

# Citizens for a Clean Columbia

Our mission: to advocate for a clean Columbia River ecosystem  
NEWSLETTER JULY 2019

## Who are we?

Citizens for a Clean Columbia (CCC) is a volunteer organization focused on advocating for the health of the Upper Columbia River (UCR) and Lake Roosevelt. We are working on a new website but visit us on Facebook at: <https://www.facebook.com/groups/315230442457913/>.

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## News in Brief

### Northern Pike

- This study collected data on metal concentrations in Northern Pike filets from 60 fish in the UCR to update the human health risk assessment (HHRA) and provide information to the WA Dept. of Health (DOH) for a fish consumption advisory.
- Based on mercury content, consumption of large fish (>450 mm) are restricted to 8 meals per month but smaller fish sizes are unrestricted.
- Anglers can deposit the heads from any Northern Pike caught into collection stations for a \$10-a-head bounty.

### Recreational (Rec) Use Survey Data Analysis Finalized

- Response rate was 82% resulting in 2109 surveys.
- Fish consumption for adults was estimated at 6.3 g/day (mean or central tendency exposure); eaten most frequently were walleye and rainbow trout.
- Beach trips, with swimming, were estimated at a mean of 6.8 days/year.
- Camping days varied by location, age and gender - lowest for the upper UCR portion (mean range 2.7 to 7.0 days) and highest average for the lower/lake regions (range 4.5 to 9.9 days).
- Boating trips varied from a mean of 3.1 to 4.9 trips in the upper river portion to 3.4 to 7.1 trips in the lower portion.

### Tribal Consumption and Resource Use Survey

- A data summary of this report will be provided in our next newsletter.

### Plant Survey Moves Forward

- Study purpose is to characterize concentrations of metals in the tissues of wild upland plants ingested or used by Colville Confederated Tribes members.
- Fifteen of the intended 22 target plant tissues were successfully collected and 10 were sampled at both high lead and lower lead sampling areas.

### Lake Roosevelt Bus Tour June 2019

- This year's highlights included a Spokane Tribal Fisheries report, National Park Service updates, information on the WA Dept. of Ecology Northport Waterfront Remedial Investigation and the UCR remedial investigation, a visit to a residential property critical action clean-up site, and progress reports on wolves and A-Z forest management.

### Sacred Annual Salmon Ceremony June 2019

- Big dugout canoes and smaller Sturgeon Nose canoes paddled from Grand Coulee dam or Lower Arrow Lakes to meet at Kettle falls for the annual Salmon Ceremony, feast, and giveaway attended by hundreds of people.

### Technical Advisor Update

- Joe focused on the Rec use data analysis report (DAR), plant tissue study, chemicals of potential concern for aquatic and terrestrial organisms report, phase 3 sediment toxicity study quality assurance project plan, soil amendment treatability evaluation (SATES) study, the tribal DAR, the plant study split sample memo, and the background soil and soil screening memo.

### Northern Pike: Pesky but Edible

This study was conducted as an add on to the 2009 fish tissue study which is part of the UCR Site remedial investigation and feasibility study (RI/FS). The study purpose was to collect data on mercury, inorganic arsenic and TAL metal concentrations in

Northern Pike fillets from the UCR to update the human health risk assessment (HHRA) and provide information to the Washington Department of Health (DOH) in their review of the potential need for a UCR Northern Pike fish consumption advisory. Northern Pike are an invasive fish that was not detected in the UCR until 2011.



The fish were collected using gill netting in July 2018 by the Lake Roosevelt Fisheries Co-Managers (Colville Confederated Tribes and Spokane Tribe of Indians) from the Columbia River area between Kettle Falls, WA and Evans Campground (north of Marcus, WA), with an emphasis on areas where Northern Pike are found to be most abundant. Two size classes were collected – 11.8 to 17.6 inches (300-449 mm) and 17.7 inches (450 mm) and larger.

Sixty whole fish were provided to the study investigators who then completed skinning and tissue filleting and composited by class size into a total of 12 composites prior to chemical analysis. The composite samples were tested for the following metals: aluminum, antimony, arsenic (total and inorganic), barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, sulfur, thallium, uranium, vanadium, and zinc. All data were considered usable.

The levels of contaminants identified were compared to screening levels (SLs), defined as the concentration of the chemical in fish tissue that is of potential public health concern. Two groups were considered - general (8 meals per month) and high fish consumers (23 meals per month) with a meal defined as one 8-oz serving.

Results were provided in mg/kg dry weight except for mercury which was given in micrograms/kg. For the smaller fish class, only inorganic arsenic exceeded both general and high-consumer SLs and mercury exceeded SLs for high consumers. For large fish (>450 mm), both inorganic arsenic and mercury, but no other metals, exceeded SLs for all consumers.

Because none of the samples were above the detection limit for inorganic arsenic (meaning that the reporting limit was higher than the risk-based concentration, and in this case a 0% detection frequency), no further evaluation was conducted for this analyte. Based on detection of mercury, allowable consumption rates were calculated. For the smaller class of Northern Pike, 10.9 meals per month are allowed which translates into unrestricted consumption of fish between 300 and 449 mm. For the larger fish class (>450 mm), consumption is restricted to 6.8 meals per month which is rounded into the DOH's "8 meal per month category". Results are available on the Teck website: <https://www.ucr-rifs.com/>.

Northern Pike are an invasive fish that are damaging to resident fish populations. As such, there is a bounty of \$10 offered to anglers who catch them and turn the heads in to one of the two collection stations – Tribal Trails Noisy Waters deli and gas station at the intersection of highways 20 and 395 at Kettle Falls or the National Park Services Kettle Falls fish-cleaning station. For additional information see <https://www.nwcouncil.org/news/fish-head-bounty>.

Anglers fishing downstream of the Chief Joseph and Grand Coulee dams are asked to kill the fish immediately and report it to the Washington Invasive Species Council at [www.invasivespecies.wa.gov](http://www.invasivespecies.wa.gov).

Mindy Smith, CCC secretary

## Recreational Use (RecUse) Survey Data Analysis Finalized

**Background:** The purpose of the RecUse survey was to collect information on fish consumption and recreational use (boating, swimming, picnicking, camping, fishing) on the Upper Columbia River (UCR) from the Grand Coulee Dam north to the Canadian border for use in the human health risk assessment (HHRA). The study was designed and conducted by Industrial Economics, Inc under contract with the Dept. of Interior. Randomly selected respondents who visited the UCR on day trips for boating or to the beach or for overnight camping were asked to complete the on-site survey from October 2010 to September 2011, and selected anglers were asked to complete a 3-month fish consumption diary. Exposures considered were oral, dermal (skin) and inhalation (breathing).



Marina at Kettle Falls

A total of 2,109 surveys were completed by eligible participants, resulting in an 82% response rate. Information on the initial study results were reported in May 2013 (see our January 2013 newsletter).

**Update:** This month, the EPA and project partners finalized the Data Analysis Report for the RecUse

Survey. The purpose of the latest Data Analysis Report was to analyze the survey responses and prepare the data for use in the final HHRA. The report presents the survey methods and outcomes expressed as both central tendency exposure (CTE) and reasonable maximum exposure (RME; 95<sup>th</sup> percentile), with the environment for recreational users. In this article, we used the RME as it is most protective.

Authors of the Data Analysis Report determined that data were sufficient for estimating exposure pathways. Fish consumption for adults (considered ages 7 years and older) was estimated at 28 g/day for RME based on questionnaire and diary data. Daily fish consumption for women ages 17-45 years was 26 g/day based on questionnaire and diary data from 81 women. For children, ages 0-6 years, the fish consumption estimate was 5.8 g/d (RME) based on diary data.

The types of fish consumed, in order of frequency, included walleye (N=492), rainbow trout (N=421), bass (N=153), kokanee (N=72), and smaller numbers of perch, triploid, burbot, lingcod, and carp. Among the 135 anglers who kept 3-month diaries, estimated fish meal size ranged from 113 to 303 g; the median sizes ranged from 113 to 236 g depending on age (larger portions for older individuals). The number of fish meals per year from the UCR site was 8 for children (mean 1.8 meals per year) and 134 for adults (mean 7.4 meals/year).

CTEs for adults and children were highest for general beach trips and swimming during beach trips and exposure times were estimated at 0.99 hours per day and 0.98 hours per day for adults and children, respectively. The corresponding RMEs were estimated at 20 days per year for adults with 2.9 hours/day of exposure time and 15 days/year for children with 2.8 hours/day of exposure time. The

number of visits to beaches did not differ significantly by location of the beach along the river.

The mean hours spent outdoors for beach trips for all regions of the UCR was 2.3 hours (95% was 5.2 hours for adults and 5.3 hours for children). Wading in water was reported by 34% to 58% of adults and 63% to 81% of children with mean hours spent wading of less than one hour on average; the exception was for children in the upper UCR who reported 1.6 hours/day on average. The 95% was 2.0 hours for adults and 2.9 hours for children.

The number of days camping varied by location and was lowest for the upper portion of the UCR area (range 2.7 days for males aged 7-17 years to 7.0 days for females aged 18-54 years), followed by the middle portion (3.8 days for females ages 0-17 years to 7 days for males aged 18-54 years) and the lower/lake regions 4.5 days for males 0-6 years to 9.9 days for males aged 7-17 years). The highest exposure hours/day values were seen among adults and children who were swimming during camping trips – RME values of 5 and 4 hours daily, respectively over 19 days/year for adults and 9.9 days/year for children.

The number of days boating also varied by location but not significantly by age. The range of boating trips was from 0.2 to 213, with a mean number of trips of 3.1 to 4.9 trips in the upper portion, 3.3 to 5.8 trips in the middle portion and 3.4 to 7.1 trips in the lower portion of the river. The mean hours spent outdoors on boat trips for all reaches combined was 5.2 hours/day for adults and 4.7 hours/day for children.

Swimming and wading in water deeper than waist deep were reported by 18-40% of adults and 4-32% of children in the upper UCR, 20-36% of adults and 1-48% of children in the middle UCR and 28-52% of

adults and 2-58% of children in the lower UCR with durations ranging from 0.4 to 3.4 hours/day. Time spent on the sand was highest for those visiting the lower UCR (1.1 to 8.1 hours/day across exposure scenarios for children and 0.8-7.2 hours/day for adults).

Adjustments were made for responses deemed out of plausible limits for that activity. These involved few participants (two reported more than 90 trips to the beach during the summer, one reported 250 boating trips, and 7 reported spending more than 16 hours in a day on the sand/beach). Outlier analysis was presented for addressing outliers and seemed appropriate to this reviewer. An uncertainty analysis was also presented and clear with respect to areas of greater certainty based on reasonably narrow 95% confidence intervals and small margin of error for many exposure parameters. Uncertainty remains for individual lake regions for some estimates and time spent swimming by children during boat and camping trips due to small sample sizes.

As a side note, a new National Park Service report shows that over 1.2 million people visited the Lake Roosevelt National Recreation Area in 2018. The \$56 million they spent had a cumulative \$66 million-dollar effect on the local economy and supported 689 jobs (see <https://www.nps.gov/laro/learn/news/tourism-to-lake-roosevelt-national-recreation-area-creates-66-million-in-economic-benefits.htm>).

Mindy Smith, CCC secretary

## **Plant Survey Moves Forward**

The purpose of the plant study is to characterize concentrations of metals in wild upland plant tissues ingested or used by members of the Colville Confederated Tribes (CCT) to determine if exposure to total concentrations of these metals poses an

unacceptable risk to human consumers. A secondary question was to determine the relationship between plant tissue and soil metal concentrations.



Wild rose

Metals assessed included aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, selenium, silver, thallium, vanadium, and zinc; mercury was analyzed in a subset of plant tissues that had a higher potential for mercury bioaccumulation (kinnikinnick, wild rose, sarvisberry, wild mint, tule, and willow).

Plants and 0-3-inch-deep co-located soil were sampled in 3 high-lead (>700 mg/kg) and 9 lower-lead sampling areas from tribal allotments in the study area of the UCR during 3 time periods - April, June and August 2018. Plants included camas, lomatium, spring beauty, black tree lichen, kinnikinnick, willow, wild rose, and rose hips, huckleberry, chokecherry, hazelnut, ponderosa pine, sarvisberry, tule, and wild mint.

Compositing of plants of the same species occurred when individual plant tissue was not enough for the analyses. Field replicates and split samples were also obtained to assess variability in the sampling process and for quality assurance. EPA oversight was provided and a cultural resource monitor was present during all sampling events.

Fifteen of the intended 22 target plant tissues were successfully collected and 10 were sampled at both high lead and lower lead sampling areas, indicated by the asterisk above. A total of 174 plant tissue and co-located soil samples were collected. Plants not collected included mushrooms, wild strawberries, bitter roots and Indian carrot roots because there were either not present or not present in sufficient quantity.

Mindy Smith, CCC secretary

### **Lake Roosevelt Bus Tour (LRF)**

The Lake Roosevelt bus tour on June 19<sup>th</sup> once again afforded a great opportunity for learning and networking as approximately 60 people, including several CCC members, visited sites along the river.

This year's morning highlights included Spokane Tribal Fisheries reports, National Park Service updates at Evan's campground, information on the Washington Department of Ecology Northport Waterfront Remedial Investigation (to be featured in our January 2020 newsletter) and the Upper Columbia RI/FS, followed by lunch in Northport.



Evans campground

I was particularly interested to learn more about the Lake Roosevelt Creel program. In 2018, anglers were estimated to have caught 140,249 fish of which

about 58% were harvested. This included over 40,000 Rainbow Trout and over 62,000 Walleye.



Northport waterfront area

In the afternoon, we visited a residential property critical action clean-up site and received progress reports on wolf and A-Z forest management. I was amazed to learn that the gray wolves, nearly wiped out in the 1930's, have made a substantial comeback in Washington state with a population count for 2018 of at least 126 known wolves in 27 known packs including at least 15 breeding pairs. The Department of Fish and Wildlife is working hard to track and control this overpopulation of wolves in eastern Washington and reduce depredation incidences. Information on wolves in Washington State can be found at <https://wdfw.wa.gov/species-habitats/at-risk/species-recovery/gray-wolf>.

Finally, the A-Z forest management program was impressive in creating efficient tree harvest while maintaining sufficient large native trees and reducing undergrowth to protect against fire.



A-Z forest management site (Right – SN canoe)

Mindy Smith, CCC secretary

### **Annual Sacred Salmon Ceremony**

Construction of Grand Coulee Dam ended the migration of salmon into the upper reaches of the Columbia River in 1942. The annual canoe and overland trips by many Tribes to harvest the sacred salmon at the Kettle Falls stopped shortly afterward.

Beginning in 2016, The Upper Columbia United Tribes (UCUT) organized a canoe trip to the ancient site. Many of The Tribes had carved dugout canoes themselves to recreate this sacred journey and take part in a Salmon Ceremony there once again. A feast, give away and name giving was also held following the ceremony at the water. The ceremony is known as one of the oldest on the Columbia River.

This journey has become a yearly affair now. In June of 2019, five big dugout canoes and several smaller Sturgeon Nose canoes left Grand Coulee dam to paddle upriver to the ceremonial site. Simultaneously, two big dugouts and several Sturgeon Nose canoes left the Lower Arrow Lakes in British Columbia to paddle down the Columbia and meet the paddlers coming up.



After a week of paddling and camping, all the canoes met across the river from the site and with much singing, drumming and celebration the canoes paddled across and landed. Shortly after, The Salmon Ceremony was held, calling the salmon back to Kettle Falls. “Ceremonies like this have to be done,” said tribal elder Richard Armstrong. “The rocks you clack together, that is the language of the salmon. When we throw them into the river, they hear that. It speaks to the salmon.” The Ceremony, feast, and giveaway were attended by hundreds of people. The Salmon Ceremony at Kettle Falls is a yearly event open to all the public.

Clifford Ward

### **Technical Advisor Report**

My efforts over the past five months focused on recreational (rec) use data analysis report (DAR), plant tissue study, chemicals of potential concern (COPC) for aquatic and terrestrial organisms report, phase 3 sediment toxicity study quality assurance project plan (QAPP), soil amendment treatability evaluation (SATES) study, tribal DAR, plant study split sample memorandum, and the background soil and soil screening memoranda. CCC used my reviews in preparing their comments to EPA.

I reviewed the recreational use DAR. I had two major concerns, both of which were addressed in the final

document. The DAR was edited to acknowledge that residents consume groundwater and/or well water within the site, and to account for the possibility that campers could spend more than 16 hours per day on a beach.

The plant tissue study was performed to examine the levels of metals in plants growing in tribal allotments that qualified for time-critical removal actions as a result of the 2014 residential soil study. I reviewed the data summary report and had only a few comments. Several soil samples were analyzed for mercury as a result of record-keeping errors. The soil samples had not been stored refrigerated as required for mercury analysis. I asked for a discussion of the accuracy of the results due to the sample storage temperature. I also requested a comparison of the results to human health risk levels. That comparison was postponed to the formal human health risk assessment (HHRA).

I reviewed the COPC report for aquatic and terrestrial organisms. I suggested that all porewater data be reevaluated after the phase 3 sediment toxicity study porewater data are available. I had concerns with the use of threshold effect concentrations developed from data that are not publicly available and may not have been peer reviewed. I also asked that the report state what organization will perform usability assessments on older data sets.

I reviewed the phase 3 sediment toxicity QAPP. My main concerns were the potential pooling of data from all three areas of interest (AOI), which assumes contamination is equivalent in all three AOIs, the omission of procedures for the backscattered electron microscopy determination of slag content in sediment, and the verification and validation of benthic macroinvertebrate identification.

I reviewed the SATES bench scale testing work plan. I requested that all data be entered in the Exponent UCR Database. I was concerned about the impact repetitive sampling may have on sample integrity during the test. I also requested that soil amounts required for each test be listed in the report to verify that there was enough volume of sample in each test container to perform the study.

I reviewed the final data analysis report for the tribal use survey. I requested that a comparison of locally-caught fish intake risk exposure between the RecUse survey and the tribal use survey be included in the report. I also suggested several modifications to the figures to make interpretation easier for readers.

I reviewed the plant tissue study split sample memorandum and had a few minor comments.

I reviewed the background metals concentrations in soil memorandum. My major concern was use of data from the 2014 upland soil study as the primary source of background data. Twenty-three of the total 39 samples used to determine background metals levels in soils are from the 2014 upland soil study. I suggested the report include that observation samples collected close to the United States-Canadian border have higher levels of metals than samples collected further from the border.

I reviewed the soil screening for plants and invertebrates memorandum. My primary concern was the inclusion of outlier values, values greater than 10 times all other values, for determining threshold toxicity levels of metals. I suggested that outlier values be excluded from the determination of toxic effect levels of metals. I also suggested that only data from soil types similar to those found in the study site be used.

I also attended the Lake Roosevelt Forum (LRF) bus tour of the Upper Columbia Site on June 19, 2019 (please see accompanying article for more details).

Joe Wichmann, PhD; CCC Technical Advisor

### **Want to be More Involved?**

CCC welcomes new members. Our next General Member Meeting will be in the fall. Please join us. We will post updated information on Facebook (<https://www.facebook.com/groups/315230442457913/>); we are working on a new website.

### **New EPA UCR RI/FS Co-Leader**

Robert Tan has taken over as EPA's remedial project lead on the HHRA from Monica Tonel. Robert earned B.S. degrees in Planning, Public Policy and Management, and Environmental Studies from the University of Oregon, and is finishing an M.S. in Land Resources and Environmental Science from Montana State University. Robert has been with EPA for 8 years and previously worked in the Brownfields Program as lead regional coordinator for the Brownfields Area-Wide Grant Program and the Environmental Workforce Development and Job Training Program. We warmly welcome Robert to the team.

The CCC board, along with Joe Wichmann, want to thank Monica for her extraordinary service as part of the UCR RI/FS.

With questions for the EPA project managers, contact Robert Tan for information on human health studies at [Tan.Robert@epa.gov](mailto:Tan.Robert@epa.gov) and Kathryn Cerise for information on ecological studies at [Cerise.Kathryn@epa.gov](mailto:Cerise.Kathryn@epa.gov). Kira Lynch is responsible for the Soil Amendment Technology Evaluation Study and can be reached at [Kira.Lynch@epa.gov](mailto:Kira.Lynch@epa.gov). Concerns may also be directed to the EPA assistant Region 10 Deputy Regional Administrator Michelle Pirzadeh ([Pirzadeh.Michelle@epa.gov](mailto:Pirzadeh.Michelle@epa.gov)).

Mindy Smith, CCC secretary