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

Council Meeting

Spokane, Washington
September 12 and 13, 2017

Council Chair Henry Lorenzen brought the meeting to order at 1:33 p.m. on Tuesday, September 11, 2017. All Council Members were in attendance, except Member Tim Baker, who phoned in.

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

Fish and Wildlife Committee
Committee Chair and Council Member Jennifer Anders reported on six items:

1. There was a staff recommendation associated with ISRP's review of 29 wildlife projects. The committee will look at an updated memo next week, and hopefully, the full Council will review it next month.
2. There was an update on the next Fish and Wildlife Program amendment process. What will potentially jumpstart the process is a draft letter to the ISAB requesting review of the 2014 Fish and Wildlife Program. The committee agreed to send a notice to the ISAB, pending Council review that afternoon. Patty O'Toole, staff program implementation manager, talked about the approach to the program amendment process. One proposal would be to set the 2014 program aside, and to focus on issues central to the work we've been trying to accomplish and that will be critical in the next five years.
3. Lynn Palensky, staff program development manager, updated the committee on Regional Coordination Forum meeting. Regional managers discussed numerous topics and processes related to program.
4. Dr. Austin Thomas reported on EDNA sampling. He demonstrated a handheld device that can produce quantitative results on the relative abundance of a species' DNA in an

hour, versus sending it to a lab. It helps researchers detect predators and inform recovery efforts.

5. There was an update on phase one studies on the reintroduction of anadromous fish above Grand Coulee and Chief Joseph dams. According to the Colville and Spokane tribes, the model predicts there is sufficient habitat to support summer and fall chinook, and steelhead. Phase one is still a work in progress.
6. Oregon Department of Fish and Wildlife (ODFW) and Washington Department of Fish and Wildlife (WDFW) discussed predation by sea lions on winter steelhead in the Willamette River. Predation has been in 20-25 percent range of adult fish attempting to pass the ladder at Willamette Falls. ODFW applied for a lethal take permit to protect what is left of the run. Only 512 winter steelhead passed Willamette Falls in 2017, the lowest total ever recorded. Their estimate translates into an 89 percent chance of extinction.

Power Committee

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

1. Member Karier said the committee spent two hours talking about BPA's rate structure and its conservation program. They wanted to dig deeply, and they have heard lots of concerns and issues from utilities in the region. Concerns were expressed about conservation targets, savings and how Bonneville implements the program. They wanted to look at how rates reward customers (or not) for energy efficiency. He said the bottom line is that the rate structure is so complicated; it's difficult to see the benefits from energy-efficiency savings. The utility has savings, but there's not an immediate, obvious, rate reduction based on that. The true-ups occur later in the year, and there are changes in contracts. There are savings, but they get lost in the rates. He said the reason the rates are so complicated is because there are different tiers, load following or blocks, or slice and block combinations. There also are different ways that those contracts are paid for. In some cases, there are shares allocated to owning each contract, and the shares are divided into the total cost. Plus, rates have demand charges, and there's a load-shaping charge, etc. We dove in to the complexities, he said. We understand it better, but it's a reason why the value of energy efficiency is lost.
2. There was a discussion with staff about how to develop a white paper to analyze the benefits for energy efficiency. There are costs and benefits for Bonneville in implementing energy efficiency in order reach a better understanding of what those benefits are.
3. The committee looked at a couple of contracts: extending Tom Eckman's contract and Navigant's upgrade of the Regional Portfolio Model.
4. The committee looked at the schedule for developing the new Fish and Wildlife Program and the Power Plan, and when the midterm assessment will be. It looks like that will occur the second half of 2018 and will be completed in December 2018.

Public Affairs
Committee Chair and Council Member Jim Yost reported on the Congressional Staff tour. About 20 staffers took a tour of Lake Pend Oreille, the Clark Fork Delta's habitat projects, Bonner's Ferry and Libby, to look at the dam. Mark Walker reported it was the 10th annual tour. There was a good mix of staff, including district, state and committee staff from both the House and Senate. There was a lot of positive feedback, and great Council Member participation. It was the best tour he's ever experienced.

Member Lorenzen announced there would be an Executive Committee meeting at the close of business.

1. Washington Energy Technologies

The Department of Commerce is a diverse agency that touches every aspect of community and economic development, said Tony Usibelli, special assistant to the director for energy and climate policy at the Washington Department of Commerce. They work with local governments, businesses and civic leaders to strengthen communities so all residents may thrive and prosper. Its energy programs include:

- State Energy Office
- Low-Income Weatherization Program – almost all the funding for low-income weatherization came from federal government
- Low-Income Home Energy Assistance Program (LIHEAP)
- Energy Efficiency and Solar for Public Facilities
- Growth Management Assistance

It's also involved in economic development, including developing clean technologies in the state.

Washington's three energy goals:

1. Maintain competitive energy prices that are fair and reasonable for consumers and businesses, and support the state's continued economic success.
2. Increase competitiveness by fostering a clean energy economy and jobs through business and workforce development.
3. Meet obligations to reduce greenhouse gas emissions.

Member Karier served on the State Energy Strategy Committee about six years ago. Washington maintains the lowest, or among the lowest-cost electricity in the U.S.

Washington's Governor Inslee has focused on how to reduce greenhouse gas emissions. He issued a study on the how Washington can reduce its greenhouse gas emissions by 2050.

The analysis done in the Under 2 MOU indicates you need to reduce total emissions by 80-to-90 percent by 2050. This is a thought piece, not a prediction, Usibelli said. It's a way to understand what some of the implications might be. There are three areas of importance:

1. Investing in energy efficiency makes good sense. As the Council knows, it's the cheapest activity to undertake first.
2. Increasing low-carbon electricity – ensure that when we add new electricity, it has a low-carbon footprint.
3. Electrifying the economy – especially in the transportation sector.

Usibelli said Washington has a very clean electricity system, and it gets a disproportionate share of its emissions from the transportation sector. The state committed to buying 20 percent of all new vehicles to be electric. The state recently purchased 120 Chevy Volt electric vehicles.

He discussed achieving an 86 percent reduction in greenhouse gas emissions. From a technological view, we believe we can get there, he said. He talked about the Clean Energy Fund (CEF) as a way the state can spur development of technologies.

Usibelli also discussed the state's investment in innovative energy technologies and financing programs through the CEF. Since its inception in 2013, the CEF has provided a variety of grants to utilities, nonprofit lenders, research and development organizations, and renewable energy technology manufacturers. They've had two rounds of funding and are gearing up for a third. In Clean Energy Fund 1, they had $36 million for the Revolving Loan Program, Smart Grid Program and Matching Program for Federal Energy R&D.

The first round focused on utility-scale battery projects, such as the Avista's Pullman facility. Puget Sound Energy installed batteries in Glacier for more system resiliency. Snohomish PUD is testing batteries at different locations. Member Karier wondered what has been learned to date. Usibelli said a lot of people around the world are looking at these projects. They want to know what are the technological operating systems, what are the economics (many aren't at this point), and what are the various benefits associated with storage systems?

The idea was to rigorously test these out. People from Korea and Germany are looking at the results. He said Council Members will tour some of the work that Avista is doing at Urbanova, which is trying to understand the data that tells utilities what works and what doesn't. They're funding a transactive campus project, and also funded a number of other projects. A total of $14 million in loans have been granted for a variety of energy-efficiency projects.

Clean Energy Fund 2 provided grants to microgrid projects conducted by companies (such as the Seattle City Light facility) and energy storage at Energy Northwest.

Washington hasn't passed the budget yet for Clean Energy Fund 3, but proposals include:

- Transportation Electrification – $11million

- Grid Modernization Program – $11million
- Matching Program for Energy R&D – $8.6million
- Solar – $4million
- Pacific NW National Lab Hardware – $8million
- Alcoa – Intalco GHG project – $2.4million
- Klickitat Pumped Storage Study – $1.1million

Member Karier asked what should Members look for when touring the microgrid? Usibelli said to see how storage fits into the recent work Avista has been doing — how they fit backup generation. It's a way to take a comprehensive look at different buildings, and to look at how that software is developed. He said the area they funded is the MESA standard. It's an open-source standard that allows people to integrate energy storage through software that is open — meaning that it's not tied to a proprietary software.

Member Lorenzen asked how the cost of battery storage compares to pump hydro. Usibelli replied that the costs are tied to the specific applications you have. They'll have a full day looking at pump storage, batteries and a full-range of technologies.

2. Update on Idaho Power Integrated Resource Plan

Phil Devol, Idaho Power's lead planning analyst for power supply, briefed Council members on the company's Integrated Resource Plan (IRP). It was filed at the end of June in Oregon and Idaho.

The IRP has four goals: resource sufficiency, reliability, a balance between cost and risk, and environmental concerns. It considers new resources: supply side, demand side and transmission resources. Another goal is to involve the public in this process in a meaningful way.

The IRP's planning period is 2017–2036. The first four years are considered Idaho Power's action plan period. The years farther into the future are more like "compass directions."

Devol discussed the different parts of Idaho Power's system. It has 17 MW of hydro generating capacity on the Snake River — the mainstay of the system.

Natural gas: In the last 15 years, Idaho Power has added 760 MW of gas-fired generating capacity. We're finding that those resources provide low-cost, reliable generating capacity, he said. It's an important part going forward.

Coal fleet: It generates a lot of discussion. Utilities across the country are considering reductions and Idaho Power is no exception. They are looking at the economics of owning and operating those coal plants. The company has 1,100 MW of coal-fired generating capacity. Idaho Power is a co-owner of Boardman in Northeast Oregon, which has long been slated for retirement in 2020. North Valmy in Nevada has a baseline assumption in the IRP that

assumes Idaho Power will exit from that plant in 2019 and 2025 for the two units. It is a co-owner of four units at Jim Bridger for a total of 700 MW. Two of four units have been retrofitted to comply with haze regulations. Two others have not. So there's discussion around the economics of owning, operating and retrofitting those.

In addition to generation, Devol discussed off-system purchases. Idaho Power has about 130 PURPA contracts. It's about 1,100 MW of nameplate capacity, including 630 MW of wind and 300 MW of solar. That brings about a need for flexibility. For demand-side resources, such as demand response and energy efficiency, most of the demand response comes from irrigation (390 MW) and 200 aMW of energy efficiency. Idaho Power projects growth in that area in its IRP.

On the load side, Idaho Power currently has 500,000 customers and is projected to add 220 customers by 2036. It has a load of 1,800 MW today with a projected growth to 2100 MW in 20 years.

At what point does load exceed resource projections? Devol said a lot depends on Jim Bridger, but it's the early-to-mid 2020s when Idaho Power needs to consider new resources for its system. Idaho Power is considering four different scenarios of Jim Bridger units 1 and 2 regarding retrofit investments versus early retirement alternatives.

He also discussed the scenario of Boardman-to-Hemingway (B2H) transmission line coming online in 2026. The preferred scenario is the addition of B2H and the retirements of Jim Bridger Units 1 and 2 in 2028 and 2032.

Devol said they focused on Jim Bridger Units 1 and 2 in their analysis. Idaho Power will continue to operate Units 3 and 4 through the 20 years. "Tony Usibelli referenced utilities transitioning away from coal, and we're no exception," he said. "It's a responsibility and objective we have. By the end of the 20-year window, we will exit from 730 MW of our 1,100 MW of coal capacity – about two-thirds."

Some of the uncertainties Idaho Power is examining include natural gas prices, customer load and hydro projections. Energy efficiency is an ongoing, public process, and Idaho Power nearly always exceeds those targets.

Looking at energy storage, Idaho Power anticipates putting more of it into its 2019 IRP. It will allow movement of energy from locations of abundance to areas of scarcity.

Transmission is another big part of Idaho Power's planning strategy. "We see as a cost-effective source for reliability, energy capacity and flexibility," Devol said. Permitting and planning is still underway for the Boardman/Hemingway transmission line and there is continued planning for the Gateway West line from Southern Idaho into Wyoming. The line

from Idaho to Montana is another regional connection Idaho Power uses to import electricity. Idaho Power also plans to join the Energy Imbalance Market this coming April.

Member Lorenzen observed that Idaho Power has a significant issue with the amount of PURPA contracts at their doorstep. “What do you intend to do about those?” he asked. Devol said that as a matter of policy, we spend a lot of time making those projections. We only include what’s under contract.

Member Booth said the Council has heard three or more presentations on how utilities are moving away from fossil fuel-based production. Part of the solution for everyone is that they can go to market to meet peaks, he said. “If everyone is going for the market, are they all digging into the same pocket?” he asked. I want to make sure you’re all working together.

Devol replied that the Council’s Resource Advisory Committee is a good forum for discussing those issues. Further, Idaho Power is a summer-peaking utility with agriculture and air conditioning, so they see going to market as a viable option. “But it’s an ongoing process to evaluate that load and resource balance,” Devol said.

Member Karier said it’s important for the region to meet the energy-efficiency targets of 1,400 MW in six years. If we fall dramatically short, we have more adequacy problems if we don’t hit those targets. I’m wondering about the EIM markets, for Idaho in particular: You have hydro and some coal plants, which might be more expensive on short-term operations. How will it change the dispatch of Idaho’s resources? Will you use hydro more for integration?

I’m not an expert on EIM, Devol said. It’s not something we talked about much for the IRP. My understanding is that you go into the EIM with adequate resources. You can’t go into it leaning on the system. We feel there could be some benefits to participating in that market due to our location and the flexibility we have with our hydro system.

4. Next Fish and Wildlife Program amendment

Council decision on request for ISAB to review the 2014 Fish and Wildlife Program

Tony Grover, Fish and Wildlife Division director, reviewed the document calling for the ISAB to review the 2014 Fish and Wildlife Program. He said it’s up to the Council to do this. It’s a call for recommendations in April 2018. If the Council needs more time, that’s fine, but this is what you were hoping to achieve in last month’s executive committee meeting.

Member Lorenzen asked why we decided to do this. Grover said this schedule brings us to conclusion five years after the day of the last Fish and Wildlife program, which was October 2014. That sets you up nicely for the next Power Plan, he said.

Member Lorenzen asked if this were delayed by a couple of months, what does it do for the Eighth Power Plan? You'd have a few months of flexibility, replied Grover. We can drive to an 18-month schedule from the beginning to the end, and it wouldn't seriously overlap the Power Plan effort.

Member Lorenzen asked what's the downside of starting the Fish and Wildlife Program as early as we're doing? There is no downside, Grover said, but it does require some immediate actions. The Council may want to dig deeper into some issues than otherwise.

Member Lorenzen asked if the Fish and Wildlife Committee has looked at schedule. Yes, Member Anders nodded.

Council Member Bill Bradbury said, "If I look at what fish and wildlife managers are doing, I think that's their busy season. Last time, didn't we extend to make sure people could participate? I assume that fish and wildlife managers are busiest in the warmer months." Grover replied that field biologists aren't the ones writing the recommendations. It's rare for us not to offer an extension, he said. This schedule accommodates extensions and assumes we can deliver in a timely fashion. We'll start with 90 days and see where that goes. We need an ISAB review of the program. It's also in ISAB's work plan for coming fiscal year. What's NOT required is to get the ISAB oversight board to agree that it's a good idea to review the program. They've already agreed to that.

Grover showed the Council an example letter to get the ISAB to start the review process. "We can tee up a discussion at the October meeting about what more you need in the letter," he offered. They'll spend a month getting organized anyway; it's not a quick process. NOAA and CRITFC, as members of the ISAB oversight board, may have questions or requests of their own. Therefore, are you okay with this brief letter or do you want a longer, more nuanced letter?"

Member Bradbury said they had quite a discussion about this in the Fish and Wildlife Committee. He said he's fine with the short letter to get ISAB up and running. Hopefully we will send a more-detailed set of questions in October, he said.

Grover said there's a lot of material in those implementation assessments.

Member Anders said the committee had an involved discussion. It revolves around an opportunity to approach the amendment process this time around. However, the Council's decision to proceed in that regard will inform the letter. It's too premature to decide on the scope of the projects right now. This body (the full Council) would approve the supplemental list of questions to go to the ISAB. The recommendation of the committee is to go with the bare bones version right now.

Member Booth said, “Some of us believe we need to give more guidance to the ISAB than just this. I think this time around we want to think about how we streamline this process. It’s fine as long as we don’t just drag it out, and create more work and more bureaucracy.”

Northwest Power and Conservation Council Motion to Approve a Letter to the ISAB Requesting Review of the 2014 Fish and Wildlife Program

Member Booth moved the Council approve for the signature of the Chair a letter to the ISAB requesting review of the 2014 Fish and Wildlife Program as presented by staff.

Anders second.
Carries without objection.

5. Discussion about the general approach for amendments

Patty O’Toole, staff program implementation manager, said staff has been doing some brainstorming on this approach. They have counted 18 amendment processes in the Council’s history. When we’ve undertaken a comprehensive process, looking at every word … what ends up changing is a handful of issues, she said. How about an alternative approach? If we think the program is working well, an option would be to leave the 2014 program and not edit that. Instead, let’s look at a discrete set of issues and focus our time and attention on those. There are some places where we have some policy disagreements or things we can sharpen and push on. This morning, I cautioned the committee that this doesn’t mean that it makes things faster or easier. Rather, it helps us prioritize our time to deal with critical areas of the program.

O’Toole said she’s not looking for a decision, just soliciting feedback. Staff found that fish and wildlife managers are generally supportive, but they want to provide input into what those key issues are. One example is to take a retrospective look at how mitigation is working. Most think the concept has merit. She said Laura Robinson, staff program liaison coordinator, will walk through these assessments.

Council Member Guy Norman said they received positive feedback in the Regional Forum on the concept of sharpening the review on key issues. He said he’s sensing positive momentum toward that option. I’m a new Council Member, but I don't feel cheated if we sharpen the point and work on key issues, he said. Certainly a regional dialogue would be a key component of this in terms of trying to flag those issues. There will be a lot of interest and input on what those will be under this option.

Member Karier agreed it’s a good idea. During the last review, we spent a lot of time on organizing it, he said. Large parts of the program have been rewritten in different formats. Now we don’t need to rewrite it. But how we select those sections to work on will be

important. I don't hear a lot of complaints about most of the program. One of the most innovative sections is the emerging priorities, and it was a key section that drove a lot of work. I'd hope that would be one area of focus to see what we've accomplished, what we haven't, and what are the emerging priorities? If that were all we did, that would be a lot. We had extensive recommendations on reporting from Bonneville. Most haven't been done and they need to be done, and I would like to have that moved into an emerging priority.

Member Lorenzen commented that in reviewing material related to the implementation assessment, there are so many aspects that it might lose its effectiveness on where it deserves attention. That's why I support what you're doing here. One caveat is to be mindful of the Ninth Circuit is to give deference to the fish and wildlife agencies and the tribes, and if they come up with other areas other than what we focus on, we'll have to do that in a way that does fulfill out statutory obligation. With that caveat, I support focusing on areas we find most important.

6. Briefing on Fish and Wildlife Program implementation assessments

Laura Robinson said the draft Program Implementation Assessments report focuses on 23 strategies. Robinson reviewed the process of assembling the report. Staff began started working on the report several months ago, so it's a good time to see how we're implementing strategies and measures, assess progress and determine how to continue implementing the program. They worked through each strategy and each measure within each strategy. Staff worked with different partners and determined where there was progress was made or lacking. They identified obstacles and possible next steps. The document doesn't get too deep into the weeds, but provides an overview.

The report begins with a table of strategies and a few sentences, followed by the draft report. The report has one-pagers on each strategy. Part II has progress reports for each measure.

Last summer, the report went before the Fish and Wildlife Committee. Staff also received corrections from hatchery managers, and they had a good Regional Coordination Forum discussion yesterday. Fish and wildlife managers are tracking this. They see the benefit of this document, which is still open for feedback.

Member Anders said, "It's been a worthwhile endeavor. Thank you for all your efforts."

Patty O'Toole said one of the driving factors is looking at how we did last time. We want to be responsive if we're asked how we're doing on a given measure. It was frustrating for some to keep it to one page. I've had feedback that would could go deeper in more detail, but if we look at the amendment process, need to look at doing that or looking at the issues we need to wrestle with. There's lots of good work in here to use as an update.

Member Karier said doing an assessment is a good idea. Not so much about what the assessment says, but what's been done. I think of it in terms of tangible, physical outcomes that you could give to someone who wrote the checks, he said. There's a lot of stuff in the program already. This is too much to read. It would be better to focus on what's been done and what's left to do. Some areas, we have not made much progress at all. At an executive level, we need to see those results that if you put it in a press release, it would be impressive.

Member Lorenzen said that one of the challenges is that some of the measures depend upon agencies. Do you send the report to the agencies to say we need more help here? He floated the idea of using a red, yellow or green indicator to show how they're doing on each measure.

Grover said he showed an earlier version of the table when he met with the Federal Caucus in late July and they were overwhelmed. We talked about things that are dependent upon our federal partners. Just the two-to-three pages of tables were a difficult thing for them to get their heads around. I agree with Member Karier and Member Lorenzen to make it more communicable.

Member Lorenzen said if you try to do too much, you end up doing too little.

Member Norman said, "I appreciate the idea of bottom-line summaries of what's been accomplished and what's left to do. I appreciate this report. You can go dive in as deep as you want. It's a good idea for staff to narrow things down to a more-readable version. I appreciate the opportunity to dig in deeper."

Member Booth said he thinks it's a first step. A sweep. It needs more work to make it more manageable and useful.

Grover said he's hoping they can all agree that there's too much information. But to give you an honest report, we had to do this, he said. I recommend spending time on three-to-six issues to dig into and leave the rest as they are. There was a suggestion by some of the regional coordinators to link all these to different project, but some are overlapping. After you contemplate this awhile, maybe the best next step is to identify where should we be focusing our efforts.

Member Karier said, "I want to hear from Patty and Laura. Does this report say there's been great progress? It's difficult to tell because you don't see great biological benefits. What would you say if you were an outsider?"

O'Toole said, "There are instances of all of those. "The approach is a progress report of accomplishments and where do we double down with two years left? I felt really positive. As everyone got into it, we were impressed with all the progress. Some of where we're stuck, we have some policy choices we have to make. Wildlife is a good example."

Robinson mentioned three areas where the strategies don't line up: Construction and Inundation losses, operational losses, and monitoring and evaluation of the wildlife projects.

O'Toole said that mitigation has been occurring and some areas are nearing completion. We can document where we've met that obligation. There has been some accounting as well. There's recognition that that part of the program has been progressing really well.

Grover said as the Council reads these next month, there will be discussions starting tomorrow about what issues to focus on for the next amendment. That will provide focus on two things:

1. Where are we stuck because program language is confounding?
2. What are the opportunities we work on in the next two years?

We'll bring that list to the October meeting. You can bring your thoughts to that meeting. We don't think there's a lot of science that needs to be done. We have abundant science, or the science can't answer the kinds of questions people have answers to. What's lacking is policy framework that this body could provide.

Chair Lorenzen recessed the meeting at 3:59 p.m.

Wednesday, September 13, 2017
Chair Lorenzen brought the meeting back to order at 8:35 a.m.

7. **Briefing on the Upper and Mid-Columbia sturgeon activities.**

Lynn Palensky introduced the panelists.

Upper Columbia**:** Jason McLellan, research scientist with the Colville Confederated Tribes Mitch Combs, Washington Department of Fish and Wildlife, and Andy Miller with the Spokane Tribe.

Mid-Columbia: Paul Anders, principal scientists with Cramer Fish Sciences, and on the phone, Lance Keller from Chelan PUD, and Andrew Gingrich from Douglas County PUD.

Palensky said that the Upper Columbia sturgeon efforts are 80 percent BPA funded. The Mid-Columbia programs have a lot of funders, including Accords funding, PUD funding, Bureau of Indian Affairs and BPA. A lot of folks have dedicated a lot of time to this effort, she said.

Upper Columbia presentation

McLellan provided background on white sturgeon, the largest freshwater fish in North America. It is distributed in three major river drainages: Fraser, Columbia, and the

Sacramento/San Juaquin. They are culturally important to the tribes and for nontribal fisheries. Persistent recruitment failure discussed.

The Upper Columbia White Sturgeon Recovery Initiative established. A plan was developed in 2002 and revised in 2012.

The main recovery objectives and strategies are:

- Monitor status and trends – the stock assessment shows a wild sturgeon abundance of about 3,000 fish, mostly large adults.
- Supplementation (conservation aquaculture program)
- Identify and address factors limiting natural recruitment

Conservation aquaculture is a 20-year program, McLellan said. The goals are to restore population demographics and preserve genetic diversity. The program began in British Columbia in 2001. They started a Washington component in 2004. Washington became self sufficient in 2006, no longer relying on broodstock collected in B.C. In the first year, we had low survival. The projection is if we stocked at 16,000, we would have 30,000 adults in 100 years. We were concerned that would be beyond the carrying capacity of the population. Our target is 5,000 adults, so we adjusted down to 8,000 fish. We still had poor confidence in our survival estimates.

We began wild larvae pilot in 2010. It was successful. We had a program review in 2014. We found differences in survival based on the size of the fish released. Washington fish were released at twice the size of B.C. We had about 31,000 hatchery fish greater than age five in the population in 2014.

McLellan said they did a coordinated stock assessment with B.C. for the first time on both sides of the border. They'll do another in 2017, the last year of the coordinated stock assessment program. Also, B.C. switched to wild eggs and larvae in 2014. They have better success with eggs than with larvae. The total number of fish stocked is 149,849 in B.C. and Washington.

In 2017 an effort began to target hatchery fish with a retention fishery in Lake Roosevelt. There's also a spawning sanctuary to protect adults. There's an ongoing tribal fishery. We don't have enough tribal folks who can exert the same fishing pressure that non-tribal people are. There was a nontribal fishery for two months. Estimates show 3,000 fish have been harvested. We're monitoring this through creel survey and stock assessment.

McLellan discussed larval collection results. It stated with a few thousand fish. Now they can collect more than 30,000–40,000 larvae.

Regarding recruitment failure, there's a bottleneck at the larval/early juvenile stages. There are five primary hypotheses:

- Flow alterations/turbidity
- Habitat (substrate)
- Predation
- Food availability
- Contaminants

Mid-Columbia presentation:

Paul Anders discussed efforts by each PUD that have renewed FERC licenses. The goals of different PUD management plans are:

Douglas PUD: Increase the white sturgeon population in the Wells Reservoir to a level that can be supported by the available habitat and characterized by a diverse age structure consisting of multiple cohorts.

Chelan PUD: Promote growth of the white sturgeon population in the reservoir to a level commensurate with available habitat by year 30 of the new license.

Grant PUD: (1) Identify and address project effects on white sturgeon and, (2) develop and implement "implementation measures" to avoid and mitigate for project effects of white sturgeon. Adaptive management shall be applied to resolve critical uncertainties.

The common goal:
" Increase white sturgeon growth, diversity, and abundance, commensurate with available habitat, while adaptively managing critical uncertainties and avoiding or mitigating project effects"

There are shared objectives:
1. Increase white sturgeon abundance, spawning and rearing;
2. Effectiveness monitoring;
3. Assess natural production and carrying capacity; and
4. Adaptively manage component where you use empirical data.

Anders said this group hasn't been together as long as Jason's, but each has workgroups that meet monthly to refine these plans. Each PUD has an independent but highly coordinated process (states, feds, tribes and PUDs)

All broodstock are spawned at the Yakama Nation facility
- Maximize number of crosses / families

Many broodstock recently collected below McNary Dam

- Also Mid-C (Vernita Bar area), The Dalles and Bonneville pools, and some juveniles from Lake Roosevelt.
- A longer-term, negotiated broodstock source strategy is needed.

Assessing larval collection in the lower Columbia
- Nearly 20 years of data show very low catch rates.

Yakama project's goal is to restore healthy, harvestable white sturgeon populations and fisheries in Mid-Columbia River and Lower Snake reservoirs. Its objectives are to:
- Contribute to white sturgeon recovery, research, monitoring, and a Hatchery Master Plan – federal projects (Columbia and Snake).
- Further develop critical expertise and refine white sturgeon culture with tribal staff and collaborators.
- Develop an implementation plan for white sturgeon production, rearing, monitoring and evaluation, and AM.

They believe the program has met, and continues to meet these objectives. We have to use longer time periods to evaluate sturgeon.

Anders discussed production at Marion Drain — the Yakama Nation sturgeon production facility. It uses a "conventional" white sturgeon hatchery approach versus repatriation. It would be nice not to have to rely on that for fish production. The program is talking about more than doubling production at less cost, he said. The Yakama are in step two of a three-step process, and more-detailed information will be forthcoming.

Conclusions:
A lot of scientific information and knowledge is growing annually. There's great talent and commitment by all the agencies involved. The process seems to be working, sometimes more successful than expected from the metrics.

Long-term challenges include:
- Broodstock collection, genetic and demographic management:
- Accurately estimating population size and inter-species relationships (lamprey); and
- Food web and trophic effects.

Questions:

Member Booth said he didn't know there were this many white sturgeon projects around the region. Could you provide a list of all the projects? Palensky replied that these are all the sturgeon projects under the program. They total roughly $15 million. White sturgeon projects in the Snake River are funded by Idaho Power. Member Booth asked for funding numbers on projects and their partners.

Member Karier referred to the high-flow year of 1997. “What happened to the sturgeon during that year versus other years?” he asked. “Did the juveniles survive that period? Is that only year wild larvae survived through that period?” McLellan replied, “Yes, it’s the only year they have detectable recruitment that they can link back to a specific year. They comprised up to 10 percent of our stock assessment catch where they were discernable before they grew to overlap with the other years.”

Member Karier said, “It’s continuous. It didn’t stop at any point. Those recruits are still in the mix.”

McLellan said they are, that was 1997.

“That was the highest flow year in the Columbia,” Member Karier said. “Do we need more of those?”

“We do,” McLellan replied. “We need 14 degrees C in mid-June and 200,000+ cfs in mid-July.”

Member Karier noted that the Kootenai project is doing similar work in trying to trace back the recruitment problems. He asked, “Are you finding the same results ruling out certain factors, and finding others? Or is it a different research effort?”

McLellan replied they coordinate with the Kootenai and meet annually. There are some similarities and some differences in the programs. “The main difference is that their recruitment is associated with spawning habitat,” he said. “We thought that was the case in the upper Columbia. But now with our early life history research, and the fact that we catch tens of thousands of those first-feeding larvae, we find that our bottleneck occurs at a later life stage.”

“They don’t find larvae, do they?” Member Karier asked. “Rarely,” McLellan answered.

Anders said they looked at all the data they have from the Kootenai program and there are very small numbers of fish, sometimes only one, that are estimated back over the past 58 years that we can hindcast in terms of wild production. They’ve caught just a handful of larvae, less than 10 caught in several decades of sampling, which is one reason they can’t pursue this repatriation.

“Is that because they’re hard to find or they’re not there?” Member Karier asked.

I think they’re not there, Anders replied. The same gear and same techniques have been used all over the basin for 20 years. The fact we’ve seen less than a 1,000 wild fish since the 1960s indicates there might be a mismatch occurring at the embryo stage.

“It’s possible that the problem might be different in different areas,” Member Karier said.

“The Kootenai population has recruitment failure occurring from different mechanisms at an earlier point in their development,” Anders said. “If you resolve that, you move on to the next bottleneck. We haven’t been able to get there yet.”

Anders commented on the 1997 high-flow year saying they looked data for the CRITFC program. There’s about 18 years of larval catch data around the Basin. They looked at data from the lower Snake and lower Columbia pools, and described the possible impact of high flows.

Member Karier said, “That seems to be the theory Jason is testing, that the value of the high flow is it moves the larvae into a different area faster.”

McLellan said, “Yes, through the modeling and the translocation experiment. We’re catching larvae, marking them and moving them downstream to where the modeling indicates they should be at a certain point in time and looking for a response.”

“And you don’t have those results yet,” Member Karier said. “This is the first year of releases,” McLellan answered. “We’ll be looking for our juveniles in the fall.”

Member Norman said, “With reference to the Upper Columbia, what a great problem to have. You have a propagation program so successful, you have to cut it back and start a fishery.” He asked about the difference between the survival components of the young of the year between the upper and lower river. He observed that they’re finding a lot of larvae, but the since 1997, you haven’t seen the transitions into juvenile stage. In the lower river, there’s been a recent-year reduction in recruitment as well. A lot of that is associated with a lack of larvae. “I’m wondering if there’s a difference in their ability to assess larvae abundance with catch techniques, or is there a difference — is the lower river problem associated with spawning success versus the early life stage, or is it a similar situation to Lake Roosevelt?”

McLellan said the difference in ability to collect larvae is sizable between Upper and Mid-Columbia. In the Mid-Columbia, they’re limited by navigation constraints and wind issues. Plus, just the general size of the river, relative to what we have on the Upper Columbia. Even if they are doing early life history work, they have challenges we don’t have on the Upper Columbia. Some mechanisms might be the same for recruitment failure, but we would have to look closer at each one.

There is coordination and data exchange between the Upper and Mid-Columbia, Member Norman surmised. Yes, confirmed McLellan.

I agree with what Jason said, Anders added. When the studies are first initiated, a lot of populations may be co-limited in terms of broodstock limitation and habitat limitation. It takes a long time to test the stock limitation hypothesis to let the fish get to adult age in any of these

reservoirs. There is a series of basinwide meetings. There's one planned for November in Coeur d'Alene.

Member Norman asked if there are any early indicators of survival in the PUD reservoirs. McLellan said there are some preliminary estimates ranging about 40 percent in the year of release. Member Norman asked if there is enough information yet to see differences in their survival yet? No, replied McLellan.

8. Briefing on Avista Integrated Resource Plan and Urbanova Smart Cities Project:

Tina Jayaweera, staff senior analyst, introduced Heather Rosentrater, Avista's vice president of energy delivery, and James Gall, Avista's senior power supply analyst, to brief the Council on the company's Urbanova Smart Cities Project and Integrated Resource Plan.

Located in Spokane's university district, Rosentrater said that Urbanova builds upon existing utility infrastructure to research and test new energy-saving technologies. She said that half area is underdeveloped, so they decided to create a living laboratory in this area.

Rosentrater said the objective of Urbanova is to position the University District as a "smart city" proving ground, including harnessing data to gain insights, empower people and solve urban challenges in new ways.

One of the new technologies already being used is the Smart and Connected Streetlight Pilot, which aims to manage and control streetlights to increase energy efficiency. Avista owns a lot of them, Rosentrater said. They are replacing the sodium lights with LEDs. They brainstormed other uses for the lights. For example, the university was interested in sensors to detect air quality at the neighborhood level. This is of particular interest given recent air quality issues due to wildfires.

In addition, Urbanonva is piloting a Shared Energy Economy Model, which will allow various energy assets — from solar panels, battery storage and other utility assets — to be shared and used for multiple purposes, including system efficiency and grid resiliency. Avista was recently awarded a grant from the Washington Department of Commerce and Governor Jay Inslee's Clean Energy Fund to demonstrate how a Shared Energy Economy can benefit Washington energy consumers. There's nothing installed yet, they're still in the planning phase.

Rosentrater talked about the company's Gallup "Phase O" project. She said Avista wants to make sure they're doing qualitative and quantitative research, including doing in-depth interviews with community members.

Going forward, Avista formed a 501c3, for continued entity development and a technology and governance roadmap. They're looking for additional partners and proofpoints. She hopes the presentation would provide context before Council Members go on a tour of the project.

Member Karier asked what kinds of batteries are being tested.

Rosentrater said lithium ion is a popular one. We have benefits with stationary use so there's not the footprint issue as in the transportation industry. The vanadium flow was a good one to test because it doesn't have as much loss of life when it's cycled. The lithium ion has loss of life every time you cycle it. We're still interested in different types and their pros and cons. We're planning on going out for an RFP for these battery projects.

Member Karier asked if there's any demand response. Rosentrater replied that it would be integrated with the building management systems to identify opportunities to prioritize loads.

James Gall summarized Avista's IRP, which was released last August:

Avista 20-year forecast is that natural gas and renewables are going to be the preferred choices for meeting load growth and replacing coal generation. Natural gas prices, which drive electric prices, they will stay low, Gall said. He said they see some growth to a levelized price of $4.20, but they still think there's some potential for volatility. Mid-Columbia prices will be in the mid $30 per MW range over the life of the plan. Prices will be much more stable, but there risk of volatility depending on what happens with carbon emissions and natural gas prices.

He reviewed the impact of a lot of solar growth in California and the Northwest to meet RPS requirements.

Gall discussed greenhouse gas forecasts: "We have a diff approach to modeling greenhouse gas in this IRP," he said. "Typically, IRPs like to put in a price for the model. We want to have each state reduce its emissions to a certain level and the model will give us a price to achieve that result based on the resource we select, where loads are going, and how the resource is dispatched."

He said for Washington and Oregon, it's $5 to $10–$15, which is fairly low. It depends on where natural gas prices are, where renewables are in the system and when coal plants retire. A lot of their forecasts depended on what the Clean Power Plan was, which they expect to return in some way at some point.

The IRP looked at what the market would do if carbon emissions were reduced by 50 percent from 1990 levels. To achieve that we'd have to approach a carbon price of $60 per ton, he said.

Member Lorenzen asked from what sources? Just from electric power sector, Gall replied. Member Lorenzen said but within the region, it seems like a major contributor is transportation. If you reduce it by 50 percent, you're not considering transportation.

If transportation is electrified, Gall said, my expectation is higher load, more gas turbines, more solar, more wind, and a lot of capital investing.

The resources needed to achieve that 50 percent reduction. Coal would have to be eliminated. Gas would have to be increased as well as solar. Wind didn't change much as the issue is how much can be put on the system? He said the report is a good tool to use for policymakers.

Avista hasn't added significant capacity or natural gas resources in last five-to-six years. The last major acquisition is Lancaster, a natural gas-fired power plant under contract until 2026. Loads are forecasted to grow at 0.9%, energy efficiency serves 53.3% of growth for a net growth of 0.47%. Conservation represents half of new resource needs.

Lancaster is driving the utility's resource needs. When that contract goes away, it puts Idaho Power in a deficit position. In 2030, its Chelan agreement ends.

The efficiency frontier: we have a mix of energy. We look at different resources and how profitable they are, and what value we can get from the marketplace. Model looks at how to serve the load need at least cost. In 2015, Idaho Power chose a portfolio slightly more expensive, but least risk. This one is lower cost and slightly higher risk, he said.

He said in Avista's 2011 IRP, it predicted a need for 1,000 MW of new generation; now it's down to 400 MW. Avista's preferred resource strategy is to replace power from the Lancaster natural gas plant with a 200-MW natural gas peaker, which will reduce carbon emissions because it will run less frequently. In addition, Avista plans to upgrade its thermal fleet to add capacity, and it will add additional natural gas peakers in 2030 and 2034. Gall said that perhaps in a future plan those peakers could be replaced with storage, depending on the technology. The utility continues to weigh cost and carbon impact options on removing Colstrip from its portfolio.

Avista emissions are at 2.5 tons per year. When the Lancaster combined cycle turbine is replaced by a peaker (which runs less), it will reduce emissions.

Gall outlined Colstrip retirement scenarios: Using a peaker is a lower cost than just not running Colstrip as much.

Looking at direct greenhouse gas emissions, Gall said Washington State emission goals are in reach.

Questions:

Member Yost said he's surprised Idaho Power selected peakers instead of combined cycles. It was a difficult decision, Gall replied. The model doesn't pick resources, it tells you what the costs are. We have a facility with a contract. If we can renegotiate or purchase it at a lower cost, then building new, we'd prefer that. But the next lowest-option was the peaker. It gives us more flexibility.

Member Yost asked when Lancaster was built. Gall said it was 2001. The technology that's there now, in 2025, you'll have to refurbish it and start to replace equipment. Then it could be brought up to spec to be one of the most efficient gas turbines.

Member Karier asked how often would they run the peaker. Gall replied 5 to 10 percent. It depends what equipment you use. Lancaster is operates 40-80 percent of the time, depending on the water year. "You can buy the energy on the market and generate the capacity," Member Karier said.

Member Norman said, "You had a graph showing range on-off peak at $8, dropping down and then climbing back when storage technologies advance. How does that work?"

Gall said the price of power is correlated with loads. When you have zero marginal costs (solar), it will drive prices down during the middle of the day. We expect about 30,000 MW of solar in California, which will put downward pressure during the middle of the day. Off-peak prices are less than on-peak prices in the spring. As storage comes on, it will store the power during the day for use at night.

Member Anders asked about Gall's projections for new capacity resources. In the 2021 period, you stated the need for 7,000 MW of natural gas resources to meet load. Our adequacy assessments come up with 4,000 MW to meet our goals. Gall replied that he'll have to check if their numbers are for the whole West…the 7,000 MW could be a regional number.

9. Presentation by Steve Wright (the full text of his remarks is available on the Council website, www.nwcouncil.org)

Mark Walker, Public Affairs Division director, introduced Steve Wright, who was named Chelan County PUD's general manager in September 2013 after 12 years of service as the BPA administrator.

Wright began with three major themes:

1. Least cost planning and greenhouse gas emissions. His first job at BPA was developing the conservation supply curves, working with Tom Eckman at the Council. The beauty of the NW Power Act is the least cost planning approach — the fundamental thing that

has worked for 35 years. It's a timeless methodology for assessing planning decisions that is flexible for technology evolutions, price movements and innovation. Least cost planning is a lot like exercising and eating vegetables: it's the hard work that pays off when difficult decisions need to be made. When used correctly, it leads to better public policy decisions. The framers of the Northwest Power Act didn't anticipate the closure of nuclear power plants. And that happened in five years. And it happened because of least-cost planning. If they had chosen a generation portfolio, they would have gotten it wrong.

Today, least cost planning also allows us to consider the rapidly declining prices of wind, solar and natural gas. Least cost planning brought together our environmental and economic objectives that have broad support across the political spectrum.

What can we learn? The most significant change in the electric industry is that we're moving from least-cost planning to reliably meeting load. Many of us grew up with keeping rates low as being the most-important objective. Today we're driven by goals to achieve greenhouse gas reductions. Policies include limitations on using fossil fuels, renewable portfolio standards, carbon emission limitations, carbon pricing regimes are all in support of the worthy goal of making a contribution to greenhouse gas reductions.

But our approach is in a haphazard manner. It isn't driven by a least-cost planning process. We need an analytical approach to greenhouse gas reductions. Washington Governor Jay Inslee's 2015 CERT called for the development of such a tool. Not much came of that. At Chelan we tried to develop one, a kindergarten-level approach. That work was completed last year. The public generating pool is completing an advancement of that

It was hard work to figure out least cost power planning. With greenhouse gas, it's even harder. The analysis has to include interaction between sectors, such as generation and transmission and building. We're not good at that. Greenhouse gas emissions profiles are different between regions. So you can't do a big, national study that will address all these, it has to be done at the regional level. Also, there's the difficulty of trying to resolve least cost for two variables: for load and for greenhouse gas. But if we understood where the overlap is, we'd be in a better position to achieve our economic and environmental objectives.

Do the right analysis and good things will follow. Maybe the Council would be a good place to do this work. My experience is that the Council does excellent job with power plans. The work on the Seventh Power Plan in the appendices that analyzes greenhouse gas reductions is a sound foundation. The problem for the Council is that it's funded by BPA ratepayers, and they alone should not have to support this effort. So it might be a stretch for the Council to take this on. For the work we have done, energy efficiency and hydro are the two strategies that accomplish both strategies of meeting load and greenhouse gas reductions. There's a funding stream not showing up for energy efficiency in hydropower. It's hard to imagine a path to decarbonization that doesn't include electrification of transportation and buildings. It will impact future power plans whether we like it or not.

2. The need for hydropower renewal. We have a special relationship with hydro. It's our dominant resource and our foundation for our low rates, high reliability and clean air. The most common question is why isn't it a renewable in the public policy arena? There's a logic to why it happened — to provide a foothold in the marketplace for non-hydro renewables. But as we get to higher levels of non-hydro renewable standards, we need to recognize and treasure the value that hydro brings to the market.

I think hydro is being taken for granted in the public policy world. California is moving to a 60 percent renewable portfolio standard that doesn't include hydro, and a 40 percent zero emissions standard that specifically excluded hydro imports from the Northwest. We did a study that shows – 5 percent of California's load is served by Northwest hydro. It produces 6-7 million tons of greenhouse gas emissions reductions and millions in savings for consumers. Opportunities for expansion as we move into solar surpluses. That provision was removed from the bill, but we're worried how things will be treated in the future.

There are a significant number of commercial customers looking to leave their load-serving entity. Conditionality is that you have bring something new to the table. And those criteria are excluding hydro. So it's another piece of the market being walled off from hydropower.

Wright discussed tax credit policy – Production Tax Credits and Investment Tax Credits don't provide benefits for hydro. Looking at research and development policy – Federal R&D activities — just a very small amount goes to hydro. The best example is hydro relicensing. It takes 10 years to relicense a hydro project, but a couple of years to license any other kind of generating project. These policies poorly reflect importance of hydro to meet our environmental and economic objectives.

He discussed the reliability benefits of hydro: public demands greater reliability moving to a digital economy. If one thinks about services, they include the following: energy, producing kWH, producing capacity, needing flexible capacity, needing regulation to respond and needing spinning and non-spinning reserves. There's a need for black start capability and inertia. If you think about all those services needed for reliability there's only one generating resource that does all of them well: hydropower. It's fundamentally misunderstood in the public policy world. Things are changing and hydro needs reinvestment. It's an aging resource that needs substantial refurbishment. But it is expensive and you're comparing that to market prices.

Wright said they operate Rock Island Dam, the first dam on the Columbia River, built in 1931. We have cracks in the turbine blades. Need to replace them. They're the original turbines. But things need to be fixed.

When you do the analysis, there are three values to electricity: energy, capacity and carbon. All three are undervalued in the market.

Negative pricing phenomenon will change, as the tax credits roll off, but it will be a decade or more before that happens. In the West, we do a poor job of valuing capacity. There are swings between over and undervaluing because of a lack of storage. Currently we're undervaluing. Current market prices provide inadequate revenue to invest in new or refurbished capacity for peak or for flexibility purposes.

Even back in 2008, we saw this problem coming for variable energy resources. But we didn't see how fast it would come. It's a radical change to system operations. There's a reason why the duck curve shows up at every conference you attend, because it turns traditional system operations upside down on its head. The whole system is built around the idea that the light load is at night and the heavy load is during the day. There is a risk for reliability, particularly addressing the question of the duck's neck (the evening upramp). The question is will we have adequate flexibility and can we put it into place quickly enough? I also fear a surge in prices on the duck's neck in the high hundreds of dollars. I fear it will be a precursor to future challenges. CAISO laid out near and long-term challenges in dealing with the ramp. But it didn't provide any long-term solutions.

We need policies that ensure adequate investments in flexible capacity.

3. Carbon: The California cap and trade is the only market in the West. Prices are less than $15 per metric ton, which is too low to achieve the 50-80 percent reductions that are called for.
If greenhouse gas reductions are going to be pursued, then the California cap and trade policy should be expanded to other states.

Some will say, "Well low prices sound good to most consumers." If that can be sustained, it is good. But if that leads to underinvestment, the consequences can be severe.

The most scarring event of my career was the west coast energy crisis, he said. I saw the impacts on people and families.

The stories they tell about being pilloried and picketed, public meetings begging people to do something. What needed to happen was more action ahead of that moment. We had studies that we had adequacy problems, but we couldn't act on them. Being short on supply is expensive and destabilizing.

We want to be close to California, but not too close. We don't want their policies to negatively impact our prices and resources. We have three options:

1. Status quo – system can operate the way it does today.
2. Create more connections with California – we provide a lot of balancing services and fuel displacement, and big hydro is the natural complement to building more solar surpluses in California.

3. Do less with California – proposals on RPS that limit energy imports can lead to less integration.

At Chelan, we carefully watch and engage in California issues, such as the size of RPS. What resources qualify as renewable, Resource adequacy requirements. What's the cap and trade policy? What's the governance structure of CAISO and will become more regional? All are significant issues that will have a big impact on generation and transmission investments, and these decisions will have an impact on rates and system reliability in the Northwest in the next decade.

Can we have hydropower and salmon? Yes, I've believed that for my entire career. I know the Council believes it too. The improvements in survival over the last 30 years are well documented. I see a region revisiting whether to invest in spill or habitat restoration. There are some who view habitat restoration biological benefits as not reasonably certain to occur even when there's a commitment to a financial investment. True, there's more data on in-river mainstem survival than on habitat restoration. Columbia River salmon are among the most studied species in the world due to hydropower dollars. Just because we have more data on mainstem survival, it should not diminish the evaluation of the biological benefits of off-mainstem habitat restoration.

There are 11 million people in the Northwest. There was one million in the region at the turn of the last century. The habitat has been altered, and in more places than the mainstem of the Columbia and the Snake rivers. The hydro system is the primary funding source to address the degradation in habitat caused by humans.

Wright said the best advice for policy makers I could give is prepare for the future, accept what I think has become obvious, at least in the West Coast states, that greenhouse gas emissions reduction policy will drive electricity policy. Whether you like it or not, it's just the facts on the ground today that it does drive electricity policy.

Develop the analytical tools and strategies to define least-cost approaches that seek to simultaneously achieve our economic and environmental, particularly our greenhouse gas emissions reductions goals; support strategies based on that analysis that create adequate compensation to promote investment to ensure we can reliably meet load, avoid rate excursions and achieve our greenhouse gas emissions reductions targets; pursue technology-neutral analysis and policies that allow for innovation and evolution because we are not good at predicting the future. That's probably my number one learning from the last 35 years. Engage in inter-regional discussions with the intention of supporting least-cost strategies to consumers that allocate benefits so everyone wins; and treasure the output of the hydropower system and support strategies that protect salmonids at the same time.

Member Lorenzen remarked about the concept of using least-cost planning for reduction of greenhouse gases. “I think that’s something that we as a society have not embraced yet, and I think it’s something that would be incredibly beneficial.”

Member Karier said the Council has had a series of presentations from Northwest leaders, and it’s very helpful to hear those observations. You talked about results of a study that showed energy efficiency and hydropower as being two of the major valuable resources going forward. Together, they are two of the major solutions to these problems. Energy efficiency frees up hydropower to be used for more things, such as for capacity and flexibility. So the fundamental problem, from an economic point of view is that it is undervalued. People aren’t valuing that freed-up hydropower that can provide all those resources and help solve the duck curve, help solve all these other issues. Energy efficiency where in the region is always struggling. Many utilities are saying why should we do it if we only save $20 a MWH in the energy market? Somehow we have to figure out how to sell that hydropower at a rate that is commensurate with the value it’s providing, and at the same time avoid some of the new gas plants that are being proposed that are going to operate 5 or 10 percent of the time. They are extraordinarily expensive and again, this freed-up hydropower can replace that. So our markets aren’t working, the signals aren’t working, but I think at Bonneville and maybe at Chelan where you have hydropower and energy efficiency opportunities, maybe there are ways to figure out contracts and ways to sell that hydropower at a reasonable price. Is that something that’s possible?

Wright replied, “Absolutely. While a lot of my talk focused on hydropower, you heard the words energy efficiency a few times because I do believe that energy efficiency is a key component that wins in almost any scenario. We’re doing with the NRDC on the additionality principles. One of the criteria that we are asking folks to consider is one where those who want additionality would support investment in energy efficiency that would then free up hydropower that they could be delivered to them. So why not make an investment that goes beyond what would be cost effective for the electric system, but if one took into account the cost of carbon, would be a cost-effective investment, and then that does free up hydropower as you say and ultimately these businesses need kilowatt hours delivered to them. They can’t operate on air. So use hydropower to be delivered to them that would be freed up. So yes, and that’s just one of many ways that we can make the connections between these resources.

Member Lorenzen asked, “What do you consider the greatest impediments to being able to monetize the value of the hydro system in terms of flexibility, frequency support, all those other benefits that come from it? What are the barriers?

Wright said that we as a country have not really figured capacity markets. There are complaints about capacity markets in every market, whether it’s PJM, MISO or ERCOT, we find it very difficult to successfully operate capacity markets. And there is a nascent and very not-well-formed capacity market in California, and people are caught between operating in organized markets and bilateral markets. So number one is the structure of markets. Can we

find a way to actually put them together that will compensate all these various reliability services that are necessary in order to make it work? There is some progress being made, FERC has put in place policies with respect to frequency regulation, there is a frequency regulation market today; we are selling into that market today. Bonneville is selling into that market today. Those markets didn't exist even two years ago so we're making some pretty good progress there.

But there's also a psychological problem beyond the markets. This is very similar to what happened in 1999 as we approached the West Coast energy crisis, which is when you have a big surplus of energy and people can buy a strip of energy for five years at a really low price. Then it is very tempting to say I'm going to do something that's going to lower my rates today and I'm going to be a hero in my community by lowering rates today. But if you rely on that market, and then it turns out that it's short and you don't have the capacity, it takes a while to build the capacity to make it happen. That's where you get the big price spikes. And so it takes some planning regime on top of that to call to the attention that in fact there is a need to take action early and to avoid the siren song of the short-term energy prices.

Personally, I'm a fan of moving toward some sort of resource adequacy standard. I think that resource adequacy standards are part of the deal, if you are a load-serving entity. That we all work together and we make sure that we are going to be adequate as a whole to make sure that there is enough supply and demand to avoid those kinds of price excursions. But it is very difficult to figure out how to put those in place. What's the regulatory regime to make it work, and so I'm not going to say it's easy, but something that moves us in a direction of making sure we have adequate planning and then some mechanism that causes us to actually act on that planning is where we need to move to.

Member Booth said that one of his concerns as well is the issue of adequacy of the system. One of the first initiatives of the new Department of Energy was an extensive white paper on adequacy and capacity that's just been published. It focused more on reserves and fuel on site and so forth, and was very supportive of the hydro system. I don't know if you've reviewed that.

Wright said he had and there is some very good language in there with respect to hydro.

Member Booth said, "So I'm just wondering if with that new initiative coming out of Washington from the Department of Energy, if you might see an opportunity for Northwest hydropower folks to work with the department in trying to address some of these issues that we have along the lines of subsidies for variable resources. It may take some national policy on looking at it as you do rather than a quick, easy fix. What does this mean for the longer term? I just wonder if you've given that any thought and if you see any opportunity there for maybe some national leadership now on this matter."

Wright replied that electricity policy in our country has always been somewhat confused as to whether it operates at the federal level, the state level or the regional level. And there are elements of all three. The prerogatives of the states and the feds are jealously guarded by whoever happens to be sitting in those positions. So the fact of the matter is it is going to take action at all three levels in order to be successful in addressing the issues there.

There are actions again that FERC can take through the organized markets and I will come back to frequency regulation as an example. We do see some progress there that is good and helpful. There is a development of a resource adequacy standard in the California ISO market, which I think has potential. If you go back to the paper that the CAISO produced in the so-called FRACMOO, the flexible resource adequacy must offer obligation process, it actually is fairly important in terms of saying we need to find some ways to be able to address these issues of making sure that we have flexible capacity on the system.

So what it unfortunately takes is I would love to be able to tell you that there are a couple of key points in the process and if you just touch those it's going to work. Unfortunately, it's bigger than that. Just the way that electricity policies have evolved in our country, there are many different points in this process that we're going to need to address in order to be able to get to the key thing which the Department of Energy report is addressing, which is price formation. How do we get adequate prices to make sure that we will have the capacity that we need? I'm not candidly a fan of the term "baseload capacity" anymore because I think that with all of the variable resources that operate in our system we have to have flexible capacity. I'm more concerned with that. But it really doesn't matter what your term is. They are both going at the same issue which is how do you get price formation in the market that will then attract investment? So last year just at Chelan we filed in 40 different regulatory proceedings because there is policy going on that impacts the prices in the western power market. And candidly, we're not that big an entity. It is hard for us to support that so we're trying to figure out how we can try to move the ball in a lot of different arenas.

10. Presentation on innovative water projects

Stacy Horton, Washington office policy analyst/biologist, introduced Guy J. Gregory, technical unit supervisor for the Washington Department of Ecology's water resources program; and JT Steenkamp, project manager of the Pearl Hill Project, Shell Energy.

Gregory outlined the agency's work siting new water storage facilities in the state. In 2006, the Washington State Legislature passed the Columbia River Bill, directing the agency to aggressively pursue the development of new water supplies. Included is the search for storage.

Water demand in the winter is low, so the aim is to store it and release it in the summer for "people farms and fish." Gregory said that siting surface water storage in Washington is

problematic, and building dams cost a lot of money. “We were looking at $2 billion, which is a lot of money for water to grow potatoes,” he said.

With aquifer storage and recovery, they can inject water into rock formations and extract it later. In Douglas County, they found five different storage opportunities. While it’s a little less than they hoped for, it’s still 140 cubic feet per second for six months, which is meaningful for users and fish. Plus, it comes out of ground cold, which fish prefer.

Gregory explained that aquifer storage creates a very small footprint on terrestrial and freshwater ecosystems, and they can be built incrementally. There are a few operating in Washington, such as the Walla Walla and Kennewick facilities. There are about 400 ASRs nationwide with few failures.

They started looking at sites to drill wells in Douglas County. They drilled 19 wells in 11 different sites.

Member Anders asked if they are developing a ground water resource, or are they capturing surface water and storing it, and then pumping it? Capturing winter surface water and storing it, Gregory replied. Member Anders asked if it requires a water right. Yes, replied Gregory, we’re the agency that gives them out, so we have a pretty good shot.

While the cost is low compared other water supply and storage options, the costs are still significant in the $9,000 per acre-foot range. They’re trying to reassess the project to come in at $2,500 per acre-foot.

J.T. Steenkamp described Shell Energy’s Pearl Hill hydro battery project, which would be located near the aquifer storage facility. The high-head, low-volume, 5-MW pump storage facility can take water from the river or the aquifer, and put it back in the summertime. Steenkamp said the project is slated to be up and running by the end of next year. This might be a flagship of a franchise model, he said. We wouldn’t be doing this unless we thought we could do hundreds of these. How we solve energy and water will be a major story through the end of the century, he said.

Member Lorenzen asked, “What do you find the pumping costs to be per acre foot to put water into the ground from the Columbia River. Gregory said the pumping costs are elated to the relationship with Shell. “Otherwise, we’re lifting 1400 feet, and the costs would be prohibitive. Originally we felt the projects would be stand-alone, but our project is much more dependent on their success.”

Member Norman asked, “You indicated with the current work ecology has done, there’s a potential for 140 cfs added to river in summer? Yes, Gregory replied. “Is there an objective target for increasing flow?” Norman asked. “No, there’s no objective target,” Gregory

answered. “At our office in Columbia River, in the search for storage, we’re looking for every drop. We don’t have that criteria for success for failure.”

Member Karier said he’s trying to understand the combination of the two projects. “In theory, can you work with the Pearl Hill project?” he asked. “Yes,” replied Gregory. “The notion is, during the spring, is we can lift water up into the storage tanks and pass it into the aquifer for storage and recovery.”

11. Council business:

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

Member Booth moved that the Council approve for the signature of the Vice-Chair the minutes of the August 15-16, 2017 Council Meeting held in Portland, Oregon.

Member Anders second.
Approved without objection.

Northwest Power and Conservation Council Motion to Authorize the Staff to Enter into a Regional Portfolio Model Software Support Contract with Navigant for Fiscal Year 2018 in an Amount Not to Exceed $75,000

Northwest Power and Conservation Council Motion to Authorize the Staff to Enter into a Contract with Tom Eckman for Support and Advisory Services in Fiscal Year 2018, for an Amount Not to Exceed $60,000, with Additional Travel Costs Not to Exceed $25,000

Ben Kujala, Power Division director, introduced the proposals. They have a contract with Navigant for standard maintenance and for a scoping project. Member Karier said he supported both contracts, but said that a part of the Navigant contract is set aside for scoping any modification for a conservation module. Power committee needs to take one more step and approve an outline of that module. Member Lorenzen said the $25,000 set aside could be analogous to a budget item. The contract would not obligate the Council to move forward with that aspect.

Member Booth moved that the Council authorize the staff to enter into a Regional Portfolio Model software support contract with Navigant for Fiscal Year 2018 in an amount not to exceed $75,000, as presented by staff and recommended by the Power Committee.
Bradbury second
Motion carries without objection.

Booth moved that the Council authorize the staff to enter into a contract with Tom Eckman for continued support and advisory services in Fiscal Year 2018, in an amount not to exceed

$60,000, with additional travel costs not to exceed $25,000, as presented by staff and recommended by the Power Committee.
Bradbury second.
Motion carries without objection.

Northwest Power and Conservation Council Approve the Draft Annual Report to Congress for Fiscal Year 2017 for 90 Days of Public Comment, Beginning Friday, September 15, 2017, and Ending Friday, December 15, 2017

John Harrison, information officer, introduced the annual report to Congress, which goes out for public comment for 90 days. Council approval will start the comment period Friday and it will end around Christmas. Staff will incorporate the comments and provide a final review in the January packet.

Member Booth moved that the Council approve the draft annual report to Congress for Fiscal Year 2017, for 90 days of public comment as presented by staff.
Bradbury second.
Motion carries without objection.

Public comment

Scott Levy

Scott Levy, Bluefish.org, discussed his visit to the regional coordination meeting, where he met with salmon science and salmon warriors. He mentioned talking about “how you guys are hiding information.” He spoke with Steve Wright years ago and said that we should have open discussion. “You’re hiding things from the public that are there,” he said. Levy offered to go camping with Member Yost.

Member Lorenzen adjourned the meeting at 12:01 p.m., before realizing two more speakers signed up for public comment:

Wilbur Slockish, Jr. and Bruce Jim

Bruce Jim and Wilbur Slockish, Jr.

Bruce Jim, representing the tribes of the Warm Spring Reservation and CRITFC, said he used to attend Council meetings all the time and then Kirby Heath took over. But Kirby is doing things with tribal council, so he got reappointed.

Wilbur Slockish, Jr., Yakama Nation and CRITFC, said he listened to the presentation and said that “it’s always about economics without input from our people. I’m tired of being invisible.” He said he wanted to leave the Members with some things to look at: Power,

irrigation and navigation and Columbia Basin Interagency Committee. One of the things that Isaac Stevens and Joel Palmer promised is that there would always be fish for our people to harvest and eat —and that's a federal promise. To me, we need to quit this dominion, using bible versus dominion over the land. My people never did that. We lived with it. We never tamed the rivers.

Our creator designed these rivers for purposes and everything has a role in our way. If you don't understand that, I urge you to look at that Yellowstone idea of reintroduction of wolves and what they did to reintroduce things into the balance. Invasive species? You have to remember that cattle are an invasive species along with pike minnow and walleye. And they seem to have more rights than people. I'm tired of losing salmon just for economic purposes, so I urge you to look at … Steve Wright can get you the Columbia Basin Interagency report, because it's a BPA report, and in that report they said they were going to do away with salmon. To me all the things I see that are happening … just maintain … maintain.

I was going to be quiet until Steve Wright spoke. Quit taming rivers because they're designed by our creator to do what they do. Aquifers, estuaries, flood plains, recharging and regenerating the land. Less dominion and more sense. I told Bill Bradbury you need to get an Indian science review on there. Maybe we don't have degrees, but we have knowledge form our old people. And when our people managed this land, there was an abundance of everything, clean water, land and plentiful animals.

Jim said, "Thank you for hearing us on the historical aspects of tribal people. I know you're familiar from working with us in Kalispell and other meetings. As elders, the tribal council has looked at that. When we send a younger person out, they don't necessarily understand the aspect of common sense and scientific sense. That's what we have to watch out for. The senior water user is the salmon and that's what we always have to remember and that's what we're here to protect."

Member Anders said that Montana State is doing an interesting exploration on how to combine traditional science and native wisdom. I'm going to go and pass on any good things I hear, she said.

Member Norman said, I haven't seen you since U.S. v. Oregon over a year ago. It's always

good to get your perspective and history lessons.

We kind of miss you there, replied Jim.

The meeting was adjourned at 11:55 a.m.

Approved October _____, 2017

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Vice-Chair