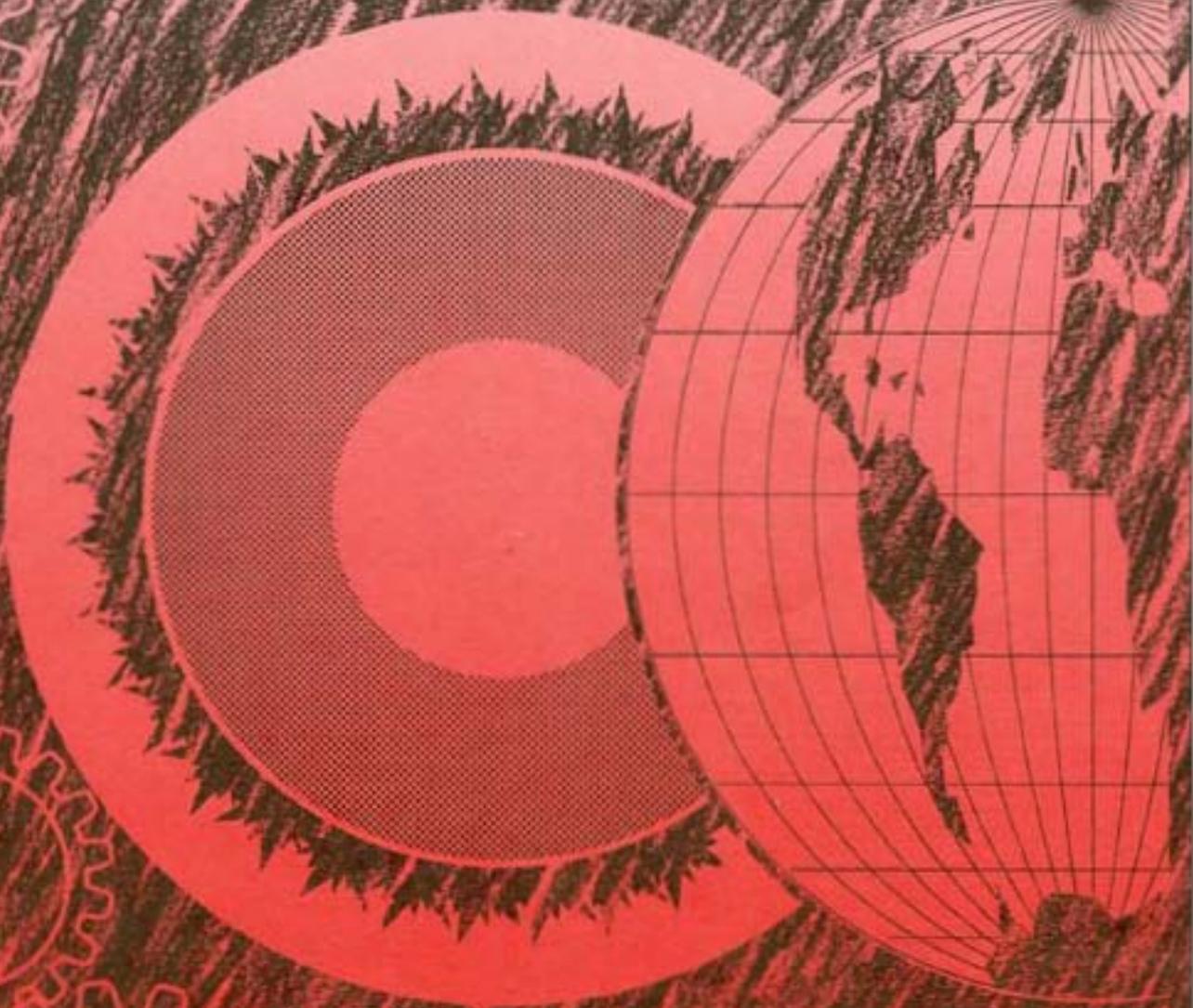


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NORTHWEST ENERGY NEWS

Northwest Power Planning Council



Power from the Planet

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This issue's cover illustration is by Lyn Nance.

from the CHAIR

Last year about this time, you could hardly pick up a newspaper or magazine without being reminded that April 22, 1991, was the 20th anniversary of Earth Day. Somehow, the 21st anniversary seems much quieter. Now the headlines rage about the economy.

To my mind, the two concepts—protecting the environment and rebuilding the economy—are inseparable for several reasons. I believe we can't have a solid and successful economy without repairing the damage we've done and are continuing to do to our environment. This is the lesson we are learning in the Pacific Northwest: wipe out the fish and you lose the economic value of the fishery; waste water and you face water shortages, increased costs to irrigate farms and higher food prices; fail to use energy wisely and you face a peck of problems both economic and environmental.

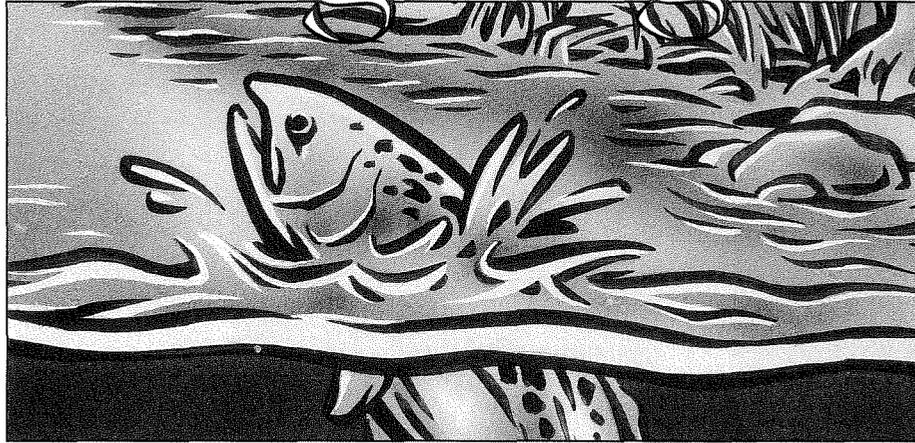
I further believe that we can bolster our economy by creating industries based on environmental corrections. We can, for example, frame major Northwest industries around energy conservation and the development of renewable resources. The region needs more electricity. The Council's Conservation and Electric Power Plan outlines a multibillion-dollar resource strategy that can create thousands of jobs in materials manufacturing, building design and construction, energy use auditing, conservation program implementation and renewable resource development. Our amendments to the Columbia River Basin Fish and Wildlife Program will likely result in similar opportunities to restore the Northwest's prized salmon runs.

I urge everyone who reads this to renew the promise of Earth Day by committing to the wise use of the Earth's resources.



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abitat

by John Harrison

Fish and wildlife program amendments focus on producing more salmon.

From the mainstems of the Columbia and Snake rivers, the Northwest Power Planning Council is shifting its focus to tributaries as it continues its review of actions to improve Columbia River Basin salmon and steelhead runs.

In December 1991, the Council completed amendments having to

do with mainstem flows and harvest of fish. In January 1992, the Council took up proposals aimed at improving salmon habitat and production.

The January action signalled the start of the third phase of amendments to the Columbia River Basin Fish and Wildlife Program. This third phase will examine a variety of issues and fin-

ish amendments to the salmon and steelhead chapters of the fish and wildlife program. The program can then serve as the foundation of a salmon recovery plan being developed by the National Marine Fisheries Service.

Snake River sockeye salmon are the focus of the Service's plan. The Service declared the sockeye run endangered last No-

vember. As this publication went to press, the Service was expected to decide whether Snake River spring/summer and fall chinook are endangered or threatened.

At the Council's January meeting, a Fisheries Service official thanked the Council for giving the recovery effort "...a running start." Merritt Tuttle, the agency's Northwest environmental services director, told Council members: "You've simplified a very complex and very long process. As a result, we should be able to move forward with the recovery effort much more rapidly than we would have without your efforts."

A seven-member team will lead the Service's recovery planning effort, Tuttle said. The team includes five fisheries scientists, a hydraulics expert and a hydro-power system expert—the Power Council's former director of power planning. They will work closely with the Council in developing the recovery plan.

Tuttle said he hopes that the sockeye recovery plan will be completed by July 1992, and not later than January 1993. He said the amended fish and wildlife program "...will be one of the strong building blocks that we will use with the recovery team."

The Council, whose eight members represent the four Northwest governors, is amending the fish and wildlife program in four phases. The first phase addressed measures that could be put in place quickly, and financed with Fiscal Year 1991 money, to focus rebuilding efforts on critical fish runs. This amendment process was begun in May

"A systematic approach helps you understand the tradeoffs between projects, but it doesn't make the decisions for you."

**—Tom Trulove
Northwest Power
Planning Council**

1991 and completed in August 1991.

The Council completed the second phase in December, when it amended into the program activities that address fish passage improvements at hydro-electric dams, increased river velocity during the annual fish migration in the Snake and Columbia rivers, harvest reductions, and a program to reduce commercial fishing.

In phase three, the Council takes up several issues. For example, the Council will discuss issues raised in the Integrated System Plan, which would coordinate efforts to produce more salmon and steelhead in the nearly three dozen subbasins that produce these fish. The plan was prepared for the Council by the

Columbia Basin Fish and Wildlife Authority, an association of fish and wildlife agencies and Indian tribes.

Other issues to be addressed in phase three include genetic impacts, biological objectives for fish runs, establishing a framework for salmon improvement actions and a mechanism for measuring progress.

In the fourth phase of the amendment process, the Council will take up measures to protect and rebuild populations of wildlife and resident fish.

The Council intends to proceed rapidly through phase three. Consultations with individuals and agencies were conducted in January, and papers on significant issues were written and made available to the public in February. (See inside back cover to order them.) In March, the Council plans to conduct further consultations and receive public comments on the papers.

In April, a draft rule will be issued for a public comment period that will last into June. In July, the Council plans to review public comments and deliberate. A decision is expected in August, the month of the Council's legal deadline for completing amendments on the salmon and steelhead portions of the program.

Issue papers are available on these topics:

- Fish production in Oregon's Pelton Dam fish ladder on the Deschutes River (Council publication number 92-02) and in the Hood River (publication number 92-03), and Idaho's Nez Perce tribal fish hatchery (publication number 92-04).

- A framework for implementing the phase three amendments (publication number 92-05).
- A systematic approach to decision-making (publication number 92-06). This paper looks at decision-making models that would help the Council compare project proposals in phase three. "A systematic approach helps you understand the tradeoffs between projects, but it doesn't make the decisions for you," Washington Council member Tom Trulove noted.



Fences can protect fragile shoreline salmon habitat from damage by cattle and other animals.

- Genetic impacts of the activities proposed in phase three (publication number 92-07). Commentors suggested during the recently completed second phase of the amendment process that the Council establish a genetics goal for the fish and wildlife program. The discussion paper also addresses questions about the interaction of hatchery-reared and wild juvenile fish.
- Mitigation of economic impacts of the Council's fish and wildlife program amendments (publication number 92-08).

Program framework

During phase three, the Council will establish a program framework including goals, rebuilding schedules, biological objectives and performance standards. This framework could include review and refinement of the rebuilding schedule for fall chinook adopted in phase two.

The scope of the framework has not been determined yet. A framework could incorporate only elements for Snake River spring chinook, summer chinook and sockeye. Alternatively, it could be

expanded to cover other weak stocks such as chinook, coho, chum, sockeye, steelhead and sea-run cutthroat trout. It could even include all stocks in the Columbia River Basin.

Passage, production and harvest measures

The Council announced during the phase two process that after a program framework is developed it may be necessary to review and revise some aspects of the program including amendments adopted in the first two phases.

For example, the Council may consider whether mainstem measures

for the Snake and lower Columbia rivers or harvest measures provide high enough survival rates to meet the program framework elements.

Artificial production, supplementation and genetics issues

The Council received numerous proposals regarding artificial production, supplementation and genetics conservation, issues that also are addressed in the Integrated System Plan.

In fact, these issues go to the core of regional concerns about endangered species and what can be done to avoid losses of stocks and protect biological diversity. There are unanswered questions, such as the long-term sustainability of natural and hatchery stocks, the details of a management plan for wild and naturally spawning fish, and the appropriate balance of natural and artificial production.

Land and water management

The abundance of salmon and steelhead stocks in the wild depends on the productivity of freshwater habitat. Much of this habitat has been degraded to some extent.

The Council began addressing this issue in phases one and two and has set priorities for projects funded in 1992 and 1993. These projects will focus on low-production areas and watersheds where there are cooperative efforts of land and water agencies, fisheries managers, landowners, local communities and other affected parties to improve land management activities and fish habitat.

In considering the habitat issue, the Council will look for assurances from state and federal land and water managers that their efforts will be consistent with the Council's program actions. To that end, there may be a need for additional or amended regulations to protect salmon and steelhead populations. In addition, the Council hopes to develop a process for selecting and prioritizing habitat improvement projects.

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The Integrated System Plan

The Columbia Basin Fish and Wildlife Authority completed the Integrated System Plan last June, but its recommendations and conclusions may need to be updated in light of the endangered species listings and other recent developments. The Council also will need to consider how the Integrated System Plan can be updated periodically in the future.

Lower Columbia issues

During phase three, the Council will consider habitat improvement projects proposed both below Bonneville and upriver of the dam.

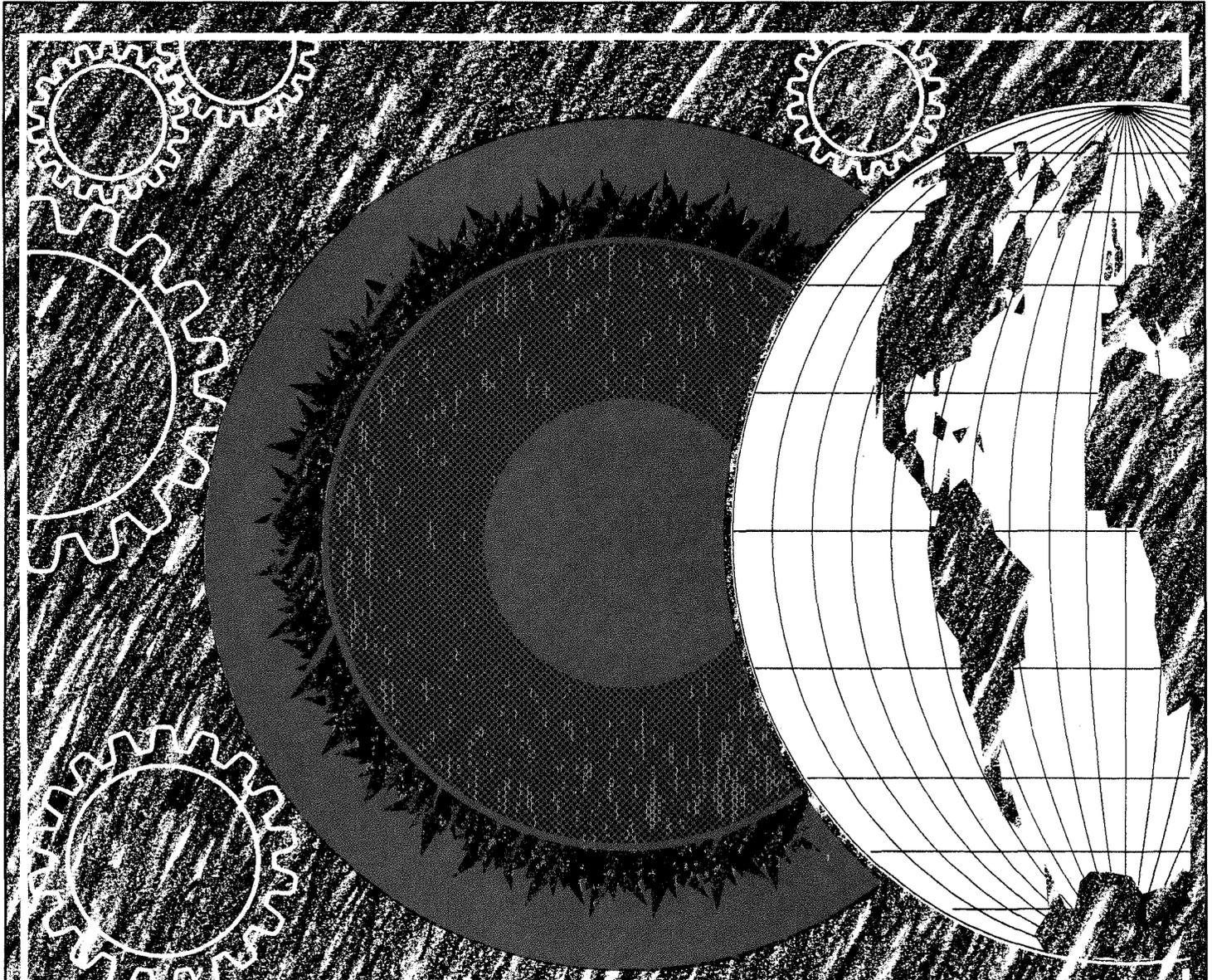
For example, the Council will discuss whether action is needed to address weak stocks of fish in the lower river, including coho, chum and, perhaps, sea-run cutthroat trout.

Protected areas

As part of its fish and wildlife program, the Council designated some 44,000 miles of streams and rivers in the Columbia Basin off limits to further hydroelectric development. During phase three, the Council will consider amendments related to the protected areas.

Selecting projects, setting priorities

The Council hopes to establish a system of guidelines for setting priorities among the myriad habitat improvement projects that will be considered. This will involve deciding what weight to give various factors, such as project cost, abundance of fish in areas where projects are proposed, the integration of hatchery and wild fish in particular streams, and location, among others. ■■



POWER *from the* PLANET'S FORGE

by Carlotta Collette

Three Northwest geothermal demonstration plants proposed.

Deep in the realm of Vulcan, at the core of the planet Earth, molten iron simmers around a solid iron ball, nearly 1,600 miles across. Scientists suggest the temperature there may be 8,000 degrees Fahrenheit. It is the source of geothermal energy.

Offshoots from the core stream to the surface, creating hot spots, some of them volcanic mountains. The Yellowstone Valley fairly floats on a burning sea. Geothermal energy propels Old Faithful.

Steamy mountain springs where water bubbles hot from fissures in the stone are stoked by geothermal energy.

In some underground reservoirs, water resides at temperatures approaching 500 degrees Fahrenheit. It could take a shaft a mile or more deep to tap into them. In other places, the water boils out of the ground, smelling of sulfur, like eggs left too long exposed.

The Pacific Northwest, with its spine of volcanic mountains just inland on the west and the hot underground lode of the Basin and Range along most of its southern edge, may be as rich in subterranean power as any place in the United States. Idaho's Snake River Plain, believed to be the remnant of thermal activity now centered under Yellowstone Park, adds to this bounty. Only the Aleutian Islands off Alaska, those delicate links in the "Rim of Fire" that encircles the Pacific Ocean, may surpass the region in geothermal potential on this continent.

In other parts of the country, notably California and Nevada, geothermal resources have been turned to the production of electricity. At least 70 geothermal plants, with a combined capacity of more than 2,700 megawatts, are online in the United States. However, no large facilities are in the Pacific Northwest, where ample and inexpensive hydroelec-

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tricity rendered the earth's heat too costly to employ.

But today, with energy use rapidly outstripping supplies, and the cost of all new resources rising, the promise of geothermal in the Northwest is ready to be tested. Experts suggest that if the resource can be developed it could contribute several thousand megawatts of electricity to the region, most of it at less than the cost of new fossil fuel plants.

To confirm the resource, the 1991 Northwest Conservation and Electric Power Plan turned to the Bonneville Power Administration and the region's utilities to lead the development of three pilot geothermal projects in the region. Bonneville announced in December 1991 that it had selected proposals from three geothermal developers.

Bonneville and the Northwest Power Planning Council, which produced the regional power plan, want to explore the unique problems and potentials of harnessing the earth's heat to generate electricity for the Pacific Northwest.

Three areas of concern

Uncertain costs

Most engineers concur that geothermal power plants can be reliable generators once the location of adequate quantities and temperatures of geothermal fluids is proven. The Council's power plan estimates that electricity from utility-scale facilities could cost between 9.5 and 10.5 cents per kilowatt-hour, easily cost-competitive with other new generating plants. Furthermore, geothermal plants, being relatively small, reduce the risk of building too large a resource and outdistancing the need for new energy. They are also comparatively quick to develop—approximately 24 to 36 months for construction.

But, as the power plan notes: "More than for most other resources, confirming the quantity and quality of a geothermal resource is a difficult, expensive and risky business." Underground temperatures, and rock and geothermal fluid characteristics vary from location to location. Even sites in close proximity, with similar characteristics, cannot be assumed to contain equal potentials or require the same degree of effort to secure the resource.

Some sites will need to be drilled repeatedly to determine what it will require, in terms of costs as well as equipment, to produce electricity there. It is in the nature of exploration that expensive test holes may prove barren. At times, the effort to confirm the resource can resemble a search for buried treasure.

Environmental risks

In addition to the capital risks intrinsic to geothermal development, there are possible environmental risks. Will development of geothermal electricity release dangerous gases such as hydrogen sulfide? Hydrogen sulfide seems to abide in nearly all geothermal liquids. If released in high concentrations, hydrogen sulfide can be lethal.

Once the power plant is operating, hydrogen sulfide and other gases can be collected and reinjected into the well, often leaving the odor of sulfur, but little environmental danger. It is while the test wells are being drilled, or the project is being developed, that more dangerous releases can occur. The hazard then is especially serious for workers at the site.

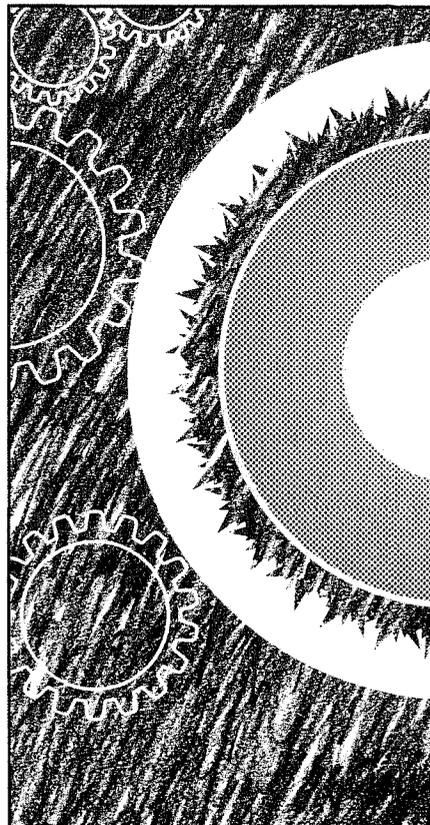
There are ways to address this danger. Detection devices, warning alarms, emergency breathing equipment, well-shutdown procedures, scrubbers and chemical solutions that can remove the hydrogen sulfide are effective and expected at every site.

Water pollution is another environmental fear with geothermal development. Both surface water and groundwater can be contaminated by drilling mud or by the geothermal fluids themselves. Engineers say that groundwater contamination can be prevented by lining the wells. The preferred method for handling the geothermal fluid is to reinject it into the well. This practice has the added benefit of keeping fluid levels in the underground reservoir adequate. Drilling mud is contained within specially constructed and carefully lined ponds during drilling. After the drilling, the mud is

Most of the region's hottest sites appear to lie beneath some of its most spectacular landscapes.

dehydrated and capped in place, if it is determined to be non-toxic. Contaminated mud is removed from the site for proper disposal in ways that vary from site to site and state to state.

Geothermal drilling and well testing also can be noisy, but the noise can be controlled by equipment shielding and mufflers.



Land-use conflicts

The third aspect of geothermal development raising concerns is perhaps the one that most specifically applies to the resources of the Pacific Northwest. Most of the region's hottest sites appear to lie beneath some of its most spectacular landscapes. The Cascade Mountain Range, for example, has few equals for grandeur, but few, also, for the amount of geothermal energy lying beneath the glory.

Geothermal facilities can be relatively small, but they *are* industrial. Land-use incompatibilities are likely to be the greatest challenge to their construction and operation.

The Council maintains that if responsible answers to cost, environmental and land-use questions can be found, the Cascades could become the Northwest's second greatest source for renewable energy after the Columbia River.

Three areas of promise

Three geological provinces in the Northwest seem to surpass all others in their abundance of underground thermal power. These are, as noted above, the Cascade Mountain Range, which runs from British Columbia into California; the northern incursions of Basin and Range that skirt the southern edges of the region; and the Snake River Plain, which runs east to west across a wide chunk of Idaho and into Oregon.

Cascade Mountains

Being an active volcanic range, the Cascades appear to be able to supply the greatest amount of geothermal energy in the region.

But the Cascades are tricky. No one has been successful in developing a Cascade-based geothermal electrical generating facility. Test holes have been drilled, but no production-scale wells have been completed.

Public opposition on environmental and scenic grounds, and inadequate temperatures to sustain electrical generation have led to the demise of at least one project. But promising temperatures in other test wells suggest that the Cascades hold great potential.

Consequently, the Council's call for research and testing of geothermal resources focuses particularly on the Cascade Range. Two of the pilot projects being considered by Bonneville would be located in these mountains.

Newberry Volcano, the first of these, is located in the Deschutes National Forest about 35 miles

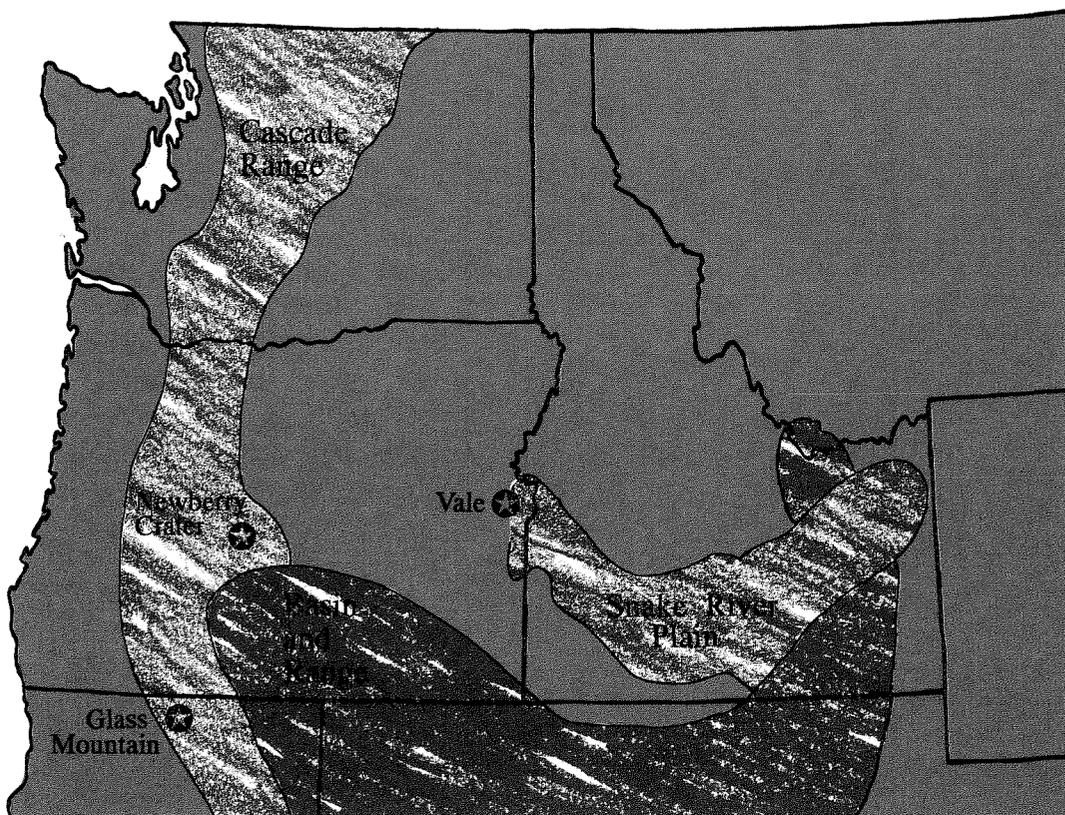
In today's world, all new sources of electricity must be tested before they can be fully exploited.

south of Bend, Oregon. Newberry has long been considered the best place for geothermal development in the region. The volcanic resource at Newberry, with estimated temperatures higher than

400 degrees Fahrenheit, is expected to be able to deliver more than 250 megawatts of electricity.

Estimates of Newberry's potential in earlier Council power plans were considerably higher than the 250-megawatt figure, but recent designation of the site as the Newberry Volcanic Monument has precluded development of about two-thirds of the resource. Instead, developers' attention has been diverted to an adjacent area from which drilling on the diagonal, aimed toward some of the hottest spots, can be carried out with the least surface disruption.

The U.S. Forest Service, state and local authorities, and the Eugene Water and Electric Board have carried out a campaign to increase public awareness and involvement in plans to drill in the vicinity of the caldera. The Eugene utility has agreed to co-



The Northwest's Most Promising Geothermal Regions

sponsor the 30-megawatt test project, calling in the California Energy Company, which has numerous large-scale geothermal electric plants operating in the United States, to undertake the exploration.

The second Cascade-based pilot project being considered by Bonneville is located at Glass Mountain, in the Modoc National Forest, 25 miles south of the Oregon border. (In the 1991 Power Plan, this site was identified as Medicine Lake.) While Glass Mountain is outside Bonneville's service territory, it is in the service area of the Portland-based utility, PacifiCorp.

The 25-megawatt Glass Mountain test project was proposed by UNOCAL, of Southern California, one of the most experienced geothermal developers in the world. UNOCAL has already secured the rights to drill there. Two successful production wells have been dug at Glass Mountain, and the developer is convinced that a 100-megawatt or larger facility could be built there.

The major problem at Glass Mountain is its high value and use as a recreational area. Like the Newberry Crater, development of Glass Mountain will have to accommodate a broad public involvement process and incorporate significant environmental protections.

Basin and Range

The second most highly rated area of the Northwest for geothermal resources is the northern reach of the geological formation known as the Basin and Range. In general, Basin and Range geothermal resources are the best understood and most developed

in the nation. They are created by deep faults through which water, heated by hot subterranean rock, rises to the surface. The Council's plan identified approximately 680 megawatts of geothermal resources that could be obtained from this province.

The Northwest's only pilot geothermal electric project to date was sited near the Raft River, in southern Idaho, on the edge of the Basin and Range. That demonstration project was abandoned in 1982, after proving that electricity could be generated using the site's 300-degree Fahrenheit fluids, but not economically.

Of the top six potential geothermal sites identified in a Bonneville study of the region, three are Basin and Range resources. However, none of the Basin and Range projects surfaced in this, Bonneville's initial resource demonstration.

Snake River Plain

The third major Northwest geologic province holding promise for geothermal development is the Snake River Plain. As in the Basin and Range, the Snake Plain has no active volcanoes. Instead, it is believed to be the residual wake of the thermal feature that now fires up under Yellowstone Park. This stored heat fuels the Snake River Plain's geothermal resources, which have been measured at 300 to 400 degrees Fahrenheit.

Bonneville's prospective pilot in the Snake River Plain is situated in Vale, Oregon near the Idaho border. Unlike the Newberry and Glass Mountain sites, the remote, 30-megawatt Vale project is not expected to face major environmental or land-use oppo-

sition. The question the Trans-Pacific Geothermal Corporation of California, proposers of the pilot, will try to answer at Vale is whether this site can be cost-effectively confirmed and developed. If it can be, the site is expected to eventually produce more than 100 megawatts of electricity.

Proving the promise

When the Power Planning Council was reviewing possible resources the Northwest could turn to to meet its energy needs, it was obvious that no new supplies of electricity would be as inexpensive as the formidable horsepower harnessed by the region's great hydropower dams. But the dams have inflicted other costs, calling into question their value.

The region and the world as a whole are more conscious now of the ramifications of any development than they were a half century ago, when giant-scale hydropower was a relatively new technology. In today's world, all new sources of electricity must be tested before they can be fully exploited.

The Council's call for pilot projects to confirm utility-scale geothermal in the region and thoroughly address environmental impacts should provide Northwesterners with the experience necessary to make informed choices among all available resources. The full force and implications of the power wrought in the earth's forge will only be understood, the Council maintains, if they are approached carefully. ■■

Point of View:

BLUM

JOE

with Rick Applegate

Northwest fisheries manager reviews changes in salmon harvests.

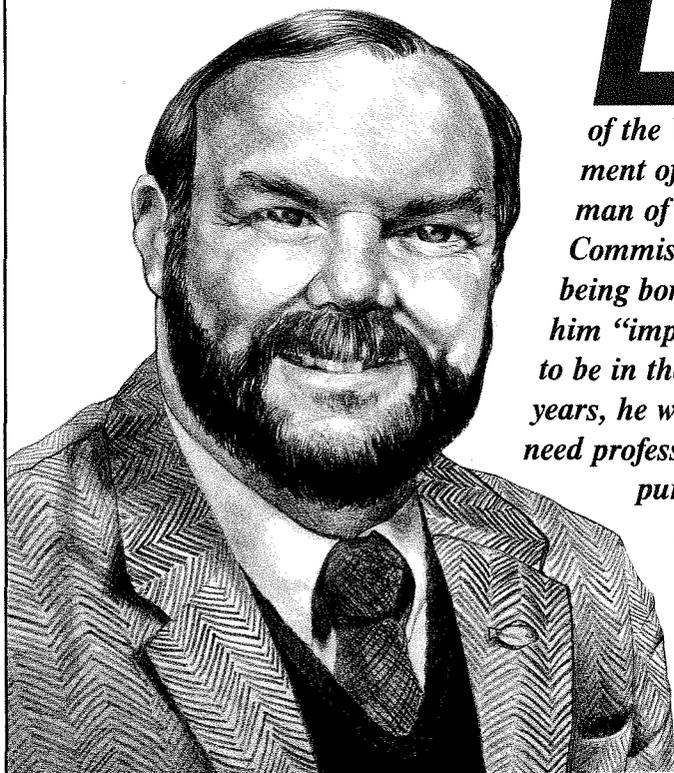
Like salmon patterning after their home streams, Joe Blum, director of the Washington Department of Fisheries and chairman of the Pacific Salmon Commission, suspects that being born in Montana left him "imprinted" with a need to be in the outdoors. For many years, he was able to satisfy that need professionally; first on a purse seiner salmon fishing off Alaska for two years, then as a fish counter, monitoring the sport

catch in reservoirs and lakes around San Francisco.

But, like many fisheries biologists, he was soon moved inside, to an office at the Alaska Department of Fish and Game. He progressed through the ranks at the Department, climbing to the status of deputy commissioner, from which post he worked hard to protect the state's fish and wildlife when the Trans-Alaska Pipeline was being constructed.

From Alaska, Blum moved, in the early 70s, to Washington D.C. to work with the National Marine Fisheries

Rick Applegate is the director of the fish and wildlife division at the Northwest Power Planning Council.



Portrait by Fredrika Spillman

Service on both the Marine Mammal Protection Act and the Endangered Species Act.

In 1976, he was asked to head one of 18 area offices of the U.S. Fish and Wildlife Service, the office located in Olympia, Washington, which served that state and Oregon. He welcomed the opportunity to return to the Pacific Northwest, where he became responsible for most Fish and Wildlife Service operations in the two states, including oversight for 20 hatcheries, three fisheries management offices and 17 national wildlife refuges.

He was particularly involved in the 1974 United States v. Washington Indian treaty rights trial known as the "Boldt" case, in which the harvestable fishery was divided equally between Indian and non-Indian fishers.

When the Fish and Wildlife Service abandoned the concept of area offices, Blum was relocated to Portland. Eventually he was named deputy regional director of the Fish and Wildlife Service, where he managed an environmental program covering six western states and the western Pacific Ocean.

In 1986, Washington Governor Booth Gardner asked Blum to assume the seat vacated by Bill Wilkerson, as director of that state's Department of Fisheries. Wilkerson had been asked by the governor to take the lead in a tax reform effort the governor was promoting. In Blum's word, he "grabbed" the Department's top position, and is the first professional fisheries biolo-

gist to serve in that capacity in many years.

Throughout his career, Blum has found himself in the center of the major fishery debates that have transformed the industry: he worked on the design of legislation to protect marine mammals and endangered species, he helped the Northwest adapt to the Boldt decision, he continues his early involvement in implementation of the Northwest Power Act and serves now as chair of the Commission that sets fish harvest limits based on the U.S. and Canada Pacific Salmon Treaty. In all of this, he has maintained his reputation for decisiveness and straight—even blunt—talk.

Wry justice may have ruled that he should be compelled to integrate all these changes, plus the precipitous decline of the Northwest's salmon populations, in his current two-hatted role as state fisheries director and Washington representative to the international treaty commission. Blum is easily identified as one of the key forces in the Pacific Northwest's attempts to rebuild salmon runs.

Q. *How would you describe the role of the Pacific Salmon Commission—basically its jurisdiction in regulating fisheries?*

The Pacific Salmon Commission is—to use a biological term—sort of the top of the food chain in the Northwest's salmon regulatory world. The Commission establishes quotas [for salmon harvests] for southeast Alaska, north central British Columbia, the west coast of Vancouver Island and the Georgia Straits. In the Pacific Northwest, we have agreed to a principle of "pass-through." We are supposed to pass through to the spawning grounds the savings that are made in Alaska and British Columbia by their having ceilings on some of their fisheries—particularly chinook.

Those ceilings, plus other things that are negotiated, become the guiding principles for the domestic fishery management in Canada and the United States. The Alaskans go home and work with their Board of Fisheries. We go to the Pacific Fisheries Management Council [see "Who Rules the Seas?"] and carry through our obligation of pass-through.

Then Oregon [Department of Fish and Wildlife] and ourselves [Washington Department of Fisheries], working with the tribes, do the "Compact"¹ activities on the Columbia. Washington Department of Fisheries, with the Puget

—CC

1. The Columbia River Compact is the forum for managing commercial fishing in the Columbia River. Oregon and Washington serve on the Compact. Neither Idaho nor the basin's Indian tribes are members of the Compact.

Sound tribes or the Boldt-case² area tribes, do the inside waters of Washington [within three miles of the shore]. Basically, the Pacific Salmon Commission is the umbrella, it's the group that sets the standards, if you will, for a given period of time.

Q. We hear about the Salmon Commission's negotiations being sometimes very difficult, going late into the night. How would you describe the recent successes of the Commission in its work?

The successes have often been overlooked, so I'm pleased with the opportunity to express my view of what some successes have been. People come back from the annual negotiating cycles, and they say, "What do we do this for? We just don't get anywhere."

They forget that without the Pacific Salmon Commission, or the Pacific Salmon Treaty,³ Canada, and to a degree, Alaska, would have no controls [on their harvest of salmon]. In fact, Canada demonstrated, particularly with coho, that absent some controls, they could catch huge amounts of fish off the west coast of Vancouver Island. At one point in time, they were up to 2.4 million fish with no indication that that was where it was going to stop. By getting a cap of 1.8 million, we have ac-

complished that objective for this period of time.

There are some instances in which they go over. But that's also governed by a management flexibility provision that, particularly with coho and chinook, if you go over by 7.5 percent you have to pay back. But if it's 7.5 percent or less on the accumulative, that's basically a management range that all of us agree is about as good as you can do,

given the nature of salmon management. So the basic idea of

2. In 1974, U.S. District Court Judge George Boldt ruled in United States v. Washington that certain tribes in their treaties had retained the rights of up to 50 percent of the harvestable fish in specific parts of Washington.

3. The U.S. and Canada Pacific Salmon Treaty was signed in 1985 after more than 20 years in negotiation. The treaty sets harvest limits on salmon and steelhead and includes special protections for Columbia River Basin salmon.



putting some caps on Canada, putting some caps on Alaska, having a rebuilding program on chinook, having some principles that we all try to live by, is the thing that we tend to forget in the day-to-day, year-to-year, all-night-long meetings.

Q. That's the good news; what's wrong with the process? Are you content with it?

We are not rebuilding chinook at the pace that the treaty and the treaty negotiators anticipated. So we've got to do better.

The problem as I see it, and as I believe the United States sees it, is that we tend to get wrapped up in the year-to-year, instead of dealing with the long-term, big picture, national objectives. We have begun, through rather painful, arduous negotiations and discussions, to get back into the long-term, national-objectives approach to management.

I'm sure that, to a person who is outside the process, it seems rather crazy that we are not operating under long-term objectives and national objectives. The reality is that fisheries management has a tendency to rapidly collapse into a day-to-day type of operation. You've got to have constructive and creative discussions and negotiations to get it out of that mode.

Another problem, and I don't know if it will ever go away, is that Canada and the United States have two different views on who's right and who's wrong in many of these issues. We get some nationalism developing, and we've got to overcome that. I don't think that will ever go away, but we have to make sure it is

We are supposed to pass through to the spawning grounds the savings that are made in Alaska and British Columbia.

balanced, that it doesn't consume everything else that we do.

Furthermore, the United States has a very difficult time reaching a domestic position before we even get to Canada because of the differences between Alaska and the Pacific Northwest. We have different management objectives.

Alaska has a view toward chinook, for example, that is different from our view toward chinook. And they have a difficult time agreeing to a strategy that has them catch less fish while, on strong runs, we're catching more fish. On weak runs, they have a difficult time being constrained. You know, it's the tension that has always existed between various management jurisdictions. So it's not extraordinary, but it does require the United States to spend some extra time developing a U.S. position.

I'm sure Canada has the same problem, but Canada has one jurisdiction. They have the Department of Fisheries and Oceans. When it gets down to it, if the Canadian Commission members can't reach agreement, the Department of Fisheries and Oceans reaches a position. On the U.S. side, we have Washington, Oregon, Idaho, Alaska and 20-some tribes, depending on who all's involved at the particular moment and what the issue is, that each has jurisdiction. The only reason I left the federal government out is they don't have the vote, but they do have a role to play on the Pacific Salmon Commission.

So you've got the difference between two countries as to how you reach your position. That takes a lot more time on our side, and Canada sometimes gets excited about how long it takes. But I'd have to say that they've begun to recognize that it's not that we're playing games, it's that we have a real jurisdictional maze, if you will, that we've got to work through.

Q. How do you see the filing of the endangered species petitions in the Columbia River Basin and the efforts to develop a regional recovery plan affecting Salmon Commission deliberations?

Obviously the United States has obligations under the Endangered Species Act. And we will in fact meet those obligations. The regional [1991 Northwest Conservation and Electric] power plan⁴

4. Technically, the power plan incorporates, under separate cover, the Columbia River Basin Fish and Wildlife Program.

will be and is a part of our calculations and our planning strategy as to what it is we've got to go in and get out of Canada.

The Canadians are very interested in what we are doing, as you can imagine. We've briefed them annually. After the first briefing, which took place maybe two years ago, they immediately went to Ottawa and sat down for almost a full day with their national Department of Fisheries and Oceans staff and briefed them on our briefing. They ask frequently to be updated on what's going on in respect to endangered species.

Q. One of the problems with managing a fishery where several species mingle is identifying distinct species so their harvest can be monitored. How adequate, for example, do you think the monitoring is of the harvest of Snake River fall chinook? The Snake River fall chinook are of particular concern because of their potential listing as endangered species.

I would say, historically, our attention to Snake River stocks as compared to other stocks would certainly not meet a standard that would now be required of us because of the Endangered Species Act. There have been other priorities, and we simply haven't put the amount of effort into it that it now needs.

So, starting from that principle, the monitoring has got to get better and is going to get better. We've got a lot more work to do.

We are not rebuilding chinook at the pace that the treaty negotiators anticipated.

At this last Pacific Salmon Commission meeting, there were two requests—one from Idaho and one from Oregon—to do some things that the Commission was not prepared to support, because it would make it difficult for the coded wire tag⁵ programs that we've got in place to continue to be of value. Oregon, Idaho and the U.S. Fish and Wildlife Service proposed that we clip the adipose fins on all salmon from particular hatcheries.

At some point in time, we've got to come up with a selective marking approach that allows coded wire tags to continue to be used, but also allows some specific fisheries to take place. We can't now because of the limited marking capability that we've got.

There's some work being done on this. I believe Bonneville [Power Administration] is funding some of the work. They're trying to come up with another visual [means of marking fish] that's a tag approach.

My point is that the Pacific Salmon Commission was faced with that issue in December and, I think, dealt with it in an appropriate way and also gave a signal

that we're not foreclosing the opportunity to deal with it a different way, as new tools become available. I would say that's an effect, in a very large part, of the Endangered Species Act and the [Columbia River Basin Fish and Wildlife] program.

Q. The Council recently called for reductions in harvest of fall chinook from rates that have averaged as high as 77 percent down to 55 percent. The Council even suggested that that rate should go lower through a variety of other measures. What do you see as the effect of that at the Salmon Commission? Will they take it into account, together with the strong encouragement for further reductions in Canadian interception of Columbia-bound chinook?

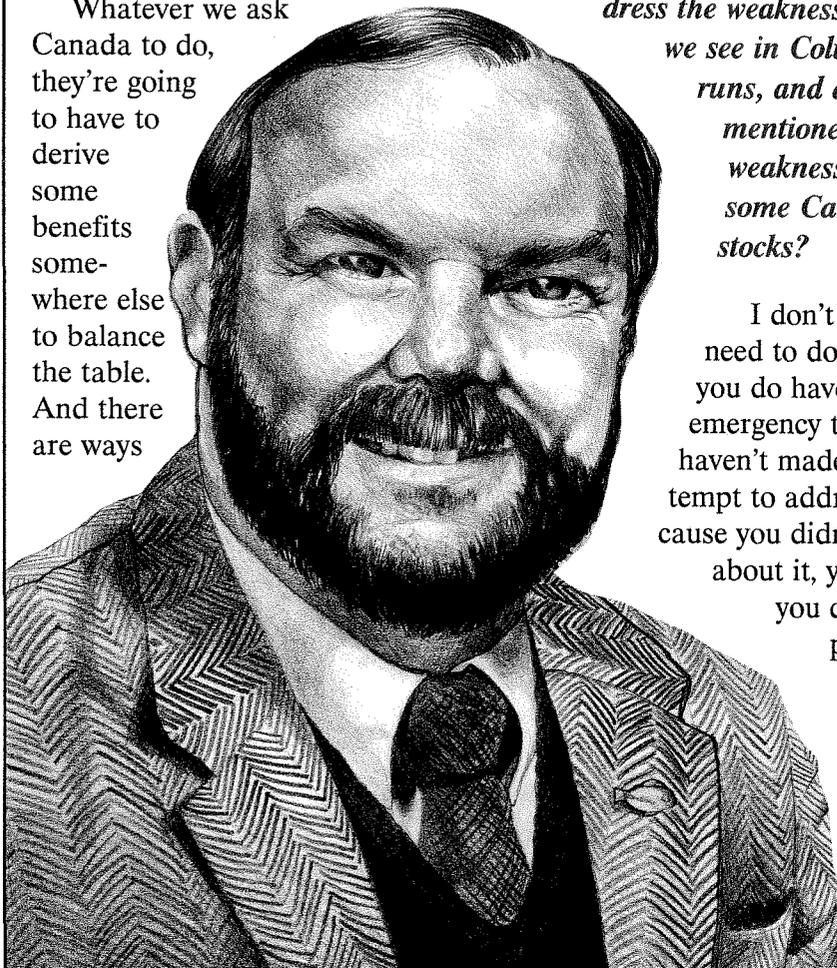
Absolutely. We anticipated for 1992 that we would have reduced numbers of fall chinook available. And, therefore, we had a slight increase [in harvest limits] in 1991 for southeast Alaska and north central British Columbia on chinook. I mean it was slight. But in 1992, it reverted back to the original ceiling. So for 1992 we have already recognized the chinook issue.

5. Coded wire tags are miniscule devices (thinner than human hair and about a millimeter long) inserted into young salmon to carry data about the date and location of a fish's release from a hatchery. To identify fish carrying coded wire tags so the tags can be recovered and used in monitoring the runs, hatchery operators clip the adipose fin of fish that carry the tags.

Canada is also having some problems with some of their heretofore strong chinook stocks. They are having to take management measures on the west coast of Vancouver Island that are bringing them in at a harvest level below the approved international ceilings. So we're gaining, sort of left handed, a little bit of support, to the degree that those fish are intermingled with the stocks of concern.

As far as what we are going to be able to do in the 1992/1993 negotiations, it's premature to tell, except that the United States is fully aware of the obligation that we have agreed to as a part of the regional solution, and that's not going to get forgotten. What we actually will be able to accomplish is a matter of negotiations. It takes two to have an agreement.

Whatever we ask Canada to do, they're going to have to derive some benefits somewhere else to balance the table. And there are ways



It's the tension that has always existed between various management jurisdictions.

to do that. But it's going to take from now until this fall to get a U.S. position together and then to work with the Canadians.

Q. Is there any opportunity for fast reaction by the Commission on an emergency basis to address the weaknesses that we see in Columbia runs, and as you mentioned, the weaknesses in some Canadian stocks?

I don't see a need to do so. If you do have a true emergency that you haven't made any attempt to address because you didn't know about it, you know you can get parties to sit down and

agree to do extraordinary things. My point in mentioning earlier that we had taken into account the anticipated lower numbers of upriver brights [fall chinook] in 1992, in my view, is moving in the right direction. If we need to do more than that, it will get done in the pass-through part under the Pacific [Fisheries Management] Council and what the Compact actions will be this summer and fall.

Q. Shifting to those management arenas for a second, the Council also recently asked that fishery managers explore changes in fishing gear and some harvest practices. Is it realistic to look for improvements in our ability to selectively harvest on stronger stocks?

If we don't do that, I think the future of harvest the way we have known it is pretty bleak. If we don't try to sit down and do what the Council has urged us to do and provided some incentive to do, we will really miss an opportunity.

Alternative types of gear that we know about are really going back in time to what used to be considered primitive approaches to harvest, but may in fact be what we will be looking at it in the future. But they don't work in all places, at all times, for all species. So there's got to be some creative work done to fit them in where they are appropriate, where they do the job. And I am encouraged.

You will be interested to know that the discussion has come up outside of the Columbia Basin. A particular situation developed this year on the Nisqually in

south Puget Sound, where we have a late chum run that intermingles with a weak steelhead run.

The Nisqually Tribe had to forego some chum net fishery in order to preserve the escapement of that steelhead stock. So we started talking—[Washington Department of] Wildlife, Nisqually Tribe, Washington Department of Fisheries—about finding some other way to have a selected harvest to accomplish the steelhead objective, have the tribe accomplish their chum objective, have us accomplish our chum objective.

So even in the few months that people have been thinking about selected harvest techniques with respect to the Columbia, it encouraged us to think about it in other places. I think you're going to get a good response.

I want to caution that it's not going to be overnight. That would be a mistake, in my view. It could be a very large investment of money for a series of failures, and I think we want to try to do it in a little more businesslike way so that there are successes instead of failures.

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What I'm saying is, don't get discouraged when we say we've got to look at it. We're not stiffing the Council. We're not stiffing the region. It's the sense that you'd better do the thing right if you want it to be successful and have it become an accepted management approach.

Q. The Council has expressed an interest in assisting in the Pacific Salmon Commission deliberations in any way that it can. Do you have any particular advice on how they might be able to approach that, how Council members might be helpful?

In all honesty, we have enough help. But, there is a clear need on the part of the Council to have more than a passing awareness of what is going on. So I would encourage observers. There are some sections [of the deliberations] that are opened to the public. Obviously those would be fine.

I think it would be appropriate if the Council wanted to observe some U.S. section meetings. Where it gets very tight and where there would be little flexibility is when you get into the actual negotiations—they call them executive sessions.

But up until we get into the executive sessions, having a Council observer would be welcome. And in fact, I wouldn't see it as anything but helpful. ■■

Who Rules the Seas?

Columbia River Basin salmon and steelhead pay no heed to state, local or even national boundaries. They are "hard-wired" with a mission. They are in motion all the days of their lives, starting in the streams or hatcheries of their birth, moving down the tributaries and mainstems of the Snake and Columbia rivers to the Pacific Ocean, swimming mostly north toward Alaska and occasionally south into Californian waters, then returning to the mouth of the Columbia and back up to their place of origin.

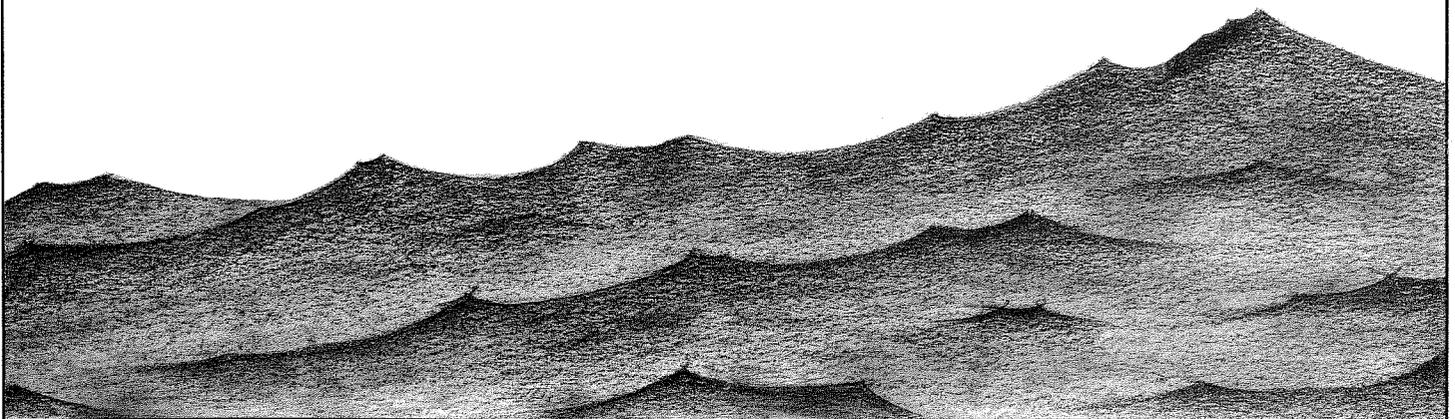
Along the way, they are the object of intensive sport and commercial fisheries. About a half-dozen different councils and commissions have been charged with managing the harvest of these fish so that adequate numbers survive to reproduce.

- *The Pacific Salmon Commission* sets seasons and harvest limits for salmon and steelhead caught in the waters off southeast Alaska and British Columbia. The Commission was created after the 1985 signing of the U.S. and Canada Pacific Salmon Treaty, which was in negotiations for more than 20 years. One important goal of the treaty is the rebuilding of Columbia River salmon, a fish that is an important element in the fisheries of both Alaska and Canada.
- *The Pacific Fisheries Management Council* takes responsibility for the salmon when they migrate from three miles to 200 miles off the shores of California, Oregon and Washington. This Council was one

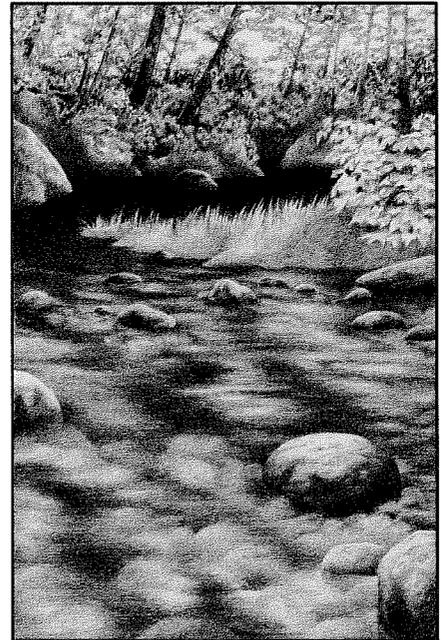
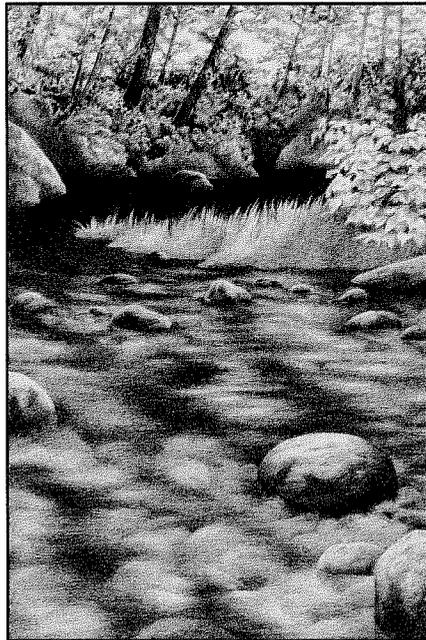
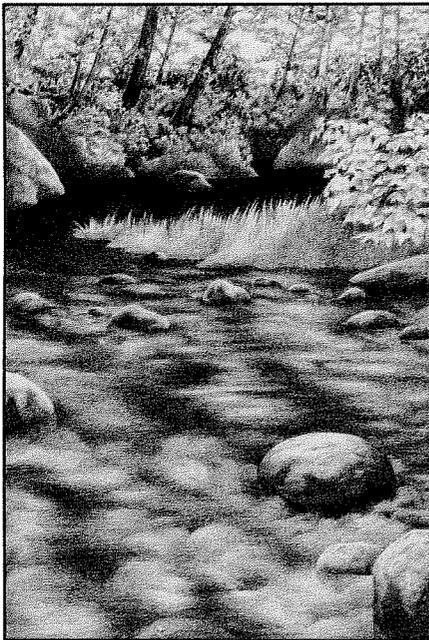
result of the Fishery Conservation and Management Act of 1976. This Act put the federal government in charge of the ocean fishery in the zone running from three miles offshore to 200 miles out to sea.

- *State fisheries agencies* set their own harvest seasons for their inshore (within three miles) fisheries.
- *The Columbia River Compact* is the granddaddy of fishery management entities in the Pacific Northwest. Initiated in 1918, the Compact provides a forum for Oregon and Washington to co-manage their harvests in the Columbia River system itself. Neither the Columbia Basin Indian tribes nor the state of Idaho are members of the Compact, however. ■■

—CC



Tackling the Tucannon



by John Harrison

Teamwork and tenacity improve farming and fish habitat in a scenic river basin.

Six thousand feet up in the mountains of the Wenaha-Tucannon wilderness in southeastern Washington state, the Tucannon River begins its 50-mile journey to the Snake River.

The Tucannon descends rapidly through steep, rugged terrain, a landscape of pine and fir forests, deeply incised canyons and, in the last 25 miles or so, fields of

winter wheat, barley, peas, bluegrass seed and cattle pasture. It is a land with a long history of settlement, dating to pioneer farms of the 1850s. A land where the temperature can drop to 20 degrees below zero in winter and climb to 109 in summer.

To those who live in the Tucannon River Basin, tenacity, it would seem, is more a necessity than a virtue. They are not many—just 800 in the 210,307-

acre watershed—but they are tenacious when it comes to improving the land they love.

They sought government help to improve the productivity of their land and the river's habitat for fish. When help didn't come, they kept on trying. They stuck with it for nearly nine years.

And won.

Today, their cooperative effort is widely acknowledged as a model for watershed improvement

projects. Their effort shows the value of packaging various improvements in a single program rather than treating each problem individually. For example, efforts to improve instream habitat for fish won't be successful unless contributing problems, such as erosion and poor riparian habitat, are solved first—or, at least at the same time.

"The Tucannon is an example of doing for soil erosion exactly what we want to do for fish habitat—a program that addresses contributing problems collectively," said Ted Bottiger, one of Washington's two Power Planning Council members. "The farmers deserve a lot of credit. They used a lot of their own money to do this work, and they did what's right."

Bottiger said the Council hopes to see cooperative watershed improvement projects like that in the Tucannon duplicated elsewhere in the Columbia River Basin. In fact, the Council recognized the importance of watershed projects in the first phase of its current, four-phase process to amend the Columbia River Basin Fish and Wildlife Program (an article on the amendments, focusing on phase three, opened this edition of *Northwest Energy News*).

In phase one, completed in August 1991, the Council recognized that about 40 percent of the remaining salmon and steelhead habitat in the Columbia Basin is bordered by private land. So comprehensive, concerted efforts by both public and private landowners are essential for an effective habitat management program.

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To that end, the Council directed the Bonneville Power Administration to finance the planning of three or more model comprehensive watershed projects, including at least one in Oregon, Idaho and Washington. (Montana has no salmon runs.) Cooperation is the key.

Perhaps no one is in a better position to assess the role of cooperation in protecting a watershed than Roland Schirman, the Washington State University extension agent in Columbia County, where most of the Tucannon is located. Schirman has been the Columbia County extension agent since 1979. He saw the Tucannon project develop from its infancy and helped it along.

"What did we learn? Well, we substantiated that all landowners do have concern for the land," Schirman said. "We learned that we can change land management practices economically. When you ask the producer to do it on his own, you place him at a disadvantage."

Can the Tucannon experience be duplicated elsewhere, as Bottiger hopes?

"I won't say it won't happen in a larger county, but in a small county like this, it's required that people wear numerous hats to get things done," Schirman explained. "So you have the groundwork already laid for the interchange of ideas. In larger counties, special interests have their own camps."

In the end, he said, the value of cooperation is the high quality of the resulting product.

"We spent a lot of time developing something workable," he said. "It will help us do what's necessary to be good stewards of the resources."

Defining the problem

In the case of the Tucannon, good stewardship means taking care of erosion. It's a big problem. How big? Consider this: One third of the land in the Tucannon Basin is used for dry-land (non-irrigated) crops. Ninety percent of this land is classified as highly erodible.

Studies in the 1980s by the U.S. Soil Conservation Service and others showed that erosion, largely from dry cropland, was responsible for dumping some 260,000 tons of sediment into the Tucannon River every year. That's valuable topsoil washing down the river. In addition, the 40 percent of the basin that is used as cattle rangeland has a history of heavy grazing. The result, in addition to declining rangeland quality, was an *additional* 47,000 tons of sediment spilling into the Tucannon annually.

Sediment spoiled much of the river's historic salmon and steelhead spawning and rearing habitat, and contributed sediment pollution to the Snake River.

There were other problems, too. The river suffered from high water temperatures in summer. Fish habitat had been degraded. And the river had a high content of organic material, such as crop residue. This was bad for fish because decomposing organic material tends to rob the river bottom of oxygen. The impact of 130 years of farming, of doing things the same way year after year, was producing a crop of problems in the Tucannon Basin.

The river no longer met state or federal water-quality standards. Fish habitat and valuable cropland were being ruined slowly, but steadily. It was time for action.

First, there were studies. The Soil Conservation Service, U.S. Forest Service (much of the upper Tucannon Basin is in the Umatilla National Forest), state fish and wildlife agencies and a consulting firm completed a study of the lower Snake River Basin in 1983.

The Tucannon recommendation: go to the Northwest Power Planning Council, which was formed by the four Northwest states under the Northwest Power Act of 1980. The Council, charged by the Act to "...protect, mitigate and enhance" the fisheries of the Columbia River Basin, prepared its first Columbia River Basin

Fish and Wildlife Program in 1982 and was in the process of amending the program at the time. Inclusion in the program would open the door for Bonneville to help finance fish habitat improvements in the Tucannon Basin.

But the 1984 Fish and Wildlife Program didn't list the troubled Tucannon as a priority. While the

habitat and production plans for each of the nearly three dozen subbasins of the Columbia that produce anadromous fish—including the Tucannon. The Council will take up those plans during phase three of the fish and wildlife program amendment process this spring.

In short, the Council has yet to discuss a detailed improvement



To control erosion, a log deflects water at a bend in the Tucannon. A Christmas tree merchant donated unsold trees, which are cabled to the log to further slow the flow.

program recognized the Tucannon's problems and proposed some of the same solutions that are being pursued today, there were other rivers with bigger problems than the Tucannon's.

Three years later, the Council's 1987 Fish and Wildlife Program included the Tucannon on a list of projects that were awaiting the outcome of Columbia Basin systemwide habitat and production planning, an effort set in motion by the Council that year. That effort culminated in

program for the Tucannon. In 1983, "the Council was a dead end," recalled John "Dusty" Eddy. He was district conservationist for the U.S. Soil Conservation Service in Columbia County at the time. Today he is district conservationist for Wasco County, Oregon. "The Council wasn't interested in upland treatment practices at the time. The Council was focusing on instream projects."

Eddy decided not to wait for the Council and Bonneville to act. He had an ally in the Tucannon project: Art Sunderland, manager of the Columbia Conservation District,¹ which has its headquarters in Dayton. Sunderland, who worked directly with farmers on land conservation measures, recognized the value of a cooperative project for the Tucannon and helped develop landowner interest and support. He listened to the farmers, gathered their ideas and helped incorporate them into the final plan.

This unique relationship between federal government and local government—Eddy working on financing, Sunderland gathering ideas—helped move the Tucannon project along.

Sunderland and Eddy turned to the Soil Conservation Service. The Service administers a fund under the federal Watershed Protection and Flood Act, Public Law 566, to improve river conditions.

“At the time, PL-566 funds mainly were for flood control and instream structures,” Eddy said. “We had to create the justification for erosion control practices, and we got bogged down in red tape.”

While waiting for a decision from the Soil Conservation Service, Eddy turned to another potential funding source—the Washington Department of Ecology. At the time, the Department was offering water quality improvement money through Referendum 39, a state law that was a precursor of the state’s current Centennial Clean Water Fund.

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“We put together a limited program for the Tucannon that had three phases: a no-till drill so we could demonstrate an erosion control practice; instream actions that included planting cottonwood trees along the banks of the river and constructing desilting basins in side drainages to collect sediment; conservation practices in rangeland and cropland, such as strip-cropping and off-stream watering for livestock,” Eddy said.

They got the money.

They bought a no-till drill, a huge thing—about 17 feet by 12 feet—that is pulled behind a giant tractor. No-till farming involves literally drilling seeds into a field, rather than tilling the soil with disks to turn it over. Tilling loosens the soil and promotes erosion, particularly in the hilly Tucannon Basin. Not all farmers embrace no-till farming because of, among other things,

weed problems—and, therefore, herbicide use—tend to increase. But the drill is available for any Tucannon farmer who wants to use it.

The conservation district and participating farmers planted one and a half miles of streambank in the upper part of the basin with willow trees. They fenced one side of the river in the same area to keep grazing cows away (the canyon was too steep for grazing on the other side).

Saplings came from existing trees along the river, an important point for Eddy. “We used all native vegetation,” he said. “The response was great.” The trees rooted and grew quickly.

There were unforeseen, but minor, problems. Beaver, for example. Beaver found the willow saplings delectable. The state Department of Wildlife trapped them and moved them to another site.

The collaborators built two desilting basins, about two or three surface acres in size apiece. The basins were completed in 1988.

Then another roadblock surfaced.

“We wanted to go upland, away from the river where erosion was a problem, to demonstrate water quality improvement practices, but the Ecology Department was hesitant to fund anything not associated with instream work,” Eddy said.

1. Conservation districts are divisions of state government that are led by locally elected boards of directors. The districts match government assistance with local needs and help landowners practice soil and water conservation.

Once again, the ingenious collaborators refused to take no for an answer. They turned to the river itself, where fish habitat had been degraded over time.

"We identified some fisheries improvements we could do," Eddy said. "We held meetings in the farmers' living rooms to talk about it. We walked the river. We came up with a lot of ideas and split it into several years' work."

Some landowners balked. They didn't oppose the idea, just the possibility of spending their own money to improve the stream habitat for fish. So Eddy and Sunderland convinced the state Department of Fisheries to pay for some of the work. Others chipped in, including private landowners, the Soil Conservation Service, Washington Department of Ecology and the Forest Service. Eventually, 54 structures were placed in the river, including log wiers and boulders to slow the flow and create resting pools for fish.

Some of the materials were free. The Forest Service donated two big logs for instream placement. The logs, spaced about 40 yards apart, completely cross the river and create resting pools for fish. The state Department of Transportation had excess boulders from a rip-rap project and said, in essence, if you can haul them, you can have them. They did.

Then, when it appeared the work hit another wall, there was another breakthrough. The Soil Conservation Service finally approved

the district's application for a watershed protection project under PL-566.

The result was the Tucannon River Watershed Protection Project, which went into effect last year. The project focuses on water quality improvement and calls for voluntary installation of conservation practices on approximately 45,000 acres of dry cropland, 62,000 acres of rangeland, seven acres of forest land and 12 miles of stream corridor.

On cropland, this will involve introducing farming techniques that discourage or control erosion. On rangeland, the project includes fencing along waterways and in pastures to distribute cattle, developing new water sources for livestock and planting grass. Grass also will be planted in the forest area.

At the request of landowners, new fences will be built along the river to keep cattle out of the water, trees will be planted and the

riverbank stabilized through the use of structures built from rocks and logs. Most of the work—about 70 percent—will be financed by the Soil Conservation Service.

This project is not going to solve all of the Tucannon's problems. Its focus is water quality, not fish habitat and production, although water quality improvements certainly help fish. Habitat and production proposals are included in the Tucannon system plan, which the Council will discuss this spring.

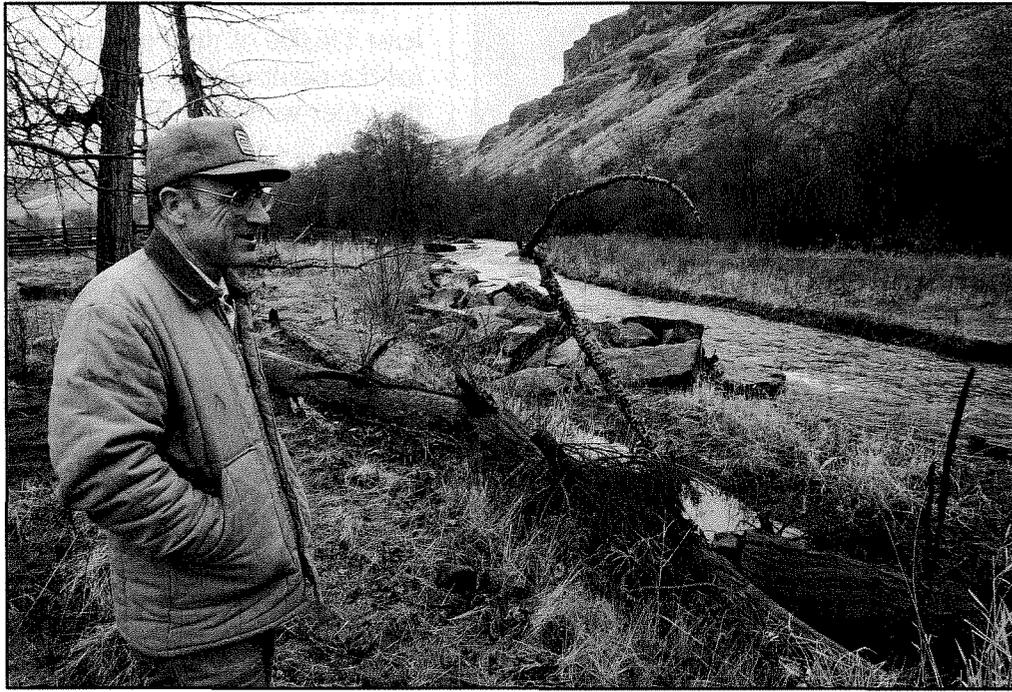
A lifetime of land conservation

In a sense, the Tucannon water quality project simply formalized and enhanced land conservation practices that began informally years ago. Decades, even.

Twenty miles up the Tucannon, 81-year-old Delbert Howard sits at the kitchen table of the home



A log placed across the river creates a resting pool for salmon. The U.S. Forest Service donated this log, and another like it is downriver about 50 yards.



Don Howard installed these boulders to control erosion and slow the flow of the Tucannon through his ranch. The boulders are connected by steel cables and can be lifted as a unit.

where he has lived most of his life, on land his grandparents settled in the mid 1800s. The view from the kitchen window is straight down the narrow valley, a quarter mile wide or so, flanked by the canyon, steep, rock-terraced and mostly treeless. He's retired now, having turned over the operation of the 6,000-acre Howard family wheat and cattle ranch to his sons, Don and Gerald, who are in their 50s.

Long ago, Del Howard shoved the riverbank around with a tractor to improve his flood protection and the river's fish habitat, too. He also envisioned desilting basins in Tucannon side drainages.

He remembers clearly what life was like in the valley earlier this century, when there were four elementary schools, dozens of families and plentiful salmon in the Tucannon.

"You could stand by the river, right out there, and watch the salmon go by," he said, gesturing out the kitchen window.

Today, the schools and most of the families are gone. So are most of the salmon. Spring chinook still run up the Tucannon, but not in the numbers they once did. Trout and steelhead are in the river, and there is a fish hatchery about eight miles above the Howards' land.

Why the salmon runs declined is a point of contention between farmers in the basin, and state fish and wildlife agencies. The agencies say erosion from farming and streambank damage from grazing cattle are to blame. The farmers acknowledge there were problems in the past, but say they have improved their practices and that the big problem today is excessive harvest allowed by the states downstream.

"If you stopped all fishing for four years, you could walk across the Tucannon on the backs of the fish," said Gerald Howard.

Maybe, but in the meantime, the Howard family is doing—has done—a lot to improve fish habitat in the Tucannon and protect their adjoining cropland at the same time. With the assistance of state fish and wildlife agents, the Howards have hauled 1,100 yards of rock for placement at strategic locations along the riverbank. The rock helps control streambank erosion and

slows the flow of the river, creating eddies and pools for spawning and rearing habitat. The biggest rocks are set into place and then drilled and strung together with steel cable. If necessary in the future, these structures can be moved as units.

The Howards have planted willows and grasses along the bank to help keep water temperature cool in the riparian zone. One of the Tucannon desilting basins is located on Howard property. When it is full—probably between 1998 and 2000—the Howards will scoop out all that valuable topsoil and spread it back on their cropland. "I'm paying my bank for the land that washes away, so I want to do what it takes to keep it here," Don Howard remarked.

Following a storm recently, it was evident the basin is working. Muddy water ran into the east end from a small creek that comes out of a nearby canyon; clear water ran out to the Tucannon from the west end.

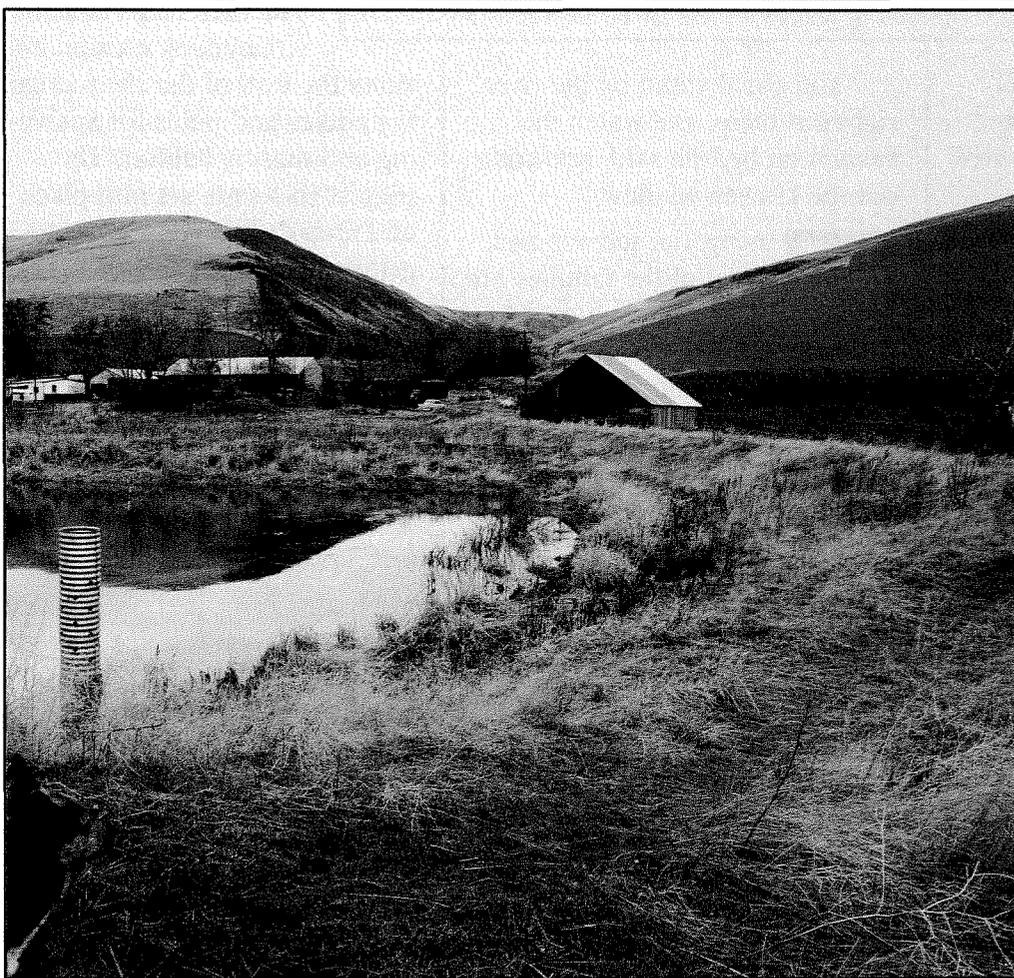
The Howards built fences to keep their cattle away from the river, and are continuing to build more fences. At one bend in the river, they even stacked huge old tractor tires two high and filled them with rock to protect cropland in the event of a major flood.

**“I grew up
on this river.
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I take care
of it.”**

**—Don Howard
rancher**

The cost of all this work? At least \$10,000 of their own money for the desilting basin. Some of the other work was financed through the conservation district, but the Howards also pitched in with their own materials, equipment and labor.

“In a river valley, you do management all your life,” Don Howard said. “You know, I hear people say, ‘you farmers run your livestock, and you till the fields, and you don’t care what happens to the land or the river.’ That’s just not true,” he said. “I grew up on this river. I make my living with this river. I take care of it.” ■■



That’s not a pond, it’s a desilting basin. The muddy creek flows into the shallow upper end of the basin, sediment collects on the bottom, and clean water flows to the Tucannon River through the perforated drain pipe at the lower, deeper end.

Healthy Habitat

It's a goal that is simply stated, but complex and difficult to achieve: healthy fish runs must have healthy habitat.

For salmon and steelhead, healthy habitat means clean, cool water; gravel for spawning; quiet pools for resting and feeding; and, where necessary, passage facilities that don't endanger fish.

Achieving clean water means controlling pollution, such as agricultural chemicals and siltation from erosion. To keep water temperatures cool, there must be adequate streamside shade from bushes, grasses and trees. Pools develop at instream obstructions, such as boulders and logs. These can be added to a stream, as can passage facilities at dams.

But instream improvements alone won't do the job. There is strong analytical support for a total watershed approach to habitat improvements, encompassing all

of the land the stream drains, as opposed to focusing solely on instream measures.

Last summer the Council amended into its Columbia River Basin Fish and Wildlife Program a number of priority projects to aid salmon and steelhead. Among those was a "model watersheds" program to undertake broad-based, cooperative work to protect and repair salmon habitat in the region's watersheds.

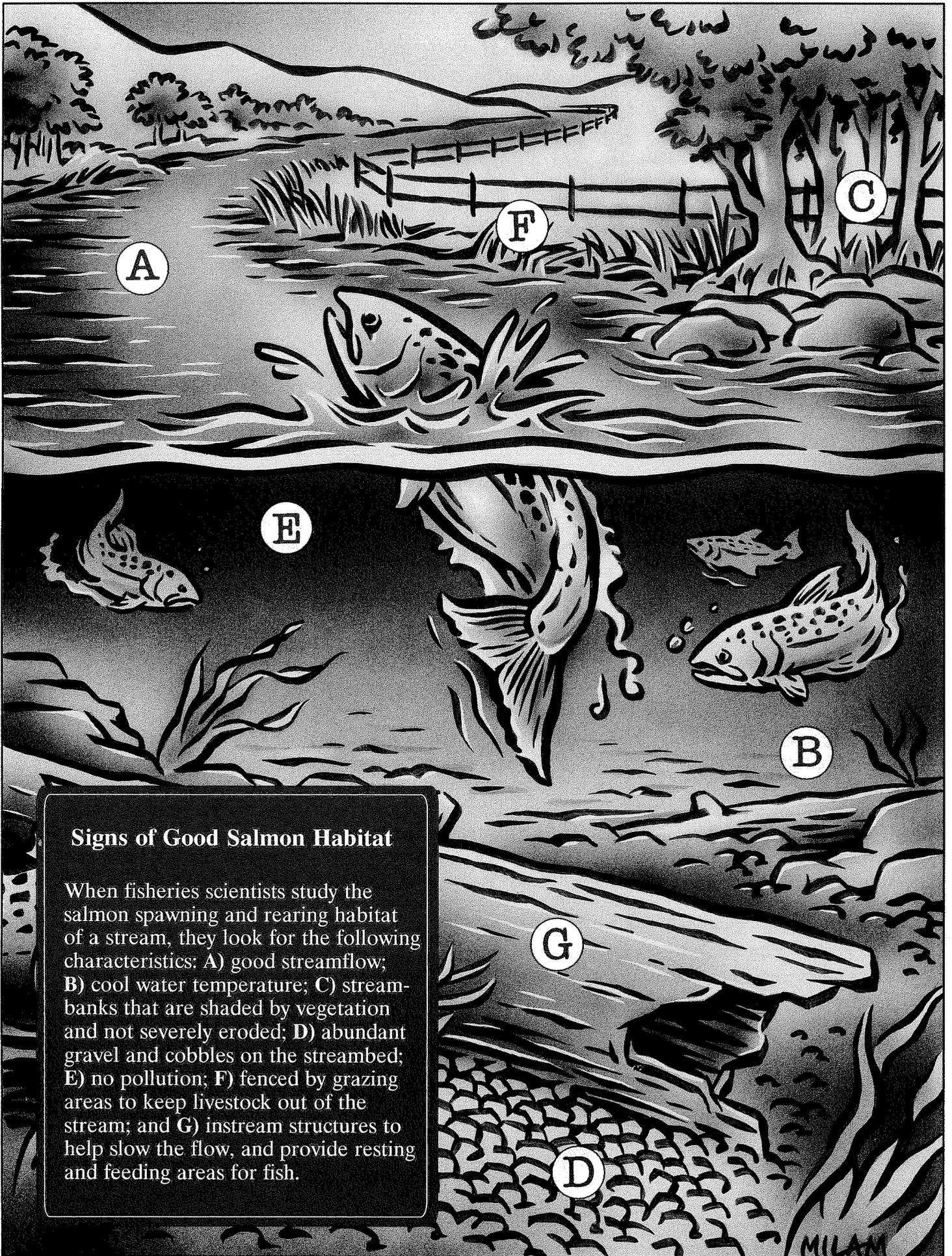
Cooperative, watershedwide improvement projects already are under way in Washington, Oregon and Idaho. The value of the

watershed approach was underscored by a study recently completed for the Bonneville Power Administration that found "dramatic, persistent and unfavorable" impacts on rivers and streambanks from livestock grazing, road building and mining in the study area, which included the Grande Ronde and John Day river basins of Oregon.

Another recent study concurs with the Bonneville findings.

In 1990, the Pacific Northwest Research Station, a subagency of the U.S. Forest Service based in Corvallis, Oregon, resurveyed the

There is strong analytical support for a total watershed approach to habitat improvements, encompassing all of the land the stream drains, as opposed to focusing solely on instream measures.



Signs of Good Salmon Habitat

When fisheries scientists study the salmon spawning and rearing habitat of a stream, they look for the following characteristics: A) good streamflow; B) cool water temperature; C) streambanks that are shaded by vegetation and not severely eroded; D) abundant gravel and cobbles on the streambed; E) no pollution; F) fenced by grazing areas to keep livestock out of the stream; and G) instream structures to help slow the flow, and provide resting and feeding areas for fish.

Grande Ronde River above La Grande, where the Forest Service inventoried fish habitat between 1936 and 1942. Since 1986, streams in four other Columbia River subbasins also were resurveyed, and the results were compared to the data collected 50 years ago.

Historic data shows that streams in these subbasins had an abundance of deep pools—important resting and feeding spots for salmon. The average was 15 or more pools per stream mile. Today, the average is fewer than seven per mile. The

only exceptions are in wilderness areas, where the number of pools is about the same. In all managed land—forested and farmed—the number of pools has declined dramatically. The reason: siltation and other changes in the structure of the stream channels caused by man's activities.

More needs to be learned about how pools form in different stream conditions, the researchers said, so that new pools can be created. ■■

—JAH

STRIP-CROPPING and GRASS WATERWAYS

A Harvest of Soil Savings and Cleaner Water

Promoted by: Columbia Conservation District

Signs like this in the Tucannon River Basin tell the story of the watershed improvement project. This sign is in a field several miles from the river.

PUGET'S CONSERVATION Report Card

- Residential retrofit
- Low-income residential
- Residential water heating
- Commercial and industrial energy management
- Commercial new construction

by John Harrison

Puget Power surpasses its 1991 conservation goal.

The conservation report card is in, and the grades are impressive for Puget Sound Power & Light Company. Puget Power, Washington's largest utility, ac-

quired 17.5 megawatts of energy savings through conservation in 1991. That is 1.5 megawatts beyond its goal for the year.

In 1992, the Bellevue-based utility plans to acquire 24 megawatts of conservation. That is

enough energy for about 14,000 homes.

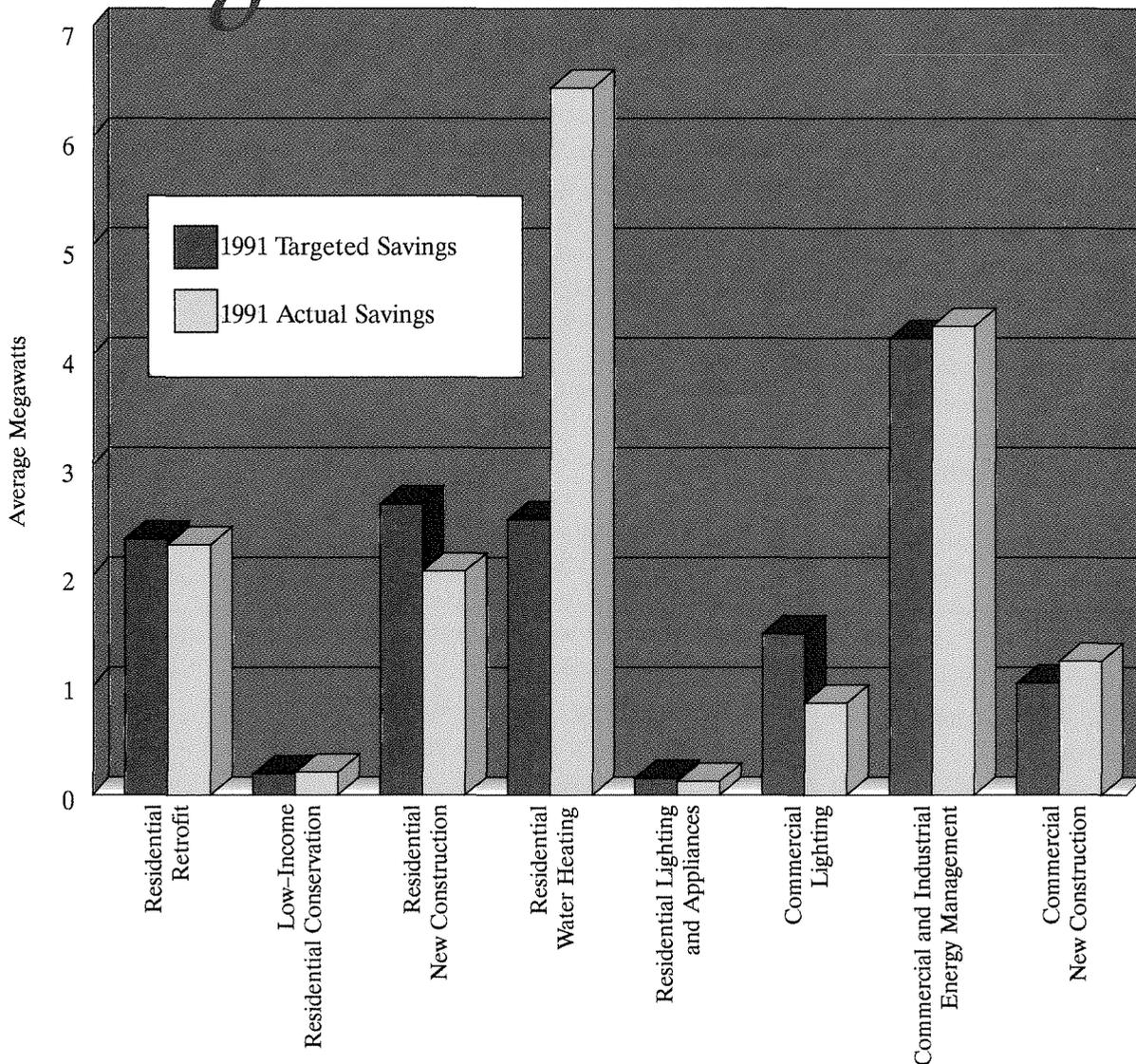
Puget Power appears to be leading all Northwest utilities on conservation acquisition. In 1991, Puget and the Washington Utilities and Transportation Commis-

sion entered an innovative rate agreement that ties the company's profits to the number of customers served, not the amount of energy sold. That cleared the way for Puget to aggressively pursue energy savings because the company doesn't have to rely solely on energy sales to make money.

In its 1991 Northwest Conservation and Electric Power Plan, the Northwest Power Planning Council calls on the region to acquire 1,500 megawatts of affordable conservation as quickly as possible. That is enough electricity to serve 1 million people. Electricity demand forecasts in the plan suggest the

region could need about 2,000 new megawatts by the year 2000. The plan also calls on the region to acquire 800 megawatts of low-cost hydropower and cogeneration (electricity generated as a byproduct of a thermal industrial process).

PUGET'S 1991 CONSERVATION SAVINGS *Targeted and Actual*



Acquiring 1,500 megawatts of conservation is an effort akin to building a new power plant, but the cost—the Council estimates \$7 billion—is about half the cost of acquiring that much electricity from conventional sources.

Richard Sonstelie, president of Puget Power, spoke about his company's commitment to conservation at a regional utility conference in Portland last November. The gathering included the region's 10 largest utilities and utility regulators from the four Northwest states.

Sonstelie said that Puget Power customers embrace the conservation effort. They realize rates won't go up as fast to pay for conservation as they would to pay for electricity from other sources, he said.

The utility's conservation target for 1991—16 megawatts—was twice the amount acquired in 1990. "We had an aggressive target in 1991, but we set it with the idea that it would be achievable," explained Jerry Lehenbauer, Puget's conservation programs manager.

In collaboration with the Washington Utilities and Transportation Commission and other parties, the utility worked out performance targets in nine major areas for the 1991 conservation program. The utility exceeded some targets and missed others, but still exceeded its overall target.

Lehenbauer said, "Commercial new construction was one of our biggest challenges. It's a new program. Other than some design assistance work with developers,

"You're so far ahead of the pack...why are you better than most others?"

**—Ted Hallock
Northwest Power
Planning Council**

architects and engineers, we had not provided funding for measures that exceed [building] codes. We had a high target, and we exceeded it. It basically means getting out there and getting everything that is constructed."

The utility excelled in commercial retrofits, commercial new construction, industrial conservation, residential water heaters and low-income housing.

Residential new construction posed problems for the utility. "Our program is flexible," said Lehenbauer. "We have the ability to move from one program element to another quickly. If you aren't successful in one area, you move on to another without losing sight of the overall goal."

Lehenbauer also pointed to his company's ability to get the word out to Puget's customers as one key to the utility's success. "Our communications plan has a component of increasing customer awareness of conservation—a call to action. That's been a big part of achieving our conservation target.

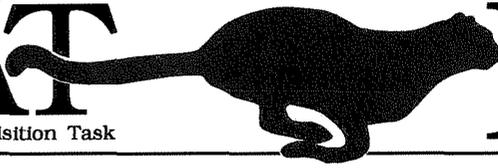
Lehenbauer said that Puget Power emphasized projects with the largest potential, such as the big gain in water heating conservation through the installation of efficient showerheads.

At its February meeting in Seattle, the Council heard a presentation by Lehenbauer on Puget's success. "You're so far ahead of the pack," remarked Council Chair Ted Hallock. "Why are you better than most others?"

"We have strong upper management support to pursue this," Lehenbauer responded. "We're successful at it because it is not that difficult. You just have to get out there and start doing it. We started in 1978, and we never really stopped." ■■

Tracking the
CAT

Conservation Acquisition Task



FORCE

Second CAT Force session stalks education and training.

The Northwest's Conservation Acquisition Task (CAT) Force, which represents utilities, local governments, state energy agencies, the Northwest Power Planning Council and citizen groups that advocate conservation, held its second meeting at the Council's office on January 15, 1992.

Tom Eckman, the Council's energy conservation manager, welcomed the 23 task force members, reiterating the Northwest's goal to conserve at least 1,500 megawatts of electricity by the year 2000.

Regional coordination

At the CAT Force's first meeting, members reviewed the benefits of sharing conservation acquisition experiences, especially the value of identifying successful conservation programs so other utilities, and state and local governments could replicate the successes.

That discussion was continued into the second meeting, where members expressed concern that it would be difficult to measure "success" in a regional conservation effort because the various utilities set independent goals for their programs. Each interprets successes against a different standard. To track the region's prog-

ress toward acquiring 1,500 megawatts, the CAT Force will need to help the Northwest translate individual utility accomplishments into a consistent formula.

CAT Force members also suggested that clear conservation goals for individual utilities, established using consistent methods regionwide, will help focus corporate attention and identify resources needed to achieve those goals.

Attacking the barriers: Coordinate energy education and training

When the CAT Force first met, the group identified a list of barriers slowing the progress of conservation acquisition (See *Northwest Energy News*, January/February 1992.)

At this second meeting, the CAT Force reviewed its list and added a new item: the need for a program that leverages the effectiveness of limited utility staffs by working with energy service companies, contractors and design firms. In this and each future meeting, members will explore these barriers and possible CAT Force responses to them.

The CAT Force had already agreed that the lack of trained and experienced conservation personnel could impede progress

in capturing energy savings. The need for a strong regional energy education and training strategy, state technical assistance efforts and other activities were seen as necessary to facilitate conservation acquisition.

Margie Gardner, conservation analyst for the Council, described a planning meeting held on January 10 to assess and enhance the region's current educational infrastructure. The meeting included representatives from organizations that provide an array of educational services across the region, ranging from technical assistance programs to four-year college level curricula.

Gardner related what *educators* said they need if they are to offer conservation training for the commercial and industrial sectors. The focus was on vocational retraining for existing professionals, and courses at community and four-year colleges for new personnel.

The Washington State Energy Office and Seattle City Light have jointly developed a compendium of energy-related classes currently offered. Despite the volume of offerings, significant gaps must be filled to ensure coordinated and comprehensive training.



One program that existed in the early 1980s, but was halted when conservation efforts were slowed down, is the technical and vocational program at Edmonds Community College, in Edmonds, Washington. Bonneville is providing funding to restart this program, which will include managerial and technical training for those who "turn the wrenches." The program is not aimed at developing program planners or program designers. Bonneville plans to fund the restart of a similar program that existed at Lane Community College in Eugene, Oregon.

Utilities and conservation contractors in the region require more qualified mechanical engineers, according to a recent Bonneville survey. One significant prerequisite for improving the supply of well-trained professionals is a long-term commitment from utilities to carry out conservation programs. Without the promise of jobs, colleges will have little incentive to develop the courses needed to train these professionals.

Gardner described four ideas the educators proposed to focus the conservation effort:

- *Technology transfer programs and continuing education courses.* The Edmonds Community College curriculum could be transferred to other areas. Four-year programs could be started now, and continuing education could be expanded.

- *Rigorous "internships" for people interested in working on conservation programs.*
- *Certification for lighting practitioners, building operators and others.* For example, the California Energy Commission may soon offer "lighting practitioner" certificates to graduates of a two-year community college program.
- *Use the Applied Technology Training Center model for energy, and include manufacturers.* The Training Center, located at Edmonds Community College, is a high-technology education facility funded by the electronics industry. Utilities and manufacturers could form a similar center for their industries.

A regional advisory committee on energy education

Bonneville set up the Energy-Smart Design Training Committee several years ago to determine what types of training opportunities should be developed to support conservation in the Northwest's commercial sector. Rather than create a new committee, the CAT Force asked the Bonneville committee if it could expand the scope of its mission and address long-term goals for the types of educational and vocational training needed to support Bonneville's 10-year commercial conservation targets.

The CAT Force asked Gardner to attend the next Energy-Smart Design Training Committee meeting and propose the following as a way to forge a regional advisory committee on education and vocational training:

- Include both industrial and commercial concerns.
- Expand committee to represent the region—invite those who deliver services and who will be hiring many of the re-trained or newly trained staff.
- Develop an education and training agenda through consensus by September 1992.
- Implement that agenda with diversified funding.

All investor-owned utilities present at the task force meeting agreed to participate in helping the region move forward.

Next meeting

The task force met again on February 20, 1992, at the Lighting Design Lab in Seattle, Washington. A meeting also was scheduled for March 19, with the location to be announced. ■■

—Dennis Bleything

Dennis Bleything is a Portland writer who will be reporting on CAT Force activities for the Northwest Power Planning Council.

Modernizing the Machinery in a MIDDLE-AGED HOTEL

Billings, Montana's old Radisson Northern Hotel is running like a youngster these days, thanks to a new energy-management system. The new, high-tech heating system implements energy-efficiency measures that have stabilized power bills incurred by the 50-year-old hotel and provided improved guest comfort.

"Even though upgrades had previously been completed," said Alan Elliott, general manager of the downtown hotel, "prior to the overhaul, we had no control over energy, and costs increased substantially year after year." A desire to save money and still provide the best services possible for their guests motivated hotel management to seek energy improvements.

Elliott said the system overhaul included replacing energy-wasting incandescent lights with efficient fluorescent bulbs, installing equipment that captures waste heat to preheat the hotel's domestic hot water supply and a computerized energy-management system.

Clerks at the front desk are now able to monitor temperatures in guests' rooms. When unoccupied, the staff keeps the rooms at lower temperatures. When somebody checks in, the heat's turned up.

Elliott feels the hotel has derived three primary advantages from the energy overhaul: first, the cost element—"Even though the hotel has experienced increased occupancy and energy rates have gone up," he said, "our power bills have stabilized and are now predictable."

Second, the system promptly alerts hotel management to problems, allowing them to be corrected before they are detected by guests.



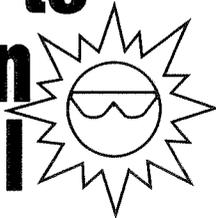
The Radisson Northern Hotel in Billings, Montana.

The third advantage is that the system allows for upgrades. Additions can be made to save even more time and money. For example, air flow across air filters could be monitored to signal when a filter becomes dirty. "Not only could it tell us that the filter needs to be replaced," said Elliott, "it could tell us what size filter to bring, and whether our energy manager needs to bring a screwdriver."

More than half the cost of the \$400,000 heating system overhaul was paid by the Montana Power Company as part of its program to pursue conservation as a viable energy source. ■■

—Ti Dahlseide
Montana Council staff

Idaho Power to Participate in Experimental Solar Plant



In an effort to tackle challenges facing the development of solar power, Idaho Power Company recently announced its support of Solar II, an experimental solar-powered electricity generating plant located in the California desert near Barstow.

The company will contribute \$500,000 over the next three years to the development of the plant. And because Idaho Power is a member of the Electric Power Research Institute (EPRI), an additional \$500,000 of matching funds will be provided by EPRI, bringing the company's total contribution to \$1 million.

Jan Packwood, Idaho Power's vice president of power supply, said that the Solar II experiments could lead to commercial sales of solar energy from the facility by the year 1998. The project is being managed by Sandia National Laboratories. Financing is coming from the U.S. Department of Energy and several electric utilities, including Idaho Power, Pacific Corp of Portland, Oregon, and Southern California Edison.

Solar I began operation in 1982 as a 10-megawatt, central receiver, steam turbine, pilot plant using water as the heat-transfer fluid. The water was converted to steam in the central receiver to directly power a conventional steam turbine. It was a workable system, but the disadvantages included the loss of steam during cloudy periods and a slow start-up.

Solar II will produce electricity during cloudy periods and at night by using heat stored in molten-salt. The salt will melt at 450 degrees Fahrenheit and will be kept liquid in an insulated storage tank at 500 degrees Fahrenheit. The molten salt will be pumped to the top of the receiver tower and heated to 1,050 degrees Fahrenheit by sunlight focused on a receiver. Then the hot salt will flow to a second insulated storage tank. When electricity is needed, the hot salt will be pumped to a conventional steam generating system.

"The combination of the central receiver solar collection technology and the molten-salt heat storage system promises to provide a reliable supply of electrical energy, even when the sun isn't shining," said John Prescott, an Idaho Power engineer.

Solar II is a relatively small power plant, but the project's developers feel the technology could be appropriate by the end of the decade for commercial solar-powered plants 10 to 20 times larger.

"This is an opportunity for the company to become involved in a technology that holds great promise for our service territory," said Packwood. "If the molten-salt technology lives up to its projected efficiencies, we're looking at plants that produce electricity at a cost competitive with coal generation, without the environmental impacts or fuel costs associated with thermal plants."

Idaho Power, along with the other project developers, will collect, evaluate and disseminate the information and knowledge gained from this project to utilities in the United States, as well as the solar industry.

The Council's 1991 Northwest Conservation and Electric Power Plan recommends implementation of a solar research, demonstration and development agenda. ■

—Karen Nelson
Idaho Council staff

Solar II experiments could lead to commercial sales of solar energy from the facility by the year 1998.

ADOPT A STREAM

Adopt-A-Stream”—the name conjures an image of someone gently caring for, understanding and lovingly tending to a stream’s overall well-being. Or, it conjures a picture of hard work and a long-term commitment. Both images are accurate and appropriate for an Everett, Washington, non-profit organization that not only is talking about polluted streams and poor habitat, but also is doing something about them.

Adopt-A-Stream began in 1981 as a Snohomish County Planning Department program to increase public sensitivity to the importance of Snohomish County’s 3,000 miles of creeks, streams and rivers, and to restore damaged waterways.

The program was so successful that in 1985 the Adopt-A-Stream Foundation was established to help others become actively involved in stream enhancement and environmental education. Most of the organization’s financial support comes from contributions from its members and volunteers.

More than 300 streams in Washington have been adopted over the past decade, including a recent start-up effort in Cheney, Washington. Tom Stalser, a Cheney biology teacher, says his students’ effort to adopt Marshall Creek, a 5-mile stream in southwest Spokane County, is going well. “The students recently met with a coalition of local residents in the Marshall Creek area and were well received,” says Stalser. “The idea is cooperation, not confrontation. I like to think of our program as stream therapy, and whatever we can do to help, we will do.”

“Adoptions similar to that in Cheney are taking place regionwide,” says Tom Murdoch, executive director of the Adopt-A-Stream Foundation. “We

teach the kids, the kids teach their parents, and the parents teach the politicians.”

There is nothing typical about the needs and actions taken within each watershed and individual stream. Activities can include: hatching salmon in a classroom to be released in the adopted stream, monitoring water quality, cleaning up garbage and debris from the stream or watershed area, or fencing off critical salmon or wildlife habitat from livestock. “The activities are limited only by one’s imagination,” says Murdoch.

The foundation sponsors educational workshops throughout the Northwest, spreading vital information and recruiting volunteers to set up parent groups who will be instrumental in the successful adoption of a stream. The foundation then provides follow-up field training sessions to those who agree to conduct a base-line watershed assessment, monitor their stream for two years and submit their data to the Environmental Protection Agency for its data base. This information can be used by citizens in local efforts, or by agencies making decisions ranging from fish and wildlife habitat management to land-use issues.

To participate, contribute to or obtain more information about the Adopt-A-Stream Foundation, write the Adopt-A-Stream Foundation, P.O. Box 5558, Everett, Washington 98206. ■■

—Carol Raczykowski
Washington Council staff

“Adopt-A-Stream/Streamkeeper” Workshops in 1992

Pullman	April 4-5
Walla Walla	May 2-3
Bellingham	June 6-7
Grays Harbor	June 27-28
Vancouver	July 18-19
Omak	August 1-2

Streamkeeper Summit

Ellensburg	August 29
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Salmon in the Classroom

There's something fishy going on at Madison High School in Portland, Oregon. It's a whole course devoted to Northwest salmon. A fish dissection, a trip to Bonneville Dam and a gourmet salmon meal all are components of this new addition to Madison's environmental academy. The class offers students a unique learning opportunity.

"We think the salmon issues of this region are broad enough to cover a wide spectrum of topics," said Chet Green, environmental studies coordinator at Madison High School. "We want to give students a hands-on approach to learning by visiting dams, streams and hatcheries. I even have a group dying to try salmon fishing."



Madison High School teacher Chet Green guides students through a salmon dissection.

Green has an innovative approach to the salmon study. He explores three different subject areas to demonstrate how environmental issues can be applied outside of science studies. From Green's perspective as a math teacher, his students analyze mathematical problems relating to salmon, learning how to calculate run sizes, water flows and electricity production figures.

Salmon biology is taught by Will Mittman with the help of outside experts. Northwest Power Planning Council biologist Dr. Willa Nehlsen will visit the class to introduce the life-cycle requirements and genetic background of salmon. Fish hatcheries' influence on wild salmon stocks will be explored with the assistance of Dr. Harry Wagner, another Power Council biologist.

English teacher Chris Brell will use literature and a visit by Indian storyteller Ed Edmo to present the history of Northwest salmon.

Additional guest speakers will visit the class to discuss the effects of commercial fishing, forestry practices, agriculture and endangered species listings.

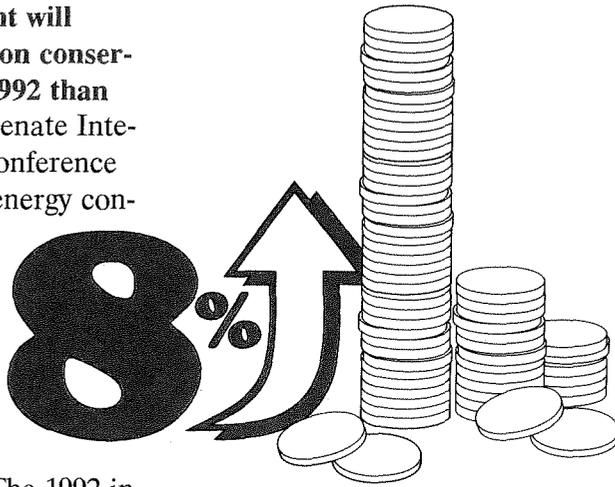
Students are also carrying out projects to pursue their personal interest in the salmon. "The kids' interest in the environmental studies program is really growing. With student projects, it may be possible for us to develop Madison as a field base for the study of flora and fauna," Green said. He hopes to include a greenhouse, a weather station and even waste management projects in future class efforts.

Madison High School is still in the beginning stages of establishing its environmental studies program at the school. The school hopes to pursue its innovative approach to environmental education by combining teachers from a variety of subjects to collaborate and present an integrated view of environmental issues. ■■

—Lisa Karnopp
Oregon Council staff

SHORTS

The federal government will spend 8 percent more on conservation in Fiscal Year 1992 than last year. The House/Senate Interior Appropriations Conference Committee increased energy conservation spending in one of its final acts in the rush toward adjournment in December. President Bush signed the appropriations bill on November 13. The 1992 increase is less than one third the amount that spending increased in Fiscal Years 1990 and 1991, but observers consider it acceptable in view of the economic climate caused by the recession. [Source: *Energy Conservation Digest*, December 9, 1991.]

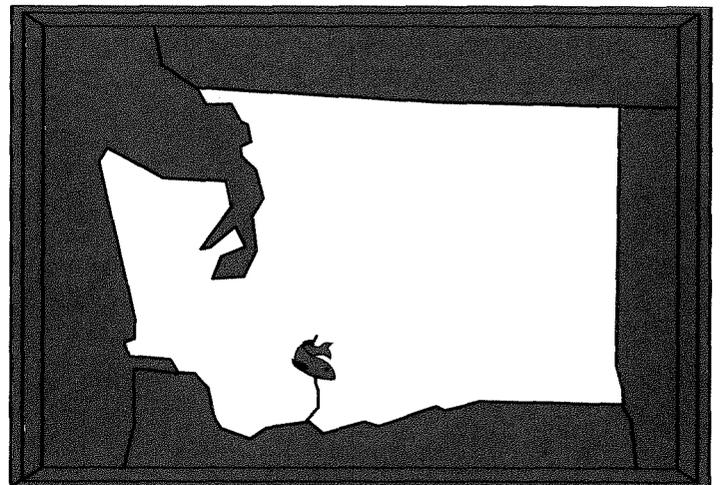


A new state energy code that took effect January 1 in Oregon will cut 30 percent to 40 percent from new electrically heated home's heating bills, state officials estimated. The new code is equivalent in energy savings to the Northwest Power Planning Council's model conservation standards. The code covers single-family homes, duplexes and multifamily buildings of three stories or less. Insulation requirements are spelled out for windows, walls, floors, ceilings, doors, forced-air ducts and slab foundations. These improvements could add \$800 to \$3,000 to the cost of a new, electrically heated home. [Source: *The Register-Guard* (Eugene, Oregon), January 12, 1992.]

The Washington Department of Wildlife is calling for the installation of fish passage facilities at Condit Dam on the White Salmon River, a Columbia tributary in Washington about 60 miles east of Portland. The department is interested in seeing wild steelhead recolonize the White Salmon, where steelhead once thrived. The 125-foot dam was completed in 1915, and is owned and operated today by PacifiCorp. Other agencies calling for fish passage at Condit include the Washington Department of Fisheries, National Marine Fisheries Service and the U.S.

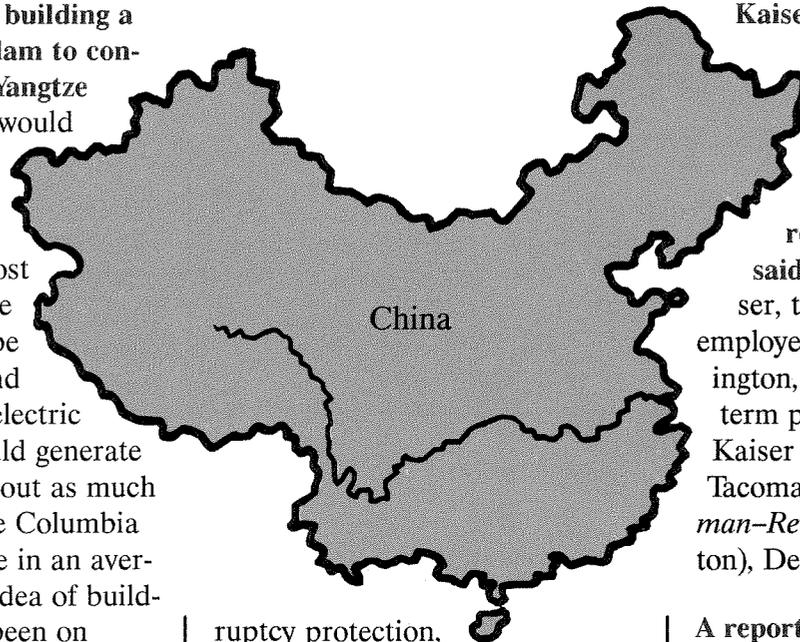
Fish and Wildlife Service. [Source: *The Associated Press*, January 7, 1992.]

North Bonneville, Washington, a town that has been fighting the U.S. Army Corps of Engineers for years over the second powerhouse at Bonneville Dam, declared bankruptcy recently. The town once sat near the north end of the old Bonneville Dam. To make way for the second powerhouse, the Corps moved the town about a mile downstream. The Corps and the town signed a relocation agreement in the early 1970s and, later, a construction agreement for the new town. Then the legal wrestling began. Both sides claimed the other renegeed on details of the agreements. Finally, in May 1985, a federal court awarded damages to both sides. The town was ordered to pay the Corps \$365,000—more than the town's annual budget. After six years of fruitless negotiations, the town declared bankruptcy last October, which will force new negotiations on a payment plan. Meanwhile, of the 20 lawsuits filed over the years, four remain active. [Source: *The Register-Guard* (Eugene, Oregon), January 5, 1992.]



China is considering building a huge, hydroelectric dam to control flooding on the Yangtze River. The new dam would create a 350-mile-long reservoir, uproot more than 1 million people and cost \$11 billion. The Three Gorges Dam would be the world's largest and most complex hydroelectric project, one that would generate 17,000 megawatts, about as much as all the dams in the Columbia River system produce in an average water year. The idea of building such a dam has been on China's national agenda since the 1920s, but it has been controversial because of the massive changes it would force on the millions of people who live in the Yangtze watershed. [Source: *The Washington Post*, December 12, 1991.]

The Norwegian fish farming industry suffered a blow recently after an association of salmon processors in that country failed in an attempt to corner the world salmon market. Auditors investigating a series of Norwegian bank failures uncovered a plot by the Norwegian Fish Farmers Sales Association. The association, which controls the sale of almost all of that nation's farmed fish, bought and froze the entire 1990/1991 Norwegian production of salmon in an effort to short the market and drive up prices. World prices rose slightly, but then began spiraling downward because of the glut of salmon already on the market. The association dumped a portion of its frozen stock, which drove down prices farther. Last November, the association filed for bank-



Kaiser Aluminum and Chemical Company expects to sign new electricity contracts with the Bonneville Power Administration, Kaiser's regional power manager said. Pete Forsyth said Kaiser, the largest industrial employer in the Spokane, Washington, area, will be "...a long-term player in the Northwest." Kaiser also operates a plant in Tacoma. [Source: *The Spokesman-Review* (Spokane, Washington), December 16, 1991.]

ruptcy protection, and a string of small banks also reported financial problems. These actions damaged the export and marketing arm of Norway's fish farming industry. [Source: *The Fishermen's News* (Seattle, Washington), December 1991.]

Energy conservation can help industries be more competitive, according to a paper prepared by the Northeast/Midwest Institute. Utilities that help industries modernize through energy conservation also help those companies become more competitive, enhancing local economies, researchers at the Institute concluded. [Source: *Energy Conservation Digest*, October 14, 1991.]

A report prepared for the Center for Marine Conservation says that U.S. efforts to halt ocean overfishing by foreign fleets actually is encouraging overfishing by Americans. The report says the Magnuson Fishery Conservation and Management Act and the regional fishery management councils have failed to conserve ocean fisheries. The 278-page report makes a number of recommendations, including establishing biologically based threshold levels below which no further fishing would be permitted. [Source: *Marine Fish Management* (Washington, D.C.), November/December 1991.]

—Compiled by John Harrison

CALENDAR

March 4-7—The Energy Efficient Building Association's (EEBA) "10th Anniversary Annual International Building Conference and Exposition" at the Sheraton Imperial Hotel and Convention Center in Research Triangle Park, North Carolina. Sponsored by the North Carolina Alternative Energy Corporation and others. For more information: William Lemke, EEBA, North-central Technical College, 1000 Campus Drive, Wausau, Wisconsin 54401-1899, phone 715-675-6331, FAX 715-675-6331.

March 7—"Energy Options: Finding a Solution to the Power Predicament," the Oregon State Federation of Garden Clubs Environmental Awareness Conference at the Reedwood Friends Church in Portland, Oregon. For more information: Pat Swonger, 8625 S.E. Morrison Street, Portland, Oregon 97216, phone 503-256-2792.

March 11-12—Northwest Power Planning Council meeting at the Baxter Hotel in Bozeman, Montana.

March 16-20—"Affordable Comfort VI," the sixth annual affordable comfort conference at the Pittsburg Hilton and Towers in Pittsburgh, Pennsylvania. The conference will address energy efficiency and affordability in existing housing. Sponsored by the Pennsylvania Energy Office and the Southwestern Pennsylvania Energy Center. For more information: Sara Crumm, Southwestern Pennsylvania Energy Center, phone 412-357-7573.

March 16-22—"Globe '92," at the Vancouver Trade and Convention Center in Vancouver, British Columbia. Globe's goal is to work with the international community to protect the environment, while at the same time, respecting the needs of national economic development. Sponsored by the government of Canada and others. For more information: Ray McAllister, Globe '92, 535 Thurlow Street, Suite 601, Vancouver, British Columbia V6E 3L6, phone 604-666-8020, FAX 666-8123.

March 17-18—"Non-Utility Generation: The Resource for the '90s? Building Alliances to Meet Future Power Needs of the Northwest" at the Red Lion Hotel/Lloyd Center in Portland, Oregon. A panel consisting of utility representatives will share their experiences, expectations and concerns. Sponsored by the Northwest Electric Light & Power Association (NELPA). For more information: NELPA, 827 N.E. Oregon Street, Suite 200, Portland, Oregon 97232-2108, phone 503-231-1994, FAX 503-231-2595.

March 25-26—"Globalcon '92: The Marketplace for Energy and Environmental Technologies" conference at the San Jose Convention Center in San Jose, California. The conference will address all segments of efficiency improvement, demand-side management, power generation and environmental management. Sponsored by the Association of Energy Engineers, Western Area Power Administration and others. For more information: Ruth Bennett, Associ-

ation of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, Georgia 30340, phone 404-447-5083, FAX 404-446-3969.

March 31-April 3—"The Crystal Ball Conference—An Insight to Your Energy Futures," at the Aotea Centre in Auckland, New Zealand. The conference will explore energy, economic and environmental trends and their impact on business. For more information: The Conference Company, P.O. Box 90-040, Auckland, New Zealand, phone 64-9-360 1240, FAX 64-9-360 1242.

April 8-9—Northwest Power Planning Council meeting at the Kah-Nee-Ta Resort in Warm Springs, Oregon.

April 8-9—"Enforcement Expertise for the 1991 Energy Code—A Better Way to Enforce the Code" at the Yakima Convention Center in Yakima, Washington. The conference will focus on enforcement issues for the new Washington State Energy Code. Sponsored by the Association of Washington Cities, Washington State Energy Office and others. For more information: Paula Fairchild, Association of Washington Cities, 1076 S. Franklin, Olympia, Washington 98501, phone 206-753-4137, FAX 206-753-4896.

April 23—A one-day regional forum on industrial energy efficiency in Everett, Washington. Sponsored by the Washington State Energy Office, Oregon State University, the Bonneville Power Administration and Northwest utilities. For more information:

Vicki Zarrell, Washington State Energy Office, 809 Legion Way, S.E., P.O. Box 43165, Olympia, Washington 98504-3165, phone 206-956-2139, FAX 206-753-2397.

April 24-26—"Theory to Practice," the second annual conference of the Environmental Education Association of Washington



(EEAW) at the Cispus Conference and Learning Center in Randle, Washington, near Mount Saint Helens. Sponsored by the Environmental Education Association of Washington. For more information: Peggy Britt, conference committee chair, phone 206-357-6333.

April 28-May 2—"Rivers for Tomorrow: Strategies for Planning and Management" symposium at the Red Lion Hotel/ Columbia River in



Portland, Oregon. The symposium will concentrate on key issues surrounding river planning and management. Sponsored by the American River Management Society, the Bureau of Land Management, the U.S. Forest Service and others. For more information: Conference Assistant, Oregon State University, College of Forestry, Peavy Hall 202, Corvallis, Oregon 97331-5707, phone 503-737-2329, FAX 503-737-2668.

April 30-May 2—"Public Policy and Competitiveness," the 26th annual Pacific Northwest Regional Economic Conference at the Conference Centre in



Victoria, British Columbia. For more information: PNREC, School of Public Administration, University of Victoria, Box 1700, Victoria, British Columbia, Canada V8W 2Y2.

May 6-8—"Changing and Innovative Strategies for Environmental Protection," the 1992 National Association of Environmental Professionals (NAEP) conference at the Stouffer Madison Hotel in Seattle, Washington. Sponsored by NAEP. For more information: NAEP, P.O. Box 1520, Alexandria, Virginia 22309-0210, phone 703-660-2364.



May 10-13—"Energy Forum '92" in Victoria, British Columbia. The conference will address energy-efficiency, energy trade and the effect of energy use on the environment.



Sponsored by the Energy Council of Canada, BC Hydro and the Province of British Columbia. For more information: Andrew Baker, BC Hydro, 910 Burrard Street, Vancouver, B.C. V6Z 1Y3, phone 604-663-3552, FAX 604-663-2844.

May 13-14—Northwest Power Planning Council meeting at the West Coast Wenatchee Center in Wenatchee, Washington.



June 1-12—"Earth Summit," the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil. In an effort to maintain the quality of the environment and achieve environmentally sound, sustainable development in all countries, the conference will address protection of the atmosphere, land and freshwater resources. For more information: UNCED, Room S-3060, United Nations, New York, New York 10017, phone 212-963-5959, FAX 212-963-1010.



June 10-11—Northwest Power Planning Council meeting at the Templin's Resort Hotel in Post Falls, Idaho.



June 22-25—"51st Annual Western Conference of Public Service Commissions" at the Coeur d'Alene Resort in Coeur d'Alene, Idaho. Sponsored by the National Association of Regulatory Commissioners. For more information: Carol Cooper, Idaho Public Utilities Commission, Statehouse Mail, Boise, Idaho 83720-6000, phone 208-334-0375, FAX 208-334-3762.



August 30-September 5—"Achieving Technical Potential: Programs and Technologies That Work" at the Asilomar Conference Center in Pacific Grove, California. The American Council for an



Energy-Efficient Economy's (ACEEE) 1992 Summer Study will focus on improving energy efficiency in buildings. Sponsored by the Bonneville Power Administration, the California Energy Commission and others. For more information: ACEEE 1992 Summer Study Office, 2140 Shattuck Avenue, Suite 202, Berkeley, California 94704, phone 510-549-9914, FAX 501-549-9984.

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

—Compiled by Judy A. Gibson

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The Northwest Power Planning Council is required by an Act of Congress to develop a program to protect, mitigate and enhance the Columbia Basin's fisheries and a regional electric energy plan that provides a reliable electricity supply at the lowest cost. For further information, see Pacific Northwest Electric Power and Conservation Act—Public Law 96-501.



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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

- 1987 Columbia River Basin Fish and Wildlife Program
- 91-04 1991 Northwest Power Plan—Volume I
- 91-05 1991 Northwest Power Plan—Volume II
- 91-07 1991 Directory of Organizations
- 91-16 Final Integrated System Plan
- 91-26 1991 Annual Report to Congress
- 91-27 Priority Salmon and Steelhead Production and Habitat Amendments (Phase One)
- 91-29 Priority Salmon Habitat and Production Proposals (Phase One)—Summary and Response to Comments
- 91-31 Amendments to the Columbia River Basin Fish and Wildlife Program (Phase Two) on Mainstem Survival, Harvest, Production and Other Measures to Protect Salmon and Steelhead
- 91-33 Amendments to the Columbia River Basin Fish and Wildlife Program (Phase Two) on Mainstem Survival, Harvest, Production and Other Measures to Protect Salmon and Steelhead—Response to Comments
- 92-01 Federal Register Notice: Notice of Response to Comments on Proposed Amendments to the Columbia River Basin Fish and Wildlife Program on Mainstem Survival, Harvest, Production and Other Measures to Protect Salmon and Steelhead
- 92-02 Staff Issue Paper: Pelton Dam Fish Ladder Production Project—Review of Master Plan
- 92-03 Staff Issue Paper: Hood River Production Project—Review of Master Plan
- 92-04 Nez Perce Tribal Hatchery Production Project Master Plan
- 92-05 Staff Discussion Paper: Columbia River Basin Fish and Wildlife Program Framework
- 92-06 Staff Discussion Paper: Systematic Assessment Methods for Decision-Making
- 92-07 Staff Discussion Paper: Genetics and Salmon Production
- 92-07A Staff Discussion Paper: Genetics and Salmon Production—Genetic Evaluation
- 92-07B Staff Discussion Paper: Genetics and Salmon Production—Genetics-Related Workshop Materials
- 92-08 Staff Issue Paper: Analysis of the Economic Impacts of the Council's Amendments to the Columbia River Basin Fish and Wildlife Program

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)

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Organization _____

Street _____

City/State/Zip _____

(Or call the public affairs division at the Council's central office, 503-222-5161, or toll free 1-800-222-3355.)

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