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# Lake Roosevelt Forum

# NEWSletter

## SUMMER 2018

Getting to Know  
Dr. B Page 2

Columbia River Treaty  
negotiations begin Page 3

2018 LRF Conference  
a huge success Page 3

RI/FS will not support  
additional air monitoring  
in Northport area Page 4

National Park Service  
soliciting concession  
proposals to operate  
Kettle Falls Marina Page 4

EPA Remedial Investigation  
updates Page 5

Soil amendments being  
tested to reduce human  
exposure to lead Page 5

Student Discovery  
Days ring in spring Page 7

Conference Columbia  
River Treaty Opinion  
Poll Results Insert

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## The Migratory Path for Upper Columbia Salmon Reintroduction

***“So many of our dreams at first seem impossible, then they seem improbable, and then, when we summon the will, they soon become inevitable.”***

*Christopher Reeve, quadriplegic and actor who played Superman*

***“Let’s go invent tomorrow instead of worrying about what happened yesterday.”***

*Steve Jobs, Founder, Apple*

Day 2 of the Forum Conference showcased the intersection of dreams, best available science and challenges for reintroducing salmon to the Upper Columbia. While this article focuses on American reintroduction efforts, speakers and participants from Canada provided a wealth of information and perspective regarding similar efforts across the border.

A key takeaway is that the Upper Columbia United Tribes (UCUTs), based on leadership from their Coeur d’Alene Tribe of Indians (CDAT), Colville Confederated Tribes (CCT) and Spokane Tribe of Indians (STOI) members, expect to move forward with cultural releases of salmon into the Upper Columbia in 2019, if not sooner.

The term cultural release is used because the salmon will not be completing a full life cycle journey to and from the ocean. Objectives of cultural releases are to:

- Provide ceremonial and harvest opportunities for tribal members.
- Ground truth expectations for viability of donor stock, habitat assessments and other life cycle modeling variables that research suggests will lead to sustainable populations.

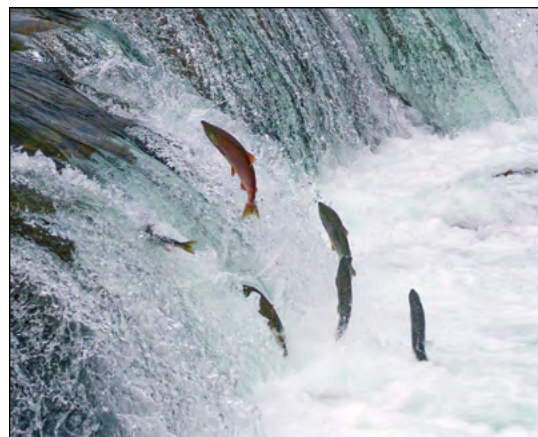
- Education and outreach to youth and community groups.

### Phase 1 Report Nearing Completion

Three years in the making, the Phase 1 report synthesizes various assessments and modeling to consider the feasibility of reintroducing salmon above Chief Joseph and Grand Coulee Dams. Natural resource managers gave a “sneak preview” at the conference of what to expect when the report is released this year.

“It’s a bit like orienteering,” said Forum Executive Director Andy Dunau. “The managers are navigating new terrain by integrating diverse data points and information sets into models that simulate the probability of success.”

Their 64,000-foot-high view is encouraging. Reintroduction is viable with habitat sufficient to maintain a sustainable population. Achieving the dream, however, will be a multi-year process with both expected and unexpected challenges.



CONTINUED ON PAGE 6

# Getting to Know Dr. B

## Dr. Brent Nichols is the Fisheries Manager for the Spokane Tribe of Indians.

Dr. B, as friends like to call him, is an affable man who hails from Tennessee. He joined the Spokane Tribe of Indians in 2013 after successfully operating an environmental consulting firm focused on Section 7 ESA consultation and waterfront permitting in Florida for 12 years. He holds degrees in Marine Science and Ecology from Jacksonville State University (Jacksonville, AL) and doctorate in Molecular Systematic and Ecology from the University of South Florida. In the five years since joining the Spokane Tribe, he, his wife, and two daughters have come to call Spokane and the Upper Columbia home.

His mission: protect, preserve and enhance the Lake Roosevelt fishery. One of his responsibilities is management of the Lake Roosevelt Fisheries Evaluation Program, a collaborative effort between the Spokane Tribe, the Colville Confederated Tribes, and WA Department of Fish and Wildlife. Often called “the co-managers,” they oversee Lake Roosevelt’s aquaculture programs (hatchery, net pen and other operations) which are partial mitigation for impacts caused by the construction and continuing operations of Grand Coulee Dam. The programs are responsible for the amazing fishery that is available in Lake Roosevelt, which includes Rainbow Trout and Kokanee Salmon.

Said Dr. B, “Top to bottom, the lake is beautiful and diverse. And being able to work for a tribe committed to a mixed-use fishery that supports native and recreational fishing is an honor. But what makes this place special to me is the deep commitment to coordination and collaboration across tribes, agencies and the public. Our fishery thrives because of our commitment to the resource and each other.”

One example is the creel survey, where managers interview anglers at boat launches to better understand the health and distribution of the fishery. Combined with tagging, radio telemetry, gillnetting and other techniques, managers do the statistical analysis needed to support management decisions.

“We try to get the word out about what we do and why because sometimes there are misunderstandings,” said Brent. “If someone sees our field crew out there with a

gillnet or fyke net, they might think we’re harming not protecting the fish. Additionally, it’s an on-going effort to educate people not to harvest wild redband or rainbow trout with an intact adipose fin (the difference between wild and hatchery fish).”

Part of the public outreach he’s inspired includes using the creel survey to help answer every angler’s favorite question, “What’s biting where?” So co-managers invested in web programming that uses the creel data to show what anglers are sharing with them. Said Brent, “It’s part of our commitment to transparency and good relations. Anglers are terrific about supporting the creel survey, so

this is part of our giveback. Like I said, the commitment to coordination and collaboration in the Upper Columbia is special.” You can access the fishery trends web page via the STOI fishery ([www.spokanetribofisheries.com](http://www.spokanetribofisheries.com)) and Lake Roosevelt Forum ([www.lrf.org](http://www.lrf.org)).

In his five years here, Brent’s seen changes big and small. “One of the things we’re really pleased about is opening up a white sturgeon fishery season, which is the result of years of research and aquaculture work paying off. And one of the things we’re most

concerned about is northern pike gaining a foothold in the system. Eradication of pike has to be the goal because their predatory ability will devastate the fishery if left unchecked.”

But if you want to see Dr. B light up, just say “salmon.” He’s a key part of the management group studying and developing plans to reintroduce salmon above Chief Joe and Grand Coulee. That’s why Dr. B has a one-word answer for his favorite prediction about Lake Roosevelt’s future, “Salmon!!”

Put it all together, and five years later it’s safe to say Dr. B and his family have found a home away from home. A regular on Facebook, he keeps his Tennessee friends and family apprised of life out west. And with his affable, determined style, he also stays true to his roots. That begins with bleeding University of Tennessee Volunteer orange. Whether it’s his vols, salmon, collaboration or friendship, Dr. B’s all in. 🌐



*Brent Nichols, Spokane Tribe of Indians Fisheries Manager*

### What’s biting where?

Access fishery trends via the STOI fishery ([www.spokanetribofisheries.com](http://www.spokanetribofisheries.com)) and the Lake Roosevelt Forum ([www.lrf.org](http://www.lrf.org)) web pages.

# Columbia River Treaty negotiations begin



Francisco Palmier, Acting Assistant Secretary of State

The U.S. Department of State announced that negotiations with Canada to modernize the Columbia River Treaty began on May 29-30, 2018, in Washington, D.C.

Said the Department of State, “The 1964 Treaty’s flood risk and hydropower operations have provided substantial benefits to millions of people on both sides of the border. The Treaty, a worldwide model for transboundary water cooperation, has also facilitated additional benefits such as supporting the river’s ecosystem, irrigation, municipal water use, industrial use, navigation, and recreation. Modernizing the Treaty regime will ensure these benefits continue for years to come.”

Francisco Palmieri, Acting Assistant Secretary for the US Department of State, provided a keynote address on modernizing the treaty at the Forum conference in April. That was followed by a panel discussion with American and Canadian opinion leaders.

Conference participants engaged in the panel discussion by anonymously answering polling questions. The resulting dialog showcased both the promise and challenges of successfully modernizing the treaty.

The state department followed up on their conference participation with a well-attended Town Hall. The department also announced their launch of a treaty web site providing background information and updates. To receive emails about upcoming Town Halls and other updates, contact the department at [ColumbiaRiverTreaty@state.gov](mailto:ColumbiaRiverTreaty@state.gov).

The U.S. negotiating team will be led by the U.S. Department of State and include the Bonneville Power Administration, the U.S. Army Corps of Engineers, the Department of the Interior and the National Oceanic and Atmospheric Administration. Tribal nations requested a seat on the negotiating team. They were informed, however, that their input would occur through a consultation process.

The Forum is pleased to share conference participant polling results (see insert). Please note that responses are representative of the American and Canadian interests attending the conference as opposed to the general public. 🌐

## Conference Columbia River Treaty Opinion Poll

See newsletter insert for anonymous poll results.

## 2018 LRF Conference a huge success

With 294 participants attending one or both days, the 2018 Conference carried on the tradition of being a must attend forum for agencies, tribes, interest groups and the public to share and dialog on critical upper Columbia topics. Presentations can be found at [www.lrf.org/conf](http://www.lrf.org/conf).



### Conference Sponsor Thank You



## *RI/FS will not support additional air monitoring in Northport area*

An April 18, 2018 letter from the Environmental Protection Agency (EPA) informed citizens who filed a petition that additional air monitoring will not be conducted as part of the RI/FS. As a result, EPA will use previously collected air monitoring data for their human health risk assessment.

The source of concern for citizens in the upper Columbia Valley is air emissions from the Teck smelting facility smoke stacks that operate about seven miles north of the U.S.-Canadian border in Trail, British Columbia (B.C.).

EPA based their decision on review and evaluation of data collected between 1999 and 2009. EPA's review found that concentrations for lead, arsenic, cadmium and zinc were within acceptable risks used by the Superfund Program. Said EPA in a letter to citizens, "From our evaluation of data collected in 1999 - 2009, we believe that the risk to you from the outdoor air in Northport is low. Based on our analysis of Ecology's report and operational improvements



at the Trail facility, we expect current-day concentrations to be even lower." The 1999- 2009 air data will be included in EPA's human health risk assessment for the Upper Columbia River Site.

An Ecology report, however, found several shortcomings with the reliability and representativeness of the existing data. Ecology recommended the pursuit of a new air monitoring program along the upper Columbia River Valley from near Northport to the U.S./Canada border. Said Ecology in a March 2017 fact sheet, "Collecting new, reliable measurements of metal particles in the air within the upper Columbia River valley will be the best way to understand current conditions."

EPA's confidence in their assessment stems from Teck making operational improvements to reduce emissions that date back to 1997. According to Teck, since that time "... stack lead emissions have been reduced by over 99%." As a result, EPA believes that, air quality has improved since 2009.

In an EPA meeting with citizens in Northport on May 3rd, many shared skepticisms of EPA's decision. Concerns included needing to validate risks are lower, that recontamination of sites already cleaned-up as part of soil remediation is not occurring, and beliefs by some that emissions contribute to an unusually high rate of Crohn's disease in the area.

Citizens asked Teck to consider funding air monitoring as part of additional corporate responsibility outreach they've supported in the area. Ecology recently also indicated they may consider funding alternatives. 🌱

## *National Park Service soliciting concession proposals to operate Kettle Falls Marina*

The National Park Service (NPS) issued a prospectus soliciting proposals for a concession contract for marina services at the Kettle Falls Marina on June 28th.

Said NPS in a news release, "In response to public input, the business opportunity for a 10-year contract includes new services not included in previous contracts, such as water taxi service and boat tours. The contract will continue amenities that have been in the area for a number of years, such as fuel sales, sewage pump-out, a convenience store, and slip rentals for boat moorage. The operator will also be able to provide houseboats and marine craft rentals, primitive cabins, water taxi service, and boat tours."

The prospectus is available on the NPS Commercial Services website at [www.nps.gov/commercialservices/](http://www.nps.gov/commercialservices/). The deadline for submitting proposals is September 28, 2018. 🌱



*Kettle Falls Marina*

# EPA Remedial Investigation updates

Over a decade has passed since EPA reached agreement with Teck to conduct an Upper Columbia Remedial Investigation and Feasibility Study (RI/FS) to identify the nature and extent of contamination, and assess possible risks to human health and the environment.

Each newsletter carries an update. To learn about the history of this investigation and what's been learned, visit our Public Guide at [www.lrf.org/2015publicguide](http://www.lrf.org/2015publicguide).

## Northern Pike Sampling

Due to increases in Northern Pike in the UCR and creation of a bounty to help rid the system of this invasive predator, Lake Roosevelt fisheries co-managers are working with EPA and Teck American Incorporated (TAI) to sample pike as part of establishing safe fish consumption standards. Sampling is scheduled for this summer with data becoming available later this year.

## Mussel and Crayfish Sampling

The main purpose of this sampling is to investigate possible human health 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. The data summary report was approved by EPA in March 2018 and is posted on the [ucr-rifs.com](http://ucr-rifs.com) web site. EPA will integrate the data summary report into their human health risk assessment.

## Plant Tissue Sampling

The 2014 and 2016 Residential Soil Sampling program and the 2014 Upland Soil Sampling results indicated elevated levels of metals in the respective study areas. Further, the Tribal Consumption and Resource Use Survey identifies uses of plants harvested from areas that overlap with locations where metals are elevated. Residents of the Confederated

CONTINUED ON PAGE 7

# Soil amendments being tested to reduce human exposure to lead

Identifying ways of reducing lead exposure in areas with expanses of undisturbed land is an ongoing opportunity in the Columbia River Valley (an area roughly defined as extending from China Bend through Northport and to the Canadian border).

With three tribal allotments being the initial focus of attention, EPA, Teck American Incorporated, and the Colville Confederated Tribe are working collaboratively on a Soil Amendment Technology Evaluation Study (SATES) to address this need. The goal of this pilot study is to establish a minimally invasive, cost-effective approach to treating these types of lands and other lands where soil replacement is not desirable.

The tribal allotment properties were selected for the study because soil sampling showed lead concentrations slightly above recommended time critical cleanup action levels. The properties, however, were not cleaned up because soil excavation and replacement would negatively alter the character of the forested and relatively undisturbed nature of these lands.

Results from this pilot study will inform EPA's Record of Decision (ROD) that will be issued upon completion of the Upper Columbia River (UCR) remedial investigation/feasibility study (RI/FS).

If the SATES remedial options prove successful, soil amendment technologies could be used to reduce lead exposures on large tracts of land where excavation is not practical or desirable. It may also be useful to address properties sampled between 2014-2016 where concentrations of lead were not eligible for critical removal action levels, but greater than EPA and State of Washington screening and cleanup levels. Local residents refer to these as "limbo" properties.

Surface-applied soil amendments potentially change the character of the ground surface soil (the top 1 – 3 inches) in a way that reduces exposure to lead. Surface soil is the focal point because human exposure is mainly through people ingesting small amounts of soil and dust found in the first few inches of soil.

Study planning began in 2016. In 2017-18, test plots were selected to establish baseline soil conditions at the tribal allotments, which will represent common conditions in



Technician from Arcadis collecting soil samples for SATES study.

CONTINUED ON PAGE 7

## Upper Columbia Salmon Reintroduction

CONTINUED FROM PAGE 1

### Reintroduction Risk & Donor Stock Assessment

USGS was hired to work with regional managers to assess various risks and donor stocks for reintroducing anadromous species. Risks included variables such as the disease history of potential donor stocks and how reintroduced species may interact with other species and the environment. For instance, what is the risk of predation by walleye, northern pike and smallmouth bass? Or how might reintroduced species compete for food and space with fish species currently present?

Researchers identified stocks of chinook (summer, fall and spring), coho and sockeye salmon and steelhead best suited for reintroduction to the region. However, due to concerns with interactions between steelhead and native redband trout, managers are not considering steelhead in the near-term.

Donor stock selection criteria included ESA (Endangered Species Act) listing status, abundance and availability from source populations and hatcheries, disease risks of various sources, capacity for local adaptation, and life-history compatibility with the current environment.

### Habitat Assessments and Life Cycle Modeling

Habitat Assessments for smaller tributaries were guided by several models. Intrinsic potential modeling was performed to determine habitat availability, a broad landscape approach to identify streams that may accommodate anadromous species. The Ecosystem Diagnosis and Treatment (EDT) model used the most recently collected stream data to evaluate current conditions of potential streams and their ability to support populations. This included looking at tributaries such as the Sanpoil River, the Little Spokane River, and Hangman Creek.

Reservoir and large river habitats are being evaluated using a different set of tools. Free-flowing portions of Lake Rufus Woods and the transboundary reach of the upper Columbia are using hydrologic modeling and sonar data to identify and quantify available spawning habitats for chinook. While limnological data for Lake Roosevelt is being used to evaluate how the reservoir may function as a nursery lake for rearing sockeye.

Life cycle modeling allowed researchers to evaluate how certain management actions may influence reintroduced populations and the abundances the region can support. This includes assumptions on habitat capacity, migration survival, and how salmon migrate upstream and



downstream past dams, in this case Chief Joseph and Grand Coulee.

Moving smolt downstream poses its own set of challenges. One option that has been successful at other dams is a floating surface collector. Toby Kock with USGS provided a presentation (codeveloped by Puget Sound Energy, Portland General Electric, HDR Inc., and the U.S. Army Corps of Engineers) on the history and current use of surface collectors at a number of hydroelectric projects around the Northwest.

### Values and Challenges

Although the Phase 1 report is expected to be encouraging, the path to reintroduction is long term and has significant challenges. As policy makers and opinion leaders discussed the future, what became clear is that the challenges are often questions of value.

The tribes and First Nations speak eloquently to the cultural values. According to a Northwest Power and Conservation Council 1986 report, 2.6 to 3.7 million salmon once made their way past what's now Chief Joseph and Grand Coulee dams. A way of life was built around their presence, with salmon being a keystone species in maintaining an ecological balance throughout the region. Mourning Dove, a Native American Author of Colville tribal descent said, "The fate and wellbeing of the future depended on how people treated the fish."

The funds needed for reintroduction, however, will be significant. Those who wish to keep power costs low for residents and business are driven by a different values discussion, as are those concerned with irrigation, flood control, and other interests.

John Sirois, UCUT Committee Coordinator, reported that 70% of BPA (Bonneville Power Administration) mitigation dollars go to downriver projects for salmon. Funding to the Upper Columbia and other "blocked areas" (where salmon cannot presently migrate) is only 16%. With protection of ESA listed stocks continuing to be the top priority, the question is who and how will long-term salmon reintroduction be funded.

Several other issues wove in and out of discussions. For those concerned with climate change, there's an argument to open anticipated cold-water refuges found at higher elevations and

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# Student Discovery Days ring in spring

Each year, the Lake Roosevelt Forum partners with The River Mile and area natural resource managers to offer Student Discovery Days. At 7 discovery zones, students learned about fisheries, clean water, habitat, power production and more.



This year, 259 students from eight area schools participated in this exciting event. Thank you to presenters from US Bureau of Reclamation, WA Department of Fish and Wildlife, Lake Roosevelt National Recreation Area, Spokane Tribe of Indians and Net Pen Volunteers. 🌱



## EPA Remedial Investigation updates

CONTINUED FROM PAGE 5

Tribes of the Colville Reservation (CCT) consume, and otherwise utilize, upland, wetland and aquatic plants which may be contaminated with heavy metals.

Exposure to these metals in plant tissue through consumption or use, however, is unknown. As a result, EPA determined that data for the concentration of metals in plant tissue is needed for the Upper Columbia River human health risk assessment. Reconnaissance in focused locations of the study area occurred in August 2017 to identify the type and availability of plants for sampling. The sampling plan was approved and EPA, CCT and TAI have completed two rounds of sampling. One more round of sampling is scheduled for August 2018.

## Additional Residential Soil Sampling

In addition to sampling and residential soil cleanup activities that took place in 2014-2015, a new round of soil sampling occurred in 2016. Sampling occurred at some properties within the original boundary from 2014 and extended through the river valley as far south as China Bend. 144 residential properties were sampled. Results were sent to landowners in April 2017. This resulted in 4 additional properties being cleaned up, bringing the total number of properties receiving cleanup since 2014 to 17. Cleanup occurred as part of voluntary agreements between EPA and TAI for TAI to fund and conduct cleanup under EPA oversight. 🌱

## Soil Amendments

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the region. This year and next, possible soil amendments are being bench tested in a laboratory environment using soil obtained from the allotment properties. Amendments selected for testing include biosolids (organic matter recycled from sewage), biochar (a carbon rich charcoal), wood ash, commercially available organic compost and locally available phosphorus containing fertilizer. Each of these materials is generally readily available and contains one or more components that might bind or transform lead into more stable forms and/or promote vegetative growth.

Based on bench-scale testing results, field trials will begin on the allotments in 2019 and monitored through 2021.

Beyond what EPA may recommend in the ROD, results could inform property owners interested in taking proactive steps to reduce the possibility of lead exposure on their property. Said Mindy Smith with Citizens for a Clean Columbia, "Individual property owners are looking for things that can be done to protect human health and our lands. This can move us in that direction." 🌱

# Lake Roosevelt Forum

2206 S. Sherman St.  
Spokane, WA 99203  
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## *Upper Columbia Salmon Reintroduction*

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latitudes (e.g. the Upper Columbia).

Other participants pointed to the Columbia River Treaty, the Columbia River Systems Operation Review EIS (Environmental Impact Statement) and other processes as levers that will determine the Columbia's future. What all agree on is that balancing power, flood control, fisheries,

irrigation, recreational and other interests is as difficult and fraught with debate as ever.

Reintroduction of salmon simply adds another layer of complexity. What's different than a decade ago is that a collaborative, discernible path for their return to the Upper Columbia has been built and is being followed. ☀

## *Paper vs. Web? It's Your Choice*

If you'd prefer only receiving the web version of the newsletter, send an e-mail to [info@lrf.org](mailto:info@lrf.org). The Forum does not distribute member e-mails or postal addresses to any other organization.

This publication received funding through a grant from the Department of Ecology. While these materials were reviewed for grant consistency, this does not necessarily constitute endorsement by Ecology.

## *Get On The List*

THE LAKE ROOSEVELT FORUM NEWSLETTER is a free publication. If you'd like to be added to our quarterly mailing list, please call us at 1-509-535-7084 or write us at the address listed above. Be sure to spell out your name and street address. Don't forget to include your zip code. ☀





# Conference Columbia River Treaty Opinion Poll

Conference participants anonymously responded to the following Columbia River Treaty opinion multiple choice questions. The first 2 questions provide demographic data of conference participants responding. Active participants: 216 of 216.

1. Who is here? Which of the following are you affiliated with?

	Responses	
	Percent	Count
Federal Agency	17.27%	24
State Agency	10.07%	14
Local Agency, including irrigation districts, conservation districts, etc.	10.79%	15
Non-profit or non-government organization	8.63%	12
Tribe or First Nation	26.62%	37
Industry	8.63%	12
Academia and Students	2.88%	4
Interested Public	10.79%	15
Other	4.32%	6
<b>Totals</b>	<b>100%</b>	<b>139</b>

2. Would you classify your main professional focus as:

	Responses	
	Percent	Count
Creating or Setting Policy	21.17%	29
Natural Resource Manager or Field Technician	32.85%	45
Regulation or Enforcement	6.57%	9
Research	8.76%	12
Communications	6.57%	9
Advocacy	13.14%	18
Concerned Citizen	10.95%	15
<b>Totals</b>	<b>100%</b>	<b>137</b>

3. The two main focal points of the current Treaty are power production and flood control. To address fish passage and other environmental concerns, should a modernized treaty add ecosystem function (e.g. increase river flows to support fish passage and temperature needs, and rehabilitating wetlands and riparian habitat) as a treaty purpose?

	Responses	
	Percent	Count
Yes	80.31%	102
No	14.17%	18
Not Sure/Don't Know	5.51%	7
<b>Totals</b>	<b>100%</b>	<b>127</b>

4. Should a modernized treaty add ecosystem function as a purpose co-equal with hydropower and flood risk management?

	Responses	
	Percent	Count
Yes	68.32%	69
No	16.83%	17
Not Sure/Don't Know	14.85%	15
<b>Totals</b>	<b>100%</b>	<b>101</b>

5. Should a modernized treaty specifically support reintroduction of salmon above Grand Coulee Dam to Canadian spawning grounds?

	Responses	
	Percent	Count
Yes	72.3%	107
No	17.57%	26
Not Sure/Don't Know	10.14%	15
<b>Totals</b>	<b>100%</b>	<b>148</b>

6. Called the Canadian Entitlement, annually Canada receives one-half of the estimated downstream power benefits derived from Treaty implementation. Delivered in the form of energy and capacity, the current value of the entitlement to Canada is approximately \$130 million Canadian (\$101 m U.S.) per year. According to a U.S. entity estimate, the future value of the entitlement ranges from \$250-350 million U.S. per year. Do you agree with the principle of Canada being compensated for downstream power benefits?

	Responses	
	Percent	Count
Yes	66.41%	87
No	16.03%	21
Not Sure/Don't Know	17.56%	23
<b>Totals</b>	<b>100%</b>	<b>131</b>

7. The flood control provisions of the treaty require Canadian dams to provide reliable, assured flood control to the U.S. These provisions expire in 2024. Should an assured flood control agreement be negotiated?

	Responses	
	Percent	Count
Yes	82.48%	113
No	8.03%	11
Not Sure/Don't Know	9.49%	13
<b>Totals</b>	<b>100%</b>	<b>137</b>

CONTINUED ON BACK

# Conference Columbia River Treaty Opinion Poll

CONTINUED FROM FRONT

**8.** Should the highest priority of U.S. Treaty negotiators be maintaining flood control benefits and keeping electricity rates as low and stable as possible?

		Responses	
		Percent	Count
Yes		37.4%	46
No. Only flood control should be the highest priority.		13.82%	17
No. Only electric rates should be the highest priority.		5.69%	7
Not Sure/Don't Know		43.09%	53
<b>Totals</b>		<b>100%</b>	<b>123</b>

**9.** Should a modernized Canadian Entitlement formula reflect the potential of Canada seasonally storing and releasing water to support U.S. irrigation and municipal water supply needs?

		Responses	
		Percent	Count
1= Not important at all		7.44%	9
2= Not very important		13.22%	16
3= Important		31.4%	38
4= Very Important		21.49%	26
5= Critically Important		21.49%	26
6=Not Sure/Don't Know		4.96%	6
<b>Totals</b>		<b>100%</b>	<b>121</b>

**10.** Should a modernized Canadian Entitlement formula reflect the potential of Canada storing and releasing water to seasonally increase U.S. river flows to meet fishery and other ecosystem function objectives?

		Responses	
		Percent	Count
1= Not important at all		4.07%	5
2= Not very important		1.63%	2
3= Important		18.7%	23
4= Very Important		28.46%	35
5= Critically Important		44.72%	55
6=Not Sure/Don't Know		2.44%	3
<b>Totals</b>		<b>100%</b>	<b>123</b>

**11.** Should a modernized Canadian Entitlement formula reflect the effect/value of U.S. power conservation/efficiency efforts, adding renewable energy sources such as wind and solar, and supporting U.S. west coast energy needs?

		Responses	
		Percent	Count
1= Not important at all		4.8%	6
2= Not very important		12%	15
3= Important		28%	35
4= Very Important		25.6%	32
5= Critically Important		16%	20
6=Not Sure/Don't Know		13.6%	17
<b>Totals</b>		<b>100%</b>	<b>125</b>

**12.** Should a modernized Canadian Entitlement formula reflect the maintenance of U.S. commercial navigation, recreational and other interests?

- 1= Not important at all
- 2= Not very important
- 3= Important
- 4= Very Important
- 5= Critically Important
- 6=Not Sure/Don't Know

		Responses	
		Percent	Count
		13.08%	17
		25.38%	33
		33.85%	44
		13.08%	17
		11.54%	15
		3.08%	4
<b>Totals</b>		<b>100%</b>	<b>130</b>

**13.** Should a modernized Canadian Entitlement formula reflect the Canadian environmental and cultural losses caused by system operations?

- 1= Not important at all
- 2= Not very important
- 3= Important
- 4= Very Important
- 5= Critically Important
- 6=Not Sure/Don't Know

		Responses	
		Percent	Count
		6.06%	8
		3.03%	4
		28.03%	37
		25.76%	34
		34.09%	45
		3.03%	4
<b>Totals</b>		<b>100%</b>	<b>132</b>

**14.** Which would you prefer for implementation of a modernized treaty?

- Provide decision makers flexibility in operations and treaty terms to account for the unknown, e.g.— climate change or power markets.
- Tightly define terms and conditions that support certainty in implementation.
- Not Sure/Don't Know

		Responses	
		Percent	Count
		68.47%	76
		23.42%	26
		8.11%	9
<b>Totals</b>		<b>100%</b>	<b>111</b>

**15.** Currently the treaty is implemented in the U.S. by the Army Corps of Engineers and Bonneville Power Administration. In Canada by B.C. Hydro and the British Columbia Government. Should a modernized Treaty include representation from U.S. Native American tribes and Canada's First Nations?

- Yes
- No
- Not Sure/Don't Know

		Responses	
		Percent	Count
		74.14%	86
		17.24%	20
		8.62%	10
<b>Totals</b>		<b>100%</b>	<b>116</b>