Council Meeting
May 16 & 17, 2017
Boise, Idaho

Tuesday, May 16

Council Chair Henry Lorenzen called the meeting to order at 1:31 p.m. All members were in attendance.

Reports from Fish and Wildlife, Power and Public Affairs committee chairs

Fish and Wildlife Committee

Committee Chair and Council Member Jennifer Anders reported on seven items:

1. The committee has decided to rethink the methodology of the Cost Savings Workgroup in light of the recent work they have been doing, as it doesn't match the original charter. They will look at that over the next couple of months. Also, the committee will use the Cost Savings Workgroup for three projects related to new sturgeon work, which results from the RFI issued earlier this year. The projects will be brought before the full Council next month.
2. The committee heard recommendation on a draft research plan, which is the product of Member Karier. Patty O'Toole, staff program implementation manager, has worked with Council staff to make comments and edits to the draft plan, which was unanimously endorsed by the Committee. The full Council will look at it next month.
3. A Regional Coordination Forum took place in Boise last Monday, attended by 37 people. Managers discussed the next fish and wildlife amendment process, how future reviews should be done, the work of the Cost Savings Workgroup, and uncertainties on BPA's future financial situation and other processes. The next meeting will be around the Council's September meeting in Spokane.
4. There was a recommendation on umbrella projects and an update on wildlife review. The committee agreed to continue the implementation of six umbrella projects, which was a follow-up to the Council's geographic review in 2013. The 2017 working budgets for the six projects total nearly $16 million in expense funding. The Council will get specifics and will make recommendations for these projects next month
5. Lynne Palensky provided an update on the ongoing Wildlife Review. The Council held

a two-day meeting where sponsors presented to the ISRP. An ISRP report just came out as well. Sponsors will reply to the report. A final recommendation to the committee is expected in August

6. Dan Isaak of the U.S. Forest Service discussed research relating to warming trends in regional rivers and streams, and the implications for cold-water species. Climate velocity is what's relevant to cold-water fish. The U.S. Forest Service's modeling is public and online, and can inform policymakers about where and where not to invest money.
7. The committee heard a presentation on scheduling for the next Fish and Wildlife Program, and Power Plan.

Power Committee

Committee Chair and Council Member Tom Karier reported on five items:

1. There was a discussion on the Eighth Power Plan schedule, and about why is it a six-year timeline instead of five-year. More discussion will be had about the merits of both.
2. The committee had a first look at the adequacy assessment. In 2021-22, we're right on the margin of adequacy, Member Karier said. He explained that we try to have it under five percent adequacy, and we're looking in the neighborhood of six percent.
3. There was an update on PacifiCorp's IRP, which reflects a lot of changes in the next 10–20 years. PacifiCorp plans to meet 88 percent of its growth with energy efficiency, and plans to retire coal plant capacity in the range of 750 MW by 2025, and 3,600 MW by 2036. It is replacing the coal with energy efficiency and a lot of renewables. There will be 1,100 MW of new wind coming online by 2020. Plus, PacifiCorp is repowering existing wind sites — 950 mw of existing wind will be renovated with new turbines and rotors to increase their efficiency by more than 30 percent. There also are a number of investments in demand response that will come later in the period. There will be a significant reduction in coal emissions, dropping 20-21 percent over the next 10–20 years.
4. There was a tutorial on natural gas and electricity market prices, which are inputs into the Council's models. It is part of our exercise in understanding nuts and bolts of power planning, Member Karier said.
5. Last, there was a description of system adequacy with a focus on an analysis of the Council's liability. It looked at where we think we're at most risk of having enough power, and what are the conditions that lead to that. Events in the winter are much larger in magnitude, but are less frequent. Summer events are of a smaller magnitude and more frequent. It looks at how to build the right resources to meet those demands.

Public Affairs Committee

Committee Chair and Council Member Jim Yost said the committee didn't meet last month, but it is planning to meeting today at the close of business.

1. Report on oral arguments in Ninth Circuit on 2014 Fish and Wildlife Program challenge:

John Shurts, staff general counsel, said it's important to publicly acknowledge that the Council argued the merits of the 2014 Fish and Wildlife Program before the Ninth Circuit on May 11. The argument was the Northwest Resource Information Center (NRIC) versus the Council —

a challenge to the 2014 Fish and Wildlife Program. This is the second time in 36 years that the Council's Fish and Wildlife Program has gotten to an oral argument before the Ninth Circuit, Shurts said, so it was an important event. The panel of presiding judges included M. Margaret McKeown, Carlos T. Bea and N. Randy Smith, representing was a nice geographic spread, he said. Each side had 20 minutes to present. Shurts acknowledged the interveners present supporting the Council, including the assistant attorneys general from Montana and Idaho, attorneys from the Kootenai and Spokane tribes, members of BPA's general counsel's office, attorneys from the Northwest River Partners and the Power Council. Former Council Member Phil Rockefeller also attended. A recording of the oral argument is on the web. It was live streamed as well. "I've learned never predict what the court will do after oral argument," Shurts said.

There were a number of issues briefed. One was whether the Council confused the Power Act with other considerations, such as the Endangered Species Act. This panel wasn't interested in that issue, Shurts said. They understood the difference and that the Council knew the difference. Instead, they focused on what does the Power Act require of the Council when it does its Fish and Wildlife Program, and how well did the Council meet the substantive standards and procedures? Is there something the Council should be doing that it's not, and how well did the Council explain what it was doing? They still have to go through issues and briefs and write an opinion. Sometimes an opinion is produced quickly, but the usual is from six months to another year and a half. It will be some time before we get an opinion. But we will get guidance in time for the next Fish and Wildlife Program, he said.

Member Karier remarked that it seems like the court's four-year schedule works with the Council's five-year schedule for doing plans.

Shurts said the last time we had a decision from the Ninth Circuit, it was a remand that came out. It was at the exact moment when we were going to start another program, so we just rolled the guidance from the court into the program.

1. **Briefing on stand-alone vs. integrated capacity value for resources**

The Council was briefed by John Fazio, staff senior power system analyst, on how the storage in the Pacific Northwest's hydropower system can add capacity value to renewables, energy-efficiency measures and other resources.

Member Karier and Fazio have worked on this study for months. The issue is, how does the storage capability of the hydropower system enhance the capacity value of resources in the Northwest? In particular, they looked at renewables and energy efficiency. First, Fazio defined stand-alone capacity versus integrated capacity. Capacity is the ability to produce power. Power is a rate of producing energy, which is in megawatt units.

- Standalone capacity is the percentage of nameplate capacity that can be counted on to offset our peak needs, with no interaction with the hydro system.
- Integrated capacity is the percentage of nameplate capacity that can be counted on when allowed to interact with hydro storage. It's the overall capacity of the system.

Fazio discussed running a 200-simulations study. He showed a peak-hour curtailment

probability curve. Using that curve, he estimates how much capacity is needed to lower the loss-of-load probability (LOLP) to a desired value. Fazio said that with a five percent LOLP, we don't want more than five percent of the simulations to have problems. So what's needed to get it down to an acceptable level? By adding 500 MW of capacity, he goes from nine percent LOLP to five percent.

Fazio then discussed a study running 6,160 simulations. He took the highest curtailment hour, sorted them and the raw LOLP is 9.5 percent. Fazio outlined the impact of adding 930 MW energy efficiency on capacity, which drops the LOLP to six percent.

He said that by turning on another resource during the light-load hours, they could save hydro to use in the peak hours. That can increase the peaking capability of the hydro system. For example, adding 930 MW of energy efficiency, reduced the MW need by 713 MW in the standalone example. In the integrated example, it reduced the MW need by 1,184 MW.

Using a standalone energy-efficiency capacity contribution, the standalone capacity value was 77 percent. Integrated was 127 percent, which is gain of 50 percent.

"If they add a 100 MW combustion turbine to the system, it's like adding a 128 MW capacity resource, because of its integration with the hydroelectric system," Fazio said. "All these values were incorporated into the Regional Portfolio Model to help the Council develop its resource strategy." This is to ensure that the potential build-out of resources will deliver an adequate supply.

Council Member Tim Baker said he's not clear how 930 MW of added energy efficiency in standalone, only reduces it by 713 MW. Fazio, replied that you have to go back to the peak-hour curtailment duration curve. The drop is the timing of when it happens. "You don't have 930 MW of energy efficiency savings every hour, it's shaped," he said.

Council Member Bill Booth said, "When we talk about our five-percent risk of curtailment, if you're looking at a temporary emergency, hot or cold, I can see how this is a valuable asset to the hydro system. If you're in a crisis, what you're assuming is you have excess capacity somewhere to generate that power during low demand periods. If you're in a weather crisis, and it's cloudy, for you to ramp up, you'd have to initiate some excess capacity in a coal or gas-fired plant. Don't you assume they're already running?" "Not all the time," Fazio replied. "When it's available, you do that. A lot of times it isn't the physical limitations, it's the price."

This helps us in how to best use hydro storage, Fazio said. If we're going to have a curtailment the next day, prices should be high enough the night before so we'll run all our resources the night before.

Member Yost asked if there was an assumption that hydro operations wouldn't interfere with the saving-water operation. Fazio replied that we assume that within the constraints of the BiOp and the constraints of the hydroelectric system. We don't assume the storage is there to use whenever we want. The amount we can use at any time changes. All those things have been taking into account in this analysis, he said.

Member Yost said, "Then what about your example of 880 MW… is that energy efficiency location dependent?" Fazio said the analysis has two locations: east and west. Either the

energy efficiency is in the east or the west. It's not more specific than that. The 930 mw of energy efficiency capacity is just an estimate. It has a shape.

Fazio said the reservoirs can only store 15 percent of the water going through the Columbia River system. That's a small amount of storage relative to the volume. Still you can generate 2,000–2,500 aMW of energy. It is a large battery. There are things that inhibit it, such as minimum turbine flows at night.

Member Anders asked what about adjustments to spill operations? Fazio replied that spill generally would be during the hour of need. Some is at night, while some is 24 hours.

Ben Kujala, power division director, added that any time you're spilling, you might be taking water that could be used for storage.

Member Lorenzen said that one of the challenges of this analysis is that, at some point, you've used up the capacity of the system to provide that capacity value… at what point do you get one for one or less than that because the hydro system's storage is used up? Fazio said we have a lot of wind, which uses up a lot of storage. For the Seventh Plan, we did incremental and individual. It definitely goes down.

Member Lorenzen said to gauge the loss due to spill, it might be easier to calculate the foregone energy or the energy purchased on the market. But trying to put a value on capacity would be difficult, but it's very real. How do we come to grips with being able to advise the region on the alternatives and economic impacts of options being considered? Fazio replied that it's hard to do on the back of an envelope, which is why we use the model to simulate it.

Member Lorenzen asked, "You can't put a number on the capacity issue?" Fazio replied, "We can calculate it with those constraints." Kujala said they use the one in the Fish and Wildlife program as their starting point.

Fazio discussed to a solar study of standalone vs. integrated capacity. He said they operate hydro to minimize spikes and shortages, and to flatten it out. By adding solar, we affect a lot of different resources including thermal, he said.

Member Karier said that he and John have been studying the value of hydro storage for a few months. "It's a phenomenal system: You can turn it on and off quickly to integrate other resources, it's carbon free and it's like a system of batteries," he said. "But it's complicated because it's not always available. For example, there is very little storage capacity in the spring. Other times, there's a lot of storage capacity. What we've tried to do it to get into the detail of capacity, measure it and understand the value."

In addition, you can overwhelm that storage capacity if you have a lot of renewables all at once, Member Karier added. With Gorge wind, you have thousands of additional megawatts that overwhelm the capacity of that minute of that day. It can only store a little water and then it's used up. There's still potential for solar, but there's not as much of solar in the Northwest. What about solar on the West Coast? What about Montana wind? That wouldn't overwhelm the system now because there's not a lot of it. What about spill? The Canadian treaty? With these tools, we can estimate these more accurately than ever before.

This assumes these resources have access to hydro storage, but that's not the case such as with Montana wind, Fazio added.

There's an article in the Electricity Journal coauthored by Member Karier and Fazio.

Member Booth asked about trying to put a value on the capacity. Kujala replied that they've been exploring that, but there's not a capacity market yet, so there's not an easily discovered price for it.

2. Briefing on highlights from Marine Fisheries Advisory Committee meeting

Tony Grover, director of the Fish and Wildlife Division, said the Columbia Basin Partnership Task Force (organized under the Marine Fisheries Advisory Committee) met in Portland on April 18 and 19, in order to make recommendations on common goals and to find a shared path on salmon recovery. The group settled on some operating principles. It worked to define the work plan for the next two years, discussed a shared vision and introduced a pilot study concept. It's a very diverse group, he said. Four Council Members participated. The Council made a decision to merge its goals and objectives process with this Columbia Basin Partnership process. Grover said his statement provides another element of transparency for those who can't make the meetings.

The group is driven by the need to recommend goals to the region. Its scope is:

- Listed salmon, nonlisted salmon and steelhead in the Columbia Basin, including some extirpated populations, above and below Bonneville Dam; in the upper, middle, and lower basins; and in the estuary.
- Ocean, mainstem and tributary fisheries that harvest Columbia Basin stocks, including commercial, recreational and tribal fisheries.
- Multiple geographic scales – basinwide, sub-basin, evolutionarily significant unit (ESU), and major populations groups (MPG).
- Multiple temporal scales (e.g.,100-, 50- or 25-year goals).
- All impacts across salmon and steelhead lifecycle (e.g., habitat (main stem, tributary, estuary, and ocean), harvest, hatchery and hydro).
- Ecological functions and conditions, and current and future habitat capacity.

Member Norman said the National Fisheries Service did well selecting the participants, representing all the interests. The right people are at the table. There's an expectation of some pilot studies and some examples of qualitative goals, fish populations and ESUs. What do particular goals mean for different fish populations? How are those connected with actions to achieve those objectives? As schedules get lined out, the intent is to get at those conversations and how to link those population objectives.

Grover said they're seeing some innovative projects being rolled out.

Member Anders said, "The schedule that is on the table is extremely aggressive, daunting actually. But I'm encouraged that everyone seems to realize that and is committed to working constructively together. But we haven't really looked at the tough issues yet. What can habitat sustain? Harvest and hatcheries also are tough issues." NOAA's done a good job picking

skilled facilitators. She was introduced to NOAA's model, the salmon slider. They can turn these dials for the hatchery components and see the impacts of setting different targets. It's an interesting and scary process, but I applaud NOAA for going after it, she said.

3. Update on details of Public Utility Regulatory Policies Act (PURPA) in Idaho

Kristine Raper, a commissioner with the Idaho Public Utilities Commission, discussed the challenges for utilities that are forced to bring on more Public Utility Regulatory Policies Act (PURPA) contracts.

She added that, with a nearly empty FERC, it's anyone's best guess where we're headed.

Raper said Congress passed PURPA in 1978 in response to the national energy crisis. The intent is to assist small power producers, small renewables and cogeneration to get into the market. Power producers were seen as resistant to letting smaller outfits get into the market. It set out a mandatory purchase obligation. If a qualifying facility (QF) goes to the utility and wants them to buy the power, the utility has to consider it. "Under PURPA and FERC, the utility is supposed to pay the QF a price it would otherwise pay for energy but for the QF having come on line," she said. "That's the definition of avoided costs."

FERC regulates how the contracts come together. They give the solar QFs the option on whether they'll purchase the energy at the time it's delivered to the utility or upon contracting. We've had contracts between two to 35 years, she said. The element of pricing, at the point of delivery or at the time of contracting, has been what our commission has struggled with.

Raper said they have had 20-year contracts with the price determined when it was brought on. Nobody else gets the benefit of knowing what the price will be for that length of time, she said.

"Idaho's PUC history shows we've tried to implement intent of PURPA," Raper said. "We have a lot of run of river hydro, geothermal, small wind and solar, cogeneration, but what we began to see in 2010 is wind coming in and disaggregating."

She explained that there have been projects where 100 MW projects have been broken into 20 MW separate facilities. Together, they wouldn't qualify under PURPA to get the avoided cost rate and the 20-year price. So they disaggregate the project … such as Cedar Creek project … to get the 20-year rate. "We believe that's against the intent of PURPA," she said. "Utilities asked us to react to the disaggregation to look at what we could do to allow legitimate projects through, but stop the big corporations. It's Shell Oil and BP — they aren't the little guys."

The Idaho PUC through extensive litigation, looking to implement rules that would not allow disaggregation. Oregon has a list of things that have to to be complied with. But people work around that system as well.

So for Idaho to manage these projects coming in, it changed the calculation of avoided costs for those projects. Federal law requires that in projects 100 kW or less, the state offers a standard rate for the project. Idaho had a 10 aMW rate for its projects, which the disaggregated projects tried to obtain. It ultimately ends up higher because the published rate is based on a surrogate resource, which is natural gas. To level the playing field, we reduced

wind and solar to the 100 kW threshold for a standard rate contract, she said. That meant it wind and solar have to go through an IRP mechanism.

When the commission issued its order, multiple projects took it to FERC. “We’re infamous for being the first state commission taken to court by FERC,” Raper said. But FERC’s declaratory orders aren’t enforceable unless the FERC or the QF takes it to District Court and tries to enforce it.

“QFs have no money behind them at this point,” she said. “It’s settled. FERC got mad and took us to court. Our position was vindicated in that settlement. It’s more complex, but they asked us to settle. So we did.”

Around 2015, solar has value to utilities. They look at what the QF can produce, time of day and avoided cost to the utility. They figured that solar comes back at a pretty high rate. There was a time when it came in at 135 per MW. Now $30 per MW in a competitively bid market than what IRP methodology is rolling out in calculated avoided cost rates.

In 2015, the utilities came to the commission and said they’re being overwhelmed. Idaho Power said that on a low-peak day, they only needed 1,100 MW to satisfy their customers. Their QF facilities alone were generating 1,300-1,400 MW that has to be purchased, and the costs are passed through 100 percent to the ratepayer.

It’s about the avoided cost being set for a long-time period, she said. As the time runs, 8-10-12 years, the excess is exacerbated. It’s out of synch with what the avoided costs are. The Idaho Commission issued an order to set the contract at two years instead of 20. “In doing that, we really modify nothing else,” Raper said. “As long as PURPA exists, the mandatory purchase option exists. They renegotiate the energy rate every two years, based on what the avoided costs to the utilities is.”

Avoided cost of energy is the only thing that changes every two years.

Member Lorenzen asked, “When you go to a two-year contract, do developers say they can’t finance a project based on a short-term contract when the cost is fixed? Raper replied, “Yes, but I’ve seen no evidence of that.”

The QFs have no obligation, she said. When a utility brings on resources, it has to be proven that it’s used and useful. But a QF doesn’t have to show us their books. QFs say they can’t finance it, but have they given us their books? No, they have not.

Member Karier asked how the commission came up with two years. Raper said it seems like they couldn’t recover in two years, but they never saw that they have an obligation to make projects financeable. “We tried hard not to pull out an arbitrary number; we chose it based on the IRP filings,” she said. Utilities have to do it. QFs aren’t accounted for in those prior IRPs. Utilities don’t know they exist until the contract is submitted to the utility. The way the QF projects come through tend to be lumpy, sometimes in 100-MW chunks.

She said they needed a timeframe to reassess what’s on the utility’s system so the avoided costs are an accurate reflection of what that next resource would be.

Member Lorenzen said he represented Oregon Trail Electric Coop when PURPA came about. Oregon was struggling, trying to determine the avoided costs of the retail electric utility. They found that if you relied on wholesale power costs, cogeneration wasn't profitable. The said they should have a surrogate avoided costs. It looked at Idaho Power's Valmy coal plant. The Coop ended up with 20-year contract for a 7 MW facility. The avoided costs from 1983 – 2003 ended up being $175 per MWh. That was quite a struggle for that utility with 20,000 members. It cost them $120 million over the life of the plant. "It's a wonderful idea, but gone sideways due to the inability to calculate avoided costs," he said. "I compliment you on grabbing this by the horns and watching out for your ratepayers."

Raper said, "In an answer to the two-year question, we chose contract length because we don't have a lot of tools to adjust that system so we don't get overwhelmed," she said. "We could have continued to allow 20-year contracts, with a modifier to recalculate the energy cost every two years (but they got the 20 years). Our strict read of the FERC regulations is you can't do that. If the QF determines they want avoided costs calculated when it is entered into, it's for the length of the contract. I'm very impressed that FERC held it."

Raper added that there's a new slate of commissioners coming in, and they don't have the background.

Member Baker sought clarification: "You can get 20 years wind or solar under 100 MW, but every two years the rate changes based on the IRP? Why is there the distinction for some types of QFs where they get the 10-MW window for a 20-year contract? Raper said the projects coming in under standard rate, before 2010, were initially the true PURPA projects. The run of river projects don't make a huge contribution, they aren't inundating the utility. That's the distinction. They're the true, small projects.

Member Baker asked, how often do you set your rates? Standard offer rates are recalculated every year, she replied. They are based on the surrogate resource, which is natural gas.

Member Baker asked, "Does the value of carbon free resources fit into this picture?" The value of a carbon-free resource was contemplated by Congress when they set the PURPA rules for renewables and cogeneration, she replied.

Member Lorenzen said PURPA helped send his kids to college. "It helped me get appointed," Raper said. Member Lorenzen said the issue speaks to the complexity of the system.

4. Update on Idaho Power solar projects

Michael Darrington, energy contracts leader, Idaho Power Company, told Council Members he appreciated Raper's comments and wanted to provide an overview of some of these issues. He showed Idaho Power's service area, mentioned the company's 101 years of operations and said the company relies on a foundation of hydro, which provides 40–50 percent of its generation.

The company forecasts it is in generation surplus until at least 2025. Its first capacity deficit indicated in its 2015 IRP will be in July 2025. Idaho Power's 2017 IRP is currently under development.

Darrington discussed some PURPA projects under contract. Some of the earliest projects were under 30 year terms and are now coming up for renewal. Other developments are wind, solar, biomass, wood waste, landfill gas.

Darrington outlined the historical and future PURPA costs compared to Mid-C market and pointed out disparities.

He listed Idaho Power's nonutility renewable projects:

- PURPA under contract and online: 1,115 MW
- PURPA under contract and not yet online: 21 MW
- Non-PURPA under contract and online: 136 MW

Idaho Power's all-time system peak is 3,400 MW. Its minimum load is 1,100 MW.

Darrington said Idaho Power has 14 projects totaling 209 MW. Most are located in southwestern Idaho and eastern Oregon. He reminded Members that solar is an intermittent resource and it can present operational challenges when it comes off. He discussed Shoshone Falls. With an abundance of hydro, Idaho Power has experienced several curtailments due to operational issues. In that event, the priority is to take dispatchable resources offline, and then PURPA projects are the last to be taken offline.

Member Yost asked what time in the afternoon do the solar projects drop off? It varies, Darrington answered. It depends on weather and they just don't have enough data to make that assessment yet. Most projects came online in the last two-three months.

Member Karier said Idaho Power has a surplus. "Are we running into impacts from California?" he asked. Darrington replied that it does make it more complicated. We've seen prices go to -$15, due to a lot of intermittent resources.

Member Lorenzen asked how many acres would a 10-MW solar facility require? Darrington replied the facility needs enough room to handle the tracking systems and avoid shading. It's about five-to-seven acres per megawatt.

Member Anders asked about the lifespan of a solar project. Darrington said all of the projects came under contract when 20-year contracts were in effect. There are warranties of 25 years, but degradation occurs.

Member Yost said, "You integrate solar and wind, and that adds up to more than the load you had this spring. Do you limit your thermal, then reduce hydro, then limit the solar or wind? Darrington replied they operate when they can (when the wind is blowing or the sun is shining). It's the amount generating in a given hour. If there's no load for generation, and we're running into reliability constraints, we'll back off thermal or any resource operating to its threshold. The last to be backed-off is PURPA.

Member Yost asked, "Do you have must-run generation?" Darrington said, yes, there are requirements on various resource types to ramp up and ramp down to balance the system.

Member Lorenzen adjourned the meeting at 3:40 pm

Wednesday, May 17

Member Lorenzen called the meeting called to order at 9:02 a.m.

5. Update on Bonneville Dam Sea lion tour

California sea lion populations are booming, reported Council Member Guy Norman, who recently took a tour of the sea lion predation operation facilities at Bonneville Dam. He said sea lion populations once were as low as 10,000 in the 1950s and are now as high as 300,000. They used to feed at the mouth of the Columbia, but now they've moved upriver and favor dining on salmon. There are 32 populations of ESA-listed spring Chinook harmed by sea lions. NOAA research has shown that 18-45 percent of upriver spring Chinook are lost before reaching Bonneville Dam. This is after accounting for harvest and other losses. In addition, Steller sea lions, which also feed on white sturgeon, have become a threat to listed fish at Bonneville.

Since 2008, states have trapped and removed 166 California sea lions that were documented "repeat offenders." To remove a sea lion is cumbersome. They have to record the activity of individual sea lions and put them on lists that qualify them for removal. A bill has been introduced to grant states and tribal managers more flexibility in addressing predatory sea lions.

The *Endangered Salmon and Fisheries Predation Prevention Act H.R. 2083* was introduced by Congresswoman Herrera-Beutler (R-WA) and Congressman Kurt Schrader (D-OR) last April. It's about the fifth time a bill like this has been introduced, Member Norman said. In 2014, the full house passed the bill, but the senate didn't take it up.

The legislation would allow managers to address problems at locations other than Bonneville Dam, change the criteria for removal, no longer require repeat presence and salmon consumption, and would expand annual removal limits.

Member Booth is visiting Washington, D.C., next week to talk with Congressman Simpson and others.

Member Booth appreciated the tour. There was a nice turnout of Members, staff and Congressional staff. It helped a lot. It helps that we have bipartisan support on the bill in the house. Historically, the problem is getting consideration in the Senate. But there are new concerns and statistics. NOAA's research from Dr. Rubin has been accepted. Now 20 percent of that spring run is disappearing. In the past, it was visual kills at the dam that ran in the 5–10 percent rage. Member Norman has been a leader on the technical side.

Member Norman said a lot of agencies and tribes are working together on this issue. The Corps of Engineers has been providing the facilities, the National Fisheries Service has produced a quick turnover on permits, and states and tribes have worked together on functional implementation. In terms of all the actions that have taken place to reduce impacts (hydro, harvest, habitat or hatchery), with this particular impact on adult salmon to try and spawn, has the capacity to negate those investments, particularly if it grows. That's the

message to Congress that this needs to be addressed. It's an expensive problem and hopefully it will get their attention. All the different interests in the basin can support it.

Council Chair Lorenzen also attended the tour.

6. Update on Energy Imbalance Market

Tess Park, vice president of power supply for Idaho Power, discussed her company's decision to sign an agreement with California Independent System Operator (CAISO) to participate in the western Energy Imbalance Market (EIM) starting April 2018. "Many said Idaho would never go into the California market, looking back at the energy crisis," she said. She said that Idaho Power spent a lot of time working with Northwest entities trying to develop a Northwest market. But the transmission issue "kept rearing its ugly head."

Initially, an automated, bilateral market was proposed, Park said. But there were transmission obstacles. Inside the BPA footprint, you didn't have to pay a transmission charge. Outside the BPA footprint, you had to pay wheeling to get into it and a transmission charge. "With a $30 resource and add $5-6 in transmission, your resource is not going to get dispatched," Park said. "So after a time, we realized we weren't going to get there."

She said Idaho Power did benefit and cost studies. The benefits were between $4-5 million a year, and the costs were $500,000 a year. "We felt the benefits were conservative," she said. "We limited dispatch of our hydro resources to a 20/20 case. The reality is we have more flexibility with hydro than that. So it didn't show what the true benefits would be. Also didn't include anything for reserves." She said they have 700 MW of wind and 300 MW of solar. She said they thought wind was an integration challenge until solar. There were two periods in an hour when solar went from 200 MW to zero in five minutes. But they still have that need on our system. In a market, they can bid in and the market can cover that imbalance with the least-cost resource. Park said Idaho Power balances within their own footprint.

Idaho isn't the only entity joining. "Portland General Electric goes this fall and Salt River Project announced they're joining," Park said. "It's a lot more resources and a lot more diversity. East-side peaks are different than west. We peak in July due to irrigation, whereas others peak in August and September. It should result in lower prices for everyone."

Park shared a slide on what EIM is:

1. An EIM is a real-time market that economically dispatches low cost power to balance fluctuations in generation and load.

2. An EIM efficiently resolves imbalances in real-time through an automated five minute dispatch across multiple balancing areas.

3. Generation resources are bid into the market on a voluntary basis. There's no requirement for "must offer." Now working with market monitoring on how to set up bid and cost basis for the hydro system to protect that resource.

Member Karier said, "I was thinking about hydro being different because of constraints. Can you alter it day to day as conditions change?" Park replied that Idaho Power is one of the first

utilities with hydro based on reservoirs. CAISO is willing to work with them and Idaho Power will have a strategy on how they'll bid. It will allow them to change the bid price on an hourly basis. We'll be able to protect that resource, she said.

4. It provides forward-looking transmission congestion management. There's an economic penalty to not sticking to your schedule. So they've gotten more accurate. It looks at congestion constraints prior to dispatching resources and adds a charge.

Member Bradbury asked for the definition of "loop flow." Park said the main transmission is really a big donut. In the summertime, due to a lot of resources, the transmission may be scheduled on the I-5 corridor, but goes around, taking the path of least resistance.

Member Anders asked if the loop-flow problem is fixed at the CAISO level. Park answered that it's at the process of scheduling where it's corrected. You get a market charge when you're not meeting your schedule.

Member Booth asked if the transmission infrastructure is in place to make this work by 2020-2021. Park answered that there are a lot of times when transmission is not fully utilized. If you have a transmission path rated at 1,200 MW, and you only have 400 MW on it, the market can use that capacity. Today there's enough to support the operation of the EIM, but as more intermittent resources are built, more transmission will be needed.

What changes with an EIM from a resource perspective? We still do our IRP, we still use our 18 month risk management process. We still use monthly balancing, day-ahead scheduling and hour-ahead bilateral deals. The piece that changes is intra-hour balancing.

Additional software and processes changes will be required to give to the market operator. Idaho Power is in the process of gaining those tools. They'll need people to deal with settlements as well. It's something they haven't done before.

The process is a continual information exchange; it starts at T -75. They go though a process of updating. The updates continue until T -20 and then dispatch occurs. They use an outage management system if something changes and the resource isn't available. It's a very detailed process, Park said.

Member Booth asked, Does this address the issue that if the sun goes away for five minutes?" Park replied, yes, because if the sun goes away, the market sees there's an imbalance and it will dispatch the lowest-cost resource.

Member Karier: do you have to forecast that in advance? Park said we'll submit a forecast in advance and the California resource will submit their forecast. We can take theirs or ours. That's what the imbalance will be based on.

Karier: I didn't understand the difference between 15 and 5 minutes. Park said, "You bid in for a 15 minute period and it dispatches every five minutes."

Member Booth: I assume BPA is doing the same? BPA isn't participating in EIM. There are legal and regulatory issues about why. Elliot did announce six month ago that they are going

to set up tools and processes so at some point they could participate in a market. Member Booth remarked that they must have the same problem with wind and solar. Park said they do. “They’d be in better shape if they do. I think in 10 years there will be a western market.”

Member Yost said can you give me a common language on what infrastructure we’re talking about when we say “getting ready.” Park said it required them to update metering. They have it on an interchange perspective. From a software perspective, they need a bid-to-bill system. It allows them to send all this information to the market. It allows them to do the settlements. They selected OATI as the vendor. And they need an outage management system. It allows us to change the parameters for resources and availability. They selected Versify as the vendor. Then you need a system model that goes to CAISO to model the system. There are staffing changes and you have to train people. What existing personnel are doing will change.

Member Yost asked how much money and how long will it take? Park said it will cost $11 million, which is mostly tools. $1.5 million participation fee. Some O&M changes for settlement expenses and software expenses.

They start this fall for their April “go live” date.

CAISO organizes EIM integration into six tracks:

Track 1 – Project management
Track 2 – Registration and regulatory
Track 3 – Resource modeling – transmission, generation, SCADA
Track 4 – Software systems and Integration – outages, forecasting, scheduling, dispatch, metering and settlements
Track 5 – Metering and settlements – physical upgrades, data submission and charge validation
Track 6 – Training and readiness

Member Lorenzen said, “You mentioned that this allows you to have fewer resources available to balance your system. M y understanding is, with EIM, each participant has to bring its own resources to bear to handle their own balancing, but EIM allowed balancing to occur in a more efficient way. Park replied, because we’re by ourselves, what we’re carrying exceeds what the market requires us to have. We have 700 MW of wind. I’ve seen wind go from 700-to-200 MW in 15 min. You can’t carry 700 MW continuously. Without these tools, and allowing the diversity of the resources across the footprint, it’s cost-prohibitive. You have to have sufficient resources to meet your needs. But you don't have to be able to cover 160 MW that will go away in a five-minute period.

Member Karier said, we heard the presentation on renewables from Idaho Power. What percent of your average energy load is renewables? Is it 10 percent? 20 percent? Park replied that over the year, it’s less than that. The average capacity factor for wind is about 28 percent. Solar, because it’s only available 12 hours a day, will have a lower capacity factor. On peak, 51 percent of it will be there, according to some studies, but we haven’t seen that.

Member Karier said states’ renewable portfolio standards are based on percentage. I wondered if you did calculation. Park answered, “We haven’t. On Idaho Power’s website, under the energy resources tab, you can see what resources were used for any given hour for

the last three days."

Member Karier asked, "Do you ever sell wind and solar into California and get a premium price?" Park said, they sell those credits into California and tie it to a resource. But with intermittent, they don't exist. "Buyers want a firm energy product, so it's tied to a firm resource," she said. "So typically, we'll sell out of our coal or hydro resources."

Member Lorenzen remarked that he thinks people overlook the challenges of renewable integration. It's helpful to learn what you have to do to keep the lights on. Park said, if you're going to say 100 percent renewable, you have to have hydro in the mix, or you won't make that happen.

Park offered Members a tour of Idaho Power's operation center.

7. Briefing from Natural Resources Conservation Service and NOAA on recent weather compared to past years

Ron Abramovich, water supply specialist, NRCS;; and Troy Lindquist, senior hydrologist, National Weather Service, Boise.

Ben Kujala introduced the panel, citing the importance of having a historic record of weather for informing loads and river flows. Plus, the recent weather has been unusual.

Jay Breidenbach, warning coordination meteorologist for the National Weather Service in Boise, presented a set of challenges across the region. Snow is a major part of the weather and hydro. He talked about their organization's vision for the weather service: protection of life and property. He mentioned the severe weather experienced that week in Boise, in particular the raging river. They launched a new satellite to help improve lead time and accuracy for high-impact events. Forecasts impact power company decisions and emergency management.

He outlined the structure of the weather service and where its offices are located. He reviewed extreme weather events in the Pacific Northwest in 2016-17. Twenty events have caused a billion dollars in damage. The Pioneer Wild Fire last summer cost $100 million, which was the second-most expensive in the nation's history.

Between December 16 and January 17, there was severe snow and snow load. There was so much snow it crushed buildings. Is this something we could have predicted? I don't know if I could have predicted the extreme, he said. But ocean temperatures were below normal last fall. That impacts the jet stream.

Member Karier asked if it was cooler than normal. Yes, it actually set record lows, Breidenbach said. They are anomalies.

Breidenbach reviewed Columbia Basin precipitation, snow accumulation and melt. Unique thing is that you can see how snow is a resource in the Northwest, he said.

Discussed water year temperature and precipitation in Boise. It was up to 13.28 inches between October and today. There has been 39.1 inches of snow — normally there's about 20 inches.

Member Anders asked a question about local impacts. There's an extensive amount of cloud seeding in Southern Oregon, does that have an impact? Breidenbach said it wouldn't impact the larger weather patterns, which are more influenced by El Niño.

Troy Lindquist, senior hydrologist for the National Weather Service in Boise, discussed fall precipitation. After months of warm and dry summer, autumn precipitation sets the stage for what our snowfall is going to look like. He said we had 200 to 400 percent of normal precipitation. Unfortunately, southeastern Oregon continued in drought. Overall, it was excellent for recharging soil moisture after the summer months.

The typical October jetstream goes into British Columbia. In 2016, there was a shift south. The direction of these storms can play a role. Had tropical cyclone influence too, bringing lots of moisture. It has been a fantastic start to the water year, he said.

Water supply forecasts weren't much more than normal. In early February, we saw low-elevation snow come off, and mid-winter flooding resulted. He discussed spring flooding in Idaho due to high-elevation snow coming off the mountains.

Discussed Columbia River volume forecasts at The Dalles, and forecast volumes for the Columbia Basin.

Member Norman asked it appears that March, April and May's actual runoff and forecasts are way above normal — are we getting to normal in June? Yes, Lindquist replied.

Member Karier said if we're hoping the flows will slow to help Chinook, there's not a lot of hope. Yes, Lindquist replied, there's a lot of water moving through the system.

Yost asked if he could convert acre feet to cfs?

Ron Abramovich, water supply specialist, Natural Resources Conservation Service (NRCS), said Hell's Canyon was releasing 75,000,and the Salmon River 80,000.

"So at Lower Granite we're in the neighborhood of 200,000 cfs," Member Yost said. I'll bet you're right, Abramovich said, and we're not done melting yet.

Abramovich said that 22 percent of the Boise River Basin is snow covered. They don't like to close the gates until they get to 10 percent, so there's a lot of snow still to melt.

He reviewed weather maps of water temperatures. Last year was a strong El Niño. Then there was La Niña that built up on the equator. When you go from a strong El Niño, there's a lot of energy to get rid of in the oceans and atmosphere. He discussed historical impacts of years following an El Niño year, which tend to be above average.

Looking at worldwide conditions, Siberian Russia's snowfall could have a big impact on the U.S. winter.

October through April precipitation was discussed. There has been record precipitation in some areas, with 45 atmospheric river events that made landfall on the West Coast. It makes for a pretty intense winter.

Washington, Oregon and Montana: There are no flood or drought concerns for the moment.

Oregon rivers have been above average, with the best water supply outlook since 2011. Many reservoirs were spilling at the end of April and that hasn't happened since 2006. Since February, monthly stream flow has been well above average throughout Oregon. The Columbia River was flooding in places. There's an adequate irrigation supply this year.

He looked water levels at Teton River, Big Lost River, Big Wood Basin, Boise Basin and Mores Creek Summit.

Member Lorenzen asked about the Blob. Has that dissipated? Did it contribute to storms coming on shore? Abramovich replied, yes, it dissipated. It turned into a cold spot on the Pacific. Member Lorenzen said he read that the warm body might have submerged. Abramovich said he didn't know, if they did, they would know more about the weather.

Member Karier said that Idaho Power seeds the clouds. Did he know what projects? Abramovich said it's happens in Payette Basin and it's been going on since the early 2000s. Also in the Ketchum Valley and the Snake.

Member Norman asked about the process for cloud seeding. Abramovich said they have a ground-based generator that shoots a flame of silver iodine into the atmosphere when the conditions are right: 22 degrees Fahrenheit. Also there are a couple of planes on call, flying right into the storms. They turn on jet flares in key locations. The crews learned where the targets are. A lot of science goes into it.

9. Council Business

Council decision to release the draft Fiscal Year 2019 budget and Fiscal Year 2018 revisions for public comment

Sharon Ossmann, administrative division director, said May is the time of year when the Council releases a budget for a 35- to 45-day comment period. The revised 2018 budget is at the same level we proposed last year, she said. There is some shift in line items, but the bottom line is the same. The 2019 budget is the same proposed last year. They are in the cap contained in the Act and are in the level of the agreement with Bonneville. If approved for release for public comment, the schedule is to take oral comments at the June meeting in Corvallis, with a goal of adopting it in July. Ossman will summarize and bring any comments received to the Council.

Motion to Release the Draft Fiscal Year 2019 Budget and Fiscal Year 2018 Revisions for Public Comment

Member Booth moved that the Council release the draft Fiscal Year 2019 Budget and Fiscal Year 2018 revisions for public comment.

Member Norman second.

Member Yost said, “We’re spending way too much.”

Carries without objection.

Approval of minutes:

Northwest Power and Conservation Council Motion to Approve the Minutes of the April 11-12, 2017, Council Meeting

Member Booth moved that the Council approve for the signature of the Vice-Chair the minutes of the April 11-12, 2017, Council Meeting held in Missoula, Montana.
Member Anders second.

Carries without objection.

Public Comment:

Scott Levy, from Bluefish.org, said at the Council meeting last August 10, he presented how the Lower Snake River Dams aren’t economic. He said Member Booth talked with him about how we also should also look at how the Snake is involved in voltage stability and contingency for the system. Levy said he did research and said the Snake is not used for automated generation control (AGC) during the fish migration window. For voltage regulation, you can remove turbine blades and turn them into synchronous condensers. They balance voltage, he said. For renewable resource integration, the system is great — dams are a battery. The CRS process looking at what would happen if removal occurred. BPA’s system modelers look at nameplate capacity and what each could provide. Each dam is keeping 10 percent for itself. He discussed an event that shut down a nuclear facility and what the dams contributed. He handed out a comment to Members that he had submitted. He said it didn’t make it to Congress and it will be brought up with the Council’s attorney.

Member Booth said a lot of times, Scott has come, but the statistic that bothers me is talking about the average megawatt production over a year or three-to-four-year period. “One document you handed out said 350 MW,” he said. “It turns out that the way they system is configured, the Snake River Dams provide one quarter of the system’s resources for renewables. He further talked about a three-day cold snap in February 2014. At night, the dams ramped down to nearly zero, while the dams ramped up to 1,500 aMW during the day. The nameplate capacity is 3,000 MW.” He will provide Scott with information and the sourcing.

Levy said the goal of bluefish.org is to provide a dialogue concerning the plight of Idaho salmon. He said he’s trying to provide decision-makers good information.

Member Lorenzen adjourned the meeting at 11:27 a.m.

Approved June _____, 2017

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Vice-Chair