

Columbia River Treaty 2014/2024 Review

Current river and reservoir operations

Federal agencies operate many Columbia River dams to meet a wide spectrum of needs in the Pacific Northwest. Among the most important are flood risk management, power production, fish and wildlife protection, navigation, irrigation, recreation, and municipal and industrial water supply.

With the future of the Columbia River Treaty under review, an understanding of current river operations provides valuable context when considering the role of the Treaty after 2024.

Coordinated river operations under the Treaty allow the United States and Canada to improve both power production and flood risk management by storing water behind dams and releasing it at more beneficial times. Supplemental Treaty agreements allow the two nations to achieve other mutual objectives. An agreement to store additional water in Canadian reservoirs, for example, augments flows to support fish populations in both countries.

On the U.S. side of the border, day-to-day and month-to-month variations in river operations may go largely unnoticed to the casual observer. Let's look more closely at how agencies typically operate the Columbia River's federal dams over the course of one year.

Each new operating year begins in the fall. To prepare, system operators develop overarching guidelines called rule curves that indicate (or "shape") the timing of water releases from the dams on the river to achieve multiple objectives. Once the basic annual operating plans are set, the actual operation aims to meet several related, but sometimes conflicting, objectives. These include:

- Accommodating specific seasonal needs for the passage and spawning of a variety of fish species, including providing flows to aid juvenile fish migration downstream.
- Managing water quality.
- Maintaining a high probability that reservoirs will refill at the end of the spring runoff, both to meet recreation needs and to provide water for power and fish operations.
- Preserving and enhancing habitat for resident fish (those that do not migrate to the sea).
- Optimizing power generation within the requirements necessary to meet the other objectives.

River managers divide the operations of the Columbia River system for flood risk management, power production, fish and wildlife protection, and other purposes into three seasons.

September through December

This period is the fixed reservoir drawdown season. During this time, operators lower reservoirs to predetermined levels since no one can forecast with certainty how much storage space will be needed for flood-risk management. Monthly water volume forecasts, based on the amount of snowpack in the region's mountains, are typically not available until January.

The goal at this time of year is to ensure that reservoirs reach specific levels by the end of December. Toward the end of this period, operators also begin to manage flows at Bonneville Dam to aid the breeding and rearing of threatened chum salmon immediately downstream. They strive to hold flows from Bonneville Dam at a level that protects nests of chum eggs.

Operators also schedule flows from Grand Coulee Dam at this time to meet the requirements of the



Columbia River Gorge

The Columbia River Treaty 2014/2024 Review

The coordinated operation of the many dams and reservoirs under the Columbia River Treaty has provided significant flood risk management and hydropower benefits for both the United States and Canada. The Treaty calls for two "entities" to implement the Treaty, one for the U.S. and one for Canada.

The U.S. Entity, appointed by the president, consists of the BPA administrator and the Northwestern Division engineer of the U.S. Army Corps of Engineers. The Canadian Entity, appointed by the Canadian cabinet, is the British Columbia Hydro and Power Authority (BC Hydro).

While the Treaty has no specified end date, it contains provisions that will change its implementation in 2024. Additionally, either Canada or the U.S. may unilaterally terminate most provisions of the Treaty in 2024, with a minimum of 10 years' advance notice, hence the focus on 2014 and 2024.

The U.S. Entity is undertaking a series of studies regarding current and potential future operations under the Treaty. The goal is a recommendation from the U.S. Entity to the U.S. Department of State by the end of 2013 on which elements the Pacific Northwest would like the Department of State to pursue in negotiations with Canada.

Collectively known as the Columbia River Treaty 2014/2024 Review, this multi-year effort will provide information critical to a U.S. Entity recommendation through evaluation of the value of Treaty benefits to the region and consideration of contemporary concerns that reach beyond flood risk management and power generation.

Integral to the Treaty Review process is the U.S. Entity's direct consultation with the Sovereign Review Team, comprised of representatives of the four Northwest states, 15 tribal governments and 11 federal agencies. Supporting the Sovereign Review Team is the Sovereign Technical Team, responsible for completing the technical work that informs the Sovereign Review Team and the U.S. Entity.

This publication of the Columbia River Treaty 2014/2024 Review was developed to inform you of issues surrounding the Columbia River Treaty. It is published by the U.S. Entity, which includes the Bonneville Power Administration and the U.S. Army Corps of Engineers.





Pacific Northwest Reservoir System

Hanford Reach Fall Chinook Protection Program. This is a multi-agency agreement to aid a non-listed species of chinook salmon while its eggs incubate and, subsequently, as the young fish emerge from the gravel riverbed in the prolific Vernita Bar area of the Columbia River. Both this and the chum operation extend into the next season, and usually conclude in March.

January into April

This is the variable drawdown season when monthly forecasts of runoff volume guide the operation of the reservoirs. These forecasts estimate how much water will flow through the river basin over a given time. This period is the most uncertain regarding the timing and volume of runoff.



Hungry Horse Dam has room to fill if needed.



Spill helps juvenile fish pass the dams on their way to the sea.

System operators lower reservoir levels during the winter and early spring primarily to provide space for water from later snowmelt and rain, helping reduce downstream flooding. The water that is released also produces electricity and helps maintain flows needed for fish. Operators look ahead and plan operations to hold enough water in storage to be available in early April to aid juvenile salmon and steelhead in their annual downstream migration.

April through August

Spring and summer are the river system's primary fish passage seasons. During this time, operators release water from Columbia Basin reservoirs in support of fish flow objectives at Lower Granite Dam on the Snake River and McNary Dam on the mainstem Columbia River. The flows aid threatened and endangered fish as they migrate. Since flow objectives depend on the amount of water provided by nature, it is not always possible to meet them.

System operators aim to begin July with full reservoirs. This provides water for both summer fish flows and summer recreation. Over this period, operations to manage flood risk continue as needed and power is generated, with some restrictions on the amount of water passing through turbines as opposed to over spillways. Passing water over spillways benefits migrating fish from April through August.

Putting it all together

As demonstrated above, flood risk management, fish and wildlife protection, and hydropower production all heavily influence the operation of Columbia River Basin

dams. Other uses of the river also influence management of the system. For example, minimum water levels at several reservoirs ensure irrigation pumps can reach the water. Operators hold reservoir levels steadier at certain times of year to aid tribal fishing; certain operations that support fish protection may change briefly to allow shipping traffic to navigate safely past the dams.

Coordinating the delivery of these many regional river system benefits occasionally requires compromise. For the most part, however, system operators successfully meet the diverse requirements of a wide range of stakeholders and river users. This is due in large part to a collaborative Columbia River water management process. While the U.S. Army Corps of Engineers and Bureau of Reclamation have ultimate authority over the operation of the federal dams entrusted to their care, they work in close alliance with other federal agencies, states, tribes and regional stakeholders to best balance the needs of all.

Federal agencies and many others who are deeply invested in the Columbia River are working collaboratively under the Treaty Review process to understand how river operations may change after 2024, and how best to provide the benefits and services of the river on which the region has come to rely.

For more information

For information on the Columbia River Treaty 2014/2024 Review, please visit www.crt2014-2024review.gov, email us at treatyreview@bpa.gov, or call the Bonneville Power Administration at 800-622-4519 or the U.S. Army Corps of Engineers at 503-808-4510.