

Jennifer Anders
Chair
Montana

Tim Baker
Montana

Guy Norman
Washington

Patrick Oshie
Washington



Northwest Power and Conservation Council

Richard Devlin
Vice Chair
Oregon

Ted Ferrioli
Oregon

Jim Yost
Idaho

Jeffery C. Allen
Idaho

Council Meeting May 7 and 8, 2019 Boise, Idaho

Tuesday, May 7

Chair Jennifer Anders called the meeting to order at 1:30 p.m. All Council Members were in attendance, except Member Tim Baker, who joined by phone.

Member Jim Yost welcomed the attendees to Boise. Member Anders noted it's Member Baker's last Council Meeting. He submitted his resignation from the Council, effective June 7, 2019.

Member Baker said the work the Council does in the region is critically important. The decisions that are going to be made in the next 20 years will be some of the most important for this region. The challenges have never been greater. The work done by the Council provides an objective look at what's going on, instead of a subjective one. He said he was glad that he could play a role, however brief.

Reports from Fish and Wildlife, Power and Public Affairs Committees

Fish and Wildlife Committee

Member Guy Norman, committee chair, said the Council directed staff to move forward with an addendum to the 2014 Fish and Wildlife Program rather than revise the entire program. Nothing in the addendum is to override or supersede the program. There has been good interaction with stakeholders. Staff is prepared to revise the addendum for the committee to discuss May 22. A May 29 work session will be held in case it's needed. A full Council review is scheduled for June.

Power Committee

Member Tim Baker, committee chair, reported on seven items:

1. Ben Kujala, Power Division director, talked about the Power Plan's resource strategy. It's comprised of fuel costs, forecasted use of electricity, existing and potential electricity supply, and what's needed for adequacy. We really need to be careful in how we derive the types of information we use to drive our analysis, Member Baker said.
2. Steve Simmons, senior economic analyst, discussed natural gas and other fuel prices that are connected to electricity, and how we develop the forecast of those prices for the Power Plan. Natural gas is a key influence on electric prices and drives expansion decisions.
3. Simmons also discussed transportation forecasts, which is more about demand than fuel. He discussed how we model it and the types of inputs used. Transportation is a leading factor in carbon emissions. Over the next 20 years, electric vehicles (EVs) will be greater in number, which could be a big factor in electric consumption.
4. Gillian Charles, energy policy analyst, discussed generating resource reference plants, which are needed to forecast how generation will be implemented over the next 20 years.
5. Tina Jayaweera, senior energy analyst, discussed demand response supply curve development. Demand response is one of the key, potential cost-effective resources available. Member Yost is skeptical, but Member Baker said he thinks it's a critical, low-cost option, and our regional portfolio model will certainly consider it.
6. Simmons gave a presentation on gauging the impact of behind-the-meter solar and batteries on load. Staff is doing fine work to better understand the impacts. The focus is on the ability of the system to flatten out load. Especially with the duck curve.
7. Mike Starrett, energy analyst, gave a tutorial on transmission and the ways to optimize it. He talked about how it's done in this region, versus centralized market in other parts of the country. He noted the differences.

Public Affairs Committee

Member Jeffrey Allen, committee chair, said that planning for the Congressional tour is moving along. They have secured a boat for the trip. They also discussed the

Transboundary Conference, which takes place September 12–14, 2019, in Kimberley, B.C. There was no meeting this month, but there will be one in Portland next month.

1. Briefing on PNUCC Northwest Regional Forecast of power loads and resources.

Kujala introduced Shauna McReynolds, Pacific Northwest Utilities Conference Committee (PNUCC) executive director. McReynolds said PNUCC has been around since the 1940s. It's an association of investor-owned utilities, consumer-owned utilities and industry partners, such as Energy Northwest. It used to have industrial members when the aluminum plants were operating in the region. She distributed a book by the Northwest Power Pool.

She discussed PNUCC's Northwest Regional Forecast, which they have published since the early 1950s. Similar to Bonneville's White Book, it's a system adequacy barometer. PNUCC's forecast is the sum of utility forecasts. It's a look at utility loads and the resources they have to meet those loads. She talked about the parameters of the data they obtain from utilities for its tabulation. The forecast does not include independent power generation not intended for regional use.

Looking at Northwest load forecasts, summer peak is higher and growing. We think that has a lot to do with air conditioning. Winter peak is a little lower. Weatherization and codes and standards have had an impact on winter. It hasn't changed a lot since last year. Every utility is unique, and we have to consider each one's experience, McReynolds said. We have five utilities with 12% of the load with 3.7% growth per year.

Five utilities, which make up 25% of the load, have declining or flat load. Energy efficiency, and codes and standards are having an impact. In fact, energy efficiency is the one utility constant — realizing 160 MW a year in savings. Utilities have this figured out and it's what their customers want, she said.

Demand side measures are similar to 2018. Energy efficiency shows a modest increase from last year. Winter demand response is forecasted to be down slightly. Summer demand response will show a small increase, particularly in Idaho Power's system. But otherwise, it's been hard to convince customers to participate.

We used to have the best demand response program in the world with the aluminum companies. We had the ability to turn off 1,000 MW. We just need to get that back, she said. Finding the right customers is what it's all about.

Hydro is still a big piece of the pie. There's more variation in the winter than in the summer. Solar is showing up to be more than a sliver and it's starting to make a difference.

Looking ahead at peak loads, the summer picture is staying on track. Even though the winter picture has improved, there is 3,600 MW of coal generation going away. McReynolds reviewed a bar graph showing 3,100 MW of additions.

Few, new dispatchable resources are planned, and new wind and solar projects cannot offset the amount of retired coal generation. Utilities are putting a lot of hope in new technology, such as batteries, which is being tested but not yet proven.

Member Yost asked how the region will keep the loss of load probability below or at 5% without some type of generation. I don't think we know that yet, McReynolds replied. Utilities are working to figure it out and to uncover what the new great resource is going to be. In the meantime, we're stretching everything we have today. Member Yost asked if that means being more efficient with generation and transmission. She answered that this forecast doesn't address transmission. For example, Montana wind is great, but transmission is the problem. She said that Idaho Power and BPA have been talking about the Boardman to Hemingway transmission project, but it's been a 17-year process. "But we don't have 17 years," she said. "The next big challenge is in the next 10 years. How do we fill those gaps?"

Member Yost observed that she didn't include imports. McReynolds replied that the report just looks at the firm picture — what's available in the peak hour. The wires aren't big enough to send more to the Northwest.

Member Norman noted on the slide with the 3,100 additions, one item was capacity. Where does that come from? She said Portland General Electric bought a big chunk from the mid-Columbias, so it might not add to our real resource stack. It could be a reorganization of the existing system.

Member Devlin said the pace of technological change will only quicken, as well as the change in public policy. In Oregon, the Public Utility Commission looks at issues solely in terms of costs. The legislature sets policy that isn't necessarily determined by cost. We'll see more changes in technology and policy. McReynolds said he raises the perfect question about the cost-effective piece we're all trying to solve. We don't know how that stacks up with the risks.

Member Devlin said society should look at the full cost of decisions being made, not just the current costs.

2. Update on Idaho Power participation in the Energy Imbalance Market (EIM).

Shirley Lindstrom, Idaho policy analyst, introduced Tess Park, Idaho Power's vice president of power supply. Parker announced the utility's goal of providing 100% clean energy by 2045.

It came to a surprise to a lot of people when we announced it, she said. We believe we can achieve it, but it must be reliable and affordable. She talked about their energy mix. Their long-term purchases total 9.3%. "We can't say that energy is clean today, so it's an area we'll have to continue to explore.

Park said Idaho Power keeps its lights on 99.975% of time. They don't want to sacrifice reliability for clean energy. Their prices are more than 20% below the national average. "That's very important to us," she said. "We've surveyed customers. If prices go up 5%, clean is good. Beyond that, people are backing off — it's not clean at any cost."

Fifty percent of Idaho Power's electricity already comes from clean hydro. The carbon emissions intensity is 46% less than in 2005. Park said they reached a deal to buy 120 MW of low-priced solar.

Park talked about the utility's path away from coal. By the end of this year, they will cease operations of their share of Valmy 1 and then stop their share of Unit 2 in 2025. They will cease operations from Boardman in 2020. In its current IRP, they're showing retirements of some of the Bridger units. The proposed Boardman-to-Hemingway transmission line should help move clean energy from Montana and Wyoming. Plus, they have a better solar picture than most of the Pacific Northwest.

We continue to carefully plan for the future and keep an eye on technology, Park said. Getting to 100% clean is probably not feasible without natural gas to have the reliability and price they need.

Park said they are very passionate about their environmental and Snake River stewardship programs. People can learn more at www.cleantoday.com.

Member Anders asked if it's a function of technology that will get them there. Or is there a relationship to joining the EIM (Energy Imbalance Market)? Has that given you a jump start? Park said EIM helps from an inter-hour perspective, but it won't help with the capacity piece. We need something that will deliver the capacity, she said. Solar sometimes has a 50% capacity factor, but it's mostly 38-40%. Wind is considerably less. We need something more reliable than that, she said. She said pumped storage might be an option or fuel cells. Nuclear may have a future, but that's a long ways out for small modular.

They went live with the EIM in April 2018. It has realized \$10 million in savings to Idaho Power customers. The savings comes from being able to operate the hydrosystem in a different way. Operators are learning the value of the flex hydro system.

Park said she can't talk about EIM without talking about the Extended Day Ahead Market (EDAM). EDAM makes for more-economic unit commitments. It will help as they transition from day ahead to real time. More important, EDAM is different from full-market participation. It's not full market consolidation and it's not relinquishing transmission assets. If we're going to continue moving to a clean, Northwest entity, I don't know how we can do it without a progression to the market, Park said. With EDAM, we have governance. Governance is what gets people upset. We count on the governance we have in place, but they won't have control of our assets. We don't think there's a change coming to the California governance structure any time soon.

Member Ted Ferrioli asked about the company's \$10 million reduction in cost and asked if that comes from solar generators. Park replied that \$10 million comes from ability to dispatch down the hydro and use the solar when it's lower cost. We help support the ramp with a lower-cost resource than what they would have, she said. Before, we used to do our markets the day ahead and an hour ahead. If wind is forecasted to be 400 MW, and you had you carry 80 MW of reserve, there's a cost to that. The energy couldn't be dispatched or used in the market unless the wind came to fruition. Now you can use it as an imbalance and it can go to someone else.

Member Ferrioli asked if that \$10 million represents someone else's opportunity cost. We're concerned about Bonneville's lost opportunity to sell excess power because so much solar is entering the market — revenue that sustains the system we've had, he said.

Park said she doesn't disagree with some of that. Issues with BPA and the lack of capacity market is more due to the lack of resources that are being built in California and the lack of wanting to curtail those. Prior to the EIM, those problems were starting to occur. The problem isn't the EIM, it's figuring out how to develop a capacity market that forces entities in California to go into it capacity sufficient in a different way. We have to go in with enough reserve to cover our contingency obligations and enough flexible reserve. We have to have those resources in the market. How it is handled in California is different. That creates more of a problem for BPA.

3. Remarks by Ed Schriever, director, Idaho Department of Fish and Game.

Todd Ungerecht, Idaho office fish and wildlife policy analyst, introduced Ed Schriever, director, Idaho Department of Fish and Game (IDFG). Schriever credited the work of former Council Member Bill Booth and Paul Kline, IDFG's Assistant Chief of Fisheries. He traced his career in fish management in Idaho and he said he continues to learn from Member Guy Norman. He talked about Idaho's rich outdoor heritage and the department's mission. He

said it's not always an easy balancing act, akin to a bowling ball on a sheet of plywood. He read the four agency objectives:

1. Sustain Idaho's fish and wildlife and the habitats upon which they depend.
2. Meet the demand for hunting, fishing, trapping and other wildlife recreation.
3. Improve public understanding and involvement in fish and wildlife management.
4. Enhance the capability of the Department to manage fish and wildlife and serve the public.

He said IDFG receives no tax dollars from the state. Most comes from licenses (\$49.7 million). BPA adds \$11.4 million a year. He talked about where the \$11.4 million goes:

- Steelhead and salmon monitoring
- Burbot and white sturgeon supplementation, monitoring and recovery
- Fish screens
- Parentage-based tagging / GSI
- Dworshak Dam/LPO mitigation
- SFSR YCT recruitment and survival improvement
- SR sockeye program
- Wildlife Mitigation — although wildlife mitigation isn't a part of the annual budget any longer.

On habitat restoration, Schriever talked about their work on the Potlatch River. It blew our minds how many places steelhead were breeding, he said. They're very resilient and have manifested ways to overcome pretty harsh conditions. He described the physical characteristics of the watershed. They used to see steelhead during the first year of life. To extend that, they had to do a lot of restoration work.

On the East Fork River Restoration, they have worked on five miles of rearing habitat with large woody debris/riparian treatments. Using modeling, Schriever said what they'll see is a 39% increase in smolt production up to a capacity of 27,000 smolts. They've also expanded the range for steelhead by addressing barriers.

He talked about Big Bear Falls passage by modifying the natural barrier. Between 50 and 350 steelhead return to Big Bear watershed annually. It opens up a minimum 15 miles of high-quality habitat.

They modeled a potential 85% increase in juvenile production after these three projects.

Schriever talked about Upper Salmon River (Lemhi River) projects. The aim is to restore the floodplain connectivity, create juvenile rearing habitat and reduce velocities. They estimate about 21% of the stream was impacted by rail and road construction. It's one of the largest

restoration projects in Idaho. It's historically one of the most important areas for migratory salmonids in the Upper Salmon River. Restoration addresses connectivity between the Lemhi River and its tributaries.

Clearwater River (Potlatch) project will open access to more than 20 miles, restore 21 miles of habitat, remove 14 barriers removed, plant 212,000 trees and shrubs, and install 10 miles of fencing to help manage grazing.

Upper Salmon River (Lemhi): They have completed 544 restoration projects and opened 75 miles of habitat, restored 352 miles of habitat, installed 158 miles of fencing, and bartered for 61 cubic feet per second of water to be left in the river.

Schriever next talked about the fish screen program in the Upper Salmon River Basin. Overseeing 270 screens. Since 1992, a partnership between NMFS, BPA and IDFG has built a successful fish screening program with commitments and easements with landowners. It's about relationships and maintenance: the success of the program is due to our access to easements and operating and maintaining the fish screens. This will ensure that we are running the fish screens as designed, safely passing fish and protecting structural investments.

Schriever said they have a long-term monitoring program for salmon and steelhead which focuses on fish-in and fish-out evaluations to inform status assessments and management of species in Idaho.

He talked about Idaho's 10 hatcheries. They have taken the deferred maintenance issue seriously. He shared a slide showing the production for IDFG hatchery anadromous releases:

- 10.75M spring/summer Chinook
- 1 M sockeye
- 5.75M steelhead

All are parentage-based tagged (PBT). They have received signed BiOps for all hatchery programs in Idaho. He talked about some problems at Springfield Hatchery. There was a difference in water hardness between the hatchery and Red Lake.

He talked about success in their Kootenai River burbot efforts. The fishery was closed in 1992. In 2018, recovery targets were met (population > 40,000). The fishery opened Jan. 1, 2019, after a 27-year closure.

Schriever talked about wildlife mitigation programs:

- Albeni Falls Corps of Engineers project on Lake Pend Oreille

- Dworshak dam Corps of Engineers project on the North Fork of the Clearwater River
- Southern Idaho Bureau of Reclamation projects on the Upper Snake and its tributaries

In summary, these long-standing collaborative projects are like pushing a rope uphill, he said. It's a lot of work with partners, including BPA, NPCC and many others. The Accords provide certainty and funding commitments over longer timeframes to allow for planning, project implementation and monitoring. Last, each program is critical for IDFG to achieve its mission.

Member Norman noted that it's the second Idaho director we've had in a year.

Former Member Booth was invited to comment. He said he enjoys being retired but misses the Members and staff. He shared a story about marlin fishing in Cabo San Lucas and how his catch was foiled by sea lions.

Member Jeffery Allen congratulated Schriever on his appointment. When you do 544 projects, what impact is there on fish populations? The impacts are huge, Schriever replied. Connectivity is as important for bull trout as it is for salmon. They are reconnecting high-quality habitat, adding base flow, reducing velocity and adding channel rearing benefits for bull trout, rainbow trout and all species as we do these anadromous fish projects.

4. Remarks by John Chatburn, Director, Idaho Governor's Office of Energy and Mineral Resources.

Idaho staffer Shirley Lindstrom introduced John Chatburn. Chatburn reviewed the creation of the office by Idaho Governor Otter. He showed a chart of energy production and consumption. The state consumes much more energy than it produces.

Idaho's sources of energy were reviewed with a pie chart. All petroleum is imported and there are no oil refineries.

Idaho's energy expenditures as percentage of GDP is 13th-highest in the nation, and it has the fifth-lowest average electricity rate. In-state electric generation is 44%. Idaho's electricity fuel mix is more than half hydro (53%), coal is 17% and natural gas is 14%. BPA is the primary source of electricity for 16% of Idaho's needs, though municipal utilities and rural coops.

Five investor-owned utilities provide electricity and gas service. Each has a different mix of electric generation. Avista is about half electric with about 35% natural gas. Idaho Power is

half hydro, 18% coal, with shares of wind and solar increasing. PacifiCorp/Rocky Mountain Power is 59.3% coal.

PURPA projects in Idaho were shown on a bar graph, illustrating the acceleration of wind power projects. Solar is more recent, but they're seeing a lot of investment in utility-scale solar.

Chatburn showed a slide of reported utility energy efficiency program savings:

- Avista's 2017 Idaho Energy Savings: 42,223 MWh
- Idaho Power's 2018 Idaho Energy Savings: 176,846 MWh
- Rocky Mountain Power's 2017 Idaho Energy Savings: 15,830 MWh
- BPA's 2017 Energy Savings: 1,370 aMW

Chatburn talked about transmission projects underway. These include Gateway West, which received its final right of way grant from the Bureau of Land Management; Boardman-to-Hemingway, which finished its federal review and is in the state of Oregon's siting process; and Hooper Springs, which is under construction.

On electric vehicles, Idaho also is expanding its electric vehicle refueling infrastructure with five stations this June along I-84 and I-15 under Volkswagen's Electrify America program. Idaho also is applying for \$17 million to mitigate emissions under the Volkswagen settlement to use for alternate fuel programs for light-duty vehicles.

Chatburn talked about small modular reactors at Idaho National Laboratory. NuScale is working through the design certification process with the Nuclear Regulatory Commission and the facility's completion is expected in early 2021.

He reviewed natural gas utility service territories and mentioned that Boise has the largest geothermal area in the country.

Member Ferrioli asked, as IOUs move away from coal systemwide, what will Idaho Consumer Owned Utilities Association members do? Will they follow? Chatburn said currently they get most of electricity from BPA and their portfolio doesn't have much coal in it. Co-ops and municipals are very resourceful.

Member Jim Yost said it seems there has been a lot of advances in geothermal. Idaho Power has two facilities. Can you explain the geothermal available? According to USGS, Idaho has some of the best in the lower 48 states, Chatburn said. The issue is the cost of prospecting. There have been had a number of leases issued on BLM land around Southern Idaho. As they refine the process for locating geothermal reservoirs, we'll see more development, he said. Some in the industry think they're close to taking the uncertainty out of geothermal exploration.

Member Yost asked Chatburn to explain the natural gas well production in Payette County. Do you know how many wells or how much gas? I don't know, Chatburn replied. The exploration in Western Idaho has slowed quite a bit.

The meeting was recessed at 4:25 p.m.

Wednesday, May 8

Chair Anders called the meeting to order at 8:31 a.m.

5. Presentation by Idaho Consumer Owned Utilities Association

Will Hart, executive director of ICUA, introduced the panel: Bryan Case, chief executive officer, Fall River Electric; Ken Dizes, general manager, Salmon River Electric; Max Beach, general manager, Idaho County Light and Power; and Bear Prairie, general manager, Idaho Falls Power.

Hart said ICUA represents 22 rural electric and municipal power companies, which get 96% of their power from BPA and serve 137,000 customers across the state.

Bear Prairie talked about the recent March event that saw a spike in market prices. Whatever the federal hydrosystem can do, we get, he said. They follow capacity and the six projects. When prices hit \$1,000 per MW last March, they got nervous. It can have major financial impacts, he said. They charted what federal hydro was doing and what other resources were doing. There were very small amounts from wind and solar. From a utility perspective, it's those morning and evening peak periods that are critical. There are economic consequences to what you pursue. It's nice that we're building solar. But batteries are costly: 250 kw costs \$600,000, and you can't count on wind.

Prairie talked about his utility's situation. My BPA contract was \$31.66 per MWh, he said. The cost of 20 MW for seven days was \$106,377. The market during early March was \$1,000 per MWh, which is \$3,336,000 for seven days. Consider this before retiring other projects or moving to market or solar.

Ken Dizes, Salmon River Electric's general manager, said it's time take another hard look at the project cost allocations for the Columbia River and Snake River dams. When the dams were built, it was determined that 75% of the costs should be allocated to power. We believe that over the decades the value equation has probably changed, he said. The power system has dwindled in its ability to deliver equivalent amounts of power — in fact, it's been reduced by a third. At the same time, the value of the dams to homes and property for flood

control has risen. Therefore, they propose that Congress and the Council urge the Bureau of Reclamation and Army Corps of Engineers to reallocate those costs. It's important for BPA to remain competitive.

Max Beach said they're close to being the smallest coop. It's rural in a county not seeing a lot of growth. They have had success in the fish programs. We've heard a lot on fish mitigation spending, he said. What does that mean to us? Last year, our power bill was \$2.3 million. About \$700,000 goes to fish mitigation, or \$18 per month per customer. The overall trend has moved up for fish. Since the 1980s to the 2000s, we've seen numbers increase. We still believe ocean conditions play a big role, since fish spend 80% of their lives there. There is 96% passage, 98% at Little Goose. We're seeing the fruits of the dollars spent. It's been expensive and we talk a lot about effectiveness. That's the key going forward.

Bryan Case said they started buying from BPA in the mid-1960s. We're the stewards of BPA. The Council are stewards, too. We understand a lot of competing interests and have made investments in environment. Looking at the long-term competitiveness of BPA, the sky isn't falling, he said. They have contracts through 2028. However, he expressed concern about the trajectory of costs. Elliot Mainzer said we lit his hair on fire. To his credit, they've been working to change the cost curve. BPA has some uniqueness. We buy from PNGC too. Our concern is long-term. BPA has ability to manage much of its costs. One is the Columbia River Treaty — it needs to be modernized. Also, BPA has relied on secondary net revenues. They need authorization to participate in California markets. Cost allocation needs to be revisited and there are the fish costs. Fish costs are a balancing act. They need to be science-based and results-oriented. Some programs are maturing and ought to be removed. We need to ask if there's a return for that. Spill is another lost opportunity.

Case said there have been great benefits from energy efficiency. He also asked the Council to look at how its Eighth Plan (now called the 2021 Northwest Power Plan) sets its conservation goals. Fall River spends around to \$300,000 to save one million kilowatt hours a year in conservation. Irrigators have been using the program quite a bit and commercial relighting has been effective. But one size does not fit all. For example, heat pumps haven't worked as well. He hopes some flexibility will be built into the programs.

Looking at resource adequacy, the March event was a warning sign. Is this something we should be building for the Northwest? There's no incentive for spending the money at the moment. We're all pointing to one another to do something. The loss of load probability is discussed, but there's no responsibility for saying you have to do something. When you need it the most, you won't have it. We're operating on margins that are pretty thin.

Member Pat Oshie asked Bear Prairie for more background on their hydro, what they'll get from their **INEL** project and how they expect it to operate. Prairie replied their hydro is run of river, so it's very predictable. It has a peak, 48 MW of capacity. We're in for 10 MW of the

INEL project. For the most part, it would be a baseload resource, but it could do load following. As you look at surplus markets, he said, and start looking at negative markets, people pay you to back off markets, so that could be a revenue stream.

Member Ferrioli said he applauds their clarity about their challenges. You're clearly articulating the value of BPA. A lot of technologies look to be less expensive, but not if they threaten the overall health of the BPA system. What's the expected life of your small modular nuclear? Prairie said they're running on a 40-year life expectancy.

Member Ferrioli followed by observing that Prairie said science-based, results-oriented and tied it to return on investment. I think those works are going to resonate with what we're doing, he said.

Member Devlin asked when all clearances will be achieved for the nuclear reactor. Prairie said it's being targeted for late 2026/early 2027.

Member Yost asked, if you're not fully subscribed with BPA, where do you get reserves and contingencies? Prairie said they are in PacifiCorp's East Balancing Authority. They get their reserves and load following through UAMPS. But you're at the mercy of the market.

Case said Fall River has four small hydros and belongs to the PNGC power pool. Beach said that Idaho County Light and Power has small hydro and is also part of the Northwest Energy Supply Market, if needed. Dizes said BPA does everything for Salmon River. For a small utility, we're not staffed to be out on the market, he said. We'd have to hire another organization to follow the market and make purchases.

6. Presentation by Independent Scientific Advisory Board on Predation Management Report

Dr. Stan Gregory, Independent Scientific Advisory Board (ISAB) member, and Erik Merrill, independent science manager, briefed Council Members on Basin predation management efforts.

Merrill said the Independent Scientific Review Panel's review of the report will be done in May. There's another companion report on the economics of northern pike. These reports take a lot of effort.

Gregory recognized the ISAB members, ad hoc members, ex officios and the manager. He listed nine prior reports on predation. There has been a large body of information over the years to guide predation management.

An ecosystem perspective is critical, Gregory said. These are systems with many predators and many preys. Three are nine predator control projects in the Columbia River Basin. Seven out of the nine are native species. We have 150 species of fish in the Columbia River and its estuaries that are part of these food webs. Being a predator is a common thing in our food web. That's a challenge in managing. If you take one out, it doesn't mean you suddenly release your salmon and steelhead to go to the ocean.

He showed the complexity of the food web with an illustration. He said they were asked to rank the predators and use an ecosystem approach to estimate their basinwide impact. The ISAB compiled a table of the major predators and categorical values of high, intermediate, and low vulnerability of salmonid prey to them. He showed a table that illustrates how the seasonal timing of adult returns and differences in body size affect vulnerability of salmonid species and runs.

There's a temptation to think of it as a river ecosystem, Gregory said. We're dealing with an altered ecosystem. We change habitats, pour chemicals into the river, and put in hydrosystems. In predation, every one of the dams is a focused route for salmon to pass. It's a magnet to attract predators. We have shaped predation in the basin. It's an ecosystem management question instead of suppressing a predator.

Reading from a slide, Gregory said that a basinwide, multipredator, multiprey approach must be taken to fully understand predation impacts. To measure the impact of predation, we need to know:

- the total predation by a predator at each point in time or space;
- the subsequent predation by all other predators; and
- the cumulative survival probability over the full life cycle or to a consistent point of reference (e.g., Bonneville Dam).

He said using a systemwide, ecosystem-based approach for assessing fish, avian and pinniped predators will create a more-effective management framework. Looking at socioeconomic considerations, Gregory said this approach should incorporate coupled human and natural systems. Cost effectiveness of predator control needs to be included when deciding where and what kinds of predator control measures to implement. Economic costs of the different interventions could modify decisions about preferred management actions.

The ISAB could not quantitatively determine a threshold for northern pike suppression, sufficient to reduce risk of emigration for the lake or sufficient to reduce the risk to other focal management species.

Gregory said northern pike was first detected in Lake Roosevelt in 2007. Gregory traced its migration. In 2018, there was a 27-pound pike caught. There's no practical way to prevent

them from going downriver and they will eventually invade the anadromous zone even with best efforts. But there is value in delaying it. They are highly invasive and are likely to reduce salmonid abundance. They prefer salmonids and can drive prey to very low levels or extinction. An important control measure is an early detection and rapid response system. There are eDNA testing sites set up, including a critical early-warning site near Grand Coulee.

There is a new technology for pike control to create YY males. It would take about 20 years before it accomplishes its purpose.

Gregory next discussed northern pikeminnow – the largest are the greatest predators of salmonids. Walleye show a different pattern. Some of the greatest impacts are from the smallest walleye. The same with small-mouthed bass. They've been under suppression for 28 years, mostly through sport reward programs, and some fishing at the dams through the agencies. The estimates of reduction are about 32%. We've never measured the control program on salmonids, it's just an assumption, he said. If you remove a predator, its prey is still there for other predators. Walleye and small-mouth bass are examples of that. This compensation is a real concern. The data behind it was completed over 30 years. Assumptions behind abundance estimates haven't been recalibrated since the 1980s. The control program doesn't have the funds or staff to do this: we're relying on 30-year-old data, he said. We know predators are more abundant in the tailraces and forebays, but we pay for sport removal from the mouth of the Columbia and other areas. But we know predation is at the dams. A more-targeted approach would be more effective. The value of adults about to spawn is huge. There's more value at the dam instead of further up the system.

The abundance of smallmouth bass has increased over time. Gregory reviewed recent control efforts. He said the restoration of riparian vegetation can reduce climate change effects by one-half for smallmouth bass and reducing effects by one-third for juvenile Chinook salmon

Gregory talked about walleye, a nonnative predator. He showed a table of consumption of salmonids by nonnative fish. The walleye have a lower impact than smallmouth bass.

He said the information online mostly talks about the sportfishing aspects of smallmouth bass and walleye, and should include warnings about not transporting nonnative fish.

Gregory discussed piscivorous birds. Terns, cormorants and seagulls have emerged as problem predators. Without this predation, salmon and steelhead returns would have been three times higher. He talked about encouraging other predator programs to think about using an adult return metric. Recent work on avian and pinniped predators is measuring impacts to adult returns and may lead to a better evaluation of the efficacy of management actions. Monitoring the movement of all avian predators is necessary to assess whether or

not these movements have decreased predation or merely moved it to another place in the Basin.

Seals and sea lions are another big issue. Predation by marine mammals, especially harbor seals, on juvenile salmonids has not received adequate attention. Lethal removal has started in Willamette Falls.

Mortality later in the life cycle is more detrimental than mortality earlier in the life cycle. A more-thorough evaluation of the biological and social outcomes of lethal removal will better inform decisions. Further study is warranted.

Member Norman expressed his appreciation for ISAB and the report. He noted that to keep reduction efforts at 30 percent, sports fishing programs have to continue at the same level. He observed that Gregory said an analysis is needed of the benefits to salmon overall. What would that entail? Gregory replied it's an enormous challenge. We have a few ideas, none perfect. He recommends getting the best minds together at a workshop to try and hammer it out. He said their best estimates on juvenile survival are in Upper Columbia system. If they had good estimates on the predator abundance in those same reservoirs, we might get a better signal. It's not perfect, but it's a start.

Member Norman said, so it would be in a specific geographical area. Correct, replied Gregory.

Also, the sport reward program could be increased and tags could be used more effectively to detect how predators are moving around.

Member Norman asked about the northern pike and the chromosome adjustment process. Do you have a sense of how extensive a process that would be? It's straightforward, Gregory said. It's been used for brook trout to eradicate it in some areas. It's being implemented in Idaho already. We know it would work biologically, but takes time to introduce into the system.

Member Devlin asked if the committee discussed that Grand Coulee and Chief Joseph might pass northern pike during spill. It's inevitable that northern pike will move downriver through floods and intentional spills, Gregory said. Grand Coulee has two different ways to spill, Member Devlin said, and he asked if they discussed more monitoring. Gregory said they didn't get into that level of detail in their discussions.

Member Devlin asked, if it would take 20 years to have an effective program for the YY chromosome, wouldn't it make sense to start it now? Yes, it would be prudent to start now, Gregory replied. It does show promise. Northern pike will be spread throughout the basin. Containment is more possible in smaller areas.

Member Anders asked about the distribution map and the cold water systems. The Grand Coulee has warmer water, she said. Does that impact the speed and prevalence of northern pike? Gregory said temperature will affect the rate of growth. Pike are in cool water. There's less production in the coldest headwaters. They do better in the warmer Columbia. We could map out habitat suitability — where pike colonization is likely and have eDNA and other locations ready to respond. But pike are adaptable and change their behaviors. The Columbia mainstem might not be the best environment for it, but it could change.

7. Council decision on release for public comment of draft Council budget for FY 2021 and revised budget for FY 2020.

Sandra Hirotsu, administrative director, said the draft Council budget for FY 2021 and revised budget for FY 2020 is ready to be released for public comment for between 30 and 60 days. The budget was developed with input from the states. It was presented to the Executive Committee, approved, and it has moved to the full Council for a decision. There is a decrease for 2020 and 2021. Both budgets are below the cap contained in the Act. There is a 45-day public comment period through June. There also will be an opportunity for public comment at the June Council Meeting. A vote will be held to adopt the final budget at the July Council Meeting.

Member Devlin moved that the Council approve the release of its draft FY 2021 and FY 2020 revised budget for a 45-day public comment period as presented by staff.

Member Norman second.

The motion was approved without objection

Council Business

Northwest Power and Conservation Council Motion to Approve the Minutes of the April 9-10, 2019, Council Meeting

Member Devlin moved that the Council approve for the signature of the Vice-Chair the minutes of the April 9-10, 2019, Council Meeting held in Portland, Oregon.

Member Norman second.

The motion was approved without objection.

Northwest Power and Conservation Council Motion to Approve the Final Version of the "2018 Columbia River Basin Fish and Wildlife Program Costs Report"

John Harrison, information officer, said this is the 18th year they've produced a report on where the money goes that BPA spends to implement its Fish and Wildlife Program. He said, they have always released it for 30 days of public comment. It's the same timing as last year's report. We received one comment from Tom Iverson, a consultant for the Yakama Nation Fisheries. Most of the changes were editorial. They were accepted except for one comment, which asked for us to express an opinion that is beyond the scope of the report. Upon approval, we can put it on the website and ask for comment.

Member Devlin noticed that the disclaimer is softer in this report than in previous years. This report says the numbers came from BPA. He requested that next year, the report come to him and other interested Members for review a month prior to public release. There are issues worth additional discussion, he said.

Member Devlin moved that the Council approve the report titled "2018 Columbia River Basin Fish and Wildlife Program Costs," as presented by staff.

Member Anders second.

The motion was approved without objection.

Northwest Power and Conservation Council Motion to Approve Patrick Oshie as Co-Chair of the RTF Policy Advisory Committee

Ben Kujala said a full Council vote is needed to approve an RTF co-chair to replace departing Member Tim Baker.

Devlin moved that the Council approve Patrick Oshie as co-chair of the RTF Policy Advisory Committee.

Member Yost second.

The motion was approved without objection.

Public comment

John Harrison reported that he received an email comment from Charles Pace on the ISAB predation report. It will be distributed to Council Members.

Chair Anders adjourned the meeting at 10:36 a.m.

Approved June 12, 2019

/s/ Richard Devlin
Vice-Chair