



# Lower Kootenai Ecosystem Restoration & Contaminants Monitoring Status and Updates

*Shawn Young  
Kootenai Tribe of Idaho*

*Kootenai Valley Resource Initiative  
April 17, 2023*



NW

35.1 F



1989



1989 - Present



**Sturgeon Program is  
30+ years old.**

**Burbot Program is  
18+ years old.**

2015





**Jose Ponce, KTOI Hatchery Manager**



**Dan Aitken, KTOI Sturgeon Technician**



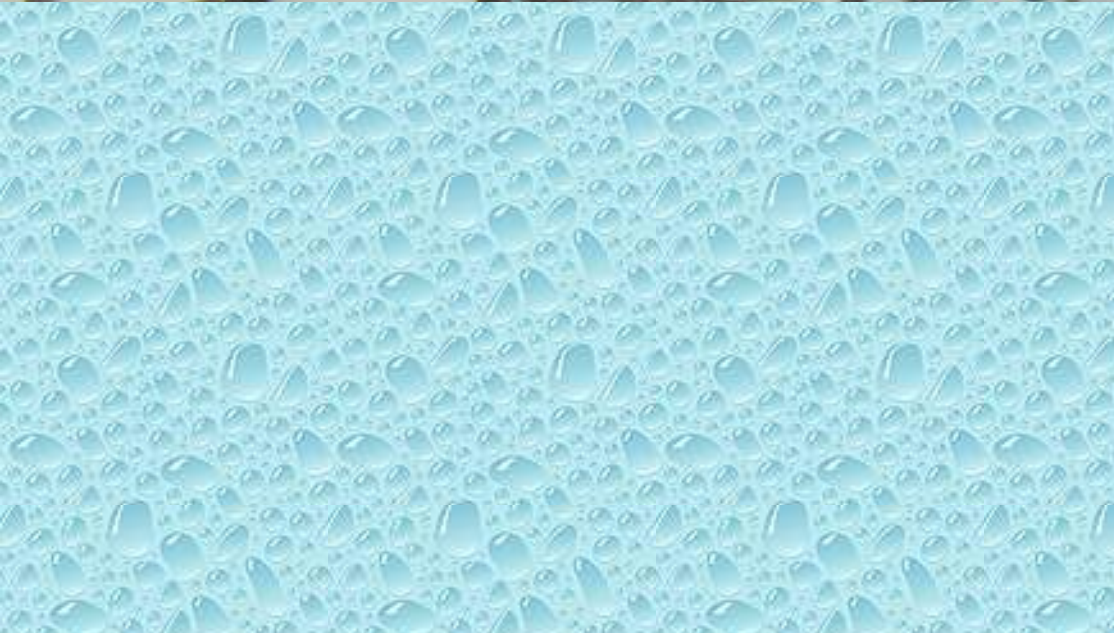
**KTOI Staff Preparing Female**



**Mark Elliston, KTOI Technician**











2012/02/12 17:22:30

E

1.8 C

2012/02/12 16:46:59

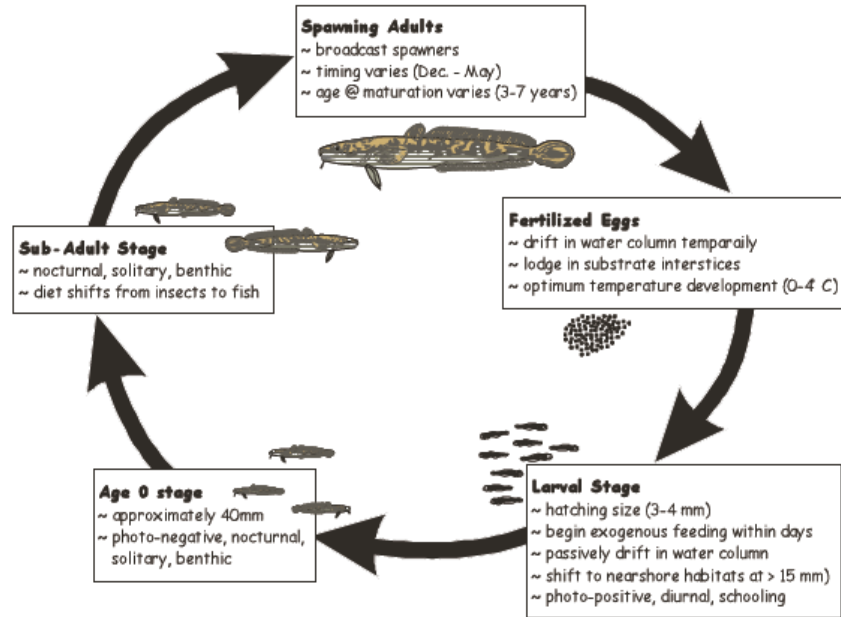
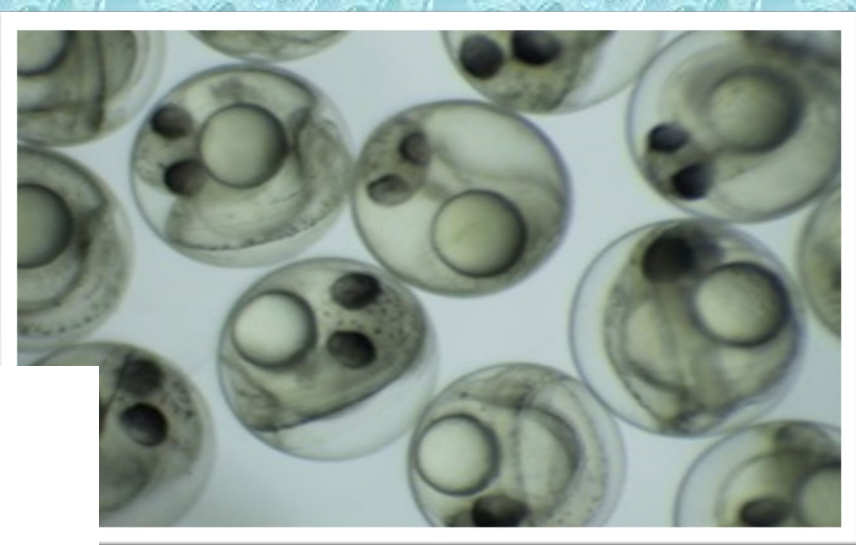
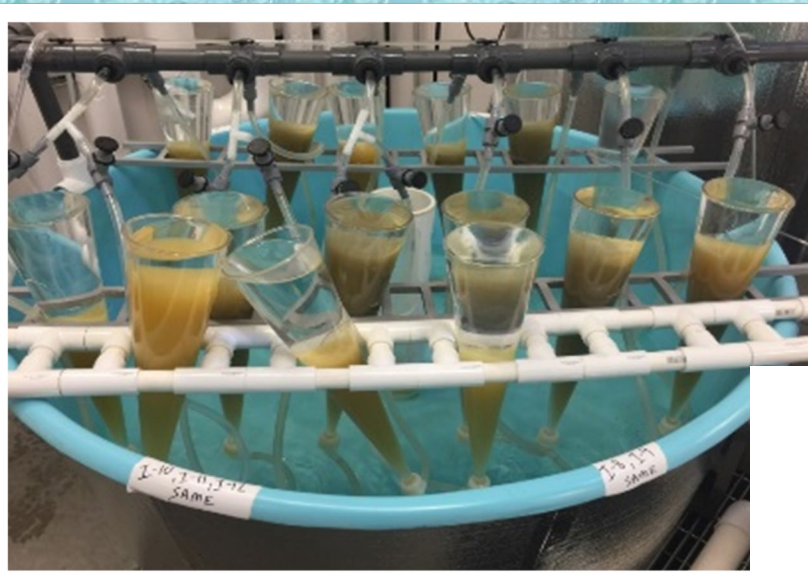
E

1.8 C











**First hatchery males confirmed sexually mature during 2020 & 2021.**

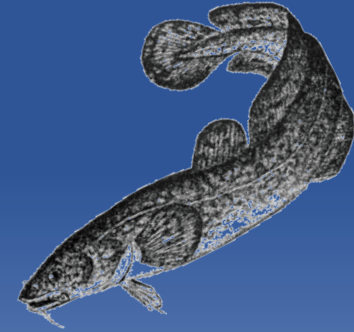


**Hatchery Burbot are viable, mature adults at 2-3 years old; and have been spawning since 2014.**





# Program Status

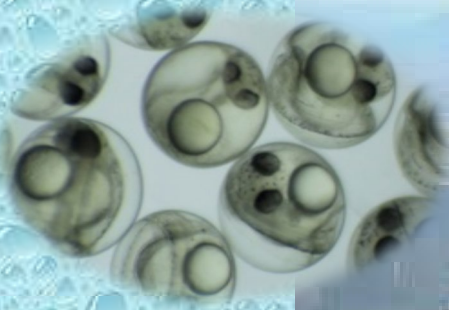
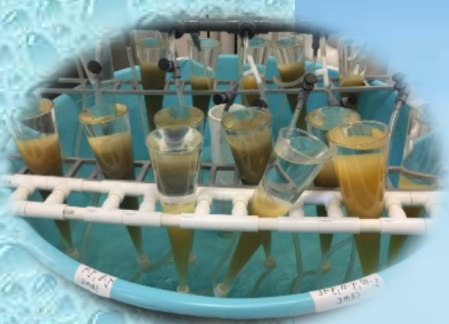


- ✓ “Ward off extinction”
- ✓ Rebuild population structure / fill year-class gaps
- **Restore a self-sustaining Sturgeon and Burbot populations in the Lower Kootenai River Ecosystem.**



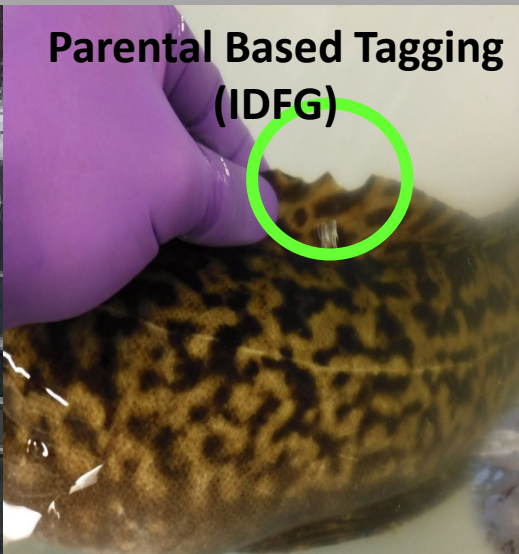


# Habitat Solutions



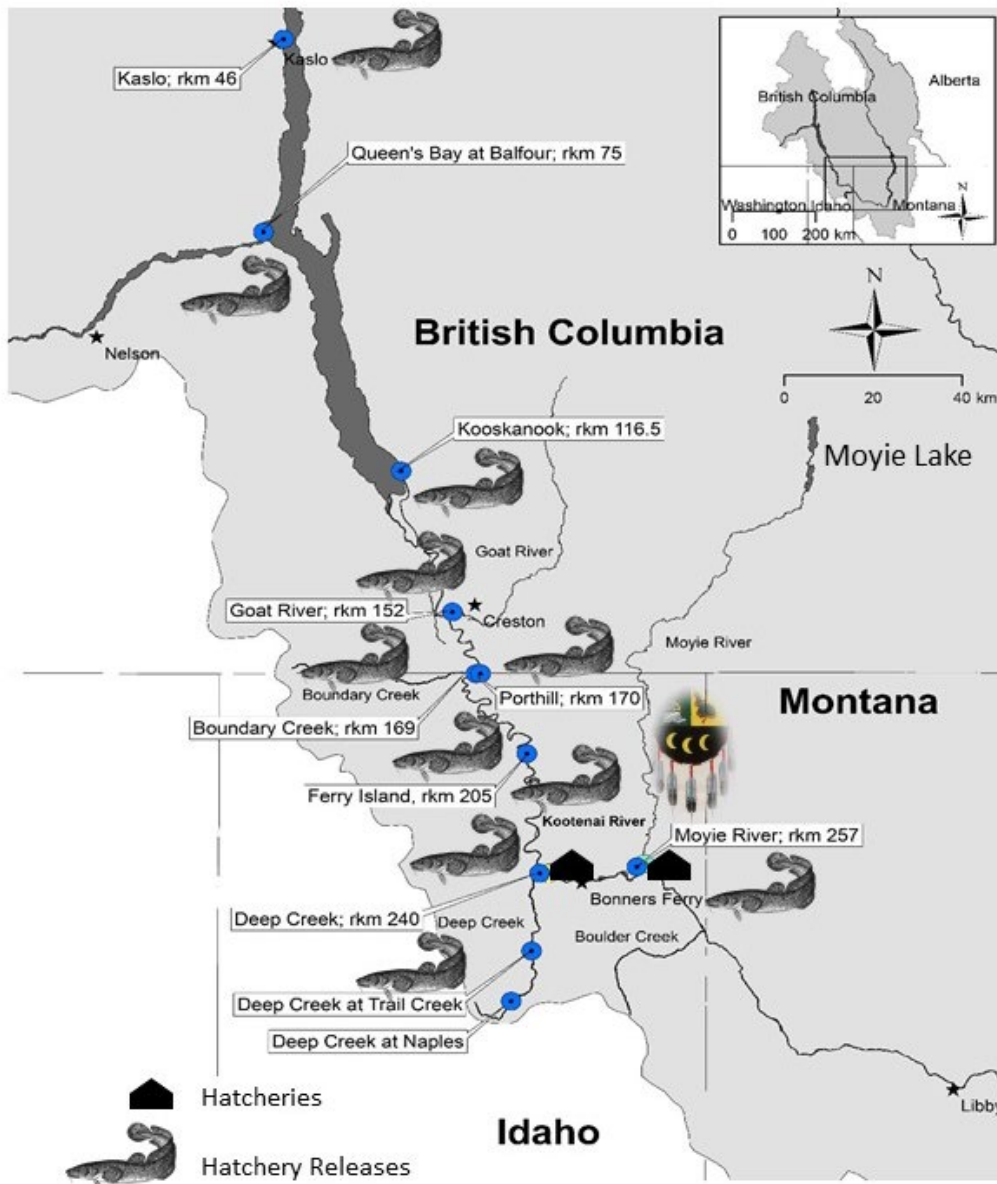


Picture of IDFG staff conducting winter hoopnet surveys, which provide almost all recapture data for adult Burbot





# Hatchery Sturgeon and Burbot Release Sites throughout the Lower Kootenai Ecosystem



## Example of Lower Tributary Release Sites



## Habitat Project – Floodplain Reconnect















## **Lower Kootenay Band Project near Creston.....**

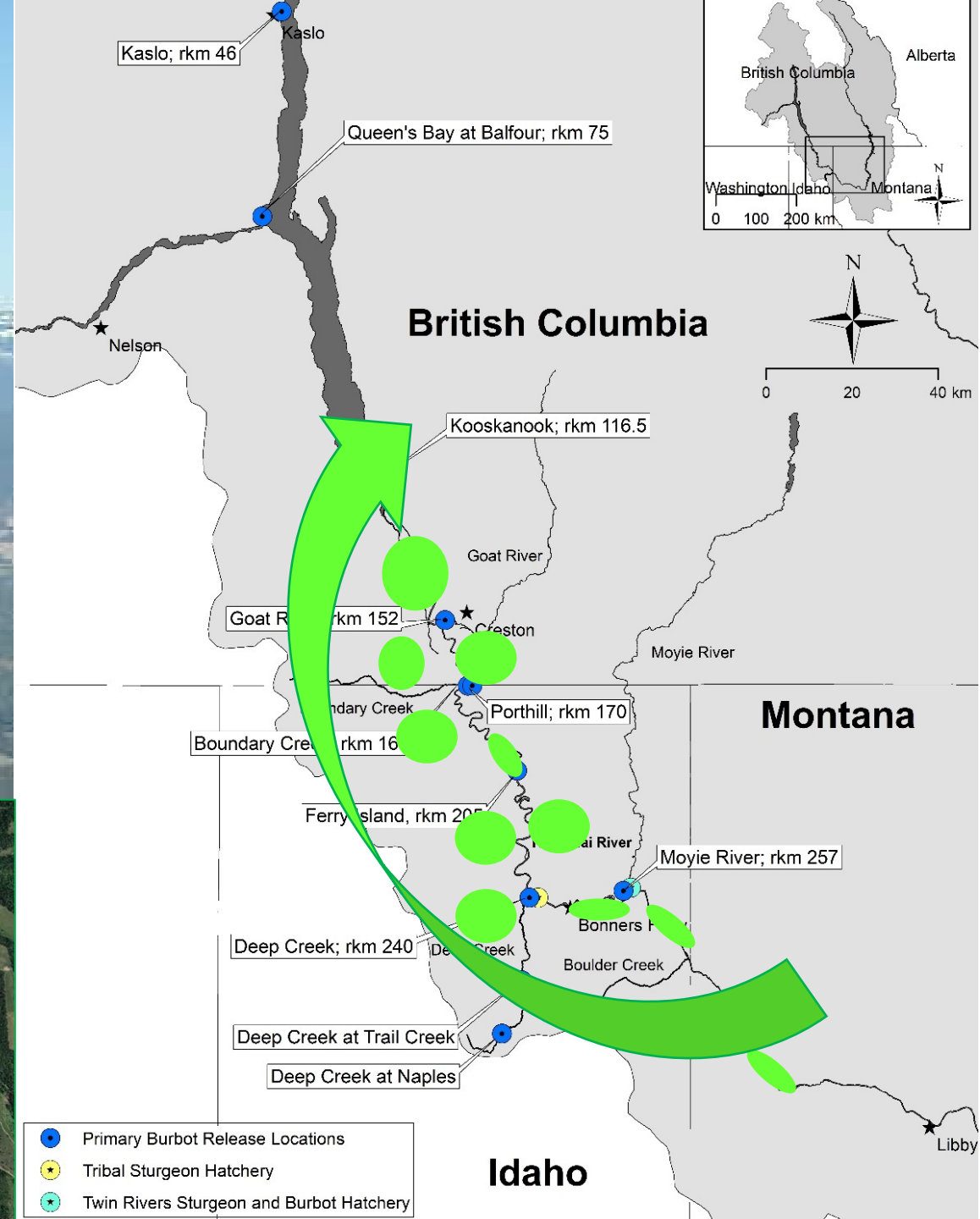
Photo provided by Norm Allard, Lower Kootenay Band Biologist;  
Photo of Lower Kootenay Band Restoration Project



Since 1890's.....

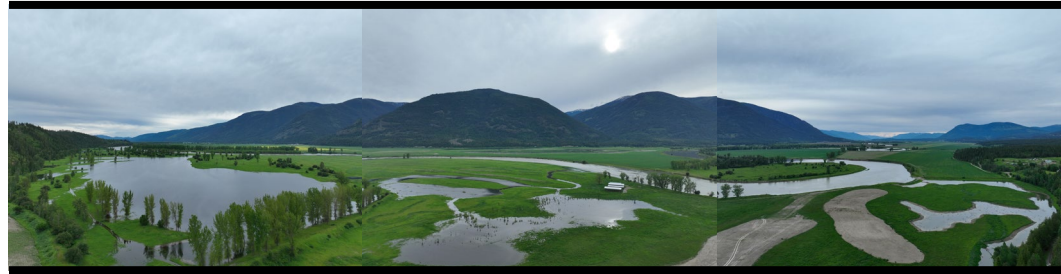
- > 100,000 acres of floodplain disconnected.
- 60,000 acres of wetlands converted.

**Habitat Restoration Programs / Targeted  
Actions taking place to reverse this condition.**





## Habitat Restoration - Water on the Landscape





# Acquiring land for wildlife and creating a legacy of conservation

- Five Wildlife Mitigation properties acquired since 2002
- 1100 mitigation acres under Tribal management







# Community Stewardship Landowner Collaboration International Cooperation

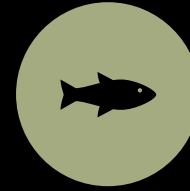




# Integrated Adaptive Management and Transboundary Coordination



INTERNATIONAL  
KOOTENAI ECOSYSTEM  
RECOVERY TEAM



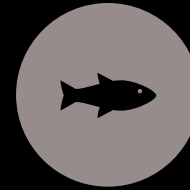
KOOTENAI RIVER  
BURBOT ANNUAL  
PROGRAM REVIEW



KOOTENAI RIVER  
HABITAT RESTORATION  
PROGRAM CO-  
MANAGER & AGENCY  
REVIEW TEAM



KOOTENAI RIVER  
HABITAT RESTORATION  
PROGRAM PEER  
REVIEWER ADVISORY  
TEAM



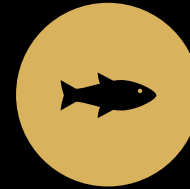
KOOTENAI RIVER WHITE  
STURGEON ANNUAL  
PROGRAM REVIEW



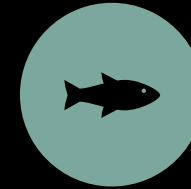
KTUNAXA NATION  
PROTOCOL



SELKIRK CARIBOU  
INTERNATIONAL  
TECHNICAL WORK  
GROUP



UPPER COLUMBIA WHITE  
STURGEON RECOVERY  
INITIATIVE



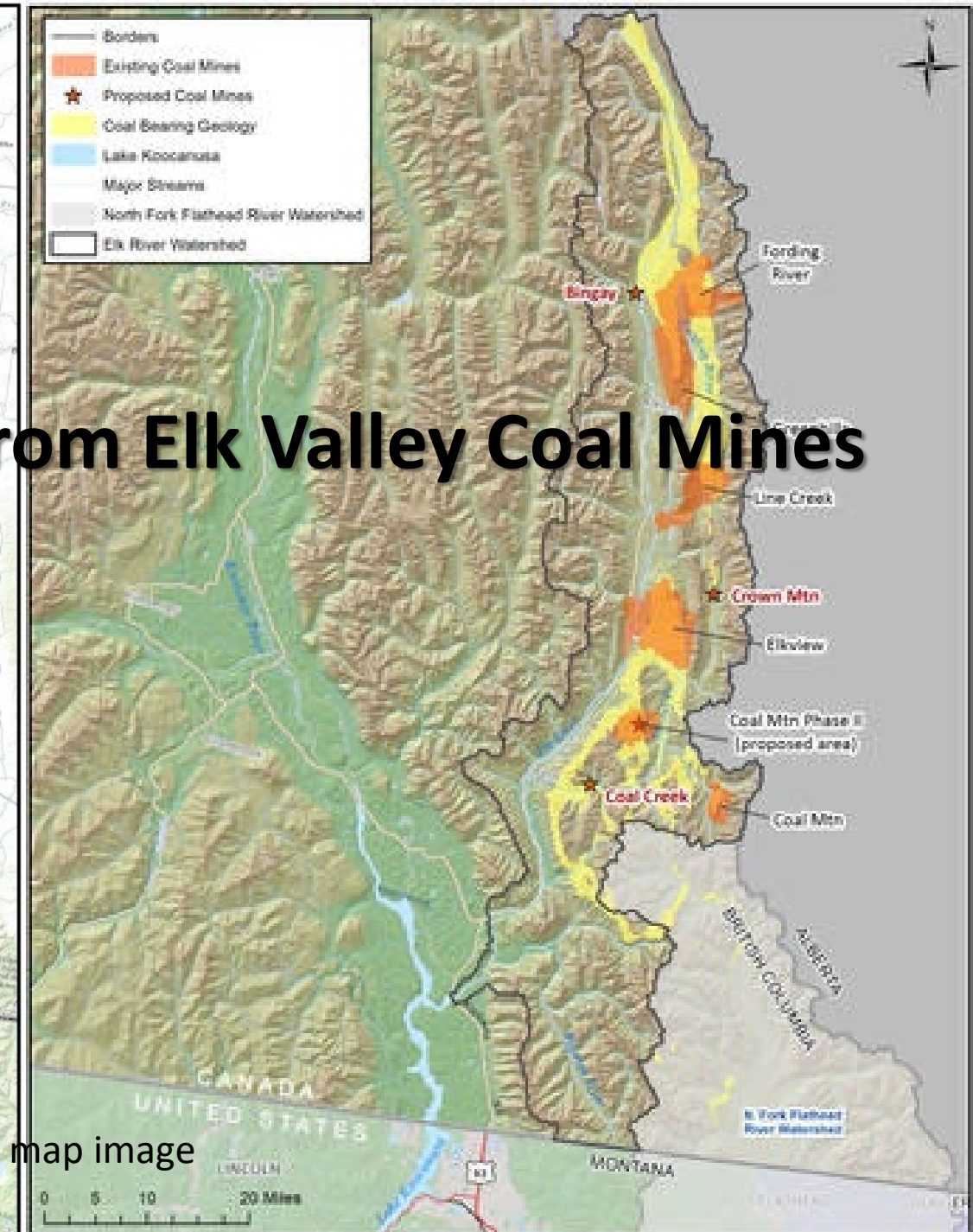
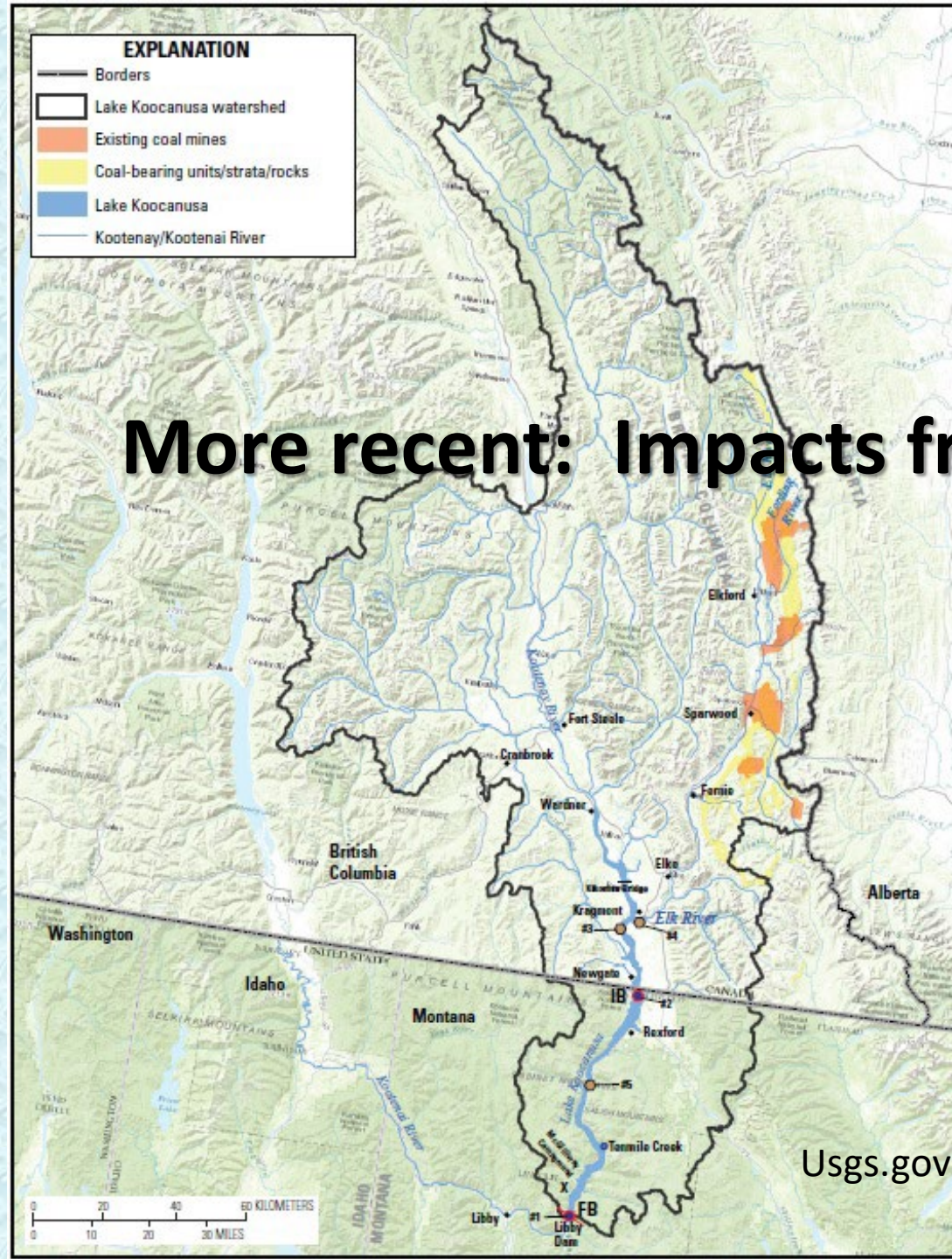
U.S. FISH AND WILDLIFE  
RECOVERY TEAM



# Restoring and Conserving a Legacy for Generations to Come...









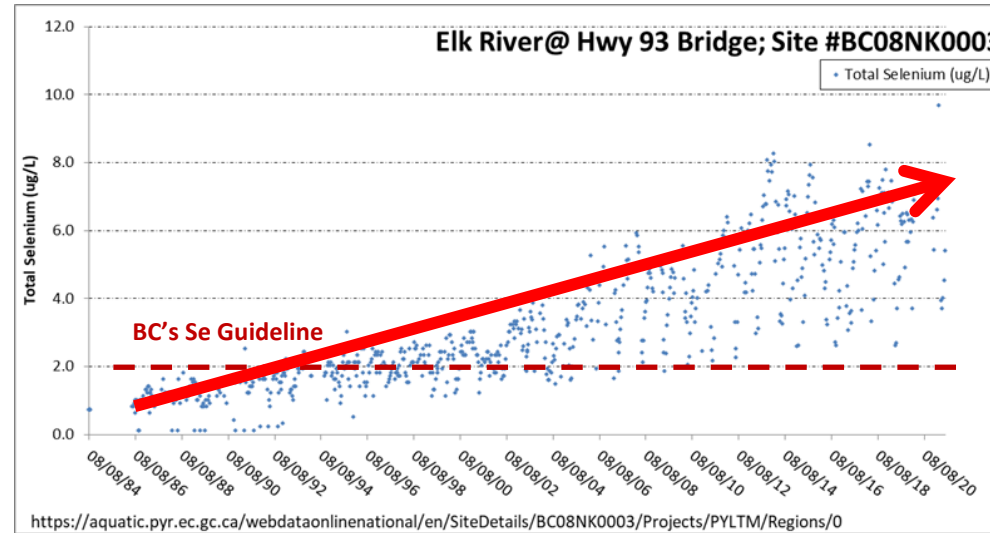


[https://thenarwhal.ca/teck-resources-selenium-fight-montana/?fbclid=IwAR3sXyqZCCucUW4Lio\\_DygXrP\\_Z4umdMfLP5lFFeGqjFD5UaKAv6tXwFNXM](https://thenarwhal.ca/teck-resources-selenium-fight-montana/?fbclid=IwAR3sXyqZCCucUW4Lio_DygXrP_Z4umdMfLP5lFFeGqjFD5UaKAv6tXwFNXM)

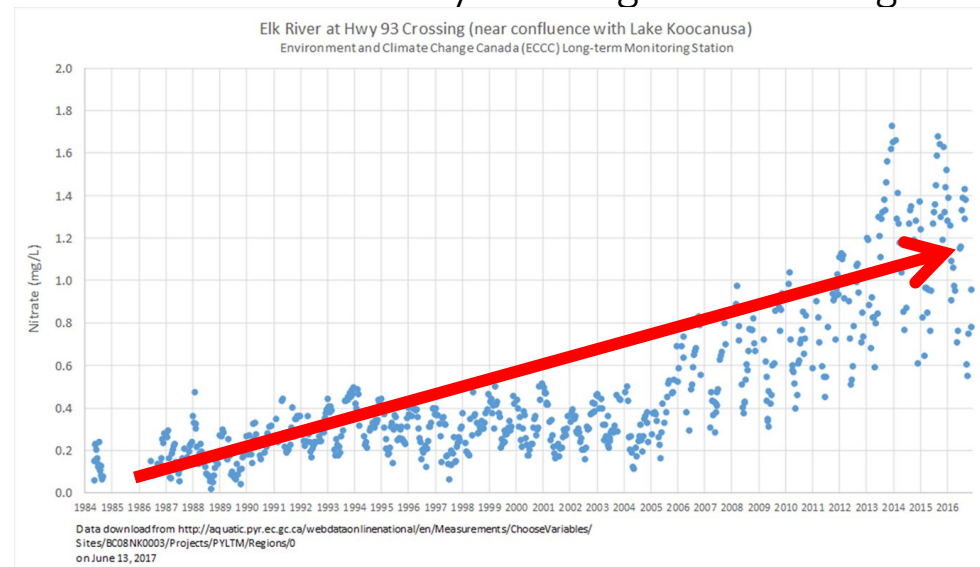


# Let's Talk Water.....

## Water Chemistry – Selenium Increasing



## Water Chemistry – Nitrogen Increasing





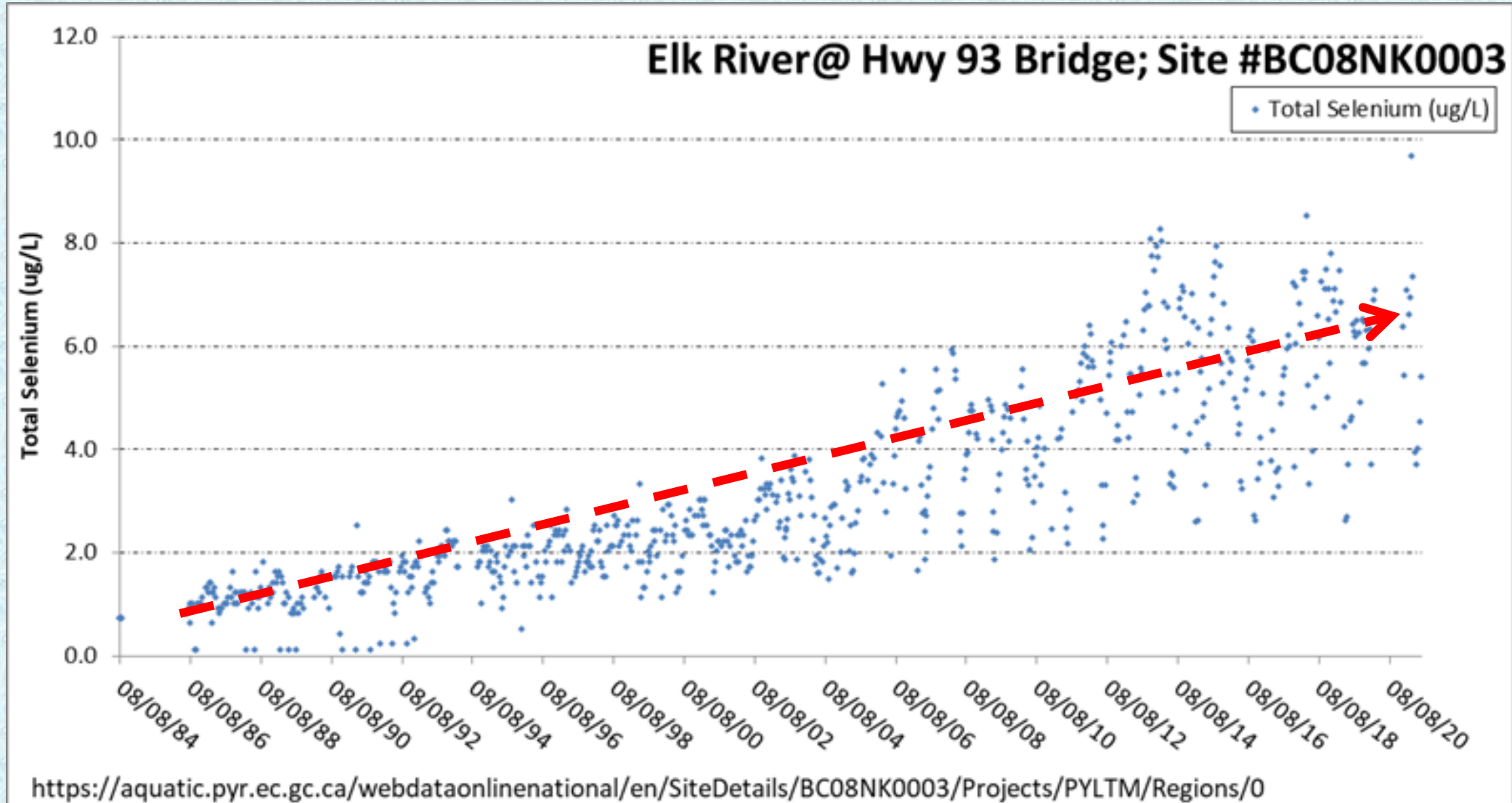
## Current – Elk River Mining



- Active wastewater treatment sub-optimal to date;
- Saturated rock-fill (SRF's) effectiveness TBD;
- New active wastewater treatment plant slated to come online @January 2022 at the Fording River Operations;
- Mitigation needs to be at the scale of the project(s);
- 3 new proposed mines in the Elk River Valley



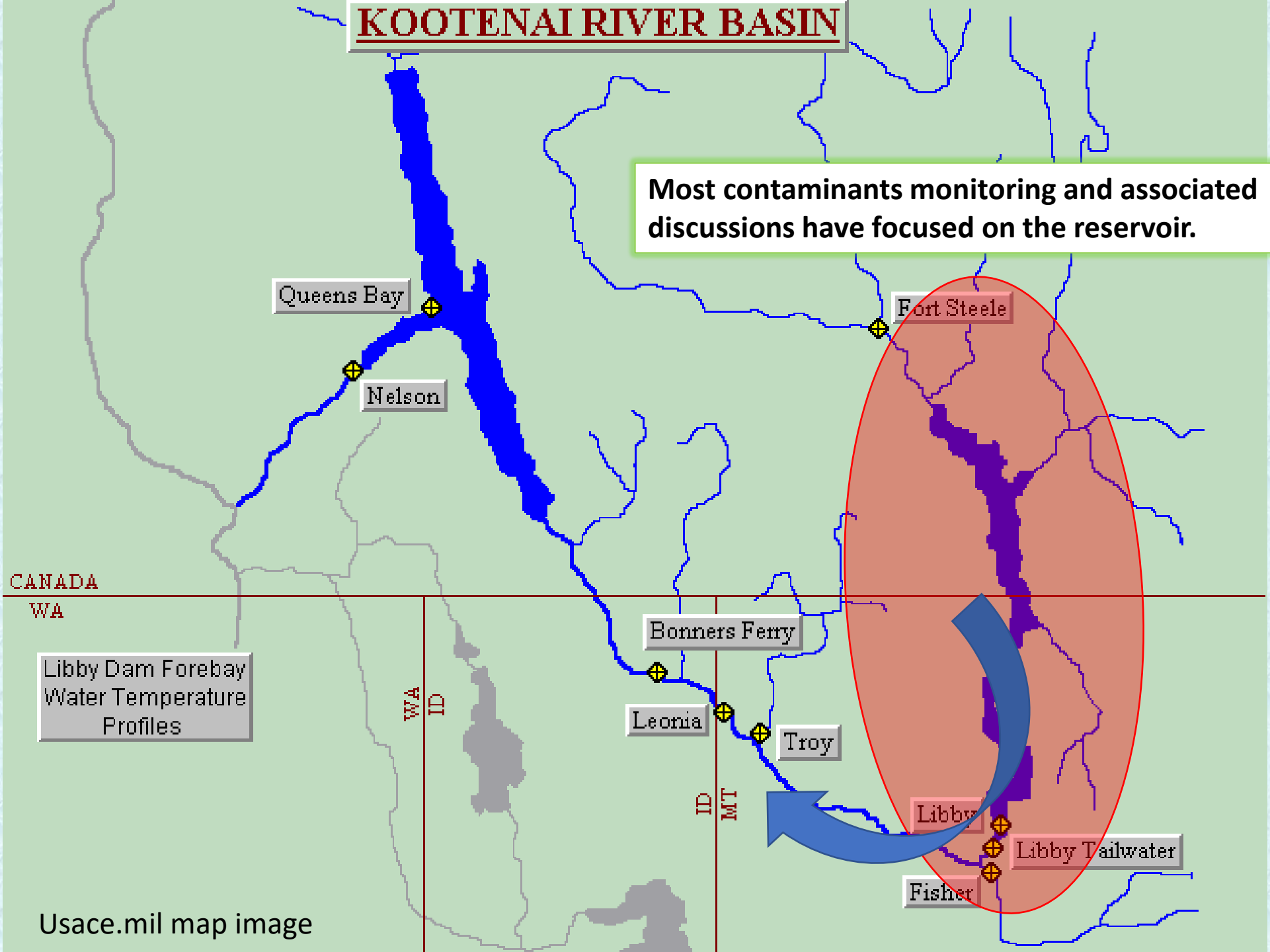
Additional Waste Rock will worsen this trend.....





# KOOTENAI RIVER BASIN

Most contaminants monitoring and associated discussions have focused on the reservoir.

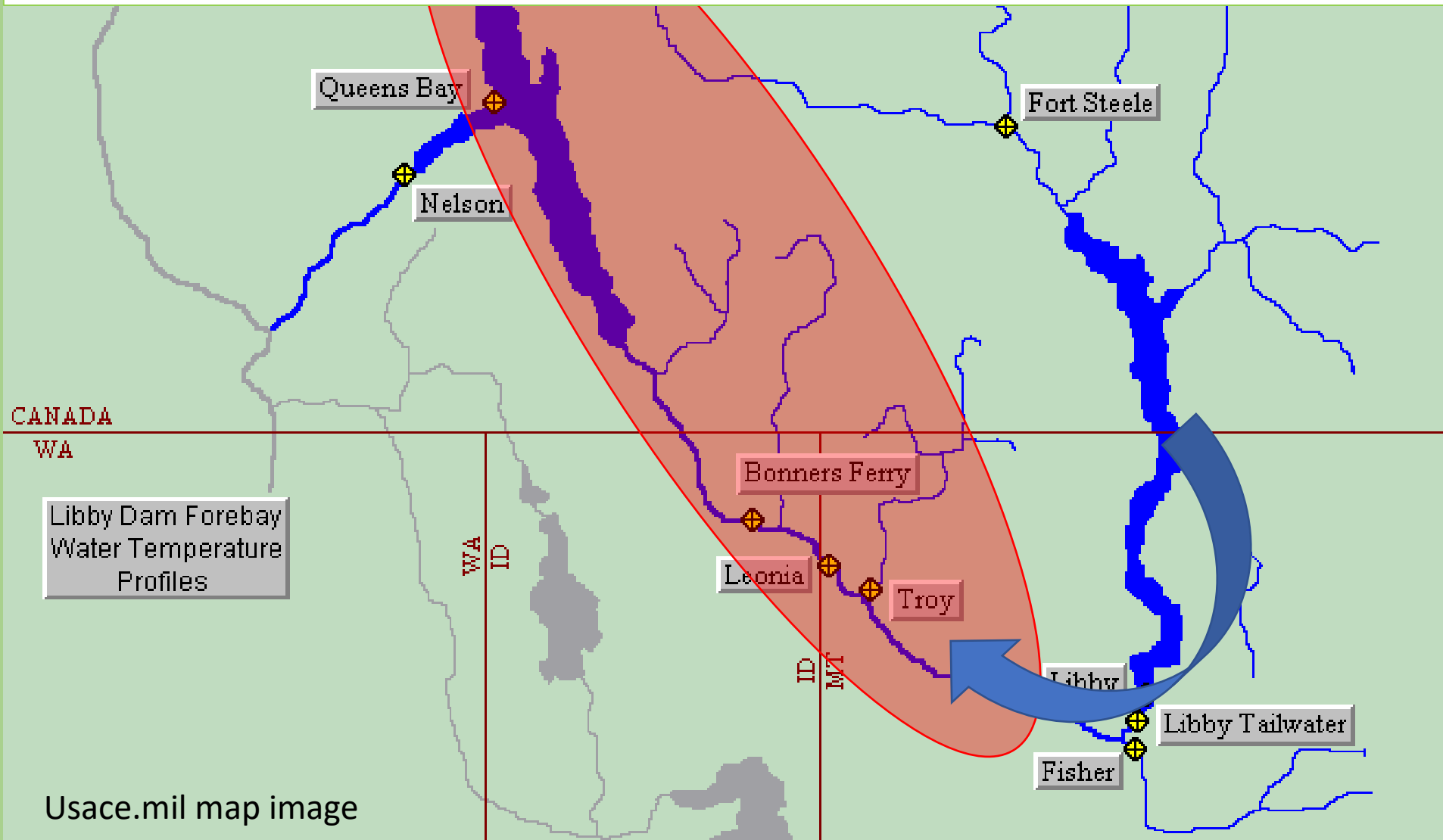


Libby Dam Forebay  
Water Temperature  
Profiles



## KOOTENAI RIVER BASIN

Given the persistent and increasing trends of Selenium and Nitrate over time, the Kootenai Tribe of Idaho is concerned about magnitude of negative impacts down-river.





# Background — EPA Recommended Criteria

Criterion Version	Chronic					Short-term
	Egg-Ovary <sup>1</sup> [mg/kg dw]	Whole Body <sup>1</sup> [mg/kg dw]	Muscle <sup>1</sup> [mg/kg dw]	Water Lentic <sup>1</sup> [µg/L]	Water Lotic <sup>1</sup> [µg/L]	Water <sup>1</sup> [µg/L]
2016 Selenium Criterion	15.1	★ 8.5	11.3	1.5 (30 day)	3.1 (30 day)	Intermittent exposure equation
1999 Selenium Criteria	N/A	N/A	N/A	5 (4 day)	5 (4 day)	Acute Equation based on water column concentration

\*EPA 2016 Selenium Fact Sheet; EPA 822-F-16-00

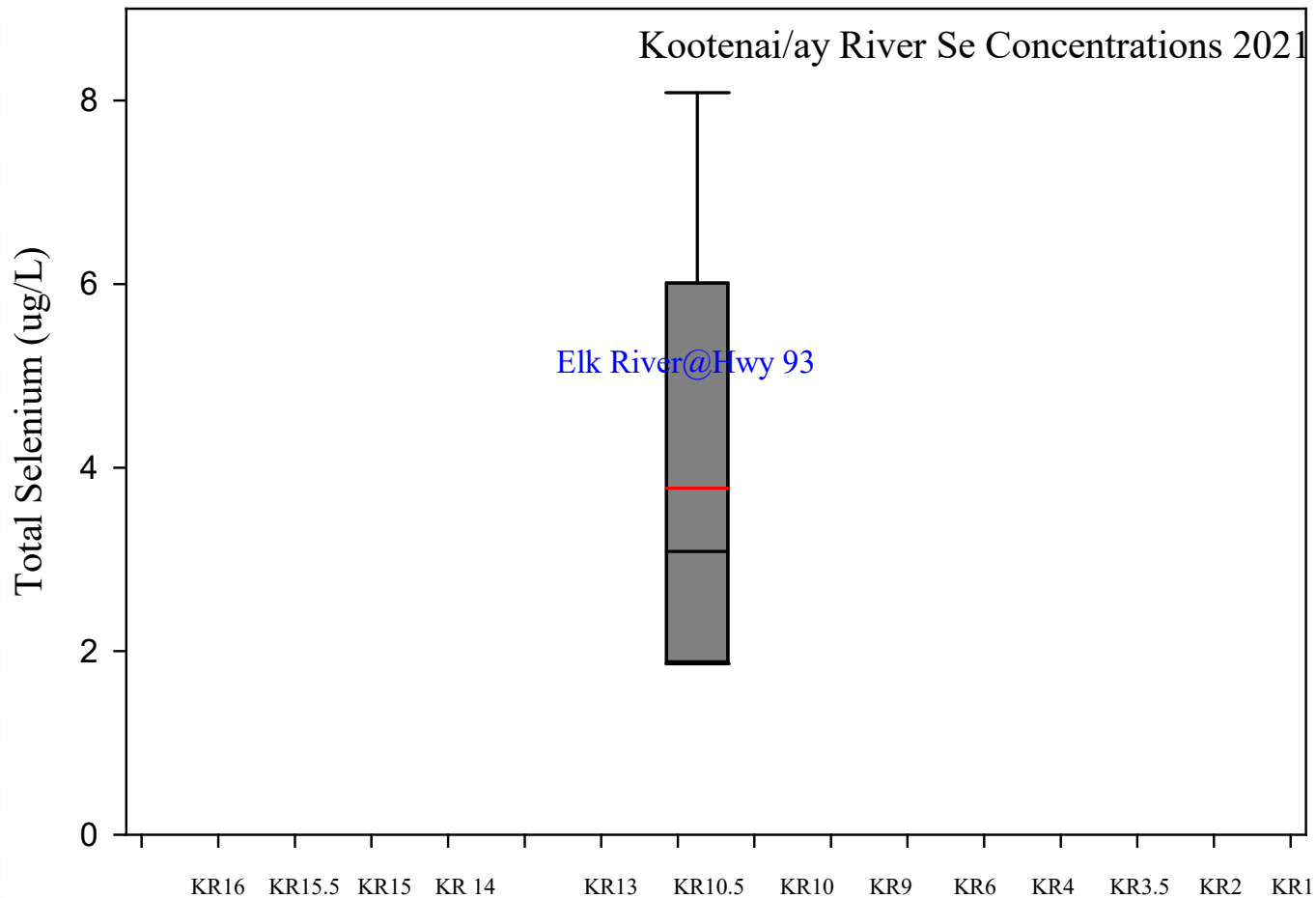






# Kootenai Tribe of Idaho Monitoring Results

## Kootenay/ai Basin– Total Se



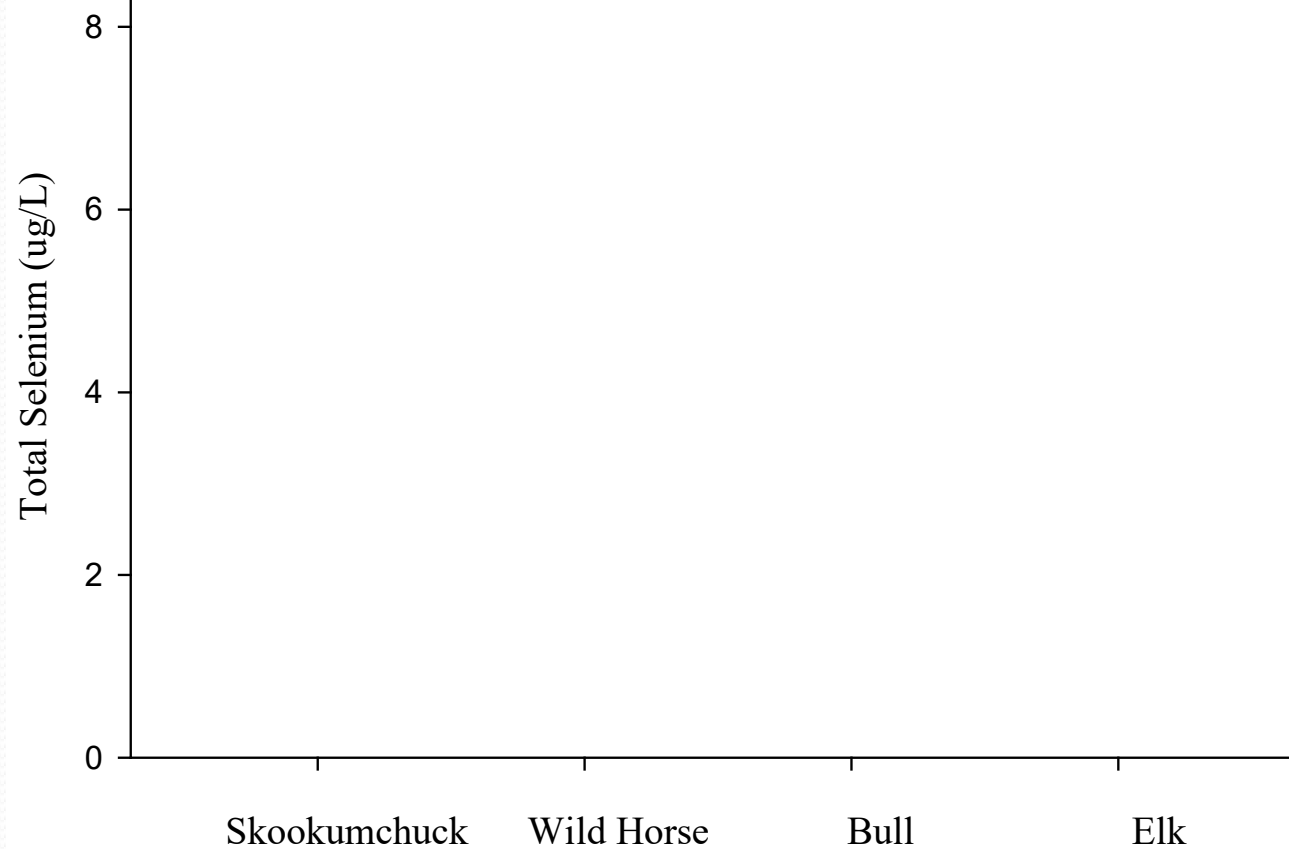




# BC Tributaries - Se

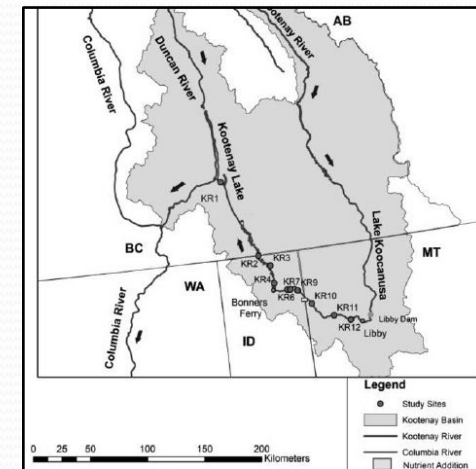
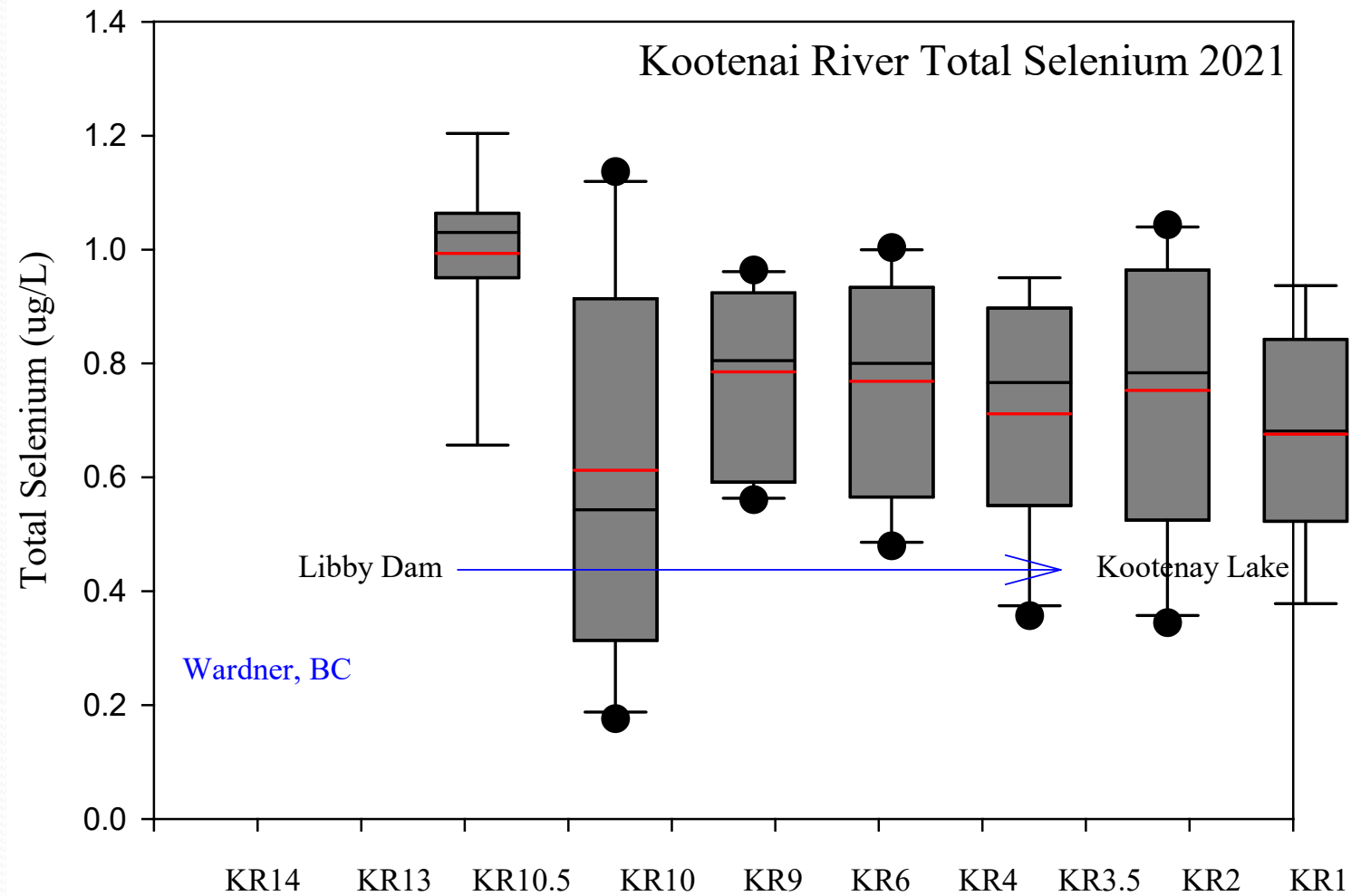


BC Tributaries to the Kootenay River 2021





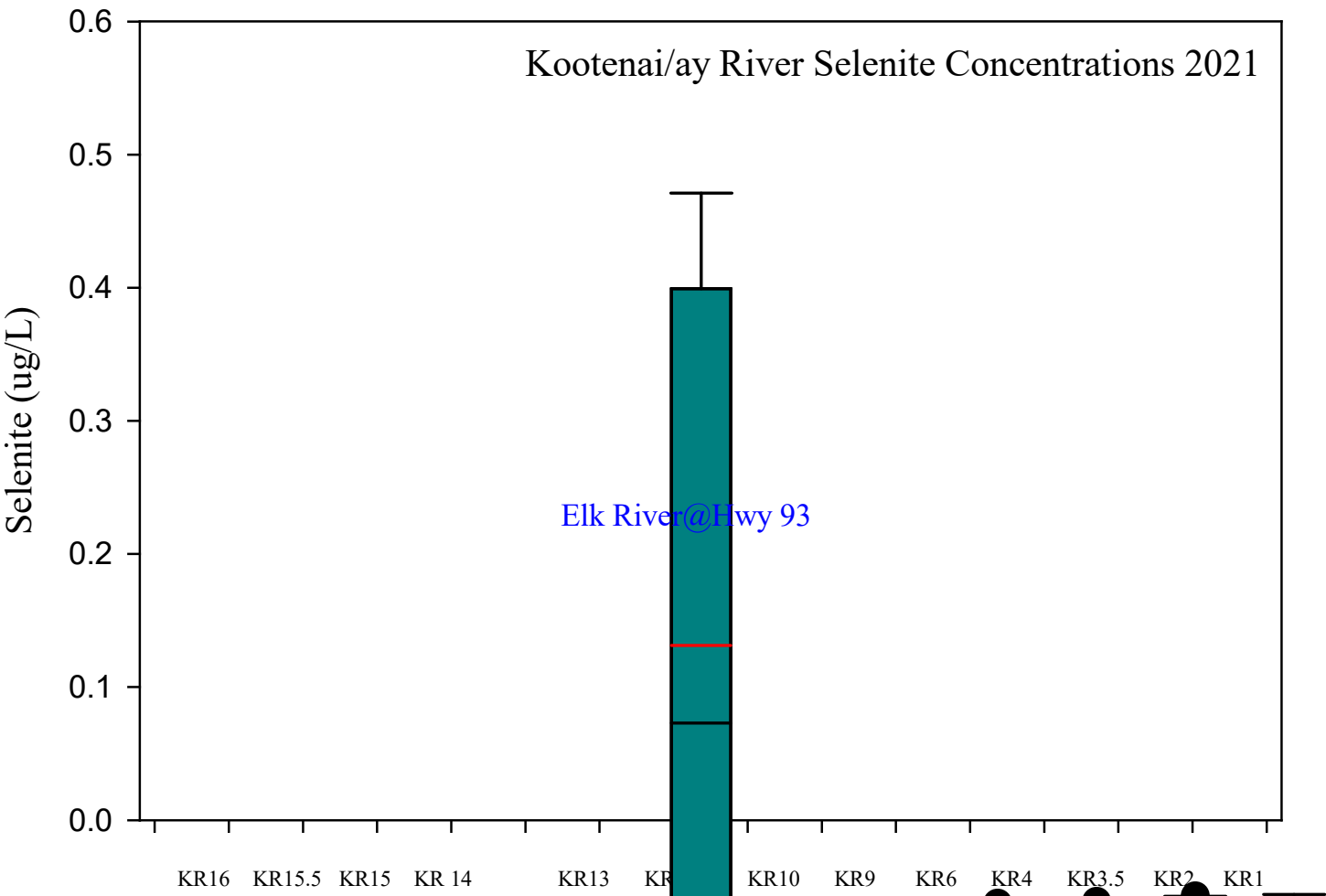
# Lower Kootenai River– Total Se





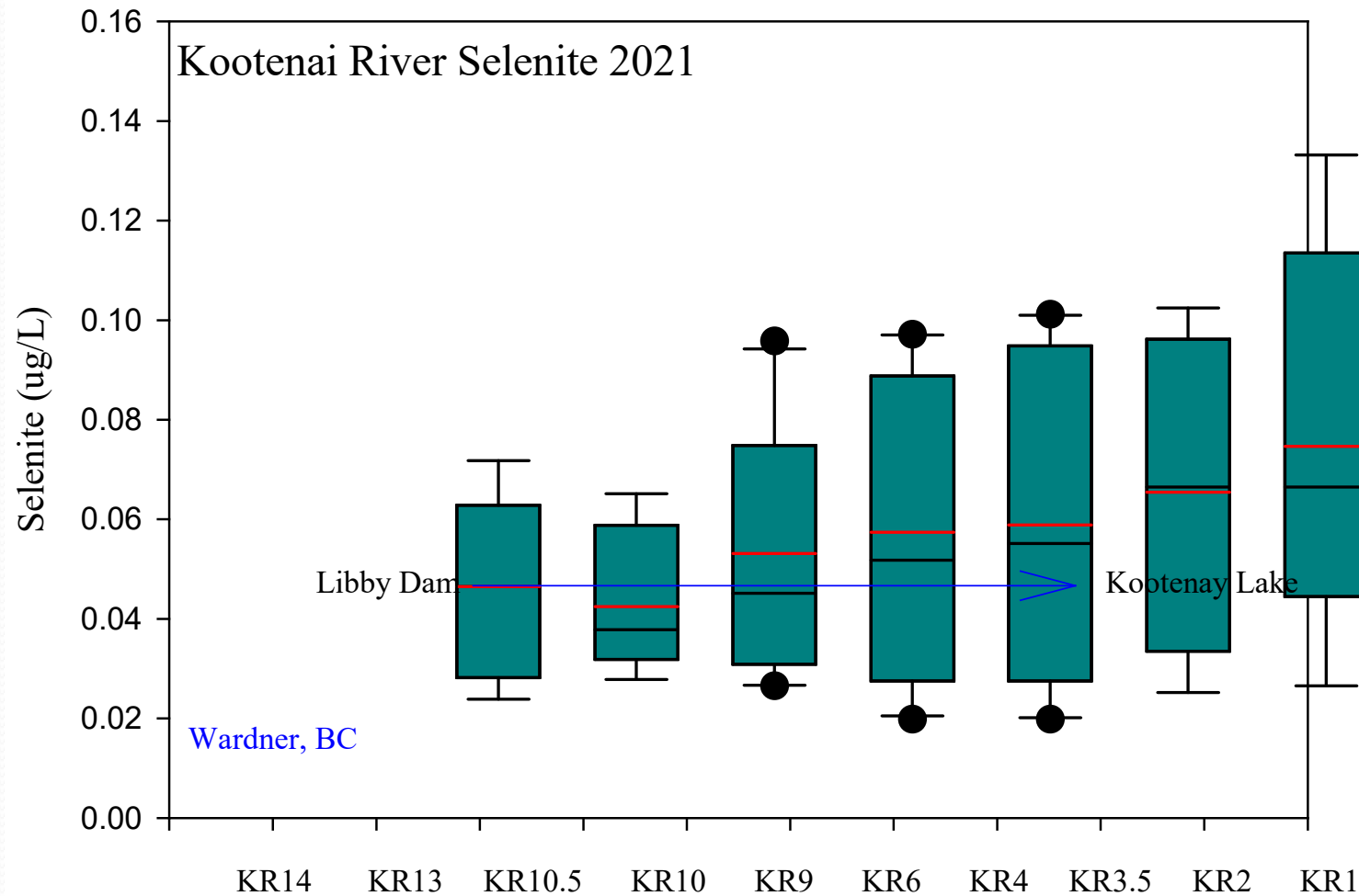


# Kootenay/ai Basin - Selenite



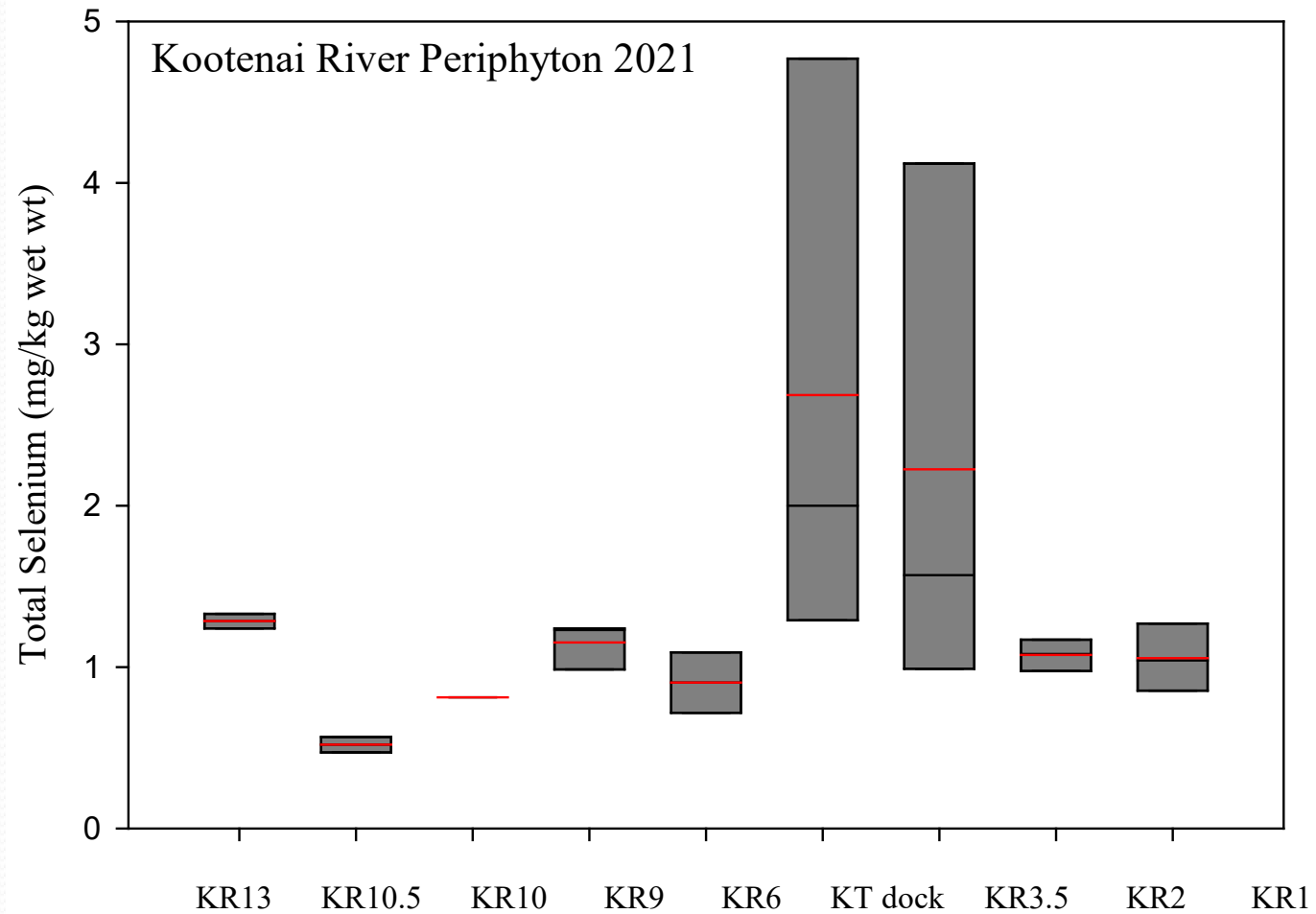


# Lower Kootenai River - Selenite



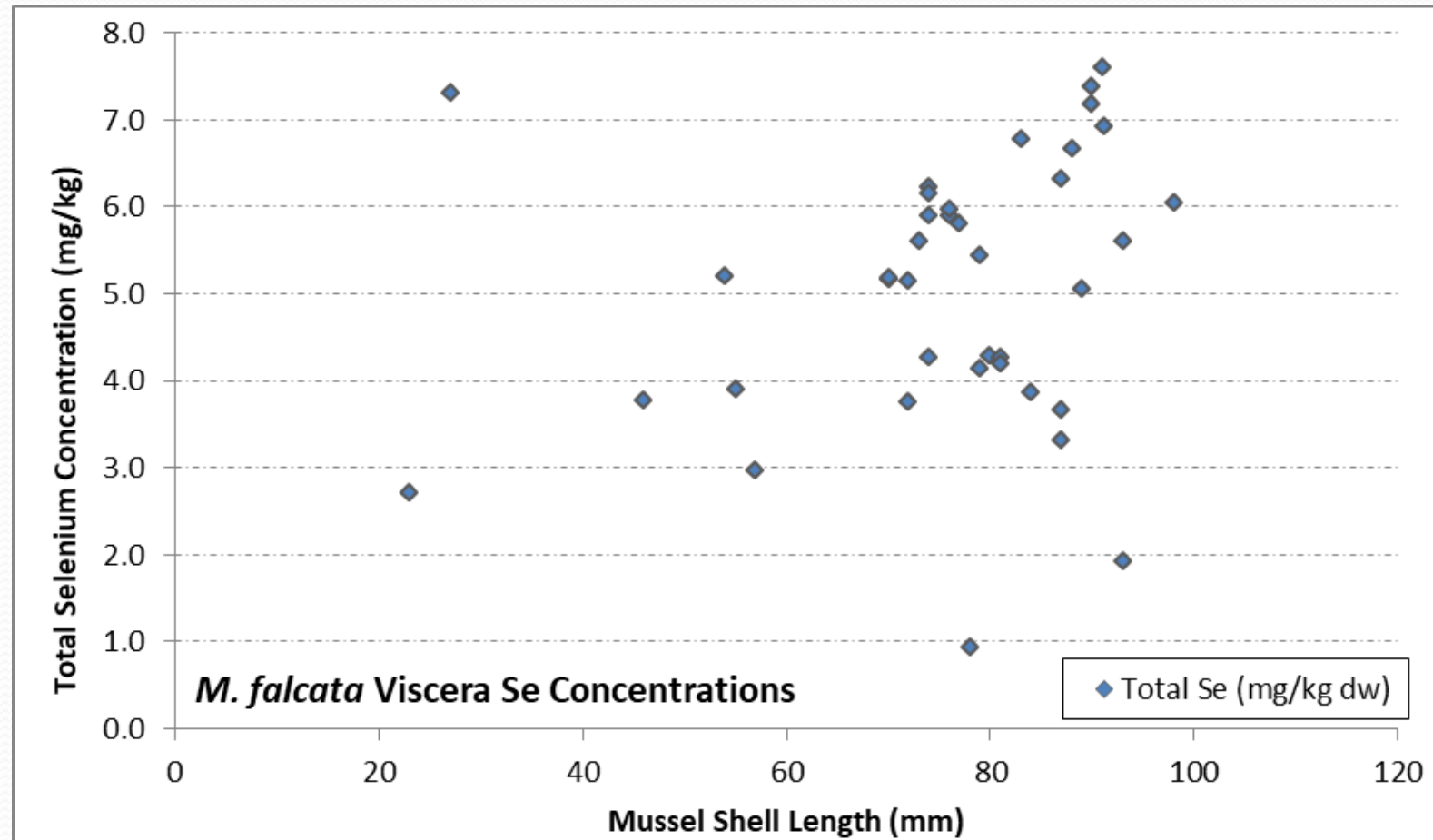


# Periphyton





# Mussels – *Western Pearlshell*



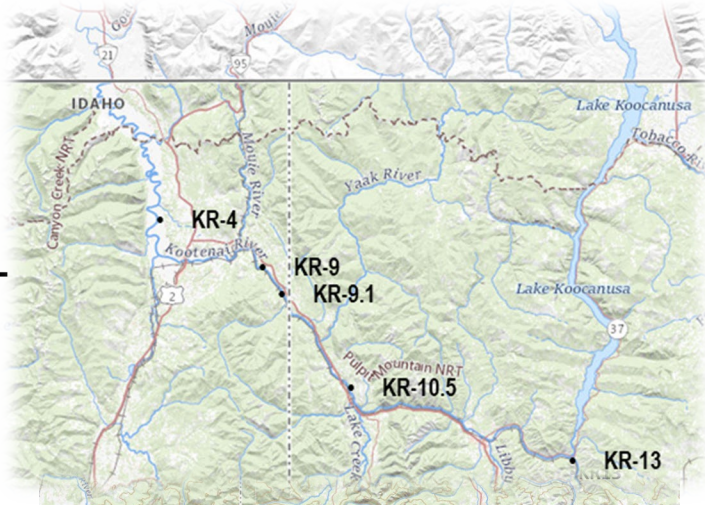
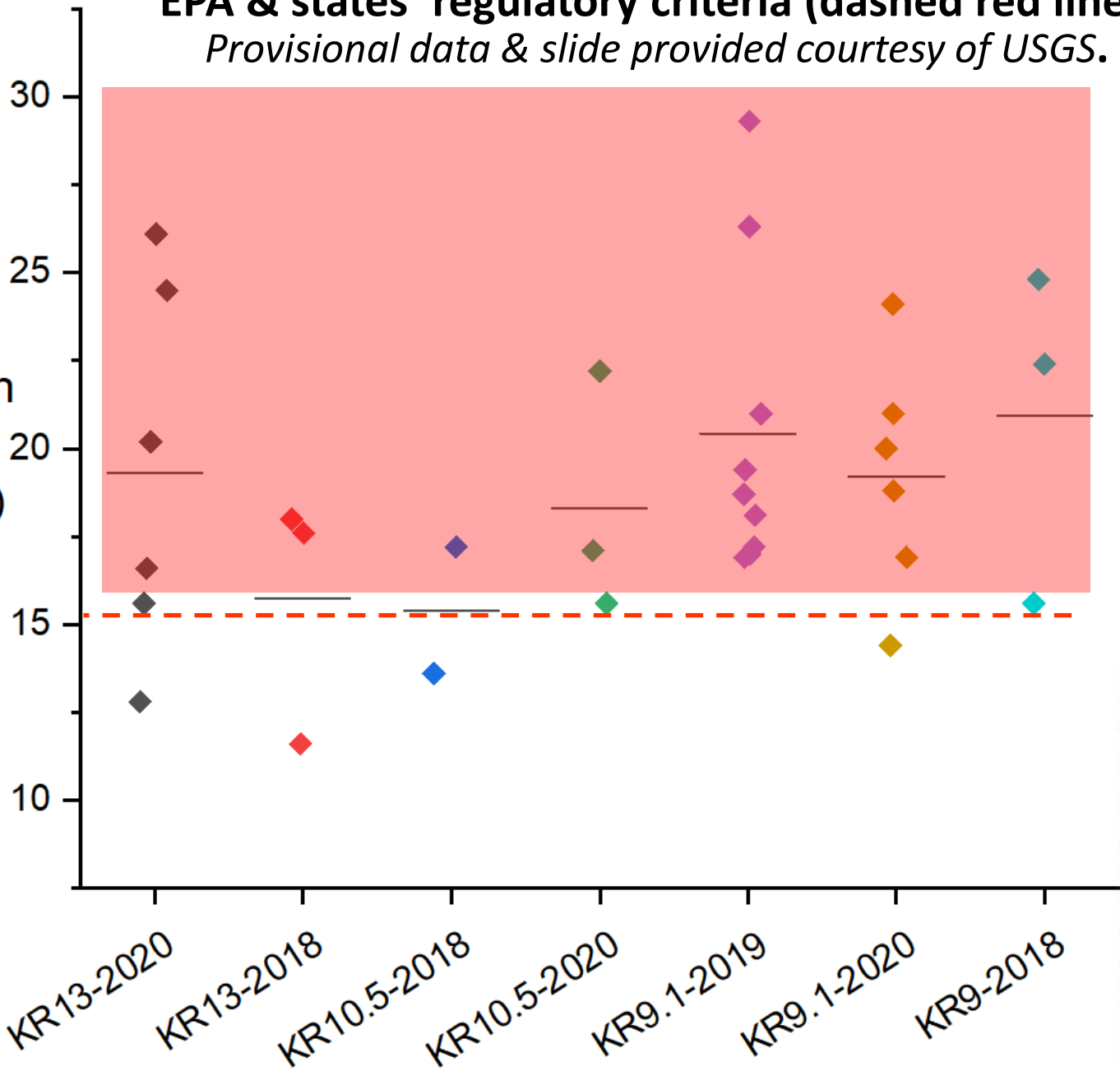


**Mountain Whitefish eggs & ovary tissue exceed  
EPA & states' regulatory criteria (dashed red line).**

*Provisional data & slide provided courtesy of USGS.*

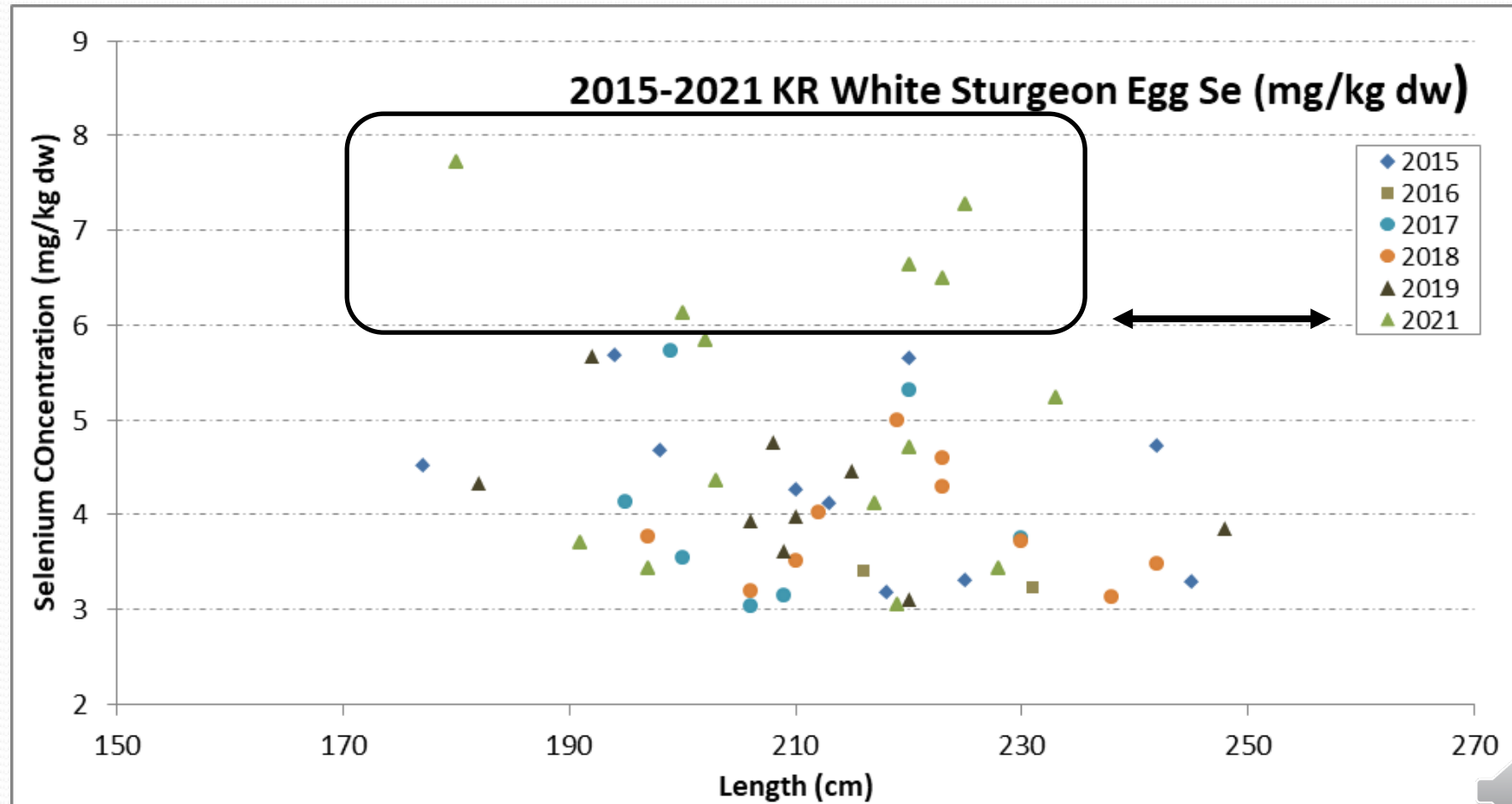


Se in  
Mtn whitefish  
ovaries  
(mg/kw dw)





# KR White Sturgeon







These decisions are political, naturally, because they can ultimately involve all 3 branches of State, Provincial and both national governments. THANK YOU for sharing the SCIENCE today! It helps citizens when sharing the truth, the numbers, the facts. ONWARD!



Compromised  
Gill plate  
on a

West Slope Cutthroat  
Caught on the Elk River 5 years ago  
about 10 miles above the dam at Elko.

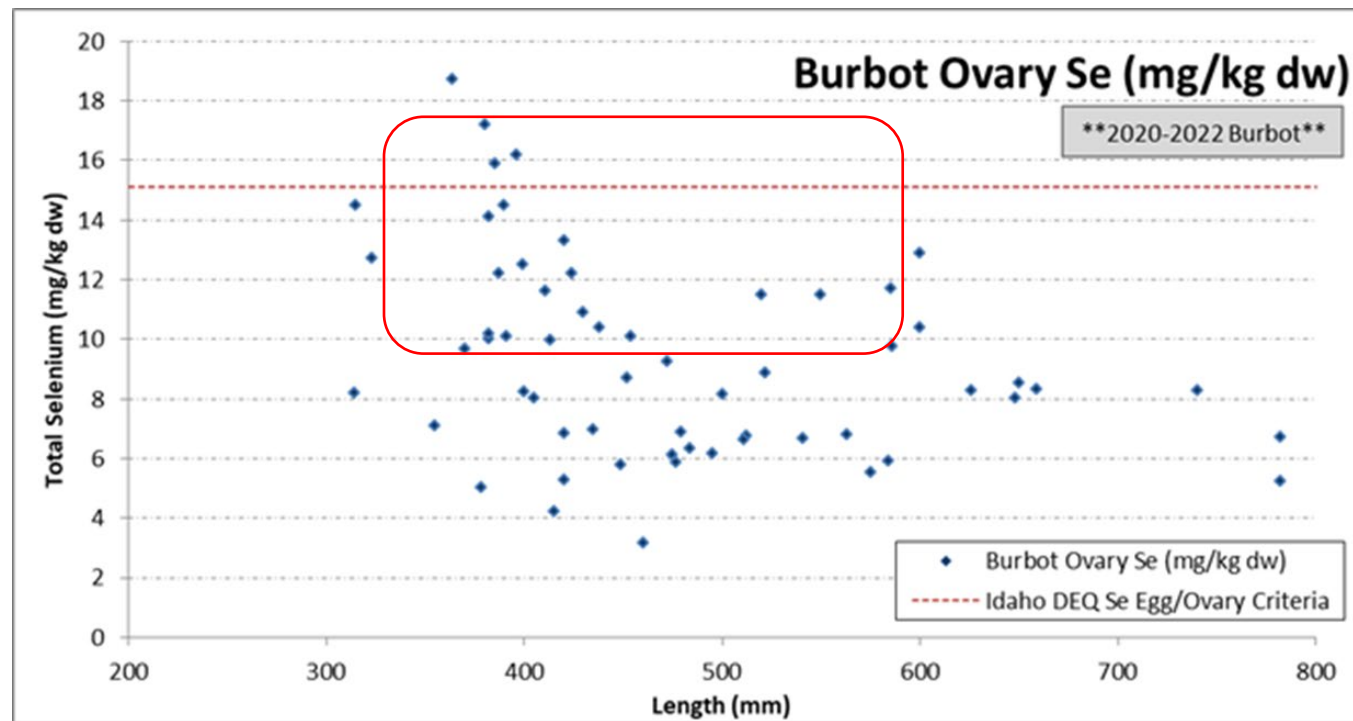
- more have  
been caught  
since -





# NOT-SO-FUN FACTS

## Burbot – Egg Selenium



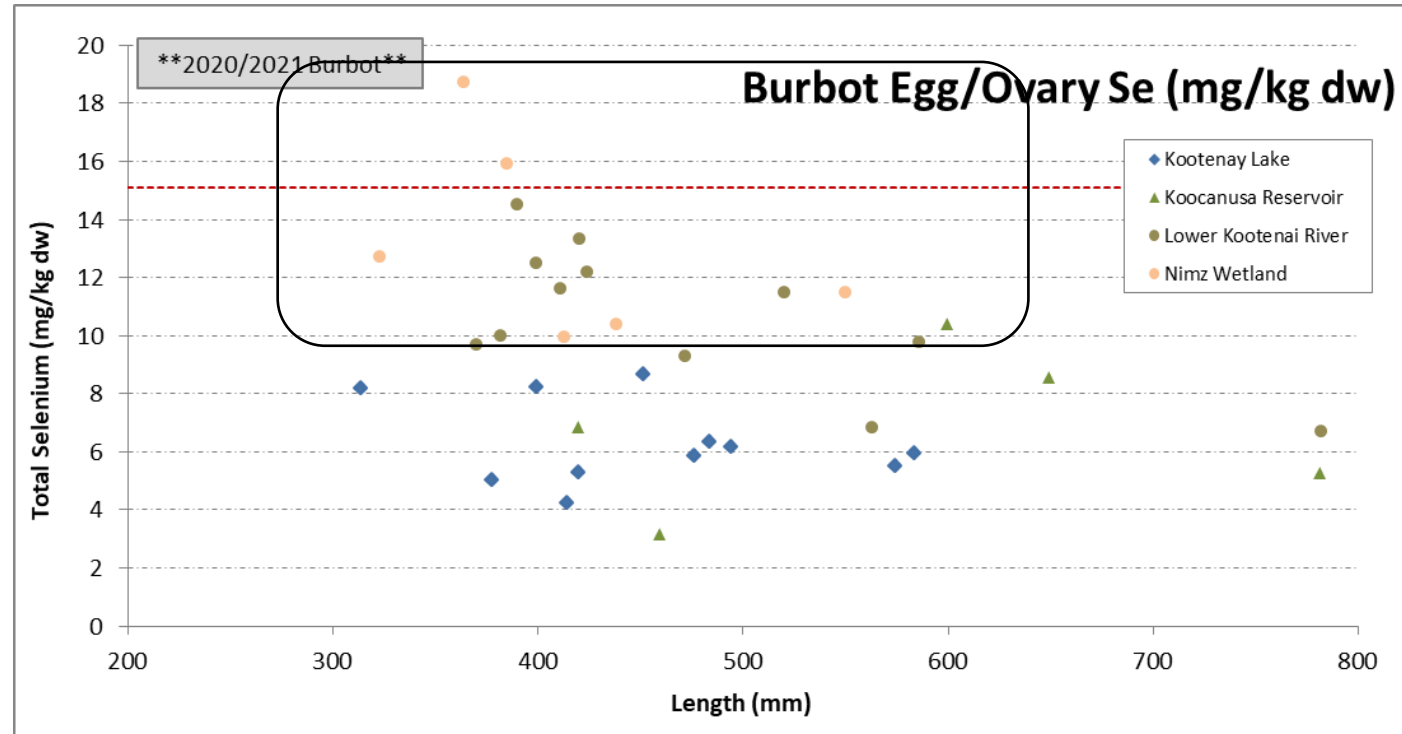
- Burbot egg Se concentrations are increasing; and some females' eggs exceed protective criteria.
- Burbot sensitivity to metals isn't known due to lack of interest in the species historically. At present, Burbot are gaining deserved respect.
- KTOI has study plans; yet again, no funding to conduct the studies.





# NOT-SO-FUN FACTS

## Burbot – Egg Selenium



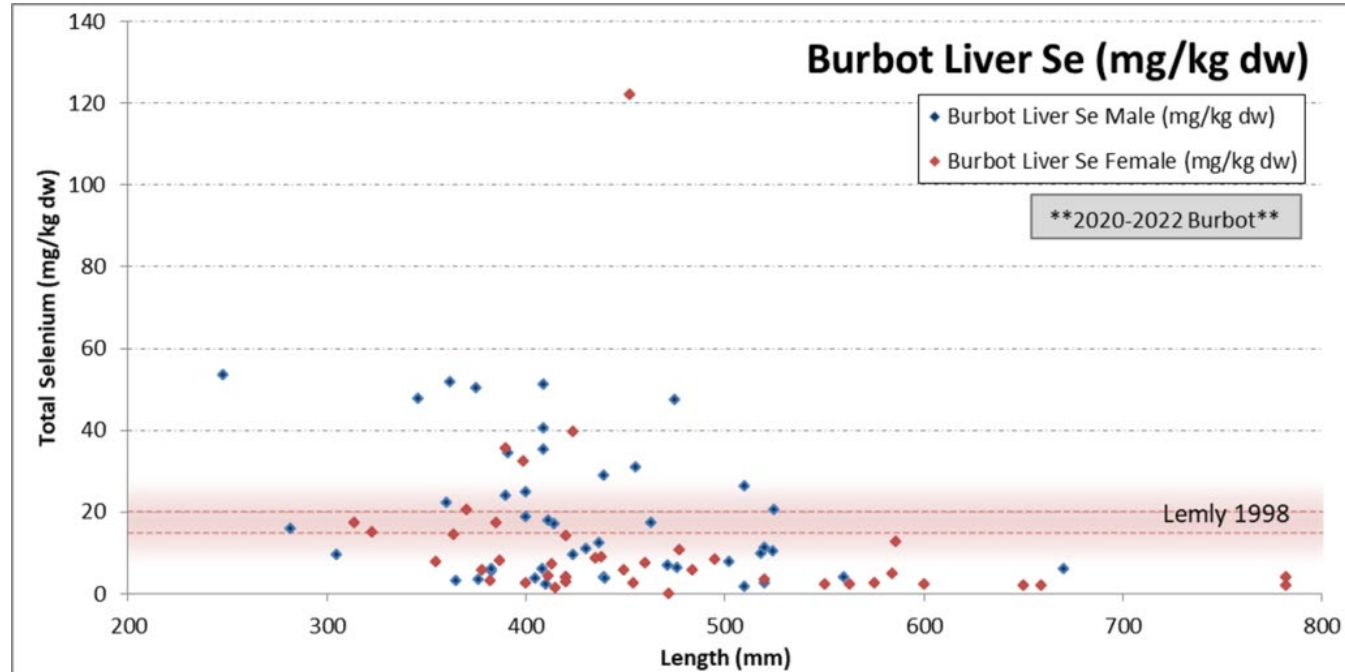
- Burbot egg Se concentrations are correlated to release site habitat types. Burbot released to river and wetlands habitats have higher Se than those released into Kootenay Lake.





# NOT-SO-FUN FACTS

## Burbot – Liver Selenium



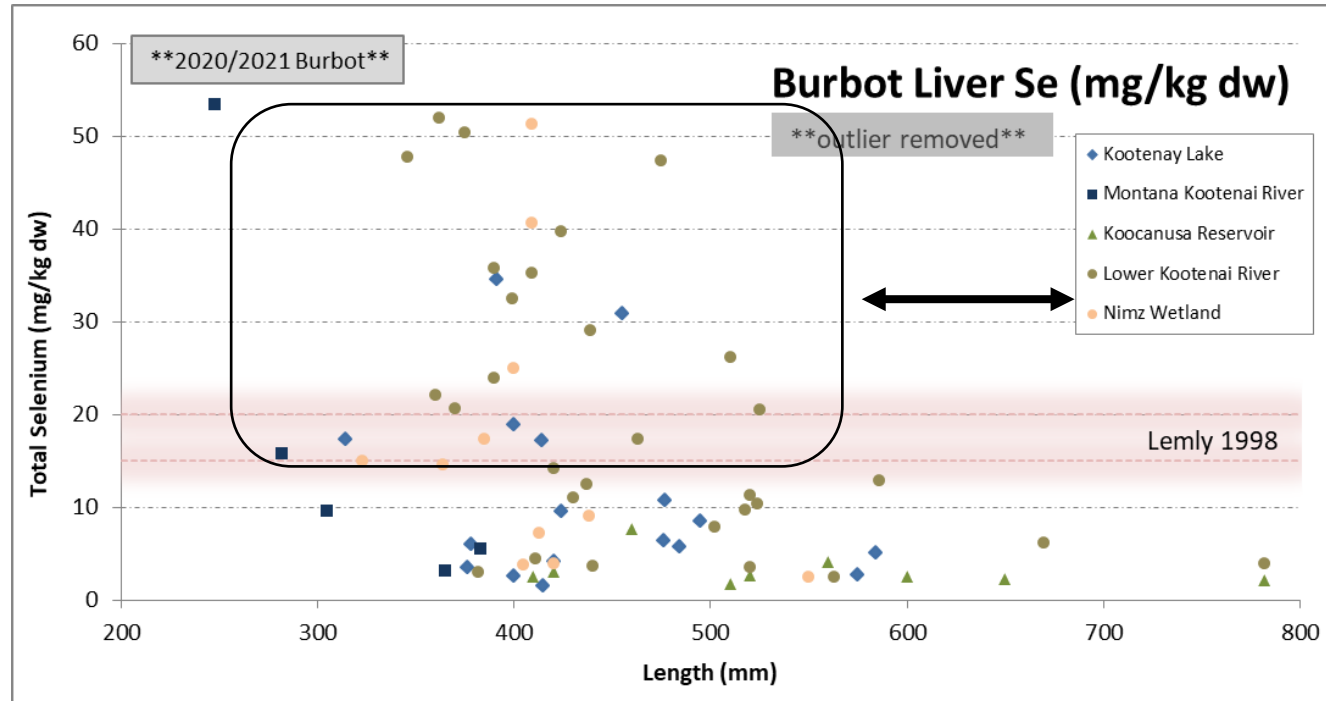
- Livers are very important to fish health and reproduction.
- Burbot liver Se concentrations are increasing; and many exceed protective guidelines.





# NOT-SO-FUN FACTS

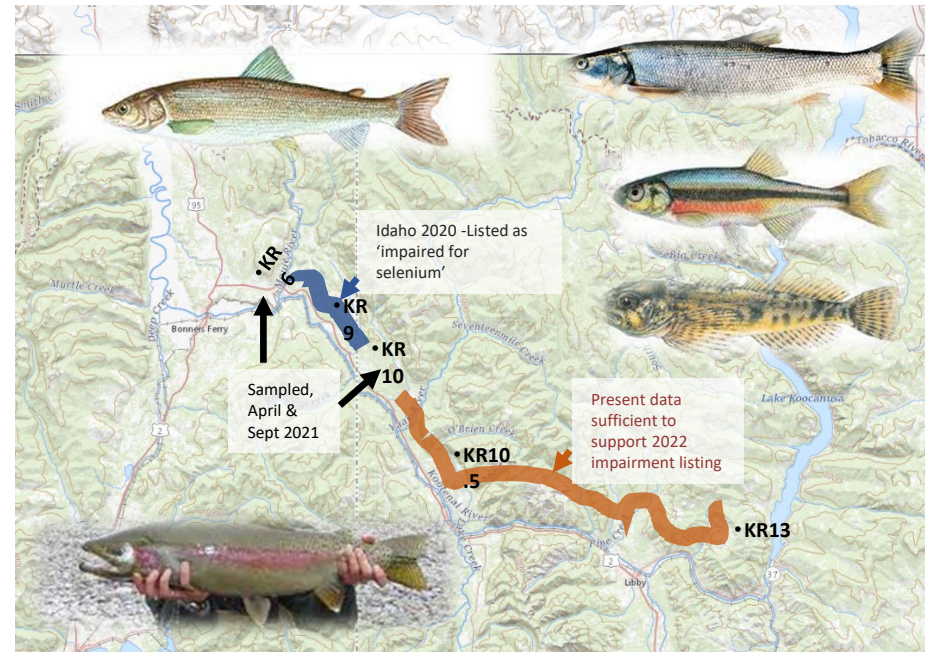
## Burbot – Liver Selenium



- Burbot liver Se concentrations are also correlated to release site habitat types.
- Burbot released to river and wetlands habitats have higher Se than those released into Kootenay Lake.



Kootenai River downstream of Libby Dam is now selenium impaired in Montana and Idaho based on fish tissue concentration exceedances.....



*\*\*slide provided courtesy of C. Mebane, USGS*

A portion of Burbot and Rainbow Trout females' eggs exceed EPA protective criteria; and we haven't collected Bull Trout or Hatchery Sturgeon yet.

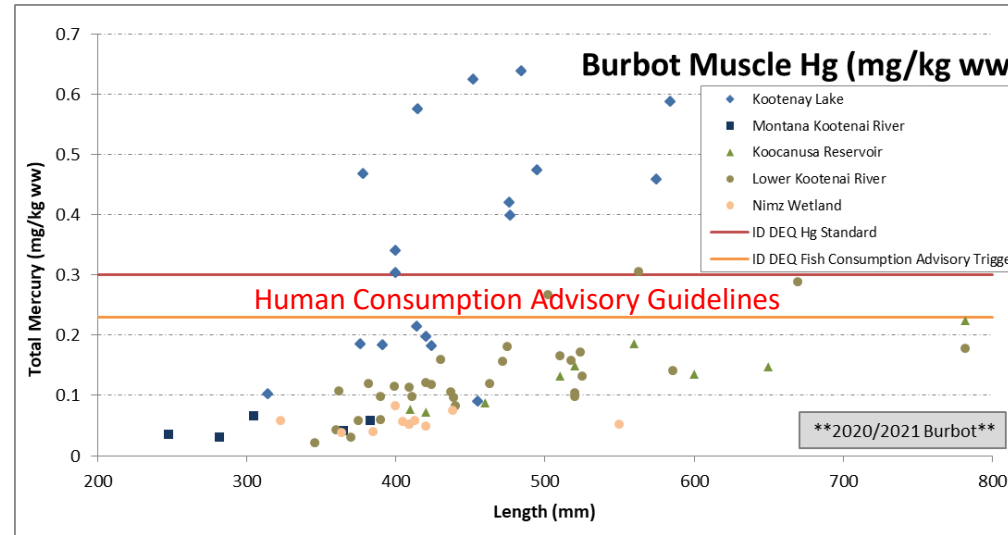




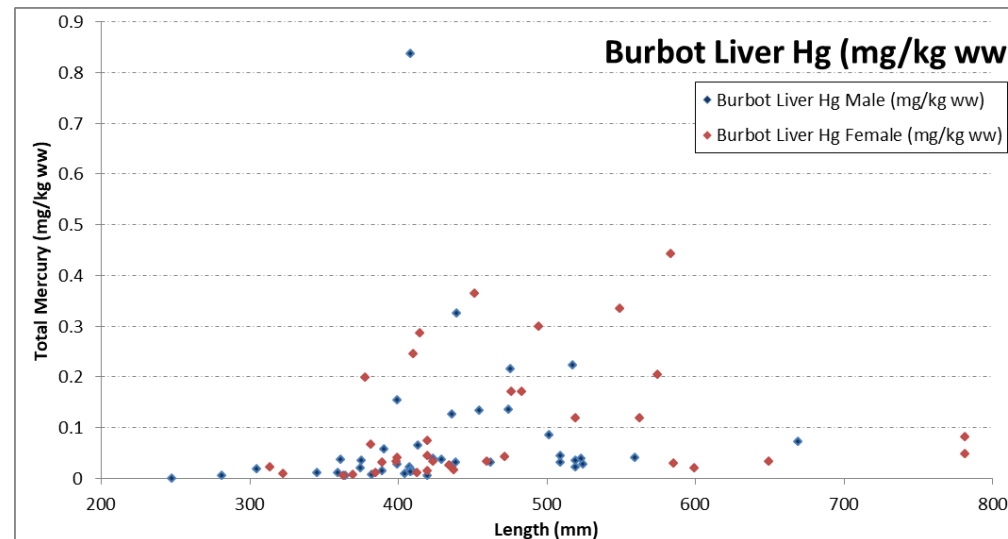


# NOT-SO-FUN FACTS

## Burbot – Muscle, Mercury



## Burbot – Liver, Mercury



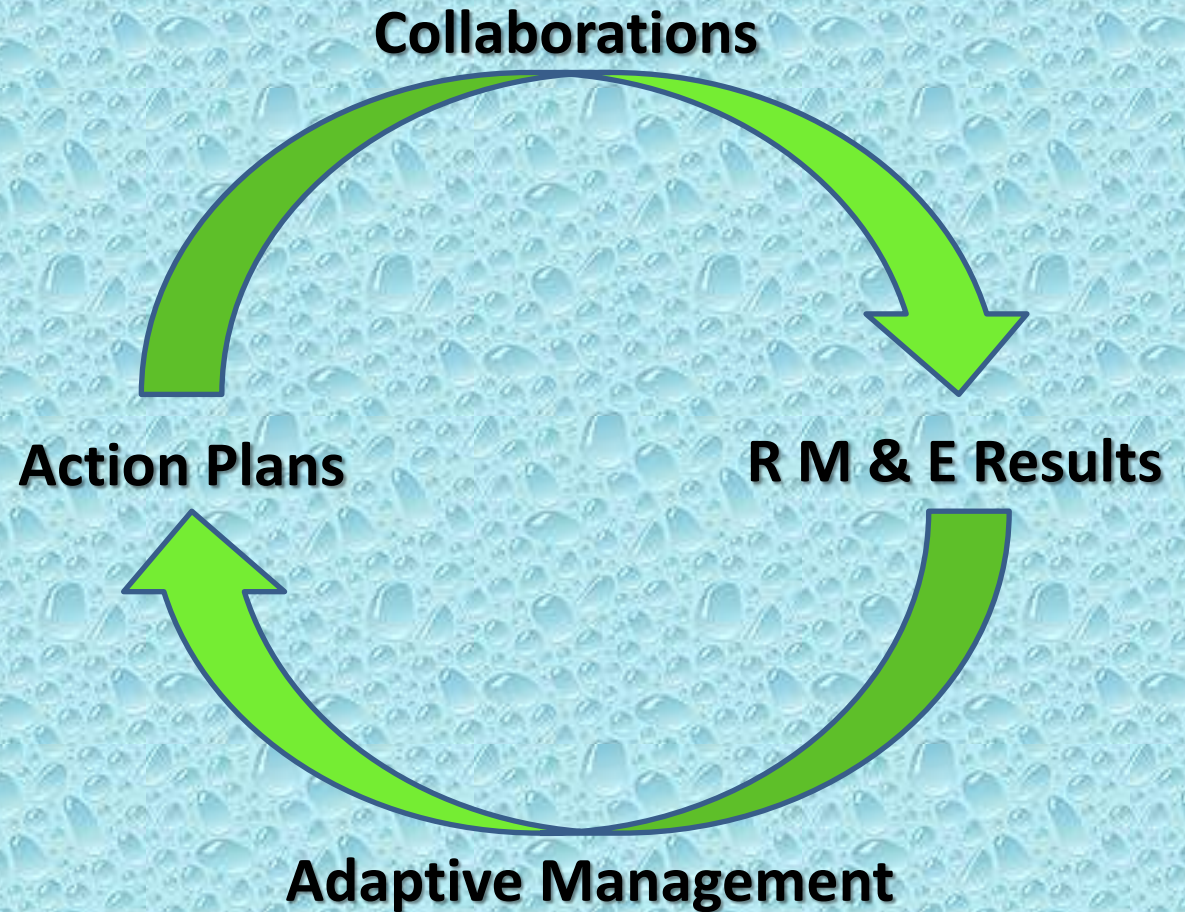


# Kootenai Restoration Components

## Contributing Programs

- ✓ Conservation Aquaculture
- ✓ Habitat Restoration
- ✓ Nutrient Enhancement
- ✓ Terrestrial & Riparian / Wildlife
- ✓ **CONTAMINANTS MONITORING**

*Research, Monitoring and Evaluation completed by a host of collaborating agencies.*





## Habitat Restoration - Water on the Landscape



Dilemma...water transports pollution to the landscape



“habitat restoration needed, but transporting pollution”







## Protect the Kootenai

Timeline: Perpetuity

- **Teck & Mining industry responsibility; NOT being held accountable!**
- **Teck & Mining industry contribution** to monitor and mitigate below Libby Dam,

TO DATE = **\$0.00**

(YES, that is correct.....a zero!)





Timeline: Perpetuity

- **Teck & industry responsibility; NOT being held accountable!**
- Only KTOI funding support is from BIA and EPA grants programs not even directly pertaining to Elk Valley Coal Mines Pollution issues.





Timeline: Perpetuity

- **Teck & industry responsibility; NOT being held accountable!**
- Neither federal government has committed to long-term solutions
- USA has pledged federal commitment; hopefully that will be formalized very soon
- Canada ????????





Timeline: Perpetuity

- **Teck & industry responsibility; NOT being held accountable!**
- Jeopardizes the \$500 million already invested to the Kootenai Ecosystem restoration.

Billions \$\$\$ (my estimate >\$100 Billion over next 100 years minimum) needed to possibly achieve measurable mitigation over the lifetime of what are, and will become even worse, legacy impacts.

(Yes, that is our reality!)



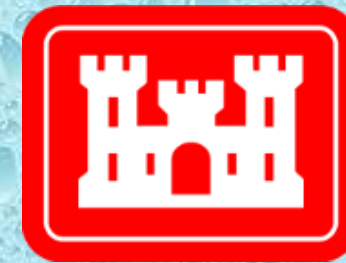








# Collaboration!



# Committment!



The image is a composite. The background is a scenic view of a calm lake reflecting a blue sky with white clouds. On the left, a rocky shoreline with evergreen trees is visible. On the right, a grassy field with some autumn-colored trees is reflected in the water. In the foreground, a large, semi-transparent oval frame contains a close-up of a fish's head. The fish has a long, pointed snout, a large eye, and is holding a small, light-colored lure in its mouth. Above the fish's head, within the same oval frame, are three small white circles of decreasing size, leading to a white thought bubble. Inside the thought bubble, the text "Thank You for your time!" is written in a black, sans-serif font.

Thank You for your time!