



NORTHWEST POWER AND CONSERVATION COUNCIL March 10-11, 2009

In Boise, one BPA representative brought the Council a gloomy financial prognosis while another cheered things up with a vibrant vision of a Smart Grid future buzzing with interactivity and energy savings. Even though fish numbers flew hard and fast all one afternoon, true conclusions were sketchy. And the Council released its high-level indicators for public comment. Next Meeting: April 14-16 in Skamania, Washington.

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FOR OPENERS

Cal Groen of the Idaho Fish and Game Department welcomed the Council, pointing out that Idaho is the only land-locked Western state with anadromous fish runs. Through our partnership with state and federal agencies, tribes, and private companies, we are making good progress on our anadromous fish runs, he said. This is our ninth consecutive chinook salmon season and the 30th consecutive year for our steelhead fishery, Groen noted. He said Idaho officials were about to hold a press conference announcing the release of 969 sockeye to spawn in Redfish Lake. We only had 16 in the 1990s, Groen said, adding "we're putting the redd back in Redfish Lake."

THE AGENDA

Delwiche Does Not Paint a Pretty Picture



The confluence of poor water conditions, declining natural gas prices, and fixed costs is creating significant rate pressure on us, Greg Delwiche of BPA told the Council. The January to July runoff forecast is 20 percent below normal – "we're well, well below average on runoff," he said.

Natural gas prices have declined to \$4.50/MMBtu since last July, Delwiche

reported. In the West, natural gas markets set the price at which energy trades, and that affects our secondary power sales revenues, he said. So low runoff has reduced our inventory, and the prices at which we can sell what we have are projected to be lower, according to Delwiche.

We expect even lower secondary power sales revenues in 2010 and 2011, he said. Our FY 2009 power net revenue estimates have gone negative, and we now project a \$272 million shortfall, compared to our start-of-the-year revenue target, Delwiche explained. Our initial 2010 power rate proposal is for a 9.4 increase, he noted.

BPA is looking at a long list of cost-saving actions, such as deferring discretionary maintenance, Delwiche said. There are "a number of dials we can turn," including using reserves differently, reducing internal costs, and considering changes in Treasury payment timing, he told the Council.

We will be doing internal belt-tightening, but that will have only a limited effect on our rate structure since so many of our costs are fixed, Delwiche continued. We are reducing hiring, travel, discretionary training, and purchasing where we can, but those actions won't have a significant effect on our ultimate rate increase, he said.

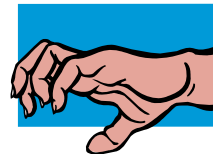
Our financial reserves are healthy now, but that won't help us do away with a rate increase, Delwiche stated. We aren't in a predicament like we were in 2001-2002 during the West Coast energy crisis, but if we have multiple years of poor water and low gas prices, it could hurt us, he said.

We are looking at a rate increase of at least 9 percent, and it couldn't come at a worse time, given the region's economy, Delwiche concluded.

Melinda Eden asked whether not getting \$272 million in secondary revenues really constitutes a "deficit." The minus \$272 million is a projection of our net revenue at the end of the year, and secondary revenues are a big factor in that figure, as are other factors such as loads being down and less energy being used, replied Delwiche. The lower our reserves, the likely higher the power rate, he added.

Dick Wallace asked how the extension of BPA's borrowing authority in the American Recovery and Reinvestment Act would affect fish and wildlife (F&W) spending. There are some items in the F&W program that we can capitalize, Delwiche replied. For example, we have used our borrowing authority to capitalize land acquisitions for wildlife habitat and building hatcheries, he said.

Will Google Grab the Smart Grid?



Terry Oliver, chief technology innovation officer for BPA, told the Council the Smart Grid is one of 62 projects his office has under way. The funding for it this year is \$10 million, he said. Oliver called the Smart Grid "a global phenomenon right now," noting efforts under way by the U.S. Dept. of Energy (DOE), Electric Power Research Institute, and European Union.

We see a new kind of energy network coming at us in the future, he said. Smart Grid is rich in information technology and features high-speed, real-time, two-way communications, as well as lots of advanced sensors, in-home energy controls, automated home energy use, and distributed computing technology, Oliver explained.

These technologies combine to improve efficiency, reliability, and the safety of power

delivery and use, he said. Smart Grid involves the entire energy pathway from power source to home and all the points in between, according to Oliver. The increased efficiency of the Smart Grid is expected to save consumers money and help reduce CO₂ emissions, he added. One driver of Smart Grid development, Oliver said, is the fact that while peaking capacity costs utilities a lot of money, that infrastructure is typically used for less than 400 hours each year.

The end-user is the centerpiece of the Smart Grid, he stated. There have been discussions about whether the end-user's interaction through the Smart Grid should be with a utility versus a third-party provider, Oliver noted. Some customers have said "give Google the data on my energy use and let them analyze it and put it on my home page," he told the Council.

What About Microsoft?

BPA wants to enable a smarter, more efficient regional power delivery system, and we think the Northwest can be a forerunner in Smart Grid technology, Oliver continued. We have companies here that are already players in the Smart Grid universe, he noted. And "you can bet Microsoft is paying attention to the Smart Grid," Oliver said.

BPA partnered with the Pacific Northwest National Laboratory (PNNL) and DOE to conduct a GridWise demonstration project in the service territory of Clallam PUD on the Olympic Peninsula, he noted. Clallam PUD, Mason PUDs 1 and 3, BPA, PacifiCorp, and PGE all contributed to the project, which had some impressive results, according to Oliver.

He described the project, which involved sending price signals to customers' thermostats and giving them a choice of operating their homes to maximize savings or

comfort. The project involved 100 homes, and testimony about its results has been delivered to Congress and to FERC, Oliver said.

BPA also cooperated with PNNL on a Grid Friendly Appliance Project that involved putting a chip in customers' water heaters that can shut off electricity use for a short period of time, he explained. BPA has worked with Whirlpool on a project involving clothes dryers, Oliver said. Whirlpool didn't want the appliance to shut off so the company developed a way to turn off the resistance coil in a dryer for a short time while the dryer keeps operating, he stated.

BPA has launched a new Smart Grid demonstration project that will expand the scope and scale of the Olympic Peninsula project, Oliver said. The project will use a pricing and signaling system from the end-user to the system operator, he explained. We will work with utilities to "smarten up" distributor feeder lines and substations, Oliver said. There are a number of places where this approach could work, he noted, mentioning Snohomish PUD, Seattle City Light, Puget Sound Energy, and PGE as examples.

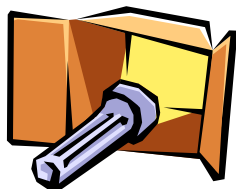
Did you quantify the results of the Olympic Peninsula project? Council Chair Bill Booth asked. PNNL wrote two reports, and I'll send them to you, replied Oliver. Tom Karier noted how valuable a Smart Grid system could be in the future when the Northwest has 15 to 20 percent wind generation and garages are full of plug-in electric vehicles. How do you determine the value of the Smart Grid system 10 to 15 years from now? he asked.

There is a challenge in quantifying this, replied Oliver. It's the same type of issue

there was when the Worldwide Web was created, he said. At the time, you couldn't imagine you'd create Amazon as a result of what you were developing, Oliver noted. We'll be able to capture reasonably foreseeable benefits, he said. The demonstration project will last four to five years, and we will refine the possible benefits as we learn more, Oliver stated.

A lot of this depends on the price of electricity, said Wallace. Will there be price signals that would make the Smart Grid economical in the Northwest? he asked. We think the essential part of this is the ability to communicate vertically through the system, replied Oliver.

If you nail the communications infrastructure right, then we will be able to layer more things on it, he said. The point of the demonstration project is to work with retail utilities to see what the right scale is and what the appropriate order is for establishing the Smart Grid in this region, Oliver concluded. It's the wave of the future, for sure, commented Booth.



Power Plan Should Illuminate Policy Choices

Staffer Terry Morlan updated the Council on the development of the Sixth Power Plan, explaining what chapters have been drafted and what else has been done. The plan assumes that economic growth will be slower for the region, he noted. Morlan said natural gas and oil prices are expected to remain volatile, and that fuel price forecast ranges are wider, reflecting greater uncertainty about future fuel prices.

Demand is projected to grow at 1.6 percent, or about 380 aMW per year, he reported. But

conservation and revised electricity prices could reduce that to 1.4 percent, Morlan said. Peak loads are expected to grow faster than energy, especially summer peaks, he noted.

The achievable technical potential for conservation we see for this plan is about 10 percent higher than the Fifth Power Plan, Morlan stated. The residential and commercial sectors hold three-quarters of the potential, and there is increased potential in the industrial sector and through conservation voltage reduction, he added. About 2,900 MW of demand-response potential is included in our analysis for the plan, Morlan said.

With respect to hydro generation, he said the plan assumes the Biological Opinion (BiOp) mainstem operations are in place. In the previous plan, we assumed a loss of 450 aMW of energy capability over the planning period, but we are thinking of using 300 aMW as an assumption for this plan, Morlan said, adding it is an issue on which the staff would like some guidance. We have looked at water conditions using a 70-year simulation, from 1929 to 1998, and there have been questions about using that approach in light of the effects of climate change, he noted.

We have assessed "a big pile of technologies," and most of the near-term generating potential seems to lie in natural gas, Columbia Basin wind, and small dispersed renewable opportunities, Morlan continued. We used to look at the energy potential of resources, but in this plan, we also have to look at the capacity potential so we can do things like integrate wind, he said.

The Council tries to anticipate and plan for contingencies, and it seems to me that with climate change, policy does drive costs, Wallace stated. The Council should consider

setting forth some principles that could help inform policy choices about climate change at the state and federal levels, particularly with respect to the implications for the hydro system, he said.

Our models can look at different levels of carbon costs, and from those, there are different things we can infer about policy choices, and we'll bring those to you, responded Morlan. We are getting close to the point where we can request a model run of specific things, noted Jim Yost. We will try to tease out what could happen so that policymakers can understand "if you make that decision, here is the price implication," he said.

As the BiOp becomes firm, we have a legal responsibility to implement it, and that results in limitations on the hydro system, Yost stated. Using the model, staff can assess what additional flexibility there is in the hydro system that can be used to integrate wind, he said. We are getting close to being able to identify what a carbon tax would mean and what state renewable portfolio standards (RPS) would mean, Yost noted. We are getting closer, and it's been a long time coming, he added.

This seems to be "a pretty well-greased cookbook" you are assembling, Booth told the staff.



What's New on Electricity Prices?

Staffer Maury Galbraith presented information on the power plan's

electricity price forecasts, noting that under "medium" fuel price and CO₂ price assumptions, the plan projects wholesale power prices at the Mid-Columbia hub will

increase from \$45/MWh in 2010 to \$85/MWh in 2030. He noted that Mid-Columbia wholesale power prices averaged \$56/MWh in 2008.

State RPS requirements are also a big driver of the price forecasts, Galbraith said. Our model assumes that California will achieve 25 percent of its retail load from renewable energy sources by 2025, he stated. Oregon and Washington are both well on their way to meeting RPS requirements, Galbraith reported, adding that Montana is also well-positioned to meet its targets.

He said incremental RPS resources primarily provide energy and that the Council's model tends to add resources with high capacity value to meet reserve margin targets. The model likes combined-cycle natural gas turbines because they have energy value as well as capacity value, Galbraith noted.

Booth said if the model relies on gas turbines to meet future needs, it would be very sensitive to changes in natural gas prices, and Galbraith said that was true. So your assumption must be that there is plenty of gas and that it will be relatively inexpensive over time, Booth stated. The price today is below \$4/MMBtu, replied Morlan. We have a recession effect, but there has also been a tremendous expansion in the supply of natural gas from non-traditional sources, and LNG imports are an important long-term factor, he said.

There's a lot of uncertainty, and that's why our high-price scenario goes up to \$12/MMBtu, Morlan noted. We have been getting comments on our demand forecast that say maybe our natural gas prices are too high, but I don't feel uncomfortable with our projections, he said.

With respect to CO₂ prices, Galbraith said staff is assuming that carbon regulation starts in 2012 at \$8 per ton and then goes up to \$50 per ton by the end of the planning period. The sensitivity of wholesale power costs to CO₂ costs is similar to what it is for natural gas costs, Morlan noted.

Booth asked if the plan would pick a carbon price, and Morlan replied that the portfolio model looks at a whole range of CO₂ futures, as well as other factors, and tries to capture risk. Don't you need to pick a CO₂ price to forecast electricity prices? Booth asked. We'll bring you more information on the uncertainties related to the price forecast and on the analytical strategy for developing the plan as we go forward, Morlan said.

Yost suggested the plan could look at a zero-carbon tax, a price of \$25 per ton, and a price of \$100 per ton and follow the analysis through to see how wholesale electricity prices and residential electricity prices are affected. We should also do the same thing with forcing renewable energy into the resource mix and look at the impacts on wholesale and retail power prices, he stated. That information would help people understand what you get when you make different policy choices, Yost added.

We all want to see scenarios using different CO₂ costs and what impacts would result, said Karier. When we see the results, we may decide CO₂ costs should be much higher or much lower, he added. We need to make this part of the plan as understandable to the public as we can, Wallace stated.

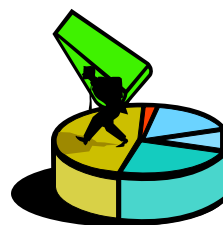
Now You Can Rate the High-Level Indicators

Karier reported on the development of high-level indicators to communicate the progress of the Council's F&W program



to the region's governors and Congress. He said a draft list of 17 indicators has been put together and that now is a good time to get public comments on them.

We are considering a 30 to 40-day comment period so a final revised draft of the indicators can be brought to the Council for approval at the May meeting, Karier stated. Bruce Measure urged release of the indicators as soon as possible. Wallace agreed, saying "it's a good opportunity to get public input and then we can decide where to go from there." The Council agreed to release the draft indicators for public review.



Demand Forecast Tidbit

Morlan reported that the Council received comments on the demand forecast issue paper from six different entities, "mostly utilities." The comments had two major themes, he said. The first involves the effects of the recession on demand and fuel prices, Morlan noted.

The second is that our peak load demand forecast looked pretty low to them, he said. We have been working with PNUCC and BPA to address that issue, Morlan noted. We haven't yet decided what to do about the effects of the recession on the forecast, but we are giving it more thought, he added.



A drift in a Sea of Salmon Statistics

The Council convened a panel to provide the latest information on adult salmon runs, ocean conditions, and mainstem fish passage research and improvements. **Pete Hassemer of the Idaho Dept. of Fish and Game (IDFG)** reported on 10 years of Columbia River salmon and steelhead returns, from 1999 to 2008, and how the fish are counted. For each species, the counts of adult fish crossing Bonneville Dam provide the first accounting of run strength each year, he noted. His charts of fall chinook returns showed high numbers in 2002, 2003, and 2004. Hassemer said the large returns were the result of favorable environmental conditions. He pointed out that returns of fall chinook again took a notable upturn in 2008.

For upriver summer steelhead, Hassemer said his data show returns at slightly more than 300,000 from 2004 through 2008. Returns of wild steelhead have been trending slightly upward in the last two years, he reported. Hassemer also pointed out high 2008 returns of sockeye salmon. For spring chinook, he said the pattern of returns over 10 years is similar to the other species, with large returns in the early 2000s, followed by stable but lower numbers, with some increases in 2008.

John Ferguson of NOAA Fisheries Northwest Fisheries Science Center (NFSC) reported on ocean conditions, salmon, and climate change, noting that the coastal ecosystem that salmon enter is dynamic, with species increasing and decreasing in abundance over long time scales as the ecosystem gets better or worse. Variability is inherent in populations that use the Northeast Pacific Ocean, he said.

The productivity of the California Current Ecosystem, which smolts enter when leaving the Columbia River and coastal rivers, changes rapidly due to shifts in large-scale forces reflected in the Pacific Decadal Oscillation (PDO), according to Ferguson. The marine survival of salmon responds to changes in ocean conditions, and good conditions for salmon are ocean currents with cold water from the north that bring food and nutrients, he explained.

Ferguson said his agency has been sampling the ocean from 1998 to 2008 to develop a set of indicators of ocean productivity and juvenile salmonid survival. We put together an ocean condition index with 11 indicators to forecast salmon trends, and what we've found is that starting in 2006, the productivity of the ocean ecosystem has improved, along with adult returns, he noted.

"We saw excellent ocean conditions in 2008 it was unbelievable the ocean was chockfull of food," Ferguson stated. All the ocean indicators were the best we've seen, he said.

Based on our index, we expect to see good adult returns in 2009 and 2010, Ferguson said. The PDO is still strongly negative so the ocean is cold "the pump is primed and ready to go," and that's good news for this year and for 2010 and 2011, he stated.

Looking to the future, Ferguson said ocean variability appears to be increasing and that the ocean is going to get warmer. The Intergovernmental Panel on Climate Change's models predict the Northeast Pacific Ocean will be warming throughout this century, which is a negative change in terms of ocean productivity and the marine survival of salmon, he explained.

Ferguson recommended that more effort be spent to integrate actions to maintain and

recover salmon populations in freshwater with what's going on in the ocean. For example, he said hatchery production could be scaled to reflect marine productivity, and hatchery and transportation release timing could be adjusted to match marine productivity. Ferguson noted there will be a meeting in May with fishery managers on the *U.S. v. Oregon* Technical Advisory Committee to consider whether NOAA Fisheries' ocean indicators can be used to improve pre-season escapement forecasts for the Columbia River.

Bill Tweit of the Washington Dept. of Fish and Wildlife (WDFW) gave a presentation on historical Columbia River salmon and steelhead returns, as well as 2009 forecasts. He said the situation this year, based on jack counts and ocean conditions, looks good, with an overall forecast for upriver spring chinook returns of 298,900.

We are predicting another strong run for summer chinook this year, according to Tweit. The forecast is for 70,700 returns, which would be the fourth highest run since the 1960s, he noted. The sockeye forecast is 183,800, and 351,800 for upriver summer steelhead, with 89,900 of those wild fish, Tweit said.

The 2009 forecast for all fall chinook above and below Bonneville Dam is 510,900, with a forecast for Upriver Bright fall chinook of 259,900, he continued. This will be the second year in a row we'll be able to put an abundance-driven framework in place, Tweit noted. The forecast for Bonneville Pool hatchery fall chinook is 59,300, he said.

Tweit noted that there are some spring chinook fisheries through the end of April and that WDFW is just starting to plan for summer and fall season fisheries. He said "this could be a ground-breaking year for us"

because it is the first time we've proposed using selective fisheries for fall chinook in the ocean and lower river.

Paul Kline of the IDFG provided an update on recent trends in salmon and steelhead abundance and the outlook for 2009 returns. He said adult returns of salmon and steelhead on the Snake River hit their highest level in 2001, saw a steady decline through 2006 and 2007, but since then, the numbers have been attempting to "climb out of that rut."

Kline reported "good numbers" for adult returns of both wild and hatchery fall chinook to Lower Granite Dam in 2008, adding "this is quite a turnaround." Wild fall chinook returns were 7,339 in 2008 compared to 2,016 in 2007, his chart showed.

IDFG got the first returns from its captive broodstock program for sockeye in 1997, and last year, the returns of sockeye to Lower Granite went way up, compared to previous years, Kline noted. The BiOp and the Columbia River Fish Accords both support expanding the Snake River sockeye captive broodstock program, he said.

Idaho is working with BPA and the Council to acquire hatchery space so the smolt program can expand to between 500,000 and 1 million fish, according to Kline. That many smolts could produce 5,000 or more sockeye salmon returns annually, he added.

Kline said the 2009 forecast for spring and summer chinook returns are 106,000 for hatchery fish and 23,000 for wild fish. The steelhead forecast is 135,831 for hatchery fish and 18,300 for wild fish, he reported. For sockeye, I predict at least 722 adults will return to Lower Granite Dam, and I'm being conservative, Kline stated.

"My message is: if you were waiting to buy an Idaho fishing license with a salmon tag, don't wait," he concluded.

Rock Peters of the Corps of Engineers

kicked off a presentation on recent research results from the Corps' Anadromous Fish Evaluation Program (AFEP), which aims to improve fish passage at federal mainstem dams on the Lower Snake and Columbia rivers. AFEP is funded at about \$80 million to \$90 million annually, he said.

With the new BiOp, the Corps is committed to higher dam passage performance standards, including 96 percent average or better survival for spring migrants and 93 percent average for summer migrants, Peters stated. We have scheduled commitments to additional surface collectors and are making improvements to juvenile bypass systems, he reported. Transportation is the main focus of our program when the science shows it's best for fish, Peters said. We are also improving water management for flow augmentation and maintaining and improving adult passage systems, he noted.

We anticipate spending \$500 million over the next 10 years for dam improvements and estuary work, Peters said. Is that reimbursed by BPA? Karier asked. Yes, at about 80 percent for the power system, replied Peters.

Marvin Shuttters of the Corps explained recent studies that looked at how seasonal adjustments in juvenile fish transportation affected Snake River spring chinook and steelhead. We found transport smolt-to-adult return (SARs) to be highest during the May 2008 BiOp period, he said. We are planning to use transportation or timed hatchery releases to optimize SARs and continue to evaluate transport timing, according to Shuttters.

He said AFEP efforts at the mainstem dams have focused on surface passage strategies, spillway improvements, juvenile bypass improvements, and turbine passage. Shuttters noted that the Corps is beginning biological studies for the removable spillway weir installed at Little Goose Dam this year.

Mike Langeslay of the Corps reported that a study on the use of surface weirs to improve passage at John Day Dam found higher fish survivals. Turbine entrainment was reduced by nearly 50 percent over previous years, he noted. Next year, Langeslay said the Corps would install structures to reduce gull predation on fish at the dam and continue testing to see if the positive results are repeatable.

He described studies at Bonneville Dam of spillway operational improvements that helped increase fish survival and use of a behavioral guidance system to move more fish into the corner collector. We did increase yearling chinook corner collector efficiency by 10 percent, but our results for steelhead and subyearling chinook were the same as 2004 and 2005, according to Langeslay.

He prefaced an update on Corps studies of avian predation and the agency's efforts to reduce tern habitat in the estuary by saying "smolts are consumed by the millions." Shuttters discussed studies in the Mid-Columbia to determine if management actions are warranted for inland Caspian terns and cormorants.

John Williams of NOAA Fisheries NFSC reported on the survival of migrating juvenile salmonids in the Snake and Columbia rivers, explaining how the scientists estimate survival of PIT-tagged juvenile fish. In 2008, a high flow and spill year, juvenile fish survival through individual reaches averaged

91 percent for yearling chinook and 92 percent for steelhead, he said. Survival through the entire federal hydropower system was 46.1 percent for yearling chinook and 47.8 percent for steelhead, according to Williams.

Survival through the final reach, from John Day to Bonneville Dam, was poor in 2008, he said. High spill rates, coupled with removable spillway weirs at several Snake River dams and a delayed start to transportation, resulted in a greater number of non-PIT-tagged smolts in the Snake River in 2007 and 2008, Williams noted. As a result, fewer PIT-tagged steelhead were eaten by birds near the confluence of the Snake and Columbia rivers in those years, resulting in increased estimated survival through the Snake River, he reported.

Williams said the 46.1 percent and 47.8 percent survival numbers for the entire system reflect all the measures that have been taken, including spill, transport, and surface bypass. They are a measure of how well all the Council's programs have done on an annual basis, he said. Can you parse out how the different factors account for the results? Wallace asked. That is always difficult to measure when you use tagged fish as a surrogate, Williams stated.

Booth asked how to improve estimates of survival related to transport and spill. In 2009 and 2010, we'll have high returns of fish that went through the system with high spill, so we'll be able to learn more in the next two years, replied Williams.

Geoff McMichael of Pacific Northwest National Laboratory described a study of juvenile salmonid survival downstream of the Federal Columbia River Power System, which was sponsored by the Corps. The focus here is below Bonneville Dam to the

ocean, he noted. The study used a prototype transmitter that weighs 0.43 grams, and we are developing an even smaller transmitter, McMichael said.

Preliminary 2008 results show survival estimates for yearling chinook at an average of 0.78 percent and for subyearling chinook, an average of 0.83 percent, he reported. The largest loss appeared to occur in the lower 35 kilometers of the river for yearlings, and in the lower 50 km for the subyearlings, according to McMichael.

For yearling chinook, the travel rate decreases as the fish move downstream and that coincides with the area where the loss is highest, he said. Have you been able to determine whether it is better to move faster through the estuary? Karier asked. When fish travel more slowly, they die at a higher rate because the predation risk is a function of time, McMichael replied.

What Does It All Mean?

What are the implications of all this research? Where can we use this? Wallace asked. "There's the big question," replied Peters. He noted that it took a long time to get the tags developed so scientists could look at the estuary component of survival. Our research has given us an idea of what's going on in the various sections of the river, at least below Bonneville Dam, but the question is "what can you do about it?" Peters said.

For the rest of the river, we've made major improvements at the dams, he noted. We know there are avian and piscivorous predators, and we've learned that a major factor in all this is ocean survival, Peters stated.

I've heard that ocean conditions have a lot to do with the improving runs above Bonneville Dam, but not with the runs doing poorly that originate below Bonneville, Eden said. Am I right? she asked. The Willamette and lower river stocks are behaving differently with respect to ocean conditions than the other stocks are, and we'll have to look at that, replied Ferguson.

As to Council member Wallace's question about implications, I think that integrating freshwater actions with what we know about the estuary and the ocean and analytically tying it all together across the whole life cycle is important, Ferguson said. We have started to do that to take a life-cycle approach and see where the responsible components are, he added. Instead of focusing on analyzing a single variable, like spill, flow, and temperature, we are now building enough data that we can start to do multivariable analysis, Ferguson stated.

Williams noted that the COMPASS model for the BiOp can take into account new data for transported and non-transported fish. But there are way more factors affecting the fish than you can put in the model, he said. There are huge swings in adult returns over just a few years, Williams stated. We can throw a lot of things in the model and get correlations, but those aren't necessarily causations, he said.

For the most part, it was a pretty encouraging afternoon, Booth summed up.

END NOTES

Wind Forum Has Been Revived. The Council renewed the charter for the Wind Integration Forum which was scheduled to expire in April. Staff said the forum has more work to do to help resolve wind integration issues in the region.

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Council 2009 Calendar

April 14-16	Skamania, WA
May 12-14	Walla Walla, WA
June 9-11	Whitefish, MT
July 14-16	Portland, OR
August 11-13	Spokane, WA
September 9-10	Oregon
October 7-9	Ketchum, ID
November 12-13	Teleconference
December 8-10	Portland, OR