Northwest **Power** and **Conservation** Council

Council Meeting
February 13 & 14, 2018
Portland, Oregon

Minutes

All Council Members were in attendance except Tim Baker, who joined by phone.

Tuesday, February 13

Chair Jim Yost brought the meeting to order at 1:30 p.m. He began by welcoming the new Oregon Council Members and asked them to provide a brief background.

Council Member Ted Ferrioli said he left the Oregon State Legislature after serving in the Senate for 20 years. He was elected from District 30, which includes 11 counties and 34,000 square miles, which includes portions of Marion and Clackamas Counties, and stretches to the Idaho/Nevada border. During his tenure, he said he has represented more incorporated cities, public utilities, jackrabbits, sagebrush and salmon than about anyone else. The district has parts of the Colombia and Snake Rivers. Member Ferrioli was the Senate Republican leader from 2005 forward. He authored the Oregon plan for the restoration and recovery of salmon and steelhead. He has spent a lot of time on fish and wildlife issues, and natural resources. He recently was the longest-serving member on the Commission for Indian Services. He said tribal issues, fish and wildlife, and productive rural landscapes are issues that are very important to him.

Council Member Richard Devlin said he has a similar background, spending the same period of time in the legislature. He spent his first six years in the Oregon House. It is

said that the House is closer to people, and the Senate exists to protect people from the House, he remarked. Member Devlin served in Marine Corps, in public safety and the private sector. He has been an elected official 31 out of the past 33 years. Most of his time in the Senate has been on the Budget Committee. There were four years where he was Member Ferrioli's counterpart in the legislature as the Democratic leader. He's comfortable with numbers and reads spreadsheets like some read novels.

Reports from Fish and Wildlife, Power and Public Affairs Committees

Fish and Wildlife Committee

Council Member and Committee Chair Guy Norman reported on a robust agenda with eight items. He said the meeting took four hours.

1. There was a presentation on Pacific Lamprey Conservation Initiative Columbia River Basin Projects. These long-term projects serve as an example of co-management and cooperation. There are lots of different funding sources. The cost saving workgroup recommended three projects with a total cost of $238,000: a) adult passage improvement in the Lower Yakima Basin; b) translocating adult lamprey past the lower Snake River Dams; and c) a lower South Fork McKenzie River floodplain enhancement project. The Committee supports these projects and will be presenting them to the full Council for consideration.

2. They heard from Rosemary Furfey of NOAA fisheries, on the Snake River Salmon Recovery Plan. The plan was completed in November 2017. She provided examples of recovery scenarios of Snake River spring and summer Chinook and steelhead. This builds through other efforts such as recovery boards and other subbasin plans.

3. Lynn Palensky, program development manager, reported on the Regional Coordination Forum held yesterday. They had over 50 fish and wildlife managers. There was good dialogue and an update on the budget status from BPA, cost-saving activities and the research plan. They also launched into a conversation about the amendment process for the Fish and Wildlife Program. The next meeting will be on June 11.

4. Patty O'Toole, program implementation manager, updated the committee on the fish and wildlife amendment process. She shared an option to have a focused amend process rather than a complete inventory of the program. Informing that process, we expect the ISAB review of 2014 Fish and Wildlife Program in March.

5. Palensky provided a research project inventory review. The initial draft inventory counts 183 projects that are categorized into research and monitoring and evaluation, and some that are hybrids of both. We sent the list to the managers for review and asked for feedback by March 23. We'll come back with a policy review for the Council this spring.

6. Nancy Leonard, fish, wildlife and ecosystem M&E report manager, gave a presentation on the story map, which is now online. She showed products that are complete, such as artificial production O&M, fish screen O&M, and objectives for salmon and steelhead. In 2018, they will add eulachon and lamprey to species mapping. There also will be some program outreach and some lands management mapping.

7. Tony Grover, Fish and Wildlife Division director, led a discussion on the cost savings workgroup. There was an option to Committee to continue a process that was absent of a formal Cost Savings Workgroup. Instead we'd move that forward with interaction with Bonneville and Council staff, with a Council Member actively involved. Member Anders will do that. Decision-making will go through the Fish Committee and then the full Council on any spending decisions on cost savings. The Committee gave its unanimous support.

8. Mark Fritsch, project implementation manager, discussed emerging priorities implementation and O&M subcommittee work, led by Member Booth. There are some projected screen and hatchery needs totaling $589,000 in 2019, and $497,000 in FY 2020. This will be presented to the Council at a later date for a decision.

Power Committee

Council Member Tom Karier led the meeting in Member Baker's absence.

1. They looked at the high-level work plan for the division for the next year. It has all the elements of the Power Plan. They looked at RFPs from the Conservation staff. They're interested in more energy efficiency for the agricultural sector. There is some innovative work underway in water scheduling and technologies. They want to learn more and incorporate that into the next Power Plan.

2. They looked at the agenda for the midterm assessment. They're looking at the Power Plan, making sure they're on track, and that there's no major divergence between what's happening in the region and what they thought would be happening.

3. There were nuts and bolts presentations on what staff uses in the energy world. One was on load forecasting. Staff makes a detailed assessment of new dwellings and builds it into a precise forecast. The other is determining the precise cost of energy-efficiency investments using a total resource cost test. These will be online.

4. There was a presentation on a forecast of loads with reduced reliance on natural gas and other non-electric fuels. Member Karier said that natural gas provides important space heating energy. That load is particularly volatile. If this were transferred to the power industry, it would require an immense amount of new resources. Staff did the analysis and confirmed that load is volatile and it would be difficult to transfer as much as 53k MW into our electric power generation. It was interesting to test that idea, Member Karier said.

Public Affairs

Committee Chair and Council Member Bill Booth said he's honored to be the new chair and to take over from Member Yost. "You were well liked," he said. The Committee will hold a meeting after close of business today to look at the public affairs work plan. Also, he said they would discuss the August congressional tour.

1. Briefing on Albeni Falls Wildlife settlement

Jeff Allen, Idaho staff, introduced Ed Schriever and Chip Corsi, with Idaho Department of Fish and Game; and Dorie Welch, Bonneville Power Administration.

Council Member Bill Booth began the presentation by giving some background on what Idaho considers to be a model land settlement agreement with Bonneville.
Booth said Lake Pend Oreille is an immensely large body of water; in fact it is the eighth largest lake in the United States by volume of water stored and contains 44 million acre feet of water and it is a key component of the FCRPS system. Since the construction of Albeni Falls Dam in 1955, it also serves for flood control and the generation of electricity for BPA and the region. Water passing over Albeni Falls Dam empties into the upper Columbia and eventually passes through all of the 11 big mainstream dams generating additional power at every one of them. The lake has 111 miles of shoreline and 11 feet of draft by the Albeni Falls Dam. This obviously raises concerns about erosion all around the shoreline, but the most severe erosion occurs at the upper end where an independent engineering study by Parametrix showed the loss of 15 acres per year of irreplaceable prime wildlife habitat and it is where Idaho has decided to focus the dollars that we receive in settlement of operational losses and BPA agrees.

Booth said that one more important piece of background is that in 2011 BPA took a hard look at their entire system in an effort to increase revenue. BPA approached Idaho with a proposal to implement flexible lake-level winter operations at Albeni Falls Dam. We

ultimately did reach an agreement with BPA whereby BPA and the Corps could initiate flexible winter operations so we worked out a deal where they could start flexible winter operations within a four-foot elevation of the lake. In return for that and the concern about the erosion at that time, in 2011, BPA agreed to start mitigation on operational losses at Albeni Falls Dam by providing $4.5 million to complete Phase I restoration of this delta and since that time flexible winter operations have been in effect and will continue.

Also, since that time we've completed Phase I of this great remediation work on the delta.

So, let's step back and look at this agreement today. Is it a good deal or not? Is it good for Idaho? Yes, it is. And is it good for the ratepayers? Well, first it provides certainty without the time and expense of protracted litigation. Secondly, Idaho agrees to take over care and maintenance in perpetuity for all the lands acquired for construction and inundation mitigation, thus relieving the ratepayers of the continuing future expenditure of annual payments and, as I said, right now those total $600,000 a year. There are no new lands being acquired. None have been acquired since 2011. Idaho agrees that we now have sufficient mitigation. Thirdly, BPA, as I've discussed, continues to have the ability to flex the lake levels during the winter, thus providing the opportunity for an additional stream of revenue to the system and the ratepayers. And lastly, Idaho agrees to settle for operational damages. Member Booth turned the presentation over to Chip Corsi.

Corsi said there are three parts to the Albeni Falls mitigation agreement: construction and inundation impacts, operational impacts and agreement administration.

Lake Pend Oreille is Idaho's largest lake and is the focal point for the settlement agreement. Corsi discussed the physical landscape of the area. The Clark Fork area is the focal point where some of the largest wildlife losses have occurred. If there are enough dollars, they can start to look at other places as well. There are Avista projects at Cabinet Gorge to the east, and Albeni Falls to the west. Albeni Falls regulates the lake level and thus the shoreline.

When they worked on mitigation at Albeni Falls in the mid-1990s, habitat units were the currency. They tried to focus their work in the Pend Oreille basin. They also stretched north and south to find more mitigation opportunities. There are more acres in the Kootenai Basin, but there wasn't as much value from the standpoint of habitat units. Corsi discussed the terms of agreement for construction and inundation. The 4,224 acres protected completes the construction and inundation for Idaho. They won't buy more, but they'll need to do maintenance.

The operational impacts are the largest part of the agreement. Corsi said they have them because they had large areas in the flooded zone that were vegetated and had valuable wildlife habitat. Since, they have maintained the lake and a higher summer

pool. A high level of erosional loss has occurred since then. The change in hydrology creates the ongoing operational losses due to the Albeni Falls Dam.

Corsi said they didn't do a full-blown operational loss assessment because they had good information to work with and it's too costly. They prefer to spend money working on the ground. The basis for the assessment was a Parametrix report. Avista looked at erosion rates in the Clark Fork Delta. They looked at erosional losses and apportioned them out as to the cause. They extrapolated that 15 acres a year lake-wide are lost due to erosion from Albeni Falls. That would go on for perpetuity without some intervention.

There was a short-term agreement from 2012 that we would credit operational loss mitigation that we were able to do to any agreement in the future, Corsi said. That's credited at 642 acres in this agreement. It provides $13 million to protect and restore an additional portion of the delta. They won't get all of the delta back, he said, but they can get much of it. It's a 1,300-acre benefit. It's a 10-year program, there is a stewardship account and there is a 30-year term for the operational agreement.

It's an important linkage site for wildlife going between the two areas. Other sites include the Pack River Delta, where some work has been done, and the Priest River Delta, which is rapidly disappearing.

The Pack River restoration began in the late 2000s. There has been some pitch-in from Ducks Unlimited and Avista. These are some big jobs using techniques that have not been proven. It served as a model of what they could accomplish at the Clark Fork Delta.

Corsi talked about what Clark Fork used to look like, and how much erosion has occurred. Avista set money aside. They were able to get those dollars to match up with BPA dollars, and do phase one of the Clark Fork Delta project. It required a fair bit of engineering.

The project objectives include stopping the erosion and rebuilding behind that. If we continue to lose 15 acres a year, another 450 acres will be gone, he said.

The next-highest priority is to implement and complete phase two to install bank and slope protection on the southern portion and to control invasive reed canary grass.

Corsi listed the project partners. There is community buy-in, tribal buy-in and learning opportunities at the schools.

A video of the project was shown.

Ed Schriever oversees the operations of the department. He said the benefits of the program speak for themselves. Schriever recognized Member Booth's leadership in bringing BPA and the state together. He said that he and Bill Maslin enjoyed contentious conversations about where to go. Schriever recognized their negotiating team of Jeff Gould, Gregg Servheen, Paul Kline, Chip Corsi and Kathleen Trever.

Schriever said the C&I settlement (construction and inundation impacts) was referred to as "closing the door," and it is from the ratepayer's perspective. But it shifts the responsibility to the state. There is and will be a need to protect that habitat. It's important to have a certainty of funding. It wasn't easy to get there, but we have that comfort that we're ready to assume those responsibilities in perpetuity, he said. On the operational loss agreement, it allows flexible winter operations in a way that doesn't continue to degrade the delta and other important habitats. It's important to address past and current habitat losses, and it's especially important to do that in place and in kind. Doing it correctly now hedges everyone's bets, including future risks to ratepayers, he said.

Dorie Welch said these agreements are complicated. Each is unique and takes into account a variety of factors. She said each agreement is based on a common methodology and is guided by the principles in the Council's Fish and Wildlife Program. The agreement will maintain past wildlife mitigation actions, which will protect future ratepayer investments. It will address operational impacts at the site, restoring ecosystem functions that not only benefit wildlife, but also fish species. It will help costs be more predictable as Bonneville manages its overall budget. It will result in fish and wildlife savings as outlined in the agency's recently published strategic plan.

Philip Key, BPA, said this is at the end of a decade-long process. Partners from Idaho were willing to stick with it, as well as Member Booth and others. BPA is in the middle of a public comment process. People can go to its website, find the draft agreement and provide comments in writing.

Member Karier said he had questions about this project originally and thanked Corsi and Welch for providing information. He said it is a phenomenal project, but he said he didn't hear much about the cost of this program and how it compares to other wildlife settlements. This is a gold standard of wildlife settlements, he said. We had two previous settlements in Oregon and Southern Idaho, and both followed a standard formula: for every acre lost, there was one acre of restoration and inundation. This project is over two to one. I don't think other agreements can go back, but future agreements will look at this as a gold standard. The second issue is the operations settlement. There's no question that the operations of Albeni Falls has a significant impact on the lake. But so do the Clark Fork project and other Bonneville projects throughout the basin. Lake Roosevelt has cliffs caving in continuously because of the operations of the dams. The question is whether it is BPA's obligation to restore back to

what was originally there, or to acquire property equivalent to what those losses were. In both the Willamette and Southern Idaho agreements, it was to recover what was there. It turns out that's one-tenth to one-twentieth of the cost of restoring back to what was there. If Bonneville had to go back and restore all the islands and all the shorelines that were lost in the basin, it would look like this. It would be a fantastic appearance, but it would be 10 to 20 times as much as the mitigation. Again, Bonneville changed the standard from the previous two agreements to this agreement. The additional acres Bonneville did buy under the C&I agreement … I'm not sure how those showed up in the agreement. Those were 7,000 acres, far more than the 2,000 acres that were restored. It's far more than was covered in previous agreements. This is mostly about Bonneville. I think Idaho is doing a fantastic job with this work. Bonneville needs to think through this in a business case, and make sure that it makes sense for the customers in terms of what BPA would pay for O&M of these properties. What's a fair guess at what future costs would be? It may not be the current budget, the one that goes into perpetuity. Have a good business case and be able to make that case to customers throughout the region. Before you sign the agreement, make sure that's the case.

Welch replied that regarding the "one to one" formula, that's an artifact of changing the mitigation currency. As Chip mentioned in his presentation, starting in 1997, we were using habitat units as the mitigation currency. In this agreement, we're capturing the acreage to be consistent with the previous agreements for clarity and simplicity. Acres are a lot easier for people to wrap their minds around instead of habitat units. When you look at habitat unit mitigation, it is at a one-to-one ratio. There have been a variety of approaches taken. Many partners are using a 2.5-acre ratio to look at the amount of habitat unit mitigation that would be associated with each acre. If you do the math, it's about 31,000 HUs, whereas 28,000 HUs were lost. So it's a pretty close level of mitigation.

Corsi said the operational part of this began after inundation in 1955. It has been ongoing since. We're preventing further loss. I think we worked hard to come up an agreement that, after 30 years, it will cost less than what the status quo would cost. We tried hard to make this responsive to good business practices.

Member Karier said he appreciated getting the Parametrix report, which is hard to find, but Avista had a copy of it. I think Avista paid for that study with Parametrix. In that study, it said that the Clark Fork projects stopped the sediments transfer from the river to the delta. That's the sediment transfer that created the delta and sustained it, and that was shut off at the same year Albeni Falls went in. So it's difficult to tell. Obviously, Parametrix found that didn't have much effect, but intuitively you'd think it would, because that's what created the delta. And I think in that area, if there had been a study, it may have found something different than what you have here.

Corsi said the Clark Fork Delta is unique. Sediment from upstream is important, but you have to put it in the context of geologic history, and its location with the Lake Missoula floods and ice dams. That delta was one of the most stable deltas. It's not one that shifted like a lot of deltas do. While sediment input is important for maintenance and rebuilding (which is why Avista had a maintenance debt to that based on what it was assigned). Parties who were not Avista were playing watchdog, as part of that negotiation in the 1990s. Is it 20 percent or 30 percent responsibility? Avista took the higher end of that, which is why we were able to get this first phase done. It's not an exact science. There are some things that are intuitive, but some aren't. I'm not saying that sediment isn't important, it's just not as important as some other systems.

Member Booth said if we're going to talk about costs and the value to the ratepayers, it's important to emphasize again the ability to use flexible operations to generate power in the wintertime offsets some of these costs.

Member Karier said he didn't see that in the agreement. Is that in there?

That was part of the 2012 agreement, Corsi said. That's a separate agreement, Member Booth added.

2. Presentation on Independent Scientific Advisory Board's Upper Columbia Spring Chinook Review

Erik Merrill, manager of Independent Scientific Review Panel (ISRP), said the Upper Columbia Spring Chinook Review was a 10-month effort. He explained the role of the Independent Scientific Advisory Board (ISAB) as serving the Council, NOAA fisheries and Columbia River tribes. It is distinguished from the ISRP, which does project reviews and serves the Council.

The Upper Columbia Spring Chinook Review is a large report. Merrill acknowledged the support of Council Staff. Kendra Coles did quality control and Eric Schrepel did the formatting. He then introduced ISAB members Dr. Stan Gregory, professor emeritus from Oregon State University, and Dr. Steve Schroder, who was a fisheries scientist at Washington Fish and Wildlife. Both are ISAB and ISRP members.

Gregory said the Upper Colombia River addressed in this report includes the Wenatchee, Entiat and Methow basins. Spring Chinook populations in the Upper Columbia have been a concern, so the administrative oversight panel had questions for the ISAB related to rates of recovery, and the analysis and methods being used for addressing those factors. The recovery rate has been low and well below the recovery goal in these three basins. There has been a similar pattern in the three basins. The

Methow natural origin spawners are recovering at an even lower rate than the Wenatchee or Entiat.

The oversight panel directed some questions. We addressed:

- The rates of recovery in the Snake River spring Chinook versus Upper Colombia River spring Chinook;
- The methods used for limiting factors analysis;
- The evidence of habitat improvement;
- How they are prioritizing habitat recovery actions;
- The adequacy of research, monitoring and evaluation program;
- Are the life-cycle and habitat models useful for addressing these issues; and
- Are these different efforts coordinated across all the agencies?

Gregory listed the participants in the Upper Columbia River program.
In July, there was a field review of the Wentachee and Entiat basins. They were invited to participate in a science review of the program last month. They are currently involved in reassessing the prioritization process. He said they are open to any of the observations from our group on the technical basis.

Discussing some of the questions:

The Snake River comparison is interesting. There's a concern that Upper Columbia River spring Chinook were not recovering as quickly as Snake River stocks. There are significant differences between the two basins. There are three subbasins in the Columbia and 26 in the Snake River. There are 2.3 million acres in the Upper Columbia and 28 million acres in the Snake. So we're comparing different-sized apples. They're also hydrologically different as the Columbia is rain-fueled versus snow-fueled for the Snake.

Gregory addressed abundance: Between 2010 and 2014, the average abundance in the Upper Columbia was 1,475, and the abundance for the Snake was 11,347. Adjusted for area, it's basically the same, he said. The average recovery rate was 74 percent for the Upper Columbia and 154 percent for the Snake, but the range for the subbasins is about the same.

Gregory talked about the survival of smolts migrating out of the mainstem. From hatchery to Bonneville, the Upper Columbia River fish have survival of 45 percent versus 33 percent for the Snake River, which is approximately the same given the variance.

Member Booth asked if that was because of the distance covered. Gregory said it's difficult to tease that out with two estimates. But looking at McNary to Bonneville, for Upper Columbia it's 80 percent versus 75 percent for Snake River fish, which are similar distances.

Habitat is about 40 to 50 percent in the Snake and about the same in the Upper Columbia. There were no big differences between these basins. Smolt-to-adult return rates are roughly the same.

The total harvest rate is 10 percent. It has been increasing in recent years for a variety of reasons. It's partly due to recovery, he said.

The limiting factors analysis started in the Upper Columbia in the late 1990s. The Upper Columbia program has enhanced those analyses. Overall, the scientific principles and methods for identifying factors limiting the recovery of Upper Columbia spring Chinook salmon are generally sound.

Gregory discussed a hierarchy of limiting factors. The factors have been weighted to a geographic extent and their impact on survival. For example, a third of the habitat in the Methow, Entiat and Wenatchee basins is in impaired condition, while 70 percent is in good or intact condition. The analysis looks at how much of the impaired habitat they have addressed, and what they could address and what would be most difficult to address. It helps them determine what impact they can have and where they can't.

Member Anders asked, in terms of habitat impairment and potential for improvement, is it a function of temperature? Toxics? Yes, all the sources of impairment, Gregory replied. There are roughly 35 different ecologic concerns that NOAA uses in its analysis.

Member Norman asked, in potential improvement, does the recovery board or region have projects lined up to address those impairments? Yes, through 2018, Gregory answered. Beyond that, I'm unaware of specific projects. But they have a process in place for making those selections and prioritizations.

One thing they do with these limiting factors is they track them at a landscape level in the different basins, Gregory said. It's been a request of the ISAB and ISRP for many BPA programs. It's a model for other subbasins to track their progress. They're paying attention to selecting projects and tracking how much they've accomplished.

They also use density dependence analysis. In the Entiat, there's evidence of density dependence, he said. This is used on top of limiting factors. An important tool is a lifecycle model. They developed them in all three basins using the full geographic range. In the Wenatchee, reducing pinnipeds increases the number of natural origin

spawners. One of the warnings is to be careful of what is contained in each scenario. Habitat actions allow you to evaluate all of the “Hs.”

We looked at the hydrosystem, harvest rates and pinniped predation impacts, he said. The effects of pinniped can be quantified.

Member Booth asked, “Do the Upper Columbia spring Chinook pass through the pinnipeds at the same time as the Snake River stocks?

Mark Cirrell looked at that, Dr. Schroder replied. The arrival times of specific stocks were set, but impacted by environmental conditions.

Gregory said in terms of habitat effectiveness, they were asked if there is evidence that past projects have improved habitat. “We find compelling evidence about 80 percent studies demonstrate wood structures are effective in increasing the abundance of salmonids,” he said.

Member Yost said, “Does that mean we don’t have to monitor the effectiveness of woody debris?”

“I respect your attention to efficiency and use of funds, but we still have more questions,” Gregory said.

A study showed they did find higher numbers of juvenile Chinook around the wood structures during early and mid-summer. It was higher total abundance, not just fish moved around.

Gregory said that scientists are always calling for years of study before doing anything, which is frustrating. But studies have found that adding one year of pre-treatment data in a before-and-after study is equivalent to 100 years of post-treatment information. In terms of the ability to detect if it made a difference, it’s very powerful.

In terms of prioritizing effectiveness, habitat protection in the Upper Columbia ranked first followed by:

- Removing barriers to connectivity;
- Reconnecting floodplains, side channels, and off-channel habitats;
- Restoring habitat complexity using log or boulder structures;
- Increasing stream flow;
- Managing fine sediment;
- Restoring nutrients; and
- Controlling nonnative species.

Are they prioritized strategically? On the biological side, yes, they have a rigorous process for prioritizing processes based on the outcomes. But we recommended that the process for characterizing cost effectiveness was simplistic and results were weighted low, so they didn't have any influence in project selection, he said. The ISAB recommends using a transparent, quantitative cost-effectiveness analysis for selecting projects. The economists on our team said we should compare the numbers of fish provided, divided by dollars.

On RM&E, the methods of the UCSRB's Regional Technical Team, public utility districts, and regional fisheries agencies are generally appropriate and can be used to answer questions about effects of hatcheries and the hydrosystem. Currently, the RM&E Plan does not encompass all Hs and their related working groups. The ISAB recommends developing an integrated RM&E Plan that connects all Hs and the Upper Columbia's related working groups.

Schroder talked about the RM&E program. He said the number of natural origin summer Chinook salmon was almost a 10- to 20-fold increase compared to spring Chinook. They looked at juvenile and adults. Spring Chinook arrive earlier to the mouth than summer Chinook. They arrive a lot earlier and move over the dam earlier. The conditions in the river in late March are such it can take that fish 30 to 40 days to move from Astoria up over the Bonneville Dam. But a summer Chinook coming in mid-June can spend as few as five days in that same portion of the river. It means there's a gradient of risk for those fish that come in early. Looking at the Methow fish, about 50 to 70 percent of the spring Chinook were consumed by pinnipeds. The chance of summer Chinook coming later has a more reduced chance of being eaten by pinnipeds.

Schroder further discussed the impact of travel time between spring and summer Chinook. Impacts on spring Chinook include waRM&Er water and arriving on the spawning grounds earlier. Summer Chinook mature and then come up and spawn. They have a greater chance of survival. Because of scarcity of natural spring Chinook, there are a higher percentage of spawners.

Spring compared to summer Chinook:

- Higher pinniped predation
- Lower mainstem survival
- Lower pre-spawning survival
- Greater potential for hatchery domestication
- Subject to redd superimposition
- Redd superimposition could be a factor in the Wenatchee and Methow

Member Karier asked a question about survival. Both races are in hatcheries and we don't see much benefit from hatcheries with spring Chinook, he said. Do we see a great benefit to summer Chinook from hatcheries? Schroder replied he didn't know.

So this isn't about performance, Member Karier said, we're using more wild fish in the summer than in the spring.

Schroder said you if can swing the proportionate natural influence (PNI) value above .67, you can have more natural influence on your population. The springs are below that value.

Member Karier asked if we have any measures of overall performance of those hatcheries.

"That's a good reason to have monitoring," Schroder said. "This is the $64 million question. People have recognized the PNI parameter, but it hasn't been rigorously tested."

Looking at juveniles, summer Chinook have more variation in their life history. Spring Chinook are locked into a yearly smolt strategy. You have a confined life history strategy for the juveniles.

Summary of juvenile differences (springs compared to summers)

- Less life history diversity;
- Narrower time span and range in body sizes at estuary entrance;
- Smaller percentage of mainstem out-migration during spill regime;
- Increased susceptibility to avian predation due to larger size; and
- Subject to capacity and survival bottlenecks in tributaries due to a longer tenure in upper Columbia subbasins.

Spring Chinook are living in a natal stream. If there are food or cover limitations, those will constrain their abundance. Summer Chinook leave at the juvenile stage. They don't live as long in their natal stream. They're not as subject to those capacity issues.

Schroder outlined RM&E hatchery questions:

- Have past and ongoing hatchery programs affected the fitness of Upper Columbia River spring Chinook?
- Are current supplementation programs providing demographic benefits?
- Can the present RM&E program answer the above questions?
- Can the present RM&E program answer questions about current hatchery effects and demographic benefits?
- A comprehensive RM&E program is in place with an adaptive management component.

Schroder discussed past hatchery effects on the fitness of spring Chinook. The first hatcheries that came into the Wenatchee and Methow were built by the State of Washington in 1899.
They collected lots of eggs and pushed fish out as fry. Those programs impacted the productivity of those populations, their abundance and genetic diversity.

Schroder outlined genetic analysis and impacts since. He talked about demographic benefits, compared to reference streams. They do not have supplementation going on in them. We can't detect any benefit in wild abundance, he said, but productivity hasn't changed.

Gregory reported on modeling. We were asked to evaluate the models being used, he said. In general, they are useful to investigate benefit of management actions at the population level, but they may not perform well when predicting the exact benefits. They are useful for ranking relative benefits for management actions. But they won't predict exact numbers. This is explained in the report, he said. We suggest that the lifecycle models should continue to be refined.

Gregory talked about coordination:

- The UCSRB has developed a useful process for coordinating recovery actions.
- Currently, there is no process for integrating the separate, coordinating committees and working groups across the three subbasins.
- The ISAB encourages the Upper Columbia Salmon Recovery Board and the tribal, state, federal agencies and the public utility districts to develop a systematic, collective process for coordinating actions, monitoring, and decision-making.

We do suggest they have these programs, he said. It's useful to have a process to bring them together to make sure they're on the same page. The Upper Columbia River program for the recovery of spring Chinook salmon is a strong program. They're using scientifically sound approaches for limiting factors analysis, for habitat restoration and RM&E. The group from upper Columbia, CRITFC and others want their programs improved.

Member Norman asked about a slide showing spring and summer Chinook relative to spill. The graph shows a substantial number of spring smolts migrating prior to early April, he said. Where does that information come from? Schroder said that's from Andrew Murdoch at Washington Department of Fish and Wildlife. It's associated with PIT-tag recovery information. We'll follow up.

Dan Rawding from the Washington Department of Fish and Wildlife interjected, saying it's from PIT-tag detections as they're leaving the Methow or Wenatchee.

Member Norman wondered about the comparison with the Snake River when the summer Chinook are leaving. Does that translate to when they're passing the federal dams? For this slide, it's when they're passing the first dam, Rawding said.

Member Karier asked, "I thought there was evidence that spring Chinook were migrating earlier, and we're missing them with the current spill, and they're talking about moving that earlier to catch them. Is that part of the story?"

"Yes," Rawding said. "You have spring Chinook coming out of the Methow and Wenatchee in March, but we're not getting spill until later on. They don't have many options other than to go through a powerhouse.

Member Norman asked, "When you said the first dam, were you indicating PUD dams?"

"Yes," Rawding answered.

3. Council decision on comments to Department of Energy on revisions to the federal efficiency standards process

Kevin Smit, senior energy efficiency analyst, said the DOE issued two RFIs on appliance standards, which the Council has been involved in for any years. The first is a process rule, or the process they use to set the appliance standards. The purpose is to streamline the process while maintaining the statutory requirements. The second is on the whole standards program design itself. They're looking at putting in some flexibility by looking at a market-based approach, instead of the limit-setting standards we have now. The appliance standards referenced started in 1975. In 1992, they added commercial and industrial equipment, and the process rule.

Why the Council should comment:

a. Energy Efficiency is a huge part of our Seventh Plan resource strategy.
b. Energy codes and appliance standards are a key part of our success. Codes and standards have accounted for over one-sixth of region's energy savings since 1980.
c. The Council has been actively engaged in the process since 1987. Consultant Tom Eckman has been very involved since 1990. We benefit from all the data that's been developed.

The draft comments and supporting information were sent to Council members. The Power Committee reviewed and discussed them, and several minor comments were received and addressed.

Official comments are due March 2, 2018, for the Process Rules RFI, and February 26,

2018, for the Standards Program RFI.

John Shurts, general counsel, said the overarching message in the draft comments they want to submit is that this process has worked well and has delivered a lot of value to the Northwest. We don't want to see that value lost. We're always open to make it more efficient and effective. With the standards RFI, that's about where we stop with the comments. Market-based solutions have always been of interest to DOE.

In the process RFI, we have more detail. We care more about this as we helped shape this process. There are a lot of ideas in that RFI for possible changes. Those comments are more substantial. Through the experience of the staff and Tom Eckman, we wanted to shape some thoughtful comments for DOE. Some issues raised make a lot of sense, such as doing away with archaic rule-making methods. We strongly support keeping the negotiated rulemaking using the advisory committee, and want to send that signal back. We set some overarching comments, both a general comment and summary comments on each category. That's what the Council would be approving. Attached to that is 30 pages of detailed comments from Eckman's experience. The detail is too much for the full Council comments. It's been through the Power Committee, and Member Baker helped shepherd them.

Member Baker thanked Kevin and John. It's been through the Power Committee a couple of times. There has been a good, comprehensive review. It has been to the full Council for a look.

Northwest Power and Conservation Council Motion to Approve Comments to the U. S. Department of Energy Regarding the Federal Efficiency Standards Processes

Member Anders moved that the Council approve comments to the U. S. Department of Energy regarding the federal efficiency standards processes, as presented by staff and recommended by the Power Committee.

Member Karier second.
The motion passed without objection

Public Comment

Member Yost said usually the Council takes public comment at the end of Council business, but he would allow a comment at this time.

Joy Juelson with the Upper Columbia Salmon Recovery Board wanted to make some comments.

Her group presented to the Council on spring Chinook last year. The Council put resources and ISAB energies to focus on this issue. We're extremely grateful you did that, she said. The ISAB was incredibly involved with local groups and asked the right questions. We commend what you did in the region. We're dedicated to incorporating key findings and recommendations into our strategies.

The Public Affairs Committee will meet upon adjournment.

Chair Yost adjourned the meeting at 4:11 p.m.

Wednesday, February 14

Chair Yost brought the meeting to order at 9:00 a.m.

4. Summary of Utility Integrated Resource Plans: Anticipated resource needs over the next five to 10 years

Gillian Charles, energy policy analyst, provided an overview of utility Integrated Resource Plans (IRPs).

Looking at the region's patchwork of utilities, it's important to remember that each is unique and do their own power plans. The two-year plans are a utility's roadmap to meet future resource needs.

IRPs are a least-cost, least-risk analysis that includes:

- Load and resource balance;
- Forecast of future demand, fuel prices and future market prices;
- Cost and availability of new energy efficiency and generating resources; and
- Various scenarios and how the utility could meet them.

Utilities develop IRPs through extensive public engagement and stakeholder meetings:

- Independently owned utilities (IOU) file IRPs with the state public utility commission. Each state has a unique set of regulations and there is a public comment period.

- Large public utilities also often develop IRPs. There are fewer regulatory rules, depending on state.

How the Council participates:

- Power and state staff are assigned to participate in each utility's IRP public stakeholder process. They offer feedback and recommendations consistent with

Seventh Power Plan's action plan. They submit staff comments during the public comment period.

- The Council invites utilities to present their IRPs and findings at Council Meetings.

Seventh Plan action items include:

- ANLYS-11: Planning coordination and information outreach. The Council will continue to participate in the development of Bonneville's Resource Program and in utility-integrated resource planning efforts. In addition, the Council will periodically convene its planning advisory committees for purposes of sharing information, tools and approaches to resource planning.

- Res-3, Res-6, Reg-3, Reg-4 – Recommended data to be included in IRPs.

Charles listed IRP presentations to the Council over the years. Snohomish PUD (March) and Seattle City Light (June) are coming up this year.

Caveats to IRPs:

- They aggregate new physical resources only;
- Do not include anticipated energy efficiency, demand response, energy storage, market purchases, transmission development or repowered wind;
- The resources identified are proxy; they are not binding;
- The farther out, the greater the uncertainty; and
- With IOUs, just portions the serve the region are included (such as Northwestern and PacifiCorp).

Energy efficiency is central to all the IRPs as well.

Member Baker asked why is it just limited to IOUs? I'm thinking about Seattle City Light, he said, which is probably bigger than Northwestern. Why not include some of the big publics?" Charles replied that at the staff level, they do look at them. Seattle is coming to the Council in June. There is not a lot of immediate need for new resources by large publics.

Charles reviewed the anticipated new resources from the IOUs. By the end of the planning horizon (2036), we're looking at 5,000 MW of natural gas and 4,000 MW of renewables. Looking at the resources identified in the next five years, utilities identified 900 MW of wind by the end of 2020, another 400 MW of peakers starting in 2018, and the first combined-cycle combustion turbine is slated for 2021.

Compared to the last round of IRPs a few years ago shows that the renewable acquisition has moved forward. The earliest we saw a few years ago was 2023. This time around, we're seeing 2018.

She said it's important to take these plans with a heaping pile of salt. Plans change – and that includes the resource plans for the next five years.

By 2036 plans call for adding 5,000 MW of natural gas and 4,000 MW of renewables, Charles said.

Compared to the last round of IRPs, the timeline for renewables has accelerated. Oregon's new renewable portfolio standard, passed in 2016, call for 50 percent RPS by 2040. Another thing to keep in mind is that federal tax credits extended in 2016 and will be expiring in 2020 and 2023 for large wind and solar PVs. For developers to get credit, construction has to be started and completed sooner. So the determination on whether that's needed sooner is something utilities have to grapple with.

She talked about the addition of natural gas generation. A lot of utilities are facing coal retirements. The build on the charts reflect that. There are also a lot of creative ways that utilities are looking at this. For example, PGE is exploring replacing coal with biomass.

Some observations:

- Energy efficiency and demand side strategies pursued first are keeping load growth low/flat and are delaying the need for resource acquisition.
- Changes in Oregon RPS, combined with expiring federal tax credits, have accelerated renewable resource acquisition. Before it was "I need a gas plant" to "I need a resource."
- Uncertainty over environmental regulations and carbon legislation has led to a lot of retirement and replacement scenarios for existing coal plants.
- A fundamental change in treatment/analysis of resource acquisition means we're seeing less resource-specific, more generic capacity versus energy need.
- Commission proceedings cast doubt on initial acquisition needs.

How does this compare to the findings in the Seventh Plan?

- Energy efficiency is the least-cost, least-risk resource across range of scenarios.
- For the first time, demand response to be developed and utilized for new peaking capacity resources.
- There will be an increased use of existing gas resources, before development of new gas plants.

- Renewable resources will be built primarily to meet long-term RPS goals.

What's next: IRPs are a starting line, much like short-track speed skating. Each utility has a plan of what to do under difference scenarios. The IRPs are an action plan that generally includes a resource acquisition strategy.

Current Activities:

a. Requests for Proposals
   - Avista released an RFP for 15 MW of solar in April 2017.
   - PacifiCorp released an RFP for 1,270 MW of wind in September 2017 (projects must be operational by EOY 2020).
   - PGE will release an RFP for 310 MW renewable resources in 2018.
     - OPUC encouraged PGE to rethink its initial identification of 515 MW in 2018; OPUC believed it to be unnecessarily risky to customers and not an immediate need.
   - PSE to release an "all source" RFP in 2018 (for delivery in 2022).

b. Repowering existing wind
   - PacifiCorp is planning to repower ~900 MW of existing wind fleet by 2020.

c. Replacement resources for retiring coal plants

d. Pursue new transmission – Idaho Power, PacifiCorp

Coming up, staff will continue to follow and participate in IRPs and invite utilities to present their IRP analyses.

Member Karier said he's interested in demand response measures from IOUs. We see a lot of natural gas peakers to replace coal capacity. That makes sense as a capacity resource, other than demand response. He said he thinks that demand response is a critical thing to track: it's underdeveloped, relative to the Council's analysis on what's cost effective, and there are barriers to it in the regulatory process. It seems hard for commissioners to measure and evaluate, and we need to understand it in more detail to see if there are things we can help with.

Charles said this is the first time we've included demand response in the Power Plan. We started the Demand Response Advisory Committee (DRAC) at the Council, chaired by John Ollis. We're making great progress and they're dealing with these issues. The question of how do you define demand response was one of the first questions they tackled. We're making progress.

Member Karier said, “On this kind of IOU review, if we see opportunities in any of the states where there’s proposals to build gas plants, that might serve the need cheaper with demand response, it would be useful for us to know that. These gas plants are going to be needed pretty soon. The coal plants are closing in five-to-seven years, so that’s a short timeline.”

Member Devlin said, “Going back to an earlier discussion of demand response, and talking about forming groups to look at barriers, I’m assuming we’re incorporating the work that some of these IOUs are doing. I only had the opportunity to look at two of the most recent IRPs from PacifiCorp and PGE, and I noted that in PGE’s 2017 IRP, it included 79 MW of demand response. So it’s obvious that they’re looking at this. I’m assuming we’ll incorporate that into our discussions.”

Charles replied that as staff collaborates on their IRPs, many of those who work on these IRPs are on the Council’s advisory committees as well. There’s a lot of collaboration that goes on in the region, especially with a new resource.

Member Baker said, “I fret about the possibility of overbuild in the region in response to signals that each individual utility sees, but they don’t collectively think about addressing. I can look at our history and if I squint, I can see some direction to us to make sure we have some input into coordinating what the region does. We do that with the Power Plan. Is there more we could be doing in our regional role to ensure that these processes are talking to one another?”

Charles replied that the commission staffs for each of the states are very involved on our advisory committees.

Ben Kujala, Power Division director, said the critical thing we do is to reach out to commissioners. IRPs are the first step in a long, regulatory process. Utilities may put things in there that they might expect would suit their needs. They know it’s a starting point of a conversation. Our role has been to talk to commissioners, their staff and utility staff, and express what we see and what we think makes sense for the regional power plan. We acknowledge in the Seventh Plan that there are utilities that have very distinct positions. From a regional position, it may not seem like there’s a lot of need, but that’s little comfort to a utility that happens to have a large hole. They have to understand the risk they face. We seem to have a big happy family view of the region that utilities will come to the aid of others in the region instead of selling it to California. We have to be understanding of where utilities are starting from. We have to also talk to commissions and talk about sharing projects, where there’s surplus power, and to look at interesting ways to get that spread around the region. We’ve heard of some utilities that are long with longer-term contracts, starting to get that spread around the region. But some utilities have distinct positions.

Member Ferrioli said, “We’re all in this together until they’re not. I appreciate the illustration of the scrum that takes place during the start. That helps me characterize how people collaborate, but in a competitive environment.

5. Presentation on Bonneville's Wholesale Market and Competitive Position

Member Karier introduced Steve Kern, general manager for Cowlitz County PUD. Kern has worked for Duke Energy and PNGC. More recently, he was at Seattle City Light in power supply, in charge of IRPs. He’s an analytical person thinking hard about these issues.

Kern said he took the job at Cowlitz PUD two years ago. The challenges they faced at the time include continued rate increases from Bonneville and an economically challenged community. Cowlitz pushes about 600 aMW of load, including 400 aMW for industrial customers. The rate increases and economic challenges have been very tough, so I felt compelled to come and talk about what I see as a financial cliff that’s coming, he said. It will be a dramatic cliff. I’ve been in business 35 years. I’ve worked for several BAs, IOUs, public utilities, I’ve been responsible for trading and marketing natural gas, and headed up a trading and marketing organization for Duke Energy at one time.

“The biggest concern I have is that the natural gas market won’t bail out Bonneville,” he said. “I’ve pushed on the natural gas forecast for the Council for the last seven or eight years. I’ve seen the downturn. Natural gas won’t rebound at a level that BPA will get its way out of its financial situation by higher prices. Our average customer retail bill is about $128 per month. Of that, almost $20 is fish and wildlife costs.”

Kern spoke about the difficulty customers have facing another rate increase. One of their large industrial customers, NORPAC, is challenged by power prices in the region. Their competition has access to spot and lower-priced energy. Who would have thought that the federal power system would be that far out of the money? It’s a quantum shift in the marketplace putting loads like ours at risk, he said.

He said he’s not here to beat up on BPA, but wants to help.

The worrying trends at BPA include:

- Increased court-mandated spill;
- Increasing fish and wildlife costs; and
- Net secondary revenues are down dramatically – several hundred million dollars down from the peak.

External factors include:

- An avalanche of $0 marginal cost power in California and the Pacific Northwest. Our view of the world is more solar and wind, he said. We see power at $20 per MWh. He's concerned that we'll see that spot market price of energy continue to fall into the teens if we continue to see these zero marginal cost resources come online at the rate we've seen over the past few years.
- Increased WECC region RPS mandates.
- Persistently low natural gas forward market prices.

Kern said we're looking at end of the take or pay contracts. BPA forecasts a rate of $48 per MWh in 2028, whereas we see it on the short-term spot market in the low $20s or $30s. This is a fundamental shift in the technology and supply/demand equation that we haven't seen. This is the cliff I worry about because in 2028, who would sign up for BPA?

Member Karier said you have 2028 compared to 2027, then there's another 10 years. Utilities will be looking forward. If it looks like that, it's not a good picture for BPA.

Kern said BPA will be so far out of the money relative to alternative supply markets, for every MW they don't sell, they have to take that power back and sell it for 50–70 percent less. We see it today. They're taking back power they hoped to sell in the $30s, but as of yesterday it was $17.

Kern showed a graph depicting BPA's rates since 2006. He said BPA pulled out $900 million in reserves and rate increases to cover increased operating expenses. He said he doesn't see the secondary sales bailing Bonneville out. Kern then showed a chart projecting BPA's total operating expenses projected through 2036.

On fish and wildlife costs, Kern said spending is expected to steadily increase. He said that Cowlitz customers enjoy wildlife, but he told the Council that they need to step back and revalue the dollars we're spending and where. "I can tell you from my board's position, there's no way we'll sign up 90 percent with BPA," he said. Industrial customers, representing 400 aMW are talking about going elsewhere. They point to the inability to manage costs and long-term supply contracts. My industrial customers are in the spot market and they can't lock up energy supply they have no control over, Kern said. He asked the Council to step back and see what can be done about fish and wildlife costs. "I felt I had to bring that to you today to raise awareness," he said. "We don't know what we're going to do as a region in 2028."

Kern ran a scenario that shows that BPA faces significant loss of customer load in 2028, which will increase future rate pressure. He called it a death spiral if they can't get their arms around their total operating expenses.

Going forward:

In attempt to be competitive now and in the future, BPA must immediately take all possible steps and actions necessary to further reduce it operating expenses and risks going forward including:

1. Control and reduce fish and wildlife spending. Work with the region to bring about increase program oversight and real accountability.
2. Challenge all operating expenses. Set firm operating expense reduction targets (e.g., 20 percent) across the entire organization to achieve savings.
3. Power supply and portfolio risk management. Improve management of BPA's power supply portfolio through additional hedging and/or completion of new creative power supply agreements.

Kern said he spoke with BPA Administrator Elliot Mainzer about the need to set hard dollars they need to cut. BPA needs to think creatively about power, products and some of the things BPA can do to try to get extra value. Last, Kern talked about the Regional Power Act itself and the need to retain an economical power system.

Member Devlin said that as the new person, he's trying to be careful not to make statements that don't have a basis. He said when he took this assignment, he read BPA's budget for the coming federal fiscal year and looked at BPA's structure. He read their strategic and financial plans. He understood their concerns. He's familiar with NORPAC and he can see why this would be an issue for them, particularly if their competitors have access to these markets. He's also familiar with Intel and their need for certainty for their power. Not all circumstances are the same, he said. He looked at these reports and rating agencies, which cited some of the things you stated. "But what you didn't state is they cited the significant debt ratio BPA has," Devlin said. During that period of recession, they cut or held rates and brought their reserves down. In 2010, they looked at their debt structure, and did a refinance and extended the term of those debts to keep rates lower for a period of time. Now those debts are coming to bear and higher payments are due. BPA should bring down their debt ratio as that's built into their rates. An issue is how to get the debt ratio down. One credit agency said they'd lower BPA's rating by one to two levels if they weren't BPA.

Kern said he tries not to second-guess what happened, but BPA's debt level is too high. The power business line is out of cash. It's close to triggering a CRAC (cost recovery adjustment clause). Most likely it will trigger a CRAC on October 1. I do think the federal agency needs to get its arms around its debt even further.

Member Devlin asked about the spot market index he's using, is it a fair comparison over time?

Kern said, "Never in my career have a felt as strongly that a forward price curve will remain as soft as natural gas, and the addition of marginal cost resources. It's a huge

shift in the structure of how we'll do business going forward. As long as the price of oil stays close to the levels it is today, the byproduct of gas will continue to climb in this country. We're seeing more fracking, oil at $60 a barrel and the U.S. is exporting oil. Oil could be the driver. Will there be peaks and valleys? Yes, but if I had to lay out my portfolio, and bet on gas at a $2 to $3 level on a long-term basis, I would put a significant amount of my risk in that portfolio."

Baker said he thinks Kern's presentation comes at a good time. There's been a growing concern among Council members about BPA's position going forward. Next month, we get the administrator in to talk about their picture. I'm hoping we can start that larger discussion. I assume he's done a lot of analysis and you'll share that with BPA and ask them to take a look at it. I also assume you will be more than willing to answer questions our staff might have about how you came up with numbers.

Kern said he shared this with Elliot and senior staff, and is happy to share his expertise.

Member Karier said Kern provoked a lot of ideas. He's hoping the Council will figure out what we should do about this. "We do planning for a 20-year period, but if BPA loses its customers in 10 years, those things won't be very relevant," he said. "I would ask our executive director what resources do we have to study this problem. This requires some analysis and projections. The situation looks pretty grim right now. The reserves did drop to zero in the power division. Transmission looks a little better. Their debts are high and the prospect for future revenues don't look very good. We need to do a little bit of analysis on this. The executive director can come back to us in a month and give us some options. We could work closer with Bonneville's financial division, because they have tools and techniques we could benefit from. We may have people in-house who could do some of this work — maybe contract with others — and we have a wealth of resources in the region to do this. I think tracking Bonneville's financial situation is critical. That's part of what the Council should be doing in this case."

Kern said time is of the essence. He believes BPA will kick off its new contract negotiation timeline within five years. "I'm an ex modeler and sometimes it gets lost in the inputs," he said. Take the point forecast that Bonneville can give you and do some simplified planning around it. It's easier to point at scenarios rather than 2,000 iterations of a model.

Member Ferrioli said he appreciates Kern's perspective and cautionary tale. On slide five, Kern shows that a 25 percent reduction in load is not unreasonable. It's logical that IOUs and others are operating under the same least costs mandates we are, Member Ferrioli said. They'll get energy at the least cost to their ratepayers. "But the suggestion is that we do an across-the-board reduction of 20 percent, and that we look at controlling those fish and wildlife costs, and that it will produce a beneficial effect if those are implemented. But those costs are mandated. Spill isn't optional if the court

says you have to do it. Treaty obligations and additional court orders limit the opportunity for cost containment. Given those scenarios, I don't think you can cut your way out of this mess. Have you given some consideration to the best-case scenario for what a cost-cutting regime might produce relative to the size of the problem that you've identified?"

"I agree with you, I don't think you can cut your way out of this," Kern replied. "I wasn't suggesting a 20 percent fish and wildlife cut, although we may have to go there. It was more about Bonneville's other costs and the need to set hard targets. If BPA will be at $5 per MW by 2028, then work backwards and look at what the revenue requirement or net operating costs would have to be. You may not be able to cut your way out. If I were Bonneville, I'd want to see how drastic those cuts would have to be."

Member Ferrioli said he and Member Devlin were arguing over whether power or fish is the more difficult assignment. From his perspective they both have the short straw given the economic pictures.

"It doesn't matter if you're getting hung with an new rope or an old one, you're still getting hung," Member Yost said.

Member Ferrioli said it's heartening that cost increases are described as "CRAC."

Member Yost said we looked at cuts and the other way to do it is to increase the secondary market. "But we have to convince the governors and legislatures to quit buying renewable resources we don't need, for energy we don't need," he said. "We're producing more energy than we need, secondary market prices are in the tank, and that's going to continue because it's the politically correct to do. Secondary market increases will help a lot and we're surplus in energy so that's the dilemma."

Member Karier said, "So you're saying a carbon tax would help us to sell our carbon-free power and make more money? Because I agree with that."

6. Presentation on survival of adult spring/summer Chinook salmon through the estuary and lower Columbia River amid a rapidly changing predator population

Dr. Michelle Wargo Rub, fisheries biologist at NOAA Fisheries, returned to the Council to discuss the survival and run timing of spring and summer Chinook salmon and the impact of predation.

Rub said this is a study they've been conducting since 2010. The study has been a collaborative effort of Oregon, Washington, tribal and Corps biologists. In 2010, the primary goal of the study was to provide estimates of survival and run timing through the lower Columbia River below Bonneville Dam, for spring/summer Chinook returning to

tributaries above Bonneville Dam. This would include populations returning to the Middle and Upper Columbia, and Snake Rivers.

Smolt-to-adult returns for these populations, even to date, are based on their returns to Bonneville, which is about 140 miles upriver. Any mortality occurring during this freshwater phase is associated with the “black box” of the ocean. When we were planning the study, we were concerned that pinnipeds entering the Lower Columbia River during the spring were impacting survival significantly, she said.

When we started the study, we thought there were about 2,000 harbor seals and 500 sea lions in the Lower Columbia, Rub explained. Since, we’ve seen the numbers explode. In March 2015, there were an estimated 6,000 harbor seas and 2,000 sea lions.

They contract with commercial tangle-net fisheRM&En to tag fish commensurate with spring returns. When they get salmon in their nets. We’ll tag for 25 to 30 days and take a fin clip for genetic sampling, she said. They will catch all the adult salmon and hand them to us.

Again, the main objective of the study was to estimate survival based on that PIT tag from the estuary to Bonneville.

In 2010 and 2011, they wanted to use acoustic telemetry to measure reach survival. The intent was to see if there were hot spots of mortality. But sea lions detected the acoustic pingers.

In 2016, NOAA and ODFW began tracking fish and pinnipeds using radio telemetry (RT).

Member Karier asked a question about the acoustic pingers. Rub explained the technical drawbacks to using that method. Rub added that RT devices also have issues. They are land-based and don’t work well in salt water.

In 2016 and 2017, they deployed RTs in fish and sea lions. The tags had temperature sensors to determine if they ended up in marine mammals.

Looking at PIT-tagged fish, as sea lion numbers increased, so did mortality with a peak in 2014. Happily, estimates for 2016 and 2017 did not increase.

Member Karier asked, “Does that strike you as odd since the number of sea lions were higher, but it dropped?” Rub said it’s not just the absolute number of animals. We have differences in flow. 2017 was a high flow year. Absolute numbers indicate the number of sea lions in 2016 was the highest. In 2017, it was similar to 2015. What we’ve seen is

the salmon tend to enter the river at different times depending on the year. It's not always the middle of March in the estuary.

Member Norman said, in terms of differences in the last couple of years, reduction relates to the hot spot with radio tag information. In terms of state biologists studying the portion of the diet that is salmon, that increases as the sea lions move upstream. If you have a high-flow year where the salmon run is delayed, even though there are a high number of sea lions, then the real key is how much they're exposed in time in those upper areas. I'm wondering if your radio tag hot spots corroborate what the state biologists have shown. Yes, Rub said, they are very similar.

Rub said the mortality estimate is about 30,000 to 35,000 fish, peaking in 2014 and 2015 at just over 100,000. Brandon Chasco talked about bioenergetics modeling that supported these high numbers. We've come down in 2016 and 2017 to fairly low numbers.

Rub discussed trends of increasing survival later in the year or lower survival earlier. She discussed where they place RT gates to make survival estimates. They tagged 30 California sea lions in 2016. They never detected them anywhere up into the river. These animals are foraging in the estuary, in the near ocean. They stay a couple of days and then leave. At least half the animals in 2016 tagged did not venture up into the lower river. Just 13 percent went to river mile 28, and 10 percent went to river mile 40. Only 7 percent made it to the tailrace at Bonneville and both of those animals were removed.

Member Booth asked how many total fish made it to Bonneville. A couple hundred total, or about 7 percent of tagged fish, Rub answered. Generally less than 10 percent of what they see in the estuary go to Bonneville Dam. The number of California sea lions versus stellar sea lions is changing that proportion as the California sea lions are removed. You need to ask states for specific information.

Forty-eight percent of the fish mortality observed occurred within the tailrace at Bonneville, about a mile from the dam. Very few dropped out.

Member Norman observed there isn't much mortality in the middle area. Does this total mortality include the handling as well? Rub replied that it is total mortality for the RT fish. It has not been corrected for harvest.

Member Norman said he's suggesting that handling mortality is immediate. She answered that the handling mortality isn't very high. Sometimes when water temperatures are waRM&Er, there's less oxygen, potentially some are dropping out from handling, but I don't think it's a large component, she said.

Rub said in 2017, we had crazy high river flows. It resulted in a shift in predators and fish. Only one tagged sea lion was below Bonneville. The majority of sea lions shifted their position.

She talked about how spill and flows affect the fish. It was a low-flow year in 2016, a high-flow year in 2017. She discussed how long it took for fish to travel. High flows really delayed fish.

Rub talked about Linear Mixed Effects Modeling. It shows how those covariates affected survival. This included evaluating eulachon. They thought it would help salmon survival, but they discovered that the eulachon arrive below the spring run, which draws the predators into the river, and then salmon come in and get eaten.

What have we learned?

- We have identified significant mortality that is unexplained by harvest and handling for upriver spring/summer Chinook salmon.
- This mortality appeared to peak during 2014 and 2015 at approximately 100k fish.
- Mortality during 2016 and 2017 was ~19k and ~24k respectively and appears to be similar to estimates from 2010-2012 ranging from 29-35k.
- Pinniped predation is likely the primary source of mortality, but not all animals are equal with respect to the impact they are having on returning fish.
- Additional covariables potentially influencing survival include spill, abundance of smelt, and clip status.

Future objectives:

- Continue to study reach survival using RT.
- Estimate survival for all Columbia River spring Chinook salmon based on when/where they are exposed to predators/harvest.
- Confirm and define relationships between fish survival and California sea lions, eulachon and spill.
- Conduct an up-close study of tailrace survival.

- Study population level survival and behavior further using parentage-based genetics results.

- Study delayed mortality effects of non-lethal pinniped injuries beyond the hydrosystem.

Member Booth said this is important, pure research work. “I’ve been on the research boat twice with you,” he said to Rub. “Before your work, NOAA was estimating a 3–5-10 percent pinniped take. Those opposing more severe intervention by the states used this. Now we have this data that shows it’s about 30 percent.”

Member Anders said predation is one thing in our program we recognize and emphasize as a threat to our investments, instead of something we actively pursue and fund through the Council. One thing we’ve done is Member Norman, Member Booth and Oregon Council members have sponsored letters to Congress to affect changes at that level. Are there other roles the Council could play? Is it research?

Rub said, “I feel like the more information you have, the better you are at making good economical decisions. More research being done with respect to the diet points to a problem group. If you focused on them, you’d get the biggest bang for the buck. We’re not advocating getting rid of predators or messing significantly with the system, but a group of animals are taking advantage of a large number of fish congregating just below Bonneville Dam. The research points in a direction that might be more economical or palatable for management."

Member Norman said Rub mentioned a follow-up with post Bonneville mortality associated with injuries. “I’m familiar with the information that has been accumulated over the years, he said. “A significant number of fish passing Bonneville have sea lion injuries. So immediate mortality is part of the story. Can you elaborate on work to follow up on about long-term mortality?” Rub said unfortunately, it’s difficult to make estimates that high in the river. You have to have a known population coming through Lower Granite Dam, then count or identify those at the end site. Without having additional marking at Lower Granite, which is do-able, but you have to take genetic samples, know where they were destined, then have a PIT-tag array end point to detect those fish at the end stage. It’s complicated. There’s no easy data set sitting there.

Member Norman asked if this research would continue for the foreseeable future. Rub said their research is funded through this spring. She’s been funded through NOAA’s cooperative research program for several years. She’s waiting to hear if they’ll be funded again.

Member Karier said this is very important in terms of measuring the magnitude. “Other important findings include the high variability from year to year, he said. “One year we

lose 20,000 fish and another year we lose 106,000. It's important to figure out what might have changed that. The flows have an effect there. When fish slow down in the estuary and at the dam, their mortality skyrockets. When they're moving in the river, they have much lower mortality. When fish slow down due to high flows, the mortality goes up as well. That's a hypothesis worth testing. The Council should try to identify, on their list of future research, the things most important to us: what we need to know to help those fish improve survival. Maybe flows can be adjusted during that short window to help the fish get past that dangerous place faster. I think the relationship between flows and survival is critical in that reach. And I think there are a few other questions that would be helpful, like where mortality is, because when we take sea lions out, where should we take them out and when? Some are interesting science questions and some are critical policy questions. We should help identify what those are."

Rob said a reference to low survival in 2013, 2014 and 2015, is related to bad ocean conditions. A poor prey base off the coast of California drove an unexpected number of sea lions north in search of food. At the same time, there was an increase in the eulachon run that also drew more animals up. Hopefully, that was an anomalous event that may reestablish itself. Animals are smart. It might take a couple of years for them to reestablish. There are clear patterns we see, but it's complicated.

Regarding spill, it holds fish back below the dam, but when we look at it overall, it helps increase survival, Rub said. We'll look closer in the tailrace to see if it changes behavior in predators, creates more directed migration for the fish, or if the increased turbulence allows fish to get by the predators. During a real low-flow year, the reduced time in the river helps survival.

Council Business

Northwest Power and Conservation Council Motion to Approve the Minutes of the January 9-10, 2018, Council Meeting

Member Anders moved that the Council approve for the signature of the Vice-Chair the minutes of the January 9-10, 2018, Council Meeting held in Portland, Oregon.

Member Karier second.
Motion approved without objection.

Northwest Power and Conservation Council Motion to Release Fiscal Year 2017 Annual Report to Congress Following a 90-Day Public Comment Period

John Harrison – power act required report to congress required after a 90-day public comment period. A complete draft was put in the January report. In January, there were

some comments from Snohomish that were missed. They were significant and important. This is now before you for final approval.

Member Anders moved that the Council approve the release of the fiscal year 2017 Annual Report to Congress, as presented by staff.

Member Booth second.
Motion approved without objection.

Northwest Power and Conservation Council Motion to Appoint a Council Member to Serve as Co-Chair to the Regional Technical Forum Policy Advisory Committee

Member Anders moved that the Council approve the appointment of Tim Baker as Co-Chair of the Regional Technical Forum Advisory Committee for a one-year term.

Booth second.
Motion approved without objection.

Chair Yost adjourned the meeting at 10:58 a.m.

Approved March ___, 2018

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Vice-Chair