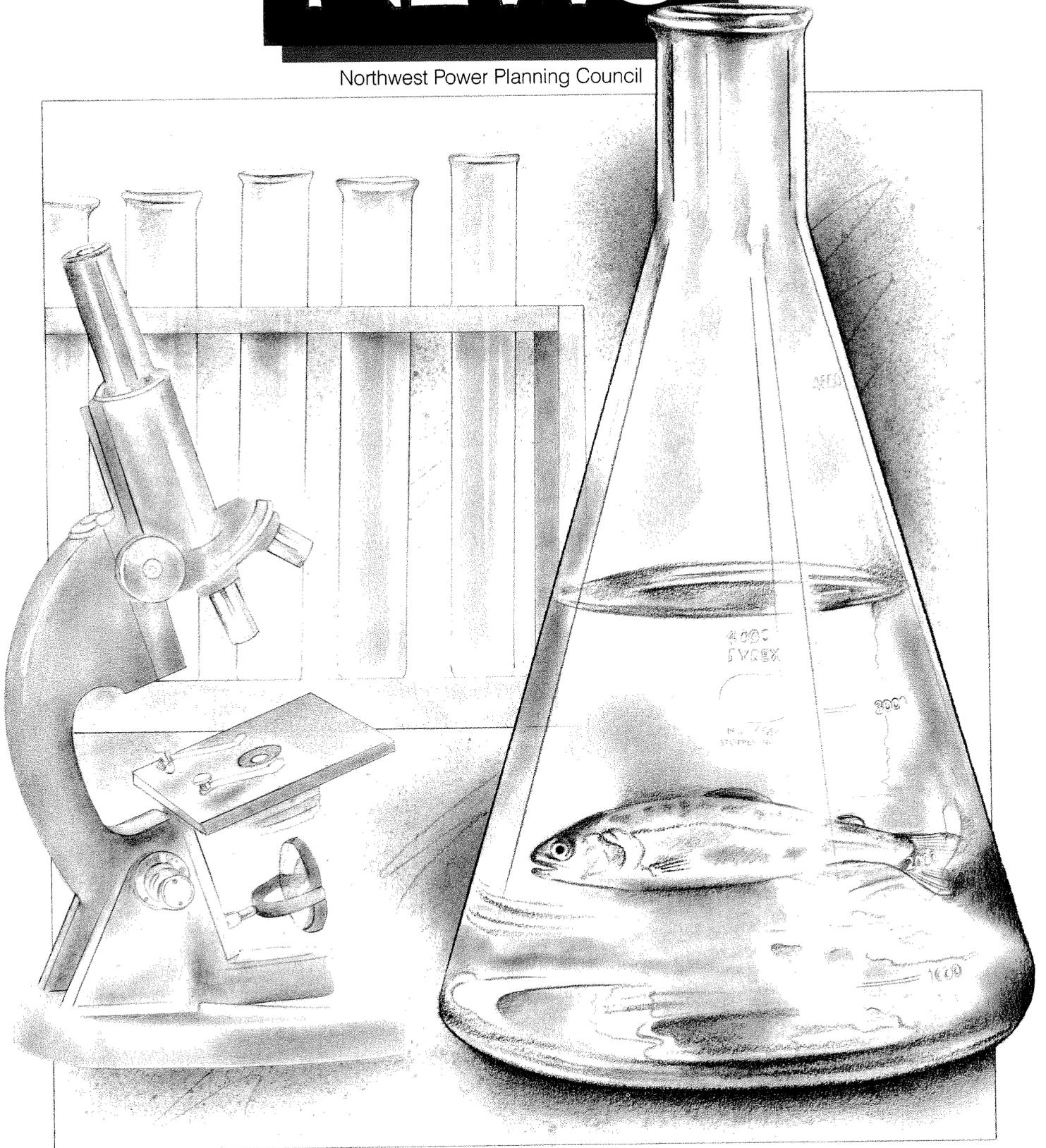
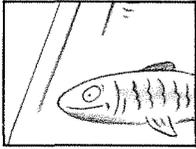


NORTHWEST ENERGY NEWS

Northwest Power Planning Council

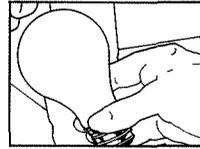


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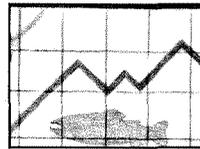
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Editor's Notes

Yes, this is still *Northwest Energy News*. The new look is our way of saying we're enthusiastic about the changes taking place in the region. This issue explores some of those changes—new technologies in the fish and wildlife program, new participants in the region's Super Good Cents conservation marketing program, and new energy-efficient lighting systems.

With this issue we also say good-bye, for now, to two Council members. Member Kai Lee, from Washington, actually resigned from the Council just as we were going to the printers with our last issue. We took the time to change the Council member listing, adding R. Ted Bottiger, Lee's replacement who joined us after leaving the Washington State Senate, but we never announced Lee's return to his post at the University of Washington.

Then, just as we were about to put this issue "to bed," one of the Council's founding members, Montana's Gerald Mueller, also announced his resignation. After more than seven years' involvement in the Northwest's energy scene, Mueller wants to take more time to be with his family.

Montana Governor Ted Schwinden has picked his Lieutenant Governor George Turman to replace Mueller. Before his term as lieutenant governor, Turman served as a Public Service Commissioner for the state of Montana.

COVER ILLUSTRATION: This issue's cover art was drawn by Lynn Carson.

27 Calendar

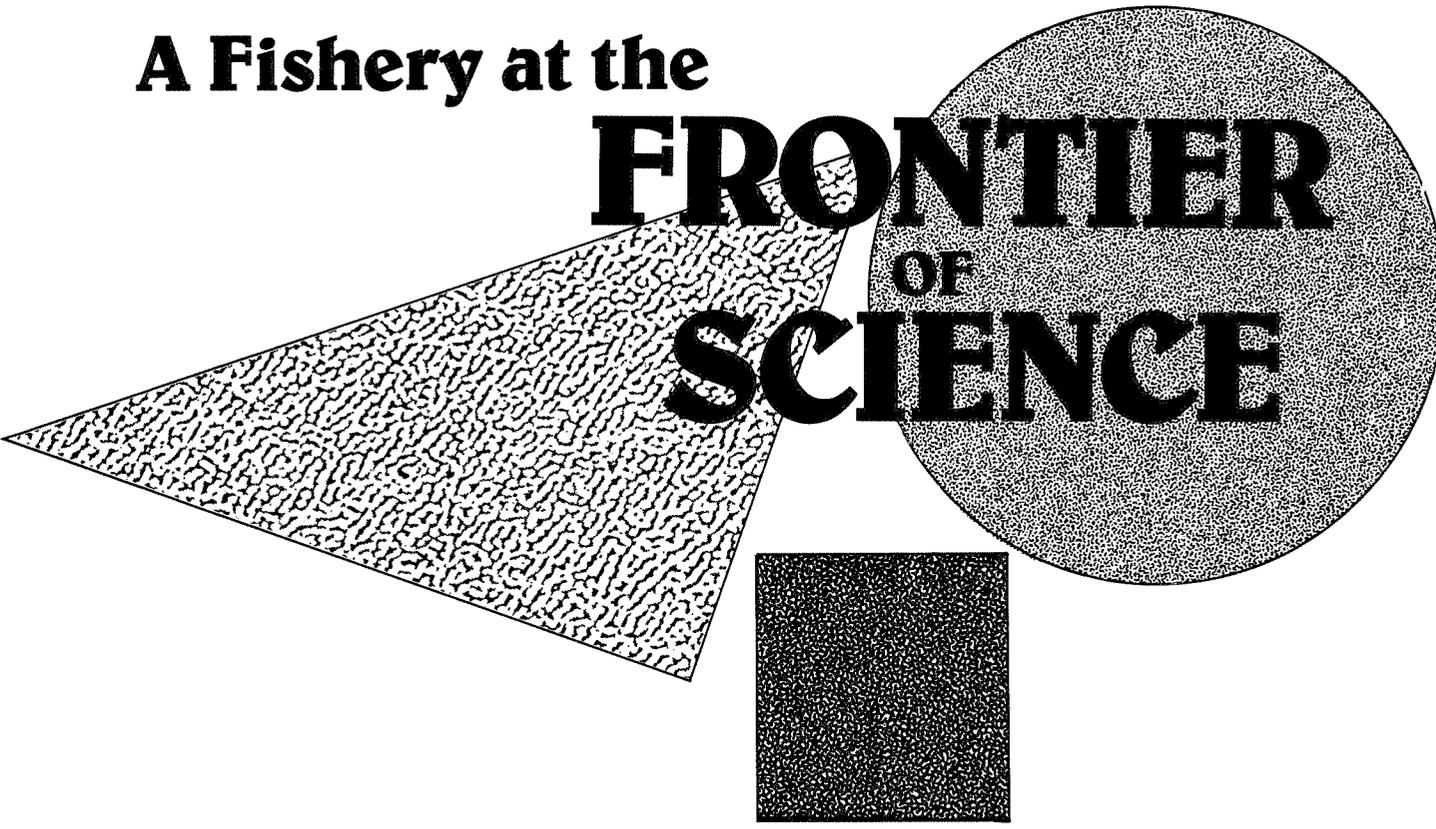
NOTE: NEW ADDRESS

The Northwest Power Planning Council has a new address. No, we have not moved, but the post office has requested we use a different mailing address. Our building fronts on both Broadway and on Sixth Avenue. Each street has a separate zip code. To simplify delivery, the post office has asked us to join the rest of this building's occupants and change our address to reflect the Sixth Avenue zip code. Hence, our new address is:

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

A Fishery at the

FRONTIER OF SCIENCE



In a quiet laboratory at Oregon State University's Corvallis campus, microbiologists with a special interest in fish diseases are delicately splicing genes and cloning bacteria.

Through genetic engineering, these scientists are developing immunization techniques that should help salmon and steelhead resist the deadly virus known as infectious hematopoietic necrosis or IHN. Since the late 1970s, more than 25 million salmon and steelhead eggs have been destroyed because they were infected with the IHN virus. The potential value of these losses has been estimated at \$250 million.

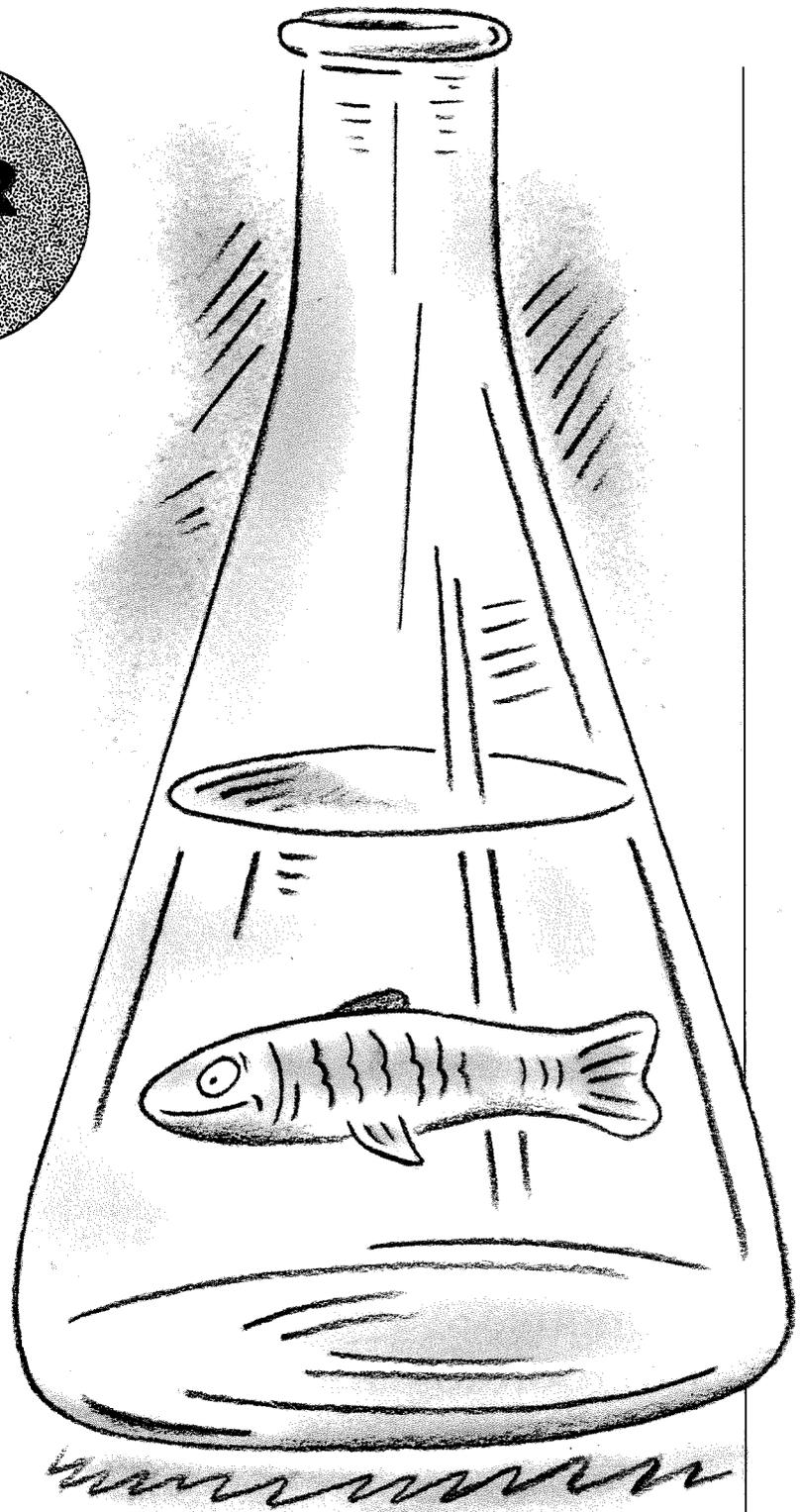
Elsewhere on campus, other scientists are studying the health effects of six vitamins — C, B6, E, folic acid, pantothenic acid and riboflavin — on young salmon and steelhead. Most biologists agree that these vitamins strengthen human and domestic animals' resistance to certain infections. The Corvallis researchers believe the nutrients will do likewise for

hatchery-reared Columbia River Basin smolts. Their goal is to find an economical way to enrich fish feeds in hatcheries where over 80 percent of the basin's salmon and steelhead are produced.

In Washington's Yakima River Basin and in Idaho's Salmon and Clearwater river basins, experimentation revolves around the effects of introducing hatchery fish into streams that normally support runs of wild or "naturalized" salmon and steelhead. In the first years of the projects, researchers will be carefully cataloging the timing and distributions of the runs that are already extant in these basins so they may eventually be able to monitor any life-cycle changes wrought by sowing new fish into these communities.

A Fishery at the

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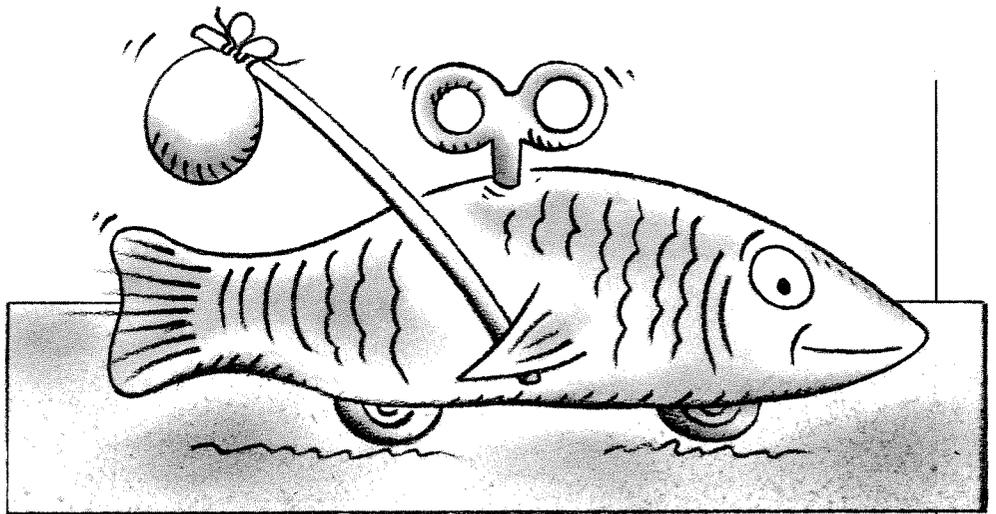
Most of this work, and that described below, is unique to the Columbia River Basin. Some of it has been carried out in other regions – the Great Lakes or the Northeast – but without the diversity of participation or degree of detailed analysis evident in the Northwest. Some of it has been under way for many years.

But in the Pacific Northwest, particularly in the watershed of the Columbia, what distinguishes these labors from other research efforts is the fact that all these studies have the same goal – to double salmon and steelhead runs in the basin.

Unified by the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program, these various projects are applying the most contemporary scientific technologies to the confounding problems facing a fishery just now pulling back from the edge of extinction.

During the summer of 1987, teams of Northwest scientists, engineers and others met to set salmon and steelhead research strategies for the next five years. They formed work groups according to areas of emphasis defined in the fish and wildlife program. They focused on making hatcheries more efficient and effective; reducing fish losses from diseases; improving fish survival in reservoirs and through mainstem Columbia River dams; and ensuring that hatchery-bred fish released among native fish do not endanger wild populations.

Over the next five years and on into the early part of the next century, the achievements of these scientists on the fisheries frontier will vary from subtle to significant. Their findings will be shared and compared, not just among the basin's scientists, but among fisheries researchers worldwide, who have watched the decline and now the tentative beginnings of recovery of one of the world's great natural resources. As each new strand of information and each successful experiment is worked into the fabric of the Columbia River Basin program, the rest of the fisheries community, spread out wherever salmon and steelhead still exist, will be taking notes.



Imitating Life: Computer Models Salmon Migration

In 1980, a handful of bright young physics graduate students took it upon themselves to use computer technology to crack the roulette wheels at gambling casinos in Las Vegas, Nevada. They developed a set of reference data about the spin of the wheel and the speed of the ball's slide toward the wheel's center.

A simple relay device installed in one of their shoes was used to tap out a code between the student at the wheel and a comrade who calculated the chances of the ball settling on a given number. Their unconventional collaboration netted them about a 40-percent

advantage over the unassisted better. While they were still investing in a game of chance, they had definitely improved their odds.

Repairing damaged ecosystems generally offers better potential for controlled outcomes than does a roulette wheel, but there are still basic uncertainties, not the least of which are the complexity of possible causes and the unpredictability of effects.

Until recent years, fisheries management was largely an unaided guessing game. Researchers took direction from the past, added the wisdom of the moment and tried to predict the outcome of events in the future. Now, with the assistance of computer simulation models, the likely effects of actions can at least be explored before major expensive actions are taken.

A Fishery at the

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With the computer simulating a range of possible outcomes from fisheries experiments, for example, the odds of decision makers selecting appropriate actions are improved. Such a model is being developed as part of the Northwest Power Planning Council's Columbia River Basin Fish and Wildlife Program.

By applying computer modeling technology to the life cycle of a salmon or steelhead in the Columbia River Basin, scientists are now able to incorporate far more elements and options than they could consider without computer assistance. The Council's model incorporates information contributed by biologists and others in a series of workshops held throughout the Northwest in 1986. Participants shared the contents of their file cabinets with each other, compiling details about the fish at various stages in their life cycle and in different environments. In continued meetings, the model is being tested and refined. Thus, the model is designed to reflect the collective wisdom of the fisheries community.

This broad base of data is essential because the model can only summarize and review what it is fed — com-

plete with prejudices and preconceptions. If the information in the computer is biased, the model will share that bias. The computer does not increase the amount of information it works from; it merely organizes it and draws conclusions that may appear to be additional facts, but are actually only reasonable conjectures.

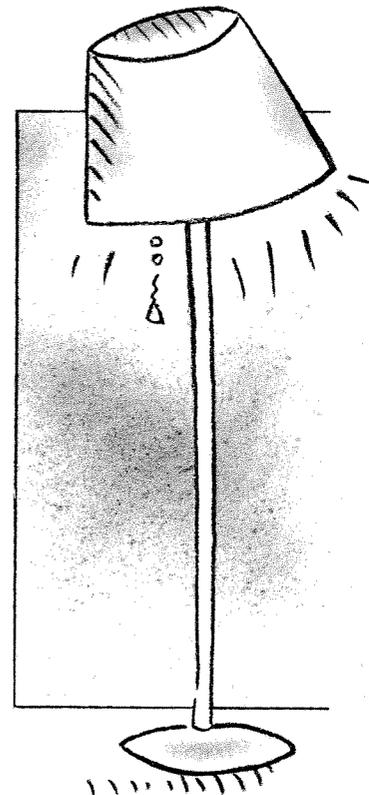
By playing data off other data or reducing data mathematically (taking annual averages, for example, and calculating what daily or even hourly averages might look like), the computer may appear to give a greater understanding of the ecosystem than the scientists who originally supplied the numbers. It still falls to the model's users to distinguish the computer as crystal ball from the computer as educational tool.

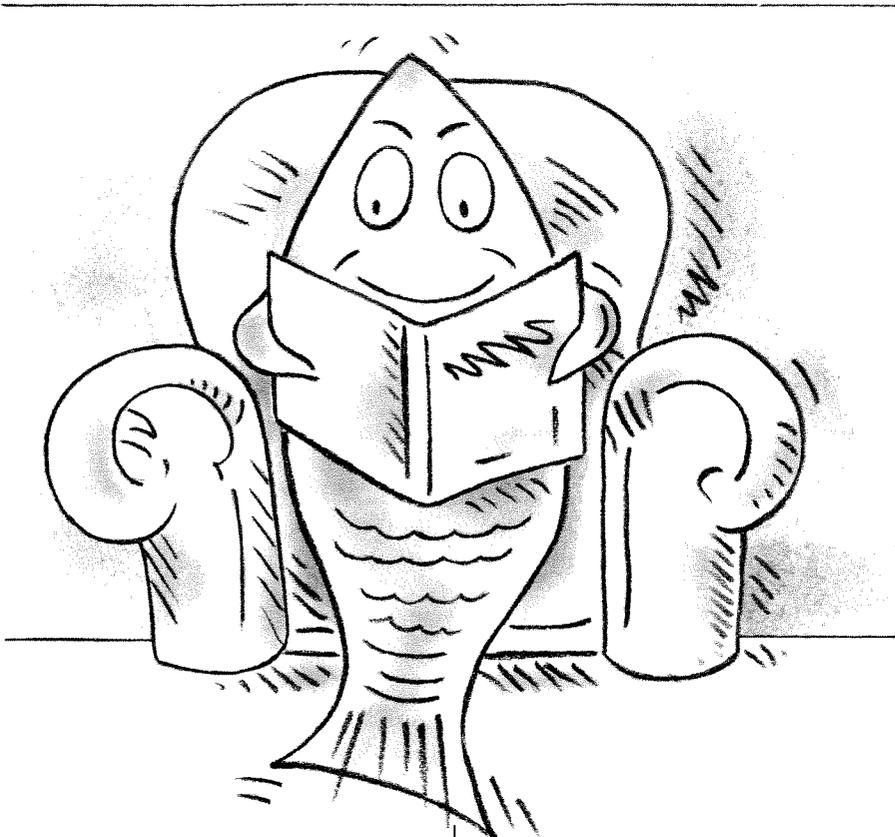
In use, the model will likely be most helpful during the Council's system planning process. In system planning, 31 individual river basins will be studied to determine each one's potential contribution to the goal of doubling salmon and steelhead runs in the Columbia Basin. The model can help select the mix of activities that will best provide long-term returns from

ratepayer investments in the fish and wildlife program.

Much like the computer-assisted physics students, participants in the fish and wildlife program will gain an edge over the uncertainties of nature by enlisting the aid of technology.

—CC





Computer Catalog of Fish: Salmon and Steelhead Database

Which streams in the Northwest have salmon and steelhead habitat that is not being used? Which are important to citizens because of valuable recreational opportunities? And, at which sites can a hydroelectric project be located with little

chance of it destroying the value of a stream? These are questions asked regularly by planners in the Northwest, but until recently there was no easy way to find the answers.

That is changing. The information planners need will be easily available on their computers in the near future. Under the Northwest Power Planning Council's program, the first regionwide, detailed data bases have been developed containing the information needed to plan the future of Northwest rivers.

The first of the new data bases catalogs information about anadromous fish. It characterizes stream reaches throughout the region, based on whether they contain salmon or steelhead, their importance as migratory routes for the fish, and their value as potential spawning and rearing habitat.

The second, produced by the Bonneville Power Administration's Rivers Assessment Study, identifies the significance of each stream, based on such values as wild and scenic rivers status, resident fish or wildlife use, recreational use, cultural values (for example, historical or archaeological significance) and natural features.

Finally, there is a data base developed by the U.S. Army Corps of Engineers and Bonneville. It contains specific information on existing and proposed hydroelectric projects in the Northwest — information such as the generating capacity and location of each project.

By cross-referencing between the three data bases, a very clear picture of each Northwest stream can be generated. This information is being used to map the distribution of various stocks of salmon and steelhead in stream reaches throughout the Northwest; to determine

A Fishery at the

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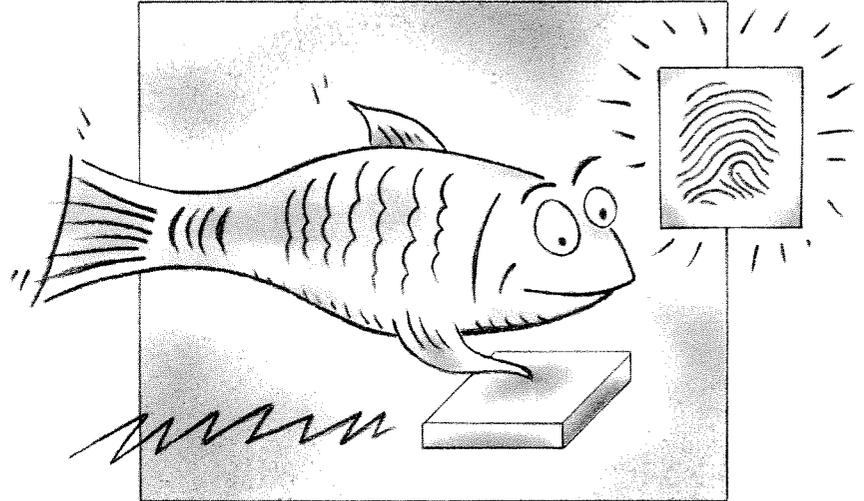
which, if any, areas in the basin should be protected from hydropower development; and to estimate how much hydropower the Northwest can reasonably expect to develop without damaging its rivers.

Other uses also are being found for the data bases. Last year, Idaho's Department of Fish and Game used that state's section of the data base to catch wildlife poachers. Through an anonymous phone call, the department learned that deer were being killed illegally along Rock Creek. The poachers would wait in their pickup for a deer coming to drink. They would turn a spotlight on the deer and, when it froze, they would shoot it.

Unfortunately, there are six Rock Creeks in Idaho, and the folks at the Department of Fish and Game didn't know which one the caller referred to.

Then someone remembered the data base. Using listed environmental factors, Idaho's data coordinator searched for a Rock Creek that had deer habitat and that a pickup would be able to get to. Only one matched. It turned out to be the correct creek, and the poachers were arrested by the local game warden.

—RLC



Fingerprinting Fish: Electrophoresis

The overworked detective studied the lab results and his spirits lifted, "Just as I suspected, Sir Reginald's blood wasn't the only blood spilled that night. The electrophoresis shows two different types of blood on Sir Reginald's smoking jacket."

Just as forensic biologists use electrophoresis to figure out "who done it," fisheries biologists are beginning to use the technique to answer the question "who are they?" Electrophoresis allows them to determine fish origins by analyzing the genetic variation in fish body fluid and muscle tissue within hours of

sampling. The Northwest Power Planning Council's fish and wildlife program includes a five-year demonstration project that uses the technique to determine the genetic profile of salmon stocks in the ocean. The speed of the analysis helps harvest managers "shape" fishing seasons to protect some stocks while permitting others to be caught. Electrophoresis may also be used to monitor changes in genetic makeup of streams "seeded" with hatchery-bred fish.

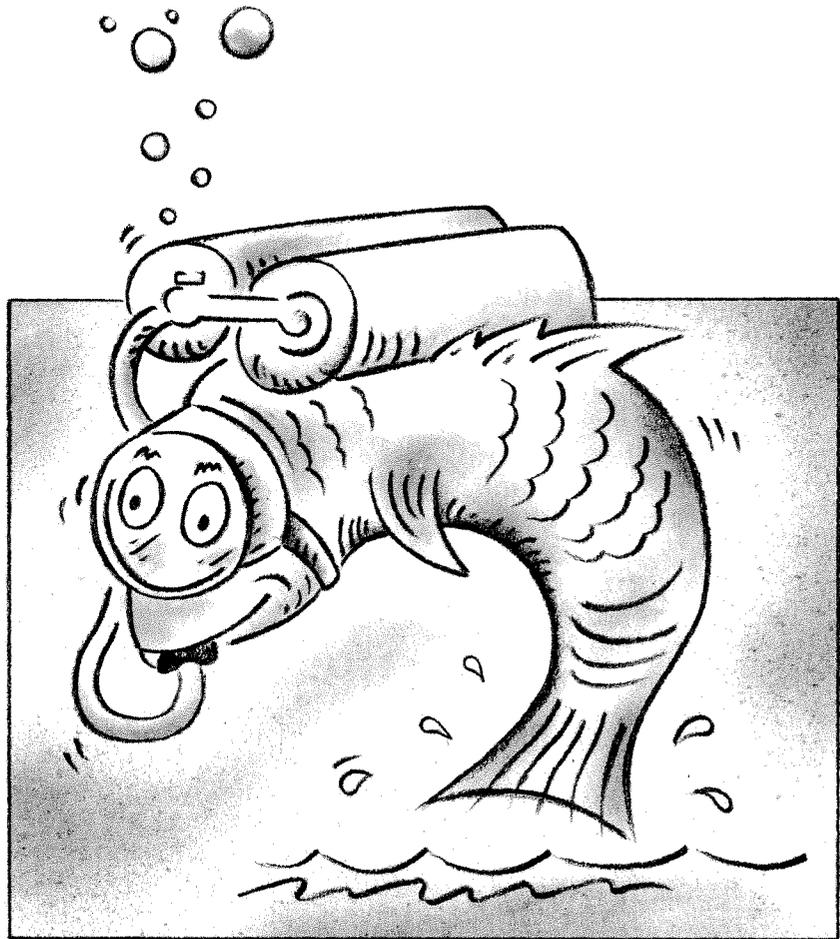
Because salmon return from the ocean to reproduce in the stream where they were born, they develop distinct genetic patterns which tie them to their birthplace and to the season in which they were born. Some of the genes produce different proteins that scientists can extract from body tissues such as liver and muscle. By putting these fluids in a starch gel and subjecting the gel to an electric current,

different genetic types of a protein can be distinguished because they have different electrical charges.

When a starch gel containing extracts from several fish is stained, a pattern showing these protein variations becomes evident. By studying these patterns, scientists can determine genetic profiles for various fish stocks. These profiles act as a sort of "fingerprint," which geneticists use to estimate the probability that fish sampled from stock mixtures belong to a particular stock. The technique should help fisheries managers distinguish between hatchery-produced and naturally produced fish, an important distinction for those who manage ocean fish harvests.

In criminal forensic medicine, biologists have used electrophoresis to test blood serum, enabling them to narrow down suspects when blood is left at the scene of a crime. In fisheries biology, electrophoresis is used to trace the roots of fish stocks, enabling fisheries managers to determine which stocks should be caught and which should be restricted. Thus, modern science is helping man catch both felons and fish.

—PMW



Upping the Yield: Oxygen Supplementation

The primary factor that limits the number of fish a hatchery can produce is the volume of water available (either physically or economically). Normal activities of fish result in a variety of changes in water quality. The most important effect is that, like other living organisms, the fish absorb oxygen from the water and release carbon

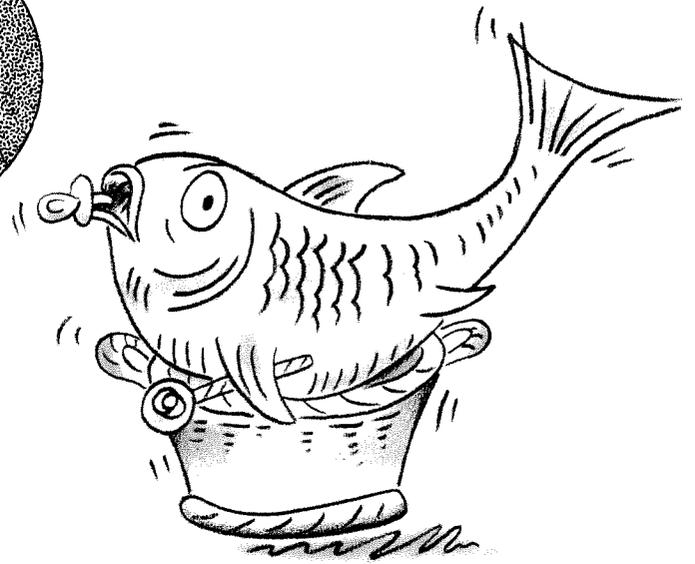
dioxide into it.

The natural flow of a river provides fish with a steady supply of oxygenated water. But in a hatchery, new water must be circulated to keep fish healthy. Normally, water is passed through the hatchery ponds twice. But, through a process called "oxygen supplementation," the now oxygen-depleted water is re-aerated so that it can be used a third time. This allows more fish to be reared within the existing facility.

Dramatic results with oxygen supplementation have been reported for trout and

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steelhead hatcheries in the Great Lakes area. The first major experiment with the technique in the Northwest will take place at a planned salmon and steelhead hatchery on the Umatilla River in northeastern Oregon. Earlier this year, the Northwest Power Planning Council approved expansion of the hatchery's master plan to include testing of oxygen supplementation.

The Umatilla hatchery is considered a good choice for testing the concept of oxygen supplementation because it would rely entirely on groundwater, thus eliminating outside sources of contamination. This decreases the possibility of disease spreading from the hatchery into streams or rivers. The process will raise the capital cost of this hatchery from \$7 million to \$8 million, a 14-percent increase. However, it is estimated that it could raise the hatchery production capacity from 160,000 pounds to 290,000 pounds, a 55-percent increase. This would result in a dramatic decrease in the cost per pound of fish.

—DM

Natural Rearing: Outplanting and Supplementation

Fisheries biologists have been looking for ways to integrate hatchery production with natural production. One way is through a process known somewhat interchangeably as "outplanting" or "supplementation." The first term refers to the process, while the second refers to the effect of the process.

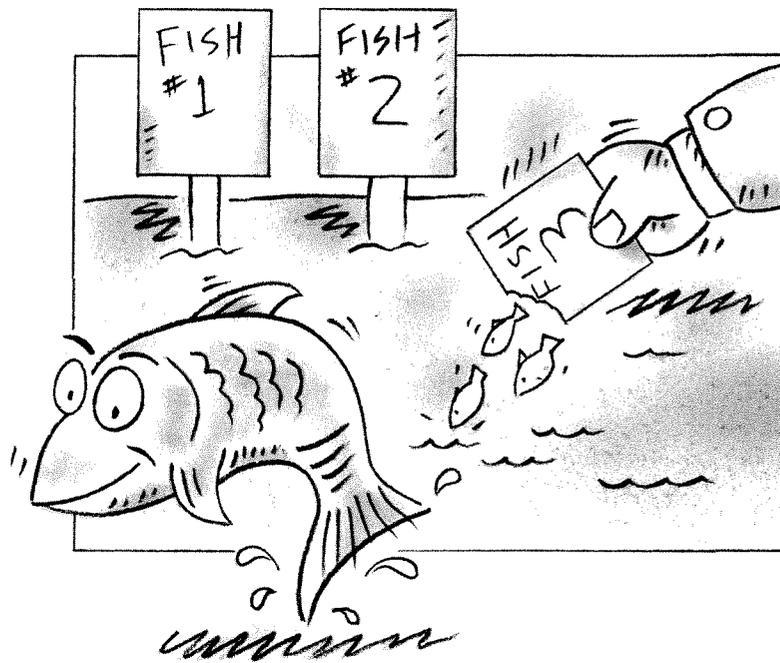
Hatchery-bred fish are "outplanted" into natural habitats for rearing, and the hoped-for result is that natural fish stocks will be "supplemented."

Researchers look to a variety of positive effects. They hope that the technique can be used to reseed certain barren areas and provide harvest opportunities in key streams, as well as rebuilding natural runs. While still in the experimental stage, outplanting has been carried out throughout the Northwest and Alaska. However, in the past it had not been subjected to rigorous scientific study.

With outplanting, juvenile fish at various stages of development would be transferred from the hatchery to streams. This frees up hatchery space for new breeding and makes use of natural rearing habitat. The largest outplanting experiment will begin soon in central Washington's Yakima and Klickitat river basins. The Northwest Power Planning Council recently approved preliminary design work there for a state-of-the-art outplanting facility.

The facility promises to become a laboratory for testing the effectiveness of supplementing local stocks. The project is expected to produce 10 million smolts within a decade. These could include spring, fall and summer chinook; early run coho; and summer steelhead.

While many fisheries experts believe outplanting is the key to sustained yields of fish, they are also aware of certain risks. There are a number of uncertainties related to outplanting, such as genetic implications, the effects on other fish species in the natural habitat, and the impact on overall fish survival



and productivity. For example, one uncertainty concerns planting densities – how many smolts can be released at a specific site before survival begins to diminish? Of particular concern is how hatchery fish can affect survival rates of other fish by either dominating or displacing local stocks. The genetic diversity of the local stocks could be at risk.

Because of these uncertainties, the outplanting programs must be designed to provide long-term, stringent monitoring and data collection. At the Yakima/Klickitat project, biologists will mark all outplanted fish with coded wire tags and will develop a computerized record-keeping system. They will study the timing and numbers of fish migrating to and from the ocean; the maturation schedules and size of the outmigrants; the number of fish harvested throughout the migratory range; the size, sex and age of returning adults; and survival rates both from egg to smolt and from smolt to adulthood.

Sites for releasing young fish must also be chosen with care. The water needs of various stocks must be analyzed. Project operators will look at water quality, availability of suitable flows, site-related considerations (roads, proximity to hatchery, etc.), and

land-use factors. Because of the scarcity of water in the area, hatchery managers will also work closely with irrigators.

While outplanting has been tried elsewhere with both success and some failure, the Yakima/Klickitat project will be the largest scale and most rigorously scientific test of outplanting ever. Fisheries experts all over the world will be watching the results.

–DM

Reseeding the Rivers: Imprinting

One of the many mysteries of the salmon's unique life cycle is the fish's homing instinct. After three to five years migrating thousands of miles in the ocean, surviving adult salmon will usually return to spawn in the exact stream reach in which they themselves were spawned. No one knows exactly why this is so, but the conjecture is that the peculiar characteristics of an individual spawning environment are somehow

“imprinted” in each salmon at a very early developmental stage.

Ordinarily, hatchery-bred fish would be expected to return to their hatchery to spawn. Such fish are frequently put into acclimation ponds prior to release in streams to improve their chances for survival. By filling these ponds with water from the streams into which the young fish will eventually be released, researchers hope to duplicate nature's imprinting process for that stream. If this process can work on a large scale, it will mean that some natural stream reaches now depleted of fish could be repopulated.

–DM

The most comfortable investment you'll ever make.



Get 46¢
to a more
energy
efficient and
comfortable
home.



If you're a mailbox owner in the Pacific Northwest and are planning on building a home soon, cut out this coupon and put it in the mail. You'll receive free information on how to build a more energy efficient and comfortable home. A Super Good Cents Home that can cut your heating costs up to 50% over yours. The information is free and yours for the asking. Simply cut out and send in the coupon.

Please send me free information on the Super Good Cents Program for homes in the Pacific Northwest.

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Because we've
I help make your
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to build a Super Good Cents home comes from utility. You see, when you choose to build a home, you get your builder and your working in the most energy efficient way possible. Save the most money.



SELLING SUPER GOOD CENTS

by Paula M. Walker

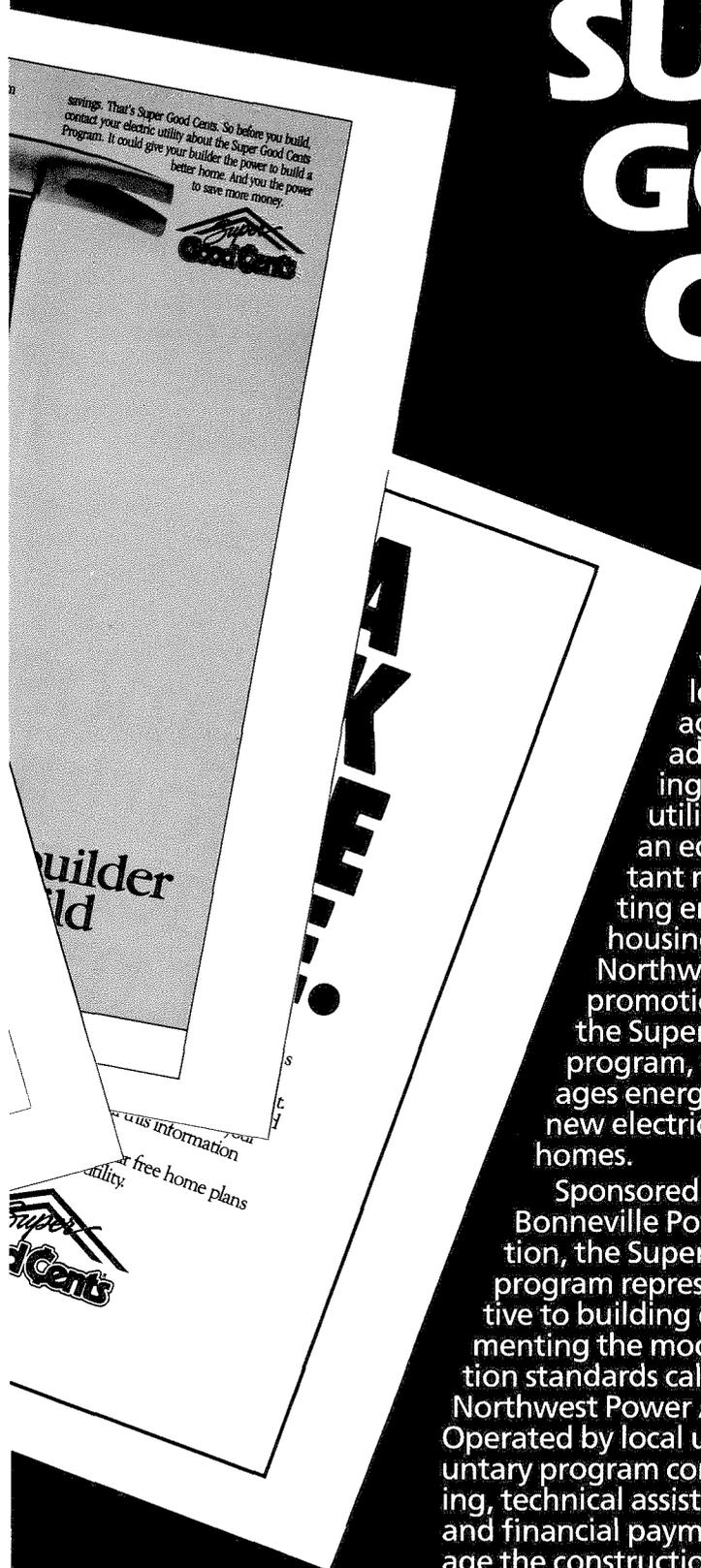
Balloons, wine coolers and Superman are a far cry from R-value insulation levels, air leakage controls and advanced framing. But for some utilities they play an equally important role in promoting energy-efficient housing in the Pacific Northwest. They are all promotional tools for the Super Good Cents program, which encourages energy efficiency in new electrically heated homes.

Sponsored by the Bonneville Power Administration, the Super Good Cents program represents an alternative to building codes for implementing the model conservation standards called for in the Northwest Power Act of 1980. Operated by local utilities, the voluntary program combines advertising, technical assistance, training and financial payments to encourage the construction of electrically-heated homes that meet high standards of energy efficiency. As of January 1, 1988, more than

100 utilities had signed up for the Super Good Cents program.

When the Super Good Cents program began in 1985, it initially met resistance both from builders who were unfamiliar with energy-efficient building techniques and from home buyers who imagined energy-efficient homes as small, dark, airtight boxes wrapped in plastic, allowing no architectural creativity. To overcome those biases and to promote construction of Super Good Cents homes, many utilities have developed creative marketing strategies. While Bonneville assists the utilities with general promotional material about Super Good Cents, several utilities have tailored their own marketing programs to the distinct needs of their customers.

Utilities have aimed advertising campaigns either at homebuilders or at people who are thinking about building a new home. Some ads emphasize the value of energy-efficient homes; others focus on local Super Good Cents success stories, using testimonials from builders in the program.



House Plan Dream Book

When it first joined the Super Good Cents program, the Eugene Water and Electric Board conducted an in-depth marketing survey of its customers. The results indicated that people in the Eugene, Oregon, area already supported energy-efficient housing and were willing to pay more for an energy-efficient home. Consequently, the utility focused much of its promotional effort on the building industry.

Activities included a booklet of house plans for Super Good Cents homes and the construction of model homes built to Super Good Cents standards. To encourage builder participation, the Eugene Water and Electric Board offered to reimburse builders for the cost of maintaining the model homes while they were on display.

For the house plans book, the utility ran a design contest for house designers and architects, with a \$1,000 award for the winners. To encourage customers to use Super Good Cents house plans, the utility offers to share half the cost of purchasing the plans up to \$200.

Bob Lorenzen, Super Good Cents coordinator for the board, says model homes are important not only to give the builder practice in applying Super Good Cents techniques, but also to show prospective buyers the flexibility of energy-efficient home designs. "Model homes help to demystify the impression that the [Super Good Cents] homes are different, that they have less window area, etc.," he says. The Eugene utility is using funds from a weatherization bond they sold a few years ago to pay for parts of their Super Good Cents program.

The Media Markets the Message

Chelan County Public Utility District in central Washington has run television ads featuring two "down-home" characters sitting on the front porch discussing the merits of their Super Good Cents home in the style of popular wine cooler ads. Benton County Public Utility District in southeastern Washington has run ads with a Superman theme: "Wouldn't it be great if you could see through walls?"

Mike Greene, of Chelan's public utility, says the utility has had a difficult time overcoming the

stereotype that "a Super Good Cents home is very tight and it sweats." As a result, the utility's advertising campaign promotes the homes' comfort and energy savings. To overcome the impression that the homes limit the number of doors and windows, the utility offers to adapt any house plan to meet Super Good Cents standards.

While project-labeled balloons, billboards, door mats and door knockers may seem frivolous to some, utilities have discovered that one cannot underestimate the power of advertising. Converts have come from unexpected places.

The most comfortable investment you ever make

Your door to a more energy efficient and comfortable home.

U.S. MAIL

If you're a mailbox owner in the Pacific Northwest, and are planning on building a home, save, cut your energy bills and put into the mail this coupon and you'll receive free information on how to build a more energy efficient and comfortable home. Super Good Cents home that can cut your energy costs up to 50%. Information is free and yours simply.

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One builder even called the City of Tacoma's utility division from his mobile phone while he was stuck in traffic behind a bus that bore a Super Good Cents sign.

Centsable Collaborations

Some utilities with adjoining service areas have stretched their Super Good Cents dollars with cooperative advertising campaigns.

Benton County, for instance, belongs to a consortium of utilities that are promoting the program in the Tri-cities area of Washington state. Also in the consortium are the City of Richland, Benton Rural Electric Association, Franklin County Public Utility District, Columbia Rural Electric Association and the Umatilla Electric Cooperative. Together, the six utilities serve about 70,000 residential customers.

Because the utilities often work with the same builders, the consortium has taken pains to coordinate their Super Good Cents programs, so that they are administered consistently in the various service areas. "We try to make sure that each utility enforces the specifications in

the same way to avoid confusion among the builders," says Ron Goodman, energy adviser for the Benton County utility.

Another recent cooperative effort between the City of Port Angeles and the Clallam County Public Utility District in northwestern Washington resulted in a "Super Good Cents Week" promotion that included builder training sessions and a home tour of nine Super Good Cents homes under construction. Sheila Hardy, director of conservation for the City of Port Angeles, said at least one builder was asked to build another Super Good Cents home as a result of the tour.

The Personal Approach

Some of the smaller and mid-sized utilities have found that their best promotional aids are word of mouth and one-to-one contact with both builders and prospective new home buyers. Says Hardy, "Our best marketing tool has been our energetic technical representative who drives around town and talks to builders. Those contractors have come in here with their plans the same afternoon after he talks to them."

Lakeview Light and Power near Tacoma relies almost exclusively on one-to-one contact. Because the



utility's service area encompasses only eight square miles, its program representative is able to visit every Super Good Cents construction site to conduct inspections and answer builders' questions. The utility boasts that 88-percent of the new homes constructed are Super Good Cents buildings. Most of the energy-efficient construction in the utility's service area has been in multi-family dwellings.

Builders Training

While advertising and marketing play an important role in these promotional efforts, some utilities have focused on the training and technical assistance aspects of the program. Bonneville supplies participating utilities with training materials and tapes to instruct builders on various energy-efficient construction techniques. Several utilities, including Snohomish County Public Utility District, Gray's Harbor County Public Utility District, and the City of Port Angeles have worked with carpentry classes at community colleges, vocational-technical schools or high schools to encourage the construction of a Super Good Cents home as a class project.

Says Joann Hansen, Super Good Cents coordinator for Gray's Harbor County Public Utility District, "These are the future builders of America. They have been very receptive to the new techniques. And the instructor at the community college loves the Super Good Cents program." Hansen said that two Super Good Cents builders in her service area conducted program training at the college.

The Eugene Water and Electric Board publishes a technical newsletter for builders and other members of the housing industry. Called "Building Cents-ibly," the newsletter provides technical tips for building energy-efficient homes and features a different Super Good Cents builder in each issue. Chelan County has paid registration fees for builders who participate in Super Good Cents training programs.

Financing Conservation

Bonneville offers funds for the utilities to award to builders or home buyers to defray the costs of materials and equipment needed to increase energy-efficiency levels in buildings. Some utilities match the Bonneville incentives with their own funds. Some offer their incentives in the form of loans. The Columbia River Public Utility District in northwestern Oregon offered \$1,000 credit on a Super Good Cents customer's utility bill. While it has discontinued that practice, it still offers both an additional \$1,000 construction payment and a \$1,000 credit toward a line extension fee if construction of the new home requires a new power line. Emerald Public Utility District in central Oregon also offers a \$1,000 construction payment to match the Bonneville payment.

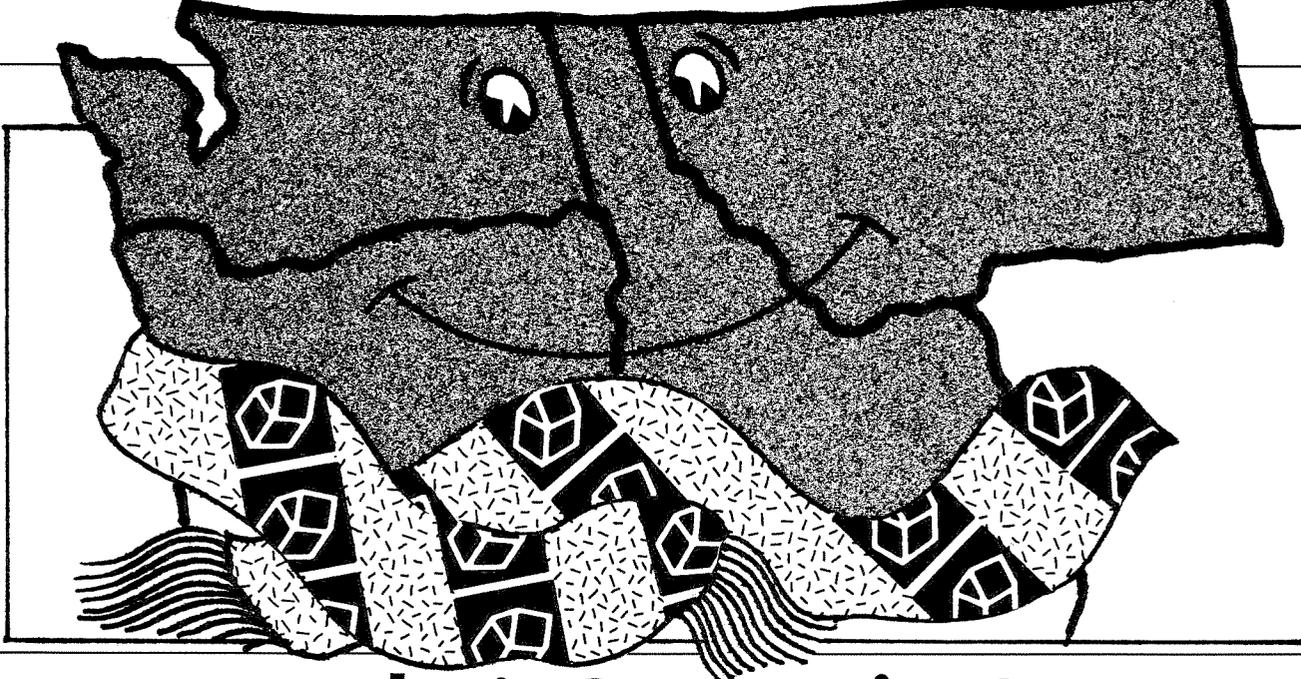
Chelan County offers a 10-year loan at zero percent interest to help pay for the cost of energy-efficient equipment installed in Super Good Cents homes. Kootenai Electric Cooperative in northern Idaho is working with the local building contractors' association to feature only Super Good Cents homes in their 1988 home show. To entice builders to participate, Kootenai will donate the electric heating system

and an energy-efficient water heater for each home. The utility has also agreed to waive its \$95 new-connection fee.

The above examples represent just a smattering of the creative efforts some utilities are taking to make the Super Good Cents program a success. Snohomish County in Washington and the City of Ashland, Oregon, have been featured in past issues of Northwest Energy News for their aggressive marketing of the program.

While each utility has developed its own promotional formula, the successful programs share one common denominator — enthusiasm. According to Carol Perigo, Bonneville's Super Good Cents representative for the Lower Columbia area, attitude may equal advertising in determining success. Praising Ashland's energy conservation coordinator Dick Wanderscheid for his positive approach, she said, "Sometimes it's how you look at a problem. It can be either an opportunity or a brick wall. If a negative comes up, Dick will try to turn it around to a positive for the program. He'll say, 'How can we do this?' If we could get others to adopt that positive attitude, we'd have more success." ■





Who's Conserving? Virtually Everyone!

A combination of incentives, strong marketing programs and simple pragmatism has carried the Pacific Northwest over its first hurdle in achieving regionwide electrical energy efficiency in new construction. In one way or another, virtually every utility or local jurisdiction has taken at least the first steps toward meeting building standards that could save the region as much as 1,200 megawatts — the equivalent of two nuclear plants or three coal plants.

Energy saved through efficient new construction is one of the most cost-effective sources of new electrical power. For about half the cost of energy from new coal plants, the Northwest Power Planning Council's model conservation standards will deliver economical electricity to the region and simultaneously save new home buyers roughly half of their electricity use.

To achieve regionwide acceptance of the conservation standards, the Council encouraged the Bonneville Power Administration to offer marketing programs, builder and building-code official training, assistance to local governments wishing to incorporate the model conservation standards into building codes, and technical advice to utilities and local governments attempting to achieve the savings of the model standards in alternative ways. If those inducements failed to move the region closer to more efficient use of electricity, Bonneville could levy a surcharge on those utilities which were not participating in the conservation effort.

As of January 1, 1988, virtually every community or utility had submitted a plan to Bonneville outlining ways it intended to conserve electricity at the level called for by the Council. More than 30 cities and counties had become "early adopters," by rewriting the local building codes to reflect the increased savings available through the standards. More than 100 utilities had signed up for Bonneville's marketing program, Super Good Cents, to encourage new construction that meets the standards. In addition to the residential sector, approximately 80 percent of all new commercial buildings in the Northwest will meet the Council's energy standards. In dollars and cents, these savings could total up to about \$620 million that would otherwise have to be spent building power plants.

Already, the "Northwest Energy Code" has attracted the attention of the rest of the nation. Nowhere else is there such multi-state concurrence on the need to make the most efficient use of the region's shared electrical resources.

SHORTS

Federal funds for Columbia River fish screens and other fish passage improvements at major dams survived budget cutting efforts in the nation's capital. Northwest Senators Mark Hatfield (Oregon), Dan Evans (Washington) and James McClure (Idaho) worked to secure the appropriations. The Northwest House delegation also backed the bypass improvements package. The Northwest Senators had earlier pushed to increase the funding for the Columbia River projects from the \$2.1 million proposed by the administration to \$10.8 million. The larger budget will mean that the projects can be completed on the schedule agreed to by a consensus among the Northwest Power Planning Council, the Bonneville Power Administration, the Pacific Northwest Utilities Conference Committee, the Public Power Council, the Columbia River Inter-Tribal Fish Commission and the Columbia Basin Fish and Wildlife Authority.

The U.S. Congress has approved a bill requiring the Department of Housing and Urban Development (HUD) to develop national energy conserving construction standards for manufactured housing. Members of the Northwest congressional delegation worked hard for this bill's passage in part because 9,000-10,000 new, manufactured homes are located in the Northwest each year. These homes constitute about 30 percent of all new housing starts in the region. The Northwest Power Planning Council had defended new HUD standards because they benefit both the owners of new manufactured homes and the region's entire power system. The bill was also supported by the American Public Power Association, the National Association of Home Builders and the American Association of Retired Persons.

Guaranteed access to the sun is the goal of a uniform solar access building code that may eventually be adopted by 21 local governments in the Portland, Oregon, and Vancouver, Washington, area. The new code, currently being tested in 12 of the 21 communities, has been developed by a unique coalition including five counties, two states and 15 cities. Known as the Metro Area Solar Access Project, the coalition is funded by the Bonneville Power Administration. "Studies show that houses which are sited to receive the sun's rays in the winter will use less energy over their lifetime than homes whose south walls are shaded," states an article in the project's newsletter. More than 20 governments in the Pacific Northwest have already adopted solar access codes as a means of conserving energy. (For more information: *Sunlines*, the newsletter published by the Metro Area Solar Access Project is available from, Conservation Management Services, Inc., 1130 S.W. Morrison, Suite 328, Portland, Oregon 97205.)

Employment growth in the Pacific Northwest exceeded national employment growth during 1986 and 1987, says a report on the economy and regional electrical loads, prepared by the Northwest Power Planning Council. The report also notes that commercial use of electricity in the region has been growing by about 3.2 percent per year since 1979, while Northwest electrical use in all sectors combined has declined slightly during the same period. (Copies of the report are available from the Northwest Power Planning Council. See the back cover of this issue for ordering information.)



The solar power of polar bears betters the best sunlight collectors, say researchers studying the fat and furry creatures. Polar bear fur, contrary to appearances, is clear like optical fibers. Underneath, the skin itself is black. The fur seems to function much like the glazing on a solar collector, with the black skin absorbing the heat. But polar bears are 95-percent efficient, compared with the best and most expensive solar collectors, which are rarely even 65-percent efficient. The fur also appears to permit only ultraviolet light to penetrate to the skin, a feature that enables the bear to collect solar heat even on cloudy days because ultraviolet light passes through clouds. When "polar-solar" collector panels, designed to mimic the optical qualities of the fur, were tested on rooftops, collection efficiency was increased by 50 percent. (Source: Christian Science Monitor story, carried in *The Seattle Times*, December 7, 1987.)

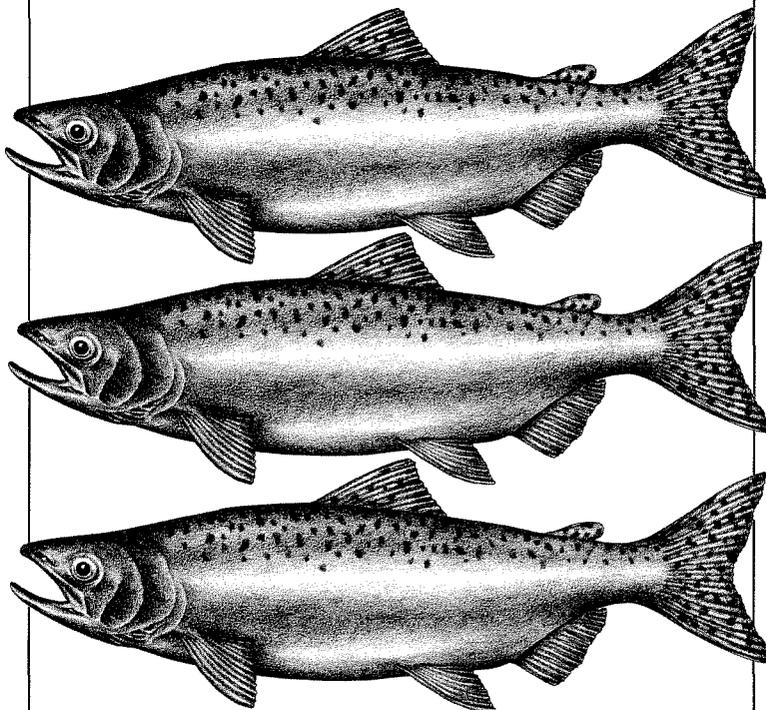
SHORTS

Non-profit agencies may save 10 to 15 percent of their energy costs thanks to a pilot project in Clark and Skamania Counties in Washington. The project, sponsored by the Bonneville Power Administration, will offer free energy management advice to the 15 to 25 organizations selected to participate. No-cost and low-cost energy saving measures will be stressed along with energy audits of agency buildings. Free training seminars will help participants learn how to monitor their ongoing energy use and the savings garnered through the conservation improvements. (For more information: Contact Claudia Fisher, Intergovernmental Resource Center, Box 5000, 1013 Franklin Street, Vancouver, Washington 98668, 206-699-2361.)

The U.S. Bureau of Reclamation has announced plans to change its mission from one of developing water resources to one of conserving them. After more than 85 years in the business of dam building and irrigating deserts for agricultural purposes, the Bureau has concluded that its mission in those areas has been accomplished. Its new mission will include making existing Bureau projects — some of the largest dams and most complex irrigation systems in the world — more efficient and more responsive to environmental concerns. The Bureau may also apply its engineering capabilities to looming problems such as the depletion of groundwater and the build-up of silt and toxic wastes in Bureau projects. (Source: *New York Times*, Sunday, November 8, 1987.)

Global energy use can be cut in half and economic growth encouraged by using existing energy-efficient technologies, suggests a report published by the World Resources Institute. Developing countries could achieve the living standard equivalent to 1970s Western Europe with only a 30-percent increase in per capita energy consumption, the report also noted. The authors, energy experts from Brazil, Sweden, India and the United States, emphasize four areas they consider technologically promising: space heating, appliances, automobiles and steelmaking. They list super-insulated homes, energy-efficient refrigerators and light bulbs, cars that can get 98 miles to the gallon and steelmaking processes that halve energy requirements. (Copies of the report, "Energy for a Sustainable World," and a companion piece, "Energy for Development," are available for \$10 plus \$2 postage each from World Resources Institute Publications, Box 620, Holmes, Pennsylvania 19043.)

Between 7,000 and 2,000 years ago, Columbia River salmon runs declined so much that basin Indian tribes had to rely on other fish, mammals and plants, says Oregon State University anthropologist Patrick Thomason in his recently completed master's thesis. His studies of bone remains and other artifacts from the banks of the Columbia led to his conclusion that climatic changes may have led to a 5,000 year collapse of the fishery. The huge runs seen by early explorers to the region signify the recovery from that ancient destruction. (Source: *Sea Pen*, the bimonthly newsletter of the Oregon Sea Grant Program, Administrative Services 422, Corvallis, Oregon 97331.)



The Oregon Department of Fish and Wildlife is calling 1987 "The year of the chinook," because of record ocean and inriver harvests of the prized fish. In addition, the runs featured larger-than-average fish, some weighing more than 60 pounds. The department credits a mix of factors for the successful returns. Reduced harvests in Alaska and Canada due to the U.S./Canada Pacific Salmon Treaty; improved smolt passage down the Columbia because of Columbia River Basin Fish and Wildlife Program measures; improvements in hatchery productivity; and improved ocean survival were all praised as contributing to the year's successes. The Department also predicts the good news to continue through next year's chinook runs and harvests.

Brighter Lights

Imagine a facility at which an architect can have mock-up rooms constructed to test various types of lighting before a lighting system is actually installed in a building. Or picture a place that lets designers demonstrate state-of-the-art equipment to help their clients avoid taking huge financial risks. That is exactly what Seattle City Light, the Northwest Conservation Act Coalition, the Natural Resources Defense Council and the Bonneville Power Administration are thinking of building in Seattle.

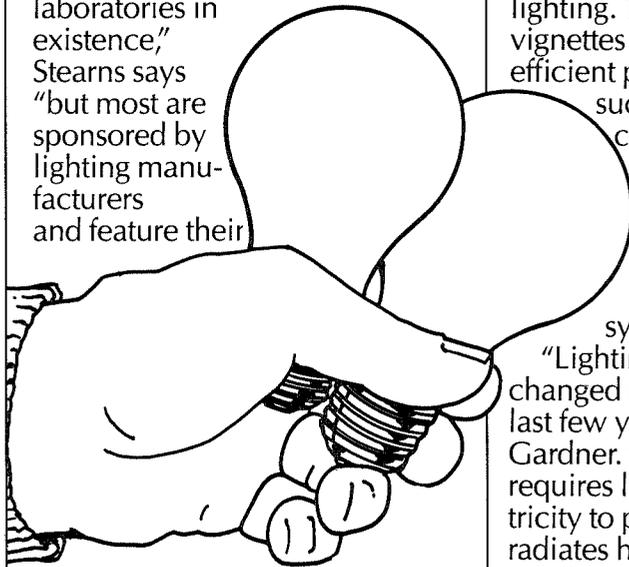
These organizations are convinced that actually looking at and experimenting with new equipment and various lighting strategies in a realistic design situation is the most effective way for a lighting designer to become familiar with energy-efficient systems.

"Energy efficiency in lighting is extremely important," explains Margie Gardner, conservation analyst with the Northwest Power Planning Council. "The lighting of buildings currently uses about one-third of the electricity consumed in the commercial sector. As that sector uses 20 percent of the electricity sold in the Northwest, lighting is a significant user of electricity."

and Smarter Switches

Tim Stearns, policy coordinator with the coalition, hopes this "lighting laboratory" will improve both the energy efficiency of lighting and the design of lighting systems used in new buildings.

"There are other lighting laboratories in existence," Stearns says "but most are sponsored by lighting manufacturers and feature their



products. This laboratory will allow people to compare fixtures from many companies and to learn about energy efficiency, something other labs do not focus on."

"This facility will consist of several parts," according to Diana Campbell, Seattle City Light's project manager. "The 6,000-square-foot facility will house a resource library, lighting displays and, most importantly, a mock-up space, able to accommodate an unlimited number of different strategies in efficient lighting. The displays will be vignettes showing the most efficient products in work areas such as retail space, conference rooms and restrooms. In addition, there will be resource people and computers to help design lighting systems."

"Lighting technologies have changed phenomenally in the last few years" says the Council's Gardner. "Inefficient lighting requires large amounts of electricity to produce light, it also radiates heat. This causes air-conditioning systems to work overtime. Both electricity and money are wasted. Hence there has been a great deal of incen-

Keeping Commercial Conservation Current

When the Northwest Power Planning Council first developed its model conservation standards for commercial buildings—setting energy-efficiency levels for restaurants, offices and other buildings—the standards were as stringent as any in America. Now, new technologies and new codes are passing the Council's commercial standards by. As a result, the Council is currently reviewing its standards and may revise them.

Four papers on issues related to this potential revision are being distributed for public review this fall and winter. Based on the analysis and comment received on these papers, the Council intends to release a draft rule on the model standards for new non-residential buildings this spring. A decision on the revision is scheduled for midsummer.

The Council adopted model conservation standards for new commercial buildings as part of its 1983 Power Plan. These standards were based on the Council of American Building Officials' model energy code, which had as a technical basis the American Society of Heating, Refrigerating and Air-conditioning Engineers' (ASHRAE) Standard 90A-1980, Energy Conservation in New Building Design. This is a national consensus standard that serves as a model for energy codes in the majority of states.

The Council modified two sections of the code covering lighting and ventilation. The lighting provisions were modified to be consistent with what was then Seattle's lighting code—the most stringent in the Northwest at the time. ASHRAE's more recent ventilation standards were used in the model conservation standards to ensure acceptable indoor air quality.

Portions of the commercial standards have been modified since 1983. Now, the entire commercial model conservation standards are being reviewed. Tom Eckman, conservation analyst with the Council, says the review was prompted by the fact that building practices and techniques have advanced, making several energy-efficiency features even more economical. In addition, other codes are appearing in the Northwest that are tighter than the Council's model standards.

Since the Council first adopted its model standards in 1983, Oregon and Washington have revised their energy codes, and Seattle adopted a new, more stringent code for non-residential buildings. ASHRAE also is in the final stages of updating its energy conservation standards. In addition, the U.S. Department of Energy recently proposed energy conservation standards for new, government-owned, non-residential buildings. These will serve as voluntary guidelines for other commercial buildings and parallel ASHRAE's new standard. All of these codes contain more stringent provisions than the Council's standards.

Currently, the Council's strategy to achieve energy-efficient commercial buildings consists of two elements. The first is the adoption of more energy-efficient building codes. But Eckman notes that "because there is so much diversity in commercial buildings, it is not possible to identify all regionally cost-effective conservation measures in a single set of building standards." So, the second element of the Council's strategy is to have utilities offer programs that help identify more efficient designs. The Bonneville Power Administration, through its "Energy Smart" design assistance program, encourages architects, designers and builders to construct buildings that are at least 10 percent more efficient than the Council's current model standards require. One part of the program, called "Energy Edge," offers incentives to build to 30 percent beyond the level of the standards.

The Council, in its commercial standards review process, is looking at these programs to see how well they are working and if other programs or policy options should be developed. Please contact the Council's public involvement division to receive further information on the review process.

RLC

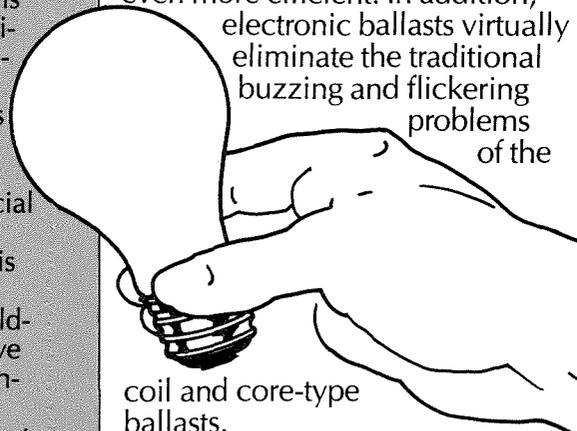
tive to make lighting technologies more efficient, and the Northwest can now reap the benefits of these changes."

Innovations have occurred in the most common type of lighting fixture used in homes—the traditional incandescent light bulb, which uses electricity to heat a tungsten filament until it glows. New types of these lights are appearing that represent significant energy savings.

Fluorescent lights are often recommended for commercial buildings, because they use about a quarter of the electricity of incandescent bulbs and last 20 times longer. Fluorescent lights consist of the lamp tube, the fixture and the ballast, which is located at the base of the tube and regulates the electric current that passes through the tube.

Ballasts have changed significantly in recent years. Conventional ballasts work through magnetic forces and are made of an aluminum coil wound around an iron core. More efficient ballasts are now made with higher grade iron or steel at the core and copper windings instead of aluminum. Just appearing on the market are electronic ballasts, which are even more efficient. In addition,

electronic ballasts virtually eliminate the traditional buzzing and flickering problems of the



coil and core-type ballasts.

In California, all ballasts manufactured after 1983 must meet a minimum-efficiency rating. This standard ensures that only better quality ballasts are produced and limits retail and wholesale ballast sales to only those that comply with the standard. This is one method of

ensuring that energy is used efficiently.

Also very efficient are high-intensity discharge lights that work like fluorescent ones but contain different gasses. The three major types—mercury vapor, metal halide and high-pressure sodium—have traditionally been used for outdoor lighting because they change colors (as compared to common incandescent lighting). However, they are being used indoors now for special applications where color is not a major concern.

The number of hours a light operates significantly influences the amount of electricity used. No matter how efficient a lighting design, electricity is wasted if the lights are used when they are not needed. Therefore, "lighting control strategies" are also being implemented.

One of the most common controls is the on/off light switch placed in each room of an office building. This seemingly obvious "strategy" is now required in most building codes. However, before the oil crisis in the 1970s, the lights on entire floors of commercial buildings were switched on by only one or two wall switches. This meant that if only one person were working late, all the lights were operating. The science of lighting controls has advanced considerably since those days. Now controls are available that turn lights off when there is daylight in the area or when people leave a room.

"The goal in lighting new energy-efficient buildings is to produce an effective, pleasing and satisfying working environment with minimal electricity consumption," says Gardner. "Both the quality and quantity of lighting are important aspects of good lighting design."

In the Council's model conservation standards (which set energy-efficiency levels for new buildings) a lighting "budget" is laid out. The budget lists power allowances for different building types, such as office buildings, retail stores, warehouses, restaurants or schools. For example, the office building allowance is 1.5 watts of power per square foot. Work areas that need lots of light may exceed this allowance, while areas such as hallways may require less. The overall facility complies with the code if it averages out to less than or equal to 1.5 watts per square foot. This method is used in many other codes such as the Oregon and Washington state codes.

But the changes that have occurred in lighting technology may mean that the Council's standards no longer reflect the level of energy efficiency possible in the lighting systems of commercial buildings. This is being considered as the Council evaluates potential changes to the lighting budgets in the current model conservation standards for commercial buildings. The accompanying box on the commercial model standards describes this ongoing evaluation.

In the meantime, Seattle City Light is planning to go ahead with the lighting laboratory, a resource the utility hopes will open next winter to serve the whole Northwest.

CELEBRATING THE FOURTH



by Carlotta Collette

For virtually all of its history, the city of Tacoma, Washington, has had to contend with taking second place behind Seattle. Like Gary, Indiana, to Chicago, Tacoma was the workhorse, while Seattle pranced ahead of it. But in 1983, Tacoma demonstrated its foresight and took the lead by becoming the first city in the Pacific Northwest to adopt as building codes the Northwest Power Planning Council's

model conservation standards (MCS) for new electrically heated buildings. (Seattle adopted comparable codes in 1987.)

Tacoma took its giant step toward energy efficiency at a time when the Northwest had not even developed support programs to encourage such participation. There was little technical assistance and none of the financial incentives that now ease community acceptance of the rigorous conservation standards.

Four years later, the city's Mayor Doug Sutherland, proudly proclaims that his jurisdiction has produced over 6,000 new living units, 150 new commercial buildings, and nearly 500 additions and remodels that all meet the super-conserving standards. In fact, Tacoma's conservation effort has netted the city more new and remodeled energy-conserving buildings than the rest of the region combined!

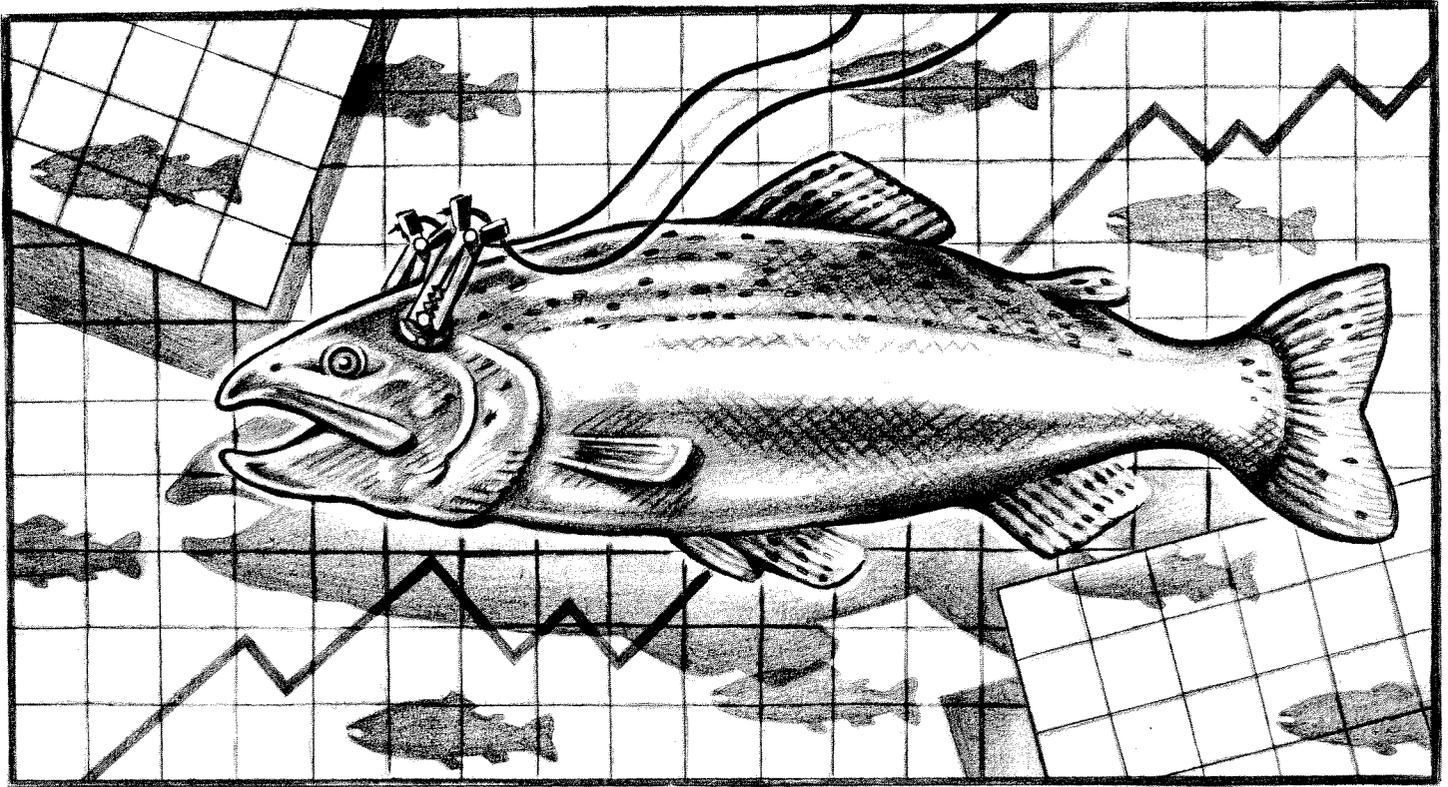
"We estimate that for every year we implement the MCS, we save one average megawatt," notes the mayor. "During 1987, we saved three average megawatts."

Undaunted by its reputation as an also-ran, Tacoma has built on its solid industrial base and multi-billion dollar military presence. The Port of Tacoma is considered one of the five best natural harbors in the world. It now also ranks among the fastest growing ports in the nation, with the city expanding its role as an international shipping center focusing particularly on Pacific Rim trade.

Electrical loads have followed the city's growth. Power needs for the city-owned utility, Tacoma City Light, expand between 1 and 2 percent per year, and finding energy resources to meet that load is becoming a challenge. "Our MCS program is obviously making a dent in what our load growth would otherwise be," said Energy Conservation Manager Jacob Fey, during his report on the city's success at the Council's November meeting in Tacoma.

Fey explained that Tacoma is now looking to the rest of the region to catch up with the conservation leaders. "To achieve the MCS regionwide within the next five to 10 years requires a commitment and a long-term strategy on the part of Bonneville, the Power Council and the region's utilities," he said. "The citizens of the Northwest deserve it," the mayor adds.





THE FEEDBACK FACTOR

by Beth Heinrich

Monitoring and evaluation. What could be more dry? The combination is one surefire way to put any audience to sleep. But before you doze off, consider this. You are a racehorse fan and the thrill of the track has you betting on your favorites. If they continue to cross the line first, you'll continue to bet on them. But if, in your meticulous review of each day's race results, you find a favorite horse coming up short, you're apt to stop betting on him. Instead, you place your money on a horse with a more promising track record.

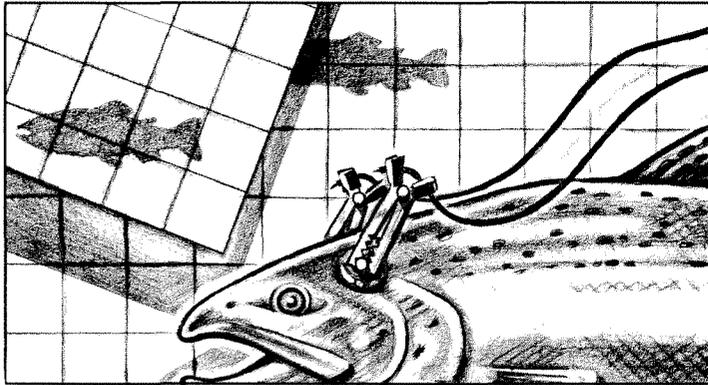
Whether you realize it or not, you've just conducted your own monitoring and evaluation program. You monitored the races, evaluated a particular horse's performance, and then made the necessary changes to spend your money more wisely. The new horse may not be a sure bet, but according to your research, he's your best bet.

The Northwest Power Planning Council doesn't deal in horses, but the fish business can be just as risky, especially when you're betting with someone else's money. That's why the members of a technical work group, including the Council's Chip McConnaha, are spending hours designing a monitoring and evaluation program for the Council's Columbia River Basin Fish and Wildlife Program.

The monitoring and evaluation group is focusing its attention on the new, regionwide thrust to double the basin's salmon and steelhead runs. Its members — all experts in the technical numbers game — have been working since last April trying to devise a program that will measure progress made toward that doubling goal.

It is no secret that some projects to increase fish numbers are a calculated gamble. "The Council's fish and wildlife program represents a sizeable investment on the part of the region's electrical ratepayers," explains McConnaha. "In some instances, investments in projects are being made without knowing what the real benefits will be. That's where the monitoring and evaluation program comes in. By keeping close tabs on individual projects, as well as progress toward the doubling goal, we'll be able to know what does and doesn't work."

In addition to assessing and accounting for changes in the salmon and steelhead run sizes, the monitoring and evaluation program will ensure that efforts to increase fish production will be consistent with several policies the Council spelled out last February, when it adopted the interim doubling goal.



The information will also supplement the Council's annual reports to Congress.

McConaha points out that an effective monitoring program is necessary not only to justify expenditures, but to provide the valuable feedback and information that will help guide future investments. "Any information the monitoring and evaluation program provides will give us some insight into the effectiveness of the fish and wildlife program and should result in better, more informed judgments in the future."

But measuring the effectiveness of the fish and wildlife program isn't as straightforward as one might think. The tendency is to simply count the returning adult salmon and steelhead each year. If the numbers are increasing, then the fish and wildlife program is working. Right? Not necessarily!

The fact is that mitigation efforts under the fish and wildlife program are only part of the whole picture. The annual abundance of adult fish, or "total adult production," is also influenced by harvest, water conditions, the number of fish produced during up to four brood years, and a host of other

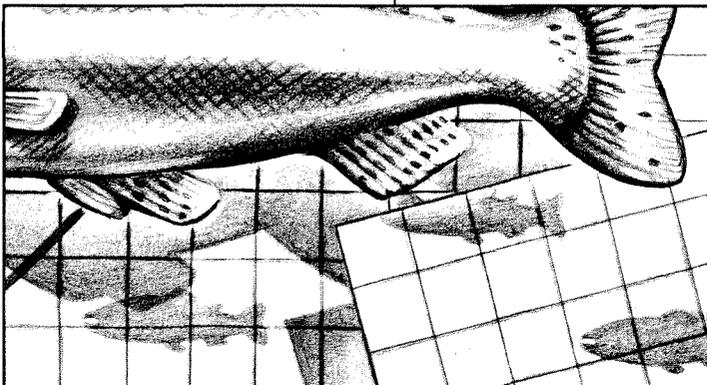
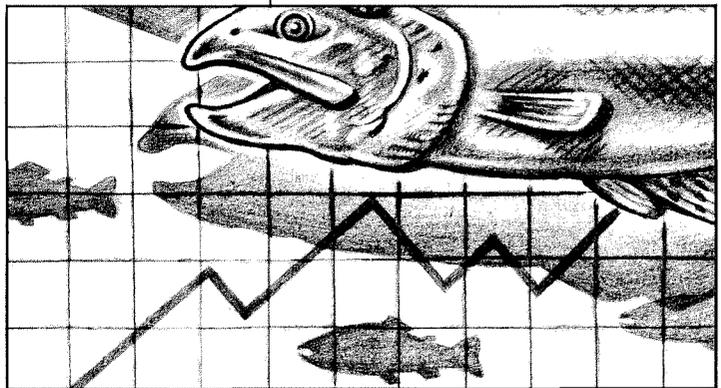
things outside the scope of the Council's program. In other words, the number of returning salmon and steelhead alone is not a good indicator of program success.

Recognizing this, the work group, in addition to looking at total production, has been discussing the use of a measure of productivity that might be called the "equilibrium production potential."

The group contends that while the fish and wildlife program refers to the doubling goal in terms of total adult

production or *numbers* of fish, an alternative approach to that goal is to double the *productivity* or production capacity of the system. According to McConaha, productivity refers to the system's ability to *efficiently* produce adult fish and could be measured, for example, as the total number of adults produced from a given number of spawners or given habitat.

Sound complicated? It is. But despite the technical jargon, monitoring and evaluation are essential elements of any effective and efficient program. Without them, managers could end up dumping money into worthless projects, never realizing their mistakes, let alone learning from them.



Fisheries management is an art, not an exact science. It is chock-full of unknowns, especially in a system as complex as the Columbia River Basin. It only makes good sense to incorporate the necessary checks and balances so resource managers and planners can identify unproductive efforts and make the appropriate changes. Identifying the successes becomes just as important as identifying the failures, however, because projects that are proving to be wise investments are likely to be good bets in the future.

The key is to learn from a monitoring program and transfer that knowledge and experience into the field, where it counts. No one will argue that the stakes are high and the risks are great, but with a good, solid monitoring program in place, the odds are in our favor.

CALENDAR

January 30 — Aquaculture conference at the Tye Motor Inn in Olympia/Tumwater, Washington. Sponsored by the Washington Department of Agriculture and Washington Governor Booth Gardner. For more information: John Pitts, Washington Department of Agriculture, 206-586-2777.

February 10-11 — Northwest Power Planning Council meeting at the Madison Hotel, 515 Madison Street, Seattle, Washington.

February 17-19 — The "15th Annual Energy Technology Conference and Exposition" in Washington, D.C. Sponsored by the American Gas Association, the Electric Power Research Institute, the Gas Research Institute and the National Coal Association. For more information: Energy Technology Conference, Inc., 966 Hungerford Drive, Number 24, Rockville, Maryland 20850, 301-251-9250.

February 25-26 — "Lighting Management" seminar in Los Angeles, California. Sponsored by the Association of Energy Engineers. For more information: Association of Energy Engineers, 4025 Pleasantdale Road, Suite 420, Atlanta, Georgia 30340, 404-447-5083.

March 9-10 — Northwest Power Planning Council meeting at the Canyon Springs Inn, Twin Falls, Idaho.

April 10-14 — The "Solar Energy Conference" in Denver, Colorado. Sponsored by the American Society of Mechanical Engineers. For more information: ASME Meetings Department, 345 E. 47th Street, New York, New York 10017, 212-705-7793.

April 16-20 — The "Frontiers of Public Service" national conference in Portland, Oregon. Sponsored by the American Society for Public Administration. For more information: ASPA, 1120 G. Street, N.W., Suite 500, Washington, D.C. 20005, 202-393-7878.

June 27-July 1, 1988 — "International Symposium and Educational Workshop on Fish-marking Techniques" at the University of Washington in Seattle. Sponsored by the American Fisheries Society and the U.S. Fish and Wildlife Service. For more information: Dr. Nick C. Parker, Marking Symposium, U.S. Fish and Wildlife Service, Route 3, Box 86, Marion, Alabama 36756, 205-683-6175.

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

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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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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
- 1987 Northwest Power Planning Council Annual Report
- Issue Paper on Protected Areas Designation
- Status Report on the Regional Economy and Loads
- Heating New Homes: A Comparison of the Cost of Heating with Electric, Natural Gas and Fuel Oil Heating Systems (Final Report)
- Western Electricity Study briefing papers
- Briefing Paper: Western System Overview
- Briefing Paper: Electricity Use in the Western U.S. and Canada
- Briefing Paper: Interregional Transactions
- Draft Briefing Paper: Existing Generating Resources in the West
- Draft Briefing Paper: Future Resources
- Staff Briefing Paper on Commercial Lighting

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 mailed with the Council meeting agenda)

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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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