September/October 1990

NORTHWEST ENERGY NEWS

Northwest Power Planning Council

Volume 9, No. 5

Draft Action Plan maps the future

CONTENTS

This issue's cover illustration is by Joan Barbour.

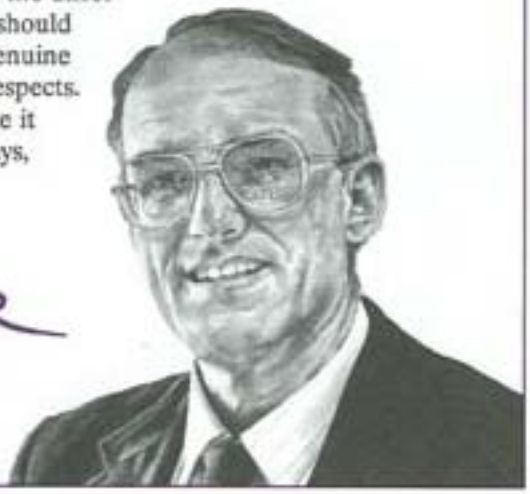
from the CHAIR

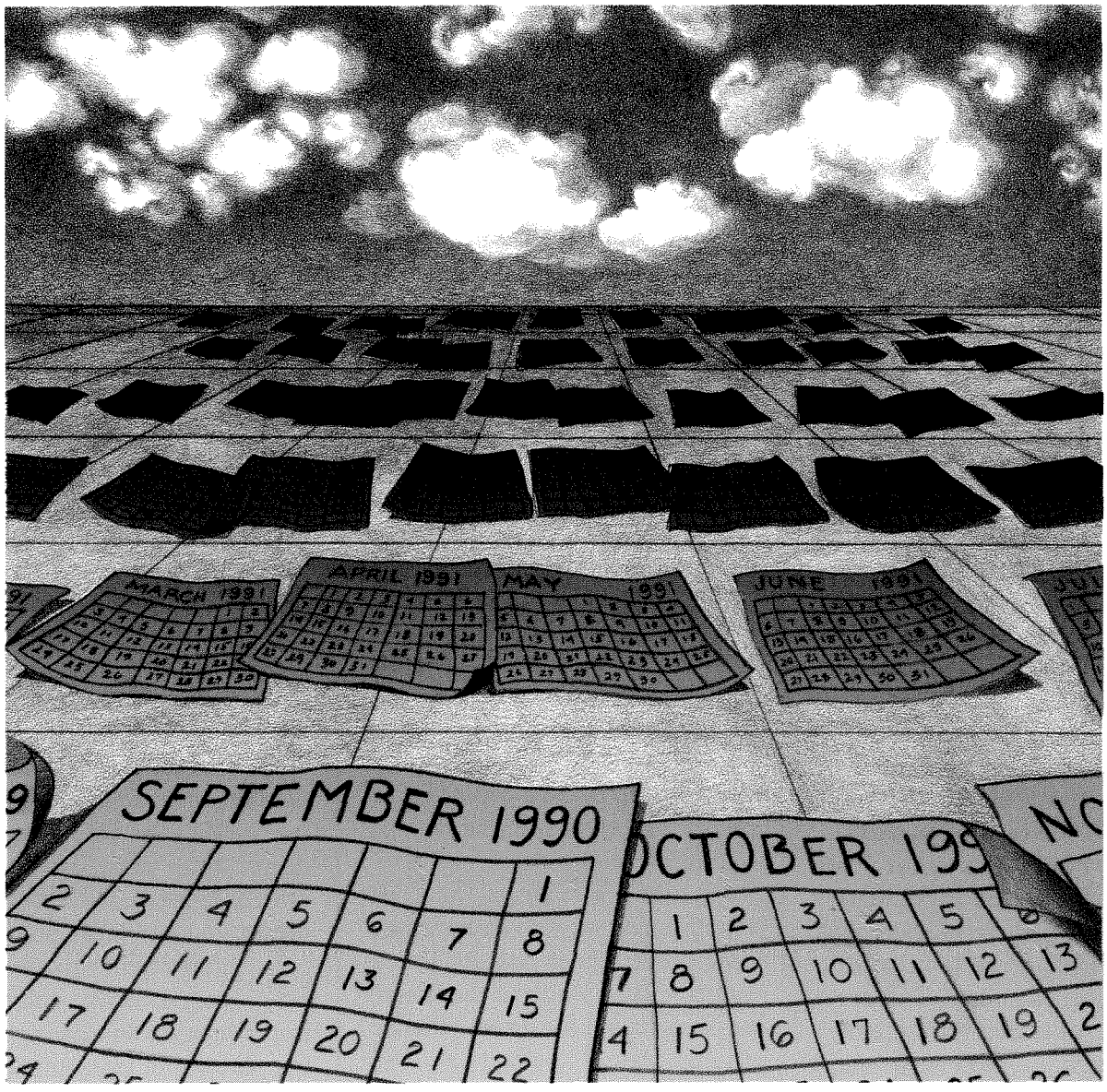
Like any business or organization, the Council must periodically take time to review its operations, assess how well it is serving the public, and explore ways to improve. The Council has been engaged in such an exercise this summer in preparation for our second decade.

After taking a careful look at ourselves, we decided we would make some changes to do a better job of serving the citizens of the Northwest. While we are proud of our past accomplishments and our public process, we are convinced that we need to respond to new challenges. Perhaps "fine-tune" is a more appropriate characterization, because the thrust of our intentions is to offer a more effective forum for defining and resolving regional issues and balancing competing regional interests. At the same time, we remain committed to the same fundamental principles of openness, responsiveness and broad public involvement.

In fact, one of our goals is to make the Council even more accessible to a broader public. Over the next few months, you will see a new look in meetings, publications, issue papers and other public involvement activities and documents. Some of the differences will be subtle, others more noticeable. Our meetings should be more informative and easier to follow. We will make a genuine effort to improve our outreach and communications in all respects.

The Council is proud of our record, and we want to make it even better by rededicating ourselves to excellence. As always, we welcome your suggestions.





A PLAN FOR ALL SEASONS

Draft Action Plan explores ways to face the future.

by Carlotta Collette

Look at it this way: even with the best computer models and data everyone agrees on, the future is still out there, invisible and uncertain, an unwieldy stretch for which there are no maps. People in the business of planning for the future develop theories and calculate the probabilities of one version of tomorrow being more likely than another. They study the biggest variables and try to figure ways to minimize the impacts of arriving at the wrong conclusions.

At the Northwest Power Planning Council, where the future is a 20-year span into which electric power resources are slated, indefinite outcomes are sliced into ranges that bracket the possibilities for future electricity use. The region's economy could grow very big very quickly,

Illustration by Joan Barbour

slip into a slump or, as is most likely, maintain a rate of growth somewhere between these two extremes. At the moment, it is growing very quickly.

The Northwest's current electric power needs are just being met by the region's existing system. There is little surplus electricity left in the region. Another drought could push the electrical system into a power deficit.

That's a complete turnaround from 1986, when there was enough excess power to serve more than two Seattles. The abrupt change—triggered by regional recovery from the recession of the early 1980s, a boom in aluminum sales (aluminum plants use a lot of electricity) and the "N Reactor" nuclear power plant at Hanford in Washington being turned off—should serve as an indicator of the quicksilver quality of at least some of the region's energy scene. The regional power plan the Council authors must enable utilities and other energy providers to match the pace of change with the most economical and environmentally benign resources available.

This is the risk of betting wrong: if too many power plants are started, as was the case in the 1970s and early 1980s, the region could end up paying for power it does not need and cannot use or sell to recover its costs. If too few resources are acquired or they are built too slowly, the region could be forced to buy expensive power from other regions or face curtailments, brownouts and other symptoms of an unreliable power system.

The future is still out there, invisible and uncertain, an unwieldy stretch for which there are no maps.

Like it or not, investments of time and money must often be made well in advance of certainty about the future, because most new resources, both conservation programs and power plants, require long lead times.

In past power plans, the Council proposed ways to operate in a time of surplus electricity. The Action Plan section of those earlier plans called for heavy reliance on improving the efficiency of all new uses of electricity while testing the efficacy and removing development obstacles of other resources.

The menu and schedule for new resources in these plans put decision dates closer to the turn of the century. But the year 2000 is approaching, and the new plan must provide realistic guidance on which a regional consensus to actually acquire energy resources can be built.

For planning purposes, the Council looked at hundreds of possible energy futures, carefully testing the existing power generating and delivery system's response to each potential new resource. The Council studied resource costs, some of which had changed substantially since the last planning process. They took a longer look at other renewable resources in addition to hydroelectricity to see how much power the region could expect from the wind, sun, underground hot water, and other sources.

These studies were reviewed by technical advisory committees and energy and environmental organizations to ensure that the information used was the best available.

The product of this process to date is a diverse list of resources that could meet future energy needs under several scenarios and at varying costs.

The least-cost[1] plan of action would turn first to cost-effective efficiency improvements in existing generating plants and transmission systems, plus programs to improve the efficiency of each end use of electricity, such as heating, cooling and lighting for homes and businesses.

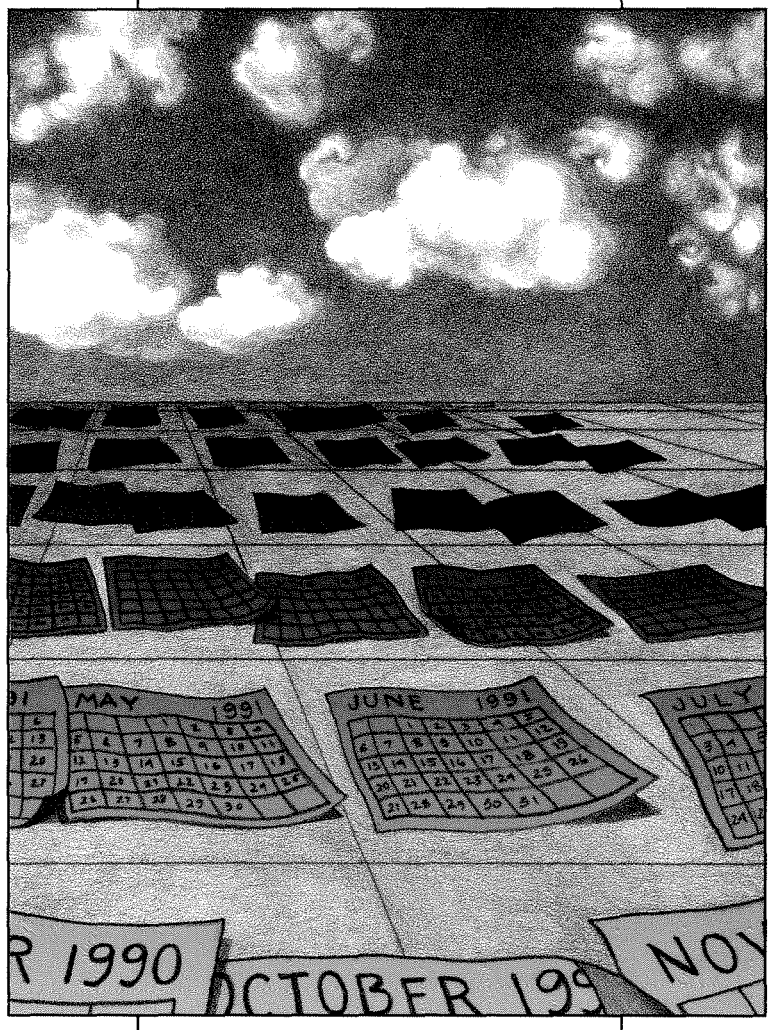
1. The Council uses the terms "least-cost" and "cost-effective" to refer to total costs to society, including environmental, labor and other capital costs.

In addition to efficiency improvements, the Bonneville Power Administration and the region's utilities would begin the "options" process[2] aimed at acquiring other new resources.

These new resources include cost–effective new hydropower (at sites that are not considered protected areas for fish and wildlife or other reasons), wind and geothermal. High–efficiency thermal resources, such as electricity cogenerated with steam used in industrial processes and gas–fired combustion turbines that could be used with other strategies to make better use of the existing hydropower system, are also in this new–resource category.

This combination of resources would cope with an uncertain future by diversifying and acquiring the most cost–effective resources first. As much as 12,000 megawatts of conservation, renewables, high–efficiency resources and more conventional thermal resources, such as coal and nuclear power plants, need to be acquired over the next 20 years in this scenario.

If the region continues to grow rapidly, the Washington Public Power Supply System's nuclear projects could be needed by the end of the 1990s, and new coal generating plants could be required soon after that.



The Council also looked at scenarios where large thermal projects, such as nuclear and coal power plants, might be delayed or blocked from development. If this were the case, the region would have to replace the 6,500 megawatts these thermal resources could provide with other sources for new power.

The strategy for bringing on conservation and renewable resources remains about the same as in the first scenario; acquire all cost–effective efficiency improvements across all sectors—residential, commercial, industrial and agricultural, as well as in generating and transmitting electricity. Simultaneously begin to site and build wind and geothermal demonstration projects; then, assuming the demonstrations prove the value of these resources, begin acquiring up to 400 megawatts of wind and 300 megawatts of geothermal energy.

But without coal or nuclear power, the balance of resources shifts to rely more heavily on gas–fired technologies such as combustion turbines and cogeneration. This strategy would cost about $100 million more than the first resource set.

The Council has estimated that heavy reliance on natural gas for electricity generation could deliver 2,500 megawatts, but such reliance leaves the Northwest vulnerable to gas price increases and supply shortages. This adds a new dimension of uncertainty to the planning process.

---

2. The options process breaks the acquisition of new resources into two steps. In the first step, resource developers begin the time–consuming but relatively inexpensive tasks of designing, siting and licensing new projects. These projects are not constructed until step two, when it is clear that the power is needed. This approach reduces the risk of overbuilding or underbuilding by splitting the process into two decision points, with the majority of the financial investment falling during construction of the resource after the second decision point.

Until recent years, the region has supplied as much as 75 percent of its electricity needs by capturing the power of the Columbia River's watershed. This has meant that few out-of-region factors could jeopardize the reliability of most of the electrical system. Heavy dependence on gas could alter that regional "self reliance."

Nonetheless, if coal or nuclear resources are not available, the region would need to know how to acquire gas-fired resources while minimizing their riskiness.

The Council explored another scenario to address this risk of overreliance on natural gas. In this scenario, potential gas price and availability problems are deemed too big a question mark, and coal and nuclear technologies must be relied upon.

Conservation and renewable technologies would still have highest priority, and there would still be a mix of new sources of electricity, but efforts to confirm coal and nuclear resources could be accelerated. This scenario could cost as much as half a billion dollars more than the first two, but the region would be buffered from fluctuations of gas prices and availability.

Action Plan Objectives

Again, because the future could play out along any of these lines, and each of these scenarios has assets and debits, the Council reasons that the planning process should give the region the flexibility to respond to a range of futures. No single scenario is the dominant one at this time. But several common activities will help the Northwest cope with any energy future.

The Council estimates that more than 1,000 megawatts could be saved with cost-effective efficiency programs over the next 10 years.

The map the Council is considering has four objectives. These are being discussed at Council meetings and in consultations with interested parties. The Council may modify these objectives in response to these discussions and add other activities in the Action Plan section of the new power plan, scheduled for release in November.

Realistically, the region should move forward on all four objectives at once. The conservation programs would be needed in all the scenarios the Council studied. These programs are on an unprecedented scale. The Council estimates that more than 1,000 megawatts could be saved with cost-effective efficiency programs over the next 10 years. That would be like saving all the electricity Seattle uses.

This conservation push could cost the region between $6 billion and $7 billion, but that's a bargain. Over the long term, these energy savings are the least costly resource available—about half the cost of new thermal plants.

They will reduce the demand for electricity regionwide, in many cases, for the life of the dwelling or enterprise. And there are no related fuel costs. Furthermore, they are the resource with the shortest lead time. When the demand for electricity begins to surpass energy supplies, conservation is the most flexible and least risky resource to turn to.

So the Council's first draft objective is the acquisition by regional utilities of about 1,000 megawatts of energy savings by the year 2000.

Under this objective, conservation programs could be coordinated so that similar measures are offered across the region, enabling utilities to purchase energy saving equipment and supplies together, thus saving money by buying in bulk. Public Utility Commissions, legislators and other regulatory bodies should help promote actions necessary to acquire high levels of conserved energy.

Utilities should treat conservation the way they would treat any other resource. Its acquisition should be planned for and tracked in utility least-cost plans or in conservation reports submitted to Bonneville.

Nearly all supply-side resources will require longer lead times, regionally coordinated research and, in some cases, demonstrations. For many, such as wind power development in eastern Montana, transmission lines will need to be run from the energy source to areas where the power is needed. For others, there is

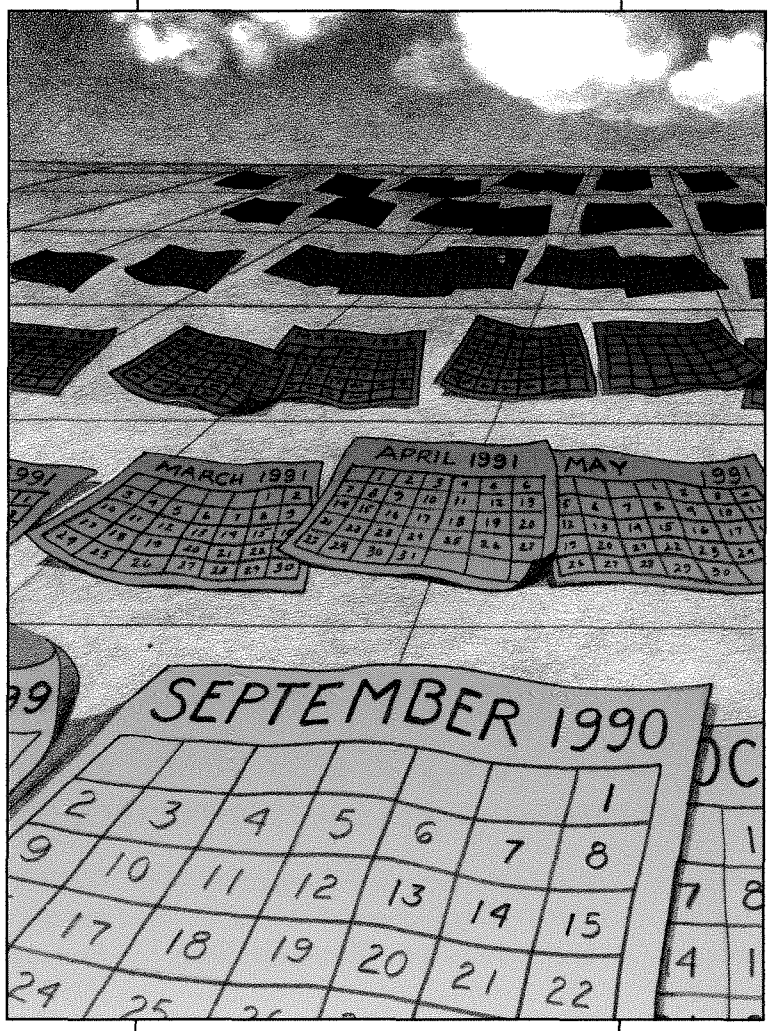
still not enough information to even know what the problems might be.

The Council's second draft objective addresses these issues by calling on the Bonneville Power Administration and others to test optioning and acquisition strategies for new renewable and high-efficiency resources such as geothermal, wind, new hydropower, cogenerated electricity and strategies to back up the hydropower system. Again, the Public Utility Commissions and state power plant siting officials could facilitate this process by exploring ways to expedite siting procedures.

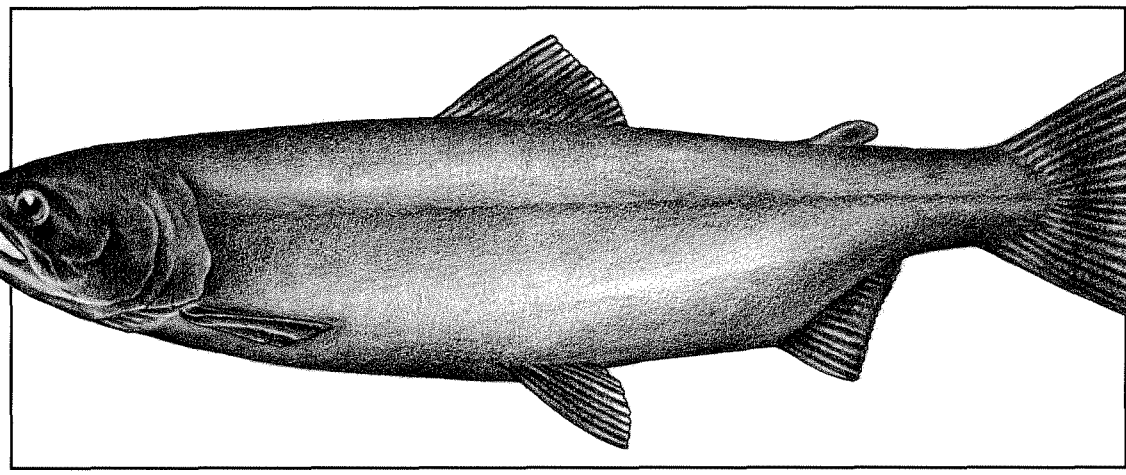
The Council's third draft Action Plan objective is designed to offset the potentially precarious position the region could be in if it became too dependent on natural gas, and the price of gas went up or the supply of gas diminished. This objective would call for confirmation of the viability of large thermal resource options. Actions that respond to this objective include determining whether either of the mothballed nuclear power plants in Washington can be completed cost-effectively, and the optioning of three sites capable of supporting approximately 500 megawatts of power from new coal plants at each site.

To improve the region's overall planning capabilities, the fourth objective would look at other ways the region could secure needed electricity, including extraregional power purchases and exchanges. Under this objective, regional energy entities would collaborate to study existing and planned transmission facilities to determine potential upgrades and environmental consequences of such upgrades. The environmental consequences of developing electrical systems in general would also be examined.

"The overriding goal of this enormous planning effort is to come up with a realistic set of actions that will give the region's ratepayers electricity they can count on at a reasonable price," sums up Council Chairman Tom Trulove. "We're going to need more electricity, because we're a growing region. And we know we have to pay for that power. The plan we put together should be able to guide Northwest utilities so they get the best value for their ratepayers' investments. We want to talk with utilities, Bonneville, state energy and regulatory agencies, environmentalists and others to see if these are the best actions, and to see if these parties are willing to help implement them." ■



ENDANGERED SALMON?



by Carlotta Collette

Northwesterners try to stay ahead of the Act on endangered species review.

Northwesterners, who could never be said to ignore their environmental issues, may be getting a little winded trying to keep abreast of recent developments regarding the near extinction of several of the region's animal species. Early this summer, the U.S. Fish and Wildlife Service, that branch of the federal government responsible for administering most of the Endangered Species Act of 1973, ruled that the northern spotted owl was indeed a "threatened"

Illustrations by Joan Barbour

species and worthy of rigorous and controversial protective measures to prevent its total demise.

That decision shivered the timbers in most of the region's lumber-based communities, where protecting the threatened bird will likely mean that whole tracts of old-growth forest, the habitat favored by the spotted owl, will be off limits to tree harvest.

Now the spotted owl issue may be shadowed by concerns about five species of Northwest salmon: Snake River spring, summer and fall chinook, Snake River sockeye and Lower Columbia River coho.

This spring, the Shoshone-Bannock Tribes of Idaho, Oregon Trout (an organization that promotes wild fish protection), the American Fisheries Society and several environmental groups filed five petitions with the National Marine Fisheries Service (the federal agency responsible for seagoing fish) to list these fish as either endangered or threatened under the Endangered Species Act. (See *Northwest Energy News*, Volume 9, Number 3, May/June 1990.)

Their petitions set into motion the machinery that, within two years, could redefine the way the Columbia River is managed. Power generation, irrigated agriculture, both commercial and sport fishing, river transportation and virtually all other river uses could be severely affected. Protection of depleted runs could become the number one function of river managers. Northwesterners will need to cooperate more effectively than they have ever done in the past.

To push this process out ahead of any regional panic and begin building a consensus for action, Oregon Senator Mark Hatfield and Representatives Ron Wyden of Oregon and Jolene Unsoeld of Washington have called for joint congressional oversight hearings on the salmon petitions. Under the auspices of the Senate Appropriations Committee and the House Committee on Small Business, the three legislators convened the first of these hearings on June 30, 1990 in Portland, Oregon.

There was little disagreement on the basic theme of the meeting. A preliminary review of the status of the runs, requested by Senator Hatfield and carried out by the Oregon Department of Fish and Wildlife and the National Marine Fisheries Service, concluded that runs of several Columbia Basin fish were down.

Those who gathered to testify all agreed that the biological accounting of the runs (a more detailed analysis than was done for the Hatfield preliminary review) should be done in an open, public process, and that any recovery program would have to be produced and carried out cooperatively.

Senator Hatfield set the cooperative tone of the hearing by asking that the region's governors, federal agencies, Indian tribes and others, facilitated by the Northwest Power Planning Council, devise a process for developing a "predecisional" management plan that addresses issues presented by the potential listings. The senator set a deadline of October 1, 1990 for this first step. Hatfield also called on each group to prepare a list of all potential options that could be incorporated into such a management plan.

What follows are excerpts from written or oral statements prepared for the hearing.

Senator Mark O. Hatfield (Oregon)

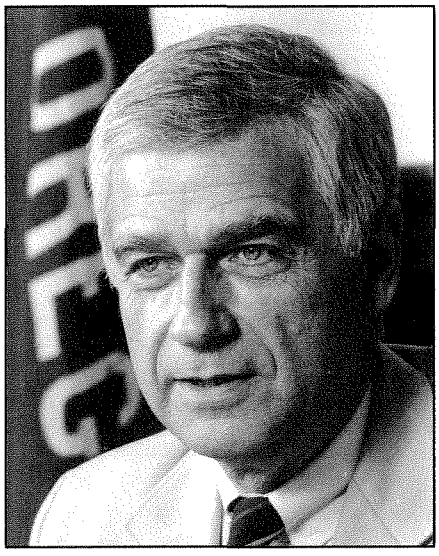
I am not suggesting that we attempt to supersede the Endangered Species Act process. That process has been set in motion, and we will do what we can to make sure that it is carried out completely and fully.

It is entirely possible that listing petitions will be filed on more than a dozen additional runs before this year is over.

Hydroelectric power generation, irrigation, commercial and recreational fishing, tribal fishing, navigation, dredging, timber production, and agriculture—among other interests—all could be severely affected. We cannot take this possibility lightly, and we must not shrink from our responsibilities.

That responsibility is to develop sound management strategies for the Columbia River Basin and its resources. It does not take a scientist to realize that some of these runs are in serious trouble.

Our current management strategies are not working—at least not completely. Something needs to be done, sooner rather than later. Not just because the threat of an Endangered Species Act listing is hanging like a sword of Damocles over our heads, but because it is the right thing to do. Not just because of the law, but because of our responsibility to be just and wise stewards of these resources.



"Something needs to be done, sooner rather than later... Not just because of the law, but because of our responsibility to be just and wise stewards of these resources."

Senator Mark Hatfield

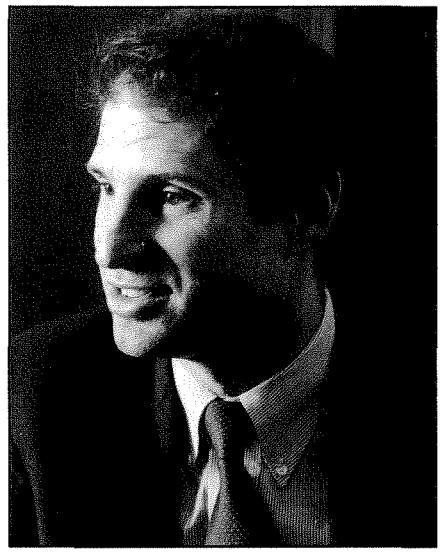
Should we fail in this mission and a listing were to occur, the effect would be to divest the region and *all of the institutions* of their management flexibility.

There is no excuse for those who sit on their hands on the sidelines, waiting for a crisis, and then, and only then, reacting to it. We have done that too often, and it has cost us dearly. Now we must begin a good faith cooperative effort to develop future management strategies for the Columbia River Basin—in the Northwest, for the Northwest, and by the people who live here.

Representative Ron Wyden (Oregon)

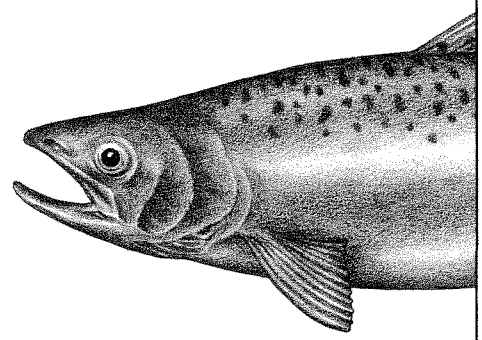
Our challenge today is to help prevent another civil war in the Northwest that would pit fish protection against power bills and a host of other activities dependent upon Columbia River water.

There is some reason for optimism. No Northwesterners come to my office and say they are against wild fish stocks. There is a historic commitment, from industry, from the states, from the tribes, from the other river users, to salmon. This issue doesn't have to polarize the region. Our love of fish is almost in our chromosomes. We can work together, and together, we can move biological mountains—and maybe even juvenile salmon.



"This issue doesn't have to polarize the region. Our love of fish is almost in our chromosomes."

Representative Ron Wyden

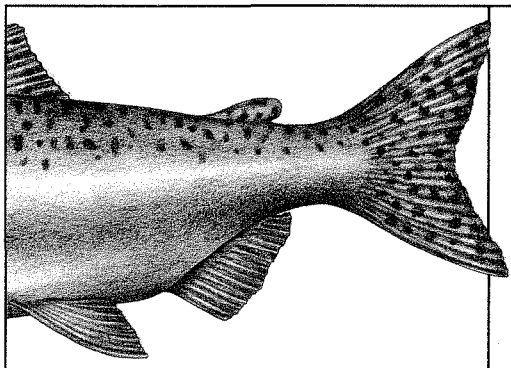


Representative Jolene Unsoeld (Washington)

The health of these stocks also signifies the health of our river, and the dwindling populations are warning us that the mighty Columbia is suffering from neglect.

Power system operations, fisheries management, water storage and flows, irrigation, navigation, and recreation must all be considered within an open and fair process to reach a balanced solution.

With an open and balanced process, we can move beyond the "power versus fish" arguments that have dominated discussions so far, and begin to focus on how to better protect the entire Columbia River system as a resource, and how to ensure that the necessary resources are devoted to the system.



"With an open and balanced process, we can move beyond the 'power versus fish' arguments... and begin to focus on how to better protect the entire Columbia River system."

Representative Jolene Unsoeld

Rolland A. Schmitten, director, National Marine Fisheries Service, Northwest Region

First, on April 2, 1990, a petition was received from the Shoshone-Bannock Indian Tribes to list sockeye salmon in the Snake River in Idaho. Then, on June 7, 1990, four petitions were received from Oregon Trout and other co-petitioners to list Snake River spring, summer, and fall chinook salmon and lower Columbia River coho salmon.

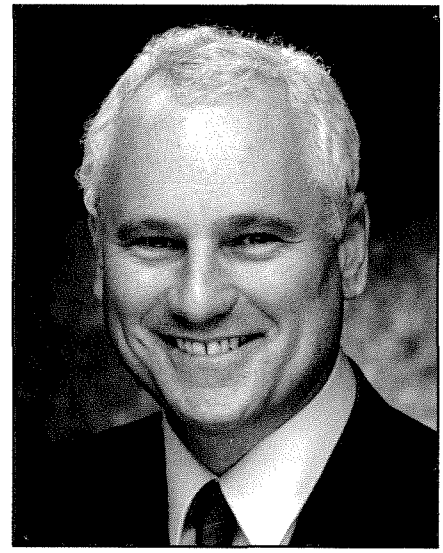
During the status review, there is no basis for speculation as to the ultimate outcome of the review or the likely impacts of a decision to list.

The scientific information used in the status review will be deposited in our administrative record and will be available for inspection by the public. To help ensure the scientific record is complete, we have established a technical committee comprised of representatives from state fish and wildlife agencies, other federal agencies, Indian tribes, public utilities and other interested entities. This committee will help gather information and discuss the validity of the data base. These committee meetings will be open to the public.

Oregon Governor Neil Goldschmidt

The effect of a listing might reach management of timber and grazing on public lands. It could touch efforts to set water quality standards and reach accord on dioxin levels.

Significantly, a listing might even reach Indian treaty rights and tribal management of the fishery.



"Anyone who uses the river might be made part of the solution, regardless of whether they believe themselves to be part of the problem."

Governor Neil Goldschmidt

Anyone who uses the river might be made part of the solution, regardless of whether they believe themselves to be part of the problem.

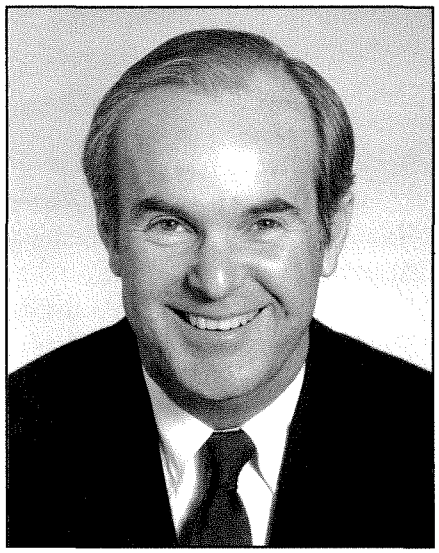
We should convene a group of interested parties to consider a management plan if NMFS [National Marine Fisheries Service]

does issue a proposed listing. This group would need to include representatives of the major river interests, yet be small enough to be manageable. It would need to be sufficiently high-level to make very large decisions about use and management of the river quickly. If there is a proposed listing, and if this group concludes an enforceable agreement on how to preserve the stocks, NMFS could then decide if the management plan is sufficient to avoid a listing. It would need to be realistic, scientifically sound and enforceable.

Washington Governor Booth Gardner

I have established a cabinet level task force to guide the state's response. Included in this task force are the departments of Agriculture, Ecology, Fisheries, Trade and Economic Development, and Wildlife, the Energy Office, the Utilities and Transportation Commission, and my appointees to the Northwest Power Planning Council.

I have asked my agency directors to keep their rhetoric in check and their minds open as we search for the best means to resolve the issues raised by the listing petitions.



"I have asked my agency directors to keep their rhetoric in check and their minds open."

Governor Booth Gardner

Idaho Governor Cecil D. Andrus

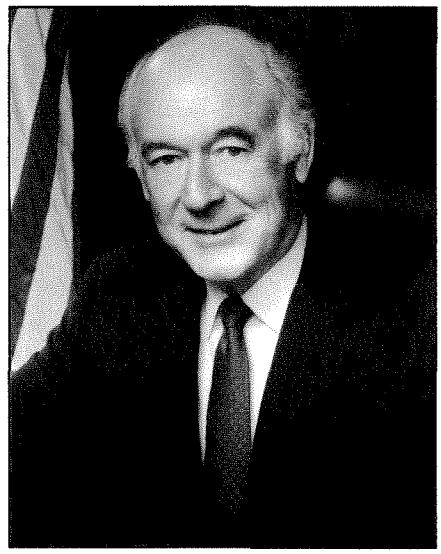
Idaho believes more can be done in addition to a biological assessment. We prefer that federal agencies and the region begin to act now and examine ways to conserve and rebuild the anadromous fish runs *before* a possible listing.

Explore ways to modify the Snake River Basin reservoir flood control rule curves, and shift flood control responsibility to Columbia River projects.

Consider utilizing the considerable forebay storage in these reservoirs for "flushing" of downstream migrating juvenile fish.

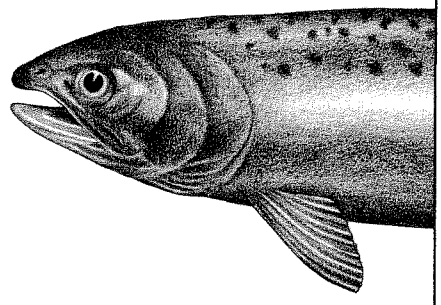
Explore the feasibility of constructing and operating smolt collection facilities upstream of Lower Granite Reservoir.

Stop the winter energy releases at Dworshak. This measure will ensure reservoir refill in low-water years.



"We prefer that federal agencies and the region begin to act now and examine ways to conserve and rebuild the anadromous fish runs *before* a possible listing."

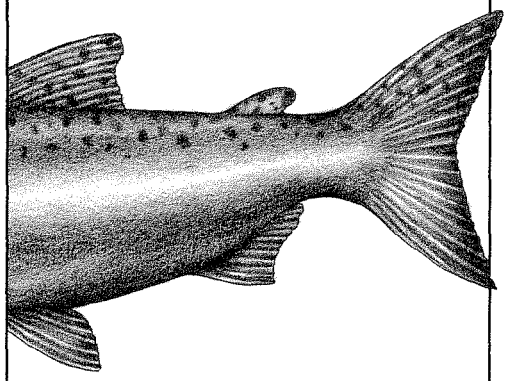
Governor Cecil Andrus



Montana Governor Stan Stephens

Montana feels responsible to work with the other interested parties toward a common sense conclusion to the potential listing of these salmon as an endangered species. We are a headwaters state for a significant portion of the Columbia River Basin, providing about 20 percent of the water for the system.

Unlike our neighboring states, however, Montana does not have ocean-going fish. While Montana would not derive any direct benefits from restoration of downstream fish runs, our livelihood and quality of life would be affected by an endangered species listing. Consequences could include severe drawdowns of Libby and Hungry Horse reservoirs, disruption of the unique Flathead Lake ecosystem, impacts on resident fish, and economic repercussions on our residents, agriculture, timber and business communities—industries such as Columbia Falls Aluminum—and our tourism and recreation opportunities.



"While Montana would not derive any direct benefits from restoration of downstream fish runs, our livelihood and quality of life would be affected by an endangered species listing...Montana will be an integral player in this effort."

Governor Stan Stephens

I fully support the regional process initiated by Senator Hatfield to develop a pre-decision management plan. Montana will be an integral player in this effort.

Ted Strong, executive director, Columbia River Inter-Tribal Fish Commission

Our tribal perspective predates these recent events. Because of this history, I come before you now with a sense of urgency and frustration. Urgency because certain stocks of salmon have continued to decline in the last 10 years; frustration because the tribes' requests to bring salmon back to the upper Columbia River had been ignored for too long.

The actions I have briefly described in the areas of fish production reform, flows, habitat protection and harvest management are the same actions we have been seeking for the past decade and longer. Regardless of whether any fish is listed under the Endangered Species Act, the tribes will continue to seek and support actions which promote the rebuilding of each of the upriver runs. The tools for restoration are available. It is for our children, and our legacy that we must take the necessary actions without further delay.

Angus Duncan, Oregon member, Northwest Power Planning Council

Among our responsibilities, we are charged with protecting and enhancing fish and wildlife to mitigate for damage caused by construction and operation of Columbia River Basin hydropower facilities. At the same time, we must assure the region an adequate, efficient, economical and reliable power supply. In short, we have a central and difficult role in balancing fish and power needs in the Columbia River system.

We cannot afford to expend our emotional and political energies unproductively in confrontation and in directions that will lead toward yielding management of the river to the courts.

Such a program [to rebuild runs] will require the sustained cooperation of all of the managers and users of the river system and its adjacent watershed. This is not a power-versus-fish question; or power-versus-irrigation; or environmentalists-versus-the Corps. It is a question of the recovery of the stocks.

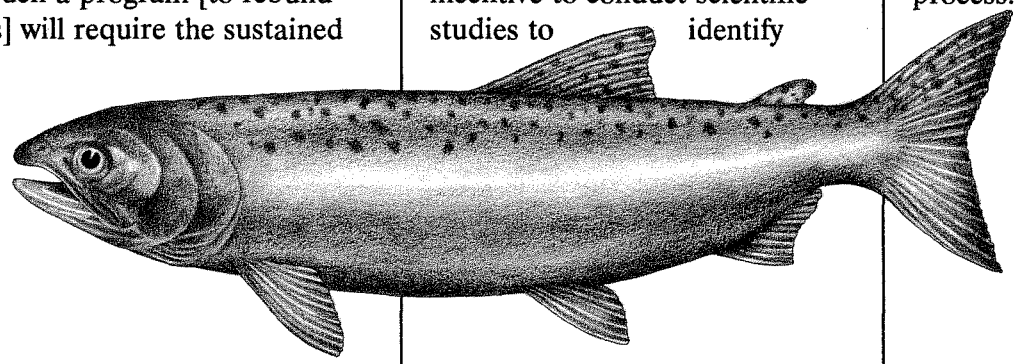
We are not the most knowledgeable entity about any single dimension of this question. And we are far from the most powerful. But these circumstances may suit the Council to *intermediate* a solution which by its nature cannot be dictated.

James J. Jura, administrator, Bonneville Power Administration

It is not enough to know that the candidate species have declined from levels in the 1960s. We must ask why. Why are the returns of coho on the lower river so low? These fish have no dams to contend with. And why are upriver brights—which must pass four dams on the Columbia River—doing so well?

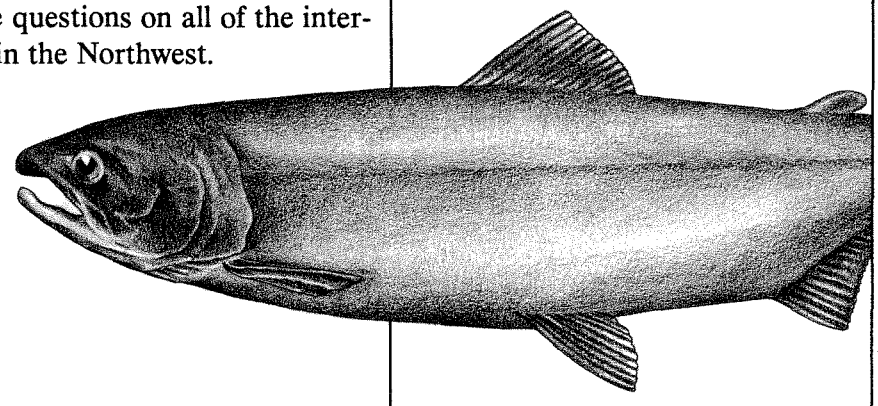
The petitions raise difficult biological issues. For example, what is a species? Are fish that spawn a hundred yards up a tributary to the Salmon River distinct from those that spawn just downstream from the point where the creek enters the river?

The Endangered Species Act petitions offer an opportunity and incentive to conduct scientific studies to identify actions that will increase the number of fish returning to the basin. And the petitions place the responsibility for addressing these questions on all of the interests in the Northwest.



Brigadier General Pat M. Stevens IV, U.S. Army Corps of Engineers

What can we in the Pacific Northwest do to assist the National Marine Fisheries Service in this effort? First we must approach the process in an atmosphere of mutual trust and concern. It will require an open, objective, scientific analysis to determine if listing is appropriate to protect specific stocks and to identify and implement acceptable actions necessary to rebuild any depleted fish runs. There is a pressing need for a more complete understanding of the fishes' life history if we are to formulate effective remedies that are considered necessary to rebuild the population of any listed species. It must be a reasoned scientific process.

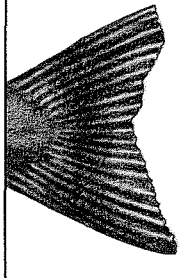


John W. Keys III, regional director, Bureau of Reclamation, Pacific Northwest Division

In the course of our project planning, development and operations activities, we have gained significant expertise and experience that we would like to cooperatively "bring to the table" in the current endangered species considerations. It is necessary for the Bureau to be represented in appropriate coordinating activities addressing this important issue. We will continue to cooperate with the National Marine Fisheries Service and other federal and state agencies to achieve this goal.

Al Wright, executive director, Pacific Northwest Utilities Conference Committee (PNUCC)

PNUCC does not believe that a crisis regarding any salmon run exists. While some salmon runs have declined, we do not believe there is any need, between now and the time that the National Marine Fisheries Service completes its status review, to take any sudden actions for any species of fish. The fish and wildlife program has been in place since 1982, and it is working. The region has worked diligently on fisheries issues over the past 10 years and has made substantial progress. Overall, the number of adult salmon and steelhead returning to the Columbia River has increased by about 300,000 fish annually.



Ed Chaney, director, Northwest Resource Information Center, Inc.

I strongly urge you to guard against those who would use the ESA process as an excuse to delay fish restoration efforts already required by law. The governmental agencies and energy industry responsible for the problem you are addressing today are instinctively and strategically inclined to use any pretext to study the studies and interminably argue the conclusiveness of the data, at the expense of acting on observable facts. To this extent, they are brethren of lobbyists for the tobacco industry; they would have us study the fish to death.

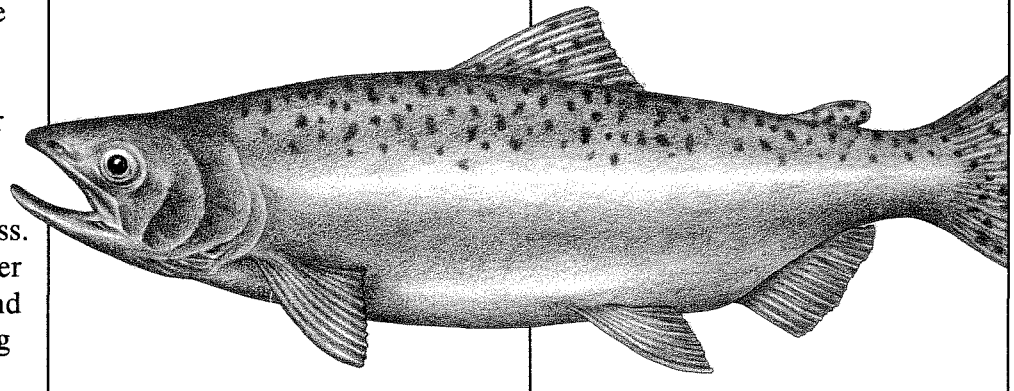
It is too late for Snake River coho, which recently became extinct. It is nearly too late for Snake River fall chinook and sockeye. It is not too late for spring and summer chinook and for some native steelhead runs, which also are in trouble. We still have the opportunity to prevent the technologically elegant Federal Columbia River Power System from going down in history as one of mankind's greatest avoidable ecological and economic disasters.

John Rosholt, State of Idaho Water District 01

I would like to make clear that the farmers whom I represent have no desire to see salmon become extinct. They recognize the contribution our fishery resources make to the quality of life here in the Northwest.

Our concern is that, in the process to deal with the problems created by the filing of the petitions to list certain salmon stocks under the Endangered Species Act, certain interests will seek to take water from the upper Snake River farmers by promoting such a maneuver as a panacea which solves everyone's problems. It should likewise come as no surprise to anyone that, should that occur, the people whom I represent and their friends, families and neighbors would be forced to respond to protect their rights. It is not a matter of choice. They would simply have no option.

My clients urge that a fair and reasonable solution be found within the existing framework of measures designed to protect and enhance anadromous fish stocks. We believe success is possible without the drastic measures required under the Endangered Species Act, if clear direction and strong leadership is provided. ■



Point of View:

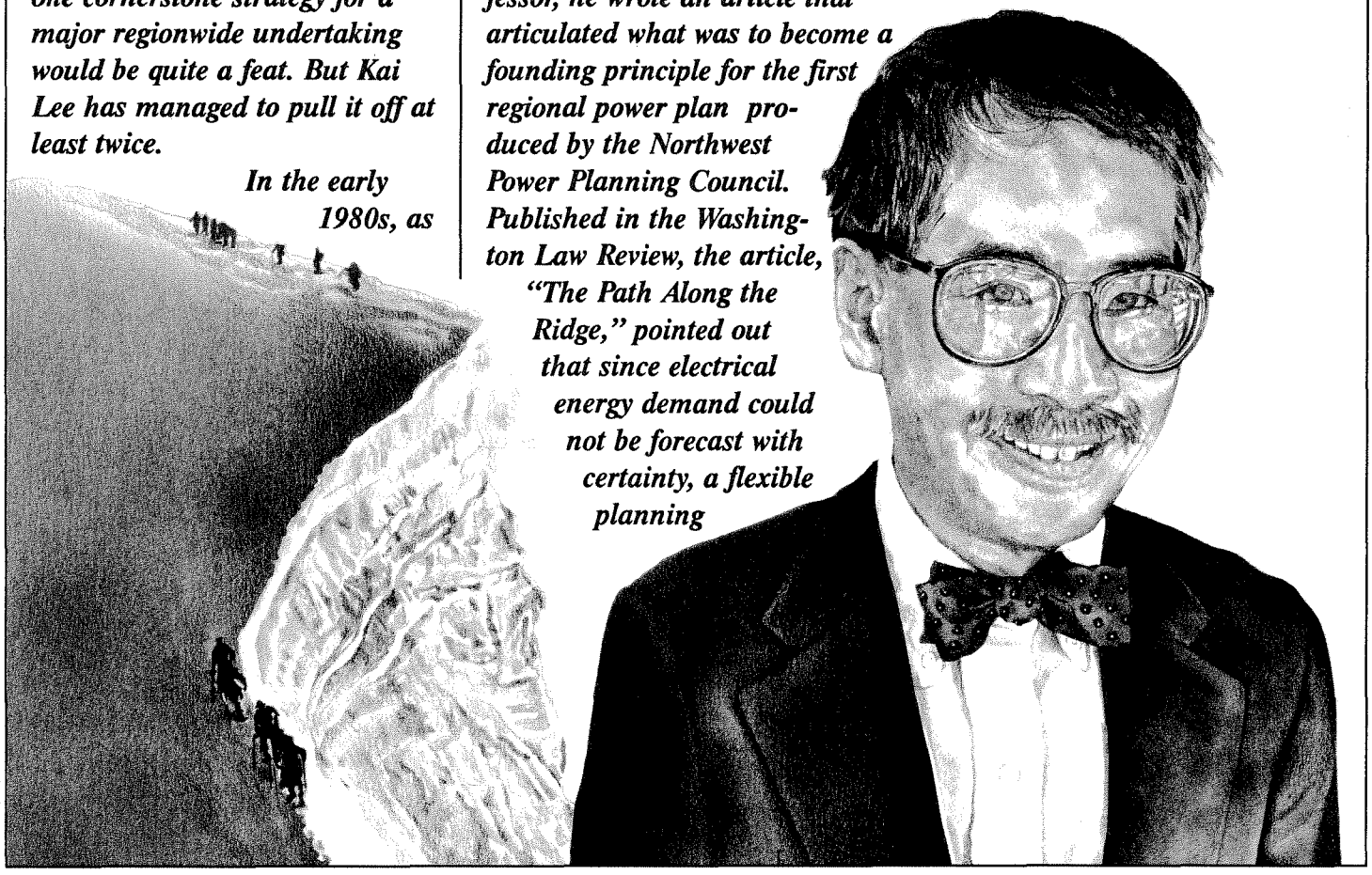
KAI LEE

by Dulcy Mahar

Former Council member still exploring the "path along the ridge."

For most people, coming up with one cornerstone strategy for a major regionwide undertaking would be quite a feat. But Kai Lee has managed to pull it off at least twice.

In the early 1980s, as a University of Washington professor, he wrote an article that articulated what was to become a founding principle for the first regional power plan produced by the Northwest Power Planning Council. Published in the Washington Law Review, the article, "The Path Along the Ridge," pointed out that since electrical energy demand could not be forecast with certainty, a flexible planning



Portrait by Lynn Carson

strategy that minimized risk was imperative.

In 1983, after many of his ideas had been incorporated into the power plan, Lee was appointed to the Council. In his four-year stint on the Council, he was to articulate yet another key strategy, and this one was to become a founding principle of the Council's Columbia River Basin Fish and Wildlife Program. His idea was to apply an experimental approach, known as "adaptive management," to rebuilding fish and wildlife populations.

Lee is the first to admit he didn't originate the idea of adaptive management. The concept emerged in the late 1970s out of the University of British Columbia where a group of scientists was looking for ways to manage large-scale ecosystems by running large-scale experiments within them. But Lee was the first to apply the concept to the Columbia River Basin.

A definition of adaptive management proved elusive. It is, Lee said at the time, simply learning by doing. In this interview, he expands on that definition. He also does more looking ahead for the current Council, than looking back to his tenure with the Council.

Lee arrived at the Council with impressive credentials—graduation magna cum laude from Columbia University, a doctorate in physics from Princeton, a White House fellowship and service as an assistant to the Secretary of Defense. At the time of his Council appointment, he was—and is now—an associate professor of political science and environmental studies. He has also taught at Stanford University and the University of California in Berkeley.

In addition to teaching, Lee has actively pursued research since he first worked under a grant at Berkeley. His research has included work in energy policy, radioactive waste management and environmental dispute resolution.

This fall, he will begin a year's sabbatical in Japan as a visiting fellow of the Institute of Economic Research at Kyoto University. He also intends to complete a book on adaptive management during the year. He is already a co-author of two other books: "Electric Power and the Future of the Pacific Northwest" and "Sub-seabed Disposal of High-Level Nuclear Waste: An Assessment of Policy Issues for the United States."

Lee is a member of several boards, committees and advisory groups. Much of his current focus is on international studies of the global warming phenomenon.

Lee and his wife and two daughters live in Seattle.

Q. Looking back on your years on the Council, do you feel there has been progress and, if so, in what areas?

I think some important steps have been taken, and some important progress has been made. In other areas, there are declines. The Spring Creek Hatchery, for example, was the most productive hatchery in the Columbia River system. It predates the Northwest Power Act and in fact goes back to the 1960s. Spring Creek has had a disastrous and so far unexplained decline in numbers.

So, you can't look at the Columbia as a snapshot and say that the Act kicked in in 1980, or the program kicked in in 1982, and everything since then is a product only of what's been done.

I think we are in a period of some uncertainty, a period not unlike where we are with the greenhouse effect. In the greenhouse effect, we don't know whether the climate is really warming. Similarly, in the Columbia Basin, we don't know whether the runs are really getting better or worse. What we need to do is keep the efforts up and watch very closely. And it's watching closely that's the essence of adaptive management.

Q. Explain the concept of adaptive management.

Adaptive management is a concept that has proved to be remarkably hard to understand precisely, because it's very easy to understand approximately. The essential part is to use the things we're doing in the Columbia Basin, efforts that are now over $100 million per year in the fish and wildlife program, as experiments.

Now to use them as experiments means that we are trying to learn from our own experience. We're trying to learn, not just by trying one thing after another and seeing what works and what doesn't work, but thinking about what we're doing before we get started so that we have clear expectations.

What's different about the projects done under the Council's program is that many reflect a lot of careful thought before they get started. This has meant more delay. Something like the Yakima Hatchery Project, for example, has gone through extensive detailed planning. That's meant that probably two additional years will go by before new fish are in the river. But that planning means that the Yakima Hatchery Project will now be able to answer questions about whether specific runs of fish can be restored to the Yakima drainage—the largest, most promising salmon habitat in the whole Columbia system.

That learning is something that's going to take a long time, but once we have learned, we will have brought back fish runs that can not only support a larger fishery, but will continue to do so permanently.

Look at what we haven't done in the last 10 years. We haven't taken out any dams; we haven't undermined the basis of the hydroelectric power system that's so fundamental to the economy of the Northwest. All the good things we've done to the fisheries have been done with very, very little impact to the power system.

The water budget is much more important for what it says about people than what it says about fish. It says that people were willing to make a big change in restoring the river to the way it used to be.

Q. What kind of timelines are we looking at?

Well, a salmon takes five years to go from an egg to an adult. Doubling a healthy population will take something like four or five fish generations, so that's 25 years. But ours is a population that isn't healthy. It's a population that's been under stress for a long time. So, if things go well, it might take 10 generations, or 50 years.

You're looking at something that's a long-term process. I think that doubling the fish runs will be about as long in time as it took to get the hydro system built, which was about 50 years from the time that Bonneville Dam was started.

Q. Has adaptive management been applied elsewhere?

Yes. It has most often been applied in fish harvest, not in fish production. The Canadian Department of Fisheries and Oceans manages its salmon catch, for example, with a series of directions to fishermen—when, where and what kind of gear they may use. They keep quite a careful record. So the first element of actually carrying out adaptive management is careful record keeping.

The second thing that they do is, before the season starts, while they're designing the regulations, they estimate how many fish will be caught in each of several different fisheries. Then they compare their records against their expectations. They also have counts of how many fish return to the river to spawn, and they compare their initial expectations against their observations, and try to learn things about the stocks of fish they are trying to manage.

They might learn, for example, that in one year there's an unusual abundance of what are called "jacks," the males that return early. That's a warning that the population may be out of balance in some way or another. So the next year, they will go back out again, trying to make adjustments. That's why it's called "adaptive." You're trying to deal with the information you're actually getting back from the natural environment.

The way we have designed energy conservation programs is in

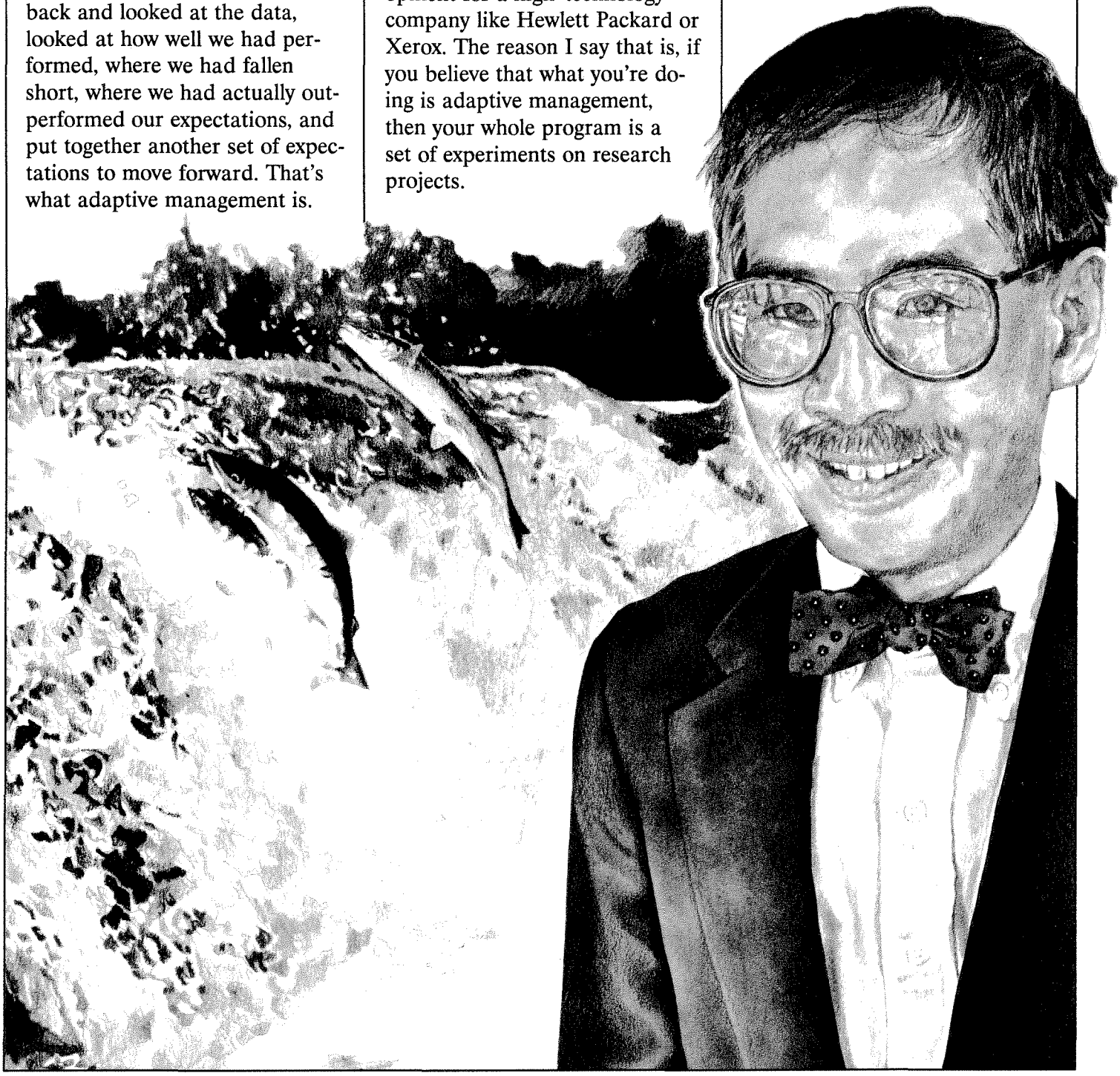
many ways a process very much like adaptive management. In its first power plan, the Council made a set of expectations about how much was going to be accomplished in the first two years, how far we were going to be able to go with the model conservation standards, how much energy we would save and at what cost.

Two years later in 1985, as we wrote the 1986 plan, we went back and looked at the data, looked at how well we had performed, where we had fallen short, where we had actually outperformed our expectations, and put together another set of expectations to move forward. That's what adaptive management is.

Q. Are there measures or standards that can be applied to gauge whether adaptive management techniques will be successful?

I don't see any perfect ones, but I do see some guidelines. Monitoring and evaluation in the fish and wildlife program is the analogue of research and development for a high-technology company like Hewlett Packard or Xerox. The reason I say that is, if you believe that what you're doing is adaptive management, then your whole program is a set of experiments on research projects.

The typical levels of research and development expenditures for high-technology companies are between 10 and 20 percent [of operating budgets]. So, somewhere around 10 to 20 percent, I think, is one good benchmark to take, but I don't think there's anything magical in those numbers. What you need to do is to come back



and say, "Well, are you really learning things with the money that you've spent, with the information that you're gathering."

Here you run into another important part of monitoring and evaluation. By monitoring and evaluation, I mean collecting information about what's happening to the fish and to the fish management programs in the three states where we have salmon and steelhead.

That means that you are building a library. In many respects, this is a library that hasn't existed in the past. There's been lots of information collected, but it's been very fragmented.

So there is a start-up phase where I think it's going to be more expensive than it will be later. The reason it's going to be more expensive is that at first you don't know what you need to know. So you should collect a little bit more than you think you need at the outset, and as you gain experience, try to prune it back.

It will take a lot of vigilance by citizens, by electric utilities, by Bonneville [Power Administration] to keep raising the question of whether the information we're collecting is cost-effective information. Bonneville's done a pretty decent job of pushing in that direction. I don't expect them to be letting up the pressure, and I hope they don't.

The Council now has a much more significant leadership task than the Councils of the 1980s.

Q. Let me ask a two-pronged question. Now that we have nearly 10 years under the Northwest Power Act, what do you see as the greatest accomplishment? What has been most disappointing to you?

I think the greatest accomplishment of the program was something that happened before I got here. It was the water budget, and making fish and wildlife truly one of the basic purposes for which the Columbia River is operating. Now, after 10 years of the Northwest Power Act, the water budget is also one of the greatest uncertainties. We don't know whether the higher flows in the springtime really are helping the juveniles survive better, because the information is mixed.

It takes five years to get the first set of adults back, and the water budget only started two or three years ago, so we still don't have enough data to draw a clear conclusion. But the water budget is much more important for what it says about people than what it says about fish. It says that people were willing to make a big change in restoring the river to the way it used to be.

The water budget has gone through wet and dry years. It's gone through a power supply surplus, and it is now headed for a period of power deficit when the economic value of that water is going to go up. But I think it is securely in place.

The Council didn't create the water budget. The Council was the midwife, in many ways the referee of a battle that had been going on for a long period of time. But that my predecessors on the Council put this measure into the program, and that all of us ever since have kept it in place and help to make it work year after year is, I think, one of the proudest achievements of the whole Northwest region.

My greatest disappointment is that the people who should be, and I think, who think of themselves as helping the fish the most—the fish and wildlife agencies of the Northwest states—have found it quite difficult to gain the self confidence to take a full role as participants in the range of activities covered by the fish and wildlife program.

What they have done is to press their institutional interests to do the things that they had done in the past. The fisheries agencies have tried to do what they already knew how to do, rather than to stop, look and listen to realize that they were in a fundamentally different environment. They have not been sufficiently imaginative and creative

about taking advantage of all the opportunities in that environment. The consequence is that we have some projects in the fish and wildlife program that certainly don't reflect new thinking.

When I joined the Council, there was a great deal of work on habitat restoration. This wasn't the Council's idea; this was the idea of the fisheries agencies. After I had been on the Council for several years, the realization began to percolate from the Council—from one of my colleagues on the Council who is a very bright and incisive critic—that it didn't do much good to restore habitat far upriver if you couldn't get the fish back past the dams anyway. The paradox is that we wanted to get fish back into the upper river, but the habitat above eight dams was not habitat that we knew how to repopulate yet, even if you could restore it.

That's an illustration of the old thinking. The fisheries agencies should have taken the lead on the science and on creative ideas. It is not that the fisheries agencies were dragging their feet. I think they were preoccupied with the crisis they had in harvest that was triggered originally by United States v. Oregon and the Boldt[1] decision in the late 1960s.

The 1980s was a period of historic change for the fishery agencies, because they made peace with the Indian tribes, accepted the Indian tribes as full partners, and sorted out what that was actually going to mean, and how they were going to run the rules for catching fish.

I think there'll be more and more attention focused on the Council's program in the next 10 years, because they realize that this is where their own future is.

As they do so, there are certainly a lot of bright people in the agencies, and some excellent strategists and scientists among the Indian tribes who'll be pushing the agencies to shake off the cobwebs that have dogged them in the past.

Q. What are your views on the recent filings under the Endangered Species Act related to Columbia Basin salmon species?

First, I think it's important to see the endangered species filings in historical context. Before the Northwest Power Act was passed, there was a preliminary filing for some of the Snake River salmon stocks. It was filed before the National Marine Fisheries Service, the same agency that's now handling it. So this whole process got started once before.

It was suspended when the Northwest Power Act was passed, because the Act promised a Columbia River Basin Fish and Wildlife Program. So you should see the filing now, in part, as a gesture, an expression of frustration, that 10 years have passed, and the fish runs aren't restored. There are still runs that are endangered, so why don't we get some action?

Second, I think the Endangered Species Act filings have chosen the correct biological target. I would say that there is a canary in this mine, and the canary is the Idaho fish runs. If the Idaho fish runs are doing O.K., then it's very likely the rest of the system's doing O.K.

If they're in trouble, the rest of the system may not be in trouble yet, but it's a warning sign you ought to watch for. So by focusing attention on some of the upriver runs, the Endangered Species Act filings are putting the spotlight where I think it belongs biologically.

---

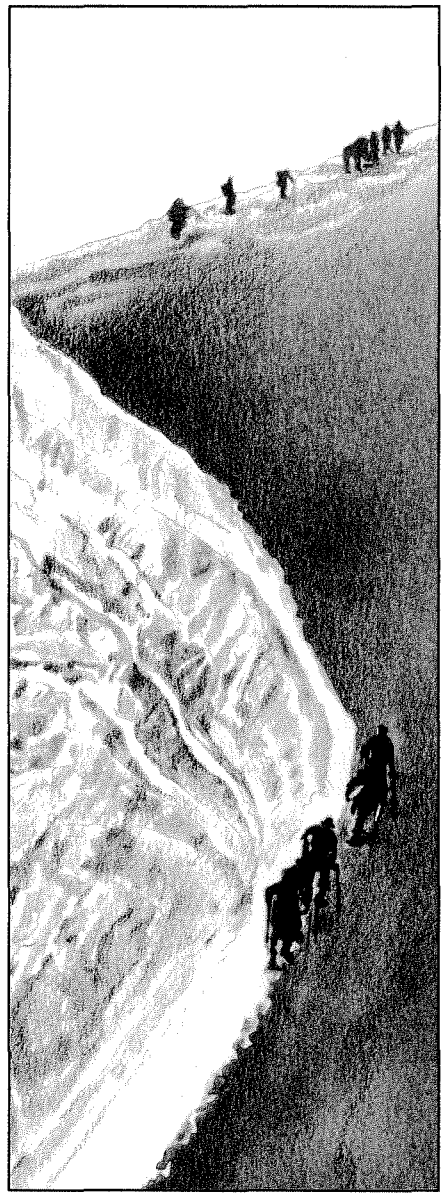
1. United States v. Oregon and the "Boldt decision" (United States v. Washington) were two federal court cases that attempted to clarify Northwest Indian treaty fishing rights.

The difficulty that I see is that it isn't clear to me what remedies will work. We aren't sure today that shutting down the timber industry in Oregon and Washington will save the pine marten or the spotted owl. It's not at all clear to me that a dramatic change in the flow of water in the upper Snake River Basin will, by itself, have much of an effect on these runs that are in so much biological trouble. The reason for that is, we don't have a natural river anymore.

We've got a river that's got a lot of concrete in it in the form of dams, that has very different flow patterns because of irrigation diversions, so that the water flows in different seasons, and when it flows, it's got agricultural chemicals and pollutants from municipal and industrial use. We cannot go back to that base line.

So the question's going to be, "What are the practical, doable things that this nation—because this is a national problem—can do about these species that are in trouble." This is where I come back to the central importance of adaptive management. We don't know if these fish runs can be saved. What we can do is make our best effort to try things and see what works, and to be very, very careful, because there aren't very many fish left to do experiments on. We don't have a choice not to experiment.

One of the bridges to be crossed in the future is, should any remedies under the Endangered Species Act be folded into the fish and wildlife program. Should the ratepayers who pay for the fish and wildlife program



be charged with the costs of doing something which is a national responsibility under the Endangered Species Act?

Q. On the power side, the electricity surplus of the past several years is over. What would you recommend this Council do as it develops a new power plan?

Well, I think this Council should do exactly what its predecessors did, because its predecessors did the right thing, which was to get this region ready for a period when tough choices were going to have to be made. In substance, that means that this Council is going to have to take a leadership role in sparking some of those choices.

The Council can't make resource acquisition decisions; that's for Bonneville and the utilities to carry out. What the Council can do is to point directions that the economic actors should take. This is exactly the situation that the Northwest Power Act was originally envisioned for.

During the 1980s, when we had this unexpected surplus, the Council took advantage of the surplus by shaking the bugs out and putting the basic institutional infrastructure in. We now have model conservation standards for residential structures in Washington and progress being made in Oregon, Idaho and Montana. I think we would not be as well prepared for the period of deficit looming ahead were it not for the work of the Council.

The failure was in the utilities. The utilities, after loud complaint through the 1970s about the need for resource acquisitions, when confronted with a surplus, confronted with the difficulties of putting new plants online with regulatory commissions that didn't want their ratepayers to suffer sudden rate shocks, the utilities just abandoned planning. They fired their planning staffs and didn't think about resource acquisition. They found themselves in a situation where it was much more profitable in the short

run, both politically and economically, simply to ignore the future.

That's why the Council now has a much more significant leadership task than the Councils of the 1980s. In 1980, there was a lot of acrimony among the public and the private utilities dividing the generating utilities from the non-generating utilities, and Bonneville from everybody else. But there was still a faith that if people were going to survive a deficit, they were going to have to look to Bonneville as the engine.

Today, there is concern about the deficit, but different utilities are trying to pursue different paths. I haven't made a close study of this, but I think that's wrong. I think that for most of the utilities, probably for all of the utilities in this region, Bonneville still is the basic engine, because Bonneville has two very important things: it has a transmission system that holds together the region, and it has the pool of low-cost hydropower, which is the essential economic buffer so that new resources as they come in won't have big economic impacts on small pools of ratepayers.

Q. The Council's been around for 10 years. What do you see as its role in the next decade?

I think the future of the Council rests in the hands of the governors of the Northwest. The governors choose the Council members, and how they choose Council members is going to determine whether the Council can make a positive contribution.

I think the organization will be here. But we used to say in the busy times of the mid-'80s, when we had a huge work load that we were all drowning under, we used to say to each other, "The trouble is we can hire more staff, but we can't hire more Council members." And that's still true.

If we're going to figure out how to manage the earth, we have to learn how to do very large chunks the way that we're trying to do in the Northwest.

The Council has been blessed from the outset with an excellent staff, a superior set of professionals that has done a great deal to make this body into one of the few public policy institutions in the western world that's been driven by analysis and by the kind of leadership that creates the atmosphere for non-political judgments. But the staff are not a replacement for the Council members. They are there to help as partners and supporters of what the Council decides to do. It's the Council that decides its directions.

The Council has two very important substantive tasks ahead of it. The first I've already talked about—mapping the directions in the power plan to address the expected power deficit of the 1990s. What will really be put to the test, I think, is the idea that greater energy efficiency can really be harvested in an economical fashion.

What's always been very difficult in the conservation game is to figure out how much more of the technical potential you can get from these millions and millions of independent power generators that we call consumers. We're going to test that idea in the 1990s, and I think that the Council needs to have, through its plan and through oversight of the implementation of the plan, an active role in that test.

The second task is back on the fisheries side. Today we have three institutions that will determine the future of the Columbia Basin fish and wildlife populations. We have the tribes and agencies that are the official managers of the resource. We have the Army Corps of Engineers, which operates the dams and determines the flow of the water. And we have Bonneville, which is the basic economic driver, the basic funding agent. Those three institutions have each had to sort out through the '80s how they were going to deal with the Columbia River Basin Fish and Wildlife Program

Now as we head into the '90s, those three institutions are individually going to be doing things to carry out the plan, to carry out the fish and wildlife program, and to advance the rebuilding of the fish and wildlife populations. What is not clear is how the

Council will be involved in that.

The Council's critical role is to take the experience that comes from the tribes and agencies, from Bonneville and from the Corps, and to integrate it into a kind of knowledge that can be used to make the tribes and agencies smarter at dealing with the biological challenges; to make the Corps smarter in knowing when it's important to release water and when there is some flex in the system; and to help Bonneville be an effective steward of the ratepayers' money.

You can think of those three institutions as a triangle, and the Council is the inside of the triangle. The Council is the institutional meeting ground for drawing together the major actors.

And something that I've deemphasized improperly is the third important mission of the Council of the 1990s. That is to come back to a commitment to public involvement and public participation. What the Council has done through the '80s is to be the catalyst for changing, in a basic way, those special interest groups that are involved in steering the power system and in steering the fish and wildlife management game.

The challenge for the '90s is to keep your eyes peeled on whether these special interests still correspond to the general interest that needs to be served. When the Bureau of Reclamation and the Bonneville Power Administration brought electric power to the farms of eastern Oregon in the 1930s and '40s, they were serving the general will. They

were doing things that brought a lot of pleasure and a lot of happiness and fulfillment to people. Those agencies were heroes of their time.

By the 1960s and '70s, those agencies had lost contact with the wider public. And that's why we had the series of crises that led to the creation of the Council. What the Council can do as an institution for the Northwest, is to continue to keep the eyes of the actors on that larger audience before whom they play.

Q. Are there any issues we have not touched on that you want to talk about?

There's one that I feel is important to add, although it carries us farther afield. I've had an experience that I guess is a little bit like the experience of the astronauts when they fly up in outer space and look back at the globe, and they understand how precious and valuable the earth is. For that reason, the farther away I've been from the Northwest Power Planning Council, the more precious and valuable the Council and the institutional world that it works in seem to me.

What the Council represents, and what the regional consensus that the Council has been instrumental in building represents, is one of the few attempts that I know of in government and in partnership with private interests to manage a very large ecosystem. The challenge is to manage the Columbia River Basin so that the fish and wildlife can be brought back; to manage a four-state region so that energy conservation can be brought forward in a concerted fashion across many different governments, many different economic sectors with divergent interests. We are trying to build a way of dealing with regional economies and very large ecosystems.

Those are essential lessons that are important, not only for the Northwest, but for the whole world. If we're going to figure out how to manage the earth, we have to learn how to do very large chunks the way that we're trying to do in the Northwest. The challenge that we face is to take the knowledge that we are the first people who hold the destiny of the planet in our hands, and to work in constructive ways to make sure that we are not the last people to do so. And for that, the work that's going on in the Northwest is of great importance for the future of mankind. ■

BACK TO NATURE

by Ruth L. Curtis

Can hatchery-reared salmon survive in the streams?

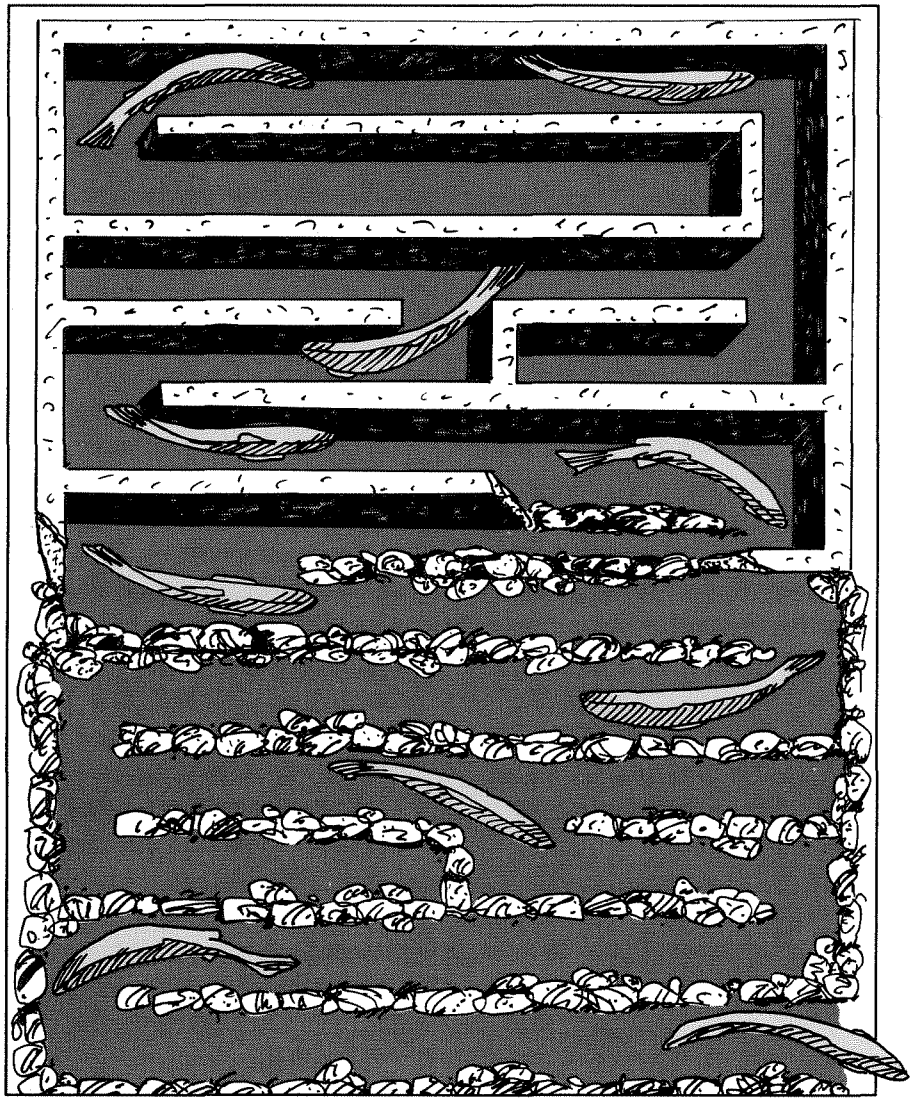


Illustration by Lyn Nance

Columbia River Basin fisheries managers "once again find themselves between a rock and a hard place," says Tom Trulove, chairman of the Northwest Power Planning Council. This is nothing new to fisheries managers and others who are struggling with salmon and steelhead runs that have been cut by 85 percent from their predevelopment bounty.

"The only way we can reach the Council's goals for rebuilding these runs is through extraordinary means," Trulove states. "There's no one cheap and easy way to add a couple of million fish to a river system and expect them to persist there for generations."

Reconstructing these runs will require a variety of actions. Improving passage for juvenile and adult fish at the dams that have been their nemesis is certainly the most important step. Improving the habitat available for salmon and steelhead spawning and rearing also is critical. Carefully con-

trolling the fish harvested in the ocean and rivers contributes to survival of the runs, as well.

Taking all of these steps will add to the numbers of fish that remain in the basin's streams. But relative to the magnitude of their decline, only small increases in the numbers of fish can be expected. The fisheries managers want more. "Unfortunately, substantial increases in the size of the runs may not be possible from these improvements alone," Trulove explains.

Consequently, fisheries managers are turning to the release of hatchery-bred fish into streams in the hope that they will return to those streams to spawn. This is known as "supplementation" or "outplanting," and it differs from the traditional management technique in which hatchery fish that survived to be adults returned to the hatchery to spawn.

"Supplementation is the leading strategy being advocated," says Trulove, "but we apparently don't have an example of its successful use. It is a risky business."

Supplementation has been practiced for a long time in the Northwest, although most efforts were designed to provide more fish for harvest rather than perennially replenishing runs that spawn in the natural habitat. Unfortunately, not enough is known about how supplementation could work in this longer-term vision.

"There's no one cheap and easy way to add a couple of million fish to a river system and expect them to persist there for generations."

—Tom Trulove

The concept seems simple enough. Eggs or young fish from a hatchery spend a period in an acclimation pond fed by water from the stream where fishery managers want the run replenished. The young fish imprint the chemical characteristics of the stream so that after they spend a few years in the ocean they can find their "home" stream again. When the fish return as adults, they will spawn in the stream, rebuilding the fish run already there.

In practice, things are not so simple. The hatchery-bred fish can out-compete native fish, can interbreed with them to the detriment of natural spawners and can stray into streams where they are not desired. Scientists fear they will decrease the genetic strength and uniqueness of the wild fish. In short, the risk is that supplementation may harm rather than help the natural population of fish.

Despite these concerns, supplementation is the leading strategy presented in the recently completed subbasin plans. These are individual salmon and steelhead production plans for 31 major subbasins of the Columbia River Basin. The plans were developed by the region's fishery agencies and tribes and will be used by the Council to determine future directions for the Columbia River Basin Fish and Wildlife Program.

Because so many of the subbasin plans rely on supplementing native fish runs with hatchery fish, the Council has made supplementation one of its four research priorities. One of the first research efforts required by the Council was a summary and evaluation of past and current supplementation projects.

The Council wanted to know where supplementation has worked and where it has failed. The review was conducted by staff at the U.S. Fish and Wildlife Service and funded by the Bonneville Power Administration.

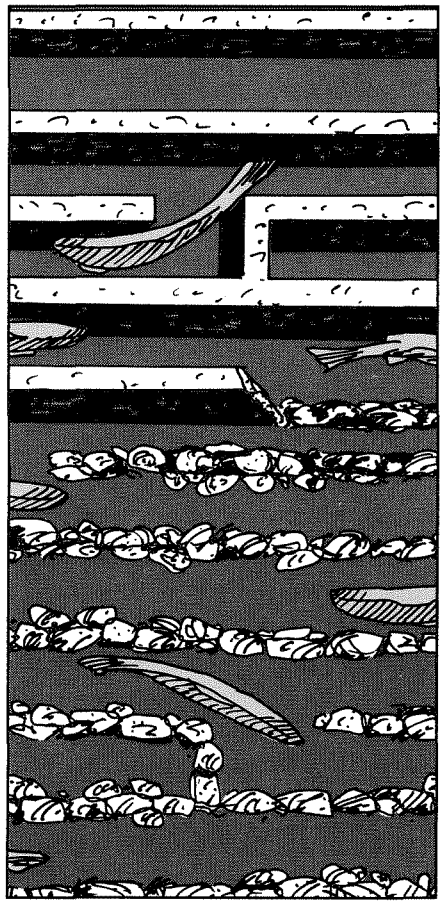
Completed this summer, the summary looked at supplementation in the Northwest states, as well as in Alaska, California, British Columbia and New England (working with Atlantic salmon). Over 300 projects were reviewed. Researchers concluded that:

"Examples of successes at rebuilding self-sustaining anadromous [seagoing] fish runs with hatchery fish are scarce or non-existent. The successes we recorded ... were mainly in harvest augmentation, not rebuilding (naturally spawning) runs.

"... there are many documented cases of introduced hatchery fish returning as adults to a specific area. However, little data was found on the capability or probability of supplemented hatchery fish building up and sustaining, over time, naturally spawning fish.

"Does supplementation of anadromous fish work? We believe that it can work and success seems to vary dramatically by 1) species, 2) stock, 3) area, and 4) method or type of supplementation. Also, success depends on goals we are trying to achieve. If we are looking at harvest augmentation, we can cite many successful examples. If we look at natural production augmentation, we have very few successful examples."

William Miller, who led the researchers, reports that supplementation has been successful with certain trout species, but with anadromous fish, such as salmon and steelhead, the results have not been so clear. It appears to work best if there are no fish of the same species in the area to begin with. For example, sockeye have been established in Alaskan lakes where they have never been before and where there was a lot of unused habitat. If there are fish already there, supplementation doesn't work as well, unless the factors that caused their decline have been corrected. Supplementation is being used successfully to re-establish Atlantic salmon on the East Coast where they had almost disappeared, but factors that caused their decline, such as overfishing, were corrected.



The researchers also found that British Columbia had one of the most successful fish enhancement programs, and one that "probably comes closer to true supplementation than in any area in the Northwest." The British Columbia program is based on public participation—citizens volunteering their time to improve the fisheries. And while the province's river systems are considerably less complicated than the Northwest's, with fewer overlapping jurisdictions, dams or major fish passage problems, "in the 13 years since British Columbia's Salmonid Enhancement Program began, they have seen real progress toward meeting their goals of doubling the runs," the report states.

One of the factors that the researchers believe contributed to British Columbia's success is the "judicious use of wild broodstock for the supplementation work."

The researchers outlined several questions that still need to be resolved. These include:

- ❑ Where should the broodstock come from?
- ❑ How will its progeny mix genetically with the natural runs already in the streams?
- ❑ Could hatchery fish transmit diseases or parasites to the wild fish?
- ❑ How would competition between hatchery-bred and wild fish affect the populations?

To help answer these questions, Cleve Steward and Ted Bjorn, researchers for the Idaho Cooperative Fish and Wildlife Research Unit, reviewed information on hatchery fish and wild fish interactions for the Council (as part of the supplementation summary and evaluation). The two researchers found that "properly designed and implemented supplementation programs can be compatible with wild fish management. There are nevertheless, good reasons to proceed cautiously with such programs. Genetic and ecological effects, and

changes in production that can be expected from supplementation remain largely unknown."

Steward and Bjorn concluded that "our knowledge of genetic and ecological interactions between hatchery and wild populations must improve if we are to reliably predict the outcome of supplementation."

One of the reasons predicting the outcome of supplementation efforts is so difficult is the almost infinite number of variables that influence success or failure. Different species and stocks of fish can be used. Fish can be released at different ages and lifestages. The released fish can come from a variety of broodstocks. Fish can be raised differently at the hatchery. They can be released using different methods and at different locations. Finally, the site where they are released can be stocked to different densities.

Consequently, the Council is not just studying what has happened elsewhere to determine how to make supplementation succeed. It is overseeing development of the Yakima Production Project in Central Washington's Yakima River Basin, where ongoing research can be tested in the basin's streams.

The Yakima Production Project will be a production and supplementation laboratory for the Northwest. Salmon and steelhead will be reared in central hatcheries, satellite facilities and several acclimation ponds that are fed by water from the tributaries into which they would be released. These particular tributaries hold miles of underused habitat. It is hoped that the fish will sufficiently imprint the characteristics of the tributaries from their time in project facilities that they will return to these streams to spawn. The project could contribute from 76,000 to 175,000 adult salmon and steelhead to the Columbia Basin. But most importantly, the project should provide information that will be useful basinwide.

The Yakima Production Project will be a laboratory for the Northwest.

Council Chairman Trulove says, "If we can't make supplementation work in the Yakima, it wouldn't likely work elsewhere... The problem is, supplementation sounds reasonable, but it's never been tried in the manner of a really controlled experiment." The Yakima Production Project will be that experiment.

Other supplementation studies throughout the Columbia River Basin are being reviewed, coordinated and prioritized by the Columbia Basin Fish and Wildlife Authority, which represents state and federal fisheries agencies and Indian tribes in the basin. For example, in the Lower Snake River Basin, three research projects that rely on test fish from existing hatcheries are under way.

One of these, on Oregon's Imnaha River, looks at the impact of supplementation on naturally spawning steelhead. Another looks at the effects of supplementation strategies on spring and summer chinook in Idaho rivers. The third monitors the genetics of eight supplemented fish populations in the basin. While there will be no quick answers from these projects, in the long term they and the Yakima Project should provide fisheries experts with the data they need to make supplementation work.

As Trulove explains, "The way to take actions now in the face of ignorance and uncertainty is to incorporate a valid scientific design into the projects and confine them to a small enough portion of the environment. If there's a mistake, the damage and the cost will be minimized. If it works, the approach can be applied elsewhere... The Council is not necessarily an advocate of supplementation at all costs, but we think it offers a lot of promise." ■

SHORTS

Oregon and Washington utility regulators are looking at ways to encourage energy conservation by decoupling power company profits from power sales. In Washington, the state Utilities and Transportation Commission (WUTC) has begun a process to examine structures and processes for recovering conservation program costs. In Oregon, the Public Utilities Commission has released a report on various options for pushing utilities to run conservation programs. [Source: *Northwest Conservation Act Report*, 7/16/90.]

The U.S. Army Corps of Engineers is going to let a city manage a Corps' dam, for the first time in U.S. history. This summer, the Corps turned over operation and maintenance of the Wynoochee Dam, on Washington's Olympic Peninsula, to the city of Aberdeen. The city will run the dam in cooperation with Tacoma City Light. City staff argued that they could run the project for less than half what it cost the Corps to operate it, and that made it cost-effective for the power company to consider adding a 10-megawatt power plant to the dam. Tacoma City Light will cover the expense of renovating the dam and installing the turbines, plus two-thirds of the ongoing costs. The new co-managers hope to acquire ownership of the dam through congressional action this fall. For more information: Bob Salmon, City of Aberdeen, Washington, 206-533-4100.

Consumers who are taught how to control their energy use when their houses are weatherized save almost twice as much energy as consumers who only receive the weatherization. This is one of the preliminary findings from a field test designed by the Alliance to Save Energy, a non-profit coalition dedicated to increasing the efficiency of energy use. When the final results are in, the Alliance intends to publish a guide to developing energy education for low-income weatherization programs. For more information: Merrilee Harrigan, the Alliance to Save Energy, 1725 "K" Street N.W., Suite 914, Washington, D.C. 20006-1401.

Six Northwest investor-owned utilities produced and distributed the lowest cost electricity in the United States, according to a report released by the Utility Data Institute, Inc., a Washington, D.C., based information service. The report only reviewed 130 investor-owned companies—no public utilities. Of these, Idaho Power Company produced the most cost-effective power between 1984 and 1988. Washington Water Power was second, and Portland General Electric Company was third. [Source: *High Desert Advocate Business Report*, 6/20/90.]

Washington produces more renewable energy than any other state, according to analysis carried out by the Critical Mass Energy Program, a branch of Public Citizen, Ralph Nader's non-profit research group. One reason the state ranks so high—relying on renewable resources for about 54 percent of its electrical needs—is that hydroelectric dams that bridge the Columbia River between Oregon and Washington are credited to Washington's power base, even though the hydropower is shared regionwide. California, which ranked second in the review, obtains 13 percent of its power from renewable sources. [Source: *Seattle Post-Intelligencer*, 6/6/90.]

The U.S. Department of Energy has set aggressive new goals for developing conservation and renewable energy sources in the United States. The Department is calling for a 30-percent reduction in building energy use in the near term and an 80-percent reduction in the long term. Solar technologies will be pushed to produce 25 percent of building energy requirements in the near term and 50 percent in the long term. To facilitate these new directions, the Department reorganized the Office of Conservation and Renewable Energy. [Source: *Energy Conservation Digest*, 7/9/90.]

—Compiled by Carlotta Collette

CALENDAR

August 26–September 1—"1990 Summer Study on Energy Efficiency in Buildings" at the Asilomar Conference Center in Pacific Grove, California. Sponsored by the American Council for an Energy-Efficient Economy. For more information: Lawrence Berkeley Laboratory, ACEEE 1990 Summer Study Office, Building 90H, Berkeley, California 94720, 415–486–7478.

September 12–13—Northwest Power Planning Council meeting at Templin's Hotel in Post Falls, Idaho.

September 12–14—"Seventh NARUC Biennial Regulatory Information Conference" at the Hyatt on Capitol Square, Columbus, Ohio. Sponsored by the National Association of Regulatory Utility Commissioners, the Ohio Public Utilities Commission, the National Regulatory Research Institute and others. For more information: Wendy Windle, National Regulatory Research Institute, 1080 Camack Road, Columbus, Ohio 43210–1002, 614–292–9404.

September 23–28—"World Renewable Energy Conference" in Reading, United Kingdom. Sponsored by the University of Reading. For more information: Professor A.A.M. Sayigh, Congress Chairman, Department of Engineering, University of Reading, Whiteknights, P.O. Box 225, Reading Berkshire, RG6 2AY, UK.

October 9–12—"13th World Energy Engineering Congress: 1990 World Environmental Engineering Congress" at the Georgia World Congress Center, Atlanta, Georgia. Sponsored by the Association of Energy Engineers, the Cogeneration Institute and the Environmental Engineers and Managers Institute. For more information: Association of Energy Engineers, 40025 Pleasantdale Road, Suite 420, Atlanta, Georgia 30340, 404–447–5083.

October 10–11—Northwest Power Planning Council meeting at the Tacoma Sheraton Hotel in Tacoma, Washington.

October 23–25—"Coal Market Strategies: Economics, Air Quality and World Markets in the 90s" at the Stapleton Plaza Hotel in Denver, Colorado. Sponsored by the Edison Electric Institute and the Western Coal Conference. For more information: Coal Market Strategies, P.O. Box 620338, Littleton, Colorado 80162, 303–592–4357 or 303–423–8208.

October 30–31—"Visions for a New Decade: Northwest Energy Expo '90" at the Tacoma Dome Convention Center, Tacoma, Washington. Sponsored by Seattle City Light, Tacoma City Light, Puget Sound Power and Light, Snohomish County Public Utility District and the Bonneville Power Administration. For more information: Will Lutgen, TLA Marketing, 10020A Main Street, Mail Stop 443, Bellevue, Washington 98004, 206–455–9917.

November 11–14—"Nuclear Energy Forum 1990" at the Washington Hilton, Washington, D.C. Sponsored by the U.S. Council for Energy Awareness. For more information: U.S. Council for Energy Awareness, Conference Office, 1776 "I" Street, N.W., Suite 400, Washington, D.C. 20006–2495, 202–293–0770.

November 14–15—Northwest Power Planning Council meeting at the Park Plaza Hotel in Helena, Montana.

November 27–29—"New Perspectives for Watershed Management: Balancing Long-Term Sustainability with Cumulative Environmental Change" on the University of Washington campus, Seattle, Washington. Sponsored by the University of Washington's Center for Streamside Studies and Oregon State University's College of Forestry. For more information: Betty Johanna, College of Forest Resources, University of Washington, AR-10, Seattle, Washington 98195, 206–543–0867.

December 12–13—Northwest Power Planning Council meeting at the Council's central office in Portland, Oregon.

A more detailed calendar of Council committee meetings and consultations is carried each month in *Update!* See order form inside back cover.

—Compiled by Ruth L. Curtis

Northwest Power Planning Council

Idaho

Northwest Power Planning Council
Statehouse Mail
450 West State
Boise, Idaho 83720
Telephone: 208-334-2956
Council Members:
James Goller, vice chairman
Robert Saxvik

Montana

Northwest Power Planning Council
Capitol Station
Helena, Montana 59620
Telephone: 406-444-3952
Council Members:
John Brenden
Stan Grace

Oregon

Northwest Power Planning Council
1400 S.W. Fifth Avenue
Portland, Oregon 97201
Telephone: 503-229-5171
Council Members:
Angus Duncan
Ted Hallock

Washington

Northwest Power Planning Council
Washington State Energy Office
809 Legion Way, S.E.
Olympia, Washington 98504
Telephone: 206-956-2200
Council Member:
R. Ted Bottiger

Northwest Power Planning Council
Anderson Hall #34-36
North Ninth and Elm Streets
P.O. Box B
Cheney, Washington 99004
Telephone: 509-359-7352
Council Member:
Tom Trulove, chairman

Central Office

Northwest Power Planning Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204
Telephone: 503-222-5161
Toll Free: 1-800-222-3355
(1-800-452-2324 in Oregon)
Executive Director: Edward Sheets
Information Director: Dulcy Mahar

The Northwest Power Planning Council is required to develop a program to restore the Columbia fisheries and a regional electric energy plan emphasizing cost-effective conservation and renewable resources.

NORTHWEST ENERGY NEWS

Printed on recyled paper.

Executive Editor: Carlotta Collette
Art Director: Stephen Sasser
Production: Judy Gibson

COUNCIL PUBLICATIONS ORDER FORM

Please send me a copy of the following publications of the Northwest Power Planning Council. (Note: not all publications are available immediately, but they will be sent to you as soon as possible.)

Publications

- ☐ Draft Power Plan (available in the fall)
- ☐ 1986 Northwest Power Plan
- ☐ 1987 Columbia River Basin Fish and Wildlife Program
- ☐ Tenth Annual Report of the Northwest Power Planning Council
- ☐ 89-1 1989 Supplement to the 1986 Northwest Power Plan
- ☐ 90-10 Protected Areas Response to Comments
- ☐ 90-10A Protected Areas Rule
- ☐ 90-12 Draft Integrated System Plan for the Columbia River Basin
- ☐ 90-13 Recommendations of the Research, Development and Demonstration Advisory Committee Regarding Confirmation Agendas for Geothermal, Ocean, Wind and Solar Resources

Mailing Lists

Please add my name to the mailing lists for the following newsletters. (Note: do not check if you already are receiving them.)

- ☐ ***Northwest Energy News*** (this bimonthly magazine)
- ☐ ***Update!*** (monthly public involvement newsletter that contains the Council meeting agenda, deadlines for public comment and a more detailed publications list)

Name _____

Organization _____

Street _____

City/State/Zip _____

(Or call Judi Hertz at the Council's central office, 503-222-5161, toll free 1-800-222-3355 in Idaho, Montana and Washington, or 1-800-452-2324 in Oregon.)

Northwest Power Planning Council
851 S.W. Sixth Avenue, Suite 1100
Portland, Oregon 97204

BULK RATE
U.S. POSTAGE
PAID
PERMIT NO. 11
PORTLAND, OR

IN THIS ISSUE