

N O R T H W E S T
ENERGY NEWS

Volume 6, No. 5

Northwest Power Planning Council

August/September 1987



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N O R T H W E S T ENERGY NEWS

is published bi-monthly by the Northwest Power Planning Council, 850 S.W. Broadway, Suite 1100, Portland, Oregon 97205. Reprinting is encouraged. Please credit Northwest Energy News.

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

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Editor's Notes

High summer in the housing industry is peak construction time. Even in the maritime Northwest, where some building endeavors can go on through most of the winter, spring is the cue for ground breaking, and the long stretch of summer sends carpenters out to homesites en masse.

In the manufactured-housing industry, featured in several stories in this issue, the weather rarely constricts construction. Factory-built homes, particularly those that are assembled completely in the plant, are not hampered by bad weather. Nonetheless, once these homes roll out of the shelter of the shop, they become subject to the same weather conditions as conventionally built homes. Consequently, new efforts to make manufactured homes as energy-efficient as site-built ones are gaining regional, national and even international attention.

This was a particularly dry summer in much of the Northwest, and it followed a dry spring. Very

low water levels in the Columbia River Basin made this the first real trial of the Northwest Power Act's mandate to balance fish and wildlife with power generation in the hydropower system. Getting millions of young salmon and steelhead safely to the ocean required more give-and-take than might have been expected. Paula Walker describes one of the more grueling debates in her story, "What To Do When the River Runs Dry."

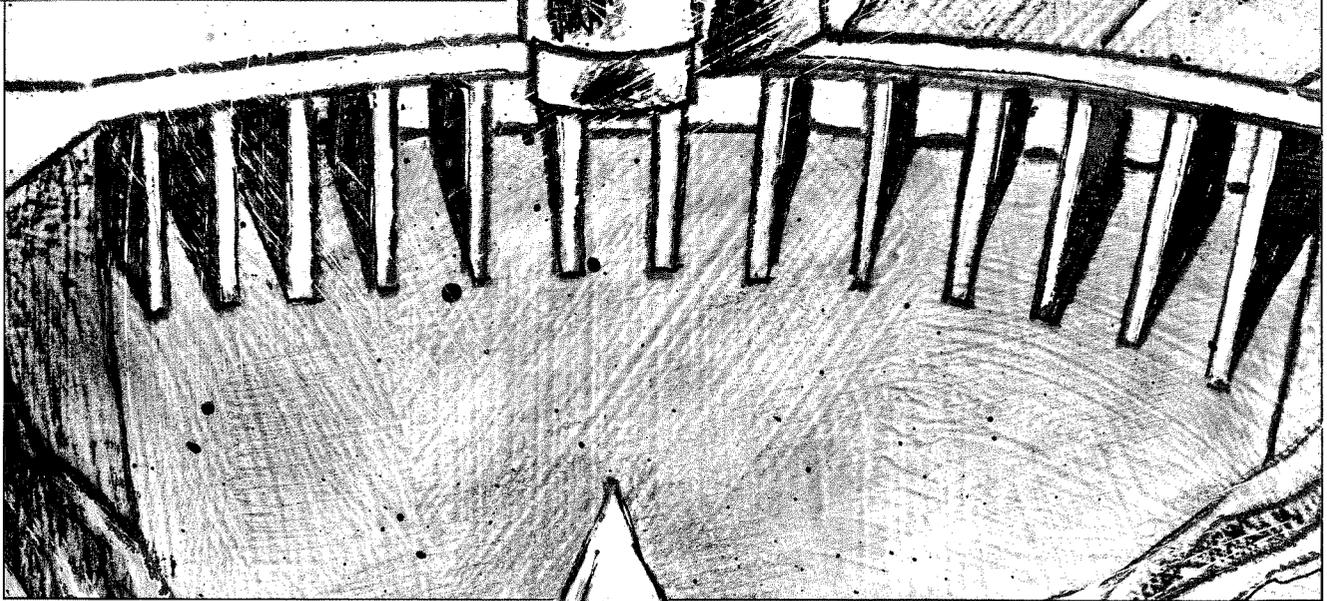
This issue's interview subject is Jack Donaldson, a central character in Northwest fisheries circles. Donaldson is executive secretary of the recently formed Columbia Basin Fish and Wildlife Authority, the organization that brings together regional fish and wildlife agencies and Indian tribes.

COVER ILLUSTRATION: Our cover illustration, "The Trout Quintet," is reproduced from an original etching by Sarah Chamberlain.

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WHAT TO DO WHEN THE RIVER RUNS DRY



Fish and Power Interests Join Forces to Counteract Low Water Levels

by Paula M. Walker

June 4, 1987. In a meeting room in Portland, a group of determined individuals wrestle with a tough decision. The outcome might mean either the loss of thousands of fish making their way down the Columbia River to the ocean or the loss of substantial revenues to the hydropower system. These people are no strangers to tough decisions. Some are responsible for operating the mighty hydropower dams that provide the bulk of electric power to the Pacific Northwest. Some have fought tenaciously to protect the fish that must pass those dams on their migratory route to the ocean. Together, they represent the major power and fish interests in the Columbia Basin — the Bonneville Power Administration, the U.S. Army Corps of Engineers, the utilities, the fish and wildlife agencies, and the Indian tribes.

“Everyone was trying to do something for the fish, and it made me feel good to be a part of it.” — Colonel James Fry, U.S. Army Corps of Engineers

T

he decision this group is struggling with involves a special release of water from Grand Coulee Dam (in eastern Washington) that would help move fish believed to be stranded in the 76-mile long John Day pool in the lower Columbia. The fish and wildlife agencies and Indian tribes argue that more water should be released from the upriver dam to increase flows to 220,000 cubic feet per second at McNary Dam (in northeastern Oregon), just above the John Day pool. The utilities object, citing loss of power revenues if the water is pushed through that quickly. They question whether such an operation is consistent with the Columbia River Basin Fish and Wildlife Program and whether fish are actually trapped in the John Day pool.

The decision is all the more difficult because neither the dam operators nor the fisheries managers can know with any certainty the full effect of their actions. More flows might mean more fish surviving their passage, but no one can know precisely how much or how little will make it work.

Two of the participants at the meeting represent the Northwest Power Planning Council, which developed the fish and wildlife program. Their job is to balance the interests of power and fish in the Columbia River Basin.

The Council set up the meeting to encourage the various groups and agencies to discuss the situation and attempt to reach a solution by consensus.

Ultimately, General George Robertson of the Corps, which coordinates flows in the hydroelectric system, decides to increase flows from Grand Coulee Dam between June 5 and June 10, although not to the level requested by the fishery agencies and tribes. It would be the second such special release in 11 days.

“Everyone was trying to do something for the fish, and it made me feel good to be a part of it,” explained Colonel James Fry, deputy commander for the Corps in the Northwest. “There was just no way we could release as much water as the agencies and tribes felt they needed to move the fish. We weren’t even sure the fish were in there,” he added. “Given the low water levels in the system, the general, who is responsible for all the uses of the water, ordered as much release from Grand Coulee as possible.”

While no one left that meeting room completely satisfied, the meeting was significant. It represented one of several efforts undertaken this year by the power and fish interests to work together to improve conditions for juvenile salmon and steelhead trying to swim

downstream when water levels were much lower than normal.

The conflict between protecting fish and wildlife and maximizing hydroelectric power production has a long history. Contention was common. Consensus was rare. The technical, economic, social and political complexities of the many uses of the river fostered an adversarial relationship among the various interests in the region. This year, water shortages threatened to accentuate those conflicts. But the actions of this unlikely group of confederates demonstrates that cooperation is possible, even under duress, and essential in helping to rebuild salmon and steelhead in the Columbia River Basin.

Council member Kai Lee expressed satisfaction with the process. “It is the Council’s responsibility to bring the parties together when they are unable to agree,” he said. “It is up to them [the parties] to make the decisions. Difficult as those decisions are, they made progress. The parties demonstrated that they could have a productive discussion on problems that arise on short notice and require quick resolution.”

Improving survival of juvenile fish on the mainstem of the Columbia and Snake rivers is a central objective of the Council's fish and wildlife program. Young migrating fish can be killed passing through dam turbines or in reservoirs between the dams if river flows do not move them quickly enough on their journey to the ocean. To increase fish survival, the Council included in its program such measures as a water budget to move fish more quickly through the reservoirs; spill to pass fish over rather than through the dams; facilities to help fish bypass the dams' turbines; and transportation of fish around the dams in barges. This is the first time those measures have been tested during a low water year.

The added urgency caused by low water levels was an important test of the fish and wildlife program's ability to respond to emergencies. With flows forecast to be 74 percent of normal in the Columbia and 62 percent of normal in the Snake, measures to save fish became even more critical. Fish passage managers calculated how much additional water they thought would be needed to move fish safely downstream. Hydropower project operators tried to determine how to preserve enough water to refill the reservoirs for power generation later in the year.



In an effort to respond to those problems, fish and power interests met together on several mainstem passage issues. The effectiveness of some of the decisions is still in question. No one knows, for instance, whether the Grand Coulee release succeeded in moving the fish out of the John Day pool. Nevertheless, the give-and-take required even to discuss those issues rationally represented a significant step toward managing the river by consensus and away from the contentious days of the past.

In a letter to the participants in those discussions, Council Chairman Bob Duncan wrote, "Cooperation leading to small but significant progress is always more difficult than angry confrontation that produces nothing."

Tim Wapato, executive director of the Columbia River Inter-Tribal Fish Commission, has been an active participant in those mainstem passage decisions. While noting that serious problems still remain, Wapato praised the Corps for releasing the water from Grand Coulee even though he maintains the amount released was not sufficient to move the fish.

"Looking at it objectively, I'd still say, 'good for the Corps.' They moved off the dime a little. They were reluctant to give the fish agencies all they requested, but they did compromise," Wapato said.

The Grand Coulee decision was one of several decisions affecting passage on the Columbia and Snake rivers this year. Fish and power interests reached significant agreements on several other mainstem issues. For the first time, water budget flows were provided in the Snake River, thanks in part to an agreement between Bonneville and the Idaho Power Company.

Those flows were essential in moving fish down the

Snake into the lower Columbia River. Once the Snake River water budget was exhausted, the Corps made the difficult decision to release water from Grand Coulee Dam to help fish migrating in the lower river.

The same group of fish and wildlife agencies, tribes, utilities, hydropower operators, and power marketers that anguished over the Grand Coulee decision hammered out an agreement to provide additional summer

spill at Lower Monumental, John Day and The Dalles dams if water and power conditions warranted it.

The agreement called for spill above and beyond the minimum amount required by the fish and wildlife program to provide at least 90 percent survival for 80 percent of the summer fish runs. Water, laden with young fish, would be spilled if water conditions were higher than critical levels, and secondary energy (energy over the amount contracted for) was being marketed. As a result of that agreement, more water was used to help fish down the river this summer.

Spill is used to help fish go over the dams instead of through the turbines. Because the water passes through the spillways and not through the powerhouses, the potential to generate electricity from that water is lost. Bonneville estimates that \$3 million in power revenues were lost in 1984 and \$27 million were lost in 1985 because of spill. The Council envisions spill as an interim measure until mechanical bypass systems are installed at each dam.

“Cooperation leading to small but significant progress is always more difficult than angry confrontation that produces nothing.” — Northwest Power Planning Council Chairman Bob Duncan



The actions of this unlikely group of confederates demonstrates that cooperation is possible, even under duress, and essential in helping to rebuild salmon and steelhead in the Columbia River Basin.

The agreement reached earlier this year on a schedule to expedite the installation of screens at mainstem dams ended a long-standing controversy between fish and power interests over delay and slippage in the installation of those screens. It is estimated that 10 to 30 percent of juvenile fish are killed at each dam without screens. While some of the dams do have screens, the unscreened ones take a significant toll on the fish that must pass several dams on their way to the ocean.

Currently, there are no screens at Ice Harbor, Lower Monumental and The Dalles dams. The Corps also is scheduled to improve screens at Little Goose, Lower Granite and McNary dams. The Council estimates that if 100 fish attempted to pass the eight federal projects on the Columbia and Snake rivers, 55 would be lost to turbine mortality alone by the time they passed Bonneville Dam. By adding screens to all mainstem dams, fish mortality could be cut in half, the Council estimates.

Another cooperative effort between the Corps and fish agencies and tribes in the basin will allow important research to be conducted at the Bonneville Dam second powerhouse next year. The Corps is continuing its efforts to determine the cause of the poor performance of the



dam's bypass facilities. The agencies and tribes, producers of most of the hatchery-bred salmon and steelhead in the basin, have agreed to provide young fish for a cooperative research project to determine the percentage of fish passing the Bonneville powerhouses and spillway. In exchange, the Corps agreed to forgo conducting a test during this low water year at the second powerhouse to see whether its operation during the daytime would attract more fish to the powerhouse. (See related story.)

None of these agreements was easily obtained. Individually, none of them represents a panacea for the problems that plague mainstem dams. The biological benefits are yet to be determined. But together, the agreements spell progress—progress that some observers believe may be measured in inches, not miles.

Wapato, a veteran of many hard-fought battles over the Columbia's fish, assessed the progress saying, "There is a difference, small but real, in the way these decisions are being made over how they operated even five years ago. We are hopeful that the process can be further refined for the needs of the fish."

Council Chairman Bob Duncan also agreed that progress had been made. In the letter to major participants in the mainstem passage decisions, he wrote, "While the final tally on these concerns is yet to be made, it is impressive to see the beginnings of a new spirit of accommodation and flexibility among all the interests affected, including the fisheries agencies and tribes, the utilities, the Bonneville Power Administration and the Corps of Engineers."

SOME PROGRESS

AT

BONNEVILLE II

Why are so many young fish still dying in the turbines at Bonneville Dam's second powerhouse? That mystery has baffled many an engineer and biologist for the past four years.

Despite \$23 million dollars' worth of fish bypass facilities installed at the powerhouse, only a disappointing 14 percent to 35 percent of the salmon and steelhead smolts were diverted from the turbines in the first year of operation in 1983. The results varied depending upon fish species.

Because of those results, the Northwest Power Planning Council urged the Corps in 1984 to shut down the powerhouse during the spring migration period unless 85 percent of the fish approaching the powerhouse could be guided safely past the turbines, or a power shortage required the second powerhouse's output to meet firm power needs. The Council also allowed operation of the powerhouse for research designed to correct fish passage problems or to aid adult fish moving upstream.

Problems at Bonneville are significant because it is the lowest dam on the Columbia River. All migrating juvenile salmon and steelhead must pass it before they reach the ocean, unless they are transported around the dam in barges.

Since 1984, the Corps has worked diligently to find a solution. But, the research has raised almost as many questions as it has answered. While none of the experimental solutions so far has achieved the Council's 85 percent fish guidance standard, the Corps has made significant progress in increasing the number of fish that circumvent the turbines.

During the initial years of research, the Corps studied the dam's problems by running relatively inexpensive

experiments on models of the dam in the laboratory. Recent work has moved from laboratory to dam as researchers have worked to turn some of their hypotheses into reality.

The problem seems to be the proximity of the dam's mechanical bypass screens (used to guide the young fish up and away from the turbine, see illustration) to the trash racks, where drifting logs and other debris are collected.

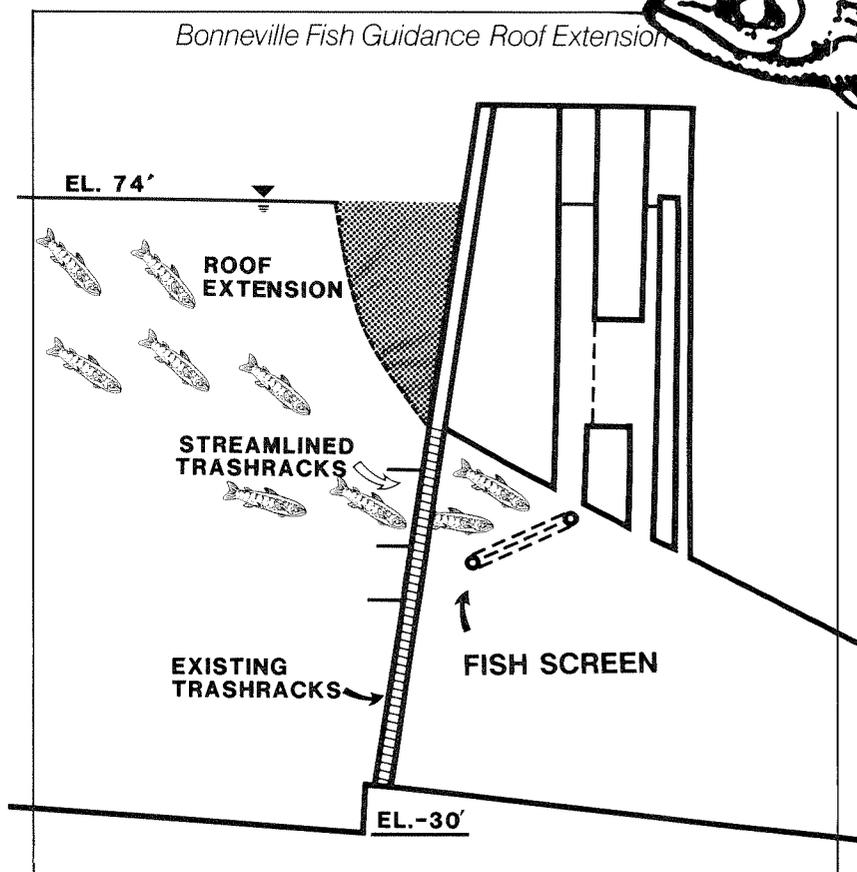
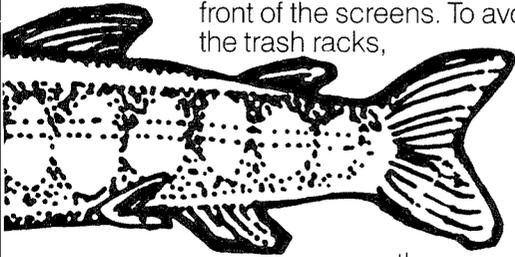


Illustration by Marty Todd

John Williams, the fishery biologist who coordinates the research on the second powerhouse for the Corps, explains that researchers have tried lowering the screens to allow more room for the fish to travel up the slots that guide them away from the turbines.

The Corps speculates that fish are reluctant to swim through the trash racks in front of the screens. To avoid the trash racks,



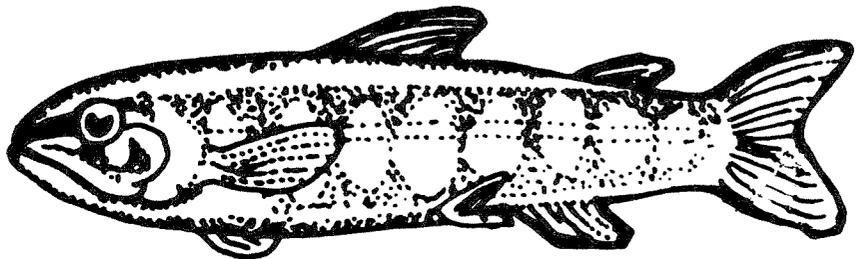
they move further down in the water and appear to be swept under the trash racks and screens into the turbines. Modifications were made to streamline the trash racks to more closely approximate the angle of the water as it flows toward the screens. In 1985, the combination of lowering the screens and streamlining the trash racks doubled the fish guidance efficiency levels of spring chinook and coho from about 20 percent to 40 percent, still well below the 85-percent level called for in the Council's fish and wildlife program.

In 1986, the Corps added roof extensions to the face of the powerhouse in an attempt to smooth the flow of water coming into the turbine intake area. Model testing

showed that turbulence was created as the water hit the face of the powerhouse. Researchers, hypothesizing that the eddies created by the turbulence sucked the fish down below the protective screens, suggested installing the roof extensions to try to cut down on the turbulence. Combined with the lowered screens and streamlined trash racks, the addition of roof extensions bore favorable results. That combination successfully guided 70 percent of the spring chinook away from the dam turbines in 1986.

The fluky results might be caused by the immaturity of the first fish that come down the river in early spring, Williams says. Often hatchery-produced fish, those early migrants are not as far along in their smoltification (a process salmon and steelhead undergo to adapt from a freshwater to a salt-water environment) as the fish that follow a few weeks later. Their immaturity might make them less easy to guide, Williams speculates.

This year, a light bulb illuminated the Corps experiments, literally. The Corps installed banks of lights on



But nature has a way of toying with the percentages. Bolstered by its success in 1986, the Corps began 1987 by testing the same three improvements that yielded the 70-percent guidance levels the previous year. The first test gave a disappointing 35-percent guidance efficiency. Three weeks later, however, the results were up to 60 percent.

the trash racks, the roof extension and on the roof of the turbine intake. Some of the lights seemed to be effective in attracting the fish through the trash rack toward the screen. Based on initial results, lights may improve guidance levels in combination with the other equipment tested. The Corps will continue the light tests on fall chinook during the summer migration season.

The shallowness of the channel leading up to the powerhouse (the forebay) also was suspected as a cause of the high fish mortality rates. Several people speculated that a berm, built during construction of the powerhouse and only partially removed after its completion, could be affecting how deep the fish are in the water as they swim toward the dam.

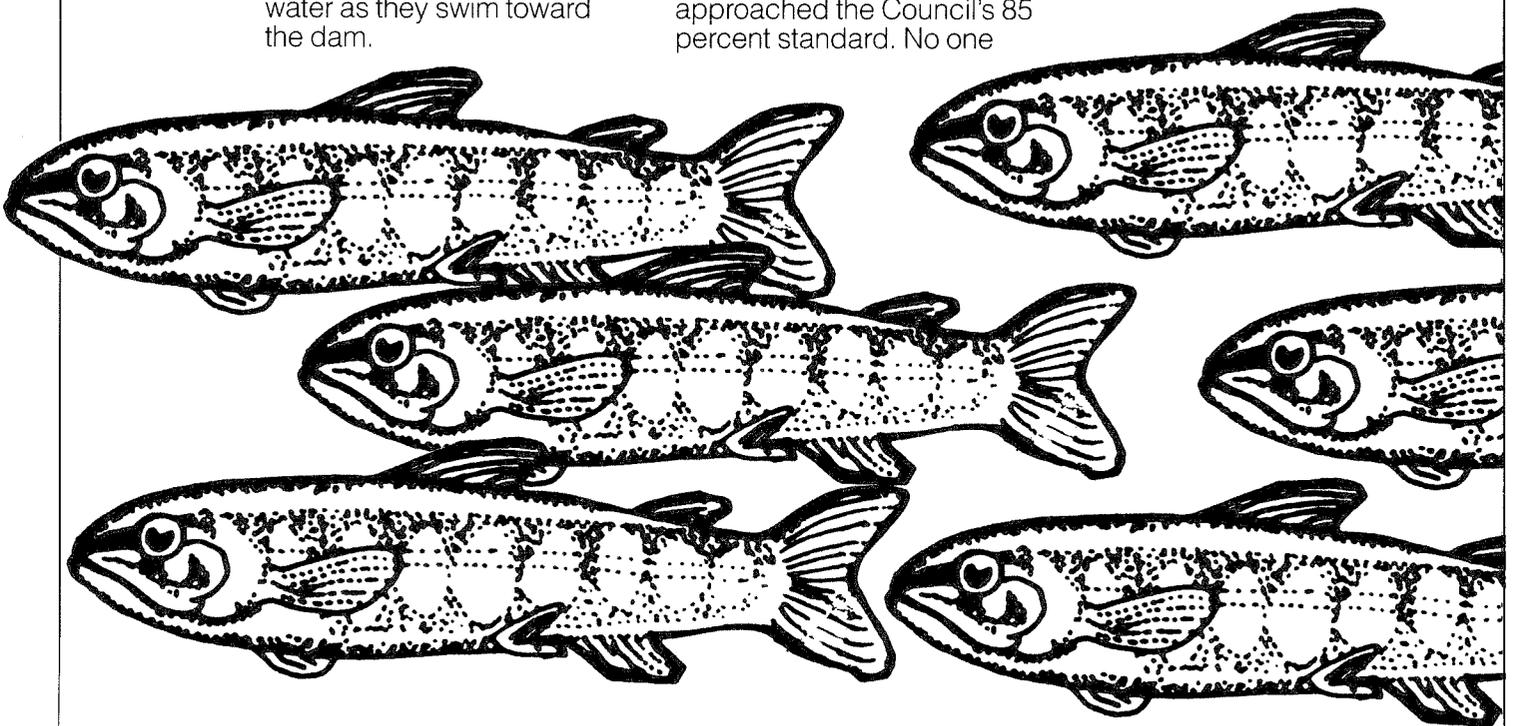
said, with no guarantee that it would significantly improve fish passage. Instead, the Corps is aiming its primary research efforts at improving the guidance of fish away from the turbines by using screens.

After five years and \$5.3 million of tests, answers still elude researchers. Guidance levels still have not approached the Council's 85 percent standard. No one

spring chinook, steelhead and fall chinook.

But the Corps is committed to solving the riddle of the smolt: How can a 2-ounce fish confound a \$600 million powerhouse? That question might make even the Sphinx shake its head.

—PMW



According to Williams, research on this possibility is currently a lower priority with the Corps because results of tests on models of the forebay were inconclusive. Digging a deeper channel would cost an estimated \$20 million to \$30 million, Williams

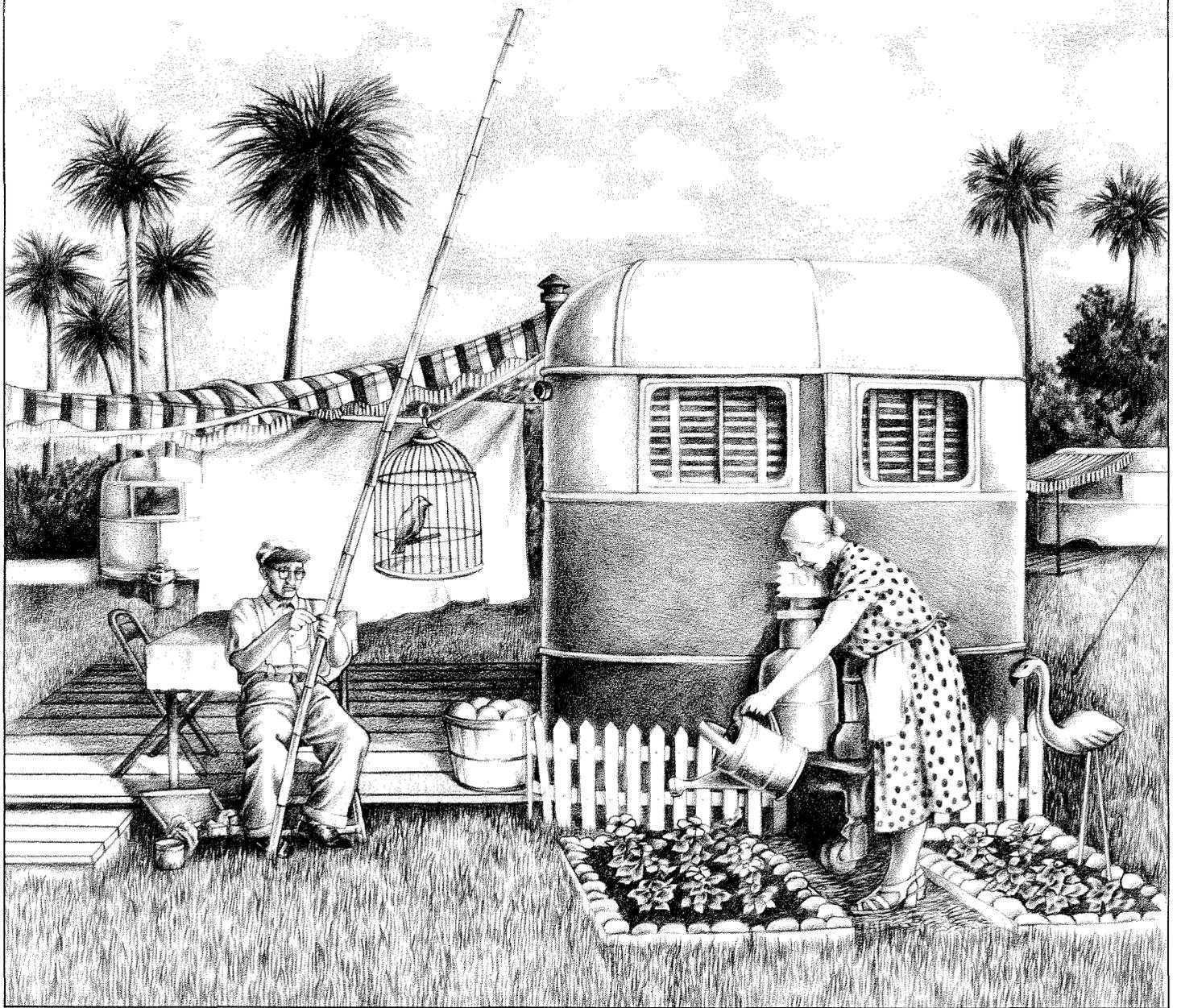
knows whether the equipment tested can be installed practically without hampering the operation of the powerhouse. Success in guiding fish varies widely among

CONSERVATION STRATEGIES FOR SHOP-BUILT HOUSES

ime was when nearly all year-round homes (as opposed to vacation homes) were constructed from the ground up on the spot where they were intended to remain for at least 20 years. Now, in the Northwest at least, about a third of the homes being built are assembled to some degree in factories and transported to homesites.

Standardized construction techniques and nationwide building codes govern the quality and efficiency of these "manufactured" homes, enabling them to be among the least expensive housing options available. But the codes that govern the energy efficiency of these dwellings have not kept pace with most state, local or regional energy codes. In the Northwest, bringing the efficiency of manufactured housing up to the level of the model conservation standards for new electrically heated homes could save ratepayers as much as one billion dollars over the next 20 years.

The three stories that follow describe alternative ways to realize those savings.



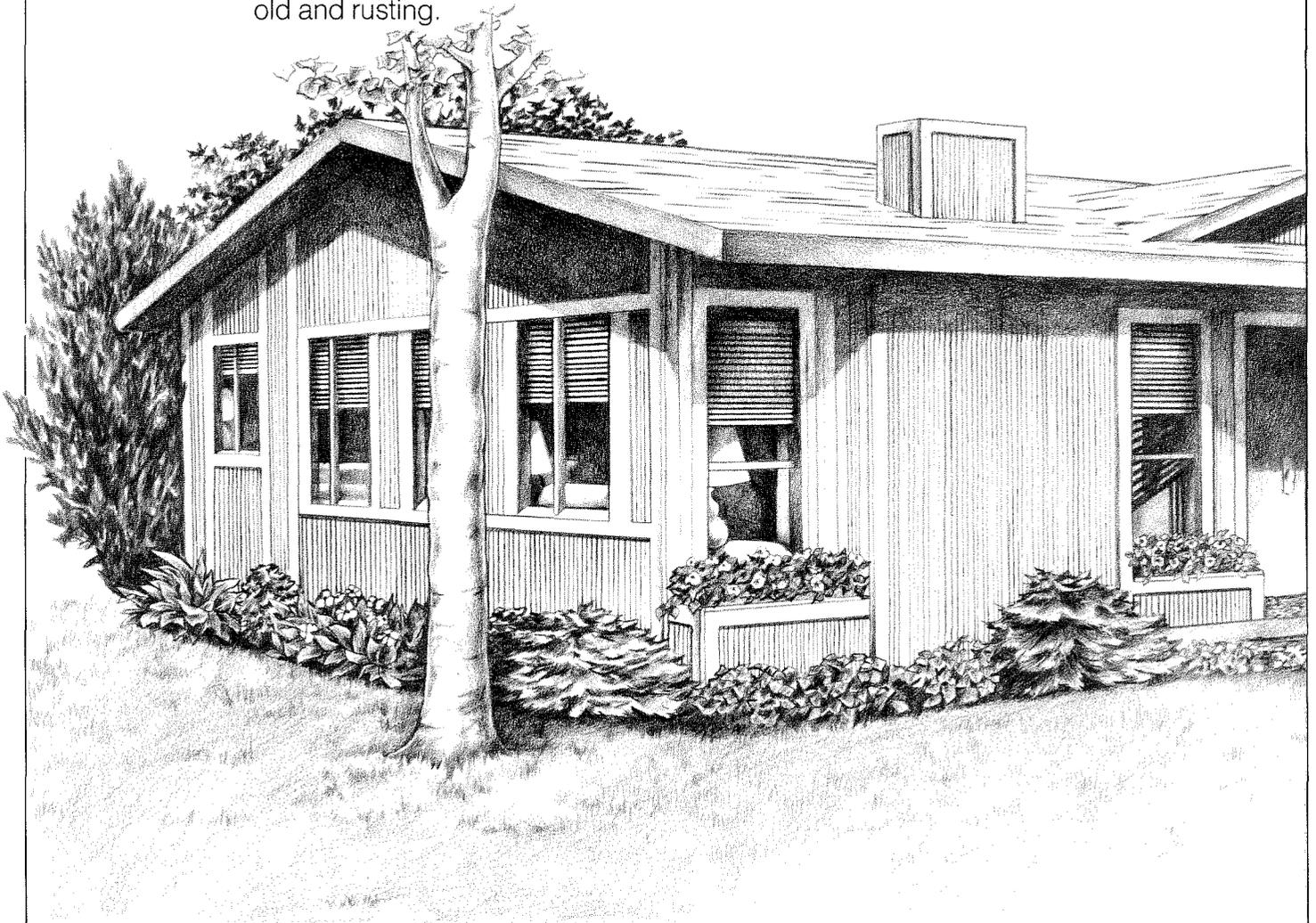
Grandchild of the Conestogas that carried settlers west, the trailer house has an image nearly 40 years old and rusting.

The **MOBILE HOME COMES OF AGE**

by Carlotta Collette



What comes to mind is a narrow metal stairway — no more than a few steps, a tiny landing and an aluminum door, ribbed aluminum exterior walls, pink and white in the 1950s. Inside there would be rooms like a doll's house, difficult to move around in for more than one person at a time, but a wonder of spatial efficiency. This is the compact capsule remembered as the home on wheels. Grandchild of the Conestogas that carried settlers west, the trailer house has an image nearly 40 years old and rusting.



Until World War II created housing shortages near defense-related industries, the trailer house was almost exclusively a recreational vehicle. The poverty and displacement of the 1930s squeezed some families out of houses and into trailers, but by and large, the tiny tin dwellings were hitched up and hauled off to the nation's playgrounds.

When the war buildup began to draw great numbers of people to big cities and small towns where jobs awaited them, it became obvious that cheap and, for the most part, temporary housing was needed. The federal government responded by purchasing and deploying nearly 36,000 trailers, each measuring only 8 feet by 20 feet. Individual units were meant to house a family of four. Some were slightly expandable to house up to six people. They were parked in lots close by the work sites where shared amenities could be provided easily.

After the war, many returning veterans and their young families found up-scaled mobile homes to be their first step toward the single-family detached home that was as American a promise

as any they'd fought for. Mobile homes were stretched to 30, 40, even 50-foot lengths and filled with "deluxe" accommodations. Metal-on-metal construction made them lightweight but tough. They even provided a substitute market for some of the aluminum industry's output after the war effort ended.

Today's mobile homes bear almost no resemblance to any of their ancestors. They roll out of the factory and onto a site and stay put.

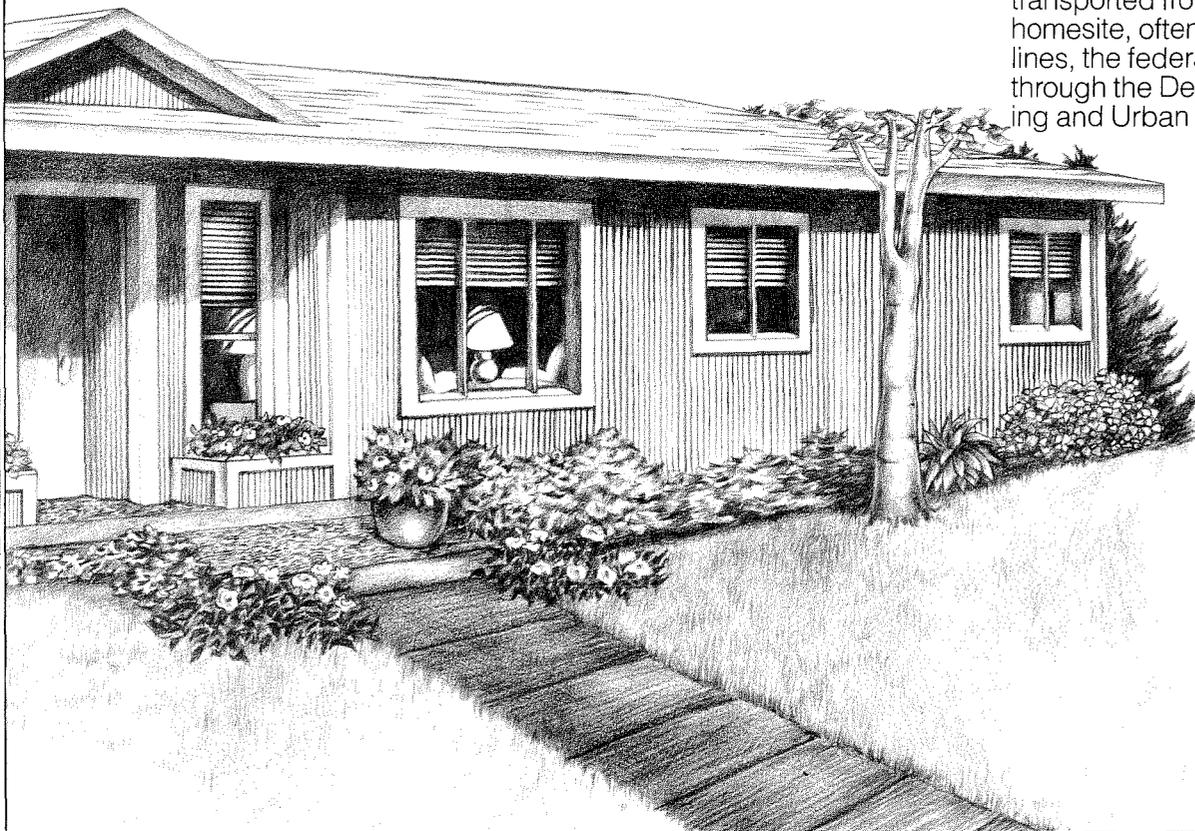
These homes are built of the same materials as homes crafted from the ground up. They have wood framing — often 2x6's, shingled roofs, insulated walls, ceilings and floors, and sheetrocked interior walls. Some of them are embellished with oak cupboards, master bedroom suites and fireplaces with real stone hearths. Individual units measure up to 14 feet wide (the legal maximum for purposes of transportation) and more than 60 feet long. Double-wide and even triple-wide units are common, making for houses with square-footages comparable to conventional, site-built homes (1,500 square feet on average).

Because they are built on assembly lines, indoors (hence, not subject to seasonal or other climatic limitations) and with standardized materials bought in large quantities, they are still among this country's most affordable options for detached, new-home ownership.

Far from being only the choice of the poor and otherwise homeless, today's "trailer houses" are home for people in every economic class.

Far from being only the choice of the poor and otherwise homeless, today's "trailer houses" are home for people in every economic class. In the Pacific Northwest, about a third of all new housing starts are mobile or manufactured homes. In Montana, nearly half of all new houses are built in factories and delivered to homesites.

Because they are meant to be transported from the plant to the homesite, often crossing state lines, the federal government through the Department of Housing and Urban Development



(HUD) has the authority to regulate the industry. In the mid-1970s, at the request of manufacturers, HUD adopted national construction and safety guidelines that preempt all comparable state and local building codes. The HUD standards refer only to factory-built homes, not modular homes, which are assembled at building sites, nor pre-cut or kit-type homes.

This single, nationwide set of codes gave the manufactured housing industry a distinct advantage over site-built or even modular housing industries. Individual companies (there were about 600 nationwide and 17 in the Northwest in 1985) may have plants in several states, yet they are still able to standardize their operations. According to industry representatives, this preemptive code is critical to the industry's ability to keep its housing costs far below the competition's. It is key to being able to provide the affordable housing alternative to people who cannot afford the \$50,000 to \$90,000 site-built home, they argue. Manufactured

HUD-code homes can be bought for as little as \$10,000. (This does not include delivery, set-up or land purchase costs.)

The HUD code includes minimum energy conservation standards all manufactured homes in America must comply with. But because these codes were developed in 1975, they rarely correspond to the more stringent energy-efficiency levels called for in contemporary state, local or regional building codes. Nor do HUD-code efficiency levels come close to the minimum energy standards required by HUD of site-built homes that carry federally insured mortgages.

While surveys of current practices in constructing and insulating HUD-code homes in the Northwest indicate that almost all manufacturers exceed the HUD minimum energy-efficiency levels (see chart), only a few companies offer models that meet state codes for site-built homes.

The most energy-efficient manufactured homes in the Northwest only come close to complying with the model conservation standards developed by the Northwest Power Planning Council to recover all cost-effective energy conservation possible from new electrically heated houses.

This becomes a serious problem when one considers that about 10,000 of these homes are built each year in the Northwest; that more than 90 percent of them are electrically heated (based on manufacturers' projections for 1987); and that building them to meet the Council's standards could save as much as 115 average megawatts of electricity over the next 20 years (the average electricity use of a city the size of Missoula, Montana). If electrically heated manufactured homes in the Northwest can be made to comply with the model conservation standards, it could mean nearly a billion dollars in savings for the region's ratepayers.

AVERAGE INSULATION LEVELS IN NEW CONSTRUCTION

STANDARD	BUILDING COMPONENT				
	CEILING	WALL	FLOOR	WINDOW	DOOR
Manufactured Homes Current Practice	R*-17	R-12	R-10	R-1.3	R-5
Manufactured Homes HUD-Code	R-11	R-7	R-7	R-1.3	R-2.5
Site-Built Homes HUD-Code	R-38	R-19	R-19	R-1.7	R-5
Oregon Code	R-38	R-19	R-19	R-1.3	R-2.5
Washington Code	R-38	R-19	R-19	R-1.7	R-2.5
Model Conservation Standards					
Zone 1	R-38	R-19	R-30	R-2.5	R-5.0
Zone 2	R-38	R-24	R-30	R-2.5	R-5.0
Zone 3	R-49	R-27	R-30	R-2.5	R-5.0

**"R" values measure the ability of a material or a combination of materials to retard or resist the flow of heat. The higher the "R," the greater the insulating value.



wo efforts under way could result in industry-wide changes in conservation levels in manufactured housing. Both the U.S. Congress and

HUD itself are reviewing the codes that govern mobile-home construction.

In the House of Representatives, the Housing and Community Development Act of 1987 (H.R. 4) has a provision that would require manufactured housing regulated by HUD to meet the same minimum thermal performance standards as those required of site-built houses. The Housing Bill passed by the Senate does not address this issue. A joint committee of the House and Senate will meet to work out differences between the two versions of the legislation.

In the meantime, HUD has issued its own proposal to eliminate thermal performance standards from the Manufactured Home Construction and Safety Standards governing the mobile home industry. The effect of such a decision would be to permit state and local governments to establish their own standards for the energy efficiency of manufactured housing.

Either action would likely result in the fabrication of mobile homes that are far more energy-efficient than ones currently being built. But mobile home manufacturers say such efficiency will come at a cost their customers cannot afford.

"Some of our customers are barely able to get together a down payment for a unit costing \$15,000," explains Joan Brown, executive director of the Washington Manufactured Housing Association. "Some of these energy saving measures could add \$2,000 or \$3,000 to their cost. That becomes a real issue to them."

Steve Driscoll, general manager of Silvercrest Industries, Inc., a mobile home manufacturing firm in Woodburn, Oregon, concurs. He describes mortgage lenders who charge higher interest rates for mobile home purchases than for site-built homes, and who fail to consider

If electrically heated manufactured homes in the Northwest can be made to comply with the model conservation standards, it could mean nearly a billion dollars in savings for the region's ratepayers.

the monthly energy savings when calculating the debt ratios on which they can help finance home purchases. "Many mobile home buyers don't have a choice about whether they'll put in added efficiency features. Sometimes the customer has to choose whether he wants a new pickup or a home. They're that close to not qualifying for a loan at all."

On the other hand, proponents of energy efficiency point out that there are two costs to buying any home, the purchase price and the maintenance cost. Energy-efficient measures will benefit low-income buyers by reducing their monthly electric heating bills, thus making the home more affordable to live in.

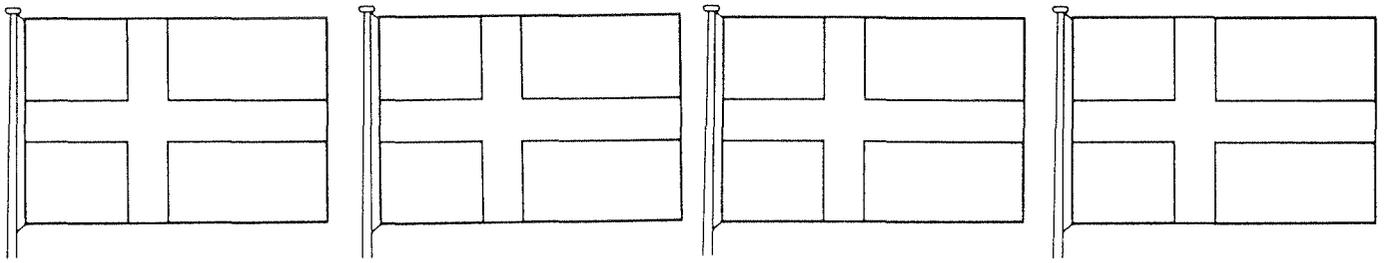
Despite two recent demonstration projects sponsored by the Bonneville Power Administration to determine the cost and benefits of making manufactured homes more efficient, there remain questions. Exactly how can the structural efficiency of these buildings be maximized without compromising their affordability? Are there ways to subsidize the addition of insulation and other energy-saving components so the region can garner the electrical savings without penalizing the new home buyer?

Manufacturers maintain that there are purely structural limitations on the amount of insulation they can fit into their units and still keep them transportable. They point to height restrictions that enable mobile homes to clear overpasses on freeways, reasoning that more insulation would literally raise the roof.

These and other concerns are being addressed in Bonneville's proposed project to build and test an additional 126 manufactured homes. "Clearly, HUD-code manufactured homes, if not built to regionally cost-effective levels of energy efficiency, would represent a significant lost-opportunity resource for the power system," Sydney Berwager, Bonneville's residential program division director, explained in testimony before the Council at its June meeting in Ashland, Oregon.

At this same meeting, the Council voted to support both the federal legislation to have manufactured homes comply with codes for site-built homes and HUD's effort to deregulate energy-efficiency standards. Arguing in favor of the Council's decision, Council Chairman Robert Duncan noted that manufactured housing will provide "a large amount of electrical energy that can be saved if we do something about it."

"Doing something," may translate into "doing a lot," if technical and financial barriers are to be overcome. If they are overcome, there's little question that America's most adaptable and affordable model of manufacturing and design efficiency can also become a snug model of energy efficiency.



THE SWEDISH SOLUTION

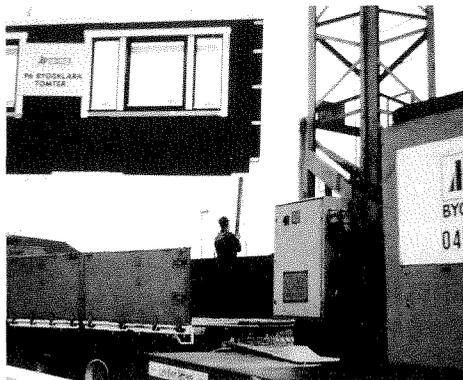
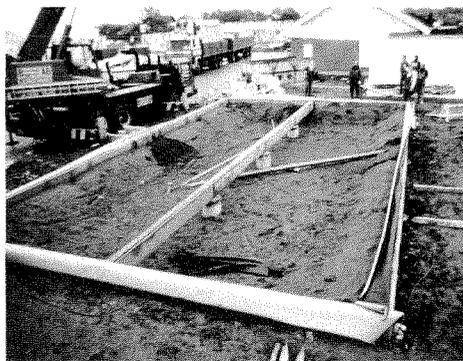
by Jim Nybo

World War II brought a severe housing shortage to Sweden, as it did to the United States. The Swedish response was to develop a manufactured housing industry that today provides nine out of every 10 new single-family homes in the country. And while there are many similarities between U.S. and Swedish manufactured housing, there are some important differences.

The foremost difference, according to the Swedes, is one of quality. Swedish industry representatives maintain that they use superior materials and manufacturing precision to produce homes that cost as much as conventional "stick-built" ones, but which are both superior overall and more energy conserving.

One feature cited by the Swedes in support of their claim of quality is the use of nordic timber, which grows slowly in Sweden's relatively dry climate, but which is denser and more dimensionally stable than faster growing timber.

The privately owned Swedish housing factories vary in size, level of automation, and in the construction format. Some factories pro-

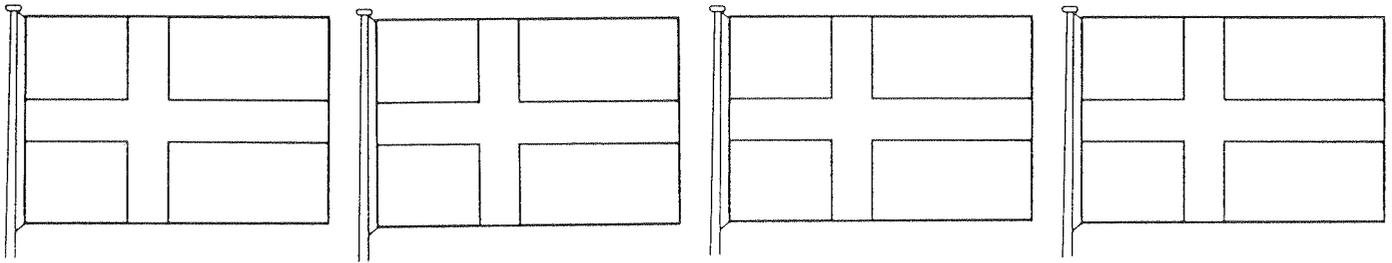


Steps in building a Swedish modular home — (top) After the foundation is completed, floor blocks are mounted on the foundation with a crane. (bottom) Workers prepare to put pre-assembled wall in place.

duce complete three-dimensional units (similar to what is called "modular housing" in the United States), while others build wall-sections which are then assembled at the homesite.

It's easier to visualize the building process by following a typical construction scenario for a wall-section home. A local sales representative, associated with the manufacturer, works with the buyer to establish the design features of the home and select the homesite. Site preparation, including laying the foundation, is usually done while the component walls are being manufactured.

In the factory, the desired construction features are fed into a computer, which guides construction of wall sections up to 40 feet long. These come complete with structural framing, insulation, windows, doors, exterior siding, wiring, air/vapor barrier and interior wallboard. The wall, ceiling, roof and floor components come off the assembly line in the reverse order they are needed for on-site erection. They are then loaded into one or more 40-foot trailers to be delivered to the homesite. The process, from placing the order till component shipping, typically takes six to 12 weeks.



On the day erection is to begin, a crew of three trained workers with a small crane meet the trailer at the site. The crane lifts the component sections from the trailer and places them on the foundation where the workers assemble them. All joints are fitted with gaskets and are precisely and solidly fastened together. By the end of the day, the structure has been assembled and the heat has been turned on. Within two or three weeks, the concrete tile roof is installed and remaining interior work is completed.

The Swedish homes are very energy-efficient, meeting or exceeding the new Northwest Energy Code (which is equivalent to the Northwest Power Planning Council's model conservation standards).

The 1984 update of the Swedish energy code for electrically heated homes calls for R-52 ceilings, R-38 walls, R-38 floors, efficient triple-pane windows with some facing south for solar tempering, and mechanical ventilation with heat recovery.

The emphasis on energy efficiency is based not only on the desire to provide affordable and comfortable housing, but it is also an important part of a Swedish

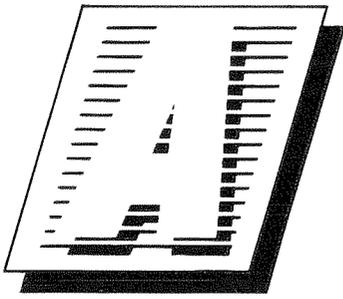


Swedish builders use energy-efficient building techniques on manufactured houses.

national decision to phase out the use of nuclear power by the year 2010.

In the Pacific Northwest, the state of Washington and the Swedish government recently sponsored a three-day conference in Tacoma, Washington, to explore ways in which the state and Sweden can work together. Over 40 Swedish business, government and academic leaders met with their Washington state counterparts to explore opportunities for joint-venture applications of this Swedish technology.

In the words of Dick Watson, director of the Washington State Energy Office, "We're looking at teaming up Washington wood products, other building materials and manpower with Swedish know-how to produce high quality, energy-efficient homes. It looks like it could be a great way to contribute to our economy, our energy future, and our quality of life."



CLASS ACT

Conservation in Cold Montana

by Terri Wilner

At age 16, Jim Blanché was indentured as an apprentice carpenter in Ireland. He was bound to devote five years to learning the construction trade for about \$10 a week compensation. Fate and love intervened in Jim's path, and an early marriage was the straw that broke the indenture contract.

Thirty-five years later and several thousand miles distant, Jim is renewing his knowledge of building skills. This time, his training is focused on the state of the art in energy-efficient building, American style.

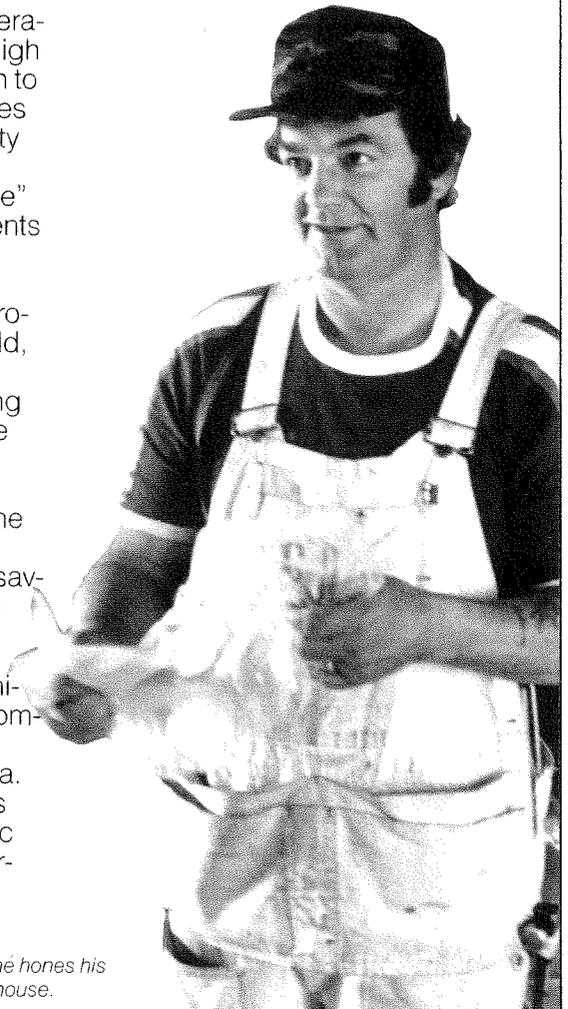
Jim and 11 other students are enrolled in the carpentry program at the Vocational Technical Center in Helena, Montana. During this past year, these students built — and recently sold — a Super Good Cents modular house. This was a seemingly spectacular feat for Jim and his fellow classmates, most of whom had very little background or prior experience in construction. And few had any idea about the importance of energy conservation in building technology. Now, however, they are pre-

paring to become the next generation of master builders, where high levels of insulation and attention to other energy-conserving features are considered integral to quality construction.

"J.C. and the Swinging Twelve" (hammers, that is), as the students refer to themselves and their instructor, John Cromrich, are winding down their year-long program. Although the house is sold, some finishing touches remain. Attention is now turned to adding to the "eye appeal" of the house by installing cabinets and trim, sealing wood doors and laying linoleum and carpet. But over the past year these students have learned a lot about the energy-saving attributes of a house sealed behind its walls.

The Helena Vocational Technical Center offers the only comprehensive training in building technology available in Montana. The standard curriculum for this course includes training in basic construction skills, including wiring, plumbing, masonry work, structural framing, and interior

Carpentry student Jim Blanché hones his skills on an energy-efficient house.



Photographs by Terri Wilner

and exterior finishing. Over the past several years, however, instructor Cromrich has added a new dimension to the program—a core of information and training on energy-saving building techniques, drawn primarily from the Bonneville Power Administration-sponsored Super Good Cents Program. Super Good Cents is a marketing program for new electrically heated homes built to the Northwest Power Planning Council's model conservation standards.

Cromrich, a native Montanan from Butte, was used to cold northern winters. Like many of us, though, he became painfully aware of the economic impact of keeping warm when energy prices soared during the 1970s. His personal and professional interest in building energy-conserving homes had grown over his 20-year career with the center. When the Montana Department of Natural Resources and Conservation began offering energy-conservation seminars (also sponsored by Bonneville), Cromrich jumped at the chance to become more proficient.

"Super Good Cents provides the best instructional information available on energy-efficient construction," says Cromrich. "The seminars, technical assistance, reliable information and good answers can't be beat."

After attending these seminars, Cromrich began incorporating the energy information into his carpentry class curriculum. He found the Super Good Cents materials were even more meaningful than information he had gleaned from trade periodicals, because Super Good Cents was tailored for Montana.

But as good as curriculum alone can be, "hands-on" training is likely to be the cement that bonds the book-learning to real-life skills. So the next logical step, in Cromrich's thinking, was to give his students an opportunity to try out these energy-efficiency concepts. For the previous 25 years, students in the carpentry program have constructed a house as part of the program requirements. Cromrich decided to pursue a new twist in this aspect of the program—the construction of a super energy-efficient house. Bonneville agreed to fund the incremental costs of the energy features; the Department of Natural Resources and Conservation agreed to provide design and technical assistance; and Cromrich convinced his administration that this effort—although a departure from business as usual—would be very worthwhile.

So when the fall 1986 instruction began, this group of carpentry students found themselves neck-deep in curriculum relating to

heat-loss calculations, thermal performance of houses, and ventilation technology (including layout design of a heat-recovery ventilator), in addition to on-site installation of vapor barriers, insulation and energy-efficient windows.

The house the students built is a three bedroom, two bath modular design, adapted from an original floor plan by Kober Homes of Billings, Montana. To meet the Super Good Cents specifications for Montana's cold climate, the students used advanced framing techniques, 2-by-6-inch walls (R-26), R-49 in the ceiling and energy-efficient windows and doors. The house will be electrically heated with fan-forced electric heaters in individual rooms. It also has a whole-house programmable thermostat for maximum control, and an air-to-air heat exchanger with a duct heater. Annual heating costs for the 1,200 square foot home are estimated to be approximately \$160, compared to \$400 for a similar house without the Super Good Cents features.

Reflecting on their experiences over the past year, the carpentry students are enthusiastic about what they have learned. They seem to echo a familiar theme, as one student succinctly described: "Energy is the big thing, the big trend in building. We gotta learn how to use the least and get the most out of it."

Vocational-technical school students build a modular Super Good Cents home in Helena, Montana.



JACK DONALDSON

He says he was born with scales. That may be stretching things a bit, but Jack Donaldson certainly has one of the fishiest backgrounds in the Northwest. Donaldson, executive secretary of the newly formed Columbia Basin Fish and Wildlife Authority, not only has a long career in fisheries, but he comes from what amounts to a fisheries dynasty.

At the time Donaldson was born, his grandfather was chief fish and game warden for the state of Montana, a position which is now the directorship of the Department of Fish, Wildlife and Parks. In those days, according to Donaldson, the emphasis was on enforcement. They had few hatcheries, and, says Donaldson, "They didn't know what a biologist was."

Donaldson's father got started in the family career when, during a summer break in his school teaching, he took a job in a fish hatchery. That first fish-related job led to a lifelong interest in fisheries that took Donaldson's father to the University of Washington where he's been for the last 57 years. He taught fisheries management for 45 of those years and is currently professor emeritus. In fact, Donaldson had his father for a professor when he attended the University of Washington, and he

claims it was terrible. "I worked my tail off doing 'A' work and got 'Bs,'" he grumbles.

Donaldson was born in Montana but raised in Seattle. Following his graduation, he went to Norway to study fisheries on a Fulbright scholarship for a year, then returned to get his masters at Washington. He worked as a biologist with the Washington Department of Game for nearly a decade before returning to the university to get his doctorate. His thesis problem was on the sockeye fishery in Bristol Bay, Alaska.

From there, Donaldson took a job teaching fisheries management at Oregon State University, a job that was also to last a decade. He left there to go into private enterprise, starting a salmon farm on the Oregon coast called Oregon Aqua Foods.

Five years later, in 1976, he was named director of the Oregon Department of Fish and Wildlife. In 1986, he retired from the agency at the age of 58, but his retirement didn't last long. He and some of his fisheries colleagues were involved in



Illustration by Lynn Carson

the process of setting up the Columbia Basin Fish and Wildlife Authority, and he was urged to step into the job as executive secretary. "I'm glad I did," he says, "I love this so much. This is exciting!"

Jack Donaldson's enthusiasm for the new project is obvious. "Exciting" is a word he uses unconsciously — and often.

Q. What is the Columbia Basin Fish and Wildlife Authority? How did it come about?

To give you a little history, about 10 years ago the fish and wildlife agencies on the Columbia River felt the need to coordinate their activities better. State and federal

agencies were going in somewhat different directions and doing different things, but still frequently overlapping. In order to coordinate better, we put together what was then called the Columbia River Fisheries Council. It functioned for a while as a little ad hoc group that grew. Eventually, we felt we needed an executive secretary, so we hired one of the fisheries administrators.

The tribes were also becoming very active in fisheries management through their court settlements, and we were trying to bring them aboard. In those days, we [agencies and tribes] weren't cooperating as well as we are today. We were still very active in court, and courts just don't breed good cooperation; they breed the

adversarial approach to problem solving, and that's not very friendly. So we couldn't put together a body that included the tribes and the agencies. We fought over the idea of consensus [decision-making], mainly because we — the agencies — viewed consensus in the negative sense. We saw it as a veto; somebody was going to say no and stifle actions. So the consensus question kept us apart for many years.

Then, with the exciting activities surrounding consummation of the U.S.-Canada Pacific Salmon Interception Treaty negotiations that had gone on for a dozen or more years, we began to see the fruits of working together. Tim Wapato [director of the Columbia River Inter-Tribal Fish Commission] and



We all began to realize that we were going to make more progress by cooperating with each other than by individually lobbing missles.

Bill Wilkerson [former director of the Washington Department of Fisheries] and I took the lead, as we all began to realize that we were going to make more progress by cooperating with each other than by individually lobbing missles. It was the right time for us to put together this group

called the Columbia Basin Fish and Wildlife Authority.

Q. This is a relatively new coalition isn't it? What parties are involved?

Yes, the Authority charter was accepted in January of this year, and it includes all the [fish and wildlife] managing entities in the Columbia Basin. That's two federal agencies — the National Marine Fisheries Service and the U.S. Fish and Wildlife Service; five state agencies in the four states of the basin (there are two in Washington); and the 13 Indian tribes in the basin. For the first time, we are part of a coordinating body that operates by consensus. I'm not aware of anything else like it in the United States or maybe even the world. It's just terribly exciting.

Consensus is now viewed in the positive light in that we have the ability to move ahead in a position of power with consensus. Therefore, it behooves everybody to reach consensus. We can only move as an "Authority" if there's consensus. All the parties must be in agreement.

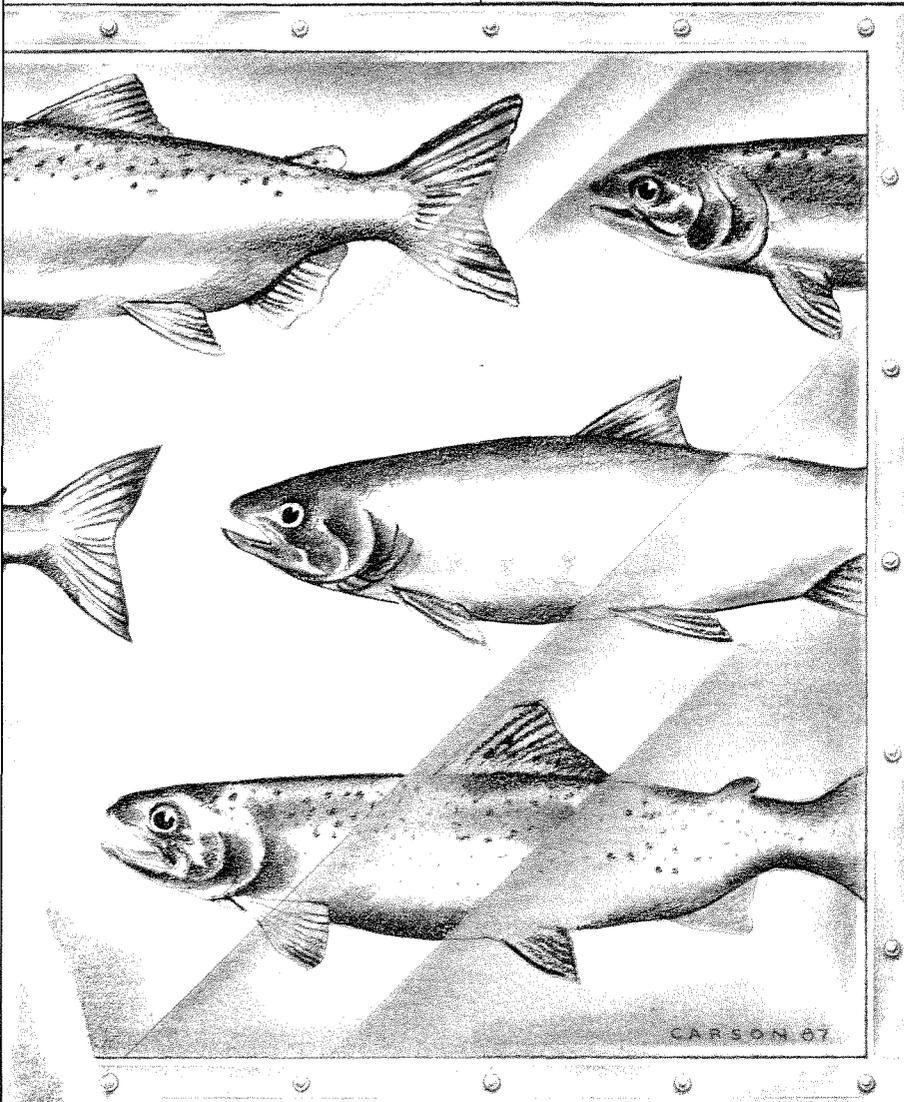
Q. What is the major focus of the Authority?

There are a whole number of objectives, but it comes down to coordination of the fisheries and wildlife management activities on the river. However, in this case we do not deal in harvest. We work on the production side of fisheries management, with artificial and natural types of production.

At some time we may entertain harvest, but currently, in order to get going and get a track record of cooperation through consensus, we are dealing only in the production side of the fisheries management issue. We're directly involved with the [Northwest Power Planning] Council, Bonneville [Power Administration], and the [U.S. Army] Corps of Engineers.

Q. How can you avoid the harvest issue since it is so interrelated with fish production?

The members of the Authority are involved in various aspects of harvest management. Each state manages the stocks of fish within its waters, and representatives of the federal and state agencies and the tribes serve on a variety of interstate and international harvest forums. In the river, between Washington and Oregon, the stocks are managed through the Columbia River Compact. Those are the commercial net fisheries of the river — tribal and non-tribal. The ocean fishery is managed through the Department of Commerce from three to 200 miles. The states, federal entities and tribes have representation through that and in the international forum of the Pacific Salmon Treaty through the Pacific Salmon Commission.



It's a great deal like a corporate interlocking board of directors in that the directors from the states are on the compact, the directors and Indian leaders are on the Pacific Fishery Management Council, and a number of us are on the U.S. Commission that deals with the international intercepting fisheries between Canada and the United States. Tim Wapato, for instance, is the chairman of the United States section; Bill Wilkerson is a commissioner, I'm an alternate commissioner.

Q. Co-management — management by both the agencies and tribes — is a term that we hear more and more. How is it working?

Co-management is the theme of the day in fisheries, and to a degree wildlife, but particularly salmon and steelhead fisheries. It's probably the most exciting thing I've been involved with in my long career in fisheries because it's so necessary and so workable. Instead of arguing over who catches the last fish, we're now cooperating to see that there are more fish that can be shared in an agreed upon formula.

People are not running to court as often. We haven't been to court on the Columbia River for a long time because of the agreements we have been able to work out. The Puget Sound issues are also considerably less litigious. We have some action on the coast right now with one of the tribes. But, in time, that's resolvable as well in this forum of co-management. It took the agencies and the non-treaty fishermen a long time to recognize that. And there's still some hold-outs — people who would rather fight than switch. But they're the minority, and certainly they do not have the voice or the ear of the management authorities or the political bodies that appoint them, such as governors, legislators and congressmen.

It has to be a relief to those political people that the fights over harvest have almost disappeared from the scene, instead of constantly coming to the courts and the floor. Co-management now is extending over into the [fish] production side of the things. In fact, the Authority only came to be

because of the recognition of co-management.

When I taught at Oregon State, we used to use the Columbia River as a class problem on how a fishery could be managed out of existence. This is where we were headed in the '60s.

Q. There have been many stories in the Northwest media this past spring and summer about rebounding fish runs. Are there still some severely depressed stocks? What is the overall situation?

The overall health [of the runs] is improving. The patient was terribly, terribly sick, almost moribund. But, it is a much healthier patient today, particularly in the Columbia Basin, which is the main interest of the Power Council and the Authority. When I taught at Oregon State, we used to use the Columbia River as a class problem on how a fishery could be managed out of existence by lack of management. This is where we were headed in the '60s.

But, if I were to teach that course today, I'd teach it entirely differently. There is now a success story, and it's the story of co-management and coordination through such things as the Northwest Power Act, which opened up the door for us to sit down with power interests and attempt to resolve our long-standing conflicts.

Q. It sounds as if you've taken the first step; the fisheries interests have gotten together among themselves and are now approaching the power interests. Are you trying to do at that level what you did among yourselves?

Yes, I think that's a good example. We went in separately before [on fish versus power issues], and

we always heard from congressmen and then from the Power Council in its early days, "Get your act together. We're not going to referee your squabbles."

Our squabbles were basically those over harvest, but production got thrown into it because harvest and production are inseparable. You can't harvest without some production planning, and if you have production planning, you certainly have to have a harvest scheme in order not to overharvest. So, once we had that understanding, we could sit down and begin talking to our long-time adversaries, the power side of Columbia River management. We could begin to turn that into a cooperative venture to have power and fish, which, simply stated, is the basic goal of the Power Act.

Q. How would you assess the progress so far?

Again, it's exciting. Progress is good. It's too easy to focus on the differences that remain. And there are significant differences, for example, over the question of roles. This comes up when all of a sudden you have some new folks on the block. The new folks are really the Power Planning Council — the Corps and Bonneville have been there a long time. We have not always been on the best of terms there. So, through the Act, we are now very frequently at the table together. However, as in any new relationship, you have to understand each other's purpose and make sure that one isn't stepping into the other's role. This is where we've had our discussions on the role of Bonneville in fish and wildlife management.

Jim Jura [Bonneville's Administrator] has been a very open-minded man and a good listener, when we have had these "role" discussions with Bonneville. We are making progress, not necessarily to redefine the roles of Bonneville relative to fish and wildlife and/or the agencies and tribes for that matter, but to describe a process that will make what we all do work better for all of us. Some of the same kinds of discussions are

going on with the Power Council. I think that with your staff and our staff — fisheries and wildlife agencies — there are sometimes mixed signals as to how we carry out our roles. But the spirit is good between the groups. When problems pop up — which they do, and we have some currently — we can sit down in various forums, either at the staff levels or at the Council member's level with our directors and leaders like Wapato, Schmittien [Rollie Schmittien is Northwest regional director of the National Marine Fisheries Service and chairman of the Columbia Basin Fish and Wildlife Authority] and the other directors.

Q. You mentioned Jim Jura, are there others in the power community who have been particularly helpful?

Well, I mentioned Jim because he sat down with the agencies and tribes and has been a very fair and open person. All too frequently, leaders want to talk more than they want to listen, and Jura is a fine listener. He speaks his mind, but he also can hear what you have to say.

We have better relations with the Corps. There have been some good leaders coming through the Corps that have been very helpful. The generals and the colonels over the last five to eight years have been very aware of the fisheries problems and very willing to work together.

We have a way to go. I think the difficult thing is that our respective staffs have been in adversarial roles for so long, it's hard to get some of them to listen to each other as carefully as I think they should. I'm hoping that such a cooperative relationship can develop with PNUCC [Pacific Northwest Utilities Conference Committee] and Al Wright [PNUCC executive director], and I think that there's no reason why it can't happen.

We have also had good relationships with most of the Power Council people, past and present. Theirs is a difficult balancing role.

Q. There's some debate and concern in the basin about balancing hatchery-produced fish with wild and natural fish. Could you address this subject?

The wild/natural/artificial argument is not new. It's been around a long time. The history of hatcheries goes back to just after the turn of the century when wild stocks of salmon were literally overfished — heavily overfished. Summer chinook in the Columbia were the first example. Since the science of fishery management was so new, we didn't have all the subtleties of system planning and subbasin planning and computer programs and all those things to help us. Somebody thought, gee, hatcheries can do it. So hatcheries became a quick fix.

I think there certainly was a backlash out of that when it was found out that you can't rob streams of eggs and put them in hatcheries and do the job. There were very successful hatchery programs, and there were very definite miserable failures. We ignored, to a degree, the habitat concerns and production of wild fish.

In the last decade, probably a little longer, we have begun to look at a balance between hatchery production and wild and natural production. I say wild and natural because wild fish, to me, and I think to most people, mean those fish which have always reproduced in a particular stream and continue to do so on their own with no help from human hands. Now I doubt there is such a thing as a truly, truly wild aboriginal gene pool, particularly in the basin. There are wild fish, but I'm sure that somewhere in the streams where anadromous [ocean migrating] fish go, a hatchery fish has probably strayed to spawn naturally with a wild fish and the genes were shared. Now that's not a disaster; that doesn't mean that it's contaminated beyond all repair. It just means that there's been a sharing of genes to some limited degree. In fact, it is that very straying of wild fish among the streams that has maintained hybrid vigor.

Hatcheries serve a role, but they are not a panacea.

So a truly wild fish probably cannot be found in the natural system. And thus the word natural is used. This is where you have wild production potential, but it needs some help, either to start or once started, to continue, because some limiting feature does not let production just take off on its own. It needs a little stimulus through what we call supplementation [planting hatchery-bred juveniles to mature in natural habitat]. Then there's the system that is totally unable to handle natural production itself, for example, where you build a dam. The Dworshak Dam is one that displaces habitat. In order to mitigate for that, you put in a hatchery and replace those stocks with artificially produced fish.

Without the hatcheries we would have a considerably reduced fishery today, particularly in the Columbia Basin. So hatcheries serve a role, but they are not a panacea. At best we have to blend wild, stimulated natural and hatchery production in order to optimize salmon and steelhead production. That's difficult because of the survival differences between stocks.

You can get a greater return for eggs with hatcheries than you can with wild and/or natural fish, mainly because you protect them during that very vulnerable early life history phase when they are in the hatcheries. So, from a cost-accounting perspective, good hatcheries that are run effectively are probably quicker and cheaper means to fish production. But that ignores the need for a wild stock that fills a habitat niche that's essential both for added production and for genetic diversity.

Those are two very big biological concerns, so we must constantly balance them. You get people who say hatcheries will do it — just forget about other stuff and produce the fish in the hatchery and the hell with it. And you get the other side, and they're saying wild fish are the only thing, the rest of these fish are not as good, and all of the other arguments. That is nonsense. There has got to be a balance.

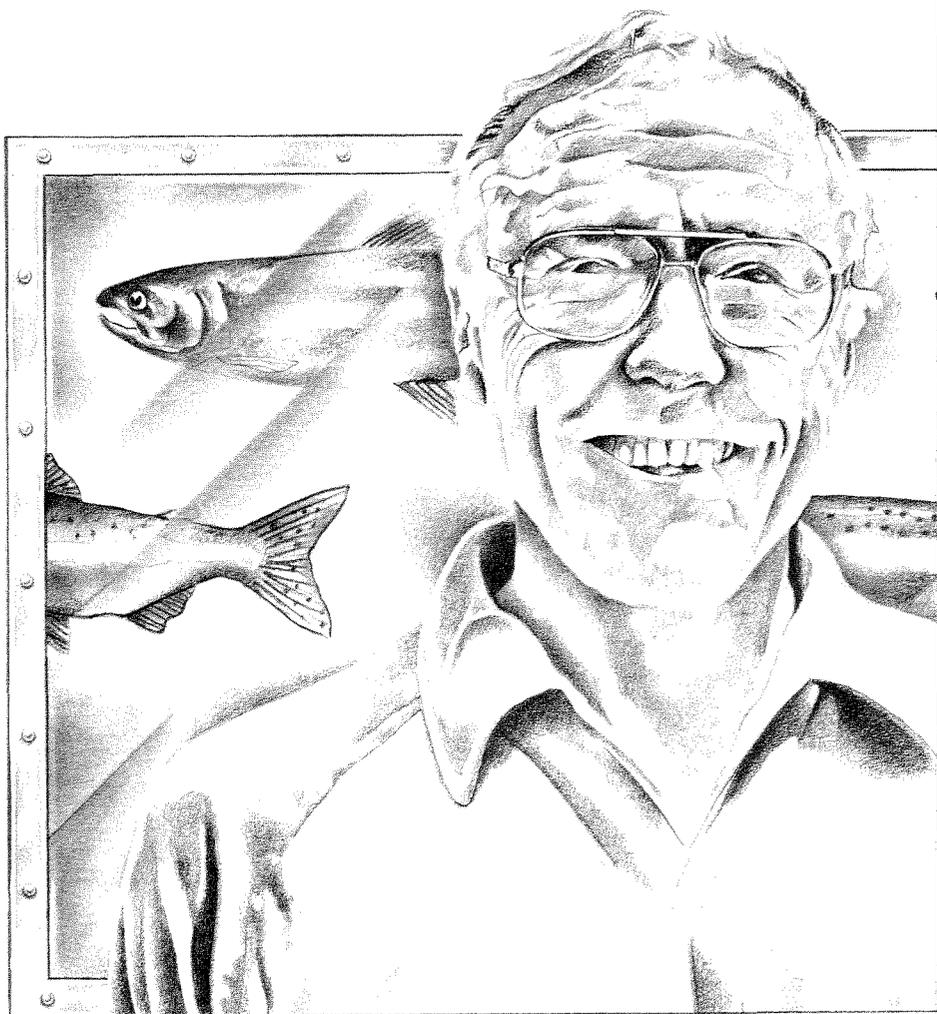
Q. Planning is a broad term. Can you describe specific things you are doing or looking at?

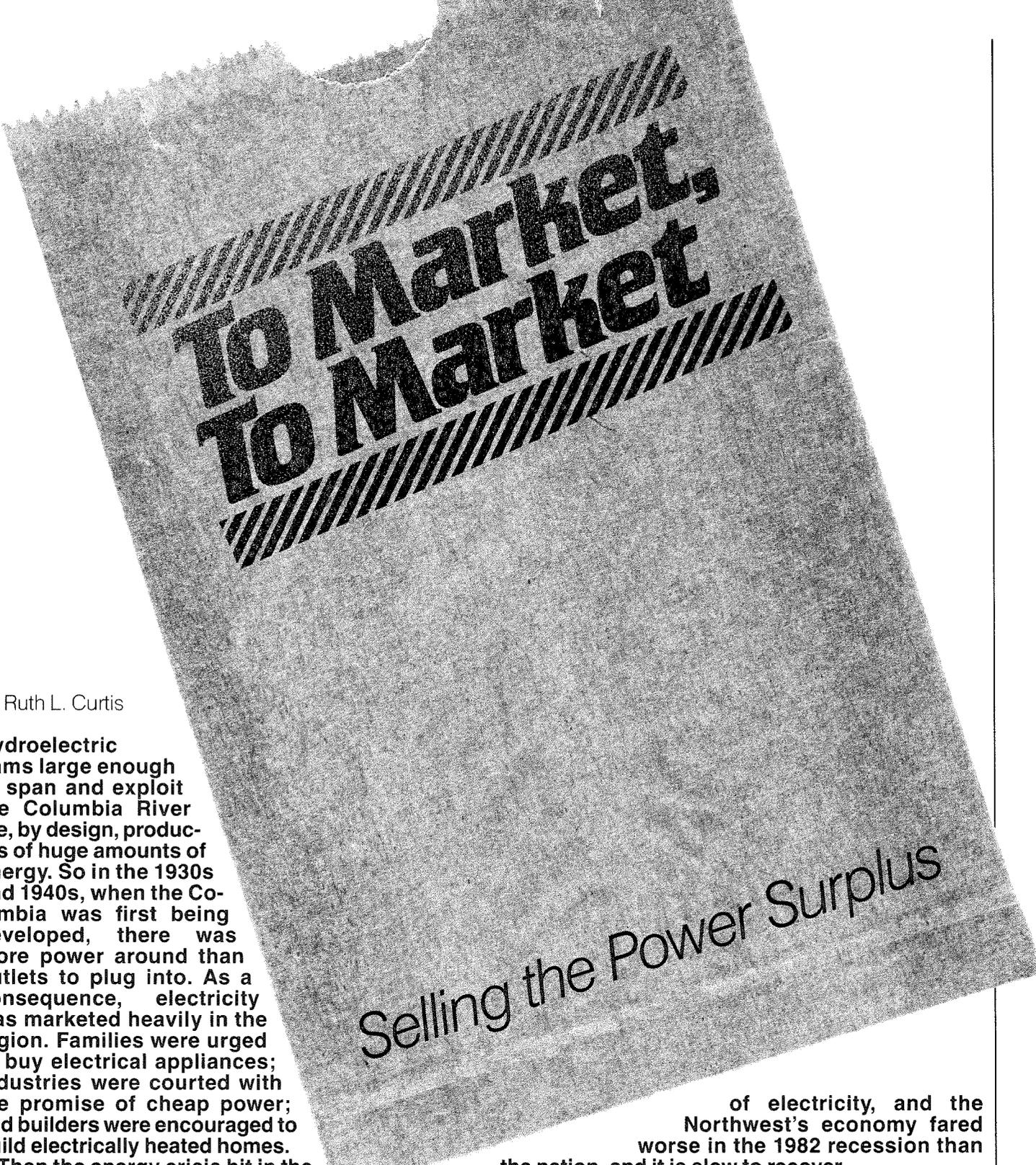
The elements in a subbasin plan are, of course, the habitat available, how many miles of stream there are, and how much of that is productive to salmonid spawning and rearing. What's the quality of the habitat? What are the impediments to passage? Are there little dams, big dams? It doesn't do any good to go high up into the Columbia system into the far reaches of the Salmon River and say we're going to produce a lot of wild fish, if we can't get them down or back.

This is how the three elements in fish management interrelate. One is the production of young fish, be it wild or hatchery or whatever, in the headwaters. The second is passage to the ocean, thus the hydro system is involved. And the third is harvest management. It's folly to produce a lot of fish, then kill them on the way to the sea or on the way back in overharvesting. It's also silly to protect too many with overly designed facilities and then over or underharvest them. So those three elements — production, passage and harvest — all have to be in balance. And that's a part of the planning system as well.

The one element we were criticized early on for not having together was the harvest system. The Power Council said, "If we're going to spend a lot of money to produce all these fish up here, how do we know you're going to manage the harvest end of this equation?" We can report back, and have reported back, we have that under control now. There's a treaty with Canada; we have coordinated management on the ocean with jurisdiction to 200 miles; and we have an agreement, soon to be ratified or consummated in court, for harvest management in the river. We are also helped by court agreements along the ocean coast and in Puget Sound.

We still need to correct the non-directed harvesting, in contrast to the directed, which is fishermen catching fish. Non-directed harvesters are the hydro facilities because of the turbine and reservoir mortality of downstream migrants. The fish bypass facilities [at the dams] need to be completed. We need to get the levels of survival up so that we can finish the production end of the three-legged stool through system planning. Once those three pieces are in line, we will have accomplished a modern miracle in resource management. When most resources in the world are in decline, we will have saved a valuable resource — the fisheries of the Columbia Basin.





To Market, To Market

by Ruth L. Curtis

Hydroelectric dams large enough to span and exploit the Columbia River are, by design, producers of huge amounts of energy. So in the 1930s and 1940s, when the Columbia was first being developed, there was more power around than outlets to plug into. As a consequence, electricity was marketed heavily in the region. Families were urged to buy electrical appliances; industries were courted with the promise of cheap power; and builders were encouraged to build electrically heated homes.

Then the energy crisis hit in the 1970s, and a combination of oil shortages and forecasts of rapid electrical load growth triggered a reversal of electricity marketing policies. Selling electricity was downplayed, while saving it was encouraged.

Today, conservation is still the priority. Efficient use of the resource is simple good sense. But marketing has suddenly reappeared as a magic word in electric utility circles.

Marketing is important again for two related reasons: the Northwest has a surplus

Selling the Power Surplus

of electricity, and the Northwest's economy fared worse in the 1982 recession than the nation, and it is slow to recover.

The Northwest economy leans heavily on industries that, in the 1980s, have suffered price deflation, stagnating markets and intense international competition. Throughout the decade, resource-based industries, such as lumber or mining, have grown more slowly than the average industrial rate of growth. Oregon, Idaho and Montana, whose economies are dominated by those industries, have also grown more slowly than the rest of the United States. The Northwest Power Planning Council, in its Western Electricity Study,

projects that these states could be among the slowest growing states in the western United States.

Because of this economic stagnation, demand for electricity has not increased since 1979. The Northwest now has a surplus of electricity, the most expensive surplus in its history. In the past, the Northwest frequently had surplus electricity, but that surplus traditionally was made up of inexpensive hydroelectric power that could be sold cheaply to customers in California.

Northwest utilities can no longer automatically expect to sell surplus electricity to California at a profit or even to recover costs.

Today's surplus includes electricity produced in coal and nuclear-fueled plants. This is far more costly. Northwest utilities can no longer automatically expect to sell surplus electricity to California at a profit or even to recover costs. Competition is tough now from other sellers. Northwest utilities are looking at other markets for their product, especially markets within the region.

Bob Saxvik, one of the Council's two members from Idaho, agrees that marketing can be a very useful tool, but cautions that it is not a cure-all. In a speech to the Northwest Public Power Association earlier this summer, Saxvik queried, "Are we marketing to solicit loads that will cure short-term cash flow problems without regard to their long-term impact on the region? Or are we using marketing to promote efficient loads that will provide stability and predictability?"

Tom Trulove, Council member from eastern Washington, reasons that planning for stable and predictable electrical energy costs is the major contribution the power system can make to creating a favorable business climate in the Northwest. "Cut-rate power or so called 'fire' sales and the like may be harmful rather than helpful to the extent they disrupt this stability," he says.

Trulove believes that stability and predictability are important to encouraging companies to locate, expand or go after new markets. "And while the cost of power is rarely a deciding factor in itself in these decisions," he says, "it is part of the mix that makes up the business climate." When that mix minimizes economic risk, an area experiences growth and, through the additional investment, more stability in the long run. This translates into more predictable electricity markets for the utilities.

Most Northwest utilities have been affected adversely by the region's economic troubles. Many have lost revenues due to industrial decline and are having trouble meeting their costs. Some of these utilities are customers of the Bonneville Power Administration, from which they buy electricity to resell to their customers. Last fall, representatives of several utilities met with Bonneville to discuss the problems they were having. In response, Bonneville developed a proposal for a consumer marketing program designed to help utilities as well as the communities they serve.

Sue Hickey, Bonneville's acting assistant administrator for conservation and power resources, explains that the agency was selling its surplus power to California at 1.4 cents per kilowatt-hour. "Folks in the region said 'Hey, we could use that power here at that price.' So we began looking at what we could do to sell that surplus power here in the Northwest and benefit the region."

The program Bonneville developed is designed to "actively support Bonneville's customers by helping them market electricity effectively," according to John Pynch, assistant director for Bonneville's division of customer ser-

vice. "It will also help Bonneville's own revenue problems during this period of surplus and will ensure that electricity remains a competitive fuel in the Northwest."

Bonneville's marketing proposal actually consists of seven different programs:

1. Special rates that local utilities could offer new and expanding industries;
2. Incentives that utilities would offer industrial plants that are operating at less than full capacity due to unprofitable market conditions;
3. An industrial technical assistance program in which Bonneville and utilities would work together to provide information on energy-efficient technologies to the utility's industrial customers;
4. Commercial design assistance to provide building owners, designers and others with technical assistance and information about energy-efficient commercial building design and equipment;
5. A program to allow utilities to experiment with creative ideas to use the surplus electricity in ways that do not fall under the other proposed programs;
6. A pilot incentive program to assist public utilities in regaining electricity sales that would otherwise be lost because of the use of wood for space heating; and
7. Special rates to utilities that serve industries which are about to close industrial facilities due to unprofitable market conditions. The industry would need to show that reduced energy costs would contribute to its continued viability.

"These programs market electricity as a package with efficient use and financial benefits," according to Pynch.

It would be folly to market inefficient loads that we will have to serve even after the surplus is gone.

The emphasis on efficiency is important, stresses Saxvik. "Much of the instability in the region's loads in the past has been due to inefficiency. Efficient loads are good loads to have in a surplus. They're stable loads that won't swing widely. It would be folly to market inefficient loads that we will have to serve even after the surplus is gone. We don't want to create demand, for example, for electrically heated homes, then end up with ratepayers who can't afford them."

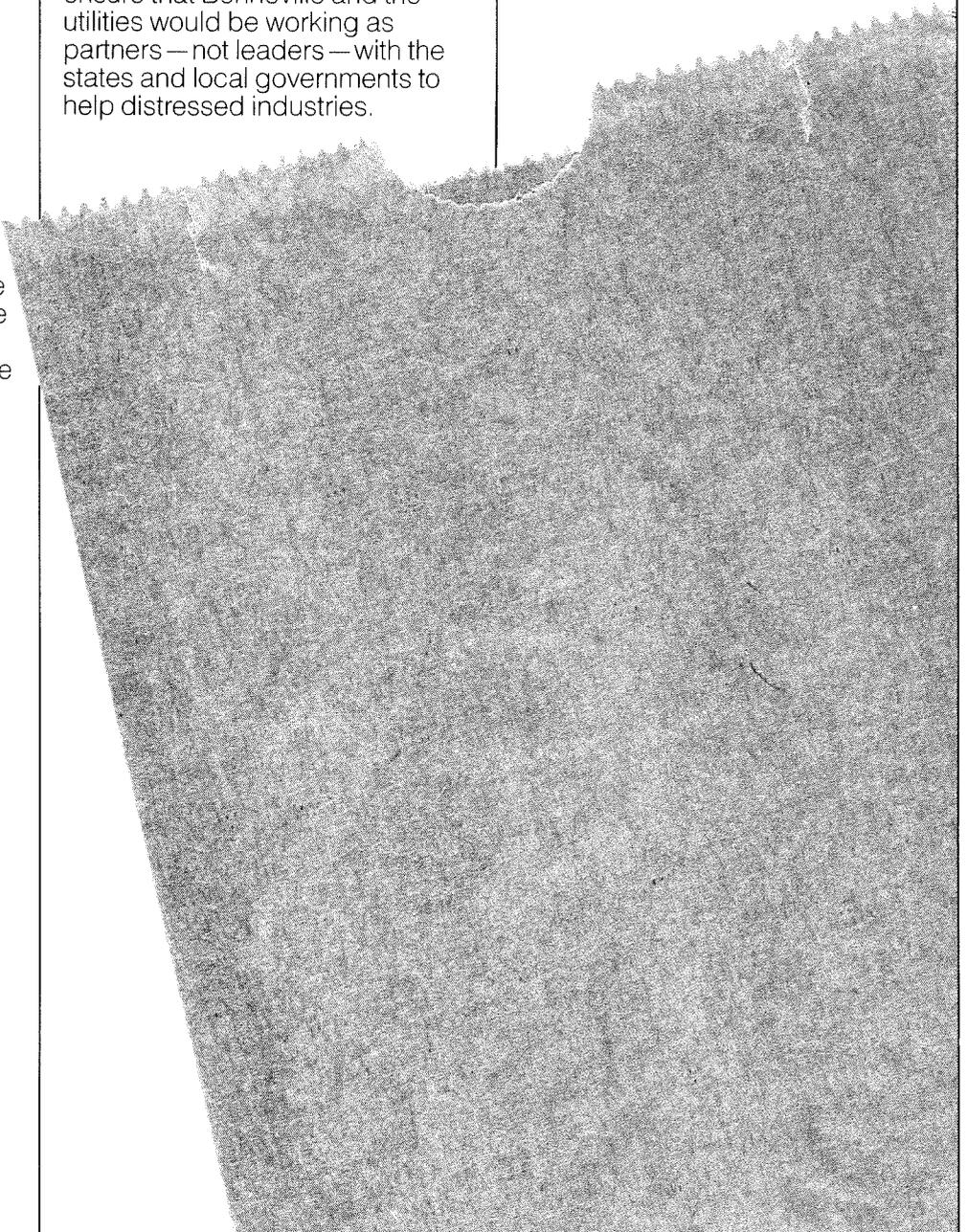
As an economist, Trulove has some general uneasiness about using the power system — or for that matter, any government program — to save distressed industries. "To be valid," he feels, "there must be reasonable hope that the market conditions will indeed improve for the industry, otherwise we are drawn into a program which promotes inefficiency and reduces long-term economic growth."

"Electricity costs are rarely the deciding factor — or even marginally important — in business decisions," explains Trulove. "Yet we can expect great pressure to reduce rates as though they were the single item of importance. To ensure that the electric system is not unfairly burdened, it might be a good idea to require firms in distressed industries to clearly demonstrate comprehensive cost-control measures in all other areas as a prerequisite to being considered for reduced electric rates."

Pyrch agrees that the power system and Bonneville must not be seen as just a deep pocket. He feels that there are enough safeguards and check points built into Bonneville's proposals to ensure that Bonneville and the utilities would be working as partners — not leaders — with the states and local governments to help distressed industries.

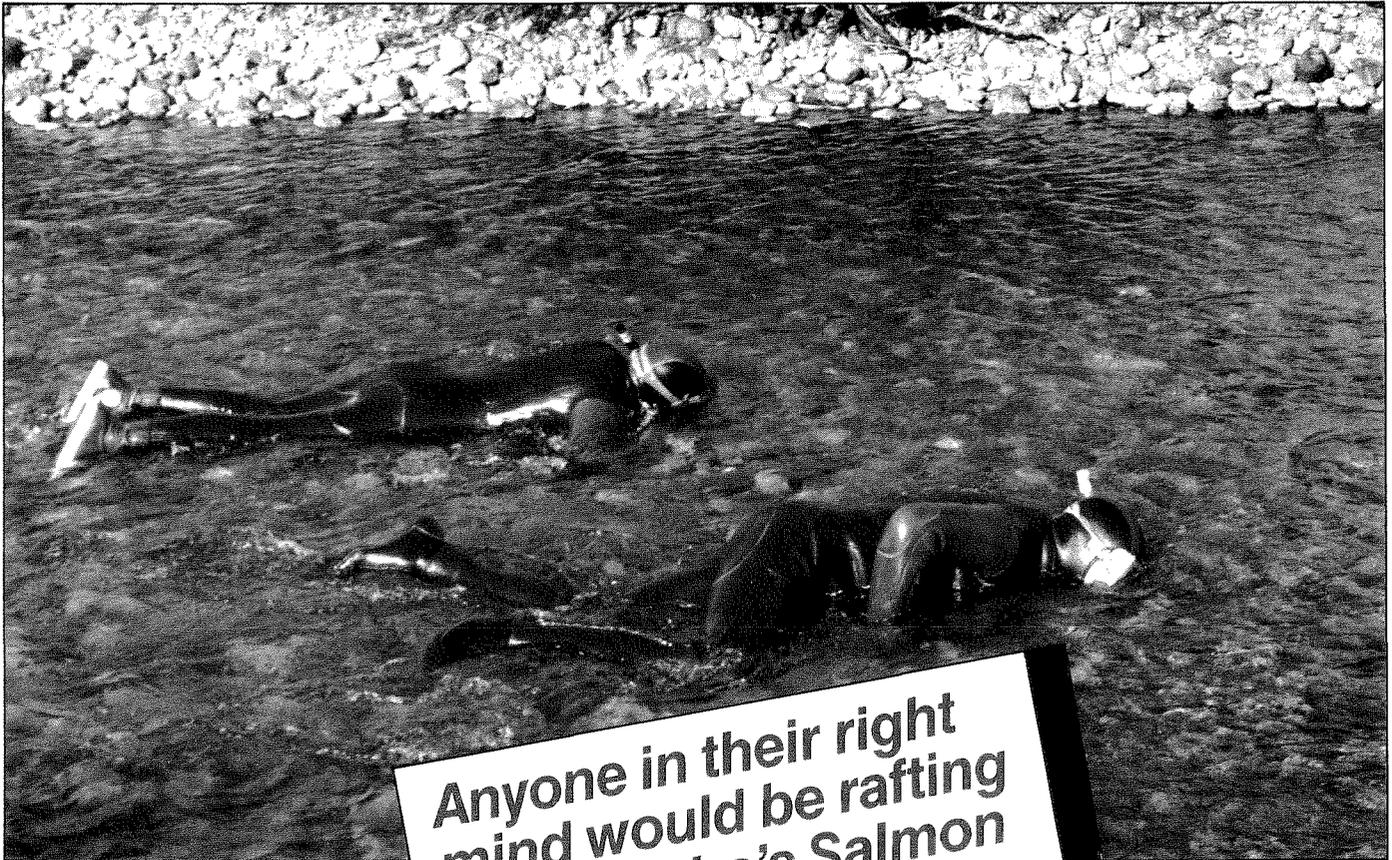
"The surplus has caused revenue problems for many utilities, and we understand the need to market the surplus electricity," says Trulove, "but when developing marketing plans, we must be sure that the uses be efficient uses, and that we don't build in inefficiencies for the future. The plans should deal with ways to improve the Northwest's economy and quality of life and not create a lack of cooperation and price wars among the utilities."

"The Council will be examining Bonneville's proposals very carefully, to ensure that they will indeed benefit the region, and that actions are not taken now that we will regret 10 or 15 years down the road," he adds.



FROM THE SALMON'S POINT OF VIEW

by
Beth
Heinrich



Anyone in their right mind would be rafting down Idaho's Salmon River in high summer, not snorkeling up it.

But to Terry Holubetz and Charlie Petrosky of Idaho's Department of Fish and Game, slithering upstream on their bellies in 55 degree water is a thrill of its own.

In that temperature, the stack of pancakes one had for breakfast only lasts for the first 50 meters of stream. From there, it's only a matter of time before one's face freezes, one's knees give out and one's energy dissipates and heads downriver with the current.

Even in August, the force of the flows and the chill of the water drain nearly every ounce of strength and enthusiasm from even the most dedicated fisheries biologist. Under working conditions such as these, one learns quickly to cherish a wet-

suit, gloves, mask and boots (not to mention lunch).

Nonetheless, Holubetz and Petrosky move from stream to stream, week after week, in search of fish. These are not just any fish, but young chinook salmon and steelhead trout, some only 2 inches long. It is surprising how effective snorkeling can be in finding and counting these fish. The fish simply move aside as this newcomer, clad from head to toe in black neoprene, works his way upstream.

By snorkeling the same sections of the Salmon, the Selway and other rivers year after year, biologists start detecting trends in the numbers of young salmon and steelhead a particular stream is "producing." In general, larger numbers of juveniles mean that larger numbers of adult salmon and steelhead spawners are reaching and using that stream. And the increased numbers of adults mean that something — some management technique aimed at increasing Idaho's salmon and steelhead runs — is working.

That "something" could be a variety of things, including increased survival passing dams downstream, adequate river flows in spring to carry the young fish to the sea, or habitat improvements in the stream itself. It is difficult to isolate the benefits of any one management effort, but Idaho, like Oregon and Washington, is trying to measure the benefits of habitat improvements.

Presently, 18 habitat-enhancement projects for salmon and steelhead are under way in Idaho rivers under the auspices of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program. Four projects are already complete. As with most of the work in the fish and wildlife program, electricity ratepayers in the region are funding the improvements. These efforts include fencing out cattle, revegetating streambanks, placing logs or boulders in streams to create resting areas, and rebuilding flood plains. Many of the projects involve removing natural barriers in the stream to open up additional spawning and rearing habitat upstream.

Whatever the enhancement technique, Holubetz and Petrosky's job is to inventory the streams—before, during and after improvements. The success of these habitat improvements is measured in the numbers of young salmon and steelhead produced. By continuously monitoring these streams, Holubetz and Petrosky are providing the information managers need to determine whether the improvements were successful and whether electricity-ratepayer funds were spent wisely.

Idaho's Snake River Basin once produced an estimated 40 percent of the spring chinook, 45 percent of the summer chinook and 55 percent of the summer steelhead in the entire Columbia River Basin.

The benefits of this monitoring program don't stop here, however. Idaho is a state long known for its prime salmon and steelhead streams. About 8,000 miles of Idaho rivers were once used by these fish, some traveling 900 impressive miles from the Pacific Ocean to spawn in small headwater tributaries. In fact, Idaho's Snake River Basin (which includes the Salmon, Clearwater and upper Snake River drainages) once produced an estimated 40 percent of the total spring chinook, 45 percent of the total summer chinook and 55 percent of the total summer steelhead in the entire Columbia River Basin—a basin famous for producing the world's largest runs of chinook salmon and steelhead trout.

But today, Idaho's 8,000 miles of anadromous fish habitat have dwindled to 5,300 miles, according to the state's anadromous fisheries management plan. By the late 1970s, naturally produced stocks of salmon and steelhead were nearing extinction. Even the numbers of hatchery-produced fish were depressed. Idaho's fishing seasons were severely restricted, even closed. Local economies in places such as Riggins and Salmon, which depended on the fisheries, suffered.

Many of Idaho's chinook and steelhead populations remain at

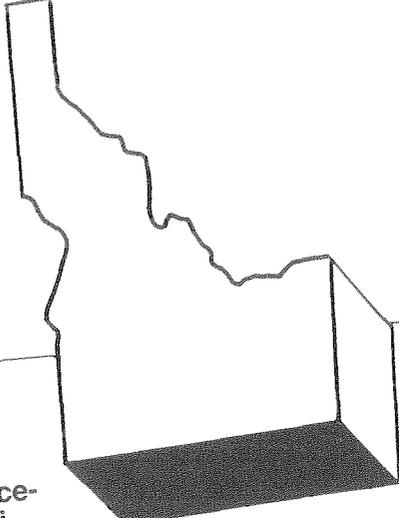
low levels today. Chinook spawning ground surveys in the Salmon River tributaries indicate that the number of adult spawners is less than 25 percent of former levels. The Redfish Lake sockeye salmon run, the only sockeye run left in Idaho, has fewer than 100 returning spawners each year.

Logging, road building, grazing, irrigation and overfishing have all been parts of the problem. Most agree, however, that the development of the Northwest hydroelectric system caused the largest losses.

Despite these problems, Idaho still hosts miles and miles of suitable habitat for salmon and steelhead. "The vast majority of the habitat is excellent," Holubetz explained to Council members who toured Idaho streams last fall. "What it really lacks is just fish. If we had spawners, the streams would be producing fish like crazy."

Because so few adults are returning to some streams, it is safe to say that many of Idaho's rivers are far from producing their full potential of young fish. Biologists believe some streams could support a much greater number of adult salmon and steelhead, though no one knows just how many that is.

That's why Holubetz and Petrosky's work will be so helpful. When they find numbers of juveniles in a particular stream leveling off year after year, they will know that the stream has reached its potential, or as the experts say, "full seeding." Similar efforts for counting salmon and steelhead nests, or redds, will enable managers to determine the optimum "escapement," or adult population size, necessary to fully seed those streams.



Idaho takes its habitat enhancement efforts seriously.

In 1985, seven fishery agencies, Indian tribes and land management agencies formed the Idaho Fisheries Habitat Enhancement Coordination Committee. The committee is essentially a peer-review group of biologists

and is unique in the Northwest states.

Members convene twice a year to review all new and ongoing anadromous fish habitat enhancement proposals in the state, irrespective of a project's funding source.

Before any proposal is brought before the Northwest Power Planning Council, it must survive the intense biological scrutiny of the committee members. And only after it receives the consensus of the group, will a proposal proceed. -BH

How long Idahoans will have to wait until their streams are teeming with salmon and steelhead again will depend upon a myriad of factors. The streams that managers will let recover naturally may take decades. Other streams, where managers are supplementing young hatchery fish, may reach full seeding much more quickly. In one instance, Fish and Game biologists have been releasing summer chinook fry (1- to 2-inchers) above a barrier-removal project on Johnson Creek in the South Fork of the Salmon to boost returns. By monitoring the survival of these juveniles, biologists not only hope to determine the number of summer chinook Johnson Creek can rear, but also discover optimum stocking rates.

Information like this will be timely, for August marked the beginning of the 30-month sub-basin planning process aimed at doubling the Columbia River Basin's salmon and steelhead runs. One of the products of this process will be a set of individual subbasin plans that will identify, among other things, local fish production objectives. Getting a better handle on just how many young salmon and steelhead a particular stream can produce will be a critical link.

No one will argue that Idaho's salmon and steelhead have seen better days. But with efforts like those of Holubetz and Petrosky's, managers are continuously honing and sharpening their management tools.

Habitat enhancement isn't the only answer, however. Holubetz will be the first to point out that



Biologists release summer chinook fry by helicopter into Johnson Creek on the South Fork of the Salmon River to boost future adult chinook returns.

increased fish survival downstream, in the form of bypass around the dams and increased flows in spring, is the key to rebuilding Idaho's runs. Nonetheless, each action is an important cog in the wheel and the sooner they all start rolling, the sooner Idaho's fishery restrictions will ease and local economies will bounce back.

States Proposing Areas for Fish and Wildlife Protection

The study designed to weigh the relative significance of each and every stream reach in Idaho, Oregon, Washington and parts of Montana is nearing completion. Begun in 1984, the Hydro Assessment Study marshalled the efforts of fish and wildlife agencies, Indian tribes, recreational and environmental groups, the Bonneville Power Administration, the U.S. Army Corps of Engineers and the Northwest Power Planning Council to develop criteria against which the region's rivers could be measured for their past, present and future values.

The Columbia River Basin Fish and Wildlife Program included the concept of identifying certain areas to be protected from hydro-power development. If such areas are adopted into the fish and wildlife program, they could help protect ratepayer investments in rebuilding fish and wildlife populations in the Columbia River Basin. Designating protected areas also would give clearer signals to potential hydropower developers and the Federal

Energy Regulatory Commission (licensor of non-federal hydro-power projects) that the Northwest is interested in careful resource development which does not further endanger fish and wildlife.

The Hydro Assessment Study was divided into three major components: 1) an analysis of salmon and steelhead productivity, habitat, migratory routes and importance to Indian culture; 2) a similar analysis of other fish and wildlife, plus recreational and historical values pertaining to river reaches (called the Pacific Northwest Rivers Study); and 3) the ongoing refinement of a data base developed by the Corps of Engineers to identify existing and potential hydropower project locations that are considered environmentally sound

and cost-effective to develop.

More than 350,000 miles of year-round streams have now been mapped and evaluated. This information was then filed into the computer data base that is rapidly becoming the most comprehensive resource of its kind. The salmon and steelhead portions of the study, carried out by the Council, have been reviewed by fish, wildlife and land management agencies, Indian tribes and the general public. The Rivers Study, carried out by representatives of the four states and coordinated by Bonneville, has also been reviewed at the state level by both agencies and tribes. The states are holding public meetings to provide

additional review of the studies' findings.

In September, the Council will release a paper describing each state's recommendations for areas to be designated as protected from hydroelectric development. The state proposals also will include the criteria each state used to produce its recommendations.

Public comment on the paper will be taken for 90 days. The Council will bring maps of the proposed protected areas to meetings in each state to solicit specific public input on the recommendations.

A decision on whether or not the fish and wildlife program should be amended to incorporate the new findings is expected later in the winter.

—CC

SOCKEYE RUNS ARE UP

Fish ladders at Bonneville Dam resembled sardine cans this summer as one of the largest runs of sockeye salmon in recent memory traveled up the river. At the height of the run, 2,000 to 9,000 sockeye were passing the dam each day. By July 6, 91,841 sockeye had passed Bonneville Dam, far more than last year's run of 39,106 fish by this date and 30 percent higher than the 10-year average of 65,227 fish counted at Bonneville.

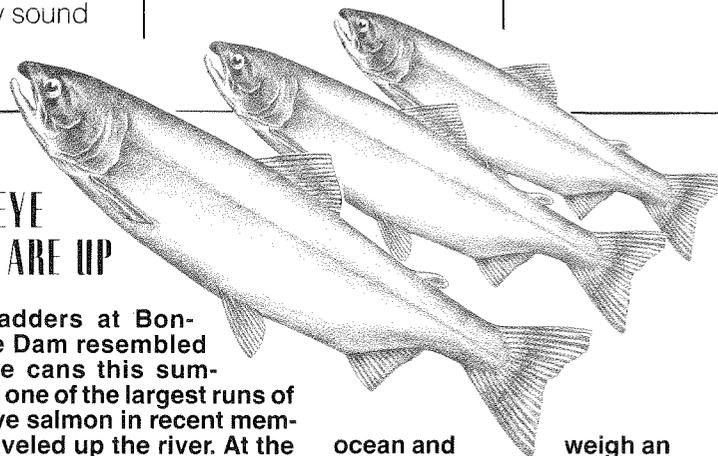
Sockeye, or blueback salmon, migrate up the Columbia River from June through September heading for their spawning grounds principally in the Wenatchee and Okanogan River basins of eastern Washington. These fish have spent one to four years in the

ocean and average of

five pounds. They will die after they spawn, but their progeny will spend a few years in their natal stream and then make the long trip to the ocean.

The smallest run in the last 10 years was in 1978, when only 15,089 sockeye had passed Bonneville by July 6. The largest run, topping this year's, was in 1985, when 142,763 fish were counted as they passed Bonneville Dam.

—RLC



Shorts

The full impact of the U.S.-Canada Pacific Salmon Treaty will be apparent by 1989, according to Tim Wapato, director of the Columbia River Inter-Tribal Fish Commission. Wapato also predicted there will be "an entirely different (Columbia) river" in 20 years, thanks to planning and fish bypass systems at the dams. Wapato's comments, made during a recent trip to Washington, D.C., were reported in *Steve Forrester's Northwest Letter*, June 29, 1987, 210 Seventh Street S.E., Box F8, Washington, D.C. 20003.

Federal funds for state and local energy conservation have dropped 77 percent since 1979, according to a report by the Congressional Research Service. The report goes on to say the prospects for the future of conservation programs are not improving, and, unless Congress reverses the trend, funding for such programs could come to an end within five years. The total Fiscal Year 1987 budget for all conservation programs has dropped almost \$900 million since Fiscal Year 1979. The report contends that conservation research and development programs have taken harder hits in budget cuts than other U.S. Department of Energy programs. (Source: *Western Energy Update*, June 1987, 6500 Stapleton Plaza, 3333 Quebec Street, Denver, Colorado 80207.)

New England has followed the Northwest's lead in touting energy efficiency as the way to meet most of its growth in electricity demand over the next 20 years, rather than building new power plants. The finding was released by the New England Energy Policy Council, a group of 26 consumer and environmental organizations. Called "Power to Spare," the study noted that increased electrical efficiency costs less than half the price of electricity from new power plants and could meet the region's estimated 2 percent annual growth in electricity demand. (Available from: New England Energy Policy Council, 3 Joy Street, Boston, Massachusetts 02108.)

Studies of how electric and magnetic fields affect humans, animals and plants will be stepped up, according to Leonard Sagan, manager of the Electric Power Research Institute's (EPRI) research program. So far, Sagan says, statistical correlations linking power line fields to adverse health effects are weak or inconclusive. But, he points out, "The fact that some studies even suggest that such a link exists requires further research." EPRI has expanded its research budget on the subject to \$2.5 million this year and expects further expansion. Researchers will look particularly for possible cancer links. (Source: *Public Power*, July-August 1987, 2301 "M" Street N.W., Washington, D.C. 20037.)

Salmon skin wallets may replace eel skin as the new status symbol if an Alaskan entrepreneur has his way. He is looking for a business partner to tan, dry and produce leather goods from salmon skins. The technology was developed by Alaskans. (Source: *Pacific Fishing*, August 1987, 1515 N.W. 51st Street, Seattle, Washington 98107.)

Conservation could save billions of dollars in acid rain clean-up costs and reduce emissions substantially, according to Howard Geller, director of the American Council for an Energy Efficient Economy. His group cosponsored a study with the Energy Conservation Coalition that contends accelerating conservation investments could reduce utility sulfur dioxide emissions by 11 percent during the next decade. Direct clean-up costs for emissions could be cut by 25 percent or more, Geller says. He urges Congress to take full advantage of state conservation investments when drafting emission control provisions. (Full report available from: The Energy Conservation Coalition, 1525 New Hampshire Avenue N.W., Washington, D.C. 20036.)

Calendar

September 9-10 — Northwest Power Planning Council meeting in the City Council Chambers, the Electric Building, 140 S. Capital, Idaho Falls, Idaho.

September 19-20 — Educational tour of the lower Columbia River sponsored by Washington Sea Grant Marine Advisory Services, Columbia/Snake River Program. For more information: Randy Anderson or Suzie Higert, Washington Sea Grant Marine Advisory Services, 1919 N.E. 78th Street, Vancouver, Washington 98665-9752, 206-696-6018.

September 29-October 2 — 10th World Energy Engineering Congress at the Georgia World Congress Center, Atlanta, Georgia. Sponsored by the Association of Energy Engineers. Co-sponsored by the Alliance to Save Energy and the Gas Research Institute. For more information: Association of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, Georgia 30340, 404-447-5083.

October 3-4 — "Northwest Rivers — A Celebration of Free-Flowing Rivers" at the Mountaineers Clubhouse in Seattle, Washington. Conference sponsored by the Mountaineers, Washington Wilderness Coalition, Northwest Steelheaders, National Park Service, Northwest Power Planning Council and others. For more information: Jennie Goldberg, Friends of Whitewater, 206-361-9310.

October 14-15 — Northwest Power Planning Council meeting in the Old Supreme Courtroom, Capitol Building, Helena, Montana.

October 26-28 — "First National Conference on Appliance Efficiency" in Arlington, Virginia. Sponsored by the American Council for an Energy-Efficient Economy. For more information: American Council for an Energy-Efficient Economy, 1001 Connecticut Avenue N.W., Suite 535, Washington, D.C. 20036, 202-429-8873.

November 2-5 — "Housing for the '90s: Meeting the challenges of a changing market" at the Sheraton Tacoma Hotel, Tacoma, Washington. For more information: Energy Business Association, 420 Maritime Building, 911 Western Avenue, Seattle, Washington 98104, 206-622-7171.

November 11-12 — Northwest Power Planning Council meeting at the Sheraton Tacoma Hotel, 1320 Broadway Plaza, Tacoma, Washington.

December 9-10 — Northwest Power Planning Council meeting at the Council's central office, Portland, Oregon.

Compiled by Ruth L. Curtis

COUNCIL PUBLICATIONS ORDER FORM

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

Publications

- 1987 Columbia River Basin Fish and Wildlife Program
- 1986 Northwest Power Plan
- Proposed Amendment to the 1986 Northwest Power Plan: Model Conservation Standards for General Conservation Programs
- Issue paper on Protected Areas (see article on page 33)
- Issue Paper on Umatilla Hatchery Master Plan
- Yakima Central Outplanting Facilities Draft Master Plan
- Issue Paper on Current Status of Commercial Model Conservation Standards
- Western Electricity Study briefing papers
- 1987 Northwest Power Planning Council Annual Report (available in early October)

Mailing Lists

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

- Northwest Energy News* (this bimonthly magazine)
- Update!* (public involvement newsletter)

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

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