benefit payments required by FERC. The PNCA does not require any utility or agency to operate any dam or reservoir according to PNCA operating criteria or violate nonpower requirements.

Pacific Northwest Utilities Conference Committee (PNUCC)
Formed by Pacific Northwest utilities to coordinate policy on regional power supply issues, PNUCC lacks contractual authority, but it does play a major role in regional power planning through its policy, steering, fish and wildlife, and lawyers committees, and the Technical Coordination Group. PNUCC publishes the Northwest Regional Forecast containing information on regional loads and resources.

peak capacity
The maximum capacity of a system to meet loads.

peak demand
The highest demand for power during a stated period of time.

penetration rate
One annual share of a potential market for conservation that is realized, as in “7 percent of the region's homes have been weatherized this year.”

photovoltaic
Direct conversion of sunlight to electric energy through the effects of solar radiation on semi-conductor materials.

post-operational capital replacement costs
The cost of major equipment replacements occurring during the operating life of a project. In practice, these costs generally are capitalized (i.e., financed by debt or equity). For resource cost-effectiveness analyses, these costs are frequently treated as expenses.

preference
Priority access to federal power by public bodies and cooperatives.

present value
The worth of future returns or costs in terms of their current value. To obtain a present value, an interest rate is used to discount these future returns and costs.

public utility commissions
State agencies that regulate, among others, investor-owned utilities operating in the state with a protected monopoly to supply power in assigned service territories.

Public Utility Regulatory Policies Act of 1978 (PURPA)
Federal legislation that requires utilities to purchase electricity from qualified independent power producers at a price that reflects what the utilities would have to pay for the construction of new generating resources (see "avoided cost"). The Act was designed to encourage the development of small-scale cogeneration and renewable resources.

qualifying facility (QF)
Qualifying facility is a power production facility that qualifies for special treatment under a 1978 federal law—Public Utility Regulatory Policies Act (PURPA). PURPA requires a utility to buy the power produced by the qualifying facility at a price equal to that which the utility would otherwise pay if it were to build its own power plant or buy the power from another source. A qualifying facility must generate its power using cogeneration, biomass. waste, geothermal energy, or renewable resources, such as solar and wind, and, depending on the energy source and the time at which the facility is constructed, its size may be limited to 80 megawatts or smaller. PURPA prohibits utilities from owning majority interest in qualifying facilities.

quantifiable environmental costs and benefits
Environmental costs and benefits capable of being expressed in numeric terms (for example, in dollars, deaths, reductions in crop yields).

quartile
The direct service industries load is divided into four quartiles. The top quartile is the portion of that load most susceptible to interruption.

R-value
A measure of a material's resistance to heat flow. The higher the R-value, the higher the insulating value.

real dollars
Dollars that do not include the effects of inflation. They represent constant purchasing power.

region
See "Pacific Northwest."

reliability
The ability of the power system to provide customers uninterrupted electric service. Includes generation, transmission and distribution reliability. The plan deals only with generation reliability.

renewable resource
Under the Northwest Power Act, a resource that uses solar, wind, water (hydro), geothermal, biomass or similar sources of energy, and that either is used for electric power generation or for reducing the electric power requirements of a customer.

reserve capacity
Generating capacity available to meet unanticipated demands for power, or to generate power in the event of outages in normal generating capacity. This includes delays in operations of new scheduled generation. Forced outage reserves apply to those reserves intended to replace power lost by accident or breakdown of equipment. Load growth reserves are those reserves intended for use as a cushion to meet unanticipated load growth.

resource
Under the Northwest Power Act, electric power, including the actual or planned electric capability of generating facilities, or actual or planned load reduction resulting from direct application of a renewable resource by a consumer, or from a conservation measure.

retrofit
To modify an existing generating plant, structure or process. The modifications are done to improve energy efficiency, reduce environmental impacts or to otherwise improve the facility.

sectors
The economy is divided into four sectors for energy planning. These are the residential, commercial (e.g., retail stores, office and institutional buildings), industrial and irrigation sectors.

simple payback
The time required before savings from a particular investment offset costs. For example, an investment costing $100 and resulting in a savings of $25 each year would be said to have a simple payback of four years. Simple paybacks do not account for future cost escalation, nor other investment opportunities.

siting agencies
State agencies with the authority for issuing permits to locate generating plants of defined types and sizes to utilities at specific locations.

siting and licensing
The process of preparing a power plant and associated services, such as transmission lines, for construction and operation. Steps include locating a site, developing the design, conducting a feasibility study, preliminary engineering, meeting applicable regulatory requirements, and obtaining the necessary licenses and permits for construction of the facilities.

space conditioning
Controlling the conditions inside a building in order to maintain human comfort and other desired environmental conditions through heating, cooling. humidification, dehumidification and air quality modifications.

sunk cost
A cost already incurred and therefore not considered in making a current investment decision.

supply curve
A traditional economic tool used to depict the amount of a product available across a range of prices.

surcharge
Under the Northwest Power Act, an additional sum added to the usual wholesale power rate charged to a utility customer of Bonneville to recover costs incurred by Bonneville due to the failure of that customer (or of a state or local government served by that customer) to achieve conservation savings comparable to those achievable under the Council's model conservation standards. Surcharges can range from 10 to 50 percent of a customer's bill.

System Analysis Model (SAM)
A computer model used by the Council to determine resource cost-effectiveness. SAM performs a detailed simulation of the Northwest generating system to estimate the cost associated with a specific set of loads and resources. It incorporates uncertainty associated with hydropower, thermal availability, resource arrival and load fluctuation due to economic cycles.

system cost
According to the Northwest Power Act, all direct costs of a measure or resource over its effective life. It includes, if applicable, distribution and transmission costs, waste disposal costs, end-of-cycle costs, fuel costs (including projected increases) and quantifiable environmental measures. The Council is also required to take into account projected resource operations based on appropriate historical experience with similar measures or resources.

thermal resource
A facility that produces electricity by using a heat engine to power an electric generator. The heat may be supplied by burning coal, oil, natural gas, biomass or other fuel, by nuclear fission, or by solar or geothermal sources.

tipping fee
The fee assessed for disposal of waste. This fee is used when estimating the cost of producing electricity from municipal solid waste.

transformer
A device for transferring energy from one circuit to another in an alternating-current system. Its most frequent use in power systems is for changing voltage levels.

transmission
The act or process of long-distance transport of electric energy, generally accomplished by elevating the electric current to high voltages. In the Pacific Northwest, Bonneville operates a majority of the high-voltage, long-distance transmission lines.

U-value
The measure of a material's ability to conduct heat, numerically equal to 1 divided by the R-value of the material.

water budget
A means of increasing survival of downstream migrating juvenile fish by increasing flows during spring and early summer migrations. The water budget was proposed by the Council and is overseen by it in conjunction with the U.S. Army Corps of Engineers, the fishery agencies and Indian tribes, the Bonneville Power Administration and the Bureau of Reclamation

watt
The electrical unit of power or rate of energy transfer. One horsepower is equivalent to approximately 746 watts.