Council Quarterly

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STRIKING A BALANCE BETWEEN ENERGY AND THE ENVIRONMENT IN THE COLUMBIA RIVER BASIN

City lights viewable from space, Photo: NASA

The New Energy Map: How the Northwest Power System Has Changed

"THE POWER SYSTEM... CREATES A GROUND OF COMMON INTEREST"

As little as thirty years ago, the only resources that energy planners considered to meet future demand were coal and nuclear. People couldn't imagine any other options.

Today, the Northwest's resource portfolio includes other kinds of generation. The system is still hydro-based, with the Bonneville Power Administration playing a dominant role as a key provider, but natural gas-fired plants and wind generation are now growing resources.

Most remarkable has been the impact of energy efficiency. It's now our third largest resource, contributing 16 percent of the region's energy. Combined with what the federal hydrosystem generates, 70 percent of the region's electricity demand is met with clean energy.

How did this happen? You could say it's a story of both success and failure; and something unique about the Northwest.

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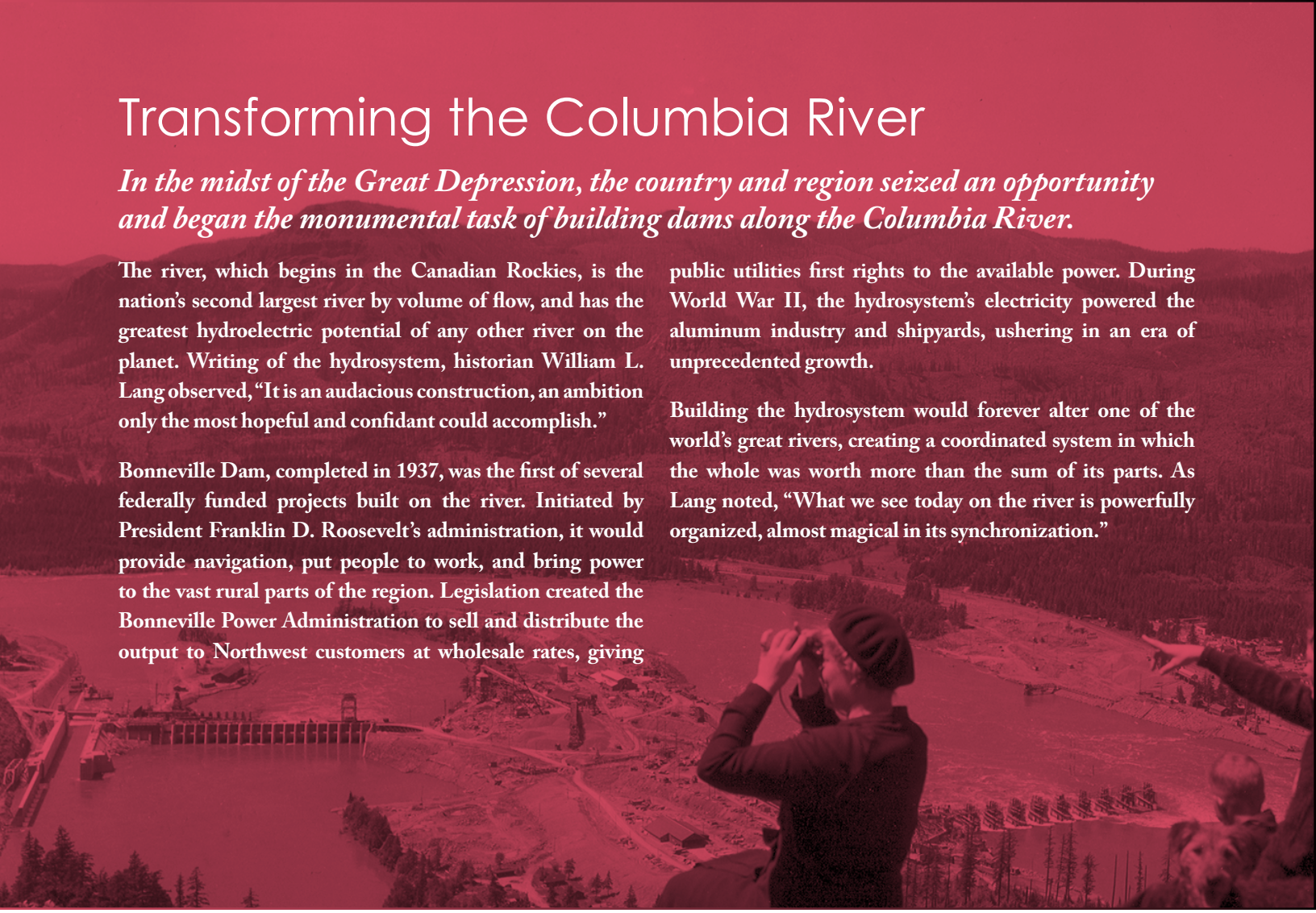
Transforming the Columbia River

In the midst of the Great Depression, the country and region seized an opportunity and began the monumental task of building dams along the Columbia River.

The river, which begins in the Canadian Rockies, is the nation's second largest river by volume of flow, and has the greatest hydroelectric potential of any other river on the planet. Writing of the hydrosystem, historian William L. Lang observed, "It is an audacious construction, an ambition only the most hopeful and confidant could accomplish."

Bonneville Dam, completed in 1937, was the first of several federally funded projects built on the river. Initiated by President Franklin D. Roosevelt's administration, it would provide navigation, put people to work, and bring power to the vast rural parts of the region. Legislation created the Bonneville Power Administration to sell and distribute the output to Northwest customers at wholesale rates, giving public utilities first rights to the available power. During World War II, the hydrosystem's electricity powered the aluminum industry and shipyards, ushering in an era of unprecedented growth.

Building the hydrosystem would forever alter one of the world's great rivers, creating a coordinated system in which the whole was worth more than the sum of its parts. As Lang noted, "What we see today on the river is powerfully organized, almost magical in its synchronization."



A Region Grows

This control would be achieved through a treaty with Canada and a coordination agreement among Northwest utilities in the 1960s.

From the 1950s through the 1970s, the region grew at a tremendous rate—over 7 percent annually. The system, says Jim Litchfield, energy consultant, had incredible flexibility—the ability to meet the high peaks in demand; what it lacked was energy[1] because it depended on how much precipitation fell each year. Major droughts in the '70s compounded the discussions about supply. The droughts the region experienced in '73 and '77 highlighted the issue of parity between public and private utilities. How to share the shortages was a critical question.

"Oregon Governor Tom McCall had a famous quote, something to the effect that 'We're not going to have lights out in Portland and Christmas lights on in Vancouver,'" says Al Wright, energy consultant.

"With Washington state dominated by public utilities and Oregon serviced mostly by investor-owned utilities, how do you prevent it from becoming a have and have not system?" asks Wright.

These questions, and the growing awareness of dwindling fish returns, were at the forefront as the region debated its energy future.

The era of big dam building was over; gas-fired generation technology was still to come. Bonneville and the utilities decided to address the need for energy by adding thermal projects—coal and nuclear plants.

"The hydrosystem would be used to match load, and we were going to add thermal plants to ease the system's energy constraints," says Litchfield.

But the nuclear plants turned out to be much more expensive than expected; electricity prices skyrocketed and demand

1. Energy is the amount of electricity consumed over time.

fell. Most of the plants were abandoned. At the time, it resulted in the largest municipal bond default in U.S. history.

Amidst this turmoil, Congress enacted the 1980 Northwest Power Act. The Act authorized Idaho, Montana, Oregon, and Washington to form the Council. The Council was to develop a plan for the region that ensures an adequate, efficient, economical, and reliable power supply while protecting fish and wildlife; and work to inform citizens and encourage public participation.

A crucial aspect to the Act was its treatment of energy efficiency as a resource. Under the Act, it's the resource of first choice and it's given a cost advantage. In hindsight, the foresight of this one provision is stunning.

"The language, and the idea of planning, came from [Oregon] Senator Mark O. Hatfield's office," says Roy Hemmingway, an Oregon member on the first Council.

"The biggest changes to the power system happened in the Council's first few years," says Hemmingway. "We got off the path of building large thermal power plants and got on the path of building conservation."

Why make energy efficiency a planning priority? "Other resources have side effects—like CO2, for example—so giving energy efficiency a 10 percent discount accounts for that. It corrects for the side effects of other resources."

The other dramatic change was the importance placed on the environment. The Act, for the first time, required that fish and wildlife concerns be considered as equally as energy needs. In many ways, it anticipated the larger shift that was to come nationally.

"One of the biggest changes to the system came with the 1995 biological opinion and its requirements for flow," says Randy Hardy, former BPA administrator.

As a result, the region lost about 1,200 megawatts of firm energy from the federal system. Peak generating capability was reduced by about 15 percent. Losing that power also meant losing a measure of operational flexibility.

"The Columbia River, because it has little storage, is more a run-of-the-river system," notes Hardy.

"Prior to the BiOp, operations managers could 'borrow' water from future years and draft more in a particular year. Today, they don't have that option."

Deregulation, Fragmentation, and Risk

The market deregulation that overtook the telecommunications, natural gas, and airline industries eventually hit the power industry in the 1990s. Resource and transmission expansion would be undertaken in response to market forces.

"People didn't think we'd need planning," says Litchfield. "Market signals were supposed to take care of the power supply."

While deregulation gave the region greater access to outside markets, especially in California, which purchases the Northwest's surplus hydro generation in good water years, the shift from integrated planning for generation and transmission came at a cost.

"It made planning much more independent," says Wright. "It made us very shortsighted, where the private sector is solely profit-oriented."

"People didn't think we'd need planning"

In 2000-01, the West Coast experienced a "perfect storm" of bad conditions that led to astronomical market prices and energy shortages. At the center of the meltdown was California's flawed deregulation legislation, but a growing imbalance between supply and demand in the region was also to blame.

"The problem was, the market allowed for a high level of risk—and we were living on [the assumption of] average water not critical water,"[2] notes Litchfield.

Deregulation also opened the door to new players in the industry—independent power producers that now compete with utilities, but aren't obligated to serve loads in the same way.

"Anyone can be a buyer and seller," says Litchfield. "It's a much more complex environment now."

2. Average water is the average amount of hydroelectricity generated under all water conditions; critical water is the guaranteed amount of hydroelectricity.

Integrating Wind and Water

State renewable resource mandates to address climate change concerns have driven the construction of wind farms in the region, with much of the output going to California to satisfy that state's ambitious renewable resource targets. Wind's intermittency, and the load management problem this presents, is a key issue.

"We've added 8,000 megawatts of wind to the system," notes Dick Adams, executive director, Pacific NW Utilities Conference Committee. "That's generation we can't control, which contributes to our growing need for flexibility."

Accommodating wind generation has been challenging because so much has come on line so quickly. While the region has been working to address integration problems, the latest controversy has been over the periods when the system generates more energy than it can use. Historically, the late spring and early summer months, when runoff is surging and demand is lower, were times when the hydrosystem can produce an oversupply of energy. With the addition of high winds, those periods have been increasing.

Aluminum companies, once a significant source of demand, are no longer a factor.

"The direct service industry load represented 3,000 megawatts of annual load—today, it's less than 500 megawatts," notes Hardy.

"It was a stable, round-the-clock load; if we had it now, we wouldn't have to worry about integrating wind generation."

At times last year, with an over abundance of power and nowhere to send it without paying negative market prices, Bonneville stopped its scheduled transmission for wind farms in its control area, substituting free hydropower instead. Citing laws limiting the amount of dissolved gas in the water, which can harm fish, the agency refrained from spilling water.

In response, wind generators filed a complaint with the Federal Energy Regulatory Commission, alleging that Bonneville was discriminating against them to protect its own public utility customers from costs they would otherwise bear from selling at negative market prices. FERC agreed, and the agency has since offered to reimburse some of the wind generators' lost revenue. But the debate continues over who should pay the costs of these episodes.

The New Regionalism

After almost a century since the first dams on the Columbia were built, the region is not the electric generation island it once was. It's now a regionally integrated system—with Canada and Southern California—and is perhaps more accurately described as a regional, plus others, system. The Bonneville Power Administration's role has changed as well.

According to Mike Katz, adjunct professor of economics at Portland State University, the upheaval caused by the failed nuclear projects also affected how utilities viewed the agency as a power provider.

"The assumption was that Bonneville would be the major provider for the region's load growth," says Katz. "But after the crisis, the agency's influence waned because utilities found they could buy other resources on their own." It was a shift that would continue with deregulation's influence.

"Today," notes Wright, "Bonneville more closely reflects the federal and national interests; it's no longer just a regional power system, it's not driven exclusively by Northwest interests."

In an energy landscape that has many different players, with competing interests and varying situations, does a regional planning approach still make sense? For Litchfield, the Council's plan, as it has traditionally been developed, may not be the best format anymore.

"We're not building power plants that take a long time to site and construct; the timeline is more on the order of three-to-five years." It may make more sense to focus on the key issues that utilities face today, which the Council did in its analysis on the oversupply issue, he says.

Adams would add the system's need for flexibility to the list. "30 years ago, we were concerned about keeping the lights on," he says. "Now, I think the focus is on how to shape energy into the timeframes when it's needed."

Natural gas-fired plants are another new reality. "We've added 10,000 megawatts of natural gas projects in the last decade, and we're looking to add another three or four projects in the next five years," says Adams. "Will we have the gas pipeline infrastructure necessary to service this electric generation?"

As for the notion of regionalism as an outmoded concept, it may be, in this era of greater fragmentation, all the more valuable to have some mechanism to step back and provide the broader perspective, the long-term view.

"What the Council does well," says Wright, "is identify the important issues we need to be thinking about. The Council can be the catalyst, the lightening rod to get the discussion going."

Describing both what has changed and what hasn't changed, Adams says, "I think 30 years ago there was a lot more regionalism, but my sense is there's a renewal of the collaborative spirit in the Northwest.

"Joint projects and efforts to understand what our mutual needs are and how to meet them are happening," he notes.

It's a quality that he finds unique to the Northwest. "The fact that we, as a region, have organizations like the Northwest Energy Efficiency Alliance and the Regional Technical Forum, which create a place for utilities to come together to achieve our efficiency goals—that's tangible proof of the cooperative spirit."

And in the end, we're still tied, immutably, insistently, to the river. Native American tribes understood: It's where we live; it's part of who we are. "The foundation is the river," says Adams. "Because of it, we will always find reasons to collaborate."

"The power system," adds Hemmingway, "creates a ground of common interest; it's hard for any one interest to go its own way—what happens in Montana affects Portland."

Which poses the question: Did we create the power system or did the power system create us? "That's a good question," laughs Wright, "I think the system built us more than the other way around."

In An Urban Corridor, Carving Out Space for Fish to Flourish

A race against time is under way in Oregon's Willamette Valley, the most densely populated part of the state, to recover four species of fish listed for protection under the federal Endangered Species Act: Oregon chub, bull trout, upper Willamette spring Chinook, and Willamette winter steelhead.

In 2008, the two federal agencies responsible for protecting these species – the U.S. Fish and Wildlife Service for Oregon chub and bull trout, and the National Marine Fisheries Service for salmon and steelhead – issued biological opinions on how to operate 13 federal dams and an associated system of fish hatcheries in the Willamette Basin without further jeopardizing the fish.

The U.S. Army Corps of Engineers built the dams and reservoirs on Willamette tributaries beginning in the late 1940s to generate electricity and reduce the flood risk to downstream cities, including Salem and Portland.

In 2011, the state of Oregon and the National Marine Fisheries Service completed a long-term recovery plan for the listed Chinook and steelhead. Much of the work for salmon and steelhead should help chub and bull trout, too.

"Recovering these fish will mean recovering ecosystems," said Joan Dukes, chair of the Northwest Power and Conservation Council and one of Oregon's two Council members. "The Willamette Valley is the most populated place in the state and growing, so getting landowners,

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Left, the Minto fish-collection facility is being rebuilt downstream of Detroit Dam to improve the collecting, holding, sorting, and transportation of spring Chinook salmon and steelhead in the North Santiam River. Right, areas of fish habitat are being reconnected along the mainstem of the Willamette River, here in the Harkins Lake area east of Monroe. Photos: U.S. Army Corps of Engineers, left, and the Greenbelt Land Trust, right.

watershed councils, and citizen groups involved as partners with state and federal agencies and tribes will be critical to a successful outcome."

At one time, more than 1 million salmon and steelhead returned to spawn in rivers and streams in the Upper Willamette Basin, and the runs remained large even into the early 20th century. In 1948, the Oregon Fish Commission reported that the Willamette spring Chinook run in the 1920s might have been as large as 275,000 fish. But overall, the counts have been in decline. The average annual count of adult fish for the last 10 years is 50,809, according to the Oregon Department of Fish and Wildlife. Today, wild upper Willamette spring Chinook are considered at a high risk of extinction, and the upper Willamette wild winter steelhead are at moderate risk of extinction.

Capturing adult fish as they return from the ocean to spawn and transporting them in tank trucks to historic spawning and rearing areas upstream of the dams has helped, but not enough to rebuild naturally spawning runs. And the hatcheries built to boost fish production "have significantly affected the genetic integrity of all Chinook populations," according to the biological opinion.

Under the biological opinions, the Council's fish and wildlife program, and the state recovery plan, work to help the fish has begun: New collection facilities are under construction by the U.S. Army Corps of Engineers below Detroit and Big Cliff dams on the North Fork Santiam, and similar construction projects are scheduled at Foster Dam, Dexter Dam, and Fall Creek Dam. Other structural enhancements to address water temperature and dam passage, as well as habitat restoration and hatchery management changes are included.

Reconnecting areas of fish habitat in the Willamette is the focus of an ongoing collaborative effort involving conservation groups, the state of Oregon, the Confederated Tribes of the Grande Ronde Reservation, Bonneville Power Administration, and others. Through fee-simple ownership or conservation easements with property owners, land adjacent to the river is being acquired and/or protected to provide resting and rearing areas for fish.

In all, more than 2,000 acres have been acquired or protected through permanent conservation easements or are being considered by the Oregon Watershed Enhancement Board and its partnership with the Meyer Memorial Trust, the Habitat Technical Team implementation of the biological opinions, and the Willamette Wildlife Mitigation Settlement agreement between Bonneville and the state of Oregon.

One area of focus is the Harkens Lake area in the mid-Willamette Valley east of Monroe. Historically, the area was a floodplain along the mainstem of the Willamette River and provided a key connection between the river and adjacent forests, wetlands, and prairies. In 2012, the Greenbelt Land Trust completed three conservation easements with landowners in the Harkens Lake area that will permantly protect nearly 400 acres of priority floodplain habitat. The lands protected under the easements are frequently inundated by the river and contain sandy, rocky soils that make it difficult for agricultural production. The landowners will now shift from working the ground for crops to working the ground to restore native floodplain forests.

"Our family has worked and lived on the Willamette River for five generations, which is why we take such pride in showing we can work around the river sustainably," said Harken's Lake landowner Gary Horning. "We know the health of our crops depends on the health of the river system. Our goal for restoration is to utilize important floodplain areas to improve water quality and protect the valuable farm land that our family farm depends on."

Planting floodplain forests will provide habitat for a number of wildlife species, including ospreys, bald eagles, black-tailed deer, kingfishers, and nuthatches. It will also help connect the river with numerous side channels, enhancing the rearing habitat for juvenile native salmon and steelhead.

"This important work can only be accomplished through partnerships with private landowners, non-profits, foundations, and state and federal agencies," said Michael Pope, Greenbelt Land Trust executive director. "We're facing a monumental task in fish recovery and riparian restoration in the Willamette Valley, and we must all work together. We were extremely pleased to be able to complete this transaction, and grateful to all our partners who work with us to protect and restore environmentally sensitive lands." ■

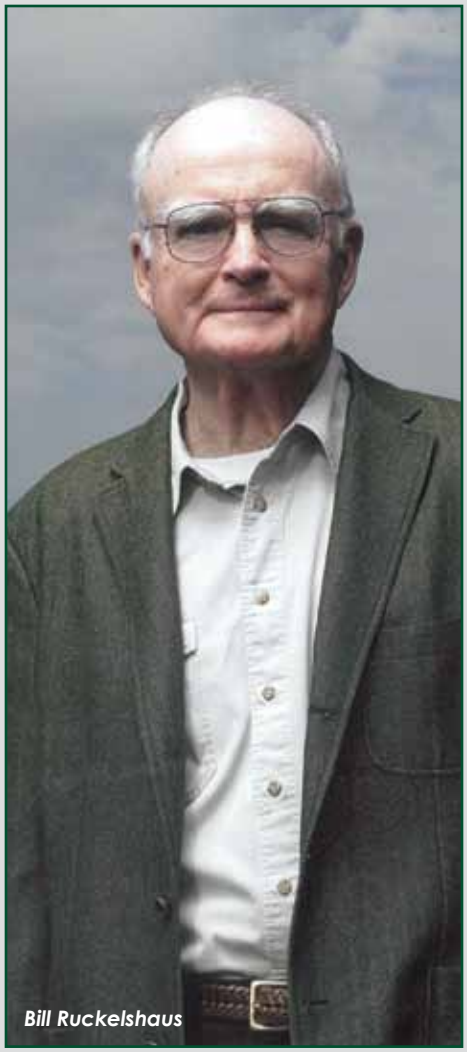
Notes From the Chair

The Northwest power system has changed dramatically over the years, and in this issue we explore the flashpoints of its evolution. You could call it a primer on today's system; on what's changed, and what hasn't changed.

In an interview with Bill Ruckelshaus, whose distinguished career in the federal government and in private industry gives him a deep understanding of the collaborative process, we hear his thoughts on what can bring people together. His work with citizens to clean up Puget Sound has been particularly encouraging, as he notes, "Once they decided to work together, the whole dynamic changed." That example of progress took time and was by no means easy, but it offers insight into the conditions that can foster understanding, and eventually, results.

Joan Dukes

Council Chair Joan Dukes


Bill Ruckelshaus

Northwest Q & A: Bill Ruckelshaus

Bill Ruckelshaus has served in the highest levels of the federal government, for major corporations involved with natural resources, and for public agencies protecting salmon.

Ruckelshaus was administrator of the U.S. Environmental Protection Agency twice, serving as the agency's first administrator when it was formed in 1970, and again in 1983. An Indiana native, Ruckelshaus also served as acting director of the Federal Bureau of Investigation, and deputy attorney general of the U.S. Department of Justice.

He has served as chairman and chief executive officer of Browning-Ferris Industries, as senior vice president for law and corporate affairs for the Weyerhaeuser Company, and as an attorney with the Seattle firm of Perkins Coie.

A Seattle resident since 1975, he was appointed to the National Oceanic and Atmospheric Administration's Science Advisory Board in 2003, and served on the Washington Salmon Recovery Board from 2005 to 2010. He was the co-chair of the Puget Sound Partnership, an agency that is organizing the cleanup of Puget Sound. Today, he is a strategic director at the Madrona Venture Group, a Seattle firm that invests in early-stage technology companies.

Q. The Puget Sound Partnership is an example of a multiple-entity approach to addressing environmental issues on a large geographic scale. What lessons from your work there are applicable to the Columbia River Basin ecosystem?

It's a little presumptuous of me to tell the Council exactly how we might help since you've been at it longer than we have, but the one lesson I think is overriding, and may well be applicable to the situation on the Columbia, is the need for a decisionmaking process that includes all of the stakeholders. Because if you don't use a process that develops decisions on the basis of collaboration, as well as push it toward some kind of end result, you don't get a durable solution.

When people gather together and collaboratively come up with solutions that address their interests, the result is a much more durable, workable solution than one achieved through the courts or the legislature or even the executive branch. Even if you get a resolution from the courts that looks final, it often isn't because it doesn't deal with all of the interests involved. That's why I think you need to use an effective collaborative process that includes all interests if you're going to make sustainable progress.

Q. In tackling tough public policy issues like protecting air, water, habitat, and multiple species of fish and wildlife, some of them at risk of extinction, what is the proper role of science in decisionmaking?

One of the things people realize when they collaborate is that what we're trying to do is make decisions in the face of scientific uncertainty. Scientific uncertainty is not an excuse for doing nothing; it can be an excuse for doing things that are tentative, for tracking progress and trying to learn something as a result of what you're doing.

It's important to the decisionmakers that scientists are at the table; to hear from them what the likelihood of success is. The traditional way is to ask scientists for their input and then lay it like a pizza before the decisionmakers and expect them to make sense out of it. But the scientists may not be looking at the right things. So being able to sit down together—scientists and policymakers—and learn and hear what the world looks like through the other guy's eyes is really important.

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"Scientific uncertainty is ***not an excuse*** for doing nothing..."

It was almost like *magic* to watch it happen.

> Once they decided to work together, the whole dynamic changed.

Q. You have vast experience with tough, high-profile environmental issues, from cleaning up Puget Sound to enforcing federal clean-air and clean-water regulations, to protecting salmon through your work with the state salmon recovery board and the Pacific Salmon Commission. You have said that it's easy to generate initial public interest in protecting beautiful places and helping iconic species, but that it's tougher to sustain those efforts in the long term. Why is that, and how can public interest be sustained?

I think public interest lags because progress is so slow. Using salmon as an example, it's taken us a long time to get here—150 years of development and man not paying enough attention to the impact of development on habitat and other concerns like overharvest, development of hatcheries, and hydropower. It takes time to make progress by reversing some of that, and it takes money, and people lose interest after awhile. That's because they don't see that while the deterioration was incremental, the improvement also is incremental. So they go on to other pursuits. The media loses interest, too. They sort of run out of stories—you can't keep repeating the same thing over and over. I don't think it's their fault; it's just the nature of the media. It's hard to sustain public interest.

People have often said to me that it takes so long to set up these collaborative processes that people lose heart in the developmental stage. But the developmental stage is really terribly important—you have to think about the end, and you have to get agreement from everyone that the effort will be truly collaborative. Putting the time in at the start helps avoid an outcome in which maybe 10 percent of the problems are solved and then another series of lawsuits follows.

Q. What are the keys to effective collaboration to address environmental and energy issues, and what are some examples of effective collaboration?

I have found it's relatively easy to get people to be concerned about the place they share with others, like Puget Sound or the Columbia River and its tributaries. But then, agreeing on what to do to improve that place is more difficult. There are multiple reasons for the salmon decline, and therefore it's possible for one interest—harvest, for example—to point the finger at some other cause, like habitat or hatcheries or hydropower. That is certainly true here in Puget Sound. There is constant finger-pointing at other causes. That complicates matters, and the truth is, we have to deal with all the causes in order to be successful. So let's get the facts as straight as we can and then deal with the uncertainties and come up with a set of recommendations that make sense for everyone.

I think it's possible to do that; government's role is to push that very hard and create the arena where people can come together to work out their differences. And tell people you will support the outcome as long as it's reasonable.

The most prominent example of success here in Puget Sound is the Nisqually River. About 23 years ago landowners, tribes, Weyerhaeuser, small towns up and down the watershed, farmers, and other interests were all getting ready to go to court to have another round of proceedings. A state legislator from there, Jennifer Belcher, introduced a bill to create the Nisqually River Council, which was passed overwhelmingly by the Legislature. There were seats at the table for all of the interest groups. After a couple of years of really harsh meetings with no progress, they finally decided working together was going to get them farther than continued fighting. That was particularly true when a farmer named Jim Wilcox shook hands with Billy Frank, the [Nisqually] tribal chairman. They decided to quit fighting. Because they were leaders in their two prominent groups, that caused the rest of them to sit down, as well. Over the next 20 years, they developed a comprehensive plan for the use of the water in the Nisqually for restoring the river. That plan is about 80 percent implemented today, and the reason is quite simple: The people affected by the necessary changes in the watershed all agreed on what needed to be done. They didn't all get their way, but by listening to one another and using professional facilitation to help them, they were able to harmonize their interests and then they all moved forward as a group to find funding for their plan. It was almost like magic to watch it happen. Once they decided to work together, the whole dynamic changed.

Another example is the Voluntary Stewardship Program. Through the center that bears my name at the University of Washington and Washington State University, we worked for three and a half years and came up with a way to manage farmland in a manner that is not destructive to salmon habitat and at the same time allows farmers to prosper. It was enacted into law two legislative sessions ago. The governor and the legislators who supported it were absolutely essential to its success.

One final point I would make is that there is sort of a ripeness rule here—sometimes disputes are not ripe for collaboration. The parties may need to become exhausted with the existing dispute-resolution process before they are willing to collaborate. When they finally decide to stop fighting, progress is possible. ■

Council Decisions

February 2012

The Council approved modifications to a weir used to collect adult steelhead to estimate escapement information in Joseph Creek, Oregon. The Nez Perce Tribe are the project sponsors.

March 2012

The Council approved a Columbia Basin Fish Accords project to restore fish and wildlife habitat along Beaver Creek, Mill Creek, and the Warm Springs River on the Warms Springs Reservation of Oregon. The project will be implemented by the Confederated Tribes of the Warm Springs Reservation.

May 2012

The Council approved funding to the Westland Irrigation District to repair the Stanfield Irrigation Diversion fish return pipe and restore the stream bank to protect private land along the river. The Council also approved a request from the Confederated Tribes of Siletz Indians to participate in recovery efforts in the Willamette Basin.

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