Columbia River System Operations Update

Grand Coulee Dam, Washington

INSIDE:

- Introducing the range of alternatives
- The alternatives defined
- Measures in Multiple-Objective Alternatives
- Next steps

Introducing the range of alternatives

The U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration are midway through a multi-year effort to update the federal plan for the long-term operation, maintenance and configuration of the Columbia River System. The co-lead agencies are developing an environmental impact statement and have identified five alternatives that are designed to meet the purpose and need[1] for action, and multiple study objectives. They are now studying the potential environmental and socioeconomic impacts of these actions.

The National Environmental Policy Act requires federal agencies to consider a reasonable range of alternatives before making a decision to act on a preferred alternative. For each of the five alternatives being studied, the agencies are evaluating the costs, benefits and tradeoffs regarding the congressionally authorized purposes of the federal projects: flood risk management, hydropower generation, irrigation, navigation and fish and wildlife conservation. The final EIS will inform how the agencies balance the multiple purposes of the system while complying with all relevant environmental laws and regulations. For an overview of the purposes and current operations of the system, visit www.crso.info and look under Latest News.[2]

> An online webcast outlining the five alternatives undergoing a detailed evaluation is available at:
>
> https://youtu.be/GpeBKAMjOok

The agencies plan to release the draft EIS for public comment in February 2020 and the final EIS in June 2020.

This update provides an overview of the alternatives. For a more detailed description of alternatives, see Special Topics on www.nwd.usace.army.mil/CRSO/Documents.

US Army Corps of Engineers

U.S. Department of the Interior Bureau of Reclamation

Bonneville Power Administration

1. http://www.crso.info/staging/Library/Revised_Draft_Purpose_ and_Need_12_6_2017.pdf
2. http://www.nwd.usace.army.mil/Media/News-Stories/Article/1849942/operating-the-columbia-river-system-today/

The alternatives defined

All alternatives were designed to benefit ESA-listed fish species. The alternatives represent different ways to balance the multiple purposes of the system. For example, some of the alternatives include more actions, or measures, to benefit fish, while some put more emphasis on power generation and other water uses. This allows the agencies to assess the full effects of achieving one set of objectives over another. The impacts of all of these measures will be documented in the draft EIS.

No action alternative

The no action alternative provides a baseline from which to compare other alternatives. Here, the co-lead agencies would continue to operate, maintain and configure the system according to the rules in effect in September 2016, when the agencies kicked off the EIS process.

Spill in the no action alternative follows the 2016 Fish Operations Plan and requires meeting performance standards that were developed under previous biological opinions.

The agencies would also implement structural measures that were already budgeted and scheduled as of September 2016. The majority of these structural projects are modifications to the dams to improve conditions for fish listed under the Endangered Species Act. For example, the Corps is assuming it will install the improved fish passage turbines planned for Ice Harbor and McNary dams.

Measures in multiple-objective alternatives

These measures are in most or all of the four remaining alternatives.

- **Update flood risk management operations at Libby and Grand Coulee dams.** These measures would give water managers flexibility to provide better flood storage responses.
- **Provide for authorized irrigation water supply.** These measures include additional pumping or changes to pumping of water from the Grand Coulee, Chief Joseph and Hungry Horse projects.

Common terms

Objectives are what the federal agencies are trying to accomplish (the "why"). They are statements of the desired outcome of the EIS, as identified by the federal agencies and scoping comments. An example of an objective is to improve ESA-listed anadromous salmonid adult fish migration within the project area.

A **measure** is the action the agencies would take to achieve an objective (the "how"). It describes an action, usually in a precise location, that meets an objective, in whole or in part. Using the objective mentioned above, a measure could be to provide structural enhancements for fish passage, such as improving fish ladders.

An **alternative** is a combination of one or more measures that, together, would address one or more of the objectives. In this EIS, the co-lead agencies designed the action alternatives to address several objectives, and are therefore calling them multiple-objective alternatives.

- **Provide structural measures for fish passage.** These would add additional surface passage structures, add lamprey passage and improve existing fish ladders. Currently, surface passage routes are installed at the spillways of all eight dams on the lower Columbia and Snake rivers, allowing juvenile salmon and steelhead to pass dams near the surface where they naturally migrate. Adult fish ladders allow passage of upstream-migrating adult salmon and steelhead en route to their native spawning areas, and several measures provide enhancements so adults can move through the ladders with less delay. Another measure includes installing a pumping system to provide cooling water to adult fish ladders at Lower Monumental and Ice Harbor dams (like those currently at Lower Granite and Little Goose dams) to encourage adult fish migration.
- **Modify operations to smooth the triggers for summer draft at some upstream projects.** This would allow summer releases to follow a sliding scale based on local streamflow forecasts.
- **Provide slightly more flexibility during fish passage season to shape flows within the day.** This would allow more water to build up in the forebay behind fish passage projects for later power

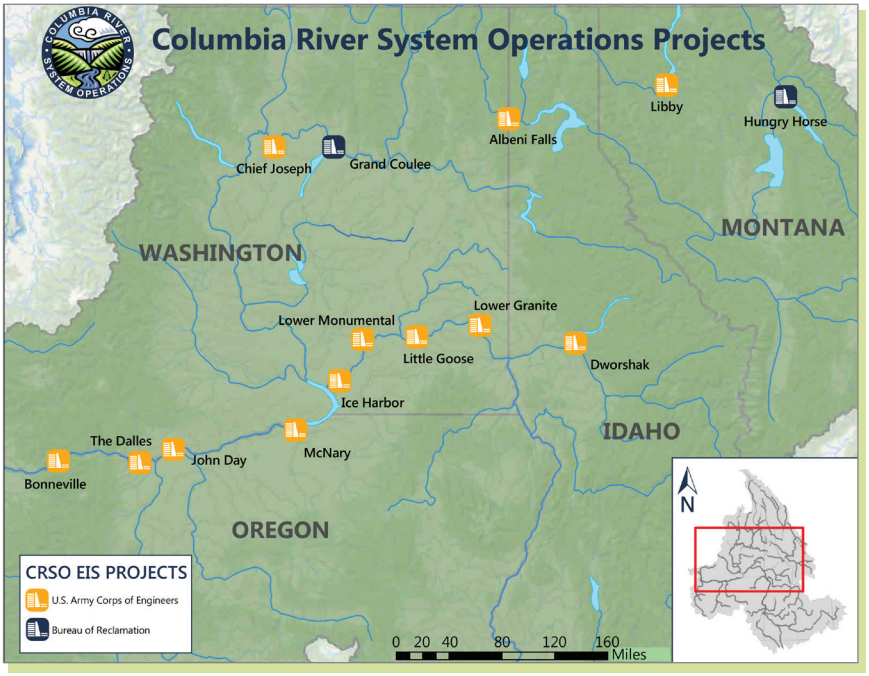
generation when the region needs it most, providing flexibility to help balance the output of variable renewables such as wind and solar.

Multiple-objective 1 measures

- **Alternating spill pattern for juvenile fish passage** is more than the no action alternative. Multiple-objective 1 would use two different spill periods in spring. A base spill period would spill to the performance standards developed under previous biological opinions. An alternating block spill period would spill up to 120% total dissolved gas (TDG) in the tailrace (the downstream side of the dam), limited by a 115% TDG level in the forebay above a dam.
- **Fish-count trigger for spill in summer to potentially end spill** earlier at the lower Snake River projects in August when the benefits to fish are limited because very few (if any) fish are migrating downstream.
- **Fish transport** would begin on April 15, earlier than the no action alternative start date of April 25. The program collects some fish as they pass a dam, places them into barges or trucks and ferries them downstream.
- **Change the timing of cooling water released from Dworshak Dam,** releasing more in June, July and September, and less in August compared to the no action alternative. The EIS will study whether this is a benefit to salmon and steelhead as they migrate upstream.

Multiple-objective 2 measures

- **Less spill.** Of all the alternatives, this one calls for the least amount of juvenile fish passage spill, reducing it to near 110% TDG. It also curtails spill in August, whereas spill continues through August in the no action alternative. These measures could increase power generation in the spring and summer, including in August when the region's power demand is the greatest.
- **Water management for power.**
  - **Greater turbine operating range** for run-of-river projects to provide more flexibility to help integrate variable renewables such as wind and solar, and to help manage total dissolved gas levels during high flows.
  - **Storage projects drafted deeper** in the winter and early spring, allowing additional generation in the winter when demand is higher, and less during the spring runoff when demand for power is low due to mild spring weather.
  - **Longer duration of zero generation** operation when the lower Snake River projects can operate at zero generation outside the fish passage season. This could increase flexibility by holding water for a few hours when demand for electricity is low to address peaks in electricity use later. This would also help integrate wind and solar power generation into the regional electric grid.
- **Fish transport** would start April 25 and end Aug. 31. Since there is less spill, fish transport would increase compared to the no action alternative.
- **Fish screens** would be used only at fish transportation collector projects. Screens decrease



Map of Columbia River System Operations projects and their owners

generation efficiency and create a more turbulent environment for fish entering turbines, which can disorient fish. Removing the screens could benefit power generation and make turbine entry less turbulent. However, more fish would also pass through turbines relative to the no action alternative because there would be nothing to divert fish into the juvenile bypasses, which are currently a higher-survival route for fish than turbines.

Multiple-objective 3 measures

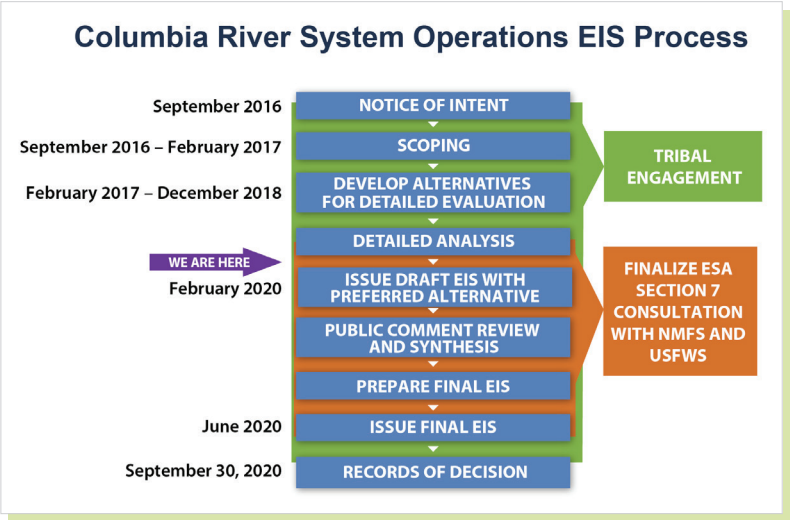
- **Breach the four lower Snake River dams (Lower Granite, Little Goose, Lower Monumental and Ice Harbor).** Breaching removes the earthen portion of a dam and additional shoreline to allow the river to bypass the concrete infrastructure. The powerhouse and other infrastructure would remain in place and be non-operational.
- **More spring spill at the lower Columbia River projects** for 24 hours a day, up to a 120% TDG level. Summer spill would be at the same level as the no action alternative and would end July 31.
- **Water management for power.**
  - **Remove irrigation restriction at John Day** to provide more flexibility to shape flows.
  - **Deeper draft at Libby** at the end of December.
  - **More flexibility for lower Columbia River projects** for power generation with fewer restrictions on turbine operating range. This can help integrate variable renewables such as wind and solar, and manage TDG levels during high flows.

Multiple-objective 4 measures

- **Spill** for juvenile fish passage up to 125% TDG at the eight fish passage projects from March 1 to Aug. 31.
- **Notch gate inserts to spillway weirs.** Water normally passes over the spillway weir's surface, but the notched inserts would sit on top and further channel the flow. This could improve passage conditions for adult overshoot or overwintering steelhead in the late fall months by providing them a non-turbine passage route for moving downstream. Overshoots are fish that migrated too far upstream through a dam and past their spawning grounds so they have to travel back downstream, past the dam again. It also calls for some spill for adult steelhead in March, October and November.
- **Augment flow** — up to 2 million acre-feet — in drier years from Grand Coulee Dam and other upstream reservoirs to more frequently meet the downstream flow target at McNary Dam to benefit ESA-listed anadromous species.
- **Reservoir drawdown** at the four lower Columbia River and four lower Snake River projects in the spring and summer to near minimum operating pools to speed the flow of water through the reservoirs.
- **Fish transport** from April 25 through Nov. 15, except June 15 through Aug. 15.
- **Limit Libby Dam discharge** in winter to potentially help establish vegetation for resident fish habitat.

Next steps

The co-lead agencies will complete their impacts analysis and identify a preferred alternative. The draft EIS, including the preferred alternative, is scheduled to be available for public comment in February 2020. The agencies will continue to post information about the Columbia River System, the NEPA process, and progress of the draft EIS on www.crso.info. At this site you may sign up to receive updates and be informed when the draft EIS is available for review and comment.



Visual timeline of Columbia River System Operations EIS process.