



YAAK VALLEY FOREST COUNCIL



# VOLUNTEER WATER MONITORING IN KOOTENAI RIVER COUNTRY



**FLATHEAD LAKE  
BIO STATION**  
UNIVERSITY OF MONTANA

Brianna Elizondo, *Big Sky Watershed Corps Member*

Dr. Rachel Malison, *Assistant Research Professor*

Erin Sexton, *Senior Scientist*

# MMW TEAM

Program launched through Flathead Lake Biological Station in 2021

Philanthropically funded



Rachel Malison:  
Program Leader



Brianna Elizondo:  
24/25 BSWC Member



Tom Bansak:  
Oversight Committee



Erin Sexton:  
Oversight Committee

# Goal of MMW

Increase the capacity of water quality monitoring in Montana  
Protect the waters of Montana



## Guidance

Monitoring Montana Waters is a program at FLBS that provides scientific expertise and guidance to citizen-led watershed monitoring groups.



## Funding

MMW offers two different types of financial support to watershed groups. These funds are available to provide support for sample analyses costs, as well as the purchase of sampling gear.



## Training

MMW offers on-the-ground training for funded groups and will travel to different watersheds to meet with our funded groups.

# Partners



**MONTANA CONSERVATION CORPS**

*Tools for Living. Experience for Life.*



Montana Department  
of Environmental Quality



**Whitefish Lake  
INSTITUTE**



**MONTANA  
STATE UNIVERSITY**

**EXTENSION**

# Guidance

MMW offers assistance and consultation in designing monitoring plans, selecting analytes for analysis, analyzing and interpreting data, and providing on the ground training.

## Sampling and Analysis Plan

A document that describes all the details needed for a successful monitoring program. Groups are required to complete and submit a SAP for approval in order to receive funding support from MMW.

## Standard Operating Procedures

To collect scientifically credible data, standardized methods must be followed. Following the same methodology as water quality professionals in MT ensures errors are not made and that data are accurate.

## Data Management

In order to receive Laboratory analysis funds groups must agree to share data with FLBS and upload all of their data to the MT DEQ EQulS Water Quality Exchange (MT-eWQX) database.





**60 volunteers trained in 2025!**



# Funding

MMW offers two different types of financial support to watershed groups, funds are available for sample analyses costs (including shipping of samples), as well as the purchase of sampling gear.

**\$7,000**

Lab Analyses  
Funding

**50%**

Cost Match in volunteer  
time, mileage, money spent

**\$1,500**

Gear Funding -  
every 3 years

**100%**

Cost match in  
dollars



# 2025 Funded Groups

## Funding 14 groups for lab and gear support

Save Wild Trout (formerly BHRF): Dillon, *Montana*

Bitterroot River Protection Association: Hamilton, *Montana*

Central Montana Resource Council: *Lewistown, Montana*

Clearwater Resource Council: *Seeley Lake, Montana*

Flathead River Alliance: *Columbia Falls, Montana*

Flathead Lakers, Swim guide: *Polson, Montana*

Mission Bay Preserve HOA: *Polson, Montana*

Missoula Valley Watershed Group: *Missoula, Montana*

Rock Creek Watershed Group & Carbon County Resource Council: *Red Lodge, Montana*

Stillwater Valley Watershed Council: *Absarokee, Montana*

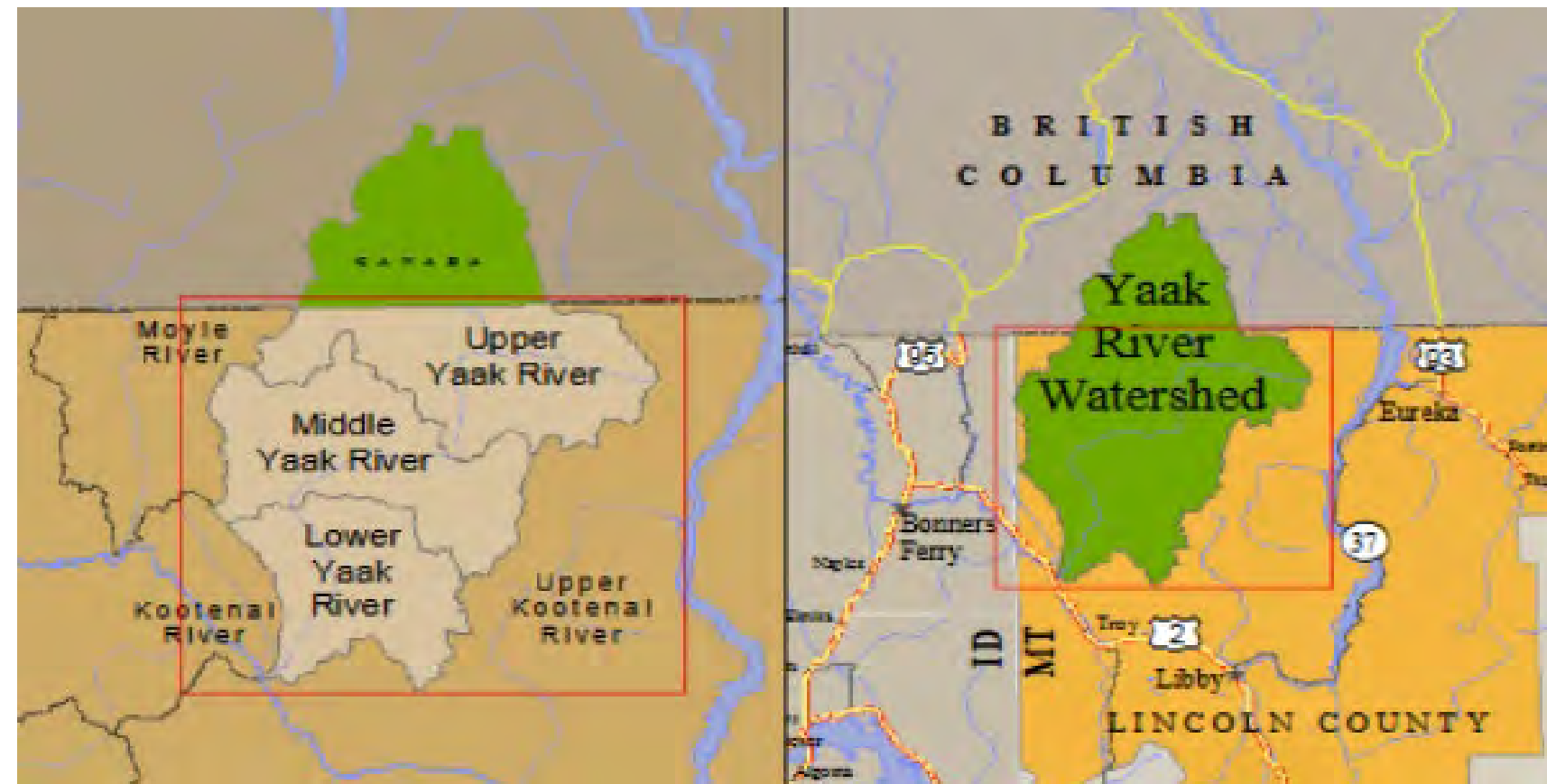
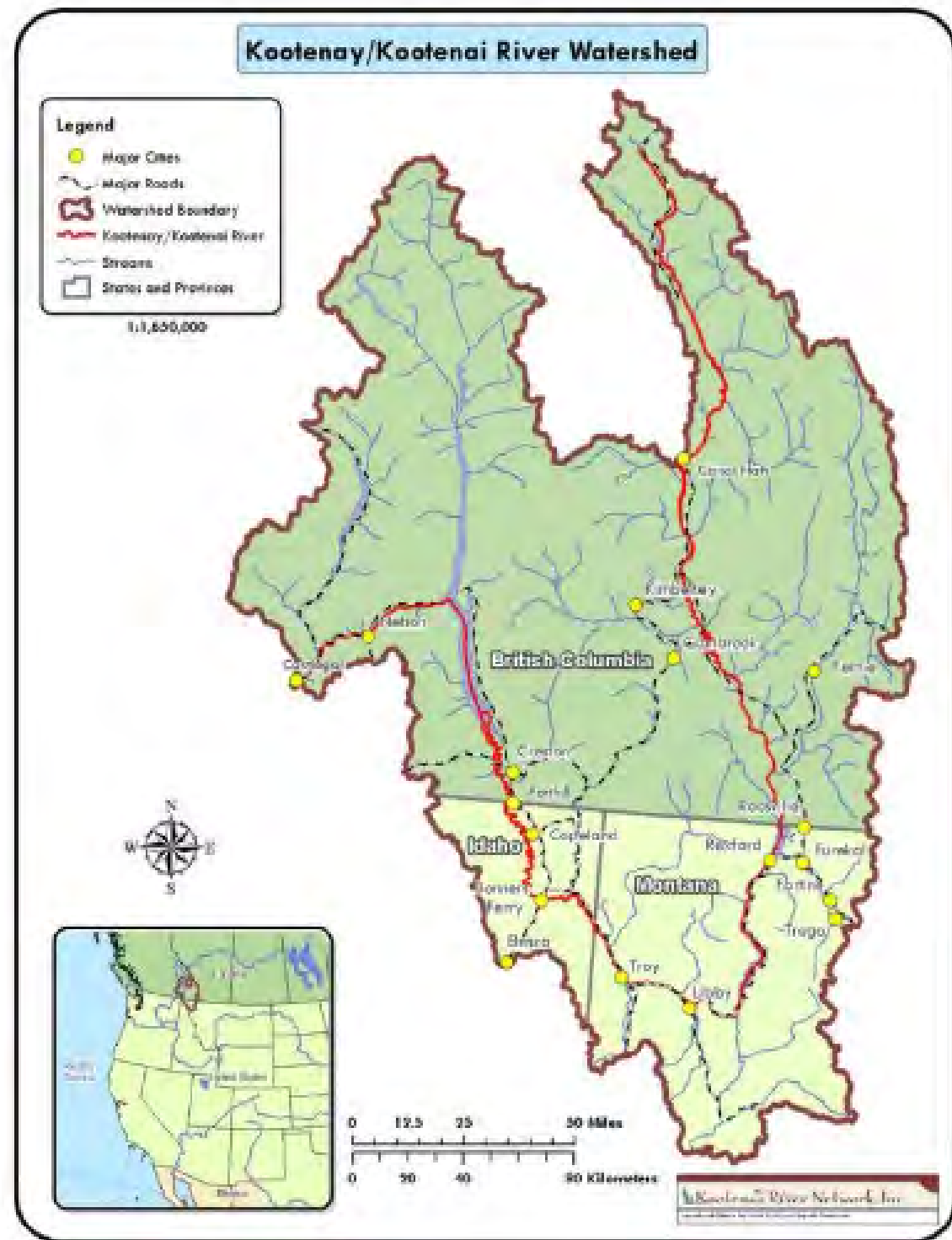
Thompson Chain of Lakes Stewardship Coalition: *Libby, Montana*

Whitefish River Group: *Kalispell, Montana*

Yaak Valley Forest Council: *Troy, Montana*

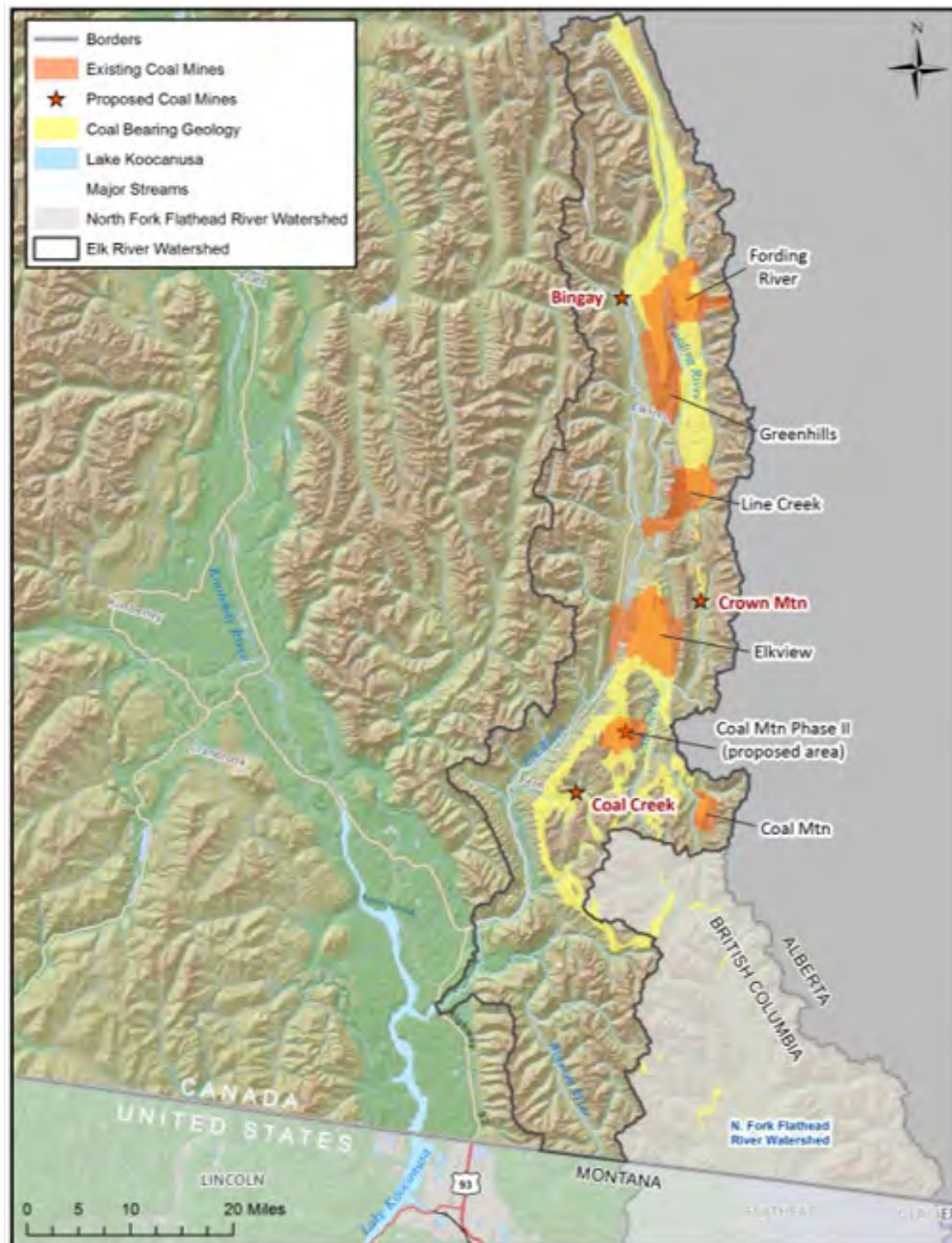
Kootenai Watershed Allies: *Troy, Montana*

# Kootenai/y River Watershed



- British Columbia, Northwest Montana & Northern Idaho
- Flows 485 miles through MT/ID before returning to Canada
- Yaak River is one of the major tributaries
- Headwaters in BC underlain by high-quality coal

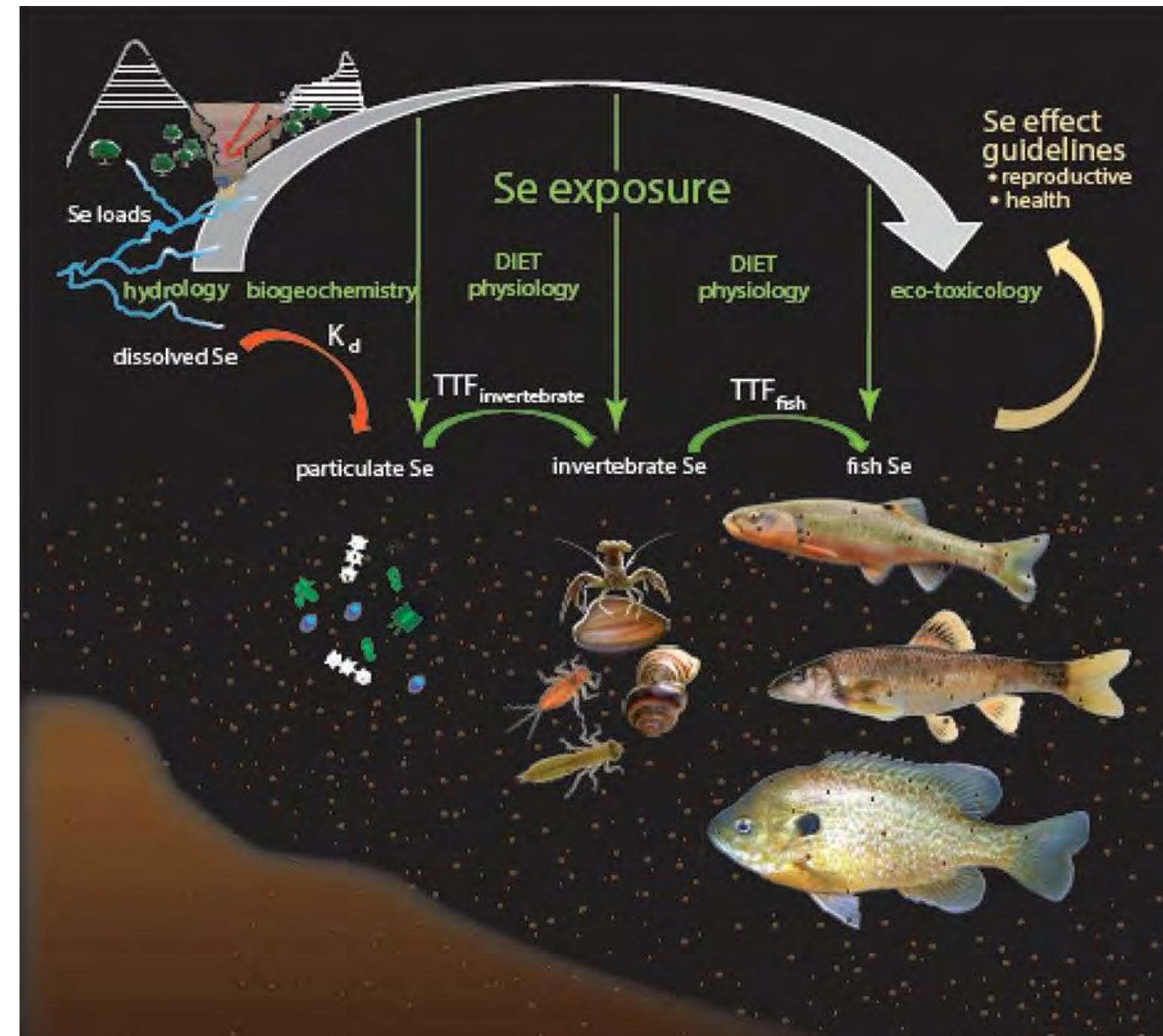
# Elk Valley Coal Mines

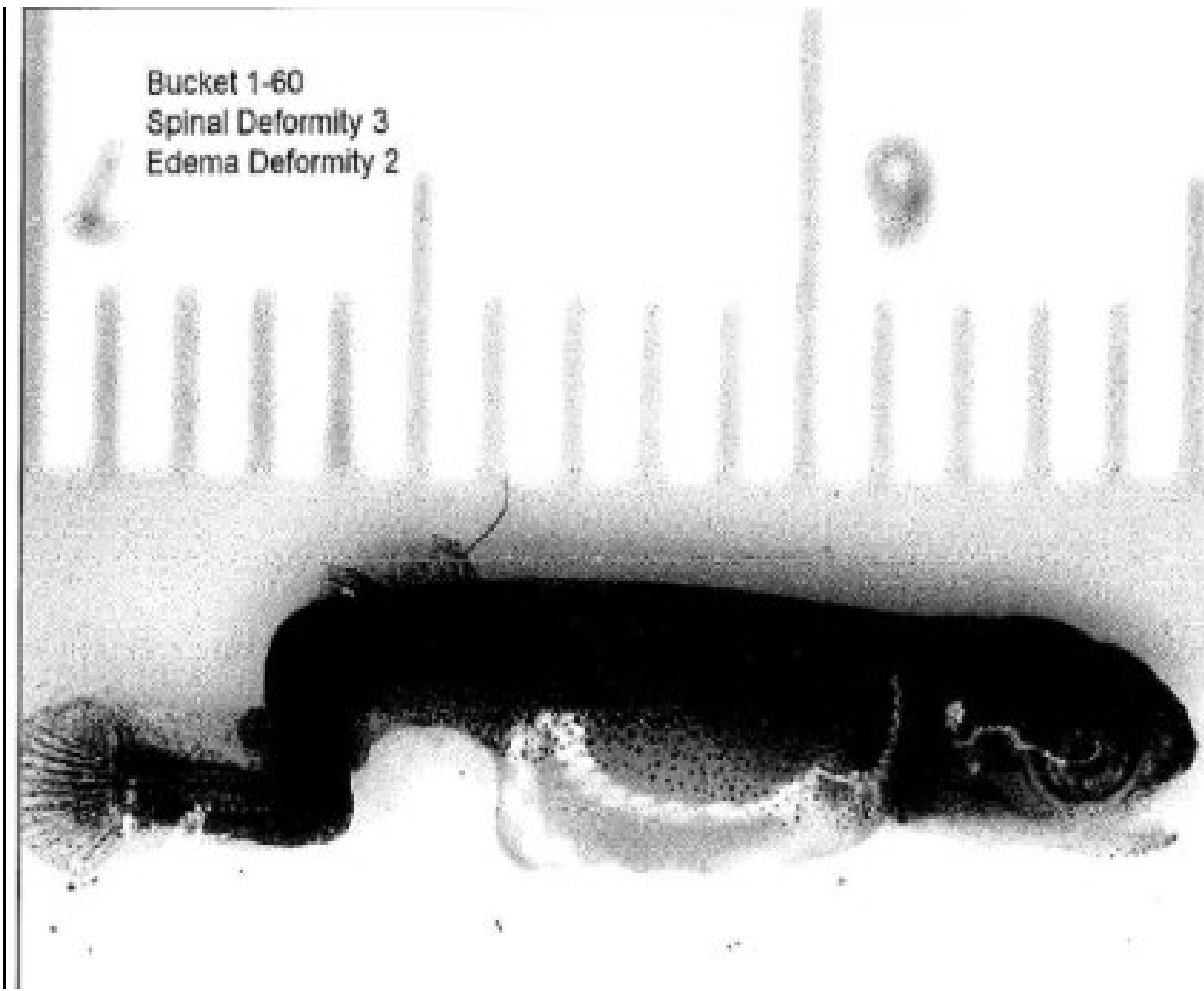
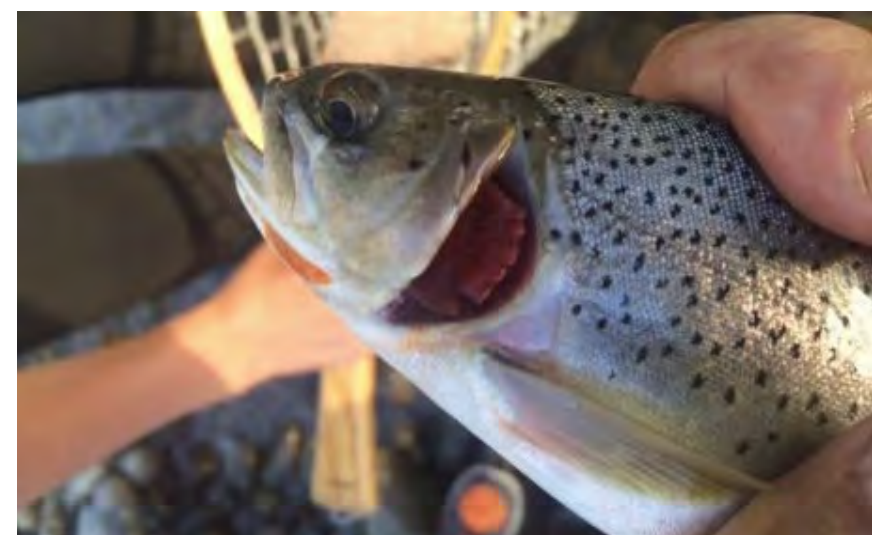


- Elk River in BC flows into the headwaters of the Kootenai River
- Over 100 years of coal mining operations
- Leaching contaminants - nitrates, sulphates, selenium into the transboundary watershed
- Impacting fisheries and aquatic life

# Selenium

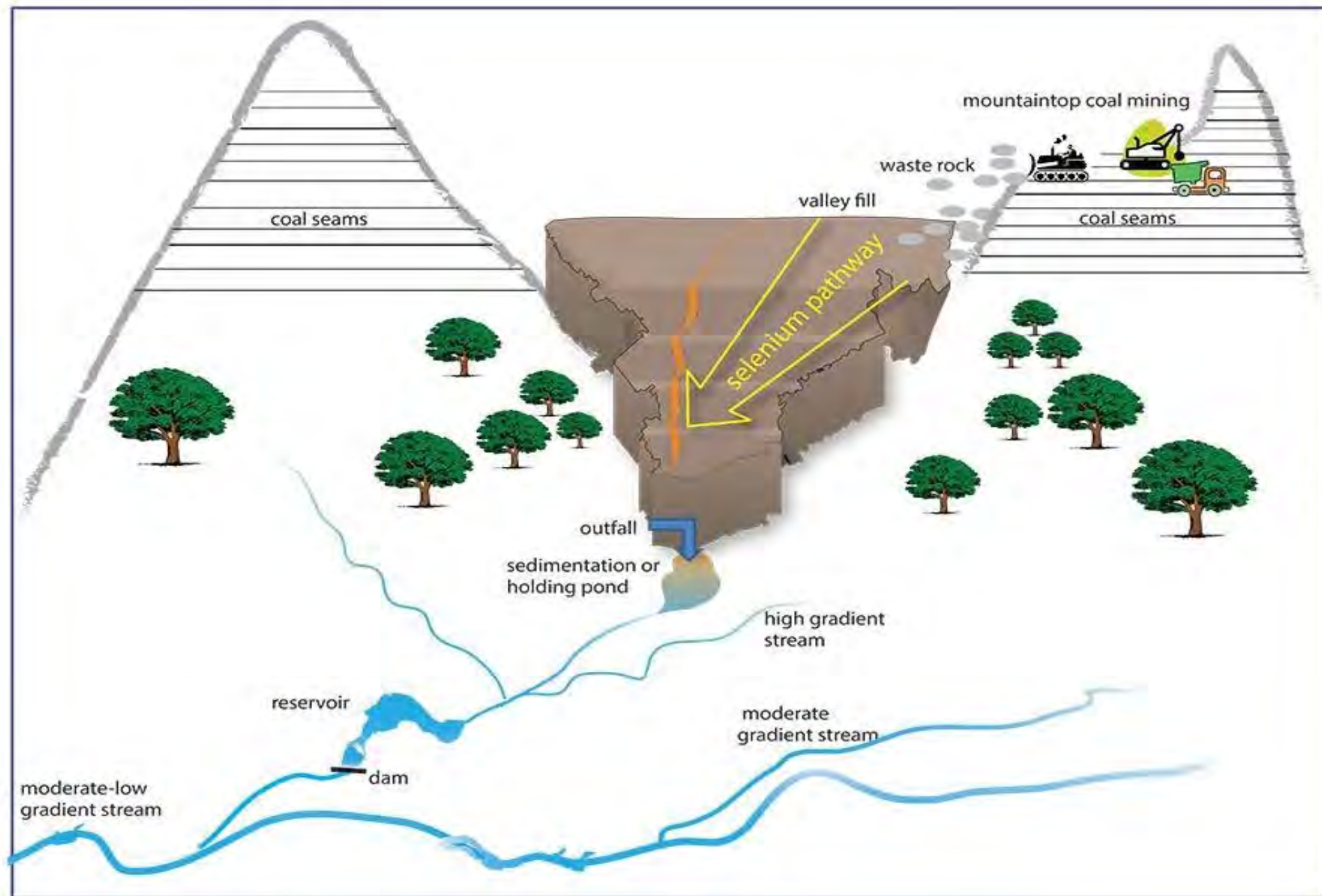
- Naturally occurring chemical element in coal
- Released during the mining process
- Tendency to bioaccumulate
  - Increases by several orders of magnitude in food web





- Toxic at low concentrations
- Physical deformities & reproductive failure
- 'Invisible contaminant'

# Mountaintop Mining



- Mountaintop removal coal mining
- Tops of mountain ridges are sheared off
- Adjacent valleys filled with waste rock
- Valley fills leach selenium into water

# Mining Impacts



- Geology of the rivers
- Fate of contaminants
- Transport of contaminants
- Receptors - rivers, aquatic life, fish, wildlife & people



All species were photographed in the Yaak by Anthony South

- Rivers are hotspots of diversity, connectivity, and abundance of life
- Kootenai River is one of our wildest rivers
  - Rare & threatened native fish species
  - Variety of wildlife

*Gravel-bed river floodplains are the ecological nexus of glaciated mountains landscapes Hauer, et al, 2016*

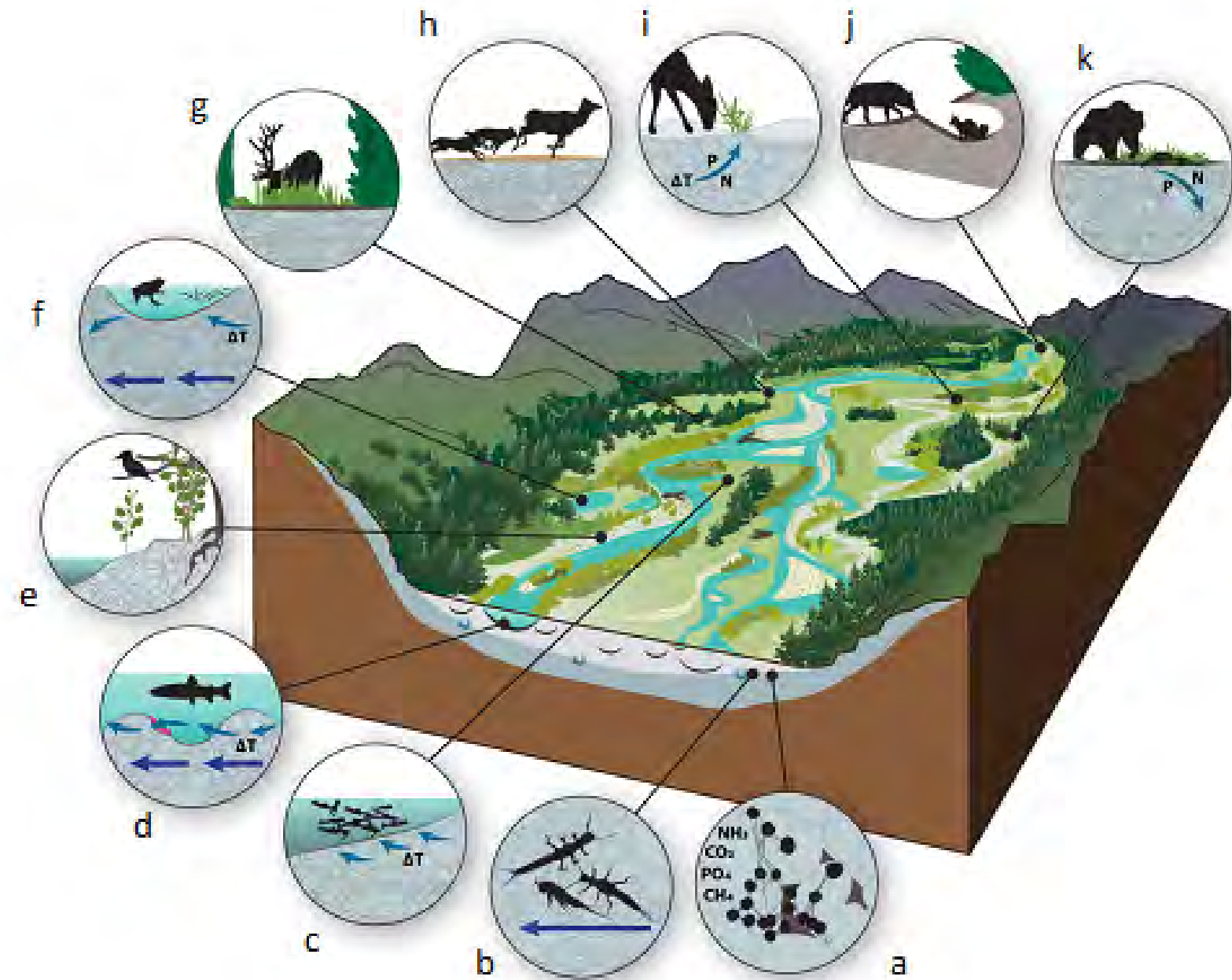


Illustration Credit: E. Harrington

# Monitoring



# Kootenai Watershed Allies

- Kootenai Canyon Anglers, KWA formed in 2022
- Collecting baseline data on selenium and nutrient concentrations
- Increasing the capacity of monitoring and filling data gaps
- Protecting beneficial uses





A) Overview Map of the Kootenai System



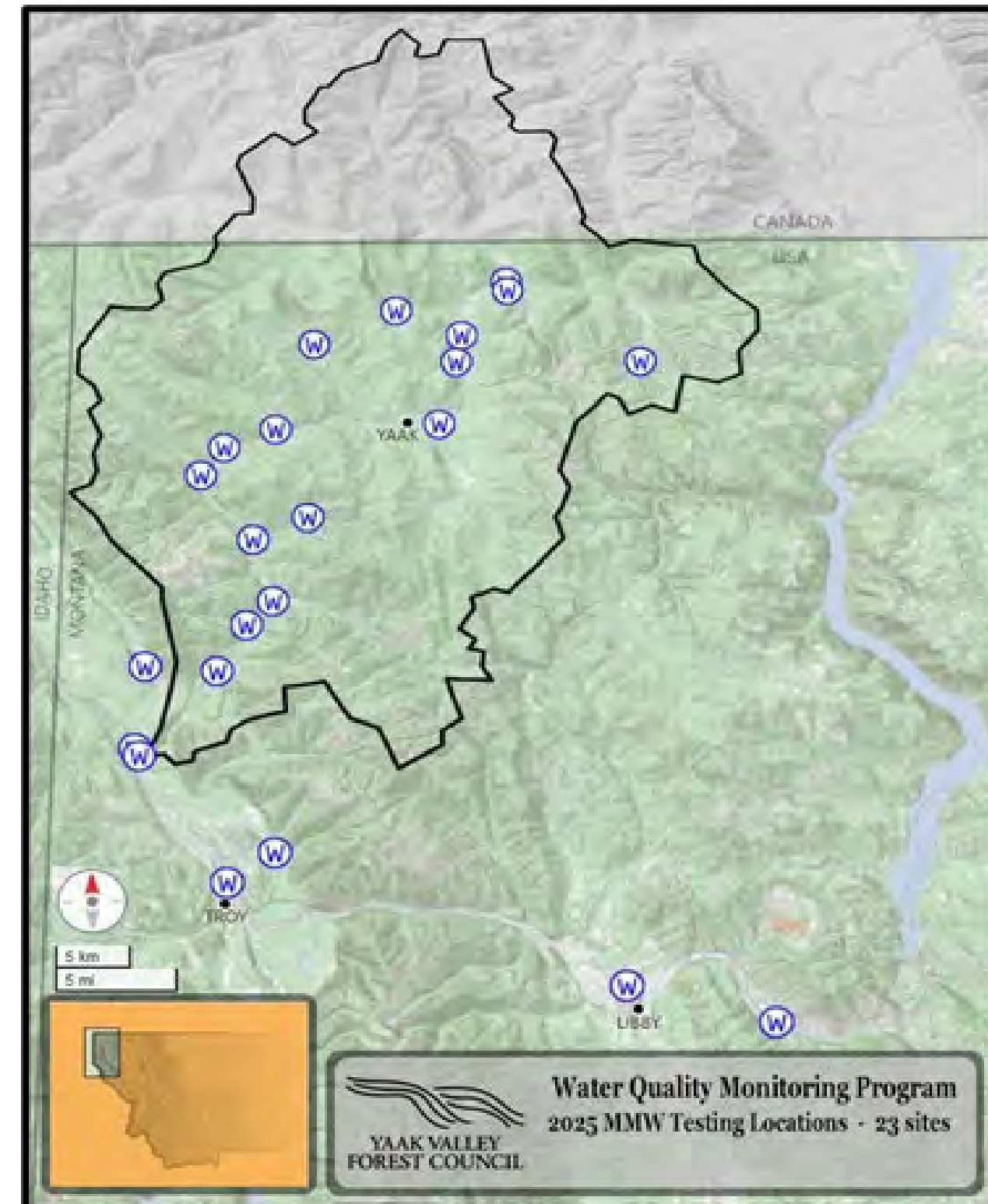
B) Tributaries of Lake Koocanusa



C) Tributaries of the Kootenai River

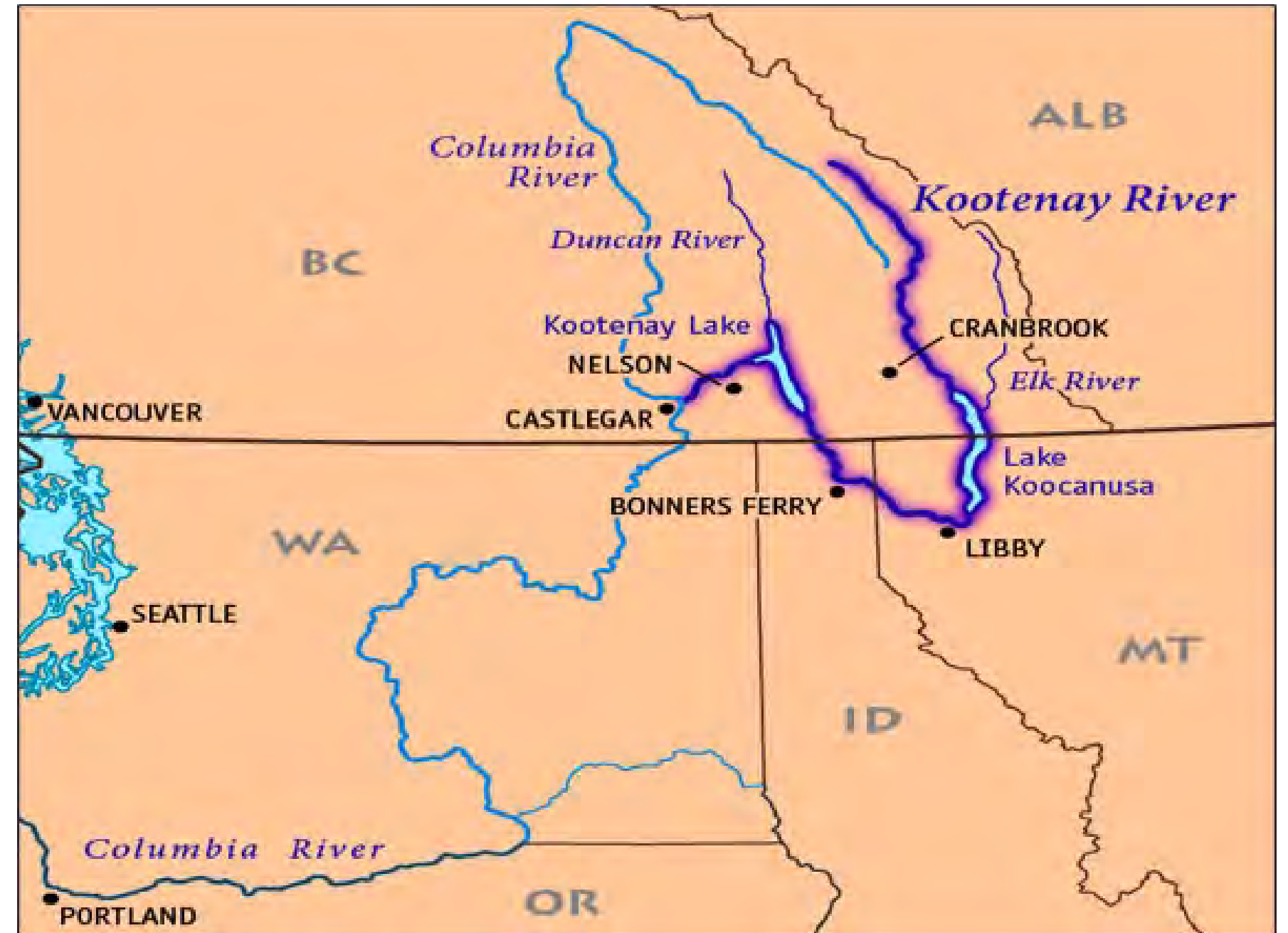
# Yaak Valley Forest Council

- Funded since 2021
- Yaak watershed & Kootenai watershed
- Nutrients, sediment, and selenium samples at 23 sites
- Timber extraction, mining activities, road density, development



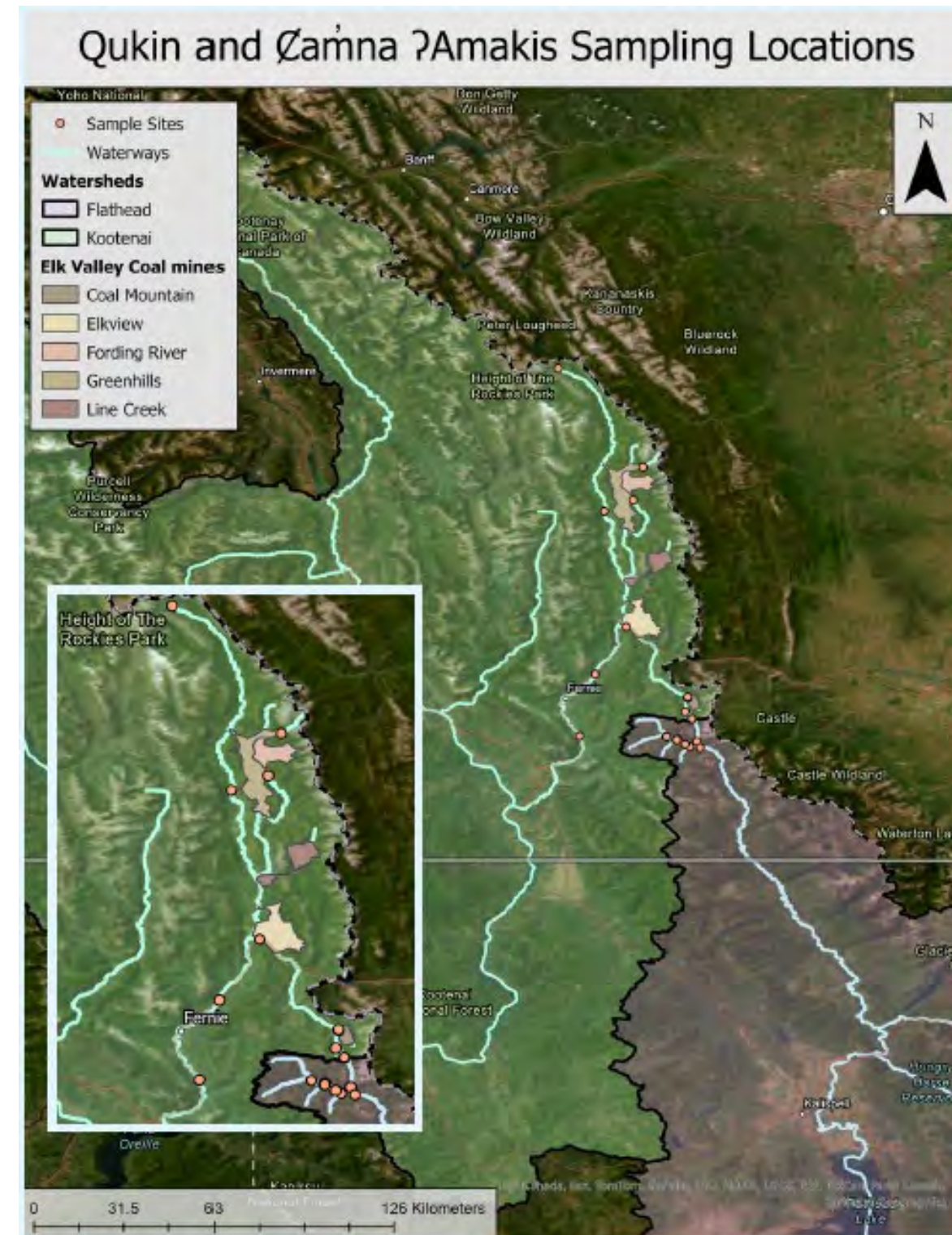
# The Bigger Picture

- KWA and YVFC are just one small part of the watershed
- There are so many partners involved in this effort
- Baseline data collection in British Columbia



# Sampling in Qukin and Łamna ʔAmakis

- Elk & Flathead watersheds of BC
- Repeat study of FLBS baseline data collection efforts started in 2005
- Monthly sampling from June-October
- Two transboundary rivers, two very different land uses



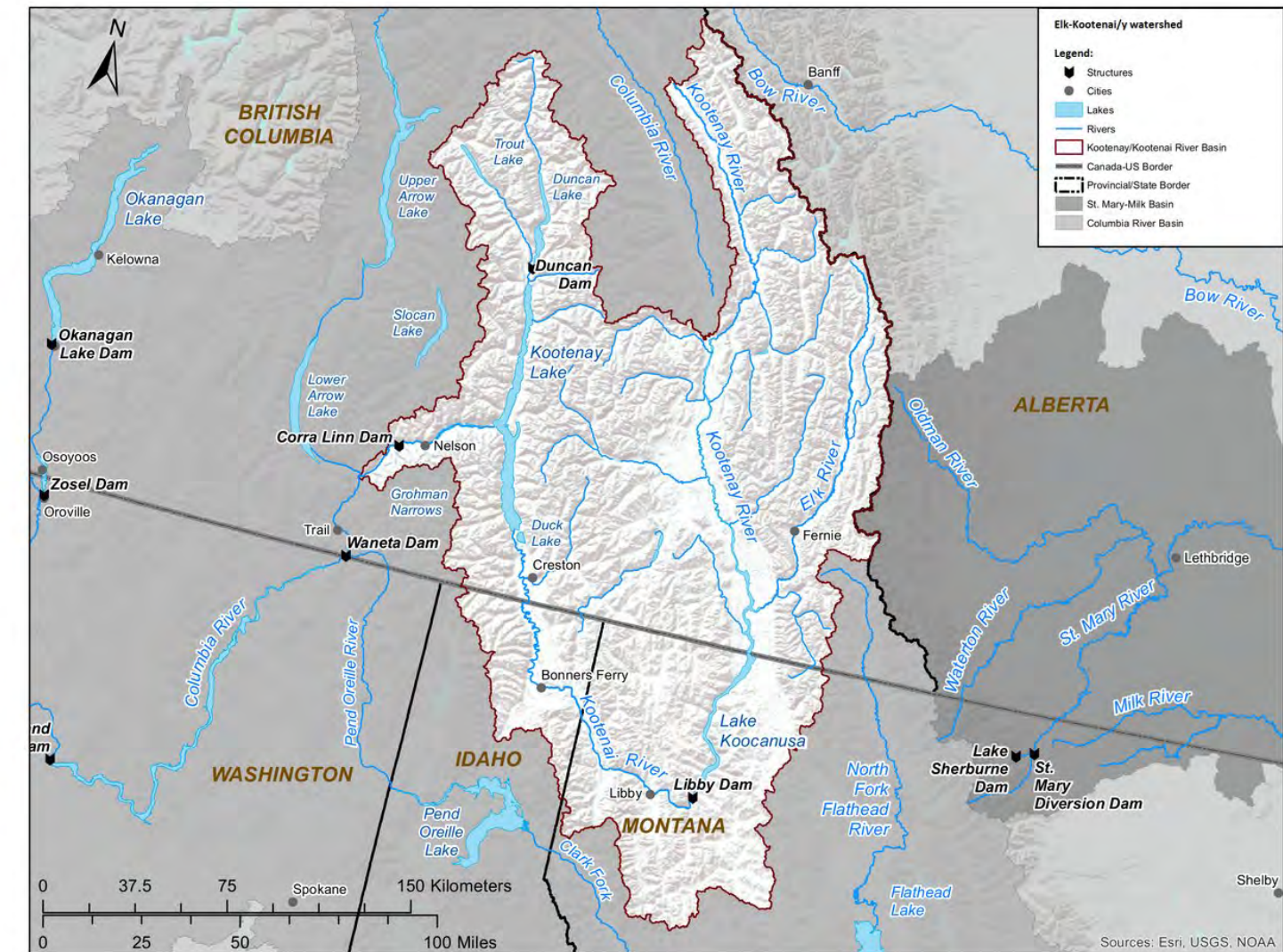
# Article IV of the Boundary Waters Treaty



- Signed in 1909 to prevent and resolve disputes over the use of shared waters
- Established the International Joint Commission (IJC)
- “...waters flowing across the boundary shall not be polluted on either side to the injury of health or property of another”



# International Joint Commission



- Elk-Kootenai/y Reference to the International Joint Commission
- First ever Tri-Lateral Reference to the International Joint Commission
- Explore the impacts of water pollution in the Kootenai/y watershed – water quality, impacts to human health, impacts to ecosystems, mitigation

# Thank you!



KTUNAXA  
NATION



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