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Lake Roosevelt Forum

NEWSletter

SPRING 2020

RI/FS HHRA
Perspectives Page 2

EPA Planning to
Clean Up Soil within
Northport Page 3

Ecology Completing
Assessment at Northport
City Park Page 3

2020 State of the
Fishery Report Page 4

Lake Roosevelt
Updates Page 6

2020 Lake Level
Forecast Page 7

EPA Remedial
Investigation
Updates Page 8

Student Discovery
Days Postponed Page 8

Draft Columbia River
EIS Released Page 9

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Draft Human Health Risk Assessment Expected in May

The Environmental Protection Agency (EPA) expects to release the draft Upper Columbia Human Health Risk Assessment (HHRA) in May. This is a critical milestone to completing the Remedial Investigation phase of the ongoing Upper Columbia RI/FS (Remedial Investigation/Feasibility Study).

Several years in the making, EPA describes the HHRA as “the process to estimate the

nature and probability of adverse health effects in humans who may be exposed to chemicals in contaminated environmental media, now or in the future.”

Once finalized, the HHRA will help determine the need for cleanup or other remedial measures to reduce contaminant exposure and protect public health. 🌍

Review and Public Comment



WHEN WILL I KNOW IT IS AVAILABLE?

The Forum will send out an electronic newsletter notice. If you do not currently receive this newsletter, sign-up at www.lrf.org/ewnews.



WHERE CAN I REVIEW AND DOWNLOAD?

To check status and availability, go to www.lrf.org/draftHHRA. This link will redirect you to an EPA web site for a status report and, when available, a link to download the draft HHRA.



WILL EPA PROVIDE PUBLIC MEETINGS REVIEWING THE DRAFT HHRA?

Yes. Due to COVID-19, public meetings will occur via webinars on June 10 and July 15th from 5:30 p.m. – 7:00 p.m. EPA will promote webinars and how to connect via all available options, e.g. – post card mailings, newspaper advertisements and stakeholder groups. The Forum will promote via electronic newsletter notice.



WILL THERE BE A PUBLIC COMMENT PERIOD?

Yes. EPA will accept feedback on the draft HHRA from May 18 to July 24. Instructions on how to submit comments will be added to the EPA site webpage: <https://www.epa.gov/columbiariver/upper-columbia-river-remedial-investigation-feasibility-study>



WILL ANY OTHER INFORMATION BE PROVIDED?

Yes. The Forum is committed to releasing a Draft HHRA Public Guide summarizing information before conclusion of the public comment period.

RI/FS Human Health Risk Assessment Perspectives from Citizens for a Clean Columbia

*Mindy Smith, M.D. M.S.
CCC Board Secretary*

In concert with EPA's release of the draft Upper Columbia RI/FS Human Health Risk Assessment (HHRA), I was asked to work with Citizens for a Clean Columbia (CCC) board members to give our sense of public and CCC perceptions about the document and process of sharing information.

These impressions are based on a fairly recent public meeting and discussions with board members and people from the town of Northport (population about 350 people). We will be interested to see how many of our questions the HHRA addresses, or whether a different forum or report will be required.

One question goes back to 2004, which is when soil removal due to lead contamination on properties within Northport was based on a lead threshold of or exceeding 1000 ppm. Residential soil cleanup voluntarily conducted by Teck between from 2015 – 2018, however, used a threshold of 700 ppm. What does this mean to the future of Northport properties with between 700 – 1000 ppm? EPA is working on this issue separately, and we strongly support this effort to extend cleanup to properties with lead levels at 700 ppm or more.

At the meeting, EPA shared how they estimated the probability of adverse human health effects from lead. However, this information does not address questions about specific human health effects, both past and future. While much of this is outside EPA's purview, the concerns about remediation and provision of adequate surveillance and monitoring, such as air monitoring, to ensure future protection against adverse health effects from contamination seems relevant. Without knowing which lead level will be selected for remediation, these concerns remain.

There's on-going interest in soil amendments to reduce lead exposure in areas that do not meet removal action levels and in expanses of undisturbed land. Citizens are asking whether other cutting-edge technologies are being considered as amendments such as hemp or fungus (bioremediation). And what changes in soil contamination occur as areas are burned or otherwise altered. I, along with others, worry that effective amendments will not be found, and that hand washing will provide insufficient protection.



Mindy Smith, M.D. M.S., CCC Board Secretary

These and other concerns go to the heart of community questions about past and future health effects, influence on property values, availability of legacy funding, additional sampling, and the perceived need for reinstated and expanded air monitoring.

From my perspective, I am also concerned about whether the HHRA will truly reflect risk as it is difficult to know the cumulative effect of contaminants, and there is no clear way to combine lead and non-lead risks into a single risk assessment. Further, the gravity-flow and pumped creek-impoundment water systems used for irrigation and sometimes drinking, like my own water system, have not been evaluated.

While I have confidence in the good will of most of those involved in this process on both sides of the border and the impressive work done over the past 14 years, I do not have confidence in the current administration and whether sufficient clean-up and monitoring will occur now and in the future.

At the state level, the Washington Department of Ecology Air Monitoring Program disappointed us when they said they had insufficient manpower to apply for an EPA grant for air monitoring in our area. When we suggested citizen volunteers could be trained in data collection, they disagreed.

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EPA Planning to Clean Up Soil within Northport

EPA is planning a time critical removal action to clean up soil on 16 properties within Northport town limits. EPA's decision was based on criteria that classifies these properties as a threat to people's health from exposure to lead in their soil. EPA will work with property owners who have opted in, the Mayor of Northport, and the Northport Town Council to schedule and conduct removal activities in the next six to twelve months.

Areas for soil removal were identified based on an October 2019 review of 2004 data reports of properties within Northport with lead levels near or above 700 ppm (parts per million). When these sites were first evaluated in 2004, cleanup was not conducted because EPA's removal action level at the time was 1,000 ppm.

The threshold of 700 ppm is the same level EPA used when working with Teck American to voluntarily clean up 18 residential properties outside of Northport town limits from 2015 – 2018. Use of this lower threshold represents advances in scientific understanding of the adverse developmental effects of lead to young children and babies.

EPA's October reevaluation documented the condition and layout of each of the properties of interest identified

in 2004. This included interviews with each property owner about changes to property use since the 2003/2004 soil sampling. Actions will focus on lawns, gardens and play areas with a high likelihood of exposure to contaminated soil. Based on possible use changes, EPA collected and analyzed additional soil samples to better delineate the contaminated area.

Results of EPA's reevaluation were documented in a site evaluation completion memo. Review of this memo supported the decision for time critical removal action. 🌐



Northport, Washington

Ecology Completing Waterfront Project Shoreline and Nearshore Assessment at Northport City Park

Last spring, the Washington Department of Ecology completed soil sampling and other testing to investigate and evaluate cleanup of smelter-related metals contamination along about 800 feet of waterfront in Northport Park. This area was principally polluted by smelter wastes deposited and dispersed along the shore from the adjacent Le Roi Smelter.

Ecology completed a draft Remedial Investigation (RI) report last October that describes the metals contamination. A focused feasibility study (FFS) to evaluate cleanup options is now underway. Later this year, once the feasibility study is further along, Ecology's project team intends to arrange a public meeting in Northport to discuss findings and seek input on cleanup

opportunities, including removing or capping the smelter-related wastes. When the FFS is complete Ecology would like to provide another opportunity for the public to comment on both the RI and FFS reports, in light of the possible cleanup options.

Like EPA's announcement that it will be returning to cleanup lead contaminated soil at 16 additional sites within the town of Northport, Ecology's waterfront work to further cleanup the LeRoi smelter legacy is distinct and separate from the on-going EPA RI/FS. 🌐



Northport City Park

2020 State of the Fishery Report

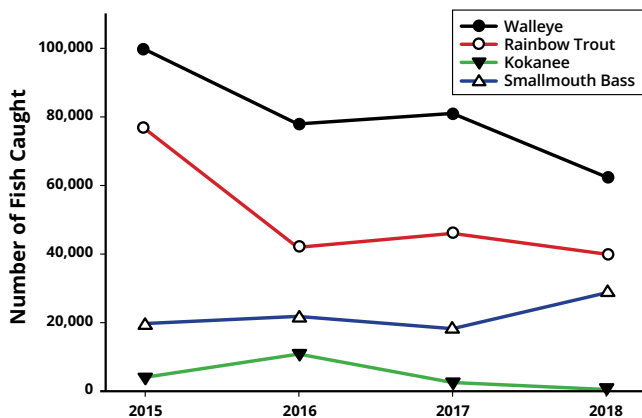
Fishery managers representing the Spokane Tribe, Colville Tribes, Washington Department of Fish and Wildlife and the Volunteer Net Pen project presented their 2020-2025 plans to the Northwest Power and Conservation Council on March 3rd. Based on proposals and presentations, the Council makes funding and program recommendations to the Bonneville Power Administration (BPA) Fish and Wildlife Program. These presentations, combined with interviews with managers and related materials, are the foundation for the Forum's 2020 Fishery Report.

2015-2019: A Consistent, Stable Fishery

The overarching goal of the fisheries program is to support tribal subsistence and non-tribal recreational fisheries. Annual angler catch of all species, within Lake Roosevelt ranged from 154,616 in 2015 to 140,249 in 2018. Creel survey results estimating the number of hours anglers spent fishing were between 311,417 hours in 2015 and 293,065 hours in 2018.

Figure A shows the annual catch for rainbow trout, kokanee, walleye and smallmouth bass for 2015-2018. Because walleye and smallmouth bass are non-native species (meaning they were introduced to the lake), they do not receive artificial production support from hatchery and net pen operations.

Figure A
Annual Angler Catch



Changes in abundance from year to year often parallel changes and timing of lake operations. For instance, the timing and depth of drawdowns for flood control and refill can affect when rainbow trout are released from net pens, entrainment (fish being flushed passed Grand Coulee Dam), and lost habitat and food resources. Other factors include hatchery and net pen conditions, and the effect of non-native predators such as northern pike.

The heart of the hatchery and net pen program will remain raising of up to 750,000 triploid rainbow trout. Up to 500,000 of these are initially reared in local hatcheries and then transferred to one of 45 net pens located throughout the lake. Based on conditions, the actual numbers released into the lake varied from about 360,000 to 700,000 annually between 2015 and 2018.

Triploids are used because they are bred with three sets of chromosomes instead of two to make them infertile, thus protecting the gene pool of wild rainbow trout.

Program Change Highlights: Kokanee Production Suspended, Larger Rainbow Trout Released into Spokane Arm



Rainbow Trout on Spokane Arm

For several years, up to 500,000 kokanee salmon were raised for release into the lake. The minimal target of 5% annual return to creel, however, could not be attained. As such, starting this year the kokanee artificial production program was suspended. Wild kokanee remain in the lake for anglers to seek.

There will be several shifts in rainbow trout production and transfer between the Spokane Tribal Hatchery, Sherman Creek Hatchery, Ford Hatchery and net pens. The net result is that the Spokane Tribal Hatchery will be able to produce up to 53,000 rainbow trout of harvestable size (1-3 lbs) for release at different times of the year.

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2020 State of the Fishery Report

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As part of this change, these larger rainbow trout will also be transferred to a recommissioned fish acclimation facility located below Little Falls Dam that was originally built by Washington Water Power (now Avista) in the 1990s. With BIA funding, the Spokane Tribe renovated this facility in 2019 to provide five raceways for these fish to finish their growth and acclimate to river conditions.

The goal is to provide additional tribal and recreational fishery opportunities in the Spokane Arm, and improve angler opportunities for catching fish at different times of the year. Said Brent Nichols, the Spokane Tribal Fisheries Division Director, "Before COVID-19 suspended monitoring efforts, the initial results were outstanding with the Spokane Arm trending toward becoming a high use area up near the Little Falls Dam."

Upper Columbia White Sturgeon

The 2019 fishery season supported state anglers receiving half of the white sturgeon harvestable surplus with the remaining half split equally between the Spokane Tribe of Indians and the Colville Confederated Tribes.

In 2002 biologists representing governments, tribes and First Nations from the U.S. and Canada began working cooperatively by creating the Upper Columbia White Sturgeon Recovery Initiative. Their goal is to arrest and reverse their decline by restoring natural recruitment.

White Sturgeon in our waters started experiencing chronic recruitment failure in the 1960s. While the mechanisms causing recruitment failure are currently unknown, research by biologists show that White Sturgeon are spawning on an annual basis. They believe recruitment failure is happening at some point between the larval/juvenile life stages.

Efforts from both the Canadian and U.S. conservation aquaculture programs have succeeded in rebuilding the natural age class structure and preventing their expiration. Since 2004, their combined efforts have resulted in release of more than 153,000 juvenile White Sturgeon. Both programs take a conservative approach with the goal to



White Sturgeon

protect and preserve the remaining genetic diversity of the population.

Due to higher than expected survival rates of hatchery released White Sturgeon, the fishery was reopened in the spring of 2017 for the first time in over 20 years. Current conservation aquaculture stocking rates are intended to reach adult abundance targets and sustain an annual subsistence and recreational fishery.

State anglers are advised to check the WDFW fishing regulation pamphlet for daily and annual harvest regulations, slot limits and area closures.

Northern Pike: The Fight to Suppress Continues

Flatten the curve can also be used to describe fishery manager efforts to suppress Northern Pike in Lake Roosevelt. This non-native invasive species is a voracious predator that devastates other resident fish populations. As importantly, if they move down the Columbia, they may devastate salmon and steelhead populations.



Northern Pike removal

To meet the challenge, over \$1 million is now spent annually to suppress Northern Pike in Lake Roosevelt. Funding comes from BPA, tribes, utilities, and others. Since 2015, over 12,600 pike have been removed from the system.

Northern Pike are still primarily located in the northern part of Lake Roosevelt and spawning in the Kettle River. In 2019, potentially new spawning locations were identified in the Barnaby and Gifford areas, and monitoring showed increased presence in the Spokane Arm and lower lake.

Suppression efforts led by the Spokane Tribe, Colville Tribes and WDFW focus on gillnetting from February through November, and electrofishing and set lines in August through October.

Anglers are encouraged to kill ALL Northern Pike caught. The Colville Tribes also provide a \$10 bounty for anglers who remove their heads and drop them off at either the Tribal Trails Noisy Water gas station or the NPS Kettle Falls, Hunters and Fort Spokane fish-cleaning stations. 🌟

Lake Roosevelt Updates

National Park Service

Modified Operations Due to COVID-19: Visit www.nps.gov/laro for updates on available facilities and operations. As of this writing, boat launches are open. However, all campgrounds, restrooms, water services, trash collection, the visitor center and education programs are unavailable.



Boater Self-Certification Required: Beginning May 1, 2020, boater Self-Certification will be mandatory for all boaters to defend against aquatic invasive species (AIS), particularly Quagga and Zebra mussels. More information can be obtained by visiting the park website at www.nps.gov/laro or at all Lake Roosevelt boat launches.

In 2018, Lake Roosevelt National Recreation Area implemented a voluntary boater Self-Certification program to heighten awareness of this national problem and help boaters take part in keeping the waters of Lake Roosevelt clean from these unwanted hitchhikers. Remember, the health and protection of Lake Roosevelt is the responsibility of all who recreate there.

Washington Department of Fish and Wildlife

Efforts to prevent the spread of aquatic invasive species hit a new peak in 2019. WDFW inspected more than 32,000 watercrafts, a 31% increase from 2018. About one third of inspected watercrafts came from known infested waters in other states. WDFW detected 18 vessels carrying invasive mussels and 1,200 vessels that failed to meet the clean – drain – dry requirements.



The state also ramped up its efforts to prepare for a possible invasive mussel infestation with a first-of-its-kind mock exercise involving state, federal and tribal governments. Located on Lake Roosevelt in the Kettle Falls area, the exercise included deploying and testing a containment system, boat inspections, public notifications, a decontamination station, shoreline surveys by trained mussel-sniffing dogs, and in-water monitoring by skilled divers and scientists.



Spokane Tribe of Indians receive compensation for lands flooded by Grand Coulee Dam

After decades of effort, Congress passed legislation that the President signed on December 20th, 2019 to compensate the Spokane Tribe for ancestral lands flooded by the building of Grand Coulee Dam.



Spokane Tribe of Indians

The tribe will receive \$6 million a year for 10 years, and \$8 million a year after that. Funds will come from the Bonneville Power Administration (BPA), which markets wholesale electrical power from Grand Coulee Dam and 30 other federal hydroelectric projects in the Northwest.

Said Carol Evans, chairwoman of the Spokane Tribe of Indians, “Financial compensation is a semblance of justice, but we never will be as we were in the past. This will not bring back the salmon lost or lands flooded, however it will help the Spokane People move forward and heal.”

The legislation is similar to the compensation system established for the Colville Confederated Tribes in 1994. The Colville Tribes received a lump-sum payment of \$53 million and receive \$15.2 million in annual payments from BPA.

WA Department of Health Receives ATSDR Grant

The Washington Department of Health received a cooperative agreement grant from the Agency for



Toxic Substances and Disease Registry (ATSDR) entitled APPLETREE (ATSDR’s Partnership to Promote Local Efforts to Reduce Environmental Exposure).

Said Dr. Jennifer Sabel with WDOH, “With this cooperative agreement, we will be able to enhance our efforts to conduct site assessments for potential human health threats and address community health concerns more fully within Washington State. Over the next six months we will be working on hiring needed staff to complement current program staff and initiate the work plan we submitted with our grant application.”

“For our communities, additional resources such as this are nothing but positive,” said Forum Executive Director Andy Dunau. “We were pleased to write a letter of support during the grant process.”

2020 Lake Level Forecast

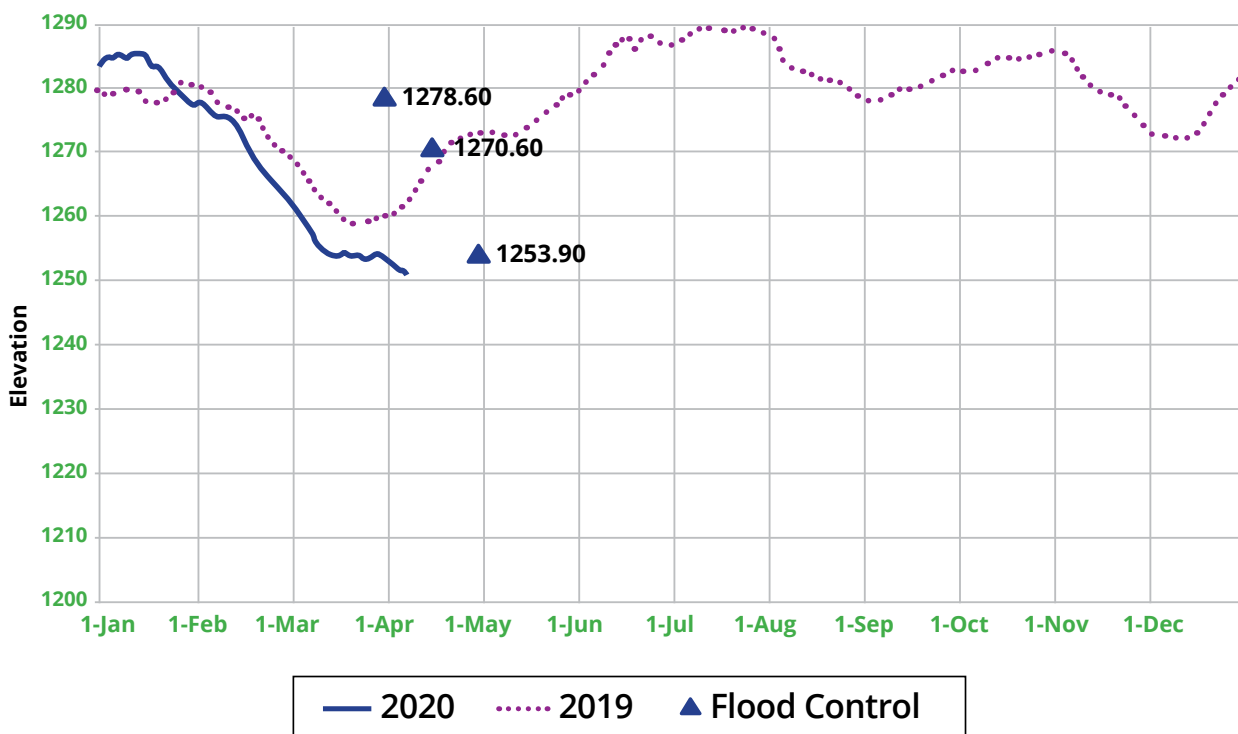
The U.S. Army Corps of Engineers April 8th lake level forecast for Lake Roosevelt predicts an end of April flood control elevation of 1,253.9 feet above sea level. Compared to other years, it looks like the 2020 Lake Roosevelt drawdown and refill will be fairly average.

Snowpack in the Canadian Rockies, the dominant source of water flowing into the Columbia, registered above 100

percent of their annual average for much of the winter. However, the April - August water supply forecast is currently at 71% of normal.

As with past years, to meet the requirements of the Biological Opinion, the lake is predicted to refill to above 1,280 feet by the end of June. Go to www.lrf.org/lakelevel to see daily lake levels, boat launch availability and fishing trends. 🌐

Lake Roosevelt Water Levels 2019-2020



RI/FS Human Health Risk Assessment Perspectives

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This is despite DOE’s 2017 report entitled “Preliminary Review and Evaluation of Available Air Quality Monitoring Data and Consideration of Potential Present-Day Health Risks.” This report recommended updated air monitoring be conducted in our area to analyze heavy metals known to be emitted from the Trail smelter which “may further contribute to potential human health impacts.” On the other hand, Ecology’s Toxics Cleanup Program has provided invaluable assistance, including current work to consider further cleanup of the Northport Park shoreline area.

It will be interesting to read the draft HHRA. We’re eager and hopeful to see how many community-based questions will be successfully or fully addressed. EPA’s RI/FS Remedial Project Manager has thus far been very responsive to our comments. Further, to ensure that the public is well informed about the HHRA and able to provide input, EPA has agreed to a 60-day public comment period and will be providing two webinars. In that positive vein, CCC remains very committed to supporting the outreach process and, as necessary, helping collate public input with EPA. 🌐

EPA Remedial Investigation Updates

Each newsletter carries an update to highlight recent studies and activities that are underway. To learn about the history of the entire RI/FS and what's been learned, visit our Public Guides at www.lrf.org/environment.

Beyond release and the public comment period for the Human Health Risk Assessment (see cover page), EPA updates include the following:

Mussel and Crayfish Sampling

The purpose of this sampling is to estimate exposure from human consumption and ecological risks of chemicals concentrating in tissues of fresh-water mussel and crayfish. In the spring and fall of 2016, samples were collected at various depths throughout the river/lake system. EPA approved the final data summary report in March 2018 and data has been integrated into the human health risk assessment. In 2019, WDOH used this data to place crayfish in the healthy choice consumption category. Mussels are in the DO NOT EAT category, which is consistent with the state-wide advisory against consuming any freshwater mussels or clams.

Plant Tissue Sampling

The 2014 and 2016 Residential Soil Sampling program, residential yard soil removal actions, and the 2014 Upland Soil Sampling results document elevated levels of metals in soils sampled in these upper Columbia River Valley study areas.

The Tribal Consumption and Resource Use Survey confirmed that residents of the Colville Reservation consume or otherwise utilize plants harvested from areas where metals are elevated.

As a result, EPA determined that data for the concentration of metals in berries, nuts, roots, and leaves from a variety of plants was needed for the Upper Columbia River human health risk assessment. In 2019, samples were analyzed, and results presented in a final data summary report. Data were integrated into the human health risk assessment. 🌱

Student Discovery Days Postponed

The sound you won't hear this May are students and teachers exploring the ecological, social and economic complexities of Lake Roosevelt's watershed. Local resource specialists create and staff zones to provide a variety of experiences.

Postponement is, of course, the result of COVID-19. "Ever the optimists," said Forum Executive Director Andy Dunau, "we're working on Lake Roosevelt Water Festival in September and considering offering limited Student Discovery Days in the fall." 🌱





Draft Columbia River System Environmental Impact Statement Released

Overview

In late February, the U.S. Army Corps of Engineers, Bureau of Reclamation and Bonneville Power Administration (co-lead agencies) released a draft Columbia River System Operations Environmental Impact Statement (CRSO EIS) on the long-term system operation and configurations of 14 Federal multiple purpose projects throughout the Columbia River Basin.

Nearly 5,000 pages long, the co-lead agencies characterized this effort as "... responding to the Opinion and Order from the U.S. District Court for the District of Oregon. The Opinion and Order states the EIS should evaluate how to ensure that the prospective management of the CRS [Columbia River System] is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of designated critical habitat."

The EIS focuses on the effects of flood risk management, water supply, hydropower generation, fish and wildlife, navigation, cultural resources, recreation and other purposes. As effects were considered, six alternatives for operation, maintenance and configuration of the CRS were developed for a 25-year time horizon.

With meeting multiple environmental, economic and cultural objectives desired by sovereigns and stakeholders at play, the co-lead agencies "sought to achieve a reasonable balance." A preferred alternative was identified that co-lead agencies believe best strike a balance between objectives, competing river resource needs and co-lead agency mission requirements, including complying with environmental laws and regulations.

This article highlights factors, operations and actions called for in the preferred alternative that are specific to Grand Coulee Dam and Lake Roosevelt.

Lake Levels

Modeling suggests changes in streamflow coming into to Lake Roosevelt (inflow) to be small, typically within 1 percent. Some of this is the result of recommendations for changes in operations at Libby and Hungry Horse dams.

Modeling also suggests the timing of inflow will occur earlier in the spring and summer due to earlier melting of snowpack induced by climate change. By the 2030s, the spring freshet peaks could occur one to two weeks earlier. This also leads to projections that inflows in late summer and early fall will be less.

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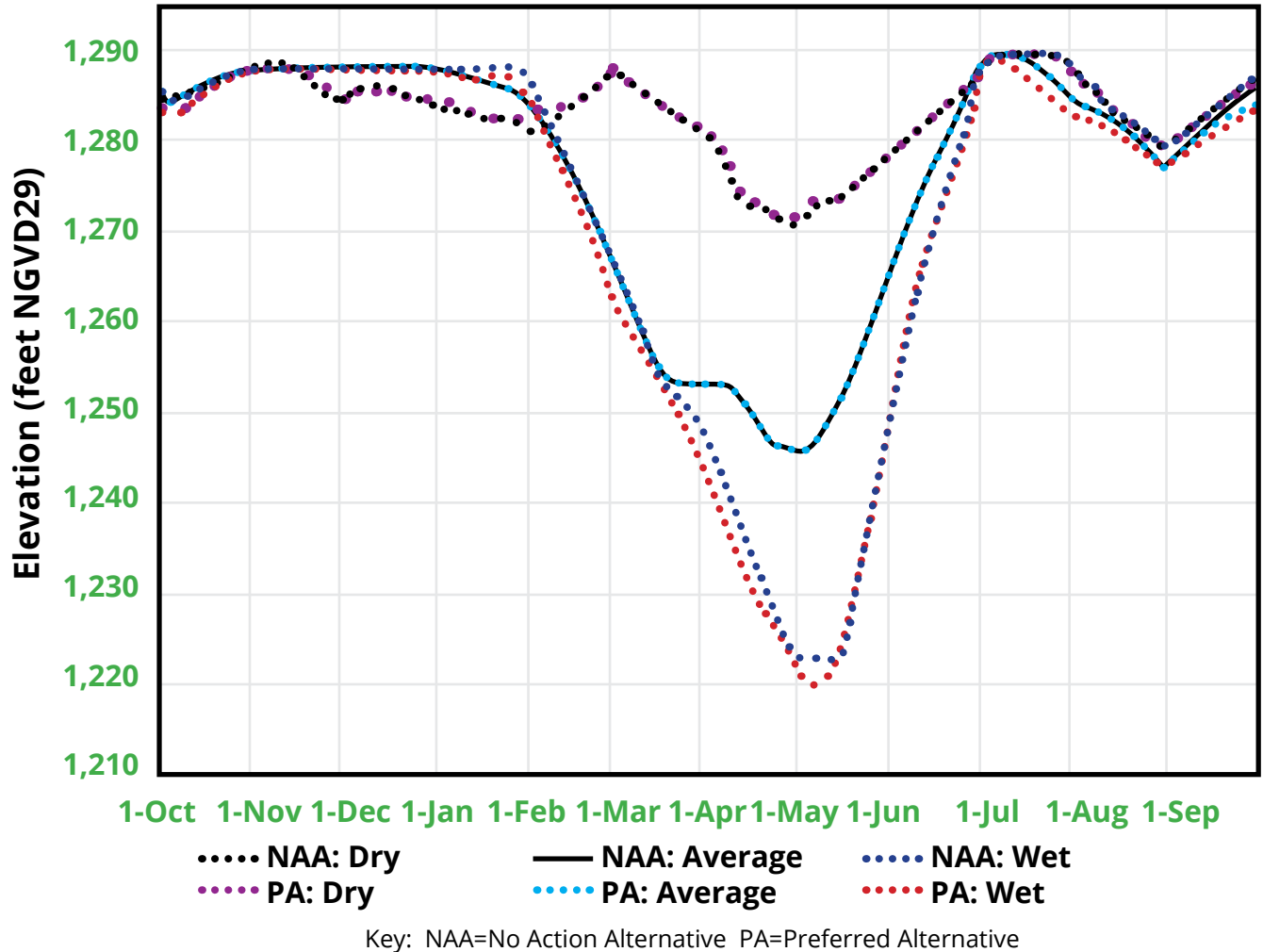


Draft Columbia River System Environmental Impact Statement Released

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Figure A shows differences in current operations vs. the preferred alternative in dry, average and wet years. In wet years (20% of the time), lake levels would be reduced in January and February. In a median wet year, the lake would be 5 feet lower at the end of February. In May, modeling shows about 2 feet less draft in wet years due to operational changes. And in the September/October time frame, the lake will be about half a foot lower 40% of the years.

Figure A
Lake Roosevelt Lake Levels No Action Alternative (Current Operations) vs. Preferred Action (Draft EIS Recommendation)



Operational changes

Operational changes include:

- Establish a planned draft rate (how much the lake level would be reduced) of 0.8 feet per day. This would reduce the risk of erosion along the shoreline and may reduce spill in some years. This is proposed to support reducing the lake being lowered up to an additional 5 feet by the end of February in wet years. This would not change the limit of reducing lake levels no more than 1.5 feet per day, which typically occurs by April 30th to meet maximum flood risk management needs.
- Changes to the procedure for determining flood risk management drafts (how much lake levels are reduced to avoid downstream flooding). One objective is to keep lake elevation above 1,222.7 feet for irrigation pump efficiency. Another objective is to be able to flexibly respond to “trapped” storage in an upstream CSR reservoir.
- Existing lake level reductions to support Odessa Subarea irrigation, improve municipal and industrial water supply and enhance downstream flows for fish are unchanged. Currently, by the end of August this results in the lake being lowered an additional 1.0 foot in non-drought years and up to 1.8 feet in drought years.

Draft Columbia River System Environmental Impact Statement Released

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- Timing of water delivery to the Odessa Subarea would be based on demand (when the water is needed) rather than the current September/October delivery schedule. Further, up to 45,000 acre-feet of additional water, based on demand, could be pumped to support the irrigation season (March to October). Reclamation would make the downstream effect of this neutral by releasing up to 0.25 feet of stored water downstream in the spring period.
- The current Lake Roosevelt minimum refill elevation of 1,283 feet at the end of September would be changed to the end of October. This provides more operational flexibility for power generation and supporting downstream flows for fish. However, this change may negatively impact the spawning success of kokanee, burbot and redband rainbow trout in Lake Roosevelt.

Fish

- In 2019, Bonneville funded a 3-year study to determine if changing the minimum refill elevation from the end of September to the end of October would impact resident fish access to spawning habitat. If it does, the co-lead agencies would supplement spawning habitat at locations along reservoir and tributaries (up to 100 acres).
- Changes in hydro operations at Libby Dam may have an adverse downstream effect on the presence of invasive species such as Northern Pike and flowering rush in Lake Roosevelt. The draft EIS indicates an invasive species management plan will be developed to address this issue.
- Water retention time (how fast water moves through the lake system) will be affected by proposed changes to lake elevations and the timing of inflow. This can lead to changes in entrainment risk (fish passing through Grand Coulee Dam), food source reductions and the timing for release of rainbow trout from net pens. Possible adverse effects in wet years were described as “minor,” and in certain scenarios “beneficial” in dry years.

Facilities and recreation

- Changes in lake elevations would result in decreased boat ramp accessibility in September and October but increases in accessibility in May and June.
- The boat ramp at the Gifford-Inchelium Ferry would be extended. This would mitigate the impact of earlier and longer lake level reductions that would otherwise make the ferry unavailable approximately four additional days a year.

Grand Coulee Dam

- Existing plans and ongoing actions to overhaul the third powerplant, modernize power-generating units in the left and right powerhouses, and modernize the John W. Keys III Pump-Generating Plant are identified and incorporated. The preferred alternative also supports expediting the maintenance schedule for the power plants and spillways.

Water quality

- Operational changes are expected to have a minimal effect on water temperature, total dissolved gas, turbidity, or sediment quality.

What wasn't considered and financing

Reintroduction of salmon above Grand Coulee Dam was not considered. Co-lead agencies pointed to data gaps and a need for a decision-making framework before reintroduction could be included in an EIS. The draft EIS is also distinct from the Columbia River Treaty (CRT) negotiations. For the EIS, 2016 CRT-related operations were applied.

If either reintroduction or CRT results in significant changes to river management, it's not clear how or whether a finalized EIS would be modified.

Implementation of the preferred alternative is not expected to significantly change costs for operating the Columbia River System. Annual construction costs are estimated to increase by \$4 million, capital costs would be the same, and fish and wildlife mitigation costs could decrease by as much as \$41 million or increase by \$6 million.

Next steps

The public comment period ended April 13th. Co-agencies will integrate comments into the final EIS, which is expected in summer 2020. A record of decision documenting final recommended actions is scheduled for September 2020.

At that time, NOAA will determine in a biological opinion if the preferred alternative for dam operations complies with the Endangered Species Act and adequately protects listed species, including orcas and salmon.

If past is prologue, some combination of state, tribal, fishing and conservation interests will challenge the resulting biological opinion. Past challenges have been based on requirements of the Endangered Species Act to protect salmon. These challenges have previously been successful. 🌐

Lake Roosevelt Forum

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