Council Meeting
Portland Oregon

March 11-13, 2014

Minutes

Council chair Bill Bradbury called the meeting to order at 1:38 p.m. and asked for committee reports.

Reports from Fish and Wildlife, Power and Public Affairs committee chairs:
Phil Rockefeller, chair, fish and wildlife committee; Pat Smith, chair, power committee; and Henry Lorenzen, chair, public affairs committee.

Phil Rockefeller, chairman of the Fish and Wildlife (F&W) Committee, said his committee received a progress report on the Fish Data Product, which indicated some objectives are complete, some are partially complete, and there is the possibility of issuing an RFP. There is funding to continue the project for 2014 and sponsors recommend the Council endorse $85,000 annually for 2015 and 2016 to continue it, he said, adding that a request will come to the Council in April. The F&W Committee agreed the project is important, Rockefeller said.

There was also a report from the Fish Screening Oversight Committee, he reported. More funding will be needed annually beyond this year to continue the committee's work on fish screens and bypass mechanisms, Rockefeller said. Our recommendation is this should be considered a core function of the F&W program, he said.

The third topic was the F&W program amendments, Rockefeller said. We are working our way through 200 pages of program draft, he said. We will continue the review and may have additional meetings this month, Rockefeller said. We hope to have something for the Council in April, he added.

Power Committee chair Pat Smith reported on six agenda items the committee addressed, including net changes in regional loads and resources since 1995. He

gave highlights from the presentation, including the changes in average and peak loads and additions to resources.

Smith said the committee heard a report on the RFP for redeveloping the Resource Portfolio Model and the schedule for meeting with vendors, as well as engagement with a stakeholder advisory group. There was also a report on the capacity impacts of energy efficiency, he said. While significant energy efficiency has been accomplished, we don't know how that affects capacity, Smith said. The end-use load study being used in the region is 25 years old, but NEEA has data that provides some comparison, he said. Smith recounted statistics from the staff report, which shows energy efficiency affects the need for capacity. The committee consensus was to move forward to get a comprehensive up-to-date end-use study done, he said.

BPA made a presentation on the business case on conservation and described a software application they have developed to tell an individual utility's story on energy efficiency, Smith said. Utilities can plug actual information into the model to help policymakers see how conservation is impacting their utility, he stated. We encouraged BPA to meet with utility board members to demonstrate this tool, Smith said.

The Power Committee also reviewed the members of the Seventh Power Plan advisory committees, he continued. The Council's Executive Director Steve Crow will make final decisions on the membership, Smith said. The committee reviewed the draft comments on NEEA's strategic plan and there was consensus to support them, he concluded.

Henry Lorenzen, Public Affairs Committee chair, said his committee would meet today with two items on its agenda: sponsorship of an estuary workshop and planning for the 2015 congressional staff tour, which Oregon will host. The annual report to Congress is finished and is being forwarded, he stated.

1. Remarks from Elliot Mainzer, Administrator, Bonneville Power Administration.
Council chair Bill Bradbury introduced Elliot Mainzer as the 15th BPA Administrator and one of the most qualified in the agency's history. We look forward to advancing the collaboration we have enjoyed with BPA in the future for the benefit of the region, he stated.

Mainzer responded by saying he'd been looking forward to the opportunity to get out and meet with friends and colleagues. BPA's relationship with the Council has been very important, and I'm committed to continuing that relationship, he stated.

Mainzer recounted that his first collaboration with the Council addressed wind integration, a highly technical topic. Today I will talk "big picture," and I want to walk away with a clear understanding of your priorities, he said.

I am deeply influenced by the history of BPA and what we have accomplished going back to the 1930s to put together a power system for the public's benefit, Mainzer told the Council. He recalled several eras in the agency's history, including World War II and the "productive and innovative years" of the 1960s under the leadership of Administrator Charles Luce that still benefit the region.

Administrator Peter Johnson in the 1980s “stepped in to make excruciatingly difficult decisions” and put BPA and the region on sound financial footing; he elevated the level of public discourse, Mainzer said. When I think of the lessons through history, I want to stay true to the historic mission of preserving and enhancing the power system and to bring long-term thinking to this work, he said. Preserving the economic vitality of the region, that’s what I want to continue, Mainzer stated.

One of the big issues for the Council is energy efficiency, he acknowledged. “Some signals from BPA’s Capital Investment Review have left the wrong impression” about BPA’s commitment to energy efficiency, Mainzer said. We will do what we can to meet the Council targets, he stated. We need to be realistic about the challenges we face in the region, and there are “a ton of competing demands” on our resources, Mainzer said. We have to be smart and collaborative to meet all of them, he added.

BPA has $10 billion in demand on capital in the next decade, Mainzer explained. We need to stay ahead on the transmission system to modernize our assets and meet reliability requirements and physical security issues, he said, adding “those are not free.” There are fish and wildlife demands and investments needed to our technical systems, and we have the energy efficiency commitments, Mainzer said. We need to meet multiple objectives and carry on a huge tradition, he added.

In concluding, Mainzer acknowledged he “wouldn’t have scripted” his path to Administrator in the way it happened. “It’s been a tragic situation,” he said. But I am excited about the job and I see tremendous opportunity, Mainzer wrapped up.

Tom Karier said he appreciated the reminder of what BPA and the Council have accomplished for the region with fish and wildlife and on the power side, with a “phenomenal amount” of wind integration and lots of energy efficiency to maintain a low level of carbon emissions in the system. The energy efficiency target is not just for the Council, it is for the region, he stated. It is the lowest cost, lowest risk way to meet the needs, Karier said. We’d like to see a customer role in energy efficiency, but with obligations tied to it; maybe “a BPA backstop” if the customer approach doesn’t work, he suggested. Working together, the Council and BPA can solve that problem, Karier added.

Henry Lorenzen said the challenge for electricity co-ops is lining up the motivation for conservation with the reality for retail utilities. As loads fall off, it puts pressure on rates, and co-op boards hate to increase customer rates, he added. While the region and utility customers benefit from aggressive conservation, it affects rates and that is one of the big challenges, Lorenzen said. There may be a way of twisting the incentives so utilities see conservation in the best interests of customers, the region, and their bottom line, he stated.

We need to get general managers to talk about and figure out how to address this issue, Mainzer agreed. While we all understand the economics of conservation, they see their fixed costs go up and their revenues go down, he said.

Bill Booth asked if Mainzer expects to see changes in terms of centralizing BPA functions within the Department of Energy. The most important thing is to get the problems in our human capital organization fixed, Mainzer responded. At the end of the day, if we aren't completely compliant, it's a problem, he said. BPA has worked through 51 percent of the cases in which hiring practices came into question, and we are well along the path to get the hiring functions delegated back to BPA, Mainzer reported.

I've heard concerns about centralization and greater DOE influence on policy, he continued. The DOE secretary and deputy secretary understand that and want us to run a compliant operation, Mainzer said. We could see more centralization of human resources at DOE, but policy and other decisions reside in the Northwest, he stated.

Pat Smith asked for an update on the Columbia River Treaty. Mainzer complimented the Council representation on Treaty issues and participation on the Sovereign Review Team. We came up with a recommendation that "found a sweet spot" among the interests, he indicated. We hear that we are likely to see some signal from the State Department at the end of April, Mainzer said. I don't know what the process will look like, but things are slowly revving up again, he added. The next phase will be very different from what has gone on, and we will see how the State Department gets involved and "how we choreograph" with them, Mainzer said, adding that it is important to continue to coordinate in the region.

Phil Rockefeller said in his recent trip to Vietnam he saw "an alternate universe" with water quality and air pollution. The Vietnamese also intend to extend their reliance on coal, he said. We have a different approach here, with coal in this region becoming increasingly obsolete, Rockefeller noted. This leads to new challenges for transmission and meeting resource adequacy standards, he said. Rockefeller asked whether BPA is thinking about a scenario that phases out and replaces fossil fuel.

We have a lot of interest in these issues because of changes they mean for the grid, Mainzer replied. When discussions about phasing out Boardman and Centralia were going on, we were working to understand the grid impacts, he said. The greatest hedge against problems is continuing to support more collaboration among balancing authorities, working through entities like the Northwest Power Pool, Mainzer said. As we decrease these generating resources, we need to plan for grid expansion and balancing services; we need flexibility and we are planning for it, he stated.

Jennifer Anders said she has been impressed by projections for population growth in the region. That presents challenges, with increased demand on our resources, including the power system, she added.

Mainzer said the increased pressure on resources is a growing theme. When we add 4,700 megawatts (MW) of wind onto the transmission grid, it puts great pressure on the dams, he said. We have gotten to the end of the capability of the dams to provide flexibility for ramping, so we are trying to bring non-federal resources into the system to complement hydro, Mainzer explained. We have been procuring those resources, and we are seeing demand response show up, he added. We were historically dependent

on hydro, but we are opening up the supply-side capability, Mainzer said. The resource opportunities are tremendous, and we need to go out and harness them, he concluded.

2. **Study on Renewables Integration by Lawrence Berkeley National Laboratory:** Ben Kujala, introduction; Andrew Mills, LBNL

Andrew Mills of the Lawrence Berkeley National Laboratory (LBNL) made a presentation on analyses he is doing to find "the right mix" of generating resources that minimizes costs while meeting needs. This "social planning" perspective is different from a utility perspective, he said. In general, the question being addressed by LBNL is how much renewable energy (RE) should be added to the system, he said. There are lots of constraints to finding the right balance, but there is a right mix, according to Mills.

The objective of social planning models is to minimize costs, and the LBNL research is exploring how much costs change with RE, he said. We look at the savings, which are the reduced costs from not needing to burn fuel and build other power plants, compared with the costs of building a new RE plant, Mills explained. If the savings are greater than costs, then adding more RE will bring down costs and help meet the objective, he said.

We want to keep adding RE until the savings are less than the costs, and the logic of the social planning models is to compare the costs and savings, Mills continued. It is never easy to find just the right mix since there are uncertainties about costs, he said.

Mills pointed out the challenge of estimating the value of variable renewables since there is a limited ability to forecast their output. The LBNL research is focusing on the value side of the question, he said. We are quantifying the economic value of variable renewables, such as wind and solar, understanding what causes changes in the value, and finding ways the changes can be mitigated, Mills added.

He explained results from various iterations of the model, including adding variable renewables in California and adding Wyoming wind in the Rocky Mountain area. The model shows us what happens as we add RE and what we get in terms of savings, Mills said. In both the California and Rocky Mountain case, the economic value of wind decreases with increasing penetration levels, he reported.

The next step in the research is to find out what contributes to the decline in value, Mills explained. In the California scenario, with the higher levels of wind, we start to displace less costly fuels and the value declines, he said. In the Rocky Mountain area, forecast errors drive the decrease in RE value, Mills noted. Researchers conducted the same analysis using solar instead of wind and found that at low penetration levels, solar has great value, he said. But the marginal value is less as the penetration increases because of the need to add more capacity, Mills added.

LBNL researchers looked at the options for mitigating the decline in the economic value of RE, he continued. There are several mitigation strategies, including geographic

diversity of wind installations, real-time pricing, and low cost storage, Mills said. There are a range of options to slow the decline in the value, he added.

In conclusion, Mills listed the following: the marginal economic value of variable renewables decreases as the penetration increases; the changes in value are driven primarily by changes in the value of capacity and energy in California; a concentration in wind sites and day-ahead forecasting errors can also contribute to the decline in value; and several measures can help stem the decline, although the value still decreases with increasing penetration.

Anders asked how the LBNL findings translate to other regions. Mills acknowledged reluctance to analyze the Northwest because of hydro. In the Northwest, the analysis is dominated by the flexibility of hydro, he said. The analysis can be translated to other regions, but you will get a different story, Mills added.

Booth asked several questions about how resource costs are treated in the analysis. I would hope if we develop new models, we focus on fully depreciated resource costs, not just fuel costs, he said. Also, the analysis should take into account a region's ability to regulate wind and include real-life circumstances, like the availability of transmission for wind, so the model is less theoretical, Booth stated.

Our focus was to compare the value, and we didn't look at costs, Mills replied.

3. **Regional Hydro outlook for this water year:**
   John Fazio, senior power systems analyst; and Jim Ruff, Manager, Mainstem Passage and River Operations.

The 2013-2014 water year started out with extremely low precipitation, staffer Jim Ruff told the Council. But things turned around in the past month, and precipitation in February and early March was 130 to 180 percent of normal in most of the Columbia River Basin, he said. Overall for the year, precipitation in the basin remains below normal, particularly in the southern portion, Ruff stated.

Late-season precipitation has increased the snowpack, which is now normal overall for the basin, he continued. The highest measurements are coming from the eastern areas, Ruff said, adding that the snowpack in western Montana is at 130 percent of normal. Conditions remain below normal in Idaho at 95 percent, Washington at 89 percent, and Oregon at 65 percent, he reported.

Things are still very bad in southern Oregon, where the snowpack is the lowest in the basin, Ruff stated. The February and March storms were tracking north and missed the southern part of the region, he said. The Governor of Oregon could declare a drought emergency for southern Oregon, Ruff added.

The peak snowpack is usually reached April 1, and it is tracking toward 100 percent above The Dalles, which is better than 2013, he went on. In February alone, there was a 14 percent increase, Ruff said.

The runoff forecast has improved since January 1 in many parts of the basin, although there has been little change in southern Oregon and southern Idaho, he noted. There was a large increase in the forecast in the eastern basin, in northern Idaho and western Montana, where things are at or above normal, Ruff said. The highest forecasts are along the Continental Divide, he pointed out.

Ruff highlighted the runoff forecast in several basins, noting the forecast at The Dalles is right at average. Conditions in the Wenatchee and Yakima are above average, but in some of Oregon's major Columbia River tributaries, the Umatilla, John Day, and Willamette, the runoff forecast is below average, he said. According to NOAA, warmer than normal temperatures are expected in the southern Columbia basin, and the current oceanic conditions are average, Ruff concluded.

While the snowpack in the basin is normal overall, there is still lots of uncertainty, staffer John Fazio said. The NOAA forecast assumes average precipitation going forward, he said. While there is good news lately, there is still uncertainty, Fazio stated.

He presented the January-July runoff forecast at The Dalles for recent years, noting the 2014 forecast is 100 million acre-feet (MAF), which is right at average. A probability curve shows the runoff is very unlikely to be less than 80 MAF or more than 120 MAF, Fazio said. The range of potential runoff outcomes narrows as we approach September and the end of the water year, he said.

Fazio also plotted historical flows and the 2014 forecast for Lower Granite and McNary dams, the measuring points for fish flow targets. The analysis shows the region can expect average flow conditions, he said. In other words, there's almost no chance of having a really bad year, Fazio added.

Staffer Charlie Black pointed out that the farther south you go in the basin, the worse the water conditions. California is in a drought emergency so there will likely be a strong market for export power, he said.

There is a consensus that with extraordinarily low flows, fish suffer, Karier said. But otherwise, the role of flows is controversial, he added. It would be interesting to see what happens to fish in the tributaries under various flow conditions, Karier said. Fish in many of the tributaries are being tagged so data on the smolt-to-adult returns will be available, Ruff responded.

Jim Yost said Idaho's reservoirs went empty last year, but will likely refill with this year's water conditions. Idaho is likely to be able to add its 487,000 acre-feet to augment flows, he said. The soil is saturated, too, so there won't be a need for early irrigation, Yost stated.

4. Council Decision on comments on NEEA strategic and business plans:
Charlie Grist, Senior Analyst

The Council's Power Committee has approved draft comments on the Northwest Energy Efficiency Alliance's (NEEA) strategic and business plans, reported staffer

Charlie Grist. The strategic plan lays out the vision and goals, and the business plan guides implementation going forward, he explained.

The issue of NEEA's overlap with some of its members' efforts arose as the plans were being developed, and the Council's draft comments encourage NEEA to manage and resolve the issue, Grist told the Council. As NEEA expanded its role and utilities moved into the area of transforming markets, "the staffs have bumped into each other" and NEEA is trying to figure out how to manage that overlap, he elaborated. One option under consideration is for NEEA members to opt in or out of various market transformation efforts, Grist said. He noted the need for NEEA to be very careful in this area in order to maintain its value in negotiating for the entire region with large retailers like Wal-Mart.

Grist went on to highlight other areas of the draft comments, including strong support for NEEA's activities to scan for new measures and practices to fill the efficiency pipeline continuously with new things. NEEA has $17 million in its budget to develop opportunities that come along as a result of the scanning, he said.

The Council comments also call for strategic coordination for conservation implementation planning, Grist continued. We want to have coverage to get all of the efficiency in the Council's plan, and while NEEA and BPA have picked up things on an ad hoc basis, "coordinated implementation planning needs a home and someone needs to orchestrate it," he stated.

With regard to NEEA governance, Grist said the Council offered suggestions. NEEA's board has gone through a lot of turnover and as a result, there has been a slowdown in activity, he said. Attention needs to be given to maintaining continuity on the board and to changing its makeup, Grist said. A lot of the strategic plan development has been done by the board without a lot of public input, he added. That is an oversight and having strong public interest representation on the board would assure that input, Grist stated.

NEEA has been very valuable, he said. We have a strong interest in seeing it continue its thoughtful and innovative work, Grist concluded.

Bradbury asked if NEEA would have to amend its bylaws to incorporate the governance recommendations, and Grist said it would. Black pointed out that the expansion of NEEA's role since the Sixth Power Plan has brought about 50 MW of energy efficiency at a cost of $40 million. That indicates the value of NEEA's work, he said.

NEEA has done a lot of good work in the last five years to expand into its larger role, Grist said. "There have been bumps along the way" and that's where the overlap issues emerged, he said.

There's agreement that NEEA does great work, but I would be remiss if I didn't say there were problems, Yost stated. Idaho will take the position that there should be a reduction in the budget of 10 to 20 percent, he said. As for the overlap issue, Idaho has

a problem with it in the irrigation sector, Yost said, adding that “it is a big problem that NEAA ought to resolve.”

There should be a way for members to opt in or out of NEEA activities, he continued. NEEA should provide a basic service, and if it wants to expand its level of service, utilities should have the opportunity to opt in to provide it, Yost stated. The reason behind the hold up on the business plan is only partly due to turnover on the board, he added. Some of the problem is within NEEA, Yost said. The internal problems need to be addressed and fixed, he said.

NEEA will have a special board meeting March 21 to adopt a new draft of the strategic and business plans, and there are four public meetings scheduled after that, Grist said.

Rockefeller asked about the proposed reduction in NEEA’s industrial sector activities. I thought this was an area in which NEEA excelled and it accounted for significant gains in efficiency, he said. Grist confirmed that the November version of NEEA’s business plan cuts market transformation activities by $3.7 million. The recommendation to scale down NEEA’s role in the industrial sector came from funders who want to see NEEA focus on residential and who are tired of the overlap with their activities, he said.

I’ve understood industrial savings are the driver of NEEA’s success, Rockefeller said. Should we comment on leaving it to the discretion of utilities as to whether to carry on with the industrial emphasis? he asked. This go-round, utilities want to do things themselves in the industrial sector and they want to keep the NEEA budget in check, Grist responded.

If you look back several years, the predominant NEEA savings came from the industrial sector, Clay Norris of NEEA said. More recently, the savings are from residential, he said. Much depends on the opportunities available, Norris added. As the local funders have ramped up their efforts, they have focused on custom programs for the industrial sector and feel they can deliver those opportunities themselves, he said.

Anders made a motion that the Council approve the comments on the 2015-2019 Northwest Energy Efficiency Alliance’s Strategic and Business Plans presented by staff and recommended by the Power Committee. Karier seconded the motion, which passed unanimously.

5. Council business:

- **Approval of minutes**

Jennifer Anders made a motion that the Council approve for the signature of the Vice-Chair the minutes of the February 11-12, 2014 Council meeting held in Portland, Oregon. Lorenzen seconded the motion, which passed unanimously.

- **Council decision on renewal of advisory committee charters**

Bradbury asked if there were any comments on the advisory committee charters. Black noted that the updates to the charters are cosmetic with no major substantive changes and that the charters were reviewed by the Power Committee.

Anders made a motion that the Council authorize the renewal and update of the charters for the Conservation Resources Advisory Committee; the Demand Forecasting Advisory Committee; the Generating Resources Advisory Committee; and the System Analysis Advisory Committee, each for a period of two years as presented by staff and recommended by the Power Committee. Karier seconded the motion, which passed unanimously.

Public comment on fish and wildlife program amendments
Bradbury opened public comment on the F&W program amendments.

Liz Hamilton of the Sportfishing Industry Association spoke in favor of a recommendation to test a hypothesis that increased spill would enhance juvenile fish passage. She said the following: sponsors of the proposal are encouraged by the Independent Scientific Advisory Board (ISAB) review of the recommendation. No other changes in the hydro system have brought about conditions in which juveniles meet the survival targets in passing the dams. We would ask the Council to have the sponsors review their proposal and submit a new experimental design that addresses the issues raised by the ISAB.

The Cumulative Survival Study points to spill as a viable alternative to increase passage survival. We recommend you request a strengthened spill test for inclusion in the F&W program; it could lead to success. We hope you consider using your staff to do an economic study of the benefits of increased salmon runs. We don't feel the economic contributions of the region's sport fishing industry are taken into consideration.

Rod Sando of the Sportfishing Industry Association spoke in favor of the recommendation to test a hypothesis that increased spill would enhance juvenile fish passage He said the following: I reviewed the ISAB findings and recommend you ask the Cumulative Survival Study staff to prepare a detailed study plan for the spill test. The recommendation is an experiment and not a recommendation for a permanent change; it fits with the concept of adaptive management. There is bias in the scientific management of Columbia River salmon. The Council should direct the ISAB to conduct a meta-science review of the F&W program to detect bias. We need to address the bias in this process.

Gilly Lyon of Save Our Wild Salmon spoke in favor of the recommendation to test a hypothesis that increased spill would enhance juvenile fish passage She summarized the key findings in the ISAB review and said the test could bring the region closer to the salmon recovery goals. We support the request that Cumulative Survival Study staff utilize the ISAB recommendations to resubmit an experimental design, Lyon said.

Andrea Matzke of Wild Washington Rivers spoke on the subject of toxics and clean water. She said the following: There should be some type of provision before we drill in areas that are known to have heavy metals. Instead of playing catch-up on clean waters, I'd like to see entities take a more proactive role in assessing sites that have the potential for heavy metals before there is drilling. We need to think before we start drilling in areas that will wash into salmon streams.

Bradbury concluded the public comment.

6. Council Decision on project review, Project #2007-393-00, *Protect and Restore Northeast Oregon/Southeast Washington:*
Mark Fritsch, manager, project implementation.

Staffer Mark Fritsch said the Protect and Restore Northwest Oregon/Southeast Washington project is a follow-up to the Council's action last year. The Independent Scientific Review Panel (ISRP) had found that the project did not meet scientific review criteria and the Council subsequently requested a revised proposal from the sponsors in November 2013, he explained. The sponsors submitted the revised proposal, and it was reviewed by the ISRP, which determined it was a coordination project, Fritsch explained. The F&W Committee recommended in favor of the project with two conditions, he said.

Project representatives Heidi McRoberts and Emmitt Taylor III made a presentation on the project. McRoberts said the objective is to work with project partners and find additional cost-share funds to carry out restoration activities. In Oregon, the primary partner is the Grand Ronde Model Watershed, and in Washington, we are working with the Snake River Salmon Recovery Board, she said. McRoberts described the project accomplishments.

Lorenzen asked about efforts to upgrade fish passage at Oregon Department of Transportation culverts. Taylor said Wallowa County and the U.S. Forest Service have been partners in Oregon, but so far none of the projects have involved state highways.

Anders asked about the conditions the committee attached to the project. Fritsch explained that the sponsors are to use the project funding only for the partnership effort and not for on-the-ground activities in implementing two umbrella projects, the Grand Ronde Model Watershed and the Tucannon Programmatic Habitat project, and they are to participate in a 2016 effectiveness review of these umbrella projects.

Karier said he supports the project. The staff memo on the project did not have anything about results, and it would have been helpful to include an accounting of benefits and results, he said.

Anders made a motion that the Council support the implementation of Project #2007-393-00, Protect and Restore Northwest Oregon/Southeast Washington, based on the conditions described by Mr. Fritsch (1) that the project funding be used for partnership efforts only and not for on-the-ground activities and (2) that the project sponsors demonstrate the benefits of the project as part of a performance review associated with umbrella projects in early 2016, as presented by staff and recommended by the Fish and Wildlife Committee. Booth seconded the motion, which passed unanimously.

7. Briefing on Vulnerability Assessments and Rapid Response Preparedness for Quagga/Zebra Mussels in Northwest:
Jim Ruff, introduction; Stephen Phillips, Pacific States Marine Fisheries Commission

Staffer Jim Ruff introduced Stephen Phillips of the Pacific States Marine Fisheries Commission, who provided a briefing on the vulnerability assessments and rapid response preparedness for quagga and zebra mussels. Phillips said infestations of zebra and quagga mussels have cost an estimated $5 billion in the United States. He showed a map with the current distribution of the infestations, noting that in 2013, the mussels were found in Lake Powell in Utah.

Phillips reported there was good participation at a May 2013 meeting in Vancouver that focused on preventing an invasion in the Northwest. The goal was to develop a regulatory response, and we accomplished a declaration of cooperation, with 24 signatories, as well as an action plan that involves two groups, a Rapid Response Working Group and a Vulnerability Assessment Team, he said. Funding for the work is coming from BPA, Phillips said.

He went on to describe the rapid response plan, starting with the control options and the permitting process that is required in order to apply chemicals such as copper sulfate to the water. Phillips noted that copper is very bad for salmon and steelhead, which is a big obstacle in the Columbia River. The next step is meeting with the U.S. Fish and Wildlife Service and NOAA in the effort to get a green light for the option, he said.

Phillips described the Vulnerability Assessment Team's work, the goal of which is to determine the status of assessments at the Columbia River Basin projects and the risk that exists, and to recommend the highest priority actions. The team's survey shows not many assessments are completed and there is no information yet for over half of them, he said. The Bureau of Reclamation said it will perform assessments at Minidoka and Palisades, which are important projects for an assessment because of the high calcium levels in the Snake River, an environment in which the mussels can survive, Phillips said. Southern Idaho and western Montana are at high risk, but the risk west of the Cascades is low, he added.

Phillips explained how the team came up with a cost of conducting the assessments, which range from $5,000 to $30,000 per project. The total for medium and high risk projects is $475,000, he said. We will be finalizing our report on the assessments and the next question is how to pay to get them done, Phillips said. He outlined the funding options and recapped the success of the inspection stations at intercepting infected water craft in 2012.

Lake Powell became infested with the mussels in 2013, Phillips said, and Idaho mapped how many boats they get from Lake Powell and where they are headed. We'd like to see watercraft in Lake Powell be decontaminated, he said. Ruff said the Council had also supported inspection and decontamination of boats leaving Lake Powell.

The Council had questions and there was discussion about the need to refocus federal agency efforts from decontaminating boats going into Lake Powell to decontaminating boats coming out of Lake Powell. Phillips described legislative efforts to require inspections and authorize inspection stations.

Smith asked if the U.S. Park Service is decontaminating all boats coming out of Lake Mead in Nevada. It has been a struggle, Phillips responded. The Park Service was unable to decontaminate boats to our satisfaction, he said. We would still like to see all watercraft that are moored long-term at Lake Mead and Lake Powell decontaminated, Phillips said.

The Council had questions about the prospects for increased funding. Phillips said the best chance is the Water Resources Development Act. He said hydro operators are starting to move on the vulnerability assessments.

Bradbury asked about the use of copper as a control option since it is not to be used in moving water. Phillips said mussels are often found at boat ramps and marinas. If we see them and have a chance to eradicate them, we could do so at boat ramps and marinas, he said. Phillips noted that manufacturers are making strides in product efficacy.

Rockefeller asked how many vulnerable dams are in federal and other ownership. Phillips said the dams are a mixture of federal and private ownership. He said most are hydroelectric dams and some are irrigation only.

Dam owners would have a great stake in protecting their projects, Rockefeller said. He asked if Phillips had approached organizations that represent generating utilities. Phillips said some of those organizations are involved in the prevention effort.

Karier asked if there are estimates about the number of boats inspectors are missing, and Phillips said he did not have that information. Karier said the Council could work with others to see what it would take to get such counts.

Yost said there is an order in Idaho for any boat coming from Nevada to be pulled over and decontaminated. We found many boats coming from Lake Mead to be contaminated and they had to be decontaminated in Idaho, he said. Yost said the agricultural community in southern Idaho is very supportive of the mussel prevention efforts in the state. We are continuing to do inspections and hope to increase the days and hours at inspection stations, he said.

We've begun discussion about how many folks we are missing, Yost said. We made inquiries and although the options aren't clear, it seems our best bet is to spend money on inspections rather than traffic counts that "chew up the money," he stated. It's expensive and we want to use the money on inspections and decontamination, Yost said.

Phillips said he gets some reports on tracking boats out of Lake Mead, and we are interested in electronic tracking. But to do that, we will have to work through privacy and data issues, he added.

I've always felt we need to be ready for that moment when we discover mussels in the region, Booth commented.

8. Briefing on Columbia River Basin fish run forecasts:
Jim Ruff, introduction; Bill Tweit, Washington Department of Fish and Wildlife; and Ed Schriever, Idaho Department of Fish and Game.

Ruff introduced a presentation on the forecasts for 2014 Columbia River Basin fish runs, noting that Bill Tweit of the Washington Department of Fish and Wildlife will cover the Columbia River and Ed Schriever of the Idaho Department of Fish and Game will cover the Snake River.

Tweit explained that the numbers he would present on Columbia River salmon and steelhead returns were generated through the U.S. v Oregon Technical Advisory Committee (TAC), and he listed the TAC members. The total upriver spring adult returns represent average to above-average numbers, Tweit began. We are still in "a sweet spot" for salmon returns, although the numbers for steelhead are not as good, he said, adding that for stocks that spend time in the Gulf of Alaska, "we are looking good."

The forecast for spring chinook returns presents an average year and an improvement over last year, Tweit said. The 2014 forecast is 227,000, which exceeds the actual returns in 2013 of 123,100, he said. "We have been bedeviled in forecasting that stock," Tweit acknowledged, and because of the variability in the spring returns, we will be conservative in our fisheries management, he said. Tweit also noted that the peak timing for the run is a week later than it has been historically. "Something has gone on with this stock," he stated.

Of the two main listed spring chinook stocks, the Upper Columbia has been the weaker, Tweit continued. That is particularly true of the wild portion of the run, although we are seeing an uptick, he said. The 2014 forecast is 24,100, with 3,700 wild fish; the actual returns in 2013 were 18,000, with 3,600 wild fish, he said. As for the Upper Columbia summer chinook, the 2014 forecast is 67,500 compared to an actual 2013 return of 67,600, Tweit said. We don't have figures for the Chief Joseph hatchery yet since the first large-scale release is this year, he added.

The 2014 sockeye forecast is 347,100 fish compared to an actual 2013 return of 186,100, Tweit continued. We are seeing good strength in returns for both the Wenatchee and Okanogan, he said, adding that the resurgence of runs in the Upper Columbia is providing a significant economic boost to local communities. As for upriver summer steelhead, the 2014 forecast is 281,000 compared to an actual 2013 return of 231,400, Tweit said. The upriver summer steelhead is not showing as much response as other stocks and the forecast is below the 10-year average, he said. We expect these types of fluctuations, and "it isn't a crisis," Tweit added.

The 2014 forecast for the upriver fall Chinook is 1,399,000, he continued. Here, you see the most effect of the ocean, Tweit said, adding that these fish spend lots of time in the Gulf of Alaska. The 2013 return was 1,078,500, he said. We had forecast 539,300 and the return "was unprecedented," Tweit said. This year, we are predicting a large return and many of these fish will go to the Hanford Reach, he said. "If you ever want to see Hanford with lots of spawners," this is the year, and it could be exciting, Tweit stated.

Rockefeller asked about the impact of drawdown at Wanapum Dam on 2014 spawning. The situation is better viewed as a longer-term problem, Tweit said. We have a series of agreements with the dam operators and flows are managed to avoid dewatering redds, he said. Once we see emergence, the agreement shifts operations to focus on avoiding stranding, Tweit explained. The primary tool for the operation has been Wanapum pool, which is a large pool, he said. In the 24-hour operating cycle, Wanapum pool is important, Tweit stated. As long as the pool is down significantly, it can't produce that needed water, he said. We are urging other PUDs and BPA to cooperate as much as possible to address the situation, Tweit said.

This run is a fantastic resource that represents natural production above four mainstem dams, he continued. When fish spawn in these numbers, they are an important part of the ecosystem, Tweit explained. We strongly encourage other operating partners to coordinate and compensate for the loss of Wanapum, he added.

Should our F&W amendment process take into consideration operations at the dams above Wanapum in response to this situation? Lorenzen asked. Ruff said staff would look at that question in context of the Mid-Columbia Habitat Conservation Plans and will have a better idea of the situation next month.

Staffer Tony Grover said the impact on adult fish passage past Wanapum and Rock Island dams is an unknown. This is an unprecedented situation in the basin, and we don't know how long this will last, he said. Grover indicated that the Federal Energy Regulatory Commission is investigating why the break in the dam occurred and is asking follow-up questions about the possibility of a design flaw.

Grant and Chelan PUDs have been coordinating closely with all fisheries managers from the first day of the problem, Tweit said. Upstream passage is our first priority and it may be the most difficult, he stated. We are also paying attention to the downstream passage and are stressing the cooperation between these parties, Tweit said.

He moved to the forecast for upriver coho, which experiences more variable marine survival. The 2014 forecast is 124,400, up significantly from a 2013 actual return of 59,540, Tweit said. We should see an uptick to the portion of the run above Bonneville Dam, he said.

In summary, Tweit said the 2014 forecast is for 2,566,600 fish, and if we are correct, this could be "a high water mark" for returns. In the larger context, which is more relevant to the Council's long-term goal of 5 million fish, the 2013 return was 2,261,000, he said, adding that "we are in a positive part of the cycle." In general, the numbers are driven strongly by chinook and the continued growth of the sockeye, Tweit said.

He went on to provide a retrospective on 2013 the fisheries, noting that the recreational, commercial, and tribal fisheries met their conservation objectives and were managed within Endangered Species Act constraints. Tweit also gave a brief update on smelt. We had low smelt returns through the mid 2000s, but are seeing strength in the recent

returns, he said. We don't think harvest was ever a big factor with the smelt, but the downturn was the result of marine cycles and possible effects of habitat, Tweit said.

Schriever reported on the Snake River runs, a subset of the upriver stocks. Fishing is important in Idaho, he said, adding that there is no non-Indian commercial fishery in the state. Rebuilding the natural stocks is important and all of the returning fish are part of some mitigation effort, Schriever said.

The Snake River fall Chinook are experiencing the benefits of ocean conditions, as well as hatchery supplementation, he continued. The 2014 forecast is over 57,000, and the natural origin fish numbers will be higher than those for hatchery fish, Schriever said.

Idaho sockeye is on "a life-support program," he said. While it is difficult to accurately forecast such small run sizes, we expect more than 1,000 fish over Lower Granite Dam in 2014, and fewer will make it to the Stanley Basin, Schriever said.

He noted that Idaho's summer steelhead run for 2013-14 isn't complete since fish that passed Bonneville Dam last summer and fall are still making their way to Idaho. The run will end up with about 24,000 natural and 76,000 hatchery steelhead, Schriever said, adding that it is difficult to forecast steelhead because they spend only one year in the ocean. We expect to see an increase in the natural return at Lower Granite in 2014-15, with about 45,000 fish, which is a little higher than the 10-year average, he said.

As for hatchery steelhead, we expect a few more than last year, Schriever said. He pointed out that the 2013 return of B-run steelhead to the Clearwater was disappointing and there was no harvest of fish over 31 inches for the first time since 1989.

Schriever said the spring/summer chinook run in 2013 was a little disappointing and there wasn't much of a fishery. In 2014, the forecast is for over 45,000 natural spring chinook above Lower Granite Dam, which is about twice the 10-year average, he said.

Schriever indicated the broodstock need for spring/summer chinook is 9,200 fish, which have to be set aside. Those are constraints on fishing, he said, adding that 2014 should provide a more robust fishery. Schriever also explained the difficulty in forecasting the runs and a tendency to under and over-predict the run, depending on its size.

Booth pointed out that two Idaho hatchery programs have done quite well: the Nez Perce effort with fall Chinook and the program to save Redfish Lake sockeye. Why are those two programs successful while others are not? he asked.

With the sockeye program, we had no alternative, Schriever said. It was a lifesaving measure and we took all of the genetic information we had into protection, he said. The science behind the program has allowed us to maintain the genetic diversity, Schriever added. With fall chinook, there could have been a lot of homogenization before there was protective action, he said, but we can't paint hatchery programs with a single brush. There are a lot of reasons and no easy answers, Schriever said.

9. Briefing on final Columbia Basin White Sturgeon Planning Framework:

Lynn Palensky, introduction; Blaine Parker, Columbia River Inter-Tribal Fish Commission; Brad James, Washington Department of Fish and Wildlife;, Tom Rein, Oregon Department of Fish and Wildlife; and Kathryn Brigham, Umatilla Tribe/CRITFC, presentation.

Staffer Lynn Palensky introduced a briefing on the final Columbia Basin White Sturgeon Planning Framework. As part of its final 2011 programmatic recommendations, the Council reviewed all of the sturgeon projects in the basin and called for developing a collaborative plan. The framework has gone through public comment and ISRP review, she said. This will be an important document for future sturgeon work, Palensky said.

Blaine Parker of the Columbia River Inter-Tribal Fish Commission said the planning framework is a compilation of other sturgeon plans in the basin. He went over the background and timeline for developing the framework. Parker described the framework development process and the planning units across the basin addressed in the framework. He listed the vision and goals for the process, which include viable, persistent sturgeon populations throughout their historical range, where feasible, and significant, stable, and sustainable fisheries and harvest, as well as an ecosystem supporting essential habitat.

The dams changed river flows and habitat, Parker said. This breaks down the complex habitat that existed before, but that doesn't mean we can't fix things, he said. Sturgeon are landlocked behind dams so we have the opportunity to work with specific populations, Parker said. He went on to describe how the framework was reviewed and how input from reviewers, including the ISRP, was incorporated.

Parker listed and provided a detailed explanation of the recommended actions, including: supplementation, including hatcheries; hydro system operations; ecological and population dynamics; and a Council dashboard and websites for white sturgeon. He said the planning team recommends the Council: adopt the framework into its F&W program or as an appendix; build a sturgeon program of short-term and long-term measures; and consolidate the recommended measures into a set of strategies for the mainstem. Sturgeon need money and BPA needs to adequately fund sturgeon, Parker stated. The bulk of the current funding goes to salmon, but for sturgeon strategies to come to fruition, they need funding, he said.

Parker laid out next steps for the sturgeon effort, including retooling the current BPA project to monitor and evaluate the effectiveness of the actions. Bradbury asked what it means to "retool" the project, and Tom Rein of the Oregon Department of Fish and Wildlife said there is no money built into the project to monitor sturgeon releases for growth, survival, and use of the habitat.

This is another opportunity to find out more from the research, monitoring and evaluation (RME) effort, Booth said. He said the planning team addressed the Council's objective of collaboration and coordination among the diverse sturgeon projects and managers, but what about the concern with sea lion predation on the sturgeon. What have we discovered? Booth asked. Another major concern from BPA customers was

harvest on a recovering species. Are we sure harvest is at a safe and appropriate level for recovery of the sturgeon? he asked. I hope your report covers a vision of harvest and how that will be managed so we don't see a decline in sturgeon numbers, Booth stated.

Rein said harvest is covered in the plan. He went on to explain how harvest is managed. Rein said biologists thought harvest could go on at a reduced level, but the Oregon Fish and Wildlife Commission closed harvest on sturgeon. We are seeing a turn-around and increased abundance, Rein said. He noted that the goal of the plan is harvest, and it is not a limiting factor.

As we move into the lower Snake, we rely on population assessments, according to Brad James of the Washington Department of Fish and Wildlife. The assessments have been infrequent and we have concerns about those populations, he said, adding that Washington's sport fishing regulations are more passive on the topic. We will be evaluating where we stand after the next population assessment, James said.

Sea lion predation is a risk factor for recovery since the sea lions prey on spawning size sturgeon, Rein said. We are doing "everything the law allows us to do" to curb the predation, he said, adding that sea lion predation downstream from Bonneville Dam to the mouth of river has become an issue.

Palensky noted that there is a lot of work on sturgeon in the Kootenai that is part of a different review. If the sturgeon work wasn't connected before, it is now, she said, noting that efforts are being made to share information and data.

Bradbury commended the collaborative effort on sturgeon. Rockefeller also thanked the team. The sturgeon inspire a sense of loyalty, he said. The remnant populations exist behind dams and are waiting for us to figure it out, Rockefeller added.

10. Update on NOAA Life-cycle Model for Columbia basin salmon and steelhead:
Rich Zabel, NOAA

Rich Zabel of NOAA made a presentation on NOAA's lifecycle model for Columbia River salmon and steelhead. He explained the history of efforts to develop a lifecycle model, noting there is an ongoing active group working on the model in the Adaptive Management Implementation Plan (AMIP) that is part of the Biological Opinion.

The goal of the modeling project is to assess the benefit of mitigation actions across the salmon and steelhead lifecycle, Zabel stated. We are trying to come up tools that have an impact at various parts of lifecycle, he said. The AMIP work is a collaboration of a number of working groups that focus on specific questions, Zabel explained. In the AMIP process, our focus and charge was to increase the number of populations we are addressing, the effects of habitat actions, and link them to hatchery impacts, spatial patterns, and complex life histories, he said.

Zabel went on to show a schematic of the lifecycle of stream-type chinook salmon. Each stage of the lifecycle is informed by data, and the goal is to look at a number of actions

that happen in fresh water and to roll those up into population viability metrics, he said. Zabel said the modeling has focused on the freshwater stage.

He went through the strategy of the model and the steps involved, explaining various factors that can affect survival, including flows and climate conditions, such as precipitation and average temperatures. Zabel went on to explain model results in specific subbasins, including the Wenatchee, Grand Ronde, and Lemhi, and with specific species, including fall chinook and steelhead.

Zabel said the ISAB reviewed the model. The ISAB said the model is helping to prioritize restoration actions, "which is what we wanted," he said. The ISAB encouraged the collaboration, reviewed the hatchery impacts work positively, and recommended that with the estuary, we bring in more ocean indicator data, which we plan to do, Zabel said. The ISAB also identified a couple of things we aren't including, such as non-native species and toxics, he added. The ISAB was favorable to these efforts, but said we need to do more work on the model. We agree and plan to have an iterative process with ISAB to incorporate its comments.

Bradbury asked about the scale of the work and whether it could be applied to restoration efforts at a local level. That is our goal, Zabel said. It would take more work to get there, he said, adding that some fish populations are data rich and some are not.

Karier said the work is impressive and has great promise for answering questions about what is working. You have the survival data at different life stages, and we all see a need for putting more of that data into a picture, he said. You are in an ideal situation to collect that data, which has value in itself beyond feeding into the model, Karier said. He asked if there are ways to present the data and make it more clear what the model would say in terms of policy changes.

Zabel said the team is working on ways to present the data so it is digestible.

11. E3 Study of 50 percent Renewable Portfolio Standard in California:
Charlie Black, introduction; Arne Olsen, Energy+Environmental Economics, presentation. Public Comment on any issue before the Council

Black introduced Arne Olson of Energy+Environmental Economics (E3), a California company that has been in the midst of the analyses on California's policies to reduce greenhouse gas (GHG) emissions. "California is pushing the envelope on greenhouse gas reduction," Black said, adding that the E3 work is instructive for the Council's Seventh Power Plan. E3 has investigated California's goal of moving to a large reduction in GHG emissions by 2050, and renewables are a big part of that, he continued. The effect of California policies is inseparable from the Northwest because of the interconnection of the power systems, Black pointed out.

The effort to investigate a 50 percent renewable portfolio standard (RPS) is the first time the state's five major utilities – publics and investor-owned – have been joint sponsors in such a study, Olson said. He recounted California's RPS achievements to date, noting that the state is on track to achieve a 33 percent reduction in GHG emissions by

2020. The estimated rate impact of the reduction is between 6 and 8 percent, Olson reported.

The state is now thinking of going beyond the 33 percent, he said. A lot of work is being done on how that might be achieved, Olson explained. “Zero-carbon electricity is key” and meeting such a goal also requires decarbonizing other sectors of the economy, he said.

There are zero-carbon options for the electricity sector, including nuclear, carbon sequestration, and renewables technologies, Olson said, adding that there are many questions about the permanent underground sequestration of carbon. The question is, how far we can push before the costs are prohibitive, he stated.

Olson spelled out the key study questions as: what are the requirements, operational challenges, potential solutions, costs, and consequences of integrating 50 percent RPS by 2030 in California? The renewables industry is saying not to have a slowdown and to keep the pipeline flowing, and the utilities are asking what that means for operations, he explained.

A 50 percent RPS is a new challenge, Olson said. The state does not yet have operating experience at 33 percent, and no other state or country anywhere in the world has achieved an equivalent RPS, he noted. Olson pointed out that California is “neck and neck” with Germany and Spain, which had 22 to 24 percent renewables in 2012, but Denmark, with 30 percent wind, is not a good example because it relies heavily on interconnections with Germany and Norway to maintain system operations.

The question is whether California can make room for all of the renewables, he said, listing the integration challenges as downward and upward ramping capability, minimum generation flexibility, peaking capability, and sub-hourly flexibility. E3 built a model called REFLEX to look at operating conditions and see how often there would be conditions that pose problems, Olson explained.

The study scenarios were a 33 percent RPS plus five high RPS scenarios up to 50 percent, he said. All of the scenarios include 7,000 MW of behind-the-meter solar photovoltaic that does not count toward the RPS, Olson added. The study assumes all renewable generation is balanced by California grid operations, he said. “We wanted to see if California can accommodate that level of RPS without leaning on its neighbors,” Olson stated.

The study also assumed retirement of 19,000 MW of coal, nuclear, and gas plants that use once-through cooling by 2013, he continued. Up to 1,500 MW of exports was allowed in the base case, Olson added.

The study found that the capacity value of renewables declines significantly over 33 percent, he reported. If you keep adding solar above 33 percent, there is no increase in load-carrying capability, Olson said. We have to think about pure capacity, he stated.

The main integration challenge is overgeneration, Olson went on, and there is increasing overgeneration with RPS over 33 percent. Overgeneration is very high under the 50 percent large-solar scenario on some days in the study, he said. In the large-solar case, overgeneration is extensive and can occur in any month; in spring months, overgeneration could be 8,000 to 10,000 MW at midday, Olson said. We have to find a way to manage this energy flow onto the grid, he stated.

"We have to be able to curtail renewables," Olson said. It is a critical strategy to maintaining reliability in the high RPS scenarios, he added.

The potential integration solutions include a managed and compensated curtailment of renewables, Olson continued. The E3 study analyzed five potential integration solutions cases, he said: diverse portfolio, enhanced regional coordination, conventional demand response, advanced demand response, and energy storage. The model tested 5,000 MW of each solution by 2030, Olson explained.

According to the results, only solutions that provide downward flexibility reduce overgeneration, he said. According to a table of results, regional coordination provides the largest reduction, from 12,000 MW of overgeneration to 4,700 MW.

The E3 study also analyzed costs, Olson said, noting the assumptions made for the analysis. The 50 percent RPS scenarios resulted in a 9.1 percent to 23.4 percent increase in average system rates relative to a 33 percent RPS in 2030, he reported. His graphs show the largest rate increases are associated with the small solar and rooftop solar scenarios; the smallest increase is the diverse portfolio. The flexibility solutions reduce the cost of meeting a 50 percent RPS in 2030, but they result in higher average rates relative to the 33 percent RPS, Olson pointed out.

Electricity sector carbon emissions decrease by 2030 in all of the RPS scenarios, and there are greater reductions with the 50 percent RPS, he continued. The cost of the reduction, according to the analysis, is $300 to $500 per ton of GHG, Olson said.

In conclusion, integrating 50 percent renewable energy in California appears to be technically feasible with only one tool, renewable curtailment, needed, he stated. The integration challenges include overgeneration during the daylight hours, which is likely to be significant under a higher RPS, Olson said. There are a number of promising renewable integration solutions, he stated.

We need to have the solutions in place before we implement the higher RPS, Olson told the Council. The most promising is the diversity in the Western Interconnection; it is more and more important to coordinate across regions, he wrapped up.

The transmission system in the Northwest works to integrate wind that goes to serve California, Lorenzen said. Does our system suffer as a result? he asked.

The more wind you have on line, the less capability you have to integrate without building new flexibility resources, Olson responded. BPA and others are providing the

integration service for wind and charging for it, he said. In the analysis, California wanted to address integration itself and didn't want to export the problem, Olson stated.

How much did you lean on the Northwest? Karier asked. The way we did the study is to model California "as a bubble," Olson replied. For example, we didn't assume you could go from 12,000 MW of imports to 12,000 MW of exports in an hour; we looked at the historical data and limited the ramp accordingly, he said. For the regional coordination scenario, we relaxed the ramping, Olson explained. We worked on load shapes in the Northwest and Southwest, and it looks like there might be a 6,500 MW export possibility, he added.

The Council meeting adjourned at 12:16 p.m.

Approved April ____, 2014

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Vice-Chair

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