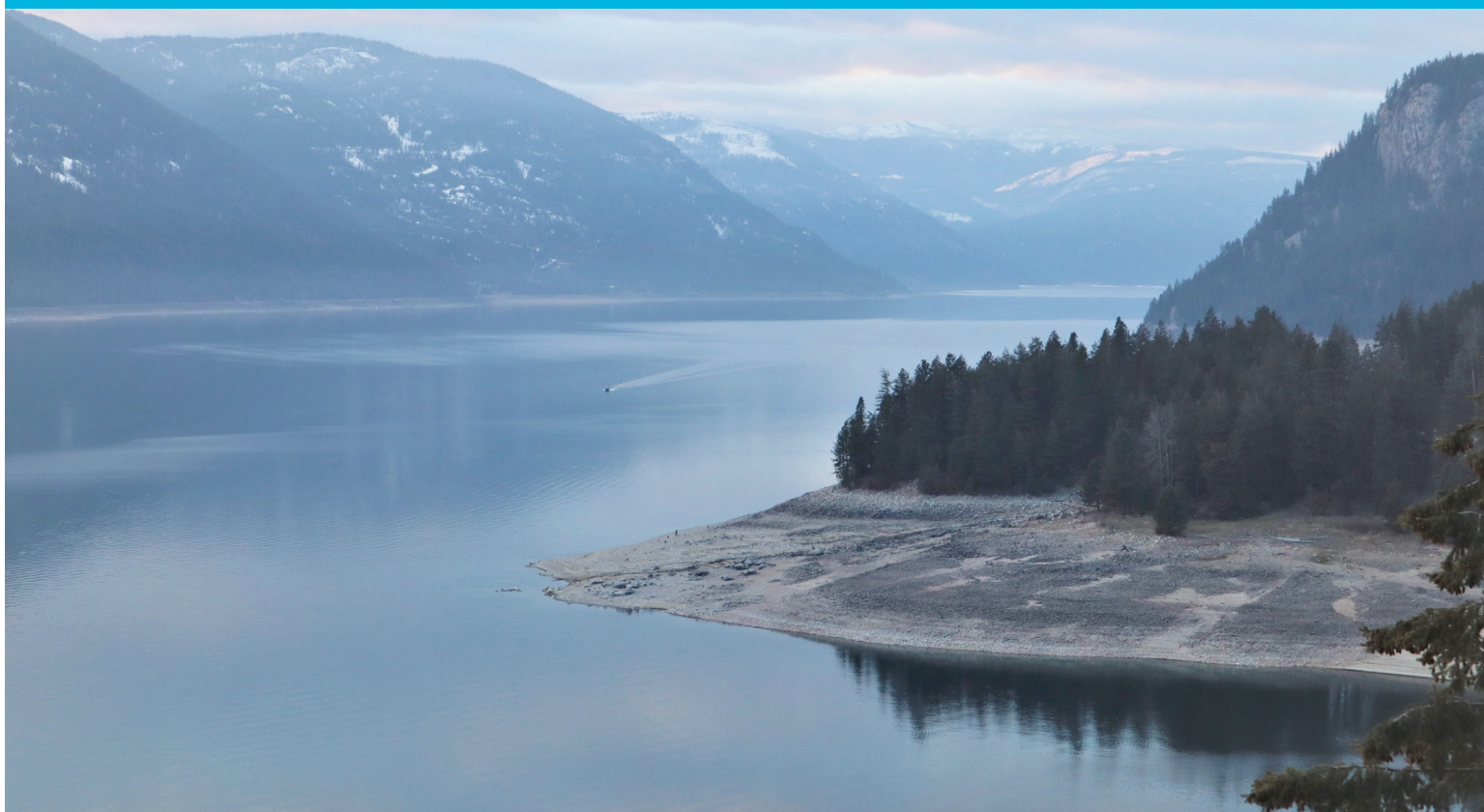


Columbia River Water Use Plan update



April 2023

We are pleased to provide highlights from the Columbia River Water Use Plan (WUP). Approved in 2007, the plan calls for a large number of monitoring programs and projects to be implemented on the main stem of the Columbia River from Kinbasket Reservoir downstream to the Canada–United States border. These projects are intended to benefit fisheries, wildlife, recreation, and archaeology.

Cover photo: Arrow Lakes Reservoir by Deer Park. Photo by Matt Casselman

 **BC Hydro**
Power smart

Fisheries

We have been working to support indigenous fish populations in the Columbia River through a number of Columbia River WUP studies and projects.

Fish stranding

Reductions in water flow from the Hugh L. Keenleyside Dam have the potential to strand or trap juvenile fish in pools that form along the banks of the Columbia River. We have been responding to fish stranding in the Lower Columbia River since the mid 1990's. Formal studies to find high risk locations began in 2000 and WUP studies continued this work from 2007 through to 2022. All water flow changes at the dam are assessed for stranding risk. During flow reductions, field teams are present along the river to survey pool locations and to search for stranded fish. Dip nets, seine nets, and electrofishing are used to collect stranded fish from the pools. Once captured, the fish are safely moved back into the Columbia River.

From April 1, 2021 to March 31, 2022, teams completed a total of nine fish stranding surveys during Hugh L. Keenleyside Dam flow changes and 1,111 fish were safely returned to the mainstem Columbia River. Fewer stranding responses occurred in 2021/2022 than in past years because many of the flow reductions at the Hugh L. Keenleyside Dam were offset by increasing flows from the Kootenay River. Columbia River flows were also at very high levels from December 2021 to March 2022 after the November and December 2021 atmospheric river events.

In 2023, BC Hydro will be testing a new approach to analyzing and determining where and when fish stranding risk is highest. We will be comparing this new method to the current protocol that guides our fish stranding responses during flow reductions. It is expected that this new method will provide a more accurate assessment of how many fish could be stranded during a flow reduction and will allow field crews to be more effective when selecting where and when to capture stranded fish.

Fish population indexing

We continued the Lower Columbia River fish indexing program in 2022, marking 15 years of our annual fish population surveys under the WUP. Key species we monitor include rainbow trout, mountain whitefish, and walleye. The 2022 survey results won't be finalized until August 2023, but the estimates of rainbow trout are as follows:

- 2010–2014: stable at ~22,000
- 2015–2018: sharply increasing to ~ 60,000
- 2020: decreasing to ~ 35,000
- 2021: slightly decreasing to ~ 33,000

Estimates of mountain whitefish abundance have remained relatively stable between 2010 and 2021 (45,000–50,000). Walleye are not native to the Columbia River in either the U.S. or Canada. The adults only reproduce in the U.S. and only migrate to the Lower Columbia in the summer. Their abundance has remained relatively stable since 2012 (10,000–15,000).

This project also allows us to monitor the occurrence of new, introduced species. For example, in 2009 it recorded the first instance of northern pike in the Columbia. Other species recorded over the years are brook and brown trout, pumpkinseed, yellow perch, small/largemouth bass, and tench.



Responding to fish stranding at Millennium Park in Castlegar. Photo by Matt Casselman.

Rainbow trout spawning studies

We also continued the Rainbow Trout Spawning Assessment Studies in 2022—another program that began in 2007. Rainbow trout (a key sportfish in the mainstem Columbia River) typically spawn in the Lower Columbia River from March until June. Key mainstem spawning areas below the Hugh L. Keenleyside Dam are Norns Creek Fan and near Genelle.

This year we used drone surveys, traditional helicopter-based surveys, and on the ground monitoring to photograph key spawning locations. When water clarity is excellent, the drone photographs provide clear photos of redds (gravel nests) dug by the spawning trout. Based on this success, drone surveys are now a regular method for this study.

Rainbow trout spawning protection flows

Rainbow trout are a key sportfish in the mainstem Lower Columbia River and typically spawn from March to July. Rainbow trout eggs are laid in gravel nests (redds) and may be vulnerable to dewatering during water flow reductions. This vulnerability exists until the juvenile fish (fry) emerge—about six to eight weeks after the eggs are laid. Egg vulnerability is dependent on several factors, including the depth of the redd, weather conditions, substrate, and the duration of dewatering.

Since 1992, we have implemented rainbow trout spawning protection flows downstream of the Hugh L. Keenleyside Dam. These protection flows maintain stable or increasing water levels during the peak spawning period to help prevent eggs laid in the Columbia River from being dewatered. Rainbow trout spawning protection flows are set at the beginning of April to provide stable or increasing flows from Arrow Lakes Reservoir (April through June). While water flows from the Kootenay River may go up and down during this time, the stable or increasing flows from Arrow Lakes Reservoir reduce the chances of eggs being dewatered.

The ability for us to meet rainbow trout spawning protection flow objectives in any given year depends on inflow conditions and Columbia River Treaty (CRT) requirements. The CRT requires Arrow Lakes Reservoir to remain below its flood control limits during the operating year and as such, this operating control may require adjustment to downstream flows under certain water conditions, causing the ‘stable or increasing’ rainbow trout flows to decrease. Providing spawning protection flows requires a Non-Power Uses agreement (NPU) with the United States under the

CRT. This allows us to reshape Arrow flows from April through June for rainbow trout protection, subject to meeting flood control requirements on the reservoir. In exchange, we reshape Arrow flows from January through July to aid in the U.S. salmon migration flow objectives.

An experimental approach was developed to help determine if spawning protection flows are contributing to the population increase in rainbow trout. On alternating years, we do not implement protection flows through a negotiated NPU under the CRT. Instead, Arrow reservoir is operated “as needed” to meet regulatory requirements under our water licenses and the CRT. Each year, during this “on” and “off” approach, rainbow trout spawning and population are monitored. Additional monitoring is carried out during “off” years. This experiment was endorsed by the Columbia River Rainbow Trout Flows Technical Forum, which include representatives from regulatory agencies, First Nations, and BC Hydro.

Monitoring since 2007 has shown that with spawning protection flows in place, 97% to 99% of rainbow trout redds in the Lower Columbia River have been protected—with 1% to 2% of these redds dewatered each year. During this time, the adult rainbow trout population in the Lower Columbia River has increased. While this may suggest that rainbow trout spawning protection flows are working, we recognize that rainbow trout protection flows were in place every year until 2019—when experimental flows were first implemented. Without comparison to those years without spawning protection flows, it is unclear if the increase in adult population is due to the protection flows or to another factor.

Since the start of the experiment, both “on” and “off” years have seen similar results to past years when protection flows were always in place. Low levels of redd dewatering, that are not expected to affect the rainbow trout population, continue. As such, when we reviewed the 2022 results with the Technical Committee in October 2022, we made the decision to collect data for another ‘off’ year in 2023.

Year	“On” or “off” year	% of redds dewatered
2019	Off year	0.7%
2020	Hybrid year—started as an on year but switched to an off year	1.1%
2021	On year	0.1%
2022	Off year	0.3%
2023	Off year	TBD

In 2023, we will once again operate as an “off” year for rainbow trout spawning protection flows in the Lower Columbia River, and the Hugh L. Keenleyside Dam will be operated as needed. Although we are expecting to see low levels of redd dewatering, we will continue to closely monitor rainbow trout spawning throughout the Columbia River. As always, we will capture any stranded fish during flow changes and return them to the Columbia River.

As part of the 2023 experiment, we will be using sampling equipment installed at Norns Fan and Genelle to collect data concerning the amount of fish food present in the river. To ensure the integrity of the experiment, we ask everyone to please leave the sampling equipment in place and to keep dogs and motorized vehicles away from dewatered redds and the sampling equipment.

The technical forum will reconvene in 2024 to review results from the redd dewatering, review productivity and fish indexing studies, and to consider what interim operation is recommended leading up to the WUP Order Review.

White sturgeon recovery

We’re continuing our work with First Nations, stakeholders, federal and provincial government partners, and other industries through the Upper Columbia White Sturgeon Initiative to help recover Upper Columbia River white sturgeon. The white sturgeon population in the Canadian portion of the Columbia River was listed as endangered in 2006 (under the Species at Risk Act) due to recruitment failure—where an insufficient number of young survive to become mature adults. We’ve been delivering long-term monitoring studies under the WUP to learn more about sturgeon—including their habitat use, movements, spawning and recruitment. We’re focusing on two segments of the sturgeon population—those living below the Hugh L. Keenleyside Dam and those living above the dam in Arrow Lakes Reservoir.

A conservation aquaculture program was initiated in 2001 to prevent extirpation (local extinction) and restore a natural age class structure in the population. Hatchery-origin juvenile sturgeon have been released annually into the Columbia River below the Hugh L. Keenleyside Dam since 2002, and into Arrow Reservoir since 2007. The conservation aquaculture program has been continually adapted based on new information since 2014. Wild eggs and larvae have been collected from spawning locations in the Columbia River near Trail, Castlegar, and Revelstoke and raised in a hatchery. This approach helps to maintain the genetic diversity of the wild population by allowing wild



BC Hydro’s Senior Environmental Coordinator James Crossman releases a hatchery-origin juvenile white sturgeon into the Columbia River. Photo by Marco Marrello.



A juvenile white sturgeon. Photo by Angus Glass.

adults to reproduce naturally. Their offspring are then released back into the river at an age and size that increases their chance of survival. Overall, the aquaculture program has been very successful downstream of the Hugh L. Keenleyside Dam. Monitoring shows that more of the young fish have survived than originally expected. Accordingly, the number of fish we raise and release each year is only a fraction of what it used to be in the program's early years. Above the Hugh L. Keenleyside Dam (in Arrow Lakes Reservoir), success has been more difficult to determine as there have been fewer recaptures of released fish. We're now releasing larger fish into Arrow Lakes Reservoir in hopes of improving survival. In 2023, we'll be releasing 200 nine-month-old sturgeon below the Hugh L. Keenleyside Dam and approximately 300 juvenile sturgeon above the dam in Arrow Lakes Reservoir at Shelter Bay. The releases into Arrow Lakes Reservoir include nine-month-old juveniles and some two-year-old juveniles reared to a larger size to determine if this will help improve survival following release.

Through our work we have learned that sturgeon spawn from June through August at multiple spawning locations in the Canadian Columbia River. Known spawning sites are downstream of the Hugh L. Keenleyside Dam and Arrow Lakes Hydro, near Kinnaird, and downstream of Waneta Dam. Upstream of the Hugh L. Keenleyside Dam, one spawning location has been identified near Revelstoke Dam. We are continuing to monitor spawning activity at these sites to determine how conditions influence the timing of spawning and the frequency each site is used. We're also using genetic techniques to analyze tissue samples from fish born at different spawning sites to estimate the number of wild adults contributing to spawning events at the different sites. This information will help us continue to refine our conservation aquaculture program.

While the specific cause of white sturgeon recruitment failure is still being investigated, changes to substrate conditions at spawning sites from dam construction and river regulation has been identified as an area where restoration could have a positive effect. We commissioned a study in 2017 to better understand current substrate conditions and to assess the feasibility of restoration options that would likely benefit white sturgeon. The outcome from this study was a recommendation to enhance the substrates at the spawning site in the tailrace of the Arrow Lakes Generating Station—where current conditions consist of a



Enhancements were made to the sturgeon spawning site in the tailrace of Arrow Lakes Generating Station. Photo by Margo Sadler.

small area of larger rip-rap material. A working group (comprised of BC Hydro, regulators, and First Nations) recommended placing a specific mix of rocks and gravel to improve conditions for incubating eggs and larvae. This gravel / rock mixture provides more complexity for growth and development while providing shelter from predators during this critical life stage. An excavator on a barge carefully places the material onto the spawning bed. This work started in October 2022, paused during challenging winter conditions in December and January, and resumed in February. We expect that this work will continue through the spring. This work builds on the success of a prior experiment at the Revelstoke spawning location in 2011 that demonstrated biological benefit for larval white sturgeon.



A specific mix of rocks and gravel will improve conditions for incubating eggs and larvae in the tailrace of Arrow Lakes Generating Station. Photo by Margo Sadler.

Mid-Columbia River white sturgeon spawn monitoring

In 2023, we held a mid-Columbia River White Sturgeon Technical Forum, with representatives from Fisheries and Oceans Canada, the BC Ministry of Water, Land, and Resource Stewardship, Ktunaxa Nation Council, and Okanagan Nation Alliance. Participants discussed study results to-date and remaining uncertainties, then recommended certain studies be extended to address those uncertainties in Arrow Reservoir and the mid-Columbia River. Discussion outcomes included further recommendations to extend our monitoring programs to 2027 or to the Water Use Plan Order Review (WUPOR), whichever comes first. The extended programs include monitoring juvenile sturgeon growth, survival, and habitat use, monitoring of white sturgeon spawning near Revelstoke, and continuing releases of juveniles from the aquaculture program. We are currently planning to implement those recommendations during 2023.



Bubz the Tug collecting floating wood debris in the Kinbasket Reservoir near the Sullivan River. Photo by Mark Sherrington.

WOODY DEBRIS REMOVAL

We're continuing to meet with Debris Management Committee members in Castlegar, Nakusp, Golden, and Valemount to plan and prioritize our floating woody debris removal work for Kinbasket and Arrow Lakes Reservoirs. Removing floating woody debris is an important part of improving recreational opportunities for those reservoirs. Since 2007, we've funded close to \$10.5M of debris work that has removed over 405,000 cubic metres of woody debris from Kinbasket Reservoir and over 91,200 cubic metres from Arrow Lakes Reservoir.

Annual debris removal from Kinbasket reservoir contributes to the objective of removing navigational hazards and maintaining shoreline access. The collection of reservoir-derived wood in 2022 was effective, despite above normal reservoir levels in the fall which delayed land-based collection until November. A total of 28,315 m³ of wood was collected and burned. Land-based spring collection commenced in Canoe Reach in late April during seasonally low water levels and ended by late-May due to rapidly increasing fire danger. Collection and burning resumed in Canoe Reach in mid-November (once reservoir levels lowered), continued until end of the month, resumed in January 2023 to late-February 2023.

In the summer of 2020, high-water wood debris was collected from one kilometre of shoreline along the north end of Canoe Reach and in Windfall Bay—60 kilometres south of Valemount. A total of 12,100 m³ of wood debris was collected, piled and burned. In Columbia Reach, a total of 14,000 m³ of wood was collected from the water in southern parts of the reservoir. This included wood collected by hoe-chucking along the northern shoreline of Bear Island—using an excavator on a barge in shallow water. Of the total 21,315 m³ of wood collected in 2022, new debris inputs from tributaries, landslides and avalanches are an estimated 5% to 10% of the total.

Annual debris removal from Arrow Lakes reservoir contributes to the objective of removing navigational hazards and maintaining shoreline access. However, the debris removal program was not implemented in 2022. The large BC Hydro barge used for debris management was required for the White Sturgeon Habitat Restoration Project downstream from the Hugh L. Keenleyside Dam.

We continue to coordinate our Kinbasket and Arrow debris removal work with our Reservoir Archaeology Program (RAP) to protect heritage and archaeological sites in both reservoirs. The RAP is an archaeological inventory program underway in Kinbasket Reservoir and Arrow Lakes Reservoir to identify and record archaeological sites within the active erosion zone. Although we have repeatedly used many of our debris management locations in the past, this coordination ensures that any ground disturbance caused by our debris work is managed according to our best management practices for heritage and archaeological resources.

BOAT RAMPS

We built new ramps and made improvements to existing ramps at two Kinbasket Reservoir sites and eight Arrow Lakes Reservoir sites from 2008 to 2016. These new and refurbished ramps will provide area boaters with safe and improved access for many years to come.



Burning debris piles in northern Canoe Reach.
Photo by Nathalie Dechka.



Excavator waits near burning debris pile in North Canoe Reach.
Photo by Nathalie Dechka.



Wetland area in North Canoe Reach cleared of debris when frozen to reduce ground impacts. Photo by Nathalie Dechka.



Repairs were completed on the Fauquier breakwater in the summer of 2022. Photo by Mical Dyck.

Fauquier breakwater fix

In the summer of 2022, BC Hydro repaired two damaged sections of the Fauquier breakwater. Work was completed over two days under the BC Hydro Approved Work Practices for Boat Launches, and we were able to safely keep the boat launch open while work was underway.

Valemount breakwater repairs

We are planning to install a floating wave attenuator, which will act as the northern breakwater, and repair the rubble mound that acts as the southern breakwater at the Valemount marina. Construction is scheduled for Spring 2024.

For the floating wave attenuator, we will install a cable/rail mounted float system and cable/rail mounted polyethylene pipe floating breakwater to provide protection for boaters from the northern waves. This system will allow recreational boaters safe access and egress to the Kinbasket Reservoir via the low water elevation boat ramp at the Valemount Marina.

The southern rubble mound forms a small bay area for the marina floats and protects the site from the south-east waves for safe moorage. We will be undertaking repairs to the existing structure as part of this project.

Bush Harbour breakwater repairs

Following the early closure of the Bush Harbour boat ramp last fall, we hosted a meeting where we heard from community members how important the ramp is to the Golden and area community. We also received several suggestions about potential temporary solutions that would allow for safe access.



Bush Harbour boat ramp. Photo by Mark Sherrington.

We listened to the feedback we received at the meeting and are now pursuing interim solutions for boater access. This includes the installation of a temporary floating breakwater, moving the existing departure floating dock to a more sheltered location, and installing a swimming dock. We are currently working through permitting requirements and hope to complete this work this May prior to the start of the recreation season in June. Please note that the ramp will remain closed to public use until the temporary works have been installed. During this time, boaters can continue to access the ramp at Esplanade Bay.

We will also continue to work on a permanent solution that will improve boater safety. This year, we will be installing a wind and wave buoy to confirm the harbour's predominant wind direction. We will also need to carry out geomorphological studies on the harbour foreshore's substrate to determine if it's suitable for anchoring. The earliest these studies can be conducted is this spring when the reservoir elevation is low. We anticipate that the permanent breakwater will be in place prior to the recreation season in 2024.

Drawdown zone habitat maintenance and enhancement

The Cartier Bay wetland on Upper Arrow Lakes is one of the most important regional wetlands for waterfowl during spring and fall migration. It also serves as a nursery pond for breeding western toad and long-toed salamander. The lower tier of this wetland is a deep pond favoured by diving ducks. Its depth is maintained by the historic Arrowhead rail ballast that was slowly failing due to the eroding force of water passing through the outlet. We took steps to reinforce the pond outlet in 2016 to assure pond depth was maintained. In October 2020, erosion along the pond's north bank, required the installation of sandbags as temporary mitigation. During the next available work window (when the reservoir is low), we will reduce erosion risk by making a small elevation adjustment to the pond level at the main control structure. We will also repair the newly eroded area with a low berm and infill of the eroded channel. Construction is currently planned for this spring, but is dependent upon reservoir elevations.

Burton Flats vegetation monitoring

The drawdown-zone-flats south of Burton Creek provided relatively little habitat. Over the last few years, we have implemented two phases of habitat restoration and enhancement near Burton, on Arrow Lakes Reservoir.

Phase 1:

A small spring (associated with Burton Creek) flows under Highway 6 and feeds into the drawdown zone parallel to the highway. The watercourse is fed by high groundwater levels in the area, which provided a viable water source for the wetland. This feature, which originally provided minimal surface water or habitat for wildlife, has been transformed into a series of groundwater tiered ponds of differing sizes and depths to increase the availability and diversity of suitable habitats for migratory birds and breeding amphibians. Excavated material from the pond basins was mounded, and these mounds were planted with a high diversity of native plants.

Phase 2

Initiated in the spring of 2021 with the addition of two more ponds deeper in the drawdown zone. The work was completed in the fall of 2021 with a final round of vegetation enhancement. Phase 2 restocking of plants was informed by the Phase 1 revegetation treatments.

There are two monitoring studies underway at Burton. The first documents the effectiveness of revegetation efforts and the second monitors the use of ponds and revegetated areas by wildlife. The team has been encouraged to see rapid influx of upstream nutrients into the ponds, and colonization by a diversity of aquatic insects and amphibians. It's anticipated that the buildup of nutrients and biomass will foster a trophic cascade to support a food web and community of wildlife that greatly exceeds baseline conditions. This is the final year for wildlife monitoring, and the revegetation monitoring will continue for another three years.

Arrow Lakes Reservoir soft constraints performance 2022

Soft constraint	Target	2022 performance
Recreation	Reservoir water levels between 1,435 feet and 1,440 feet (from sea level) from May 24 to September 30. Flexibility to achieve lower reservoir levels of 1,424 feet during the recreation season would be acceptable with proposed construction/upgrade of boat ramps for recreation interests served by these formal access points.	The reservoir water level was between 1,435 and 1,440 feet 37% of the time during the recreation season (May 24 to September 30) and above 1,424 feet 69% of the time.
Wildlife	Ensure inundation of nesting bird habitat by rising reservoir levels and availability of fall migratory bird habitat is no worse than recent average (1984–1999). Target a reservoir level of 1,438 feet or lower by August 7.	Arrow Lakes Reservoir was below 1,424 feet for about 55% of the time between April 30 and July 16. The reservoir was below 1,438 feet for 100% of the time between August 7 and October 31 for fall migratory birds.
Fish	Reservoir levels above 1,424 feet to ensure tributary access during kokanee spawning period from late August to early November.	Reservoir was above 1,424 feet 18% of the time between August 25 and November 15.
Vegetation	Maintain current (2004) level of vegetation in the drawdown zone by maintaining lower reservoir water levels during the growing season.	Reservoir was below 1,424 feet for 52% of the time between May 1 and October 31.
Erosion	Minimize duration of full pool events and avoid sudden drawdown once full pool has been reached to avoid shoreline slumping. Reservoir water level of 1,440 feet is ideal.	The reservoir reached a peak level of about 1,439.3 feet on July 8, about 4.7 feet below full pool. Arrow, reservoir drafted to about 1,427 feet on August 31 and 1,416 feet on September 30.
Culture and heritage	The original target was ‘reservoir levels at or below 1,430 feet for as long as possible to limit impacts to archaeological sites.’ During the five-year interim review of the Arrow soft constraints, this target was determined not to be effective due to the presence of 102 archaeological sites at elevations below 1,430 feet.	We are implementing a multiyear Reservoir Archaeology Program (RAP) in the Upper and Lower Arrow Lakes to inventory heritage sites and identify impacts as a result of normal reservoir operations. Information gathered by the RAP is expected to assist future decision makers and development of an Archaeological Management Plan.

HOW TO GET MORE INFORMATION

Copies of the Columbia River Water Use Plan, study terms of reference, reports, performance measures, Columbia River WUP Consultative Committee report, and other water use planning information are available online at bchydro.com/toolbar/about/sustainability/environmental_responsibility/water-use-plans/southern-interior/columbia-river.html

Questions? Please get in touch.

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Completed projects

Shelter Bay Park boat ramp upgrades (Arrow Lakes Reservoir)
Nakusp boat ramp replacement (Arrow Lakes Reservoir)
MacDonald Creek Park boat ramp upgrades (Arrow Lakes Reservoir)
Burton boat ramp construction (Arrow Lakes Reservoir)
Fauquier boat ramp upgrades (Arrow Lakes Reservoir)
Edgewood boat ramp upgrades (Arrow Lakes Reservoir)
Syringa Park boat ramp upgrades (Arrow Lakes Reservoir)
Anderson Point boat ramp construction (Arrow Lakes Reservoir)
Bush Harbour boat ramp construction (Kinbasket Reservoir)
Valemount Marina boat ramp upgrades (Kinbasket Reservoir)
Cartier Bay wetland protection project (Revelstoke)
Airport Slough wetland protection project (Revelstoke)
Revegetation planting (Arrow Lakes Reservoir)
Sturgeon hatchery upgrade (mid-Columbia River)

Completed studies

Recreation demand study (Arrow Lakes Reservoir)
Woody debris removal environmental review (Kinbasket, Arrow Lakes Reservoir and Lower Columbia River)
Woody debris inventory, management strategy and removal (Kinbasket and Arrow Lakes Reservoir)
Feasibility of boat ramp improvements (Kinbasket, Arrow Lakes, mid-Columbia River and Lower Columbia River)
Indian Eddy dredging engineering and environmental review (Lower Columbia River)
Erosion protection and monitoring (mid-Columbia River)
Erosion long term monitoring (mid-Columbia River)
Inventory of vegetation resources (Kinbasket and Arrow Lakes Reservoir)
Juvenile fish stranding study (mid-Columbia River)
Bull trout monitoring program (Kinbasket Reservoir)
Rainbow trout monitoring program (Kinbasket Reservoir)
Burbot life history (Kinbasket and Arrow Lakes Reservoir)
Macrophyte study (Revelstoke Reservoir)
Nagle Creek wetland study (Revelstoke Reservoir)
Wetland vegetation study (Kinbasket Reservoir)
Sturgeon spawning habitat assessment (mid-Columbia River)
Sturgeon incubation and rearing study (mid-Columbia River)
Effects of Revelstoke 5 flow changes on incubation of sturgeon (mid-Columbia River)
Sturgeon inventory and habitat use (Kinbasket Reservoir)
Sturgeon recolonization risk assessment (Kinbasket Reservoir)
Spawning fish tributary access study (Arrow Lakes Reservoir)
Sculpin and dace study (Lower Columbia River)
Whitefish spawning study (Lower Columbia River)
Whitefish egg monitoring study (Lower Columbia River)
Great blue heron study (Lower Columbia River)
Nest mortality of migrating birds (Kinbasket and Arrow Lakes Reservoir)
Neotropical migrant bird use study (Arrow Lakes Reservoir)
Shorebird and waterbird monitoring study (Arrow Lakes Reservoir)
Amphibian and reptile monitoring study (Kinbasket and Arrow Lakes Reservoir)
Heritage monitoring wind and wave erosion study (Arrow Lakes Reservoir)
Archaeological overview assessment (Kinbasket, Revelstoke, and Arrow Lakes Reservoir)
Juvenile fish habitat use (mid-Columbia River)
Inventory of mosquito populations (Revelstoke area)
Revelstoke Dam Minimum Flow (Revelstoke area)
Mica Dam Total Gas Pressure Monitoring (Kinbasket Reservoir)
Kinbasket and Revelstoke Reservoirs Kokanee Population Monitoring (Kinbasket and Revelstoke Reservoirs)
Kinbasket and Revelstoke Reservoirs Ecological Productivity Monitoring (Kinbasket and Revelstoke Reservoirs)
Kinbasket Fish Stranding Assessment (Kinbasket Reservoir)