



Managing the System by Season

— Streamflow without dams (unregulated)

— Streamflow with dams (regulated)

Fall and Winter Operations

(Roughly October to mid-March)

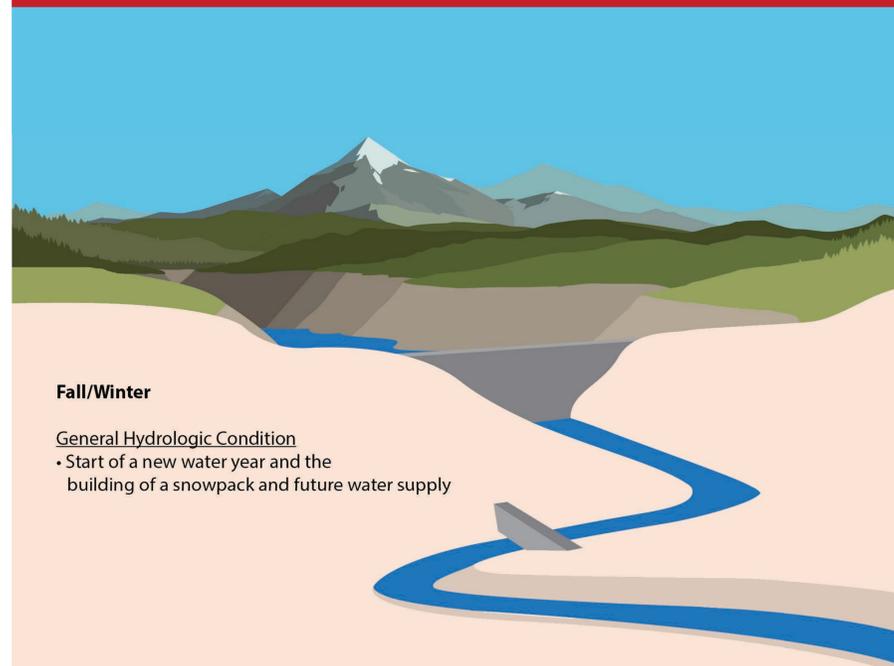
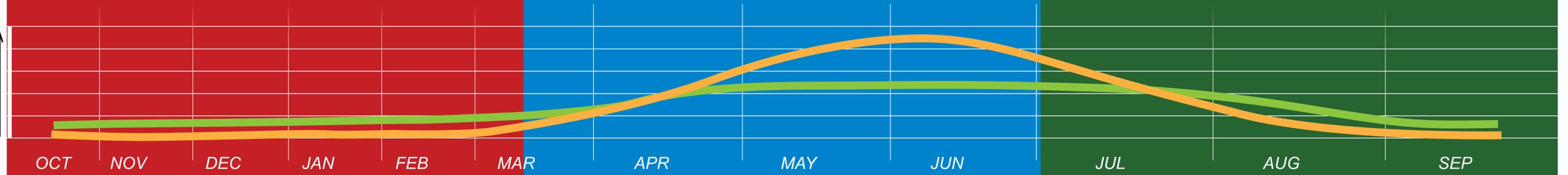
Spring Operations

(Roughly mid-March to mid-June)

Summer Operations

(Roughly mid-June to September)

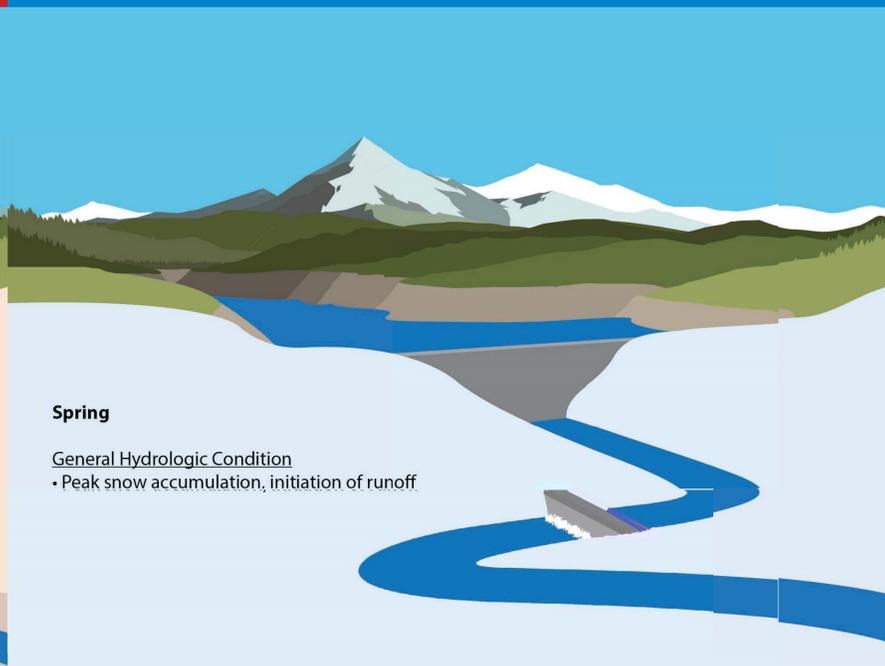
Flow in the river ↑



Fall/Winter

General Hydrologic Condition

- Start of a new water year and the building of a snowpack and future water supply



Spring

General Hydrologic Condition

- Peak snow accumulation, initiation of runoff



Summer

General Hydrologic Condition

- Runoff recedes into summer flows

In the fall and winter months, storage projects in the Columbia River Basin are preparing for the following spring's runoff (snowmelt and rain). Storage projects are operated to reduce flooding downstream. As snow accumulates in the mountains, reservoirs are lowered (drawn down) to be able to catch high flows in the spring.

In the fall and winter, river flows are flowing at low, base-flow levels. Little is known at this time of year about how much snow will fall throughout the winter and how much water will be coming down the river in the upcoming spring. Winter storms may also bring rises in the river during this season.

In the fall and winter the system is operated to prepare reservoirs for the upcoming spring runoff. During this time operators also must provide a safe navigation corridor, generate power, and protect wildlife habitat and cultural resources.

Water supply forecasts provide context to the type of runoff anticipated in the spring and they inform the space required for flood risk management (FRM) operations. Runoff can occur earlier in lower elevation basins, because of earlier snowmelt and low elevation rains. Once runoff begins, the storage projects reduce outflow and begin refilling the reservoirs. The Agencies balance FRM requirements and refill by attempting to operate no lower than the FRM elevation as of April 10th.

The system is operated in the spring primarily to manage spring runoff for flood risk management, store water for irrigation use later in the season, and provide conditions to aid juvenile and adult fish migration. During this time operators also must provide a safe navigation corridor, generate power, and protect wildlife habitat and cultural resources.

Storage reservoirs will reach their highest elevation in the summer months, often reaching full pool. Valuable water stored during the spring is then released to augment flows for fish in the lower Columbia and lower Snake rivers. Flows also provide water for irrigation, recreation, and to produce power.

By summer, the peak flows from spring runoff transition to lower summer flows. Projects fill and release water to supplement the lower base-flow period.

In the summer months the system is operated to balance additional flow for augmentation downstream to aid juvenile and adult fish migration, provide water for irrigation use, and generate power. During this time operators also must provide a safe navigation corridor, support recreation interests, and protect wildlife habitat and cultural resources.

 **September – December:**
Operate the system to meet downstream flow needs in support of salmon spawning in the Vernita Bar/Hanford Reach and downstream of Bonneville Dam.

 **November – December:**
Provide water conditions for chum, fall chinook and kokanee spawning.

 **November – December:**
Meet winter flood risk management requirements at storage projects.

 **January – March:**
Draft the system for flood risk management and provide river levels to support incubation of chum below Bonneville Dam and fall chinook below Priest Rapids Dam. The amount of draft depends on the water supply forecast. Storage reservoirs are targeted to be as full as possible while meeting flood risk management needs by April 10, in time for fish passage season.

 **September – March:**
Libby and Hungry Horse are operated to provide minimum flow for bull trout.

 **March-May:**
Operate McNary Dam to improve waterfowl nesting conditions.

 **April-June:**
Storage projects begin refilling with the goal to be full in summer.

 **April-June:**
Beginning in April, projects on the lower Columbia and lower Snake rivers release water through the spillway for juvenile fish passage. Spill levels are monitored continuously and adjusted as necessary throughout the spring and summer to manage total dissolved gas (TDG) in the rivers.

 **April-June:**
Storage projects are operated to target spring flow objectives at Lower Granite, McNary and Priest Rapids dams for the benefit of salmon and steelhead. Seasonal flow objectives are developed in-season through coordination with regional salmon managers to shape available water to provide flows that maximize benefits to both juvenile and adult fish during this time.

 **April-June:**
Lower Snake River projects are operated in the spring at minimum operating pool (MOP) to aid juvenile fish passage and provide safe navigation. John Day Dam is operated to minimum irrigation pool (MIP) to aid juvenile fish passage, provide safe navigation and meet irrigation pumping needs.

 **May-June:**
Libby Dam is operated to provide a pulse of water to encourage spawning of Kootenai River white sturgeon downstream of the dam.

 **April-June:**
Libby and Hungry Horse are operated to provide minimum flow for bull trout.

 **June-August:**
Projects on the lower Columbia and lower Snake rivers continue to release water through the spillway for juvenile fish passage. Spill levels are monitored continuously and adjusted as necessary throughout the spring and summer to manage TDG in the rivers.

 **June-August:**
Storage projects are operated to target summer flow objectives at Lower Granite and McNary dams for the benefit of salmon and steelhead.

 **July– August/September:**
Lower Snake River projects continue operating at minimum operating pool (MOP) to aid juvenile fish passage and provide safe navigation. John Day Dam remains at the minimum irrigation pool (MIP) to aid juvenile fish passage, provide safe navigation and meet irrigation pumping needs.

 **July-August:**
Key storage reservoirs are lowered in July-August (Libby and Hungry Horse are drafted into September) to provide flows downstream for salmon and steelhead. Libby and Hungry Horse drafts are limited to benefit resident fish that enter the reservoirs.

 **July-September:**
Dworshak Dam is operated to provide cool water to help maintain river temperature in the Lower Granite Dam tailrace below 68° F for the benefit of salmon and steelhead.

 **July-September:**
Libby and Hungry Horse are operated to provide minimum flow for bull trout.

 **May-September:**
Hungry Horse is operated to release warmer water to match water temperatures in the mainstem Flathead River.

 **HYDROPOWER**
Water that flows through turbines generates electricity to power homes and businesses in the Pacific Northwest and beyond year round. System operations generally prioritize flood risk management and environmental responsibilities, and any remaining flexibility to manage water flow is used to shape power production to meet the daily and seasonal demand for electricity. In emergency situations, however, operations to keep the lights on are prioritized to protect human health and safety as well as the safety and reliability of the power grid. The Columbia River Treaty with Canada and the Pacific Northwest Coordination Agreement are used to coordinate power operations among the many Canadian, U.S. federal and nonfederal dams in the Columbia River Basin.

 **RECREATION**
Projects provide lake and river recreational opportunities. The Agencies operate projects with sensitivity to widespread public use and attempt to balance operations in consideration of public safety. Important considerations include providing flows that are neither too high nor too low for safe boating. Another goal is to have water levels high enough for boat ramps to be operational.

 **IRRIGATION**
Storage reservoirs typically fill by early summer by capturing snowmelt runoff. In spring and early summer, runoff is higher than irrigation demand but in July and August, when natural flows have diminished, irrigation demand is highest. To supplement irrigation demand during times of low flow, water is stored in the reservoirs during high runoff and released from storage when streamflow runoff is lower. Storage projects help provide a reliable irrigation water supply which allows for the production of a range of crops.

 **NAVIGATION**
The Corps maintains a congressionally authorized navigation channel from the Pacific Ocean to Lewiston, Idaho and operates navigation locks for commercial and recreational traffic at eight projects. These operations require water levels above minimum levels in affected reservoirs. The four lower Columbia run-of-river projects and the four lower Snake dams operate together to allow river transport of products. Additionally, the lock system enables barge transport of juvenile salmon from below Lower Granite to below Bonneville Dam.

 **MUNICIPAL AND INDUSTRIAL WATER SUPPLY**
Municipal and industrial (M&I) is typically defined to mean water used in the operations of municipal or domestic water systems and for uses in industrial processes. Industrial processes can include thermal power generation and mining operations. Municipal uses include household, commercial and public supplies. Like irrigation, M&I demand is typically higher during July and August as household and public supplies often include watering lawns. To supplement M&I during times of low flow, water is stored in the reservoir during high runoff and released when streamflow runoff is lower. Storage projects help provide a reliable M&I water supply for both personal use and industrial processes.

 **CULTURAL RESOURCES**
Projects are operated to limit impacts and exposure to cultural resource sites.

