

Columbia River Treaty 2014/2024 Review

Considering the Columbia River ecosystem

Ecosystem-based function and the Columbia River Treaty Review

The United States and Canada negotiated the Columbia River Treaty in the early 1960s, before the region fully appreciated the role that habitat, streamflow, water quality and related functions play in healthy ecosystems. Over time, the priorities, conditions and obligations in the region have changed, requiring ecosystem functions to be considered in relation to operations for flood risk management and hydropower generation.

Over the past several decades, the operation of the federal dam system in the Columbia and Snake rivers has been modified to incorporate a range of ecosystem requirements that vary depending on timing, reservoir location and water conditions. These include flows to assist the spawning, rearing and migration of salmon and steelhead, bull trout, sturgeon and other fish. Flows are balanced across species, life stages and time periods, as well as among reservoirs upstream and downstream. Canada also has modified water releases and flood risk management operations to some extent to achieve the current ecosystem balance.

It is important for the U.S. Entity to understand how these current priorities and needs might be altered or improved before developing a recommendation on the future of the Treaty. The Columbia River Treaty Review is evaluating the potential value and consequences of theoretical operations, estimating their effect on multiple river uses, including the function of ecosystems, should Treaty provisions be continued, terminated or modified.

Technical teams for each of the use categories will complete a suite of quantitative and qualitative analyses to help the U.S. Entity and Sovereign Review Team answer "What if ... ?" questions about potential operating scenarios after 2024.

While opinions may differ on the actions indicated by a specific finding, the analyses will enhance the regional discussion of how to best balance multiple priorities. Ecosystem-based functions examined for this study include flow and water management, water quality, resident and anadromous fish, estuary effects, and wildlife and cultural resources. Their consideration is an important component of the Treaty Review. Ultimately, the U.S. Entity will evaluate this information, including suggestions for ecosystem operations improvements, in forming its recommendation.

Water management and the resulting river flow is the common currency of Treaty ecosystem studies. The timing and volume of water releases, the ability to refill reservoirs from year to year, and various requirements for flow and ecosystem protection are all affected by decisions on river flow and water management.

Water quality

Temperature, total dissolved gas and sediment transport are the key water quality criteria affected by changes in operations of the Columbia River system. High levels of total dissolved gas triggered by high flows, high temperatures and spill can prove lethal to fish and aquatic organisms. These have the



Spill helps young fish migrate past dams, but high levels increase total dissolved gas, degrading water quality.

Collaboration supports current needs

Collaborative efforts among several agencies have led to the current suite of ecosystem requirements for Columbia River system operations, as well as associated programs to protect environmental and cultural resources. These programs have been developed and balanced over many years, in consultation with NOAA Fisheries, the U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, the Northwest Power and Conservation Council, northwestern states, Columbia Basin tribes and regional stakeholders. These operations and programs balance the needs of a diverse array of river users to achieve legal requirements and regional biological objectives. For example, the Council's Columbia Basin Fish and Wildlife Program and agreements such as the Columbia Basin Fish Accords and

the Hanford Reach Fall Chinook Protection Program are an integral part of operating the Columbia River.

The Treaty Review process includes simulating and evaluating a range of potential future conditions. Some evaluations assume that these agreements and other programs remain in place, while others do not. Some focus on flood risk management or hydropower production operations that differ from those currently in place. Others simulate river operations with the goal of advancing fish, wildlife and cultural resources protection beyond current levels. No matter the outcome of the Treaty Review, requirements under the Northwest Power Act, Endangered Species Act and Clean Water Act, as well as obligations to the basin's numerous Indian tribes, will remain fundamental considerations in any river operations.

most direct influence on how federal agencies currently operate the system. Current management efforts focus on maintaining lower levels of total dissolved gas and providing cooler water to help reduce harm to fish species such as salmon and steelhead that spend part of their life cycle in the Columbia and Snake rivers and their tributaries.

As part of the Treaty Review process, a water quality technical team composed of regional experts evaluated each criterion for water quality and the effect of proposed Treaty alternatives on the three criteria of temperature, total dissolved gas and sediment. The team also is using existing and newly developed scientific models to compare alternatives with current conditions to help inform the U.S. Entity recommendation.

Resident and anadromous fish

Both resident and anadromous fish live in the Columbia River Basin. Resident fish remain in the basin's fresh water throughout their life cycle, while anadromous fish migrate between the ocean and fresh water during different life phases. Within the basin, two resident fish species, 13 runs



Salmon spawning grounds near Bonneville Dam.

of salmon and two species of non-salmonid anadromous fish are listed as threatened or endangered under the Endangered Species Act. Other important native fish throughout the basin, including kokanee, burbot and Pacific lamprey, are not federally protected. The operation of the river system may affect the specific habitat requirements of each species.

To evaluate a range of potential approaches to river management, teams of regional experts analyzed modeling and historical data for stocks of resident and anadromous fish. The experts contrasted the ability to achieve current fish operating requirements, estimates for in-river survival and travel time, adult returns and adult fallback rate (adult fish that pass a dam but then “fall back” to the downstream side) for steelhead and spring-run chinook migrants under different scenarios of reservoir management. These included current conditions, reduced or no river management, enhanced summer flow and a dry-year strategy. Analysts compared habitat availability and the ability to meet targeted flow requirements under these scenarios for various salmon, steelhead and resident fish species. Multiple metrics during juvenile and adult life stages are being used to evaluate whether a management scenario could have positive or negative effects on the species in question.

Wildlife

The habitat associated with the Columbia River and its tributaries includes many elements that support wildlife and their food sources. The habitat needs of wildlife vary greatly between species and different life stages. They include, for example, specific requirements for overwintering, foraging, reproduction and predator escape. Operation of the river system affects habitat in different ways, including inundation, low water levels, human disturbance, food source changes, loss of migration routes and disruption of reproduction. While these wildlife issues and related mitigation are already a part of Columbia River system operations, regional discussions on the future of the Treaty provide an opportunity for their review.



Protected riparian habitat benefits both terrestrial and aquatic species.



Low water in a reservoir can expose cultural artifacts.

Regional wildlife experts are evaluating three primary areas of concern regarding potential Treaty operations and Columbia Basin wildlife. The results of the team’s studies on these three topics will help inform the U.S. Entity’s recommendation on the Treaty.

Broadly, the wildlife team is evaluating the effect of differing potential Treaty alternatives on the ecological integrity of select riparian systems, the interface between land and a river or stream. These studies are designed to provide an overview of how changes may affect species that rely on this type of habitat. The team also is evaluating the effect of river flow changes in the estuary on habitat for the endangered Columbian white-tailed deer. Higher flows may erode dikes and levees that prevent flooding in areas important to this species. Finally, the team is studying the effect of flow changes on migratory species, primarily birds.

Cultural resources

Cultural resources consist of archaeological and historic sites, traditional cultural properties (including cultural landscapes) and cultural traditions associated with fish and wildlife. It is accepted that other views of cultural resources exist, particularly the Native American view that their heritage and spiritual relationship to the earth and natural resources is, itself, a cultural resource. Consequently, fish, wildlife and other natural resources in the basin are culturally significant to the tribes.

Laws, including the National Historic Preservation Act, define federal agencies' responsibilities regarding impacts to historic properties. When an agency's activities or undertakings may affect this property, the agency is required to consult with interested parties and address these effects through avoidance, preservation or mitigation. Currently, there are nearly 4,000 archaeological and historic sites recorded in the Columbia River Basin as well as hundreds of traditional cultural properties. BPA and the Corps help protect these resources through existing programs outside of the

Columbia River Treaty. However, information gained from these other programs will inform the Treaty Review process.

For more information

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

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.



US Army Corps
of Engineers

