

Henry Lorenzen
Chair
Oregon

Bill Bradbury
Oregon

Guy Norman
Washington

Tom Karier
Washington



Northwest Power and Conservation Council

W. Bill Booth
Vice Chair
Idaho

James Yost
Idaho

Jennifer Anders
Montana

Tim Baker
Montana

July Council Meeting

**Vancouver, Washington
July 11 and 12, 2017**

Council Chair Henry Lorenzen brought the meeting to order at 1:30 p.m. All Members were in attendance.

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

Fish and Wildlife Committee

Committee Chair and Council Member Jennifer Anders reported on the following items:

1. There was a presentation on Lower Columbia River chum, by Todd Hilson from Washington Department of Fish and Wildlife (WDFW). He said that 14 of 17 populations of chum in the Lower Columbia are at high risk of extinction. He talked about efforts through the Lower Columbia River Salmon Recovery Plan to help recover those populations.
2. The Cowlitz tribe talked about their restoration work close to Vancouver. Their program focus is on restoring habitat processes. So far program, they have implemented 27 projects for floodplain connection, and habitat for salmonids and other species important to the tribe. This work is being done in connection with WDFW.
3. Jeff Wittler from Clark County PUD talked about their Stream Team, which helps the PUD use volunteer donations and grant money to work on restoration programs to address problems in the Salmon Creek watershed. This team has 1,000 members, including employees, scouts, students and youth groups. They work with property owners to improve water quality and they hope to see the return of native fish.
4. There was a staff report on the status of program implementation assessments. Staff has been looking at measures in the Fish and Wildlife Program to make assessment on where we are on the strategies. It's been a huge undertaking. We heard about three areas — habitat, fish propagation and ecosystem function — where most of the Council work is taking place. Our hope is to get input from Fish and Wildlife managers over the next couple of months to help us figure out how to implement the remainder of the program over the

next year and a half; and help us with the amendment process for 2018-19.

5. The Cost Savings Workgroup had four items:
 - A policy review of rotary screw traps;
 - The group is considering developing an RFI for lamprey work;
 - It is developing a strategy for developing a tributary cold water habitat RFI; and
 - A timing and process for updating cost-saving methodology.
6. The committee heard about emerging priorities from the O&M Subcommittee. Council Member Bill Booth and Mark Fritsch, staff project implementation manager, discussed plans to put together a budget to spend 2018 cost saving funds to maintain fish screens and hatcheries in the basin.
7. Nancy Leonard, fish, wildlife and ecosystem M&E report manager, briefed the committee on the compilation of objectives that are focusing on resident fish, such as bull trout.

Power Committee

Committee Chair and Council Member Tom Karier reported on the following items:

1. The committee has a unanimous recommendation on measures to evaluate the cost effectiveness of conservation measures involving fuel choice.
2. There was a report on the lifecycle of batteries. There are half-dozen different types. The committee learned about performance and cost. The cost is going down significantly, which makes them an increasingly interesting option for utilities in integrating renewables. The active ingredients include cobalt and graphite, which is found in areas of the world where it might be difficult to satisfy demand. Lithium costs have tripled in the last few years. Some of the new technologies include an aqueous hybrid ion battery, which is not as light as lithium, but it might have utility-scale value.
3. The use of carbon dioxide in heat pumps was reviewed. Heat pumps use a different refrigerant, some that have greenhouse-gas impacts. Carbon dioxide can operate under high pressures and can operate in colder climates more efficiently. Can be combined with demand response. It's a technology that could be included in the Eighth Power Plan.
4. There was an update on forecasting. Staff uses two types forecasting methods: Long-term and short-term models. Long is for the 20-year power plan and is based on end-use analysis by the different sectors. Short-term focuses on the next five years and is used for the adequacy analysis. It's econometric — it looks at the past, trends in consumption and other patterns. Massoud Jourabchi, staff economic analysis manager, has tried to reconcile the two. Initially the forecasts weren't very close. He has since demonstrated they are compatible.
5. Portland General Electric's Josh Keeling talked to the committee about demand response. It has a dozen different programs including testing pricing models (raising prices during peak hours), contracting with third parties, and developing electric vehicle charging programs off peak.

Public Affairs Committee

Committee Chair and Council Member Jim Yost reported that the committee met the prior month. They discussed the August Congressional tour, received an update on the website redesign and reviewed an update on the value of the FCRPS project. That report will be ready for Council review next month.

1. Council decision on guidance to Regional Technical Forum on treatment of fuel choice

The Regional Technical Forum (RTF) sought Council guidance for how to estimate savings from measures where consumers or builders have a choice in fuel. “If some gas units are replaced by electric units, they want to properly account for any impacts on the electric system,” said Jennifer Light, RTF manager.

The RTF’s Policy Advisory Committee recommended starting with an assumption of zero percent other fuels in the baseline, and to monitor the market. Avista, a committee member, wrote a minority opinion, saying to either restrict measures to electric, or to start with an assumption of two to six percent gas to electric. Avista said that zero percent is wrong and believes that there’s a push from gas to electric.

NW Natural and the Northwest Gas Association (NWGA) also were solicited. NW Natural recommended requiring program controls and to account for the impact of incentives in the analysis. NWGA asked to postpone the adoption of any framework until analysis could be done to inform an assumption — otherwise the RTF should use five percent gas to electric.

The RTF also did some additional analysis to think through a framework where they could come up with a number every single time, which would be more accurate for fuel switching to electric. They looked at four different methods:

1. An economic analysis of consumer cost, absent incentives.
2. Historical trend analysis.
3. The Seventh Plan load forecast.
4. A threshold analysis on incentives.

Ben Kujala, director of the Council’s Power Division, said the measures being examined probably wouldn’t have a large impact on loads, except for the potential for the electrification of vehicles.

The Council voted to support staff’s recommendation to:

- Proceed to estimate savings for such measures;
- Use a starting assumption of zero percent other fuels in the baseline.
- Monitor this assumption for significant, clear indications of other fuel-to-electric conversions.
- Treat conversion to electricity as zero savings — not negative savings.

Northwest Power and Conservation Council Motion to Support the Regional Technical Forum's Development of Savings Estimates

Member Booth moved that the Council endorse the staff's recommendation to the Regional Technical Forum for how to develop savings estimates for conservation measures in which fuel choice is at times a part of the decision by the consumer, as recommended by the Power Committee and presented by staff.

The motion passed without objection.

Member Karier asked about the current trend on the balance between gas and electricity. Charlie Grist, the Council's conservation resource manager, said that in the residential market, 90 percent of new hookups for single-family space heating are gas. But some areas don't have access to gas. In multifamily, it's a higher concentration for electricity and manufactured homes. In water heating markets, it favors gas. However, in existing homes, water heating is 50 percent electric. There is a lot of potential in savings for existing homes. Primarily, that's what this example is getting at, Grist said.

2. Briefing on Regional Technical Forum Annual Report

The RTF released its [2016 Annual Report](#), with Jennifer Light telling Council members that its charter today remains in line with Congress' intent when it directed the Council to develop a Regional Technical Forum.

The RTF is composed of individuals with technical expertise in planning, implementation, and evaluation. Its work is developed through a public process available to all Northwest utilities, with a goal of improving program quality at a reduced cost.

RTFs 2016 highlights include:

- Implementation of the Seventh Plan
- Expanding the RTF measure library
- An updated membership with 14 new members and a new staff member, Garrett Herndon
- The formation of a Market Analysis Subcommittee — a new subcommittee that reviews market research that BPA is doing on momentum savings and NEEA
- Enhanced public engagement
- The continued role of the Policy Advisory Committee

Its progress in 2017 includes:

- Refinement of guidelines for improved analysis
- Additional emphasis on statistical methods
- Continued expansion of the resource library

Member Norman expressed interest in RTF's manufactured home replacement work. Light said that there was a lot of interest in how to support the sector. The homes were in such bad shape that upgrades weren't really an option, she said. The challenge isn't the energy savings, but the cost of replacement. You're paying for a whole new home, she said. There has been progress in partnering with the Energy Trust of Oregon on a pilot with other energy groups.

3. Briefing on 2021–2022 Adequacy Analysis and Report

Member Lorenzen began the session praising Senior Power Systems Analyst John Fazio's work on the report: "This is a phenomenal piece of work you did and it's an important thing we're dealing with here," he said.

Fazio stated that credit is due to the team that worked on the report, including Member Karier who serves on the Adequacy Advisory Committee. Fazio said that every year, the Council assesses adequacy of the power supply five years out to ensure that adequate resource development keeps pace with demand and growth. It's a check. Every year, new issues come up, he said.

In 1999, the Council began using probabilistic methods to assess the power supply. In 2011, the Council adopted a five percent loss of load probability (LOLP) standard, meaning that the system is adequate if no more than a five percent chance exists that curtailment will occur at any time during the year for the coming five years. If it's more than five percent, the system isn't adequate. Staff will revisit this standard this fall.

Fazio said that normally, this forecast is performed five years out, but due to the upcoming loss of coal plants, it prompted us to check sooner. When last checked, the system was not adequate. Now they have one more year of data.

The LOLP for 2021 is close to seven percent. There will be almost 1,500 MW of coal retirements by 2021. The Council's target savings from energy efficiency will be +1250 aMW through 2021. The targeted EE savings between now and 2021 aren't enough to get the region past the retirements. In 2022, we see have the loss of Colstrip 1 & 2, which serve the Northwest and the loss of a 44 MW small gas plant — a total of 352 MW of retirement that year. The energy efficiency target is 317 MW, plus some savings from codes and standards.

If the region only does targeted energy efficiency, and only gets energy from sited, licensed projects, the region will be short 400 MW, Fazio said.

There are lots of uncertainties in load growth and what we can import, he explained. There are lots of sensitivity studies. What would happen if we had more or less from outside the region?

Fazio discussed winter spot market scenarios. The LOLP can range from 1.8 percent to a high of almost 24 percent. We're most likely to be in the middle and there is some wiggle room. "I hate to have the report just say we need 400 MW by 2022 and everything will be okay because things change," he said.

He shared how they got from 10 percent LOLP last year to 7.2 percent this year. Under the Columbia River Treaty, regulation for Canadian projects has changed. There's a shift of generation out of October and into the summer, making October worse. So the LOLP went up. Staff changed the forecast to improve access to markets in October so the LOLP went down to 6 percent. North Valmy is expected to retire in 2019, resulting in a loss of 127 MW, so the LOLP went up to 6.9 percent. In 2022, Colstrip 1 and 2 are removed, bringing the LOLP to 9.5 percent. Adding the new load forecast, (which includes energy-efficiency savings and savings from codes and standards), the LOLP goes back down to 7.2.

Resource Adequacy Advisory Committee (RAAC) action items:

1. Review and update the availability of California market supplies for all months and over all hours.

2. Incorporate the effects of energy-efficiency savings and of codes-and-standards savings directly into the short-term, load-forecasting model for future adequacy assessments.

Member Lorenzen asked what the Council should do. Fazio replied they just agree to release the forecast to the public and make it available on the Council's website.

Member Karier said he thought it was a Council decision.

Ben Kujala, Power Division director, said because it hasn't been opened it for public comment, there hasn't been a "decision" on it.

Member Lorenzen said, "My impression is that because of increasing amount of renewables coming onto the system, it may create additional challenges in looking at adequacy going forward."

Fazio said that's true. It will increase amount of balancing reserves needed. It's another reason we're looking at our model to make it more precise, he said.

Member Lorenzen asked, because it's more difficult to predict the amount of renewables available at any given hour, does it affect the LOLP standard? Fazio replied that he didn't think so. It has to do with how much they need to keep.

Kujala said it's still open for discussion. We'll look for creative ideas from the RACC.

Member Karier said the intuition on the importance of this work is right. It sounds clear, but it's very challenging work to do. A lot of the additional considerations in this report weren't there last year. It gets better and better. The RAAC is very engaged in this. The release of this is an important event and the Council should formally be agreed to release the report.

Member Lorenzen said there's a general consensus that we release the report. I see nothing wrong with just releasing it, he said.

John Shurts, staff general counsel, said it has been done as a decision in the past that was voted upon, but the Council doesn't have to.

Member Lorenzen said, "So everyone nod your head."

Member Anders said, "As part of the LOLP, does spill have anything to do with it?"

Fazio said, "Absolutely. We only count what's been implemented to date, nothing in the future. It assumes current operations."

Member Karier said the newly ordered spill operation is primarily in the spring, but not at a time when there's an adequacy problem.

Council Member Bill Booth said he believes that adequacy is the critical subject for the region, and the aspect that gives him pause is the assumption that we have regionwide production and delivery. "We don't, especially with the decommissioning of our firm power," Booth added. "It affects some areas a little and some seriously."

Booth said that as you replace that firm production with intermittent renewables, is there a way to refine this further to take those factors into account? Have segments of the region, rather than an overall average for the region?

Kujala said they have reached out to utilities that work with us on the advisory committee, and some will say it impacts them differently. Coal closures might have huge impact. It's changing who has the resources and who has the load. "We've been careful to label this as a regional picture, and I'm not sure we want to go a look at individual utilities," he said. It's a way for utilities to see the regional market, but they have their own access to transmission and resources. We try to support each utility as they come and work with this. We make it clear where the boundary of this analysis falls.

4. Update on the diverse resources accessible from, and services provided by, the StreamNet Regional Library

Lenora A. Oftedahl, StreamNet regional librarian, and David M. Liberty, assistant StreamNet librarian, briefed the Council about this "underutilized resource."

StreamNet Regional Library provides a repository of information related to the programs and projects under the Council, including the StreamNet's online data system and the Coordinated Assessments Exchange. The library is located at the Columbia River Inter-Tribal Fish Commission, and is funded by the Columbia Basin Fish Accords (2008-2018).

StreamNet provides:

- General questions about Pacific salmon and other collection topics
- Interlibrary lending and borrowing
- Digitize documents on demand (within copyright law)
- Bibliography development/Citation management
- Literature review
- Data archiving
- Metadata development

Oftedahl and Liberty discussed Council Qualifications from the 2013 review process. They are working on mission statements to define their work going forward. They have documents from the 1800s to show the volume of salmon coming up the river, and that should be our baseline, Oftedahl said.

They are exploring the possibility of collaboratively publishing synthesis, strategies and reports for the Fish and Wildlife program.

Council Member Bill Bradbury asked if they compile a lot of documents and scan them into a database. He asked if they are available online and if they are searchable by a keyword.

Liberty said they perform OCR to make them searchable. They have 1 TB of information and will do the search if requested.

Member Anders asked how the library is funded. Through the Council's Fish and Wildlife program, Oftedahl replied. The money is granted by BPA and it is an Accord project.

Member Karier asked if the library keeps track of contacts. Yes, and they average 300 requests a month, Oftedahl said. It's divided by categories. CRITFC and government agencies make up most of them.

Member Booth remarked, "You said you're underutilized. What are you doing to increase usage?" Oftedahl said they are doing presentations such as this to get the word out. They are going to conferences and handing out business cards, and using social media sites. Liberty cohosts a television show from Gresham, where they did a show on the library.

Member Booth asked if they work with anyone on advanced search engine capabilities. Oftedahl replied that they do.

5. Presentation on Independent Scientific Review Panel (ISRP) final Wildlife Report

Steve Schroder, ISRP Chair, said that at the Council's request, the ISRP reviewed 29 wildlife mitigation projects. The last review occurred in 2009. The ISRP found that six projects met scientific review criteria, 21 projects met criteria with some qualifications, and two projects did not meet criteria.

All of the wildlife mitigation projects had overarching goals. But some of the qualifications were:

- 90 percent need quantitative and time-sensitive objectives
- 70 percent need a formal adaptive management plan
- 60 percent need to revise or develop project management plans

Quantitative and time-sensitive objectives are task-based. They can be general annual maintenance, such as invasive species control, debris removal, and fence inspection and maintenance. They can be specific tasks, such as planting shrubs and grasses, tree thinning.

Then you need to know the long-term effects of these task-based objectives. He cited an example of the Shoshone Tribe protecting a stretch of river. The idea was to decrease erosion and other measures using woven willow sticks. To apply a quantitative measure, you'd say by 2022, you want to reduce the number of days that the river temperature exceeds 68 degrees to 10 days. That's time period and a specific thing you can measure. These are ways to track what your actions are trying to accomplish. That requires monitoring.

Many didn't feel they had the money to adequately support effectiveness monitoring. There was confusion over the five-percent cap rule BPA implemented. Some used more to evaluate their projects, others got outside dollars for effectiveness monitoring. We need a resolution on the five-percent cap. We need resolution on effectiveness monitoring funding. Result of this variation is there's a large variation have that can be used to evaluate how successful they are. You can't know where you're going until you look back and see what you've done.

RM&E Recommendations:

For Wildlife mitigation projects:

- Coordinate monitoring among projects when evaluating alternative management actions. Determine where, when, what habitat actions increase or sustain habitat and biodiversity.
- Compare active and passive management. There is uncertainty about how species respond to restoration actions. While the focus is on habitat restoration, you also need to evaluate wildlife responses.

Once you have objectives, research and evaluation, you can have adaptive management. Your monitoring reveals when you have successes and problems, and you can share that. Alternatives are implemented and evaluated, and the cycle is repeated as needed. That's an adaptive management cycle. Seventy percent of the wildlife mitigation projects need to establish a formal Adaptive Management Plan, Schroder said.

His recommendations for adaptive management are to:

- Use a decision matrix to establish monitoring levels for a proposed action.
 - o Provide clarity on what should be monitored. Both habitat and wildlife responses are needed.
 - o Determine level of monitoring needed for focal species — especially large game animals.
- Have regional monitoring programs that evaluate numerous projects.
- Convene a workshop with practitioners and co-produce a formal adaptive management plan.

Schroder cited the example of the Nez Perce wanting to reintroduce California Condors into Joseph Canyon. The problem is, the condors are eating things that are shot with lead and feed it to their young, and they are dying of lead poisoning. A solution is to stop using lead ammo.

He recommends treating wildlife mitigation as an integrated program.

- Evaluate the overall status of wildlife status across all parcels.
- Evaluate restoration actions across habitat types and species.
- Evaluate the benefits of the collective restoration actions and land purchases on wildlife. Right now they're all separated.

Last, there was a discussion on weed control. It's one of the big problems these projects have. In 2009, the ISRP recommended restoring native plant communities and coordinate with adjacent landowners to control weed patterns. About 31 percent of the projects are working with landowners.

Also in 2009, there was an effort on integrated pest management. He also discussed the impact of herbicides. A review of Roundup shows impacts and there's a need to continue research on that. There also is a demand for locally adapted plants and seeds. There are several native plant nurseries in the Basin.

Schroder said that in future project reviews, they want to:

- Improve annual progress report quality
- Continue presentations, programmatic discussions and response loop
- Reinstate site visits
- Organize project development workshops
- Integrate program-level analysis

Council Member Guy Norman said in a workshop and discussions with area managers. He recognized that some wildlife areas also have been used for fish restoration projects. Any discussion on effects of wildlife mitigation associated with converting wildlife areas to shallow water habitat for fish?

Schroeder replied that at least 10 percent of the budget is dedicated to fish recovery. I admit I didn't see or hear anything about pond construction as being a site for non-indigenous

Dave Heller, with the ISRP, said there's a project on the Grand Ronde doing some stream or wetland work.

Member Karier said we need to think about Council's role in science, research and wildlife properties relative to fish recovery. When I started on the Council, there used to be a plan set up for how to mitigate wildlife. Focused on replacing the habitat that had been lost and inundated. It wasn't about replacing animals, it was to provide habitat to managers to manage. It was an agreement measured in habitat units that were better than acres. Once those replacements were made, that constituted the mitigation along with BPA's commitment to fund O&M for that. But it wasn't the same problem as fish recovery and the dams' impacts. There you couldn't replace the habitat. We had to recover the ecosystem and restore the fish. That required monitoring and research and it's why 40 percent of our budget is monitoring and research. There's a different policy and obligation. We might want to address that in the next program.

Member Lorenzen recessed the meeting at 3:58 p.m.

Wednesday July 8

Member Lorenzen called the meeting to order at 8:32 a.m.

6. Presentation from Clark Public Utilities on energy efficiency, power supply and demand response

Jane Van Dyke, Clark Public Utilities District commissioner, announced that Clark Public Utilities ranked highest in the midsize utility segment in the West region, for the 10th consecutive year in the J.D. Power 2017 electric utility residential customer satisfaction study.

Larry Blaufus, Clark PUD senior manager, discussed Clark's energy-efficiency results. In 2005, Clark started on a five-year plan. They brought together Tom Eckman, Fred Gordon, PacifiCorp and others to help create their first plan. The aim was to meet the Council's Fifth Power Plan goals. Since then, they have invested a lot of money to ensure they took care of their growth with energy conservation. Every year since, they've met or exceeded their goal. He recognized the contributions of NEEA. It has gone down in 2016-17, with the new Power Plan adjusting the base case, but he projects the numbers to go up over time. With the savings from NEEA, energy efficiency is one of the most cost-effective things they do.

Clark's industrial team had a 5.3 aMW project completed called SWEEP, the second-largest project done in the Pacific Northwest. NORPAC was the largest.

Blaufus said they have acquired 116 aMW out of the 6,000 aMW, which comes out to 2 percent. The PUD's NEEA share is 1.3 percent and it is at 2 percent. "This year, we'll go over that, so your planning has helped us in our planning," he said.

Loads from 2012 to 2016 have been very flat. Clark has had lots of new customers coming on, but the energy supplied has been flat. Before 2004, it made no investments. In 2014, 2015 and 2016, Clark paid 67 percent of its energy savings and BPA paid 33 percent. In 2017, it will be nearly a 50/50 split.

Tacoma Power did a benchmarking study. It cost Clark 11 cents per kWh in 2014. We like to keep our costs down, he said.

Member Lorenzen asked if it was over the life of the conservation measure or is 11 cents first-year savings? It's first-year savings, Blaufus replied.

"What would it be over the life of the conservation?" Member Lorenzen asked. Blaufus replied, "Our measures run close to 15 years, so the levelized cost per kWh over the life is 1 or 2 cents."

"That's the number I'd like to see," Member Lorenzen said.

Blaufus reviewed power supply costs and how it makes sense to use conservation where possible.

Clark's last CPA in 2015 shows its 2016 and 2017 targets. So far, there is a lot of residential savings, driven a lot by NEEA. Lighting was number one and HVAC number two. This year, they're seeing a big demand in heat pump water heaters. In commercial/industrial, it's custom projects and lighting.

The 2017 draft CPA shows that commercial is up over the 2015 CPA by 40 percent, mostly in lighting, and residential is up by 27 percent. Industrial goes away by 2016, so they're working with EES to verify that. By the time we get out there, there will be new technologies, which is why NEEA exists.

Zeecha Van Hoose, key account manager for Clark Public Utilities, discussed Clark's demand response efforts. Demand response is a temporary change to a customer's load, versus energy-efficiency measures, which are an ongoing effort to reduce demand and consumption. She mentioned the regional load shape and how demand response is a winter peaking resource. It can help Clark reduce its load and not have to bring on additional generating resources.

When you look at overall demand response potential, it can help reduce overall costs by not having to do large transmission builds, she said. It's a part of BPA's non-wires solution and Clark is in the bulls-eye of the South of Allston transmission constraint. Demand response can help the summertime peak in getting generating flowing south. Clark does not have distribution that would drive us to demand response for our own distribution needs, she explained.

Van Hoose talked about working at NORPAC during the western energy crisis. During April to December 2000, there was an 800 percent increase in wholesale prices. BPA managed through that crisis with contracts from some of its largest loads. She said there was 180 MW of attached

load in the pulp mill where she worked. Part of what they did was purchase pulp from Canada to make paper and avoid running their equipment. They had a crisis management approach during that time period. It raised regional awareness of the value of being able to load shed large loads. The focus on demand response was a response to that, going into the Fifth and Sixth Power Plans.

Clark is wrapping up participation in BPA's pilot commercial program. It was a two-year program, and they had three participants with multiple sites. Overall, it was successful. Another program is BPA's pilot hot water heater program. It's a collaboration of PGE, BPA and other utilities looking at whether radio signal activated demand response could be functional.

What are the barriers to demand response in Clark's territory? "We don't have the distribution pressures, so we're not looking to postpone our own builds," she said. "From a manufacturing perspective, one of our challenges is monetary. We're asking these large customers to modify their operations and reschedule production, but our power prices aren't high enough to motivate that behavioral change by itself. We don't have an active time of use program. To provide incentives right now, it has to be worth it. Right now, incentives aren't high enough."

Referring to a chart, she said if you look at \$144, it could start to motivate some people.

Our loads have been relatively flat, she said. Clark can manage that in the future without stresses on its system. They're seeing growth in residential customers, but a reduction in energy use per customer. As growth has come on, it's been more efficient. There is an increase in summer load on the residential side, due to an increase in use in air conditioning. Heat pumps provide both.

At this time, Clark wants to support the regional programs. It's valuable to have customer input. There could be both utility and customer value in more-engaged customers. From an industrial side, if Clark can mitigate the growth in transmission and generation via demand response, and keep its prices down, the industrial customer and utility would value that, Van Hoose said.

Member Norman asked if the three participants in the demand response program are all in Clark's service area, and if there are any prospects to expand that? She replied they are relying on BPA direction. She doesn't believe they're going to continue that pilot. "We told BPA that consistency in these pilots is important," she said. "We learned in energy efficiency that when programs come and go, and targets change, you lose people and it's harder to bring them back in. It would have been nice to tell those participants that we were continuing this winter."

Member Booth was interested in the hot water heater pilot. He is interested in the rules of the game in shutting down and starting up individual household systems. Blaufus said they get five bucks a month, and then they get an incentive at the end to go through whole program. The goal is getting manufacturers to put in communication protocols that are open, not proprietary when they manufacture the unit, Blaufus said. The most expensive part is getting the controls installed. He offered to get Member Booth more information.

Member Booth asked if a signal is sent, does the system shut down completely? Blaufus said that customers could override it if they don't have water. Resistance water heaters shut down completely, while it cycles on a heat pump water heater. The big test is since heat pump water heaters use less energy anyway, how much is it really contributing? Hopefully the pilot will provide more information.

Member Karier said he's on board of NEEA. The measure would put the device on the water heaters when they're manufactured. Does that program make sense? Are there other

considerations we should be thinking of? Blaufus answered, yes, it is critical. Protocols are critical. Proprietary communication devices could cause some real problems.

Member Karier said, so you've made some progress. Blaufus replied yes, it's the same thing NEEA faces in that you have to get all the momentum going.

Member Lorenzen asked, "In simple demand response, do you look at shaving the peak of individual system or reducing system as a whole? Van Hoose said it's something they discussed with BPA. "How do you balance local needs and regional needs? Based on the pilot, they can be consistent. But we're cognizant it could be an issue." Member Lorenzen said how you're billing with BPA and how it all lines up could be an interesting challenge.

Tom Haymaker, Clark County PUD's manager of energy planning and resources, talked about the Washington State Clean Air Rule. He said they are a large utility in Washington State with five percent of the load. The numbers would be higher if not for its conservation efforts. It's been a nice complement to Clark's portfolio. He said the population is about 500,000. The service area votes GOP, but not overwhelmingly. Last two issues before the public, was the carbon tax (voted down in Clark County by 2-1 margin), but 10 years earlier, when RPS came out, it voted for it 52-48 percent. It's a very balanced county. Its commissioners are adept at managing that balance.

Haymaker said Clark has had a 248 MW combustion turbine in operation since 1997. It has a block contract with BPA. They also have distribution resources, particularly rooftop solar. Wholesale costs amount to two-thirds of Clark's budget.

Back in 2012, it had a good runoff year at River Road. They don't have 2017 results, but River Road been off since February and came on last week.

A lot of tailwinds have been at Clark's back over last five or six years in terms of resource costs. It hasn't had to raise rates since 2010. Last winter, it had sustained cold weather and loads were up, but costs were less. It was able to provide customers a rebate at the end of the winter. It's gratifying to be in that position, Haymaker said.

Clark has the RPS, which it meets in different ways. It is using spending limits in the bill to meet its RPS requirements.

The newest one is the Clean Air Rule — a Washington State rule from Department of Ecology to reduce Clark's emissions. It can't exceed those limits on its combustion turbine. As it applies to Clark County, there is a baseline from 2012-2016 that reduces every year by 1.7 percent from the previous year's number. This reduction will come from running the unit less; it won't be through technology. "We have the ability to comply over a three-year period, so we do have flexibility," Haymaker said. "We can shut down River Road and import electricity from outside the state and meet our obligation. But there's no hook on the fuel source. It could be from coal. It kind of defeats the purpose."

We could manage these different ways, he said. We're not seeing an emission reduction units (ERU) market.

On the River Road generating plant, Haymaker said, "We feel like we're standing alone. River Road is the only consumer-owned combustion turbine operating on a continuous basis. It was developed in the mid-90s to reduce our take on BPA and reduce its obligations. It has saved us

money. It's almost as though no good deed goes unpunished. We've run our plant more than other plants. It's more economic on the margin. We have a good baseline for the Clean Air Rule.

Haymaker said the Clean Air Rule is in the courts with two lawsuits pending. The 2016 carbon tax initiative was defeated, but there were eight proposed carbon taxes in the Washington State legislature, although none passed. Three new carbon tax initiatives were filed for the 2017 election cycle. "We try to work with it and not overreact," he said.

"As planners, we worry," he said. "We fret over capacity planning for the future. The current regulatory environment provides no certainty for development of any dependable and dispatchable resources." Member Bradbury observed that this is the only PowerPoint he's seen that uses the word "fret."

Haymaker said the region should protect BPA resources for BPA users. He continually reminds folks that California's inability to plan should not constitute a crisis on our part. California's always has an eye on the Pacific Northwest. We need to keep in mind that their issues aren't our issues.

They will take a serious look at the carbon issue in Clark's 2018 integrated resource plan.

Member Yost asked about the relationship with the market price of energy compared to the combustion turbine plant. Haymaker said they look at it from a marginal cost perspective. That money's been spent. Member Yost asked about the cost to run gas through the unit versus the market price. Haymaker said they had a good runoff this year, so the plant has been offline. So the cost of plant to run is tied to cost of natural gas. Natural gas is really cheap, in the \$25 per MWh cost to run the unit. Looking at capital and variable costs, it is about \$40 MWh.

Member Karier said it's interesting that Clark is doing a demand response pilot, even though it might not need demand response. PGE needs the demand response and is not far away. Is there a solution to this? Some publics have more potential demand response, but it's needed by more industrial utilities. Is there a way to get across those barriers? An incentive?

Blaufus said you have to give industrial customers a pricing signal and it's just not there.

7. Presentation by Snohomish Public Utility District on actions to advance innovative and emerging energy technologies

Jessica Matlock, director of government and external affairs for Snohomish County Public Utility District, briefed Council Members. She also manages Snohomish's electric vehicle (EV), demand response and solar programs.

Snohomish began operations in 1949 and is the second-largest public utility in the Northwest. It's the 12th-largest public utility in the U.S. Snohomish is Bonneville Power Administration's largest power customer and is about the same size as Seattle City Light.

It has 341,000 customers in a 2,200-square-mile service territory, and has a 6,200-mile network of distribution lines

Snohomish is headquartered in Everett. It delivers service to 20 cities and towns, in two counties. Three commissioners run it. Sid Logan is its newest commissioner.

Its power supply is 90-percent hydro with wind, solar and market purchases.

They have a 112-MW hydro facility, the Henry M. Jackson. The others are run of the river. They built the Young's Creek 7.5-MW project two years ago, and are building two other hydro projects.

What do customers want? The demand for energy is declining, Matlock said. People continue to push the load forecast out into the future. Snohomish's loads will be declining over time, due to energy efficiency.

To meet customer expectations, utilities are going to have to figure out how to meet a growing demand for renewables:

- Major companies and many small businesses are shifting to renewables for corporate branding. Now Boeing wants 100 percent renewables.
- Large energy buyers want to work constructively with their utilities to reduce greenhouse gases (GHGs) through cost-effective renewable energy sources.
- Customers want more control over their energy source.
- Customers are looking for ways to address carbon in their own lifestyles but with the help of their energy provider.

Matlock said major companies and many small businesses are shifting to renewables for corporate branding. "It's a national issue and will hit many utilities in the Northwest," she said, naming Boeing, Ikea, Google, Starbucks and Costco among Snohomish County PUD customers seeking renewables to fulfill corporate sustainability goals. She said 65 major companies have committed to using 100 percent renewables.

Snohomish is redesigning its solar program, creating an EV program, continuing its R&D on energy storage, and creating a demand response program. Snohomish County PUD will allow its customers to meet 100-percent renewable goals with solar, since some companies don't consider hydro renewable. The utility is working with the state commission for approval on solar on rooftops in a tariff under Schedule 90, renewable blocks and solar shares of a utility-scale solar farm.

The solar farm is a 500-MW plant (it's actually 500 kW) with an option to expand further. The pricing is \$160 per share. The offer is to anyone in the service territory. It won't reduce their energy bills; just make them a part of the solar program, Matlock said.

She discussed the proposed Schedule 90 construct. Each home will have two meters (import and export) to track the energy.

Member Yost asked how much does Snohomish pay for the energy it buys? We'll buy it at a lower rate, about eight cents, but it varies on the time of year, Matlock explained.

Member Karier asked, what if the customers want to use the electricity themselves? Or store it? Is it on a different schedule? Matlock said it's all on the same bill. It will credit the customer and Snohomish will buy whatever excess they're not using.

Matlock outlined the utility's EV program, which she described as "very promising." With declining loads, EVs would impact them. Snohomish is trying to encourage adoption. It also is looking at strategic placement of charging stations to reduce their impact on grid. Snohomish also is looking at off-peak charging strategies and at using EVs as a demand response product. Matlock said King County is the leader in EV use with Snohomish behind them. There's still a lot of work to do

with EV infrastructure to get the numbers bumped up. It joined Pacific Northwest Utility Electrification Collaborative. It hired Energy and Environmental Economics (E3) to study the impact of transportation in the Northwest and to study the service territory. The 300-page report, published last March, looked at:

- Utility customer costs and benefits,
- Regional costs and benefits (across transportation and electric systems),
- Electric system impacts, and
- Numerous scenarios regarding EV adoption rates, gas prices, carbon values, energy prices, EV costs and other factors.

What is the forecast for Snohomish? Matlock said it's 57,000 EVs by 2036. It may seem like a lot, she said, especially since there's only 1,000 EVs now. By 2030, the forecast is for about 35,000 cars, which would account for 15 aMW of load.

The study also shows the benefits to EV adoption. Each passenger vehicle added produces \$1,070 of value to the customer base. If charging is managed off-peak, the value increases to \$2,676 per vehicle. It will reduce carbon dioxide by 900,000 tons. The distribution impact is manageable if spread evenly.

Snohomish's next steps are to perform data analysis and work with PG&E on its EV program. Matlock said that PG&E said not to get into incentives for EVs, but to focus on infrastructure. "In a perfect world, it would be better if utilities built the stations, but it's not practical right now," she said. They have third parties build them, but there are third-party problems, including damaged and stranded assets.

Member Booth said Snohomish must be looking at infrastructure in neighborhoods. To be practical, he said, you need a station at home, a quick-charge. Some analysis shows that the infrastructure might not be set up to handle everyone with a 220-kW charging station. Are you planning for that? She replied she believes it will happen, but charging will be at home. She said they could find pockets for putting in multiple charging stations. The key will be the DC fast-chargers for commercial applications. If not in the home, they're trying to put them in at shopping and business centers. It's an important piece to look at the impact on the distribution network. "We're not seeing a huge rush to EVs because of the lack of infrastructure," she said. "Once we have that, the EVs will come."

Matlock discussed Snohomish's R&D energy storage program. They have installed three batteries and are about to install a fourth, with plans to install more.

The program's goals are:

- Provide grid support and ancillary services
- Renewable energy integration
- Micro grid resiliency
- Test modular energy storage architecture (MESA)

It's a common communication platform between the utility and any type of battery. The architecture is housed in California. There is an effort to standardize communication between batteries and utilities. It lowers the cost of batteries a bit. It's "Plug and Play" technology. You can bring any type of battery into the system and it's ready.

The Mesa 1a and 1b batteries were the first and were given clean energy grants by the State of Washington. Also funded are Mesa 2 and Mesa 3.

Snohomish County PUD is designing a micro grid, which is a 500 kW energy-storage system. It is about to go out for bids and it will house a clean-energy technology center, house crews, and provide a backup data center and energy control system. It would be one of the first utilities in the West to do so.

Matlock discussed Arlington micro grid's goals. It's part of a DERO program. All of its batteries are connected to an optimizer. The micro grid is a 500-kW energy storage system. It's also a facility they want to bring in school districts to learn about new technologies.

Discussing energy efficiency, Matlock said it is still a large program for Snohomish. They reached about 9.57 MW this past year, she said. The goal in 2016 was 7.2, so we did well, she said. Everything cost effective is done. Everything past that is not worth doing. We're looking at energy efficiency as a capacity product. Demand response will be in the same bucket. I'm having the energy efficiency group work on demand response with me, she said. It can be used to defer power supply acquisition.

For demand response, the utility is examining potential approaches to develop a more robust program. During the recent BPA-EnerNOC pilot, Snohomish had five customers in 2016-17 with eight sites, 14 events and a 21.8-MW load reduction. The results were positive, she said. The utility will start small and learn from the pilots.

Member Lorenzen observed, "You picked the low-hanging fruit on energy efficiency. What is the levelized cost of energy efficiency going forward? At what point does it not become cost effective?" Matlock replied she'd get those numbers for him. We are trying to make our energy-efficiency program more effective, she said. Now customers want choice. Snohomish works with Amazon, which puts the utility's energy-efficiency products on their website. "If a customer from Snohomish County is searching for a washing machine, they'll see our incentives on the website," she said.

Member Karier said it's impressive the amount of things Snohomish is doing, but she didn't mention geothermal and tidal projects. He asked about the legal constraints on supporting EVs. Matlock said their attorney found no legal impediment to providing incentives. Seattle City Light is conservative compared to last court cases, and tried to get clear authority. Our interpretation is we didn't need that, she said.

Member Yost asked where the solar array is going to be located and how many acres it is. Matlock said she misspoke earlier about the size of the solar farm. It's 500 kW, not 500 MW. It's small. It's located by the Arlington Airport and could expand to 2 MW.

Member Norman asked about the vehicle-to-grid program. Is it a battery storage program? Matlock said Snohomish's intention is to have its own fleet be EVs. They want to have the ability to plug in and, during the night, charge the bigger battery if anything's left. If that's depleted they could charge them from the solar battery. Currently, no bucket trucks are purely plug-ins. It costs \$100k to buy one, which is too expensive.

Snohomish is envisioning a build-out to provide backup service to the airport in an emergency. Matlock sits on the governor's emergency response group and they're trying to find ways to help

the state in terms of cyber and physical disaster recovery.

8. Panel presentation on Northern Pike suppression in Lake Roosevelt

Chris Donley, Washington Department of Fish and Wildlife, discussed where Northern Pike originated. Its spread isn't new, but is for Lake Roosevelt. In 1950s, pike showed up in the system. The fish that showed up in Idaho came from Western Montana. He described the gill netting suppression effort. They got it down to where they can't catch them in gillnets, which took five years. So it is possible to suppress them.

The first detected the fish in Lake Roosevelt in 2011. According to Washington State Management:

- Pike are a problem, not an opportunity.
- In 2011 WDFW Fish Commission reclassified pike to "Prohibited Species."
- Harvest: there's no minimum size, no daily limit and no possession limit. It's unenforceable.
- Pike must be killed before transporting.
- Releasing live pike into other waters is prohibited.
- Other prohibited species include fathead minnow (an ecological nightmare), bowfin and snakeheads.

Why are pike so bad?

- Northern Pike have disrupted ecosystems in Montana, Alaska, Idaho, Washington, Colorado, Utah and California.
- Caused the elimination of multiple, native prairie minnow species in Montana.
- Prey heavily on Westslope cutthroat trout (WCT) and bull trout in Upper Flathead, Montana.
- Caused the elimination of native salmonids in Sustina drainage in Alaska.
- Prey on fish 75 percent of their body size.
 - o No fish are safe, except adult white sturgeon.
 - o Salmonids can grow big enough to escape walleye and smallmouth bass.

In Lake Roosevelt, what do they do if they get into salmon ESA-listed waters? Sockeye will be impacted significantly.

The goals of fish and wildlife managers are to minimize impacts to native and important game fish species, suppress Northern Pike and monitor the program, and prevent the spread of Northern Pike to other waters.

Donley discussed collaboration plans to establish a Pike Technical Working Group with regional and Canadian partners. Its task is to:

- Seek and pool funding,
- Develop a Northern Pike Suppression and Monitoring Plan, and
- Start suppression yesterday. "We didn't get moving until 2012," Donley said. "It should have been sooner. It's never too soon to try and get after these fish."

Donley discussed obtaining funding:

Colville Tribe

- BPA \$225,000 (reallocated Accord funds; 2017 only) Support from PUDs. They fully understand implications for their FERC licenses.
- Grant (\$25,000 for 3 years) and Chelan PUD (\$35,000 for 3 years)
- CCT Internal Funds (\$35,000 for 3 years)

Spokane Tribe

- Secured BPA BOG funding for 3 years (\$71,000); new BOG \$123,017 (one year)
- AFS Grant: \$6,000; UCUT \$12,000; STI \$4,500; BIA \$ \$72,000

WDFW

- STI/BPA \$50,000, Chelan PUD \$15,000, WDFW Internal Funds \$10,000

"We've tried every way to scrape up money to try and suppress these fish," he said.

Member Anders asked if the funding is sufficient. I would say it's not sufficient, Donley replied. If it becomes a value to keep them out of the fish zone, below Chief Joseph Dam, then no. There might be two levels of funding required.

Holly McLellan, with the Colville Confederated Tribe, discussed the timeline for different research, suppression and public outreach tasks.

Different surveys that are being conducted to better understand pike. Microchemistry research is being conducted to determine general spawning locations, understand their movement and spawning patterns. Data will be used to assist with suppression plans. Radio telemetry research is underway to determine spawning locations and summer movement patterns to assist with suppression efforts. Otolith growth rings identify spawning time and correlate with reservoir elevation to assist with removal planning. These are early-spawning fish, so some of the operating assumption about Lake Roosevelt was that there was no spawning habitat. They delayed their spawn two to three months to wait for the right habitat.

Member Anders asked, "Can you tell me how your research efforts help the suppression? To me, it's catching them and making sure they're dead."

"We spend more effort on the suppression," McLellan answered. "This research helps us in the suppression. Our fish are acting different than those in the Pend Oreille system."

Donley added that this is a scale issue. It's obvious where they spawned in the Pend Oreille. This is a big reservoir. The challenge to set the gill net close to where they're sited. This helps us get better. It's critical to be very efficient with our time on the water.

The eDNA study detects the early presence of Northern Pike in areas of concern, which will enable relevant agencies to respond rapidly. It breaks down quickly.

Suppression began in 2017, setting 40 nets a week.

In 2017, 525 overnight net sets have removed 1,083 pike. The majority of Pike have been captured near the Kettle River mouth, Singers Bay, and the Colville River. Fall electrofishing was discussed. It's a successful technique and will be targeting juveniles.

Member Bradbury asked for an explanation on non-lethal electrofishing. It doesn't kill the fish. It stuns them. Therefore, there's no bycatch mortality. They roll over and you can keep them in the live well.

Some of the pilot programs include testing other live collection techniques to determine if one is effective at removing Northern Pike with minimal bycatch

Public outreach has included:

- Posting Northern Pike signs at all Lake Roosevelt boat launches.
- Presented pike plans to two Walleye Clubs.
- Provided information to local newspapers, radio talk shows.
- Social media outreach on Facebook and Instagram.

Member Booth asked about bycatch rules and their impact on suppression efforts. If you're spending money and time to get rid of pike, and walleye and bass get adversely impacted. Why would you stop fishing for pike when you reach a bycatch limit on other predators? Donley said they set a bycatch limit on bass and walleye, which was a social message. From a biological perspective, we won't meet it. On the redbands, we have a conservative limit.

Looking forward:

- Implement a similar program in 2018.
- Secure funding for 2018 and beyond.
- Co-managers (STI, CCT, WDFW) will work together on a Northern Pike Research and a suppression project proposal for the NPCC and BPA.
- Technical group and managers
 - o Clarify RA and suppression targets.
 - o Review the data.
 - o Continue to refine research questions.
 - o Implement successful techniques.

Member Karier said it's a fascinating story and tragic this has moved so quickly. It's good to hear the response. It's a big reservoir, but as you do this research, are you finding that, like in the Pend Oreille, that fish do congregate in their spawning? During spawning, they do congregate, McLellan said. We know where hot spots are. Always trying to expand.

Member Norman said it's a good example of cooperative effort to address a current problem that could get larger without this kind of effort. The theory is Pend Oreille was source of the fish, but because the Kalispell program was successful, now the source is Lake Roosevelt? Donley replied, yes, the driver is critical mass and abundance. If you start soon enough, you can control natural reproduction.

Member Norman asked about the 2017 effort versus 2016. "Are there indicators of more fish in 2017 than 2016?" "Yes, 2016 was good recruiting year for pike," McLellan said. "There's more now. This is the first year we've put that much effort into it. During the last few years, they did best they could. The pike have definitely expanded." Donley added that they wouldn't know about the 2017 effort until we go back and look in 2018.

Member Norman asked, in terms of gear size, are they caught with 2- to 2.5-inch gear? Is there larger mesh available? McLellan said the nets used now go up to six-inch stretch mesh. We track what mesh each fish is caught in. Now the nets have multiple panels with different sizes in them.

Member Norman said this program is good example of a proactive attempt to get at another predator in the anadromous waters. "I see it like the sea lion program," he said. "By the time we got permits, they accounted for up to 45 percent of spring Chinook mortality."

9. Update on Council's review of tributary habitat monitoring and next steps on Council's monitoring and evaluation approach

Leslie Bach, senior manager; Nancy Leonard, fish, wildlife and ecosystem monitoring and evaluation manager; and Mark Fritsch, manager, project implementation.

Leslie Bach, Fish and Wildlife senior manager, said this issue was before the Council last March. Staff has conducted interviews with Fish and Wildlife managers as to what degree they're using tools from ISEMP, CHaMP and AEM. There is a summary of those conversations available. Bach provided an overview of what was learned.

The conversations were divided into four categories:

1. How do you go about prioritizing your restoration work on the ground?
There were a variety of approaches. Some use program-related tools (EDT, expert panels, etc.). Others use processes developed by the U.S. Forest Service. There is good coordination among practitioners and researchers collecting formation on fish. They just don't have the resources, expertise and money to access the information needed – a universal comment.
2. How do you evaluate success?
In the areas where CHaMP and ISEMP watersheds are, practitioners are making some use of them. The scale of data being collected and location of data isn't where it should be to make decisions on the ground for habitat work. Fish in/out data is very critical. Those were some good tools created under CHaMP and ISEMP.
3. Data management reporting
This is an area of ongoing development. Resources are the limiting factor. The CHaMP and ISEMP data management system and web-based access were extremely challenging for the managers. A few researchers had become proficient in them.
4. Gaps and outstanding needs
Interviewers heard greater access to technical expertise and people wanted to take a new look at limiting factors. Also wanted expanded support for PIT-tag arrays, and they said it would be great if we had a way to be transparent in data management and data synthesis.

Bach said next, they wanted to see the use and utility of products from CHaMP, ISEMP and AEM. They went through all the reports, summary products and table of tools. At a committee meeting, they were asked to be specific on which ones were providing value?

The following are in use and valuable for program implementation:

- PIT-tag detection systems
- Fish in/out facilities

The following have portions in use or potentially valuable for program implementation (still trying to develop an approach for program evaluation):

- IMW results where applicable – there are three IMWs under CHaMP and ISEMP
- Habitat suitability index
- Habitat Data
- Snake River escapement models
- Life-cycle model outputs where applicable
- Mark/recapture models
- Gross primary production
- Quantile regression forests

Some we listed we just didn't hear a lot about, Bach said. They're not developed, people haven't made use of them, or there are other tools that do the same thing.

Back discussed the process and schedule for the tributary habitat monitoring approach. The program logic path is important to get to something affordable and sensible. It's based on idea of limiting factors. Addressing them will help the focal fish species.

It has three pieces:

1. Habitat action prioritization
2. Habitat action evaluation – implementation, effectiveness, and status and trend.
3. Data management and reporting. Local database, a common synthesis tool and a Council program roll-up.

Bach said if you look around the region and look at work they're doing, it converges on these types of actions and factors for evaluating it. How you measure it is still to be determined. If we can manage the stuff by category and have a reasonable, agreed upon set of measurements, we can track them.

The ISRP would review if we have the right parameters. But everyone is focused on these categories. That allows us to roll these up. Any given project might want more info, but want to show the region what we're getting.

They need a common synthesis tool — to take that data and put it into these categories. The Council program rollup is around the change in limiting factor. Compare the fish in to fish out. She thanked Member Karier in helping her think more about that. The issue of productivity is what we want to track and is the level of reporting we want.

Nancy Leonard said that when we focus on the Council program rollup, we're looking at a watershed scale. We're focusing on what we need for the Council. We know the managers have to deal with other data. We leave that to them.

Member Anders asked at what level does the rollup occur? Bach said if we can provide a synthesis tool, everyone could get to it. It's a bit of a brainstorm. If you could develop what everyone has access to, people can put their data into it.

Member Norman said he likes how it's laid out. The question is when you get to bottom line: did you get the results expected and the fish in/out piece? Where I struggle is the connection to changes in fish productivity and habitat treatment. When we look at that, it's difficult due to other

variables in the watershed to make a specific quantifiable relationship between the actions and productivity. Are you looking at this in a general sense? Are we seeing a positive trend over time so you wash out the variables?

Bach replied, "That's the crux of it. We've seen these efforts to try to link habitat action to change in fish. That investment has been made for many years and you still see it's very challenging to do that – if not impossible." She said the question is, what do you need to do to demonstrate value of a collective suite of actions? That's why we created the logic path and sideboards, to demonstrate the value of the mitigation piece. It's more about "as a whole" we've made things better, so fish got better. It's a simplistic approach. Our actions are reducing the limiting factor. If our actions aren't reducing the limiting factor, then we have a problem. Temperature — we want to bring that down. If we achieve that, then we've addressed that limiting factor. If that has no impact, we have to rethink what we're doing. At some point you have to tell us if that sort of approach is okay.

Member Norman said simple is more defensible.

Member Karier said, "We need to have a better understanding of how we spend money. We don't want to spend \$700k per month every month. We started reviewing this 10 months ago. It's not our responsibility to figure out what's useful in the project. It's the responsibility of the project sponsors. The fact we're having difficulty in finding value of this project is a sign. We spent \$60–\$70 million on this concept that is clearly a failure. Looking at the product tools, I counted 13 measures that were limited or not used, out of 18. Seventy-five percent are useless or unclear.

"I have a proposal," he said, "but I won't propose until I have the support of four other members. I propose that Bonneville stop renewing contracts associated with ISEMP, CHaMP and AEM, beginning today. Instead, Bonneville should ensure the collection of essential data necessary to evaluate the effectiveness of current habitat investments. These new contracts will be developed through competitive solicitation, evaluated by the ISRP and reviewed by the Council for consist with the research plan."

He said that gives the Council the opportunity to continue to collect the valuable information such as fish in/fish out. Fifteen years ago, California implemented fish in/fish monitoring on key tributaries and started collecting data.

Member Karier said, "We funded ISEMP and CHaMP, pouring \$9 million into it. We have a bunch of tools that are unclear, limited and not useful. We missed boat on that. We should have funded fish in/fish out. We'd have 15 years of data. By now we'd have a trend. I'll propose the motion when I get four members."

Member Lorenzen asked, "Are you suggesting BPA not fulfill contracts?" No, stop RENEWING contracts, replied Member Karier.

Council Member Tim Baker said, "Thank you, this is the first time it's made sense to me. True I've only been on a few months, but I can close my eyes and channel Member Karier on this topic. But I support where you're going, he told Member Karier. There you go, you have one. I've watched this discussion on the fish program and concerns with where the money is going, and how we evaluate success. Your presentation is perfect. You're asking what we can do, but not asking for too much.

For the ISRP, for all the good work they do, I think their expectation for what people can do on the ground can do is beyond their capacity, Member Baker said. "You strike a balance on what we

can ask for and reasonably expect. But when I look at these projects, we've spent a lot of money and they haven't produced much."

Member Booth said he feels the same way. He thanked the team that worked on this. It was a good idea to talk to the managers, he said. "You did a thorough job. I look at charts and quite a bit doesn't seem helpful to managers on the ground. It's time to take action Member Karier is talking about. There are court, contractual and BiOp complications. I'm not ready to vote today but I'm ready to look at a stronger approach."

He said he believes BPA would be supportive to some extent, but they have issues they have to deal with. It takes clear, logical thinking to come up with graphs this concise. It also takes some guts to list projects and say they're not providing too much. "I've also felt for a long time we spend more money than we should for monitoring research that isn't well defined instead of putting it on the ground for projects. It's been about 50 percent of the funding. Let's follow through and bring it to a conclusion quickly."

Member Norman said he's not ready for a motion either. He commended staff and said that 13 of 18 tools are represented as having a limited value. We should at a minimum serve notice that they're flagged. Perhaps if they have value, it would be useful to receive that information.

Tony Grover said that's the support they're looking for. The current BiOp is about to lapse. Action agencies are working on a new biological assessment. The schedule is to have it done by December. Staff can work with Fish and Wildlife managers, take that second block of activities and decide if they should move up or down on this list. That would be instructive to the managers and to NOAA. People at BPA are working closely with staff. He's not sensing a difference on where BPA wants to go and what the Council has expressed.

Member Anders asked, "Do we know if funding for ISEMP CHaMP is in the start-of-year budget for FY 2018?"

BPA's Bryan Mercier said they are releasing the start-of-year funding early next week, and it's fair to say that there are significant changes to ISEMP and CHaMP consistent with the presentation today. However, they haven't had a chance to sit down with the managers and share their thoughts. They will be doing that in the next few weeks, and will be able to share those thoughts in the next month.

Member Yost said he lauds the effort. "I remember we had the same effort five or six years ago on coded wire tags," he said. "Were going to have some cost savings. Then project sponsors came up and the Council members wadded up like a used paper towel, and voted to keep the funding. Staff wanted it cut, then staff caved. I'm willing to try once again. But I don't have expectations that staff or other council members will be willing to make that decision in the end. Just get out the wallet and keep funding."

Bach shared the updated schedule. "Our idea is to refine and finalize this monitoring approach, update it with what BPA and NOAA are working on and their efforts on the BiOp. We hope they will synch up. We're trying to move toward an approach that makes sense. Hope you're all comfortable with us continuing to do that to make this work."

Member Lorenzen said, "It sounds like repeal and replace."

Member Karier said, "I'm still thinking about Member Yost's comment on the coded tag. BPA did stop funding the research for those projects, so it was an effective way to change BPA funding. The Idaho supplementation study did end but money ended up getting folded into Idaho. It's selective memory on how money moves through the process."

Member Booth said, "The coded wire tag money disappeared into Oregon and Washington."

Council Business

Northwest Power and Conservation Council Motion to Approve the Minutes of the June 13-14, 2017, Council Meeting

Member Booth moved that the Council approve for the signature of the Vice-Chair the minutes of the June 13-14, 2017, Council Meeting held in Corvallis, Oregon.

Member Bradbury second

Passed without objection.

Northwest Power and Conservation Council Motion to Authorize the Staff to Enter into a Contract with OMBU for the Redesign of the Council's Website

Member Booth moved that the Council authorize the staff to enter into a contract with OMBU for the redesign of the Council's Website at a cost not to exceed \$215,000 over Fiscal Year 2017 and Fiscal Year 2018 as presented by staff.

Member Karier second.

Passed without objection.

Northwest Power and Conservation Council Motion to Authorize the Staff to Negotiate and Enter into a Contract to with Navigant to Develop a Conservation Value Module for the Regional Portfolio Model

Member Lorenzen pulled this motion off the agenda.

"This is a topic near and dear to my heart," Member Lorenzen said. "We hear often that conservation is a burden due to the impact on rates, and those of lower economic means can't take advantage of it. That includes harder-to-reach customers. In my mind, there's a regional benefit, even to regional utilities. By foregoing generation, there are savings on the transmission side too. There also is a longer-term benefit that there will be power to distribute. BPA has done a good job to build a model. Not surprising if you engage in conservation, rates will go up, but that's not the end of the analysis. What I want is a further discussion on how to get a handle on the qualitative and quantitative benefits to conservation. It's worthy of a more-thorough analysis to be assisted by staff. For that reason, it's coming off the agenda."

Northwest Power and Conservation Council Motion Adopt the Council's Fiscal Year 2019 Budget and Fiscal Year 2018 Revised Budget

Council Administrative Division Director Sharon Ossmann reported that the budget went out for a 44-day public comment. There was one written comment. The Council's budget is within the budget cap contained in the Power Act.

Member Booth moved that the Council adopt the Council's Fiscal Year 2019 budget and Fiscal Year 2018 revised budget and that the Council authorize the staff to reprogram available Fiscal Year 2017 funds for unanticipated Fiscal Year 2017 costs as presented by staff.

Member Bradbury second.
Passed without objection.

Public comment

Justin Bush, of the Washington State Invasive Species Council, thanked the Council for its continued focus on the Northern Pike issue. He asked the Council to call on him if it needs any information.

Member Lorenzen adjourned the meeting at 11:57 a.m.

Approved August ____, 2017

Vice-Chair