Pumped Storage Hydropower Siting Study PSH Siting Topics: Aquatic Ecosystems, Water Quality, and Water Quantity

Date: **10/9/24**
Time: **12:00 PM – 2:30 PM PDT**
Location: **Zoom online meeting**

Study website link: https://www.energy.wsu.edu/CleanFuelsAltEnergy/PSHSiting.aspx

Meeting Objectives

- Understand key pumped storage hydropower (PSH) impacts and opportunities related to aquatic ecosystems, water quality, and water quantity and discuss participants' interests and issues related to these topics
- Provide project update and overview of topics for upcoming PSH study meetings

Meeting Summary

Following an initial welcome, participants were introduced to the virtual brainstorming software, Mural. They were instructed on how to use the program and were prompted to join a "room" where they were asked simple questions about the fall season. After this short icebreaker, **Karen Janowitz (Washington State University (WSU) Energy Program)** gave a land acknowledgement and provided a brief overview of the study's goals and upcoming meeting plans, emphasizing that the study is not promoting any specific projects but aims to gather Tribal, agency, and stakeholder input on siting concerns. She made it clear that the study was mandated by the Washington State Legislature to support the state's climate commitment to 100% renewable or non-emitting electricity by 2045.

At-a-Glance Information

Hosted by Washington State University Energy Program in partnership with the Office of Tribal Relations at Washington State University, Meridian Environmental, and Ross Strategic.

Approximately 65 people joined the meeting.

Meeting participants represented a broad array of organizations and geographic locations.

Meeting slides and a video recording are available on the study website.

Presentations

Karen introduced **Brenda Pracheil**, Fisheries Biologist at the Pacific Northwest National Laboratory (PNNL), who presented "**Aquatic Ecology Impacts of Pumped Storage Hydropower"**, and discussed the aquatic ecosystem and water resource environmental impacts of closed-loop PSH. Her information comes from a review of active and inactive licensed closed-loop systems found in National Environmental Policy Act (NEPA) documents.

Brenda highlighted that there are many fewer fisheries and aquatic ecology impacts than water resource impacts in a closed-loop system, and that terrestrial impacts are often more significant than aquatic impacts. Some key topics of Brenda's talk included:

- Differences between open-loop and closed-loop PSH systems
- Categories of impacts and mitigation strategies
- Specific examples of water resource and aquatic ecology impacts and mitigations

At the end of Brenda's presentation, there were a few questions from attendees. One participant asked about the top environmental impacts of PSH. Brenda replied that, according to PNNL data, the top impacts (in no particular order) of PSH are:

- Terrestrial resource impacts (most commonly cited impact overall)
- Impacts of connecting to transmission lines, which are needed for PSH
- Water sourcing/water quantity impacts
- Impacts of water coming from a remote source

A second participant asked if PNNL maintains a library of potential impacts and possible mitigation strategies that permit reviewers can access for PSH projects. Brenda confirmed that all information gathered by PNNL is readily available to the public, developers, and government agencies, such as at the PNNL Hydropower eLibrary. *Environmental Impacts of Closed-Loop Pumped Storage Hydropower* by Brenda (B.M. Pracheil, K.P. Duffy, L. Zeng, J.W. Saulsbury) is in revision and will be a PNNL HydroWIRES report available within a few months.

After Brenda's presentation, Karen introduced **Megan Kernan** of the Washington Department of Fish and Wildlife (WDFW) who presented, **"Water Availability and Pumped Storage Hydropower."** Megan's presentation provided an overview of water availability in Washington State, covering:

- The hydrologic cycle and groundwater
- Connections/continuity of surface and groundwater – gaining and losing streams
- Western water law and water rights, including the concept of prior appropriation ("first in time, first in right")
- In-stream flow rules and their importance for protecting aquatic habitats
- Pathways to acquire water rights, including new water rights, purchasing existing rights, and using municipal water

Following Megan's presentation, an attendee asked what role WDFW plays in reviewing water rights for projects or whether it is exclusively the responsibility of the Department of Ecology. Megan confirmed that while Ecology does have responsibility, WDFW has a statutory role reviewing water rights applications to ensure they do not impact fish and aquatic species, and they provide a full analysis of what any impacts would be.

A second participant asked if municipal water was available to transfer to pumped storage uses. If so, what is the municipal purpose for this use? Megan replied that there is precedent for municipal water to be used for industrial purposes, and in fact Goldendale appears to be purchasing PUD water for that PSH system. One could make the argument or dispute that this is an industrial purpose.

Discussion

After the presentations and a break, participants joined breakout sessions where they were prompted to answer questions on either 1) water availability or 2) water quality and aquatic ecosystems. Using virtual sticky notes in Mural, participants began the breakout sessions by responding to the following prompts:

- *What are potential effects from PSH (positive or negative) that you care most about?*
- *What areas or geographic features should PSH siting emphasize or avoid to enhance opportunities and reduce impacts?*
- *What should PSH projects do to improve outcomes with respect to water issues?*

After approximately 5 minutes of individual reflection, participants discussed the issues, questions, ideas and thoughts that were put on the notes that had been placed on the boards. There were two rounds of this exercise, with the first round lasting 35 minutes and the second round lasting 30 minutes. Participants were encouraged to change breakout group topics during the second session.

Key takeaways from the two breakouts are summarized below. The complete Mural boards are included as an Appendix.

Water Quality and Aquatic Ecosystems

- Concerns about habitat impacts due to water fluctuations, especially impacts on nesting birds and amphibians.
- Importance of considering potential impacts to cultural resources and traditional food gathering areas.
- Potential greenhouse gas emissions from reservoirs as well as greenhouse gas benefits of having energy storage facilities that may reduce the need for fossil-based power generation. (In the session, Brenda noted that closed-loop PSH facilities generate few greenhouse gas emissions because the reservoirs are highly engineered compared to other natural water bodies.)
- Need for engagement with county and other local planners and alignment with local planning efforts.

Water Quantity and Availability

- Issues related to groundwater reduction, downstream effects on native wetlands, and legal implications.
- Concerns about implications to agricultural water use—this is extremely important in WA, and any potential for PSH to negatively affect supply would be a serious issue.
- Regulators need to consider the effects of water availability for residential development use and population increase.
- (Megan) Need to consider environmental tradeoffs. One part of the four-part test for allocating water use is whether it would be detrimental to the public interest.
- Discussion about the feasibility of underground pumped storage.
- Feasibility of sealing off an underground water storage system to prevent transmission to surrounding groundwater systems, which would trigger FERC licensing requirements.
- Consideration of future water availability in the context of climate change.
- Concern about siting PSH reservoirs (if uncovered) in areas adjacent to wind farms/turbines due to the attraction open water creates for wildlife, including raptors and prey animals (referencing incidents of raptor collisions with turbines).
- Potential to trigger FERC licensing requirements.
- Providing this information to counties as they prepare to update their comprehensive plans in 2025.

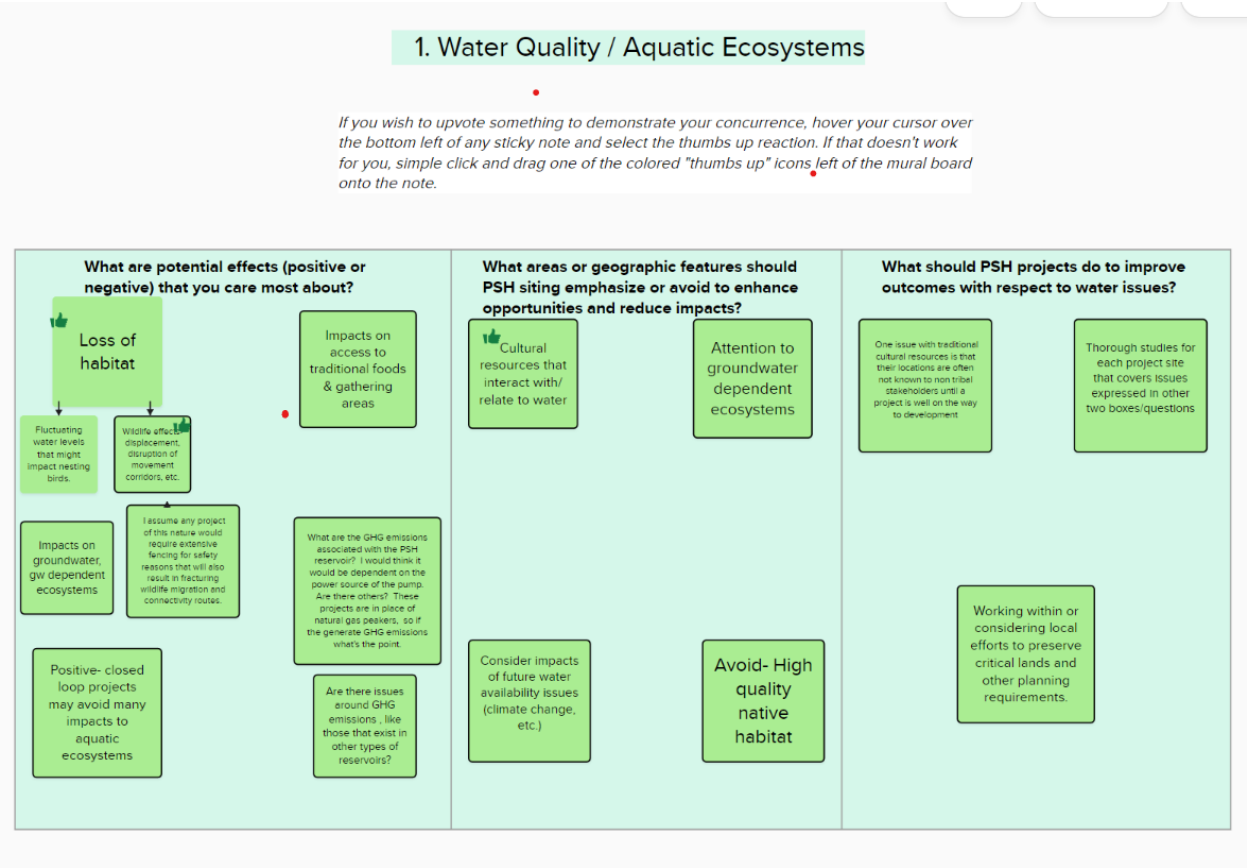
After the two breakout sessions, facilitators provided two to three examples of what was discussed on each topic, and participants were given the chance to add more to the discussion.

Future Meetings and Wrap Up

Karen wrapped up the meeting by discussing the next upcoming meeting, scheduled for October 31st, focusing on terrestrial ecology, geology and soils, air quality and noise impacts, and recreational, public, and traditional cultural access.

Participants were encouraged to spread the word about the meetings among their networks. Karen provided the project website and contact information a second time. The meeting wrapped up at 2:30 p.m.

Appendix: Mural Board Responses



2. Water Availability

If you wish to upvote something to demonstrate your concurrence, hover your cursor over the bottom left of any sticky note and select the thumbs up reaction. If that doesn't work for you, simple click and drag one of the colored "thumbs up" icons left of the mural board onto the note.