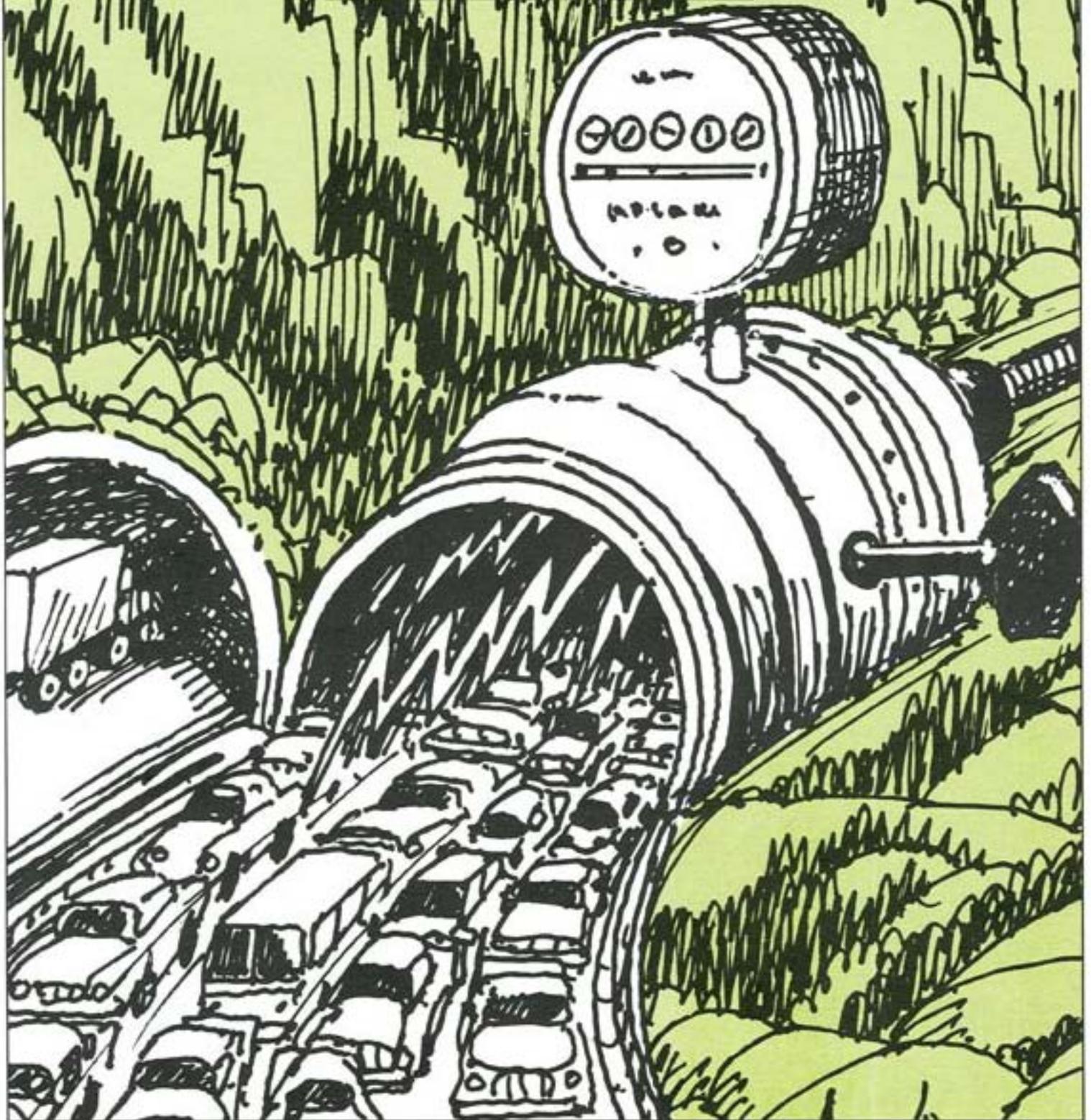


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CONTENTS WINTER ISSUE



3 Ominous Signs

Run size estimates bode ill for this year's salmon.

6 Interview: Angus Duncan

New Council chair faces new Northwest reality.

13 Taking the Long View on the Economy

Council gears up for new power plan with a look to the future.

20 Comprehending "Capacity"

Power planners take a more sophisticated look at integrating resources.

25 Trusting in Money

Will Montana's trust fund for wildlife have the money to do the job?

29 Salmon Corps

Indian youths spend a year working on behalf of salmon.

32 Shorts

34 Calendar

This issue's cover illustration is by Frank Farrah

from the CHAIR

It may be difficult to shift some readers' attention away from dwindling salmon runs, but our Council is also in the business of power planning, and this is the year we produce our next Northwest Conservation and Electric Power Plan. We face some major new issues in this endeavor:

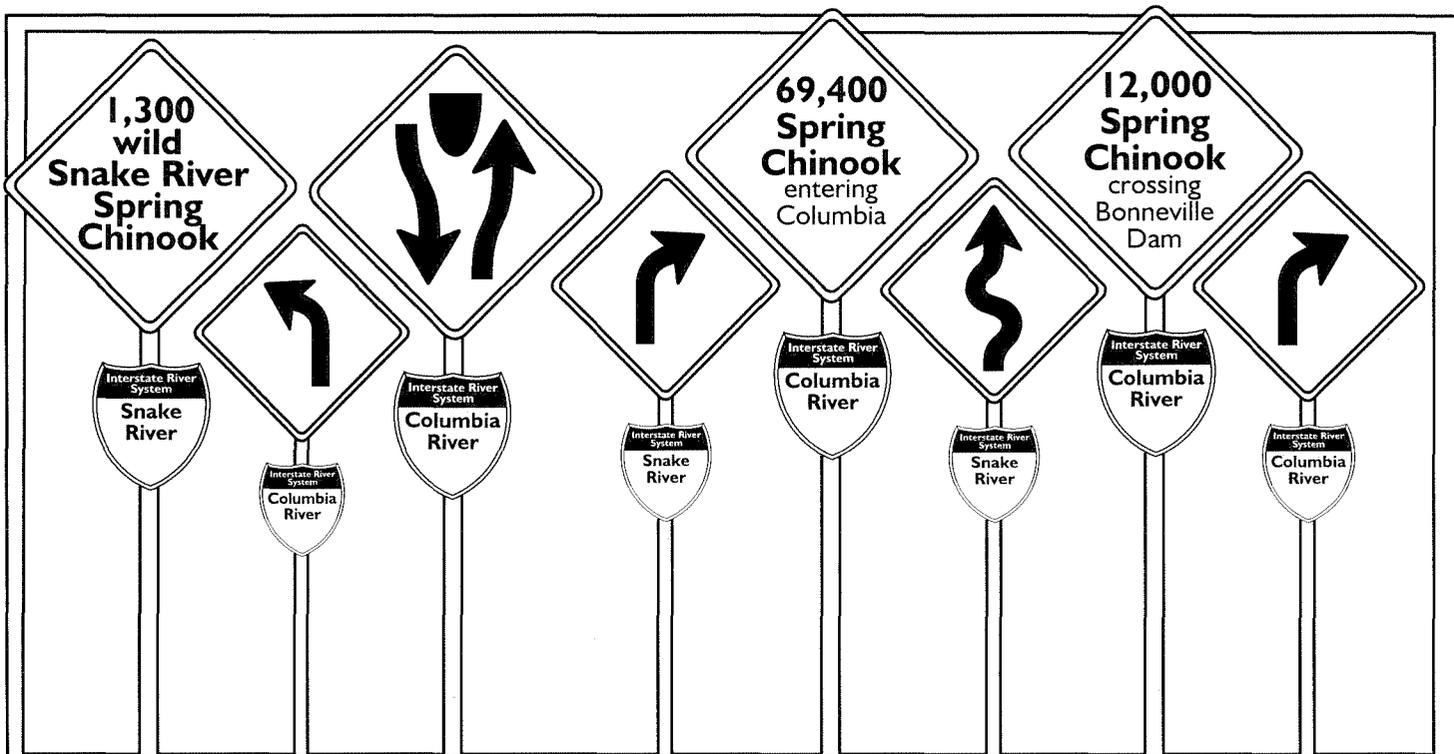
- We will need to be more sophisticated in how we preserve the hydropower system's flexibility and capability while accommodating necessary fish flows.
- We need to find ways to help electrical utilities learn to navigate their newly competitive marketplace.
- We must find new approaches to secure all available cost-effective efficiency improvements and renewable resources.
- We need to understand how environmental characteristics of various resources should influence our resource choices.

We begin to discuss some of these concerns in this issue. More than ever before, we need the advice, guidance and involvement of the region's electricity consumers — that includes all Northwesterners, not just industry professionals — as we proceed in developing our plan. To broaden our forum, we will be consulting with constituents across the Northwest over the next several months. We are also expanding our "discussions" into "cyberspace."



Power plan issue papers can now be found on the Energy Ideas Clearinghouse, an electronic bulletin board service. You can access the Clearinghouse BBS 24 hours a day by modem at 800-762-3319 from states in the Pacific Northwest, 800-797-7584 from other western states, or 206-586-6854 from other areas. You can find the service on the Internet at cicbbs.wseo.wa.gov. Council issue papers are in the NPPCPWR Forum. For person-to-person assistance, contact the Energy Ideas Clearinghouse between 8 a.m. and 5 p.m. Pacific Time, Monday through Friday, at 206-956-2237.

Also, while we received no "letters to the Council" for publication in this issue, we will continue to publish those we do receive. Please keep them under 200 words and related to subjects covered in this magazine.



by John Harrison

Like storm clouds building, something ominous is on the horizon for spring and summer salmon runs in the Columbia and Snake rivers. It's too early to know for sure, but indications are that the 1995 spring and summer runs of adult salmon are likely to be at record low numbers. For some runs, particularly those in the Snake River, this raises the specter of what biologists call an "extinction spiral" — numbers of adult fish so low that the run can't be sustained.

The ominous signs are in run size estimates prepared by the Oregon and Washington departments of fish and wildlife:

- 69,400 spring chinook are expected to enter the Columbia to spawn, down from 141,800 in 1994 and 208,200 just two years ago. The last time the run was estimated at fewer than 100,000 fish was in 1944, and even that estimate (78,400) was higher than this year's.

- 12,000 spring chinook salmon could be the number crossing Bonneville Dam, the first dam salmon encounter and the dividing line between upper-river and lower-river runs. This compares to 49,000 upriver fish estimated in 1994 and 112,900 in 1993.
- 1,300 wild Snake River spring chinook, down from 1,700 last year and some 8,800 fish in 1993.
- 49,000 spring chinook is the estimated run in the Willamette River, down from runs averag-

ing more than 100,000 fish just a few years ago.

- The outlook for summer chinook salmon is not much better. The estimated upriver 1995 run totals 9,600 fish, a record low. This includes 421 wild Snake River fish, down from several thousand fish in recent years.

In response to these estimates, the Columbia River Compact, an agency of the Oregon and Washington departments of fish and wildlife, eliminated sport and commercial spring chinook salmon fishing in the Columbia this year.

OMINOUS SIGNS

The states severely restricted Columbia River salmon fishing last year, but the only closure last year was in the Pacific Ocean. In 1994, the Pacific Fishery Management Council closed the Washington and northern Oregon coasts to all salmon fishing and allowed only limited fishing from Cape Falcon, about 20 miles south of the Columbia River's mouth, to the Mexican border. This year, the Fishery Council is expected to adopt ocean fishing regulations at its meeting in Portland, April 3-7. With run size estimates as low or lower than in 1994, the outlook for ocean fishing in 1995 is bleak.

There is no simple, single answer for the salmon decline, but some impacts stand out. "The lower-river fish are suffering because of poor ocean conditions," says Steve King, a biologist in the Columbia River Office of the Oregon Department of Fish and Wildlife. "Upriver runs are suffering from poor ocean conditions and large downstream mortalities of juvenile fish through the hydropower system."

"One area that certainly is cause for concern is the ocean, with the El Niño playing havoc with weather conditions and interfering with the near-ocean environment," agrees Dr. John Harville, an ecologist by training who retired as director of the Pacific States Marine Fisheries Commission. Harville was vice chairman of the Snake River Salmon Recovery Team, which developed recommendations for a recovery plan being prepared by the National Marine Fisheries Service under the Endangered Species Act.

El Niño, a warming of the water in the south-central Pacific, can result in dramatic weather changes around the planet, includ-

**This
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ing heavy rain and flooding in California and drought in southern Africa. As the warmer water pushes northward in the Pacific, the usual patterns of nutrient-carrying currents are disrupted, and salmon can starve if they do not migrate farther north to areas where food is more plentiful.

King noted that ocean feeding conditions have been poor for about a decade, but that during that time there have been some outstanding Columbia Basin salmon runs, including the fall chinook run in 1984 and coho runs in 1986 and 1991. "Ocean conditions are cyclic. We could see this thing snap around so quickly," he said.

Despite periods of high productivity, however, the general trend continues downward. There are multiple impacts at every stage of the salmon life cycle, from damaged spawning and rearing habitat to inhospitable river conditions (high water temperatures, low water velocities, predators, the impact of dam passage) to the impact of natural events far beyond human control — the ongoing, basinwide drought, for

example — in addition to poor ocean feeding conditions. All play a part. Some can be fixed; others are beyond human control.

"The best hope for reversing the steady decline of our salmon stocks is to attack the human-caused impacts aggressively, recognizing that we simply are unable to alter ocean conditions," said Northwest Power Planning Council Chairman Angus Duncan of Oregon.

Of all the human-caused impacts, dams probably take the greatest toll, Duncan said. Fixing the dams and improving river conditions for juvenile and adult salmon is a high priority for the Council, as it is for the National Marine Fisheries Service. In January the Service released its draft Biological Opinion on 1995 hydropower operations — in essence, its recommendations for operating the Snake and Columbia river hydropower system until the recovery plan is completed. The Biological Opinion and the river and dam measures in the Council's amended fish and wildlife program were "reasonably well-aligned," Duncan said. He noted that the Fisheries Service and the Council reviewed the same information and came to similar, although not identical, conclusions.

"Serious salmon mortality occurs at the dams as well as in the reservoirs, and both have to be fixed," he said.

But what about conditions beyond human control?

A lingering drought in most of the Columbia River Basin now is in its eighth year. Drought can affect salmon spawning and rearing

habitat by reducing stream flows and affecting air and water temperatures. 1995, however, is looking wetter than recent years. By mid-January, accumulated precipitation in the Columbia River Basin was 113 percent of normal compared to the 1961-1990 average, according to the Portland River Forecast Center of the National Weather Service. Similarly, the amount of water in the snowpack was 121 percent of normal.

This bodes well for the 1995 spring runoff, when river flows and velocities increase, and juvenile salmon migrate to the ocean. In January, the River Forecast Center predicted that with normal precipitation through the remainder of the winter and into spring, runoff should be about normal. Conditions in the Pacific Ocean, however, are far from normal this winter. This year's El Niño ocean-warming event is expected to last at least through the spring, according to the National Weather Service.

"We can't use poor ocean conditions or drought as excuses for cutting back in those areas where we can have an impact," Duncan said. "These fish runs could handle adverse natural conditions when they were healthy. We need to make them healthy again."

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What's the outlook for salmon? In the best case, ocean conditions improve and, combined with aggressive measures to improve survival inland, salmon runs steadily rebuild. In the worst case, the most depleted salmon runs plunge into an extinction spiral.

"We've had that with [Snake River] sockeye, and it looks like we're heading that way with [Snake River] spring chinooks," Harville said. "We're looking at about 40 different Snake River spring chinook stocks, and every time we lose one we reduce the genetic base."

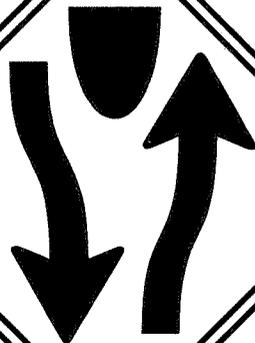
Eventually, the spring/summer chinook run in the Snake could drop so low that only a few fish return to some tributaries. If those fish can't spawn — for example, if the returning fish are of the same sex — then chances of extinction increase. If the same thing happens next year, extinction becomes even more likely.

"At that point, it's going to take an extraordinary effort to even have a chance of bringing them back," Harville said. He noted that such an effort is under way for Snake River sockeye, which have been bred in captivity in recent years. This is not the time to cut back on efforts to improve salmon survival at every stage of the life cycle, he said.

"We're either going to take these measures or we're going to lose these fish," Harville said.



**1,300
wild
Snake River
Spring
Chinook**



**69,400
Spring
Chinook
entering
Columbia**

Interview:

Angus Duncan

with Carlotta Collette

Angus Duncan tells a story about serving on an antique sailing ship. He went bare-foot most of the time and found himself bruising his feet at first as the ship motored down the inland waterway along the East Coast. After a few days, his feet acquired the knowledge of where all the obstacles were. "When we set sail out in the ocean, however, there were suddenly new obstacles added to the old ones, even in the same places, lines attached to the rings, you know. My feet had to learn all over again how to avoid getting bruised."

Duncan didn't mean this story as a metaphor for his term as chair of the Northwest Power Planning Council, but it applies. Having learned his way around the Northwest's power system and its salmon issues, he takes the Council's helm at a time when nearly everything he understood is shifting.

The Bonneville Power Administration, over which the Council was ordered by Congress in the Northwest Power Act to assume some planning authority, is no longer the entity it was in 1980, when Congress passed the Council's governing legislation. The utility industry itself is changing, from a system of regulated monopolies to a more competitive commodity market. Columbia River Basin salmon populations, which were in a steep decline at the time the Act was signed and still are, are rapidly becoming wards of the federal judiciary. Snake River sockeye and chinook have been listed under the federal

Endangered Species Act, and most of the various programs designed to rebuild them have been challenged in court.

It is this very rapidly evolving scene that Duncan has inherited, and he is fairly excited by the challenge. "Frankly, if I could choose the five years of the Council's existence in which I would be most happy to serve, these five are the ones I'd choose."

Ironically, Duncan, who now sees himself as very much centered in his watershed, started out in the U.S. Foreign Service. "It couldn't have been further away from this in some ways," he notes.

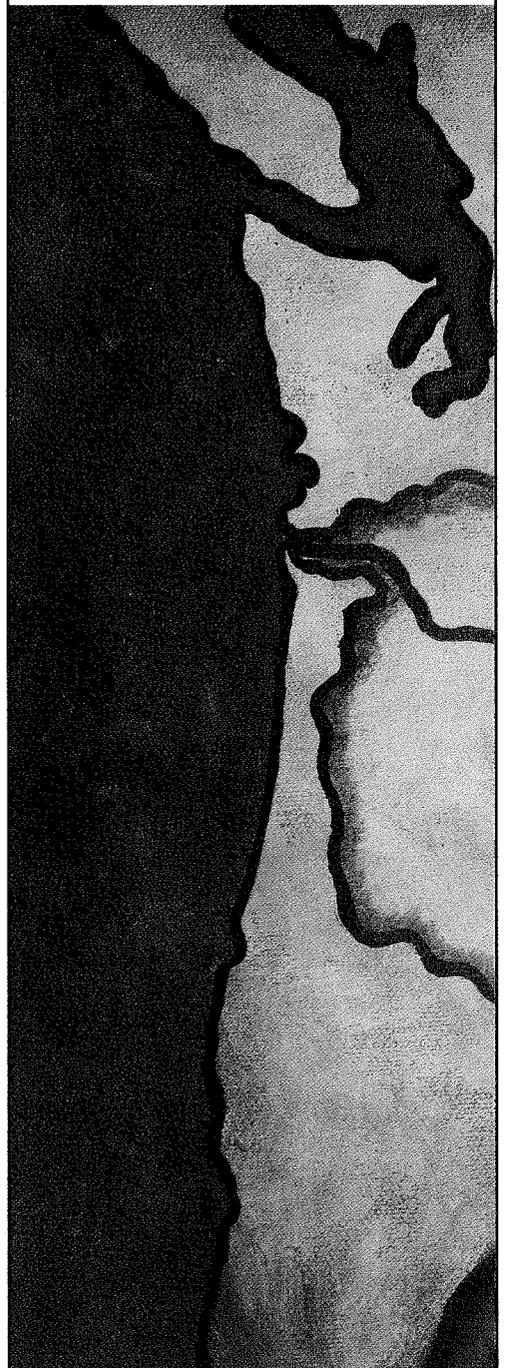
He blames his habit of reading "way too much Hemingway" for his decision to go from Harvard, where he had graduated cum laude with a degree in government studies, to the war in Vietnam instead of to law school. "It seemed the lesser of two evils. Less destructive to me personally." He studied Vietnamese and then lived there for a year and a half, working on local development and local security with the Agency for International Development.

Returning from Vietnam, he "did some political work and went sailing."

In the 1970s, he went to work for then-mayor of Portland, Neil Goldschmidt, as administrative assistant for urban policy. In 1977, Goldschmidt's office got wind that Northwest utilities were meeting at SeaTac Airport to redesign the way the Bonneville Power Administration and the Northwest's power system would operate. The meeting was report-

edly a closed-door affair.

Goldschmidt sent Duncan with a note up to Seattle for the meeting. "The note said, 'You can either let us in the room or we can hold a press conference outside the door,'" says Duncan. They let



New Council chair faces new Northwest reality.

him in. That meeting led to many more and eventually to the Northwest Power Act of 1980.

When Goldschmidt was asked by President Jimmy Carter to be Secretary of Transportation, Duncan went along to D.C. to be

director of energy policy for the Department. After Carter left office, Duncan returned to the West Coast to do energy consulting. Working for a wind energy company in California, then for a subsidiary of Pacific Power, he fo-

cused on energy resource development.

“I did everything from cogeneration in Michigan to geothermal in Utah, to solar in the western Pacific, to complete utility packages in the Caribbean, small hydro



Portrait by Stephen Hayes

in Alaska, district heating and cooling in San Diego. It was a great education in applied energy technologies and what the economics were. I supervised the engineering, developed the spreadsheets, drafted the contracts — the works.”

It was good training for the Northwest Power Planning Council. Duncan was appointed to the Council in 1990, by his old boss Neil Goldschmidt who had since been elected governor of Oregon.

While he was amply prepared for the power side of his job, he had less background on the fish and wildlife side. “There was a steep learning curve for me on the fish and still is,” he admits. “But these are important issues, and I’m glad I’m dealing with them. It’s important for the people of this region to engage these issues analytically and intellectually and to apply their values to them. There’s no more important task here or elsewhere than learning to accommodate human needs to the capacities of natural systems.”

Q *You assume the Council chair at a time when everything is in flux. We are beginning to build a new power plan, and concluding the multiyear rewriting of the Columbia River Basin Fish and Wildlife Program with the resident fish and wildlife amendments. What are your priorities for this year?*

Well, my priority is not to get eight votes on a power plan and kick it out the door. I want to ask the question: What are we trying to do with this power plan? Last time when we did a power plan, we wanted to shift the region’s thinking from a period of surplus

There’s no more important task here or elsewhere than learning to accommodate human needs to the capacities of natural systems.”

electricity to a period of load/resource balance. The practices we had talked about in the abstract were going to be applied to real life.

But those circumstances have also changed. The question now with respect to the power plan is: What is it supposed to accomplish? Where is it supposed to lead the Council and the region over the next five years?

The same is true of the resident fish and wildlife amendments. What are we trying to do? How are we going to make our contribution to solving natural resource conflicts as they become increasingly difficult? What do we do when we discover we’ve oversubscribed the rivers or the forests or public grazing land or whatever it happens to be? How do we resolve those kinds of conflicts fast enough for the fish and slow enough for the people?

Our plans should be platforms.

They have some specifics of what we want to do, but much more than that the plans ought to be how we see these forces affecting the region and how the region ought to be responding to them. They ought to be visions of how we see these pieces fitting together in a less adversarial and more collaborative way in the future.

Q *In terms of the power plan, what are the things we ought to be communicating now?*

What is most important to me is how we adjust to a utility world that is much more competitive and therefore much more focused on the short-term competitive advantage as opposed to long-term investment-horizon decisions. When we’ve got utilities that are afraid of losing their major industrial customers tomorrow, how do we convince them they ought to invest in capital-intensive, front-end loaded resources like conservation and renewables, whose payoff comes over 20 or 30 years? Their concern is losing market share this year, next year or the year after.

That’s particularly pointed right now with Bonneville [Power Administration], which had a country mile’s worth of competitive advantage for the past 60 or so years. Now it is very vulnerable to competition. And there are folks circling Bonneville like it’s a beast that’s all but dead. They think they’re going to pick its bones.

My view is that a regulated market is always a distant second-best in terms of efficiency to one that is driven by competitive forces. But one that’s driven by competitive forces also has all of the flaws of a competitive market-

place, including particularly the impulse to think and act and invest in the short term. The problem is not that the market is competitive, the problem is the resources that traditional utilities will increasingly be forced to buy. Those tend to be almost exclusively gas-fired combustion turbines that have relatively low front-end capital costs. Utilities can shift some of the risks — especially fuel risks — into the future.

The resources that suffer are the ones that are capital intensive: conservation and renewables. Once you've bought those new windows or a wind turbine, that's a sunk investment. You can't get your money out of it. To realize your benefits you've got to run it for 20 or 30 years.

So I have a lot of concern about how we act as the guardian of the long term in a region whose focus is shifting to the short term. I would argue that this is our principal obligation. This focuses us particularly on conservation and environmental values.

Q *As guardians of the long term, as you put it, what should the Council be doing in this much more competitive world?*

Markets operate better and more efficiently depending on the quality of information they have. So I think that the Council's principal function in power planning in the future will be laying out the different consequences of long-term versus short-term decisions. We should be providing information to and working closely with state utility commissions and facility siting councils so the resources they sanction are the best choices for the whole region, not just for their individual states. It is argu-

"How do we resolve conflicts fast enough for the fish and slow enough for the people?"

ably a more effective way to influence market-driven choices than relying on the levers that are in the Council's last power plan and in the Power Act.

Our information has to be a lot more sophisticated, and it has to recognize that different mechanisms are going to drive decisions than have in the past. We will be playing to our strength if we see our role as providing information about choices and consequences and tools to help people make use of that information. The idea of our developing a power planning program on a computer disc so smaller utilities can do their own least-cost plan, is the kind of tool I think we can provide.

Q *What about on the fish and wildlife side? What about the very-contentious salmon program the Council adopted in December?*

One of the questions I've gotten from time to time is why we have tried to move heaven and earth to save three runs of Snake River salmon. And the best an-

swer I can come up with is I would toss over the Snake River runs into oblivion, and I'd toss in the Endangered Species Act, too, and all I'd ask for in return is a law and a commitment to implement that law that would slow the rate of species extinction in the Pacific Northwest by half. I don't even want to stop it, because I don't think that's possible, just slow it by half. But we can't even do that; at least we can't do it right now.

The point of these three runs is to draw a line and say we are not going to consume any more of our natural resource capital. We're going to conserve what's left, because we're going to have to live off it for a long time — from now on.

We have to allow for some flexibility, of course. Some species are going to go extinct no matter what we do, but we say in the Columbia River Basin Fish and Wildlife Program that we passed two years ago that we will draw a line and say no net loss of biological diversity in the Pacific Northwest.

Q *Is that the same as saying no more development or no more growth?*

No, it isn't saying that at all. It says that before we elect to grow further and faster on the basis of consumption of our natural resource capital, we must determine what the threshold needs are of the other species. Whether it's temperatures in the river or adequate flows or a conservation reserve for owls or whatever. We must establish what those threshold needs are to keep species at a sustainable level. Not the level that existed prior to our arrival here. Just at a sustainable level.

We have to do that and respect those thresholds before we take more for ourselves. And we have to do this in the context of conserving functioning ecosystems. Species don't survive outside their ecosystems.

There's lots of opportunity for growth, but it's probably not grounded in taking more water or more trees. It probably is grounded in being smarter about how we use the water or how we use the trees, or how we use the grazing land. It's using creativity and information and imagination as economic inputs rather than doing what historically we've done, which is labor and economic capital and natural resource capital — water and trees and so on — as the basis for economic growth.

In Youngs Bay, for example, we're building a fishery that can be self-sustaining economically, not one that just eats money or endangers upriver stocks. The more efficient use of grazing land that a number of eastern Oregon ranchers have been doing, where they move their herds around is another example. The kind of water use farmers are doing in the Hermiston area where they're using satellite technology and moisture sensors in the fields to apply just the right amount of water, also accomplishes more using less.

Those are all examples of natural resource-based activities that are made more efficient and more economical by using imagination — our intellectual capital. That's the way we can grow.

One of the sensitivities I see is folks coming out from the Portland or Seattle area and telling ranchers or loggers they can be retrained to write software.

They'd probably make more money if they did, but it's not an economic issue for them. This is-

"What we're trying to do is save ourselves here, not just the fish."

sue is cultural and historical. They want to be ranchers. They understand intuitively the difference between knowing the price of something and knowing its value. They place a value on living in a community that is part of their family history. It's not a sterile economic solution. We pay way too little attention to those cultural and historical elements of environmental choices.

One of the most important lessons I've learned from these people is to look past prices, to values. So when we talk about three runs of Snake River fish, and some folks say maybe we should just write them off, I think they are missing the point badly. What we're trying to do is save ourselves here, not just the fish. The fish are important to us economically, but more to the point, they are important to us culturally. They are a part of our identity here in the Northwest. We value that, and we ought to be willing to put up our money to protect our values.

They are also important to us biologically in ways we just don't understand yet. In our hubris we always think we can apply an en-

gineering solution to a biological problem. It's what's been done on the river. It's what a lot of people still believe we should do on the river. Barging fish is an engineering solution to a biological problem. We ought to view it skeptically because it is almost impossible for engineered solutions to parallel the complexity of the biological systems they are trying to replace or augment. We've learned that with hatcheries.



Tell us about the Council's decision in December.

What I think we tried to do in December was to say to what extent can we change the river so it looks enough like what the fish evolved to that they can begin to rebuild. Barges have a much diminished role to play. Transporting fish in barges is basically a life support system. That's what the best available science says to me. We've got a critically ill patient and it's on life support. You don't unplug the life support until the patient has started to mend. But you don't pretend the life support is a cure.

What we did in the Council's plan was to say we will improve conditions in the river for fish: through additional water, through improved passage around the dams, through improved passage through the reservoirs, so the river begins to resemble the original hydrograph the fish evolved to. Water moves a little faster, it's a little cooler, it moves sooner, so the fish can move sooner. All things to try to inch back toward what the river looked like 150 years ago, without pretending that we can restore that original river.

In that context, a drawdown is simply a means of moving fish through a reservoir that wasn't there historically. It's a tool. Like

transportation is a tool. It should not be regarded as an ideological litmus test. If there's a pivot point for the Council's plan, and also for the National Marine Fisheries Service plan, it is in how we use transportation and improvements in inriver migration conditions so they are complementary and not either/or choices.

What we did in the Council's program is certainly not perfect, but it is incrementally closer to what's needed. Our analysis said, if we do this package of measures, or ones that are reasonably similar, we can expect to see runs rebuild. That should be a minimum test for any recovery program. You ought to see progress toward bringing these fish out of the critical danger zone.

Q Of course one of the criticisms of our program is that it's not based in science.

Other people have other models that analyzed the rebuilding and came to different conclusions.

How do you respond?

The science of environmental decision-making has gotten far more difficult and complex in the 90s. Thirty years ago a big environmental issue was clearing up a badly polluted Willamette River. The science was pretty clear. The sources of pollution were identified. The fix was straightforward.

The Columbia Basin is not that simple. We've got much more complex environmental problems now, the consequences of which are more uncertain. They may be visited on us downstream 20, 50 or even 100 years from now. And whether you move to fix them is as arguable as how you fix them.

The salmon are very much that kind of problem. Maybe if we had systematically started collecting

"Some people want changes in environmental laws, but most don't want to give up the protection of our environment."

data on them 20 years ago or 30 years ago, we'd have a much better sense of what we need to do. But we collected data episodically, and we didn't maintain the data, and we didn't improve the collection methods. There are big gaps. We didn't think we had to do better. After all, we had thousands of fish.

Uncertain science invites people to be rhetorically irresponsible. Whether it's the Columbia River Alliance saying there is no science supporting drawdown and velocity as important to fish — which is patently nonsense — or an environmental group saying there is no science that supports barging fish ever, under any circumstances. That is also nonsense.

But because of the inconclusiveness of the science in the middle, it is very easy for people to draw these extreme rhetorical conclusions.

Our Act says to go with the "best available science." It also

says that the science, particularly with regard to salmon, is likely to be inconclusive, and the Council cannot use that as an excuse not to take action.

It is a caution. We may take more modest and careful action. We may set up hypotheses to test. We're doing all that. But we can't not act. In addition, the condition of the runs, which are now going to be measured in three figures instead of four or five, does not allow us to extend analysis and evaluation indefinitely. We have to act.

What I think the Council did was go out and ask what is the best science available on relationships among smolt survival, life cycle survival, velocity of migration down the river, dam passage, predation, turbidity, temperature. All the things that say these fish are migrating in good conditions or in hazardous conditions. We went to an independent evaluator, Dr. Glen Cada of Oak Ridge National Laboratory, to undertake an independent review of the data that were available.

Most of the credible data said, and Dr. Cada agreed, that there is a positive correlation between flows and life cycle survival of these fish. The level of flows and the velocity of movement of fish over the past 15 years have been insufficient to do anything other than possibly slow the rate of extinction, and that is true of transportation as well.

We know we have to continue to barge fish in very bad inriver migrating conditions: low water, hot water, high predator activity, and so on. But we know the fish will not rebuild if all we do is transport. We have to improve inriver conditions sufficiently so we can increasingly move fish out of the barges and back into the river to migrate. When we have

done that, then we have a plausible chance to rebuild these fish.

We are also testing two hypotheses so we can learn over time from what we're doing. We're going to keep some fish in the river under all circumstances and barge some fish under all circumstances and compare returns over multiple life cycles so we can refine our strategy as time goes on.

We are very nearly to a point where the ability to reach a political solution will be lost entirely, and this issue will go to the courts. People who think it will be solved by repealing the Endangered Species Act or, for that matter, repealing the Northwest Power Act, are kidding themselves in some very dangerous ways. If the decision is to get rid of those runs of fish, what it would really involve is not just those two acts, but getting rid of the National Environmental Protection Act and a whole body of legislation passed over the past 20 years. And I don't believe the American public is willing to do that.

Finally, it would mean going back even further than that to override Indian treaty rights that go back about 150 years and all of the legal decisions that have upheld those rights.

That's a pretty tall order. Some people want changes in environmental laws, but most don't want to give up the protection of our environment.

We must start to recognize that the Columbia River Basin is a single watershed that begins in Canada and runs out into the ocean. The lines we draw on maps to delineate states and counties and tribal reservations and ceded lands and national forests and you

"Uncertain science invites people to be rhetorically irresponsible."

name it, we're not going to get rid of them, but we have to superimpose something on top of them that says this is also a functioning organic watershed, or at least it was once, and it can be again. But only if we learn how to stand back and conceive it as a watershed, plan for it as a watershed.

That doesn't mean setting the Council or some other body up as a command and control entity. It doesn't mean we'll vacate ways of doing business that have been built up over a number of years, or in the case of the tribes, over a century and a half.

But somebody needs to establish a reference point that says if we are to treat this watershed as a watershed and treat it well, and if we want it to recover to these standards, here is what we would do. If this is our goal for this watershed then here are the tasks that fall to the Forest Service and to the state of Washington and to the Nez Perce Tribe and to the Wallowa County Court. Here are the things they'd need to do to make what they're doing fit with what everyone else is doing.

This is what we're trying to do in the Grand Ronde Basin in Oregon. It seems like a small and isolated subbasin. In fact it's very

complicated. It encompasses parts of two states. The bulk of it is divided between two counties. The lower Grand Ronde is Nez Perce country. The upper Grand Ronde is in the ceded lands of the Umatilla tribes. Two thirds of the watershed is federally owned, the rest is state or privately owned. There are all sorts of these complications. But there's also a Grand Ronde Model Watershed Board, and it includes most of the parties who would otherwise retire behind those lines.

In a very halting way, that board is trying to think of the Grand Ronde as a watershed. Thinking about: If a mine is leaching sediment into the upper Grand Ronde, what are the consequences when you get down into the Wallowa Valley? If you pull irrigation water out of the Wallowa River, what happens to the lower Grand Ronde?

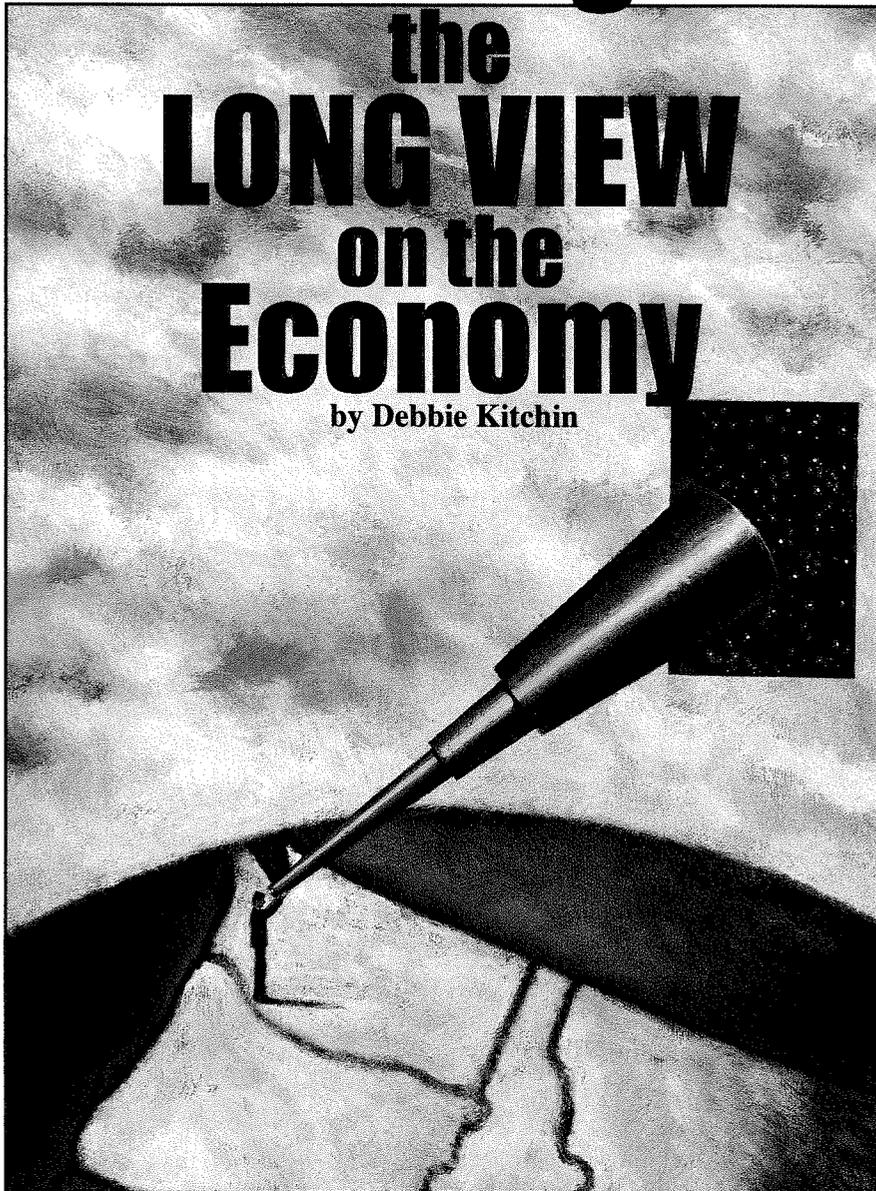
If it's important to think this way in the Grand Ronde, then it's that much more important to do so for the Columbia Basin, which stretches over two countries and is connected hydrologically to events that may take place thousands of miles into the ocean.

We need a picture of the basin that's a whole picture. That's a personal long-term objective of mine, and I think it should be an objective of the Council. I think arguably it is. If you go back and read the statute, it says treat the Columbia River Basin as a system. I may not have chosen that word, but the clear intent of Congress was to think of it as a basin and not a lot of parts that you can chop up and give away.



Taking the LONG VIEW on the Economy

by Debbie Kitchin



Council gears up for new power plan with a look to the future.

1975 Recession — Stagflation — The Fall of Saigon — Volkswagen Rabbits — Gerald Ford (the only president not elected as either president or vice president) — Mainframe Computers with Punched Cards (What, no PCs?) — High Oil Prices — Power Shortages — One Flew Over the Cuckoo's Nest Sweeps the Oscars.

A lot can change in 20 years.

Looking 20 years into the future is always a risky business, but it's what planning is all about. And it's one of the jobs of the Northwest Power Planning Council to plan for the Pacific Northwest's future electricity needs. To do that, the Council first develops 20-year forecasts of the region's economy. The Council's forecasts are the only comprehensive long-term eco-

nomical and demographic projections developed for the four-state Pacific Northwest region. The economic and demographic forecasts are the single most important means of estimating future electricity needs, although fuel and electricity prices have significant impacts as well.

The forecasts the Council develops consist of industrial output and employment projections for more than 20 manufacturing

The Council's forecasts are the only comprehensive long-term economic and demographic projections developed for the four-state Pacific Northwest region.

industries; employment projections for more than 20 categories in the commercial sector; and forecasts of population, households, housing stock by type and personal income. The forecasts are extremely detailed. Changing demographic and social characteristics are reflected in the linkages between employment and population and between population and households.

Forecasting out 20 years brings in a lot of uncertainty, so trying to pick a single target can be futile. For this reason, the Council develops a range of forecasts that covers plausible futures for the region. The high case shows a region where employment grows from 4.3 million to 7.9 million and population increases from 9.7 million to 15.7 million by the year 2015. In the low case, employment only reaches 5.0 million and population is at 10.9 million by the year 2015.

The average annual rate of growth in employment in the high case is 2.8 percent each year, compared to a low case of only 0.7 percent per year. The medium-high and medium-low cases bracket the more probable range of growth. The growth rate for employment in the medium-high case is 2.1 percent per year, compared to a medium-low case of 1.2 percent per year. The Northwest is projected to grow faster than the nation in all but the lowest growth forecast.

There are a number of big changes that are common to all of the Council's forecasts to some extent. These are some of the same big changes that have been having an impact on the region's economy and communities for some time. They will continue to affect us into the next century.

**BIG CHANGE #1
The Industrial Mix**

Traditionally, the manufacturing sector in the Pacific Northwest has been dominated by resource-based industries, such as forest products and food products. Half the manufacturing employment in 1970 was in lumber, paper and food products. Although these industries are still significant, their importance is declining. Currently, the largest manufacturing industry in the Northwest is transportation equipment — primarily The Boeing Company in Washington. Transportation is followed by electronics. Lumber and wood products now makes up the third largest manufacturing industry in the region. In addition, the group of industries generally classified as "other" has grown significantly.

In the Council's medium case forecast, the electronics industry is projected to be the largest Northwest manufacturing employer by 2015. Other industries also are

projected to grow, leading to a more diversified manufacturing sector.

The changes in industrial mix are critical to electricity use. Five industries currently account for 87 percent of the industrial electricity use in the Northwest: primary metals, pulp and paper, chemicals, food processing, and lumber and wood products. These industries are all projected to experience slow growth or decline over the forecast period. This will have a significant impact on electricity demand in the industrial sector.

The biggest change is the decline in the lumber and wood products industry. Lumber production is projected to decline in all of the forecasts, as reductions in federal timber harvest take effect. Most people are familiar with the reductions in harvest as a result of spotted owl protections, but there will also be reductions in harvest to protect other species, such as salmon.

**BIG CHANGE #2
Growth of the Service Sector**

Non-manufacturing industries now account for 85 percent of total regional employment. This growth has been aided by a number of factors. Manufacturing productivity has increased, decreasing employment relative to output. Out-sourcing has led to some functions being performed by service firms, instead of within manufacturing industries. A larger proportion of manufactured goods is produced in other countries. The increase in women in the labor force has led to the purchase of services that were formerly carried out within the home, without a financial transaction (and therefore not counted in national income tallies).

In some cases, the distinctions between manufacturing and service industries are not clear. Temporary employment companies, classified as services, sometimes provide short-term jobs in manufacturing. Portions of computer software development, which is considered a business service, may be reclassified into printing and publishing, a manufacturing category. Many services are packaged and sold in units similar to manufactured products, and manufactured items include a substantive service component. More and more, manufactured products are sold in conjunction with services or as part of a package that includes products and services.

Most people think of service industries as the consumer services: restaurants, housekeeping services, dry cleaners and beauty salons. But another important cat-

egory of the services industry is producer services: those services that are sold primarily to businesses. These include engineering and management services, computer software development, mailing services, marketing and public relations. Because about a third of these industries have sales outside their state or country, they bring in income from outside the region and provide for economic growth.

Another significant and growing industry in the Pacific Northwest is the tourism and travel industry. It is difficult to measure this industry by the usual employment categories because employment related to tourism is mixed together with employment that serves the local population. Categories include food service, hotels, guide services, amusements, airports, gasoline stations and so on. The tourism and travel

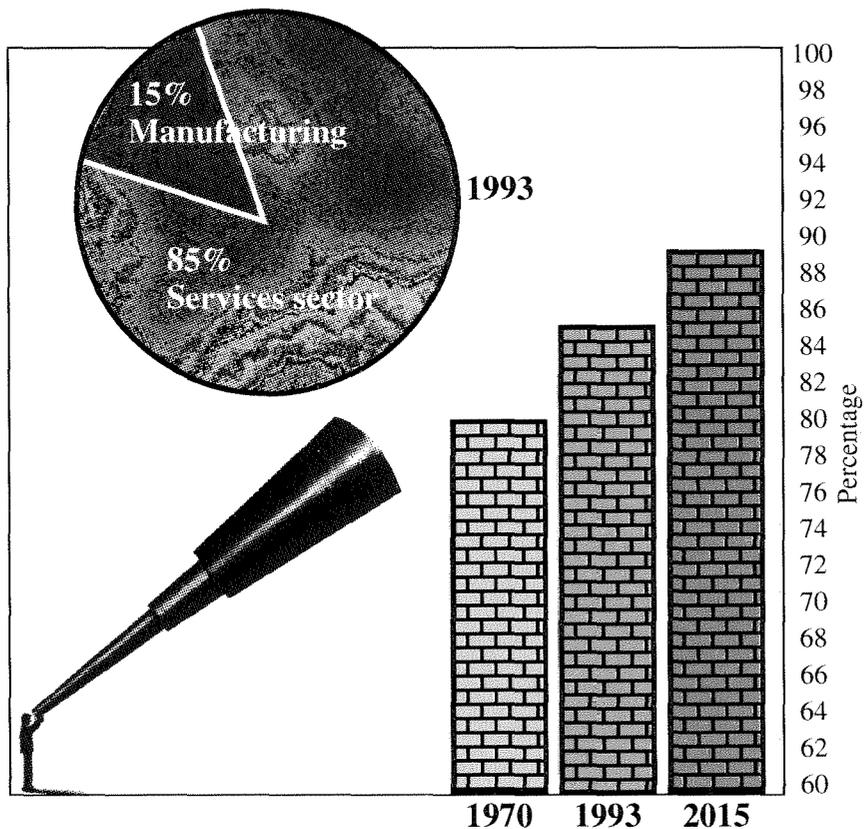
industry is expected to benefit from the aging of the population, as the middle-aged population spends more money on travel and leisure than a younger population.

BIG CHANGE #3

Aging of the Population

One of the primary demographic forces at work in this country is the aging of the population. Over the next 20 years, the population of the United States is projected to increase nearly 21 percent. This population growth will not be evenly distributed between age groups, however. The population aged 50-59 is projected to increase nearly 80 percent, while the population aged 30 to 39 will actually decline. The population over the age of 75 is projected to increase 46 percent, more than twice the rate of increase of the overall population.

Services sector share of total employment in the Northwest



This aging of the population is expected to affect consumption patterns, the labor force and labor productivity. Consumption patterns are expected to emphasize personal services, clothing, travel and health services, as the older population increases.

Over the next 20 years, the number of young people entering the labor force will increase at a slower rate than historically. As a result, lower employment growth is projected. The tightening labor supply will put upward pressure on wages. Producers will seek to

substitute capital for labor, which tends to increase productivity or output per employee. In addition, the rapid pace of technological change and re-engineering efforts will stimulate increasing productivity.

We Get By With a Little Help From Our Friends ...

When Professor William Beyers of the University of Washington sent a stinging letter of criticism on the Northwest Power Planning Council's lack of knowledge about the changing nature of the services sector, he was asked to join the Council's Economic Forecasting Advisory Committee. "We were very impressed with his letter," says Debbie Kitchin, Council staff on the committee. "It's difficult to do a good forecast from your office, staring at a computer screen. I need all the outside input I can get."

The Council's advisory committees on both the energy and fish and wildlife sides are a big part of what makes the whole process of planning for an entire region work. There are experts helping to assess both conservation and generating resources; experts helping to take the broad view working with other state agencies; experts who help coordinate operations of the hydropower system; and the experts who helped Kitchin produce the economic forecast that forms one of the foundations of the new power plan.

Kitchin's group is diverse, with representatives from each Northwest state and many of its major industries. They don't always agree on how to describe trends in the forecasts (what a surprise!), but their debate is what Kitchin is after. "The forecasts can only benefit from all the critical scrutiny. I want a credible product that can serve as the base for the next phases of the power plan. I couldn't do it without these people."

Economic Forecasting Advisory Committee

Randy Barcus	<i>Senior Market Forecaster</i>	Washington Water Power
Tom Bayh	<i>Utility Planning Analyst</i>	Northwest Natural Gas
William Beyers	<i>Chairman, Dept. of Geography</i>	University of Washington
John Church	<i>Corporate Economist</i>	Idaho Power Company
Ann Eike	<i>Chief Economist</i>	Port of Portland
Mike Ferguson	<i>Chief Economist</i>	Idaho Division of Financial Management
Charlie Grist	<i>Energy Policy Analyst</i>	Oregon Department of Energy
Don Hofford	<i>Economist</i>	Bonneville Power Administration
Lynn Michaelis	<i>Chief Economist</i>	Weyerhaeuser Company
John Mitchell	<i>Chief Economist</i>	U.S. Bankcorp
Ham Nguyen	<i>Economist</i>	Portland General Electric
Bill Nicholson	<i>Manager, Corporate Energy Services</i>	Potlatch Corporation
Lon Peters	<i>Senior Economist</i>	Public Power Council
Paul Polzin	<i>Director, Bureau of Business and Economic Research</i>	University of Montana
Chang Mook Sohn	<i>Executive Director</i>	Washington State Forecast Council
Paul Vickery	<i>Economist</i>	Pacific NW Generating Company
Paul Warner	<i>State Economist</i>	Oregon Executive Department
Pete West	<i>Senior Policy Analyst</i>	Renewable Northwest Project

BIG CHANGE #4

Labor Force Changes

The labor force has been changing as women's participation has increased. Further increases are projected, although at a slower pace than in the past. In addition, the growth of ethnic minorities in the U.S. population is having a profound effect on the composition of the labor force. This trend will continue throughout the forecast period. Changing labor force needs will also lead to increased training and continuing education for workers to adapt to a world that is transforming at a rapid pace.

BIG CHANGE #5

Expanding World Markets

The world is becoming more interconnected. The Pacific Northwest is already more dependent on international trade than other parts of the country. The region has benefited from its ties and proximity to the rapidly expanding Pacific Rim countries. This impact, as well as changes in technology and growing cultural ties, will result in economic growth in the region.

BIG CHANGE #6

New Information Technologies

The Pacific Northwest is a desirable place to live. As the changes brought about by the information "superhighway" make it easier for people to work at home and "telecommute," the Northwest will attract those who have the ability to relocate for quality-of-life reasons. Advanced information technologies will also enable more profitable utilization of natural resources in the Northwest's traditional resource-based industries. For example, in

the lumber and wood products industry, firms can use computer and laser technologies to maximize their profits. Current market information on prices for different products is combined with laser scanning that shows the most profitable cuts for each log.

Similarly, in the agriculture sector, current market price and sales information is available to help farmers target production on the most profitable products. Farmers can also use computerized, satellite-relayed weather and soil analysis to make their operations more water, fertilizer and energy efficient. Changes such as these will help the resource-based industries remain competitive.

What Do the Changes Mean for Each State?

Idaho

Idaho has been the fastest growing state in the region for the last six years, and many of those years it was at or near the top of the growth charts for the whole country. The reasons for this rapid growth have included an expanding high technology sector and a desire of many people to enjoy Idaho's high quality of life. Idaho offers stunning natural resources, less crowding, lower housing costs and lower costs of doing business. The "Potato State" is rightly named, however, as agriculture and food processing are still Idaho's largest industries. The state is much more resource-dependent than its neighbors to the west, although rapid growth is leading to increasing diversity in the state's industrial base.

Within manufacturing, employment in food processing represents 27 percent of Idaho's employment, compared to only 13 percent at the regional level. Lumber and wood products has been

the second largest manufacturing industry until recently and currently accounts for 21 percent of employment. The second largest manufacturing industry is now electronics, which accounts for 24 percent of employment. In 1970, food processing, lumber and wood products, and primary metals accounted for 63 percent of Idaho's manufacturing employment, and electronics was only 3 percent.

Growth in electronics is projected to continue in Idaho, and this, along with growth in a number of smaller manufacturing industries, new areas of food processing such as dairy products destined for West Coast markets, and other developments will lead to strong growth for Idaho for the forecast period.

Montana

The Council develops a forecast for the 16 counties of western Montana, the area that approximately matches the portion of Montana that is in the Bonneville Power Administration's service area. These 16 counties account for about 37 percent of the state's population and employment. This portion of the state has been growing rapidly over the last few years, led by an influx of new residents seeking the Montana lifestyle and by the growth of the tourism industry.

Western Montana is the most heavily dependent of the areas in the region on lumber and wood products, with 55 percent of all manufacturing employment in that industry. Other major industries include primary metals and pulp and paper in the manufacturing sector, and mining and tourism in the non-manufacturing sector. The economy has been diversifying, and this is expected to continue, but lumber will remain the largest

sector, still accounting for more than 40 percent of manufacturing employment in 2015.

Western Montana is projected to grow the slowest of the areas forecast by the Council. However, the outlook is good for steady growth, especially as the state continues to diversify its economic base.

Oregon

Oregon's economy has been growing at a steady rate over the last few years. The primary reasons for growth have been the expanding high technology industries and population growth as

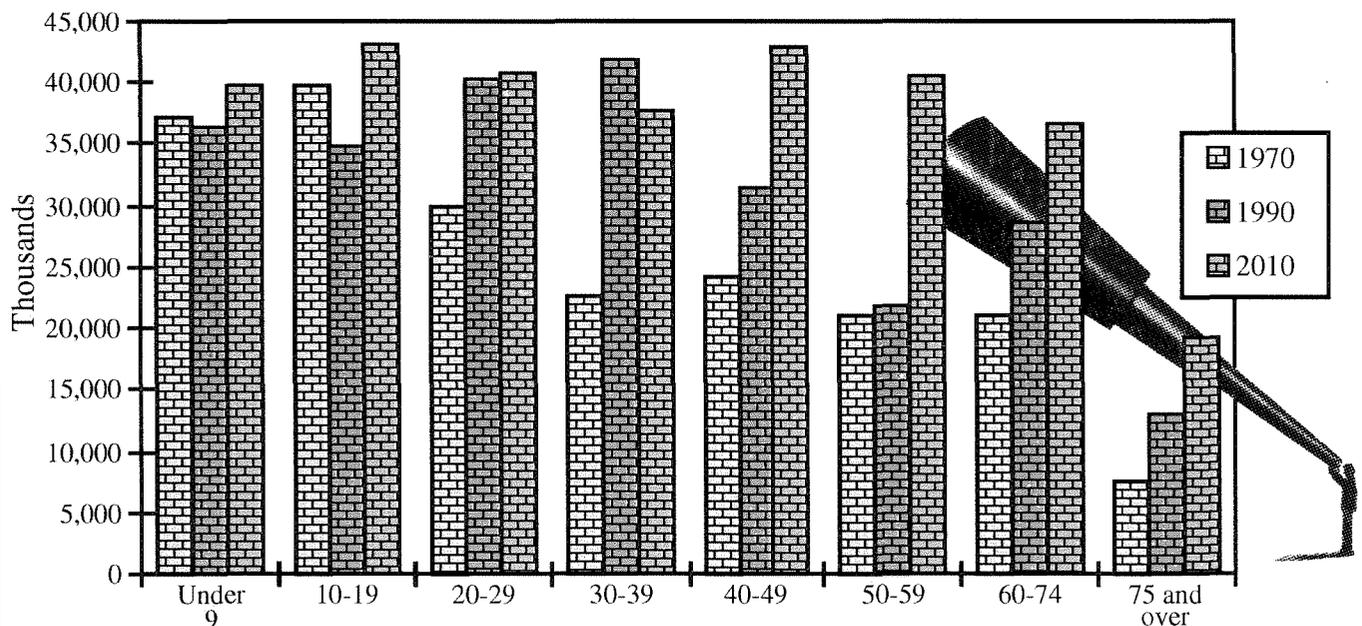
new residents move into the state, again, attracted by the high quality of life. This growth has been offset to some extent by declines in the lumber and wood products industry. Cutbacks in federal timber harvest have led to job losses in the lumber industry throughout this time. This is expected to continue through the forecast period.

Lumber is still the largest manufacturing industry in Oregon, representing 26 percent of manufacturing employment in 1993. Electronics is second, with 23 percent of employment. The manufacturing sector has diversified over the last 20 years. In

1970, lumber and wood products, food processing, pulp and paper, primary metals and chemicals accounted for 64 percent of Oregon's manufacturing employment. In 1993, they were less than half of the state's manufacturing employment. This trend toward diversification is expected to continue.

Agriculture and tourism are key industries in Oregon. The agricultural sector is quite diversified, with products such as nursery stock and wine grapes, as well as the more traditional livestock, grains, and fruits and vegetables. Northwest agriculture

Changes in the population of the United States by age



and food markets are increasingly international, with the most growth coming from Pacific Rim countries. The agriculture sector has historically employed the advanced use of machinery and capital investment to increase productivity. Now producers are employing the latest telecommunications and information technologies to enhance their competitiveness in international markets.

Tourism is one of the largest industries in Oregon. The state's natural beauty and fascinating history provide much of the attraction for visitors. The state has invested in infrastructure and development of the industry. International visitors are a growing sector. The state's assets have been promoted to a wider audience through television and film productions using Oregon as a location.

Washington

Washington has grown a little slower over the last few years than other states in the region, primarily because of large-scale cutbacks at The Boeing Company, the state's largest manufacturer. The commercial airline business has suffered heavily from intense competition and has had to postpone or cancel the delivery of aircraft. What is truly remarkable is that the state continued to grow as well as it did in the face of a loss of more than 25,000 highly paid manufacturing jobs in the last three years. This fact points to the extent that diversification and growth in other sectors have had an impact on Washington's economy.

Electronics, food processing and lumber and wood products are the next largest manufacturing

**The population
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industries in the state. More recently, much of the growth in electronics has occurred outside the Seattle metropolitan area. Clark County and the Spokane area are growing rapidly in electronics and a variety of other industries. Food processing continues to grow as the agriculture sector expands and diversifies, responding to opportunities in international markets. A wide variety of other manufacturing industries are projected to increase employment as well.

In the non-manufacturing sectors, the growth in high technology industries continues to bolster Washington's economy. Microsoft and numerous other software development firms are located in the Seattle area. Washington's small biotechnology and other research and development industries benefit from the synergies created by the research centered at the University of

Washington. Washington is one of the most trade-dependent states in the United States, and this activity is projected to grow as well. ✨

— *Debbie Kitchin is an economic forecaster with the Northwest Power Planning Council.*

COMPREHENDING

“Capacity”

by Carlotta Collette

POWER PLANNERS TAKE A MORE SOPHISTICATED LOOK AT INTEGRATING RESOURCES.

Think of electricity “capacity” as a freeway during rush hour. Everyone is on the road at once, and the planners’ job is to ensure there are enough lanes to keep the traffic moving, even if those lanes are only used twice a day.

In the electric industry, when everyone is running their furnaces or air conditioners, their lights, stoves, computers, etc., it can be an electrical traffic jam. But people don’t line up and wait for the electricity to move to them. They want it now. Utilities have to

make sure they have the “capacity” to supply instant electricity — enough power plants to fire up — when the need is greatest. Without those plants, the utility is said to be “capacity constrained.” If the utility has enough power plants to meet peak needs, and fuel con-

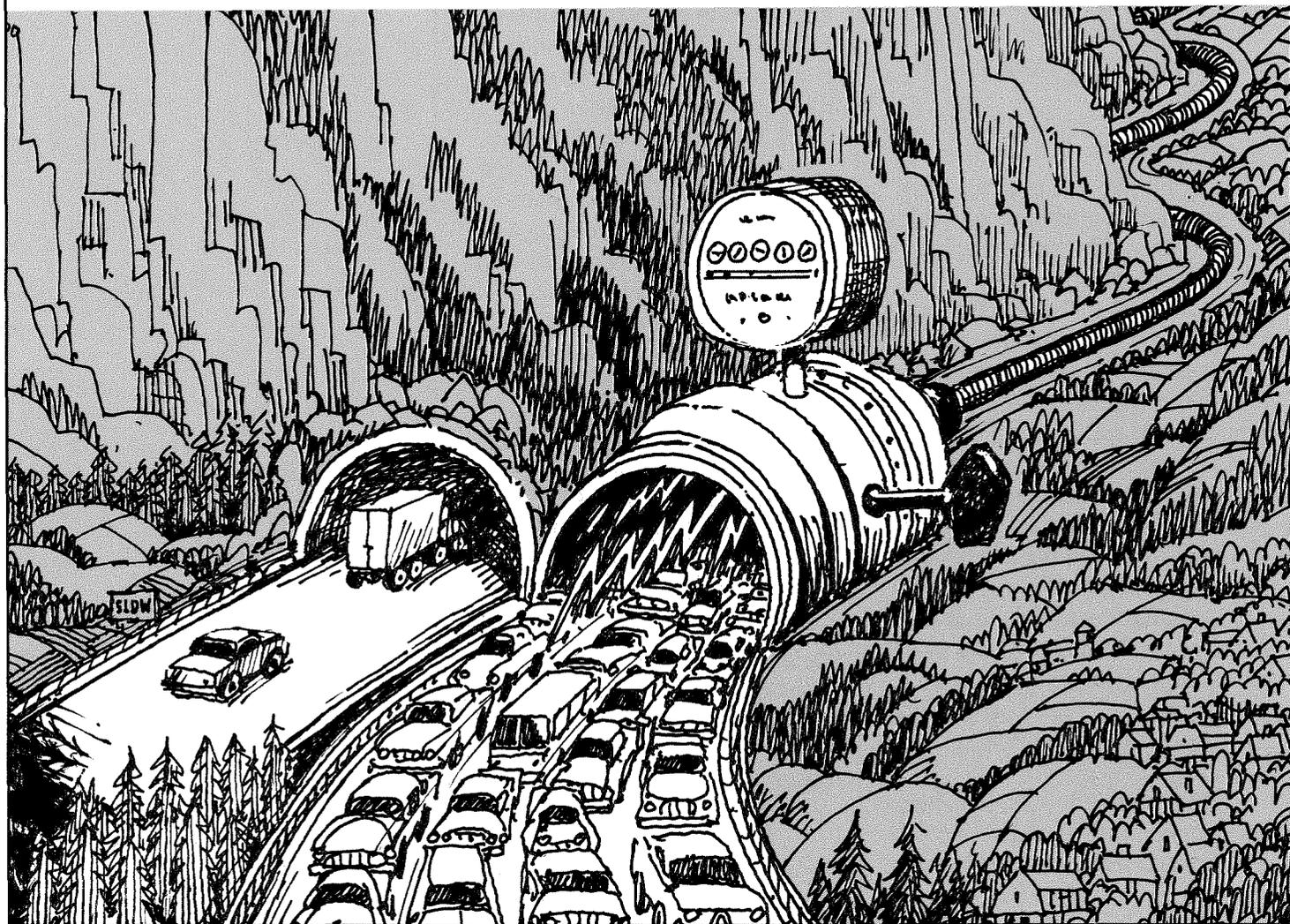


Illustration by Frank Farah

tracts to ensure steady supplies, it can meet average power needs in its service area for any amount of time.

Think of “capacity” another way, as if it is a hose, and energy is the water in the hose. That will help clarify why capacity hasn’t been a big concern in the Pacific Northwest, but is becoming a concern now. The Northwest has a very big hose — the region’s system of hydroelectric dams, which have the capacity to generate 32,000 megawatts. If you add in power plants fueled with coal, gas and nuclear fuels, the region has the capacity to generate closer to 40,000 megawatts. Since the region only uses on average at any given time about 18,900 megawatts of electricity, power planners have always assumed that there was excess capacity here. (For point of reference, metropolitan Seattle uses about 1,000 megawatts.)

In years when snowmelt and rainfall are about average, the Columbia’s system of hydroelectric dams can generate thousands more megawatts of electricity than the region needs. It can easily meet peak power needs, but only for a short time. Unlike power systems elsewhere in the country, Northwesterners can’t contract for or order up more fuel. We are “energy constrained”—limited by the amount of water in our rivers. When runoff and snowmelt are low, as in most of the years of the past decade, only a trickle, relatively speaking, is available to refill the Columbia’s dams as they are drained to produce electricity.

Even when flows are high, upriver dams can only store about 40 percent of the water that comes pouring down through them. So the system could meet

**NORTHWESTERNERS
ARE
“ENERGY
CONSTRAINED”
—LIMITED
BY THE
AMOUNT OF
WATER
IN OUR RIVERS.**

peak demands for some amount of time, but the reservoirs still might empty out faster than they can refill.

Nonetheless, in the past, the system worked magnificently. The Columbia was the world’s biggest hydropower producer. It supplied about 40 percent of all the hydroelectricity in the United States. Even with its storage limitations, the river could be shaped to follow most of the region’s patterns of energy use, including the peaks.

Two things are changing that: people and salmon. The Northwest’s citizens and its businesses are demanding far more electricity than they used to. That’s because there are more of them. Regional populations are increasing faster than in almost any other part of the country, and the economy, in most parts of the region, is expanding accordingly.

At the same time, the electricity system is being tapped for water releases to aid young salmon starting out from upriver watersheds and heading down the Columbia to the sea. Because the greatest flows in the Columbia come in the spring and early summer, when mountain snows are melting, the salmon adapted over time to enter the river then, taking advantage of the faster, colder water.

But the hydropower dams were operated, until recently, to make optimum use of the river for power generation and flood control, not salmon survival. Dam operators needed the most electricity in the winter, when most of the system’s water was still frozen in the mountains. They used the system’s storage dams to hold back as much of the spring runoff as possible, saving it until fall and winter, when it could be used to meet power needs. By early spring, the reservoirs would be at their lowest, ready to accept the next rush of snowmelt.

Most experts agree that this has had terrible consequences for the salmon runs. The region now is committed to changing how the dams are operated to enable some of the seasonal speed and cooler water the young salmon require.

As the region grows, and dam operators use the river to improve the odds of salmon survival rather than increase power production, ensuring the region adequate capacity to meet peak power needs becomes a more complicated task.

The region could just build more power plants — expand its freeway system, to get back to the first analogy. That’s already happening, and it will certainly help meet this challenge. But there could be less costly and disruptive alternatives — similar to reducing traffic jams by staggering commuting times with flexible work schedules — and the Northwest Power Planning Council is exploring these as it develops its next power plan for the region.

It’s the job of the Council to design the most cost-effective inventory of electricity resources the region can build. The Council evaluates not only each potential source of electricity, but also how

various sources can be integrated into the existing power system, so the total package of resources is the least-costly system possible — in both capital and environmental terms — and the most reliable.

For example, it may be that certain energy-efficiency efforts could help reduce power use during peak periods. “If you could save energy during a period of peak energy use,” explains Wally

Gibson, the Council’s manager of system analysis and generation, “it may have twice the value or even three times the value of conservation that saves you energy when you don’t need to be cutting peak,

COMPUTER MODELS INCREASE OUR LEARNING CAPACITY

Capacity is the latest addition to the wealth of uncertainty the region’s power system faces. Capacity issues are not only testing the reliability of the system, they are testing the limits of experts’ understanding, too. To expand those limits and help the region acquire only the most cost-effective resources, the Northwest Power Planning Council is using a new computer model and improving an old one.

By helping define the effects created by a wide range of resource scenarios, the two models will form the backbone of the analysis for the Council’s new regional power plan. What follows is a brief description of what each model does and how the results will help ensure development of a reliable and cost-effective energy future.

The Integrated System for Analysis of Acquisitions (ISAAC)

ISAAC was developed jointly by staff from the Council, the Bonneville Power Administration and the Intercompany Pool, which coordinates power operations among the region’s utilities. The Pacific Northwest Utilities Conference Committee, an organization that represents some of Bonneville’s major customers, also provided support for the project. ISAAC’s primary task is to address uncertainties in power planning.

ISAAC uses data on historical and forecast water flows, electric loads and fuel prices to evaluate the likely costs of investing in potential resource portfolios in the future. But unlike other utility models, which use only one load, fuel price or water flow level to analyze a specific set of resources, ISAAC uses the entire range of potential loads, prices and flows as inputs.

ISAAC’s more comprehensive approach provides insights into the range of consequences for a decision and can be particularly helpful in arriving at decisions that balance the sometimes-conflicting objectives of reducing both cost and risk. Given the complexities and future uncertainty surrounding the Northwest power system, ISAAC is an important tool.

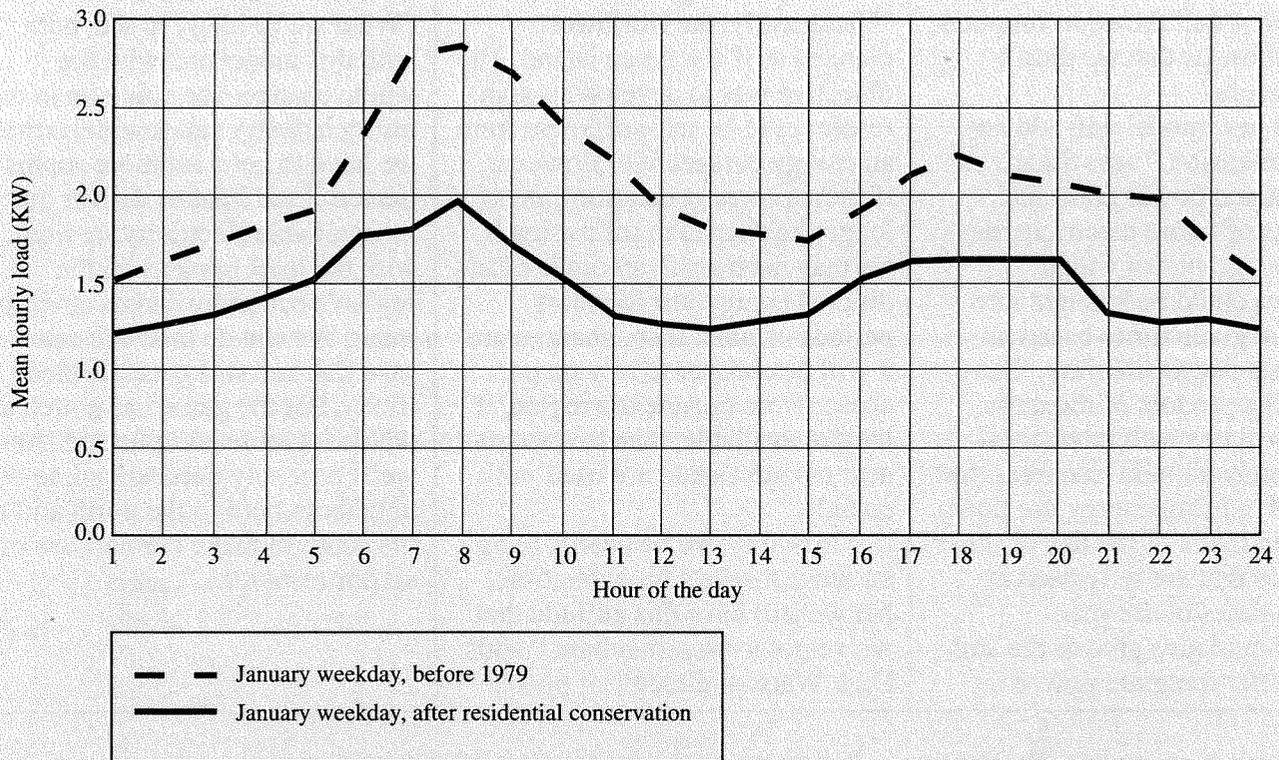
The Load Shape Forecasting System (LSFS)

Traditionally, the Council’s electricity load forecasts have been limited to the total energy required for a whole year. Now, Council staff are using LSFS to provide a picture of the region’s energy load on an hourly basis. At the heart of the LSFS is the Hourly Electric Load Model (HELM), developed by ICF Resources, Inc. for the Electric Power Research Institute.

Using historical data on the end uses of power, LSFS will tell planners when electricity is needed during any given day. Armed with this new information, the Council will be better able to evaluate both existing resources and potential new resources that might help meet the region’s future electricity needs.

For example, before LSFS, all of the electricity saved through conservation programs was assigned the same value, regardless of when it was saved during the day. With LSFS, the Council will be able to determine which programs save electricity when it is needed most — at times when our system capacity is near its limits. LSFS is an important step forward in the region’s ability to meet power needs with the least amount of cost and risk.

Conservation cuts January peak electricity use



because the specific time when the savings occur makes a difference in a capacity-constrained system.”

Commercial conservation programs that reduce the daytime energy needs of whole metropolitan areas might be a very inexpensive way to avoid or postpone having to build new power plants to serve those areas. Programs that cut electric heating needs also could shave peaks during the winter, when the Northwest generally uses the most electricity.

Similarly, renewable resources might be developed to replace hydropower at times of the year when the water is being stored for later releases. Winds in the Northwest are most fierce, for example, in the winter, when electricity use is peaking and water is being stored to release in the spring for the early salmon migration. Wind power might then have added

value to the region’s power system because of its winter timing.

The trick is in assembling the right combination of resources to best meet power needs at specific times of the year and at certain times of the day. To do that, the Council is reconfiguring some of its computer models. (See box in page 22.) The new models will not only incorporate the uncertainty of river flows and various operations of the dams, but they will bring into the equation daily patterns of energy use, energy savings and power generation.

“Because of the surplus of generating capacity, the resource planning models used in the Northwest have focused primarily on the seasonal pattern of energy generation,” says Pete Swartz, who might be called the “foreman” of the Council’s computer model “construction crew.” “We could estimate the different values

of energy contributions to the power system in January as opposed to June, but we would value all January energy at the same price, regardless of when in the day it occurred. With the new models, we’ll be able to differentiate between, say a wind project and a solar project, which might produce the same energy over a month, but with very different daily patterns of generation.”

While other power systems that rely on thermal generating plants have sophisticated computer models that help determine the comparative value of various resources, the Council’s is the first in the country to incorporate the key variables of the Northwest’s hydropower-based system. “We’re using techniques of the thermal-based models and modifying them for our use,” notes Swartz. “We’ve also added features that reflect the increasing

salmon constraints on the hydro system.”

So what will the new computer model show us that we didn't know before?

“The new model will add another dimension,” says Swartz. Past Council power plans had forecasts of future electricity demand and graphs of which resources could be brought into service at given times based on their costs and availability. Illustrating the product of the new model will be much more complex. It may include resources that are used to bring energy use down at certain times of the day or other resources that are only used at specific times of the year.

“It should also give us the ability to better integrate power

markets outside the Northwest into our planning,” says Swartz. “Historically, the Northwest planned as if it were an island. The objective was to develop enough resources to be self-sufficient from an energy perspective. However, if hydropower generation can no longer be shaped to follow loads, we may need small amounts of additional energy just for short periods of time. If so, chances are it will be cheaper to rely on purchases from outside the region, if they're available, than to construct new resources that are used infrequently.”

“In reality, we've been relying on those markets for some time, but we still have this attitude that we've got to be self-reliant,” adds Dick Watson, director of power

planning at the Council and Gibson's and Swartz's boss. “What we're likely to see, both with this model and with the whole changeover going on in the utility industry nationwide, is that we have to get a lot more sophisticated if we want to deliver the most reliable electricity service with the least impacts on the region's economy and its environment. We can do this. We can save fish and still generate electricity, but the game has gotten a whole lot more complicated. And we'll probably need to look to our neighbors both to the north and to the south to make the best use of all our resources.”



ALMOST THE WEEK THAT WAS

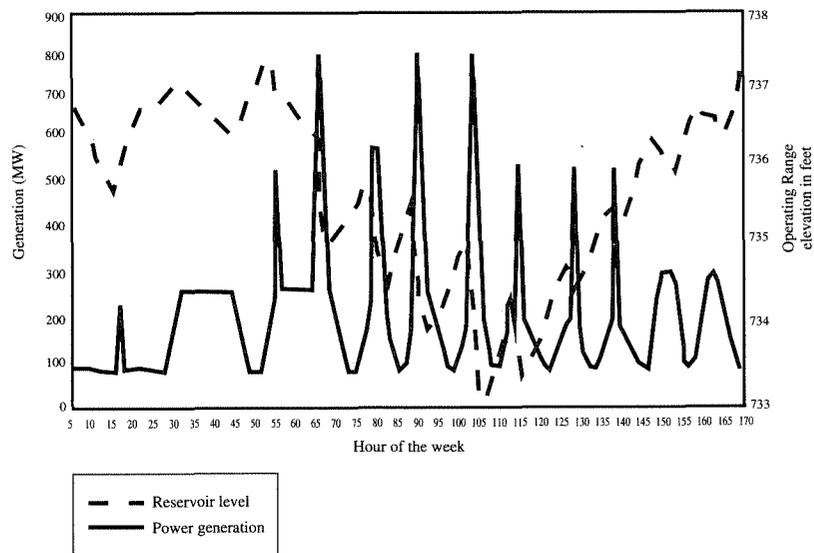
In December 1990, the Northwest's power system reached its historic peak power demand. It was cold. One of the region's "Arctic Expresses" had moved in on Monday. Turbines spun at hydropower dams across the region to generate enough electricity to keep homes warm and industries operating. As the week progressed, and it got colder, more water was released through the dams to generate electricity.

The chart at right illustrates how this set of circumstances, with higher 1995 load levels, could affect one dam, Lower Granite on the Snake River, given today's more constrained hydropower and water conditions. It illustrates the limitations on a significant part of the Northwest's hydropower system that constrain the system's ability to meet peak loads on an extended basis. In this simulation, Lower

Granite is all but emptied by Friday because less water is flowing into the dam to refill it than is flowing out of it to generate electricity. The situation

improves on the weekend because power use generally drops off on weekends, lowering demands on the system. — C.C.

Lower Granite generation and reservoir levels during one cold week



Trusting in Money

Will Montana's trust fund for wildlife have the money to do the job?

by John Harrison

During the last 40 years, more than 50,000 acres of prime wildlife habitat were lost to the rising waters behind Libby and Hungry Horse dams in western Montana. Thanks to a \$12.5 million trust fund endowed by electricity ratepayers of the Pacific Northwest in 1988, efforts are under way to recover some of that by improving wildlife habitat near the reservoirs impounded by the two dams.

It's a unique effort that is producing positive results. But it also has its critics. Some argue that so far the trust has been long on process and short on results. Supporters argue that before Montana could spend the ratepayers' money, there had to be a process for screening and selecting wildlife enhancement projects. Establishing that took time, they argue.

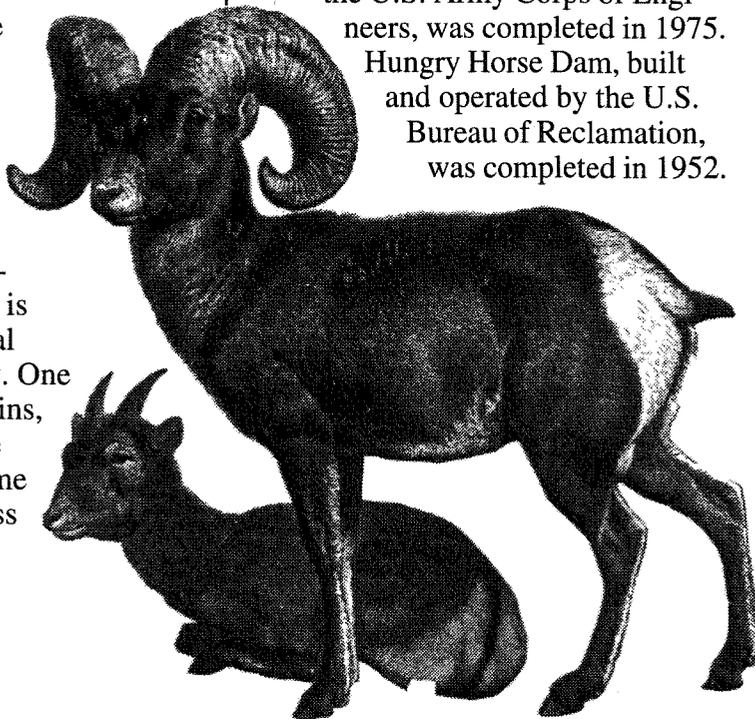
Regardless, the process is in place, money is being spent, and several projects are under way. One nagging question remains, however: Will there be enough money over time to fully mitigate the loss of hundreds of mountain sheep, mule deer, elk and other animals?

Big dams, big losses

Libby Dam, on the Kootenai River, and Hungry Horse Dam, on the South Fork Flathead River, are two of the 30 dams that make up the federal Columbia River power system. Both dams are in the Columbia River Basin. Downstream of Libby Dam, the Kootenai River flows into the Columbia in British Columbia. Downstream of Hungry Horse Dam and Flathead Lake, the Flathead River flows into the Clark Fork River, which empties into Lake Pend Oreille in Idaho. The lake's outlet is the Pend Oreille River. Like the Kootenai, the Pend Oreille also flows into the Columbia just across the border in British Columbia.

Libby Dam, built and operated by the U.S. Army Corps of Engineers, was completed in 1975.

Hungry Horse Dam, built and operated by the U.S. Bureau of Reclamation, was completed in 1952.



Where the money goes

Under terms of the Montana Wildlife Trust Agreement, the Bonneville Power Administration agreed to pay a total of \$12.5 million in six installments. The final installment of \$2.5 million was paid in December 1994.

With that payment, the principal amount of the trust reached its maximum — \$12.5 million. The state committed not to spend any of the principal on projects — only interest. In November, before the final installment was paid, the state had approximately \$700,000 in interest, which includes \$500,000 in a separate grant that the state received from Bonneville for wildlife mitigation.

Only time will tell whether that is enough money, but one thing

is certain: It could have been more.

"It is true that our earnings have been less than we projected," said Harvey Nyberg, regional wildlife project manager in Kalispell for the Montana Department of Fish, Wildlife and Parks. "During the trust negotiations, investment returns of 10 percent were not uncommon. We calculated an 8-percent return and thought we were being conservative. But in the early 1990s, rates of return dropped to 3 percent. As a consequence, our earnings have been about 60 percent less than expected."

While the state could have made more, Nyberg doesn't think the lower-than-expected return has hurt the program. "It will just take us a little longer to do what we wanted to do," he said. The cost of the work, not including routine expenditures for personnel, equipment, and so on, is low — about \$50 per acre, in some cases. Much of it can be accomplished in conjunction with

The Northwest Power Act of 1980, the federal law that created the Power Planning Council, calls on the Council to prepare a program to "protect, mitigate and enhance" fish and wildlife, and related spawning grounds and habitat, of the Columbia River Basin that have been affected by dams. The program is implemented by federal river and power agencies, primarily the Bonneville Power Administration, the region's federal hydropower wholesaler, and financed primarily by Bonneville ratepayers.

Reservoirs behind Libby and Hungry Horse dams flooded habitat that once was used by wildlife ranging from birds to bears. It is estimated that the two dams flooded 90 miles of tributary streams and approximately 50,383 acres of wildlife habitat. In addition, the necessary relocation of Burlington Northern railroad tracks and Montana Highway 37 consumed an additional 2,100 acres of wetland and riverbank habitat.

Losses Assessing

Prior to 1988, at the Council's direction, Bonneville funded studies of wildlife losses caused by all major hydroelectric dams in the Columbia Basin. The first study completed was for Libby and Hungry Horse dams. Based on the results of the study, the Council amended the Columbia River Basin Fish and Wildlife Program with the number and types of "habitat units" that would constitute adequate mitigation of the losses. One habitat unit is the amount of land or water of sufficient quality to support one bird or animal of a particular species. The size of a habitat unit varies with the size and needs of each species.

Following the loss assessments, the Council then authorized Bonneville to proceed with the mitigation projects. In 1987, Bonneville began negotiating with Montana to have the state do the mitigation work for Libby and Hungry Horse dams with money supplied by Bonneville. The Council and the

region's utilities suggested Bonneville and Montana negotiate a trust fund that would pay for the work over time and replace the annual contracts that had been financing the work to that point. Bonneville agreed to the idea of a trust fund, but only on two major conditions. First, Bonneville wanted a once-and-for-all settlement — one not open for renegotiation in the future. Second, Bonneville insisted that Montana be responsible for any additional mitigation costs for 60 years.

The Council expressed concern about those conditions. Then-Chairman Bob Duncan wrote to then-Bonneville Administrator Jim Jura in July 1987, "Even an unconditional settlement will not permit us or the administrator to avoid future claims that more mitigation measures are required, regardless of the good faith efforts of the mitigating agency, or the fact that no more money is available in the trust." Duncan suggested that the trust include an agreement to reopen negotiations after 10 to 15 years. But it wasn't to be. Bonneville and Montana negotiated the trust agreement and signed it in December 1988.

Process and progress

Since then, results have been mixed. Some observers are disappointed. Others say there has been adequate progress. On the positive side, several projects are under way, more are planned, and the planning process itself, by all accounts, is a good one. On the negative side, the trust is generating considerably less money than anticipated to spend on projects. The state's Department of Fish, Wildlife and Parks expected a higher rate of return on investments of trust fund money.

Should the state have reserved the right to reopen the trust negotiations at some future time?

"Well, hindsight always is better, and at the time we negotiated the trust we had that possibility in mind, but we

were in a position to move forward," said Don Childress, wild life division administrator for the Department of Fish, Wildlife and Parks at the Department's headquarters in Helena. "I'm comfortable with the decisions we made. If we had not moved ahead, we might not be doing the work we're doing today."

And there is progress. Two general types of projects are under way: habitat enhancement and habitat protection. Habitat enhancement projects take place on public land, particularly federal forests. There are two at the moment. One is at Lake Koocanusa, the reservoir behind Libby Dam, and the other is at Hungry Horse Reservoir.

The Libby project is intended to improve the quantity and quality of forage for mountain sheep and mule deer. "What we're really doing is restoring the open pine forest," said Harvey Nyberg, the Department's regional wildlife project manager at Kalispell. "We're trying to restore the forest ecosystem, which also will benefit the whole array of wildlife that would use an open pine forest."

The Hungry Horse project involves encouraging the growth of wintering range forage for elk. Other animals, including deer, bear, mountain lions, lynx and mountain grouse, also will benefit. In 1987, the Power Planning Council estimated that construction and operation of Hungry Horse Dam resulted in the loss of 6,650 acres of winter range, enough to support 133 elk. The mitigation effort involves managing native shrubs, removing trees that could not be cut and sold, and burning certain types of vegeta-

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in the future

tion to encourage new growth of forage plants.

Habitat protection, as opposed to habitat enhancement, is more controversial because protecting habitat involves purchasing land or signing conservation easements — agreements with landowners to set aside acreage exclusively for wildlife. The state has negotiated two conser-

vation easements. One is for 500 acres along the North Fork Flathead River, and the other is for 107 acres in the Cabinet Mountains south of Libby.

"These are more controversial because they involve private land," Nyberg said. "Government buying private land is always controversial in Montana."

So far, the state has not purchased any land with trust money. Any future purchases will be from willing sellers only. Nyberg said the state will not use its power of condemnation to acquire land for wildlife.

Critics of the wildlife trust argue that the work is progressing too slowly. Nyberg agrees that progress has been slow, but that the pace has been dictated by necessary government processes.

"When we accepted the trust, we accepted all of the responsibility for it," he said. That included developing a process to handle the money, review project proposals, undertake the actual work and then monitor and evaluate the results. The latter is an important consideration, Nyberg said, because the state wants to know whether the work is having the anticipated benefits. Monitoring has shown that the two current habitat enhancement projects have had unanticipated benefits for other species. The Lake Koocanusa

U.S. Forest Service timber sales.

Between July 1, 1992, and September 30, 1993, earnings on trust investments declined from an average of 5.06 percent to 4.65 percent. During this period, the trust earned \$556,548. Montana's Department of Fish, Wildlife and Parks, which administers the trust fund, but does not actually invest the money, wishes the return were higher so there would be more money to do more work. According to the agency's 1993 Annual Report, "the department has asked the Board of Investments to review the investment strategy for the trust account in an effort to increase these earnings."

That review occurred, but no changes in strategy were made.

"Our Board of Investments is governed by general guidelines and principles for investing, and while anyone — government or private citizens — gets concerned when returns on investments go down, those principles are in place for

protection and we recognize that," said Don Childress, wildlife division administrator for the Department of Fish, Wildlife and Parks. Childress chairs the Montana Wildlife Trust Advisory Committee.

Is the trust producing an adequate amount of money?

"Yes, I think we're getting enough, particularly now that the trust has the full amount. We're in pretty good shape," he said.

—J.A.H.

project appears to have promoted larger populations of songbirds, and the Hungry Horse project has demonstrated the importance of dead trees — snags — as breeding sites for birds.

"In general, people have been very supportive of the habitat improvement part of the program," Nyberg said. "Some people don't appreciate the need for monitoring, yet they want the program to be accountable, and so there is a bit of an inconsistency there. In the habitat protection area, conservationists are disappointed by the slow pace so far, but others, who oppose government buying private land, think the pace has been just fine."

Other approaches

Other Columbia Basin states are pursuing different types of wildlife mitigation agreements. In Idaho, for example, agreements are being negotiated dam by dam. Only one agreement has been completed, that for Dworshak Dam on the North Fork Clearwater River. In that agreement, the state and the Nez Perce Tribe share mitigation money provided by Bonneville — 60 percent for the state, 40 percent for the tribe. The state is working with Bonneville and other tribes — including the Kalispel Tribe in Washington and the Shoshone-Bannock Tribe in southern Idaho — on similar agreements to mitigate the impacts of other federal dams on Idaho wildlife. None of these is a once-and-for-all agreement.

"There is a problem with the Montana-type agreement in that it cannot be reopened, and that the agreement is for a set amount of money," said Jerome Hansen, who directs the Idaho Department of Fish and Game's natural resources policy bureau. "Land prices could go up, and the cost of operation and maintenance of wildlife projects could turn out to be much greater than you envision."

Back in Montana, the Confederated Salish and Kootenai Tribes also have concerns about the once-and-for-all trust agreement. Hungry Horse and Libby dams flooded portions of the tribes' ancestral hunting and fishing grounds. The tribes are represented on the trust advisory committee, and so are involved in selecting projects and spending the money.

"I don't want to take shots at the negotiations; we were not involved," said Dale Becker, wildlife program manager for the Salish and Kootenai tribes. "We have always maintained that although Montana signed an agreement with the BPA [Bonneville], we have never relinquished what we felt was an opportunity to seek our own separate agreement."

Becker said the tribes are not seeking such an agreement now, choosing instead to participate in the work of the trust fund. But there are disagreements on the advisory committee, particularly regarding land acquisition, he said.

"I have problems with the opposition to land acquisition," Becker said. "Any way you look at it, habitat was lost due to inundation, and we can realistically say it's not coming back. I see mitigation as the replacement of habitat. Acquisition [as opposed to an easement] gives the landowner a chance to do something on the ground. I realize there is opposition, but I think that's based on historic land use patterns that may be becoming outmoded."

Nonetheless, Becker is supportive.

"There are going to continue to be differences of opinion on the committee, and that's not bad," he said. "Basically, things are moving in the right direction now. We'd like to give the trust an opportunity to work." ❄️

SALMON CORPS



INDIAN YOUTHS GIVE A YEAR OF THEIR LIVES TO WORK ON BEHALF OF SALMON.

by John Harrison

HERMISTON, Oregon — Celsa Umtuch swings her poleax in long, back-bending arcs at the weathered baseboard of an old corral fence. As it splinters and begins to yield after three thudding blows, she stops to rest, breathing heavily.

“This is hard work,” she says, smiling. “But I like it.”

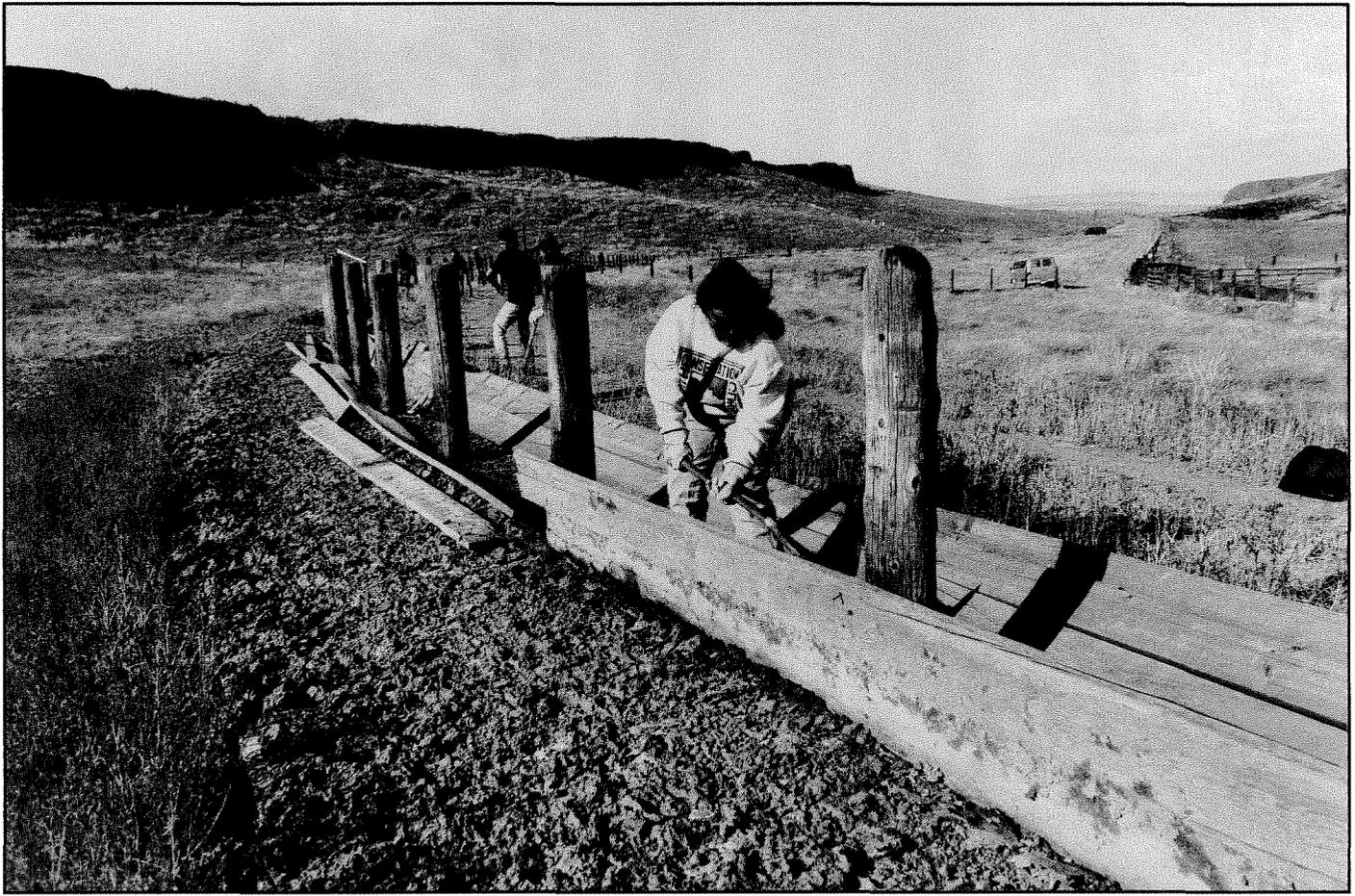
The 19-year-old Yakama Indian is one of 72 youths from five Columbia River Basin tribes who are spending a year in government

service as part of a unique educational and job-training effort called Salmon Corps. Working in small groups and occasionally as a single unit, Salmon Corps participants work to improve habitat for fish and wildlife on their reservations and, at the same time, learn job skills and study their unique cultures and heritage.

Tearing down the fence will help open the refuge to wildlife, including deer and elk. The youths also will plant native vegetation

along creeks to restore riparian areas where fish spawn.

Celsa is in one of several crews working on the former Conforth Ranch, now known as the Wanaket Wildlife Refuge. The 2,700-acre ranch, located on the south shore of the Columbia River near Hermiston, Oregon, is owned by the Bonneville Power Administration. The federal power marketing agency purchased the ranch at the direction of the Northwest Power Planning Coun-



Salmon Corps member Celsa Umtuch helps dismantle an old corral at the Wanaket Wildlife Refuge, clearing the way for new wildlife habitat at the former cattle ranch in Eastern Oregon.

cil as partial mitigation for the impact of nearby McNary Dam on fish and wildlife. The refuge is being managed for Bonneville by the Confederated Tribes of the Umatilla Indian Reservation, one of the Salmon Corps participants. Over time, the Umatilla tribe will take ownership of the refuge.

For their year-long labors on behalf of salmon, Celsa and the other Salmon Corps participants will receive education in areas ranging from first aid to tribal cultural history to computer skills. At the end of their services, they'll take home a \$4,725 tuition scholarship.

Salmon Corps is a partnership between the Umatilla, Nez Perce, Yakama, Warm Springs and Shoshone-Bannock tribes, the U.S. Department of Energy, the Columbia River Inter-Tribal Fish

Commission and the Earth Conservation Corps, a non-profit organization based in Washington, D.C., that focuses primarily on improving inner-city neighborhoods. Salmon Corps is a division of President Clinton's community service initiative known as Americorps, which is providing a total of \$1.6 million to fund the program during the current fiscal year. Continued funding for two more years appears likely, Salmon Corps Director Chuck Williams of The Dalles, Oregon, said. The money comes partly from Americorps, partly from a matching grant by the federal Department of Energy and partly from private contributions raised by the Earth Conservation Corps.

In addition to the Wanaket Wildlife Refuge work, other Salmon Corps projects will in-

clude establishing a native plant nursery near Richland, Washington; fencing a section of Wildhorse Creek on the Umatilla Reservation; fencing portions of the Deschutes River on the Warm Springs Reservation in Oregon; and cleaning mud and debris from former nuclear plant cooling ponds on the Hanford Nuclear Reservation so that they can be used for raising sturgeon.

Salmon Corps got under way last fall. The entire Salmon Corps crew came together for the first time on a blustery, sunny day in October at the Wanaket Wildlife Refuge. It was a day of work and celebration.

After pounding away at the old corral and working on a new fence along the refuge's eastern boundary, the youths gathered for speeches by invited dignitaries and

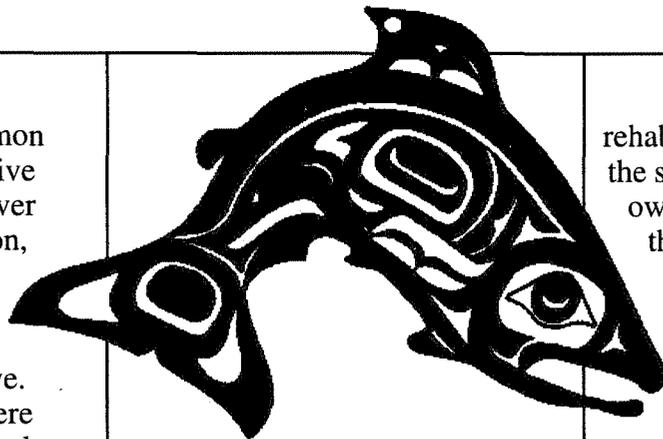
for a feast of barbecued salmon and elk. Ted Strong, executive director of the Columbia River Inter-Tribal Fish Commission, reminded the youths that "tribal people have always dedicated their lands to be sacred and holy places to live. The young adults that are here today are doing things that help glorify the land that the Umatilla Tribes hold sacred.

"Caring for your other mother, this Mother Earth, and this other, spiritual, father that is above us, is something that you young Indian adults should be very proud of," Strong said. "I commend you, and I hope your parents will be as proud of you as we are."

Marvin Osborne of the Shoshone-Bannock Tribe, whose reservation is in southern Idaho, said the Salmon Corps already had been at work building fences to protect herds of buffalo and wild horses on the reservation. "Through this work you will learn many important lessons that will help you in your future life," he told the youths.

Bob Nixon, director of the Washington, D.C.-based Earth Conservation Corps, praised the "incredible partnership" that led to the creation of the Salmon Corps, and there were similarly laudatory remarks by representatives of the U.S. Department of Energy, the Americorps program and in letters sent by then-Governors Cecil Andrus of Idaho and Barbara Roberts of Oregon. Perhaps the ceremony's most unusual dignitary was Nixon's longtime friend and Conservation Corps benefactor, Cheryl Tiegs, who was introduced as "conservationist and supermodel."

While it's not unusual for superstars to jet in and out of the Northwest to lend their smiles and handshakes to political and envi-



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ronmental causes, Tiegs has a long-term interest in conservation, backed by the substantial amounts of money she has donated to conservation causes. And refreshingly, she didn't present herself as an expert on salmon.

"It's important to look after what's going on with the salmon, and with Mother Nature," she told the Salmon Corps members. "To

rehabilitate nature, to rehabilitate the salmon, is to rehabilitate our own souls. You will get out of this what you put into it. I feel very honored to be here, and to be as much a part of it as I can."

Beyond the dignitaries and the speeches, however, was the essential heart of the Salmon Corps, the hard work that had Celsa Umtuch sweating and smiling, and Cecelia Shoeships, of the Umatilla Tribe, admitting: "I didn't know what to expect — I didn't expect such hard work. But we all pulled together, and it's been fun. I'd really like to go back to my tribe and help make decisions about salmon and the land. We're going to keep on working and learn as we go."

That's what Michael Farrow hopes, too. He's the director of natural resources for the Umatilla tribes.

"We'll train them in restoring fish habitat by planting native stocks in riparian corridors that have been hammered by roads and cows and logging," Farrow said. "I'd like to see them trained as technicians so they can work at archaeological sites on and off the reservation.

"They'll get to know the plants, the medicines, the fibers, the foods. The main thing about it is they'll get an opportunity to live outdoors, the lifestyle that our people used to live, not in houses like we do now. They'll toughen up. They'll get to know their own country, and other tribes' country, and they'll get to know one another."

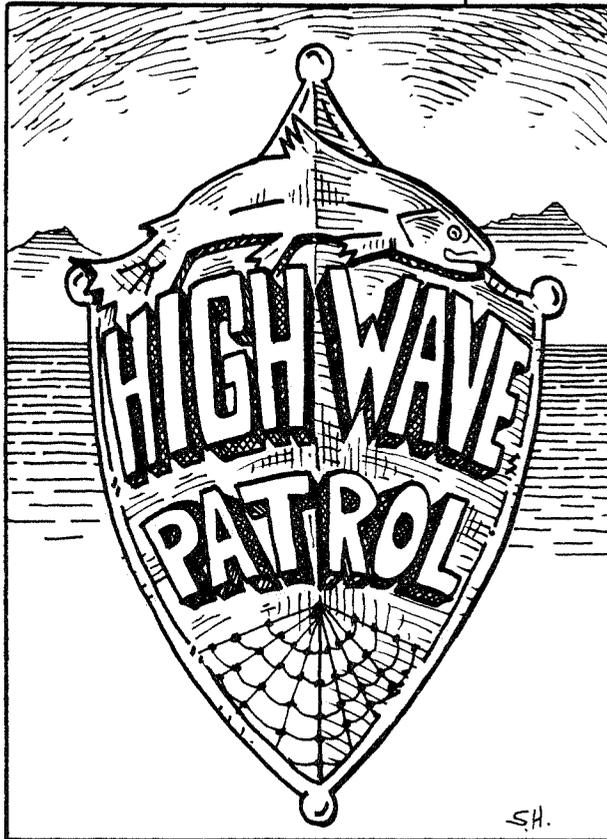


SHORTS

Positive link identified between jobs and the environment. In a study conducted by the Institute for Southern Studies in North Carolina, states with the best environmental records were shown to also offer the best job opportunities and best outlook for long-term economic development. The Institute created two lists: one green and one gold. The Northwest states of Oregon, Washington and Idaho all ranked among the top 20 states on the green, or environmental, list. Of the three, Washington and Oregon were among the top 10 on the gold list as well. States that rely heavily on mining or oil drilling generally ranked lowest on both lists. [Source: Solar Industry Journal, Fourth Quarter 1994.]

State	Green List	Gold List
Idaho	15	22
Montana	33	26
Oregon	9	8
Washington	16	7

Alaskan commercial fishers set new record for salmon catch in 1994. While salmon fisheries in the lower 48 states were closed or at record low levels, Alaskans were basking in a second record harvest in two years. Fishers brought in 194.5 million salmon in Alaskan waters in 1994, for an ex-vessel value of \$425 million. More than 9 million coho were taken. In the lower 48, coho fishing was closed due to predicted low numbers of fish. A total of only 313,000 salmon were harvested in the California, Oregon and Washington commercial fisheries in 1994. Farmed salmon harvests, however, were greater than the Alaskan catch. [Source: *Pacific Fishing*, December 1994.]



Salmon cops find fewer violators. The Columbia Basin Salmon Enforcement Team, which includes law enforcement officers from Idaho, Oregon and Washington, issued fewer citations for illegal salmon fishing in the Columbia and Snake rivers last summer than during the summer of 1993, the team reported in October. "These high compliance rates mean one thing: our enforcement program is deterring poaching," said Captain John Johnson of the Columbia River Inter-Tribal Fish Commission. "And when it comes to saving salmon, deterrence really is the name of the game." [Source: News release, Columbia Basin Salmon Enhancement Team, October 7, 1994.]

Portland and Rogue Valley, Oregon, become "Clean Cities." Through a Department of Energy program, 29 U.S. cities have agreed to encourage the use of alternative fuel vehicles as part of a clean air campaign. The two cities are the first

to join up from the Northwest. The program helps businesses and government agencies form partnerships to reduce auto emissions, which, in Portland, account for six times more air pollution than the city's industries. Portland Mayor Vera Katz has committed her city to "adding a number of alternative fueling sites, converting existing vehicles to operate on alternative fuels and purchasing factory-built alternative fuel vehicles," she said. [For more information: Clean Cities Hotline, 1-800-CCITIES.]

Heat pumps smaller than a dime are under development at Pacific Northwest Laboratory. Using microchip technology, scientists at the U.S. Department of Energy's Richland, Washington, laboratory are photoetching hair-sized channels into tiny pieces of metal where refrigerants can flow through and evaporate or condense. The heat is then transferred to the outside. The difficult technology remains trying to develop a miniature compressor for the system, but lab scientists expect to have a working model within three years. The miniaturized heat pumps could be built into walls to replace bulky furnaces, air conditioners and ductwork. [For more information: Susan Bauer, Pacific Northwest Laboratory, Box 999, Richland, Washington 99352 or phone 509-375-2561. Source: *Energy Conservation Digest*, September 5, 1994.]

SHORTS

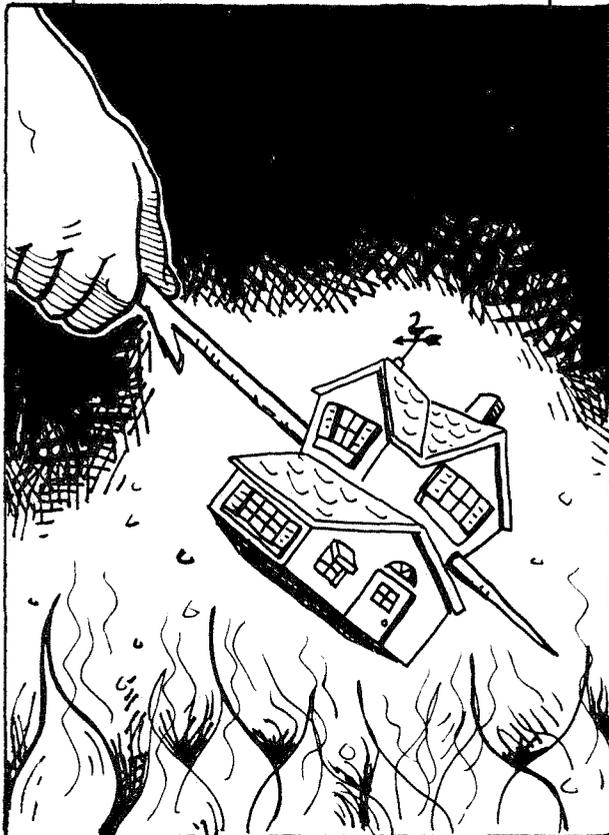
Nation

Nickel-and-a-half per kilowatt-hour solar electricity promised. Even solar promoters figured it would take decades before the cost of solar-powered electricity would get competitive with other new generating resources. But the Enron Corporation, the nation's largest natural gas company expects to offer 5.5-cent solar power in about two years. Enron's secret is largely just that — secret.

While the company has announced some technological advances in recent months, observers figure Enron's real edge is fundamentally a question of scale; Enron will build a 100-megawatt solar plant in the Nevada desert. That's significantly more solar photovoltaic panels in a single array than anywhere else. The company will also take advantage of tax incentives and financing opportunities to develop the plant that could power more than 100,000 homes. [Sources: *Los Angeles Times*, November 5 and 9, 1994, and *The New York Times*, November 15, 1994.]

Two utilities trade pollution allowances; profits go to conservation. In a unique transaction, Niagara Mohawk, the electric utility serving upstate New York, and Arizona Public Service of Phoenix have agreed to trade their ability to emit various pollutants. Niagara, which gets a substantial portion of its electricity from emission-free hydropower, will trade its rights to emit carbon dioxide to Arizona, which is experiencing a rapidly growing market for electricity and doubts that it can meet pollution standards. In return, Arizona will give Niagara sulfur dioxide allowances, which the New York utility doesn't need. Niagara will "donate" the allowances to a non-profit, which will "retire" the allowances. The New York utility

will also use part of the tax advantage from the donation to fund efficiency and other environmentally friendly utility activities around the world. The two utilities were among those signing the Clinton Administration's voluntary agreement to reduce greenhouse gas emissions. [Source: *The New York Times*, November 18, 1994.]



Here's help on heating your home. A new book, "Heating the Home," offers advice on improving the efficiency of electric, natural gas and oil-fired home heating systems. The book, published by the Energy Efficiency and Renewable Energy Clearinghouse, is available free by calling 800-363-3732. [Source: Energy Efficiency and Renewable Energy Clearinghouse.]

The U.S. Department of Energy has put its National Energy Information Center on Internet.

For answers to general energy questions, use your computer E-mail to access the information center at infoctr@eia.doe.gov. The department's Energy Efficiency and Renewable Energy Clearinghouse, which has information specifically on conservation and renewables, is also on Internet at the address of energyinfo@delphi.com. Include your name, affiliation, address, daytime voice phone number, FAX number and E-mail address for a response from either resource.

Michigan utility customers become first in nation to choose higher "green rates" for electricity from wind.

When the Traverse City Light and Power Company in Michigan contemplated adding an experimental wind turbine to its resource portfolio, the utility went directly to its customers for the financing. The company asked for volunteers who would accept a special rate increase of about 23 percent if their electricity would be supplied by a non-polluting wind turbine.

Unwilling customers would continue to receive the company's existing electricity at current rates. The project required at least 200 of the utility's 8,000 customers, and more than 260 signed up. Michigan's Public Service Commission also contributed \$50,000 to the project, which is Michigan's first utility wind project. The utility expects to break ground this spring. [For more information: Steven Smiley, project manager, at 1-616-922-0844.]

SHORTS

Americans list researching renewable energy technologies first or second for federal funding, according to a poll conducted by Republican pollster Dr. Vincent Breglio. The poll was ordered by the Sustainable Energy Budget Coalition, which represents business, environmental, consumer and government organizations. Of the 1,000 registered voters polled, 42 percent said renewables should be the top choice for federal research and development funding, and another 22 percent said renewables should be the second choice. Energy-efficiency technologies were ranked first or second by 49 percent of those surveyed. Nuclear power research topped the list of technologies where federal funding could be cut. [Source: *Wind Energy Weekly*, January 9, 1995.]

World

Solar home in Japan sells power to local utility. The owner of a home in a Tokyo suburb is selling surplus electricity generated by the home's 58 square meters of solar photovoltaic panels. The solar panels, which are built into the roofing of the home, supplement electricity supplied by the local utility. The test home was built in 1992 and monitored for a year. During that time, the home generated 4,268 kilowatt hours and sold 1,509 back to the utility. The builder, Misawa Homes Company expected to build 300 solar homes in 1994. [Source: *Demand-Side Technology Reports*, November 1994.]



CALENDAR

March 26 - 31 — Affordable Comfort Conference, at the Pittsburgh Hilton, Pittsburgh, Pennsylvania. Eighty-four workshop sessions will focus attention on residential energy efficiency and affordability. Contact Diane Tirio, Affordable Comfort '95, 412-373-0482.

April 2 - 5 — National Hydropower Association Annual Conference, Grand Hyatt Hotel, Washington, D.C. Focus of the conference is the role hydropower plays in meeting the nation's energy needs while providing stewardship and preservation of natural resources. The conference will include a Sustainable Marketplace Trade Fair on the Capitol Mall and an Environmental Achievement Awards Program at the Kennedy Center. Contact Betty Carreiro at the National Hydropower Association, 122 C Street Northwest,

Washington, D.C., 20001, or telephone 202-383-2534.

April 11-13 — Northwest Power Planning Council meeting in Welches, Oregon.

April 19 - 20 — Globalcon '95: The Marketplace for Energy and Environmental Technologies, at the Moscone Center in San Francisco, California. This energy expo also includes one-day workshops on: lighting retrofits; boiler optimization; adjustable speed drives; air quality, energy management review and compliance in production facilities; federal financing for energy savings; and retail wheeling. For more information, contact Ruth M. Bennett, Association of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, Georgia, 30340, phone 404-447-5083, ext. 210, FAX 404-446-3969.

May 1-3 — The Third National Conference on Building Commissioning, an educational forum to examine the state of the science in commercial building commissioning, will be held at the Pfister Hotel in Milwaukee, Wisconsin. For more information call Portland Energy Conservation, Inc., at 503-248-4636 ext. 215.

May 9-11 — Northwest Power Planning Council meeting in Post Falls, Idaho.

June 28-30 — 7th National Demand-Side Management Conference forum for professionals in the energy efficiency field held in Dallas, Texas. For more information, contact: Pamela Turner, 415-855-2010 or FAX 415-855-2041. Or write, 3412 Hillview Avenue, Box 10412, Palo Alto, CA, 94303.

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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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