



# Report on Our Work in 2023

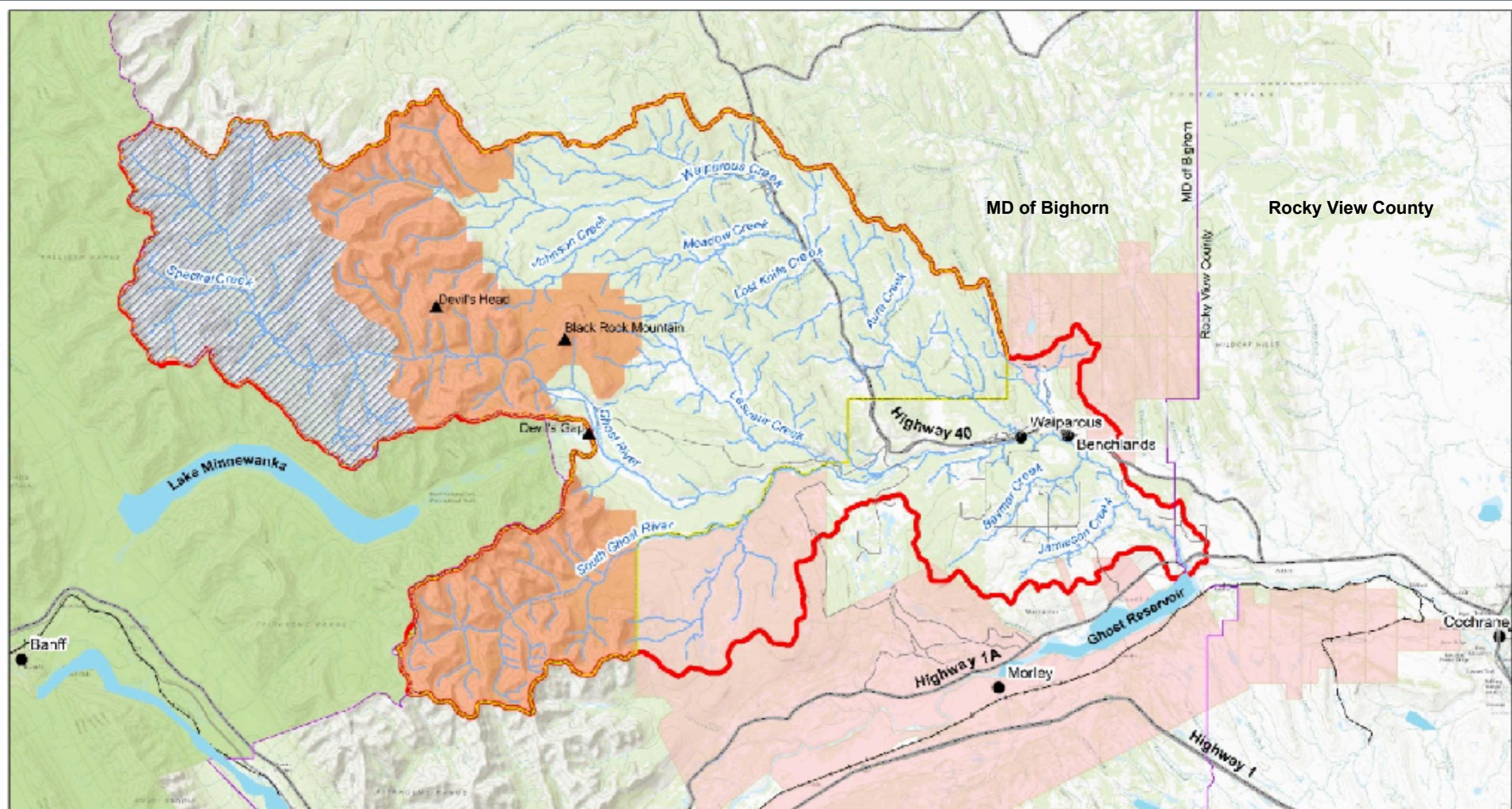
Presented by:  
Marina Krainer  
Executive Director

GWAS AGM  
The Crossing at Ghost River  
November 25, 2023



Photo credit: C. Hill

# The Ghost Watershed



- Towns
- Ghost River Wilderness Area
- MD of Bighorn
- Rocky Mountains Forest Reserve

- Ghost Watershed
- Banff National Park
- First Nation Reserves
- Don Getty Wildland Provincial Park

- Water Network
- Minor Roads
- Rail Network
- Road Network

0 2 4 6 8 km  
1:185,000  
GCS: NAD83 UTM11

Map by The ALCEC Group  
Updated on July 19, 2017  
Source: Geographic Database, ESRI Imagery

# Who is GWAS?

- ◆ Watershed Stewardship Group (WSG)
- ◆ Established 2002 (celebrated 20 years last year)
- ◆ Largely volunteer driven



Photo credit: K. Unger

# What does GWAS do?

- ◆ Gather and share knowledge
- ◆ Raise awareness
- ◆ Work collaboratively to improve watershed health



Photo credit: M. Krainer

# GWAS Operations Plan - Strategic Objectives

- ◆ Science, research, monitoring & knowledge
- ◆ Outreach, awareness, education
- ◆ Advice and recommendations
- ◆ Ecosystem repair and enhancement

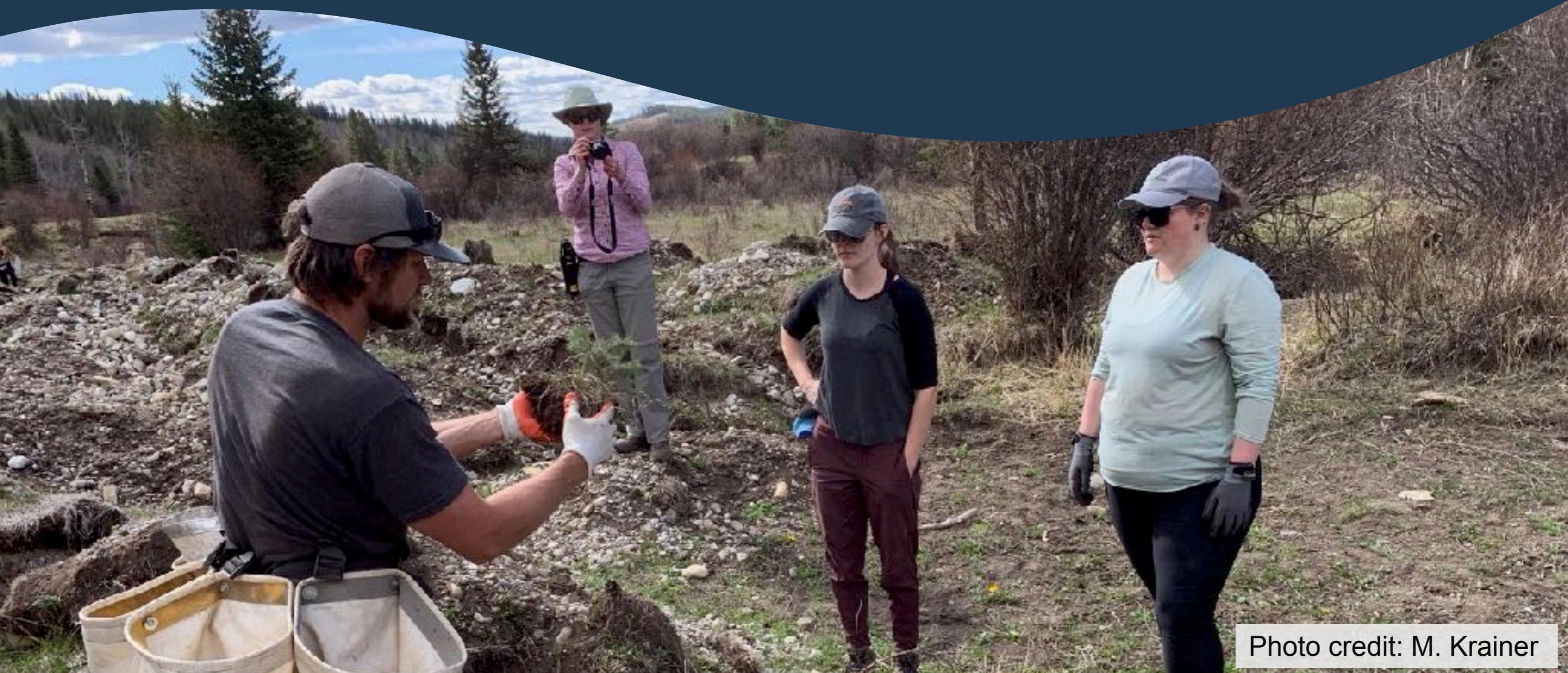


Photo credit: M. Krainer

# Ghost River State of the Watershed Report (2018)

- ◆ Water quality data gaps were identified.
- ◆ **Report Recommendation:** “Perform aquatic invertebrate sampling (as per the Canadian Aquatic Biomonitoring Network protocols) at sites within the Ghost Watershed, and use Ephemeroptera, Plecoptera and Trichoptera (EPT) ratios as a proxy for water quality.”

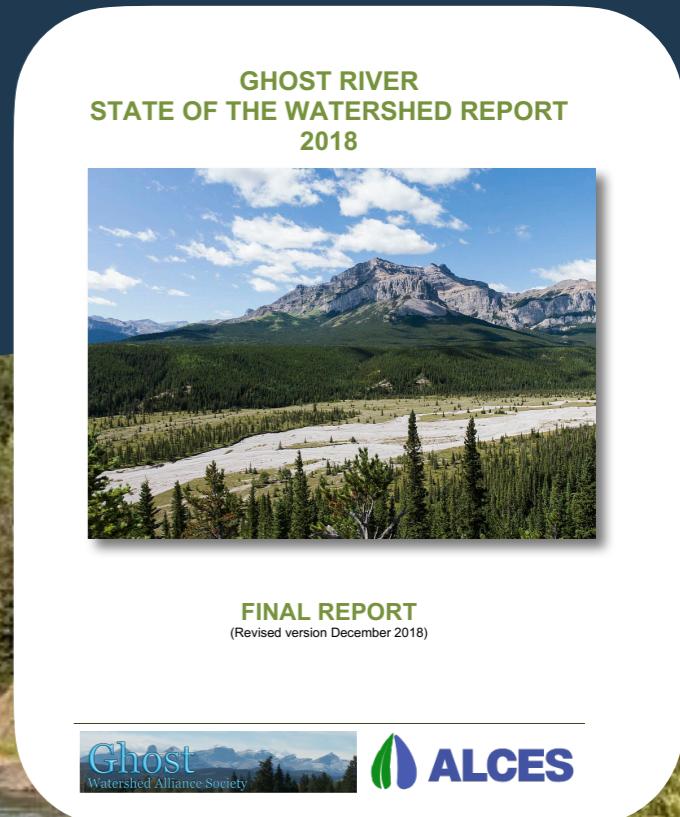


Photo credit: M. Krainer

# Ephemoptera, Plectoptera and Trichoptera



Mayflies (E)

Stoneflies (P)

Caddisflies (T)

Sensitive



Flies and Midges (C)

Tolerant

Ratio of EPT / EPT + C  
Indicator of water quality

# What is CABiN?

- ◆ CABiN - Canadian Aquatic Biomonitoring Network
- ◆ National biomonitoring program developed by Environment and Climate Change Canada
- ◆ Provides standardized sampling protocols



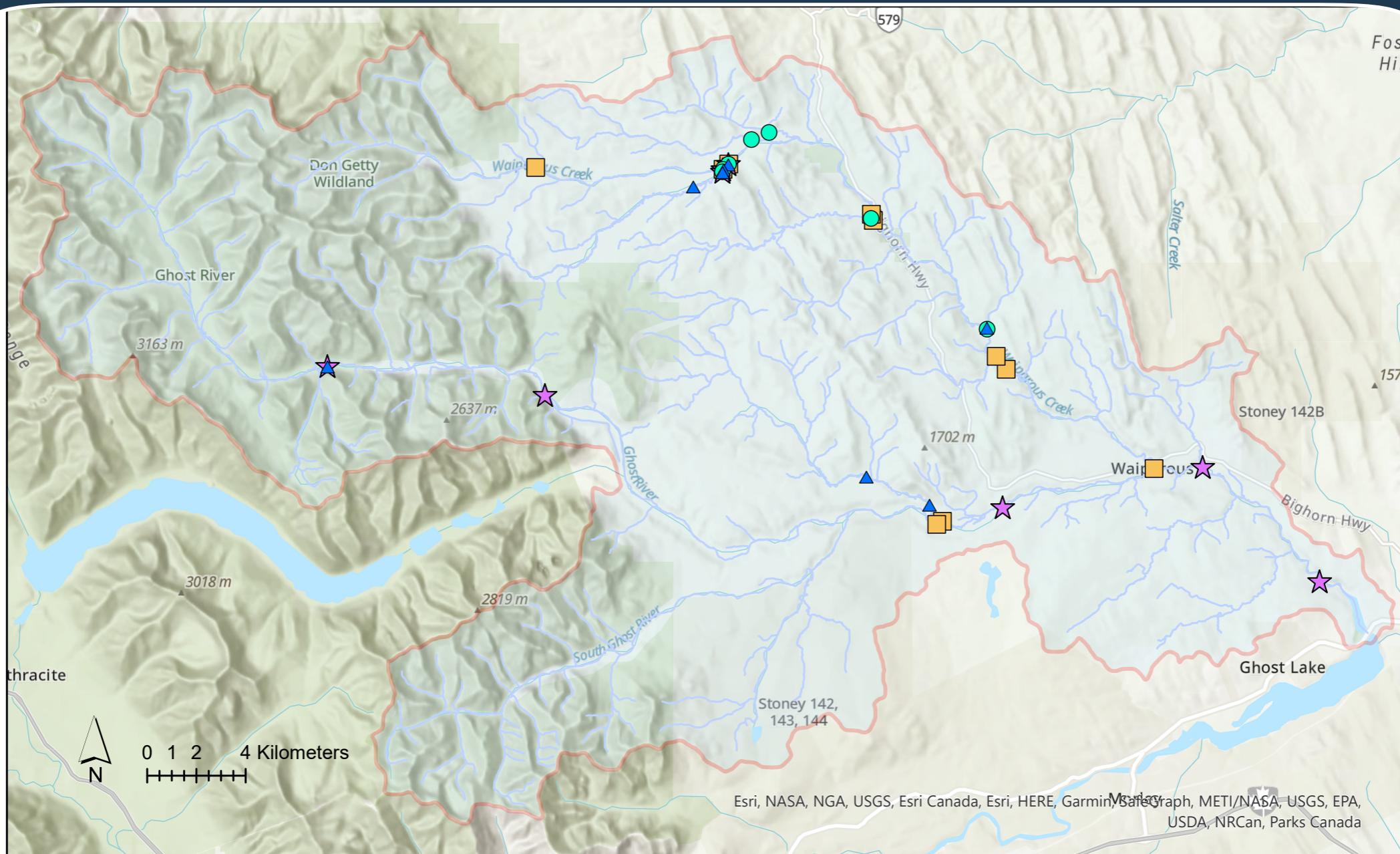
# GWAS Water Monitoring Plan

- ◆ Initially a 3-year plan: 2020 - 2022
- ◆ Three focus areas; Ghost River, Waiparous Creek, tributaries
- ◆ CABiN and STREAM, temperature loggers and lead testing



# Ghost Watershed Sampling Sites 2020 - 2023

- ◆ 10 sites in 2020
- ◆ 7 sites in 2022
- ◆ 8 sites in 2021
- ◆ 8 sites in 2023



▲	2023
●	2022
★	2021
■	2020
—	Streams
■	Ghost_Basin_Project

Author: GWAS  
Date Published: November 22, 2023  
Scale: 1:225,000  
Data Sources: GWAS, MacHydro, Esri Basemap  
Coordinate System: NAD83 10TM AEP Forest

# GWAS Aquatic Bio-monitoring in 2023

- ♦ Sampled 8 sites in 2023:
  - ♦ Tributaries: Aura Creek, Lesueur Creek (2 sites), Johnson Creek (2 sites)
  - ♦ Ghost River: 1 site (Ghost Wilderness)
  - ♦ Waiparous Creek: 2 sites



Photo credit: C. Hill

# CABiN Results to Date

- ◆ Benthic macro-invertebrate health mostly very good to excellent
- ◆ Water quality mostly excellent
- ◆ Some anomalies and indications of land-use impacts



Photo credit: C. Hill

# CABiN - Collaboration

- ◆ Eastern Slopes Collaborative formed
  - ◆ Organizations all along Alberta's Eastern Slopes
  - ◆ Exchange information, share expertise, support each other
- ◆ BRBC CABiN workshops: November 2022, 2024 (Date TBA)

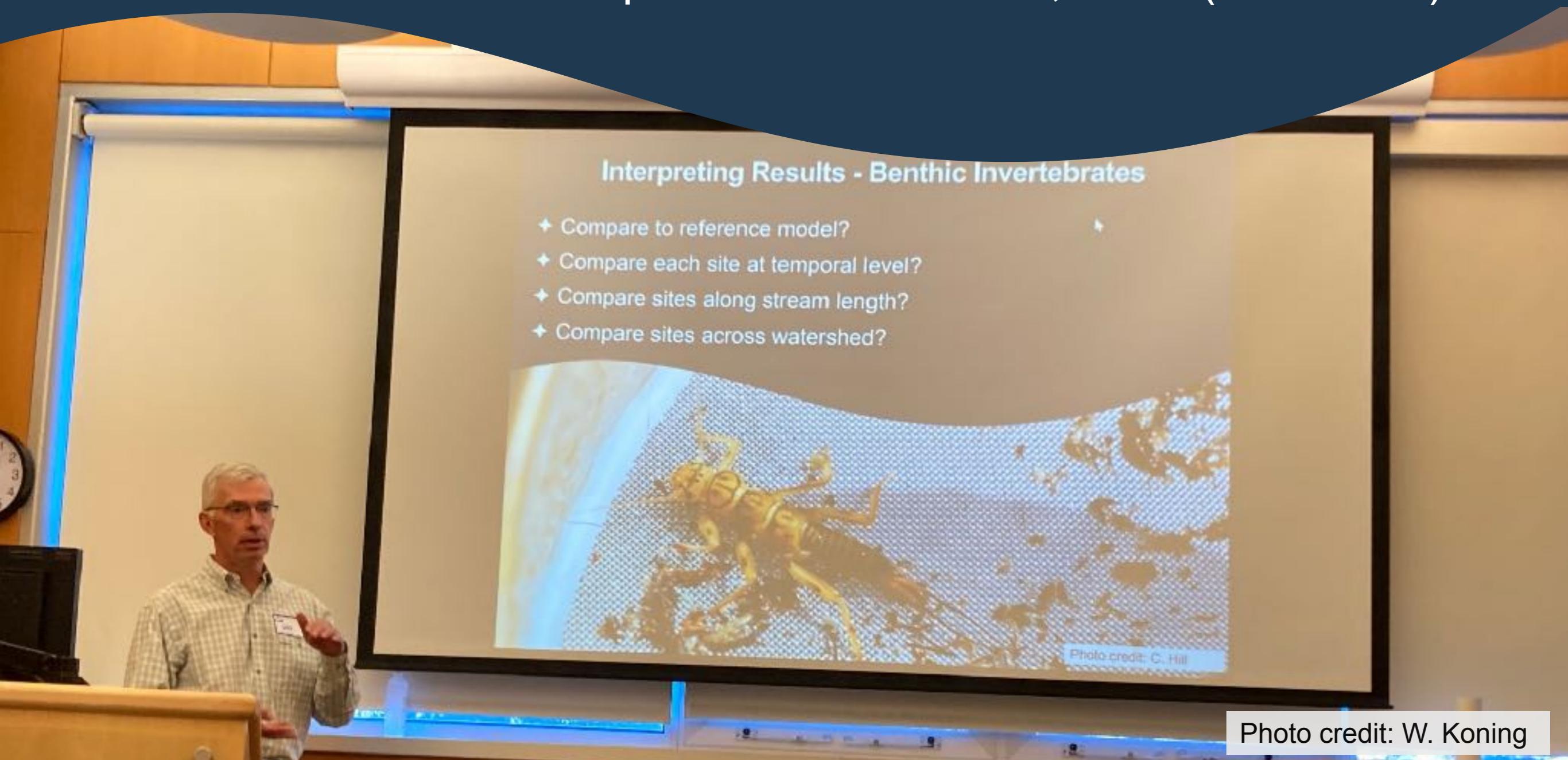


Photo credit: W. Koning

# CABiN - Training

- ◆ 2023 CABiN field training took place in Bragg Creek
- ◆ Sofie Forsstrom, Oldman Watershed Council, CABiN Trainer  
GWAS ED supported field training course this year
- ◆ Five newly certified CABiN Field Technicians



Photo credit: M. Krainer

# GWAS Water Monitoring Plan

- ◆ Added stream temperature loggers in 2021
- ◆ Installed 12 stream temperature loggers again in 2023
- ◆ Data shared with GoA Fisheries Biologists and fRI Research



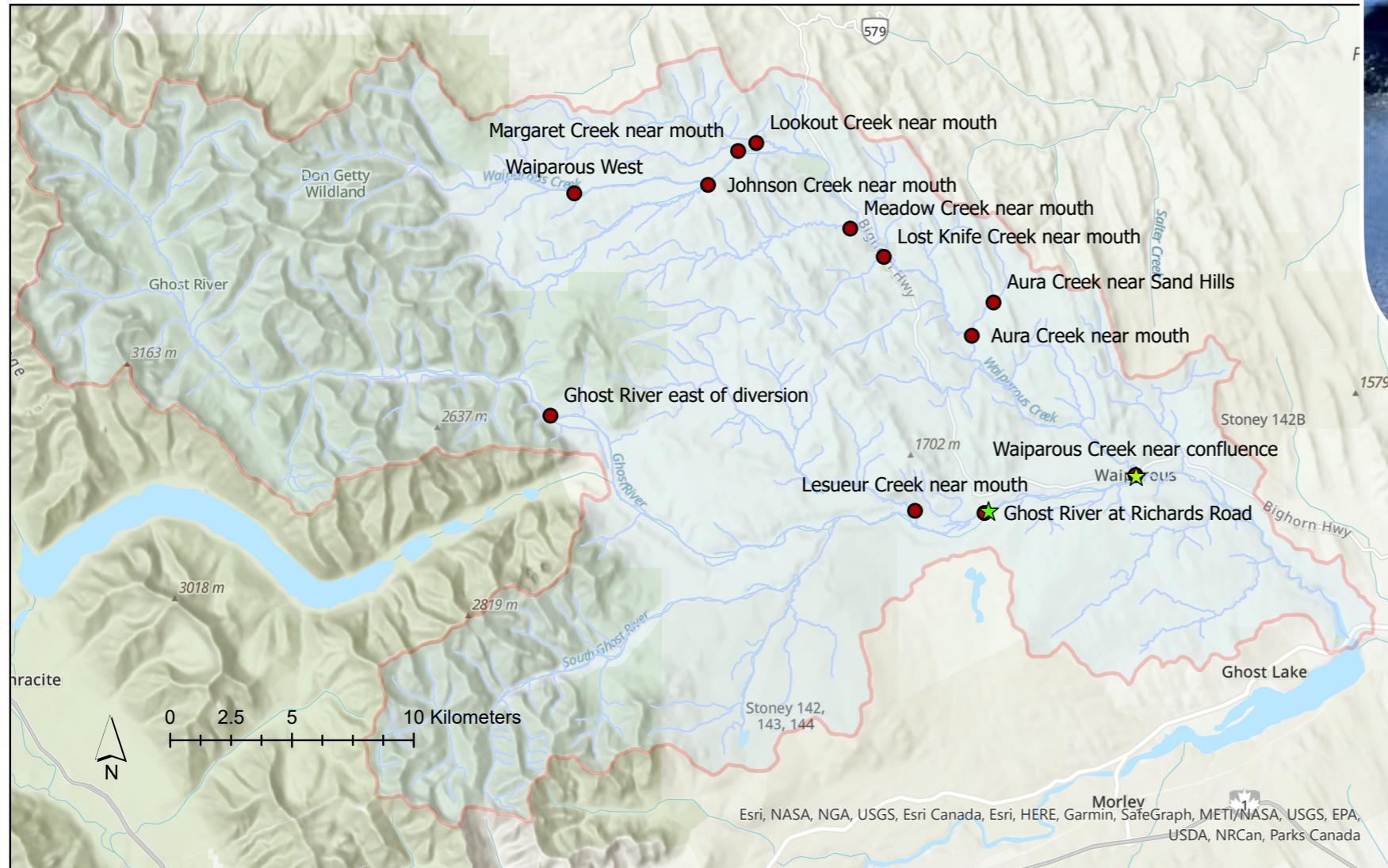
Photo credits: C. Hill

# Stream Temperature Loggers

- ♦ Great volunteer commitment!
- ♦ Always looking for more volunteers!



GWAS Temperature Logger Data Collection Sites 2022 and 2023



Water Survey of Canada Stations	2022 and 2023 Temperature Logger site
Station_No	Streams
05BG010	Ghost_Basin
05BG006	

# GWAS Water Monitoring Plan

Lead testing:

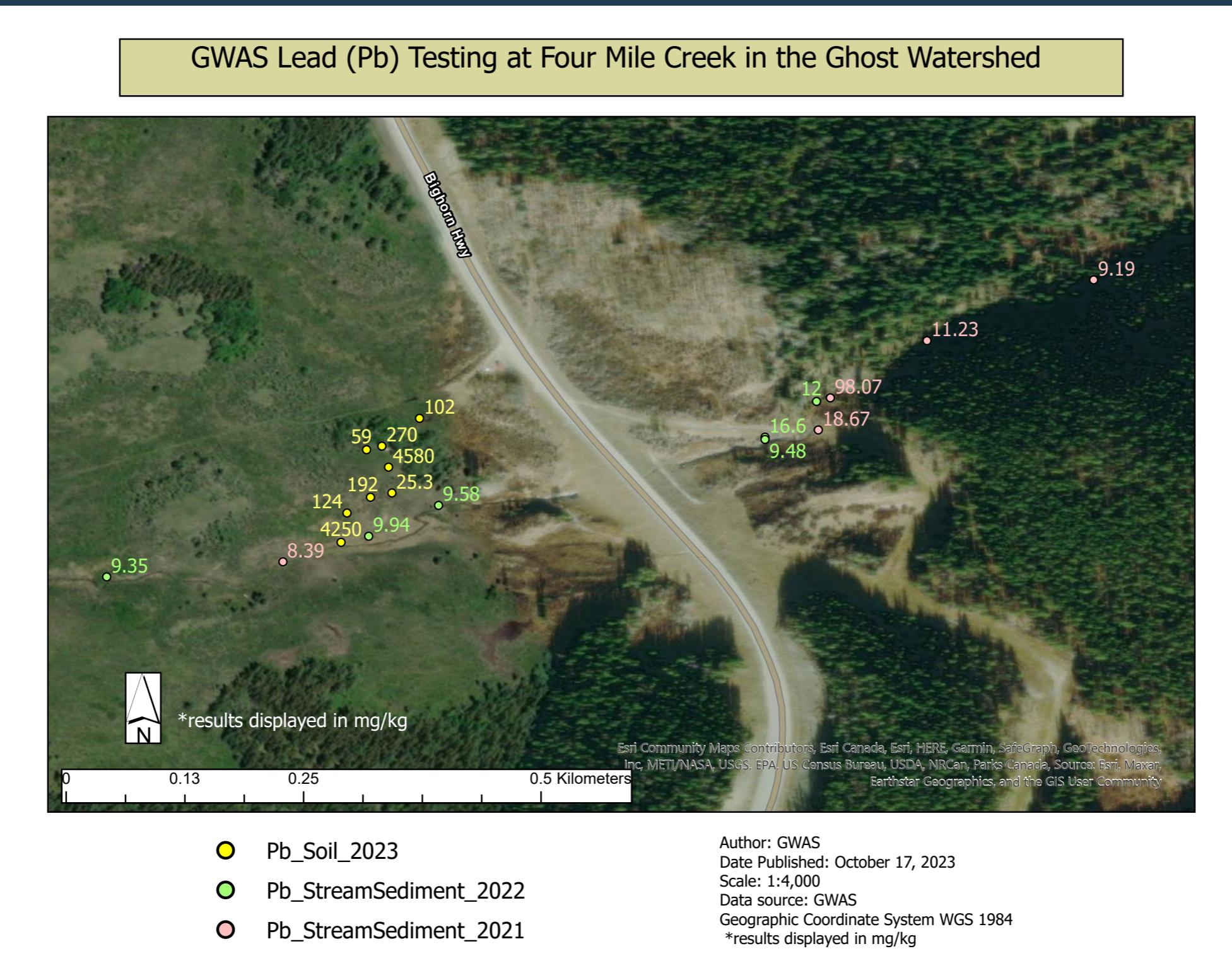
- ◆ Four Mile Creek
- ◆ Samples taken 2021-2023
- ◆ Smaller amounts of lead were found in stream sediment with higher values at shooting sites



Photo credits: M. Krainer

# GWAS Water Monitoring Plan - Lead

- ♦ Soil samples taken in 2023 showed high lead concentrations in several locations.
- ♦ Letter outlining findings submitted to GoA in November 2023



# Working Together on Native Trout Recovery

- ♦ Collaboratively work on awareness, closing data gaps and restoration
- ♦ Cows and Fish Native Trout workshops



Photo credit: M. Krainer

# Working Together on Native Trout Recovery

- ◆ Virtual workshop held on March 29, 2023
- ◆ Hosted by Cows and Fish
- ◆ 56 people attended!



**HOSTED BY**  
AMY MCLEOD  
COWS & FISH

**PRESENTERS**

<b>SPEAKER</b>	<b>TOPIC</b>
MARINA KRAINER	USING BIOENGINEERING FOR EROSION CONTROL
MAGI SCALLION	DESIGNING SUSTAINABLE TRAILS
DANNON KRUSE	CALGARY ATV RIDERS ASSOCIATION STEWARDSHIP PROJECTS IN THE GHOST
BARRY TUNZELMANN	2022/23 MARGARET LAKE PROJECTS

MARINA KRAINER  
GHOST WATERSHED ALLIANCE SOCIETY

MAGI SCALLION  
MCELHANNEY

DANNON KRUSE

BARRY TUNZELMANN

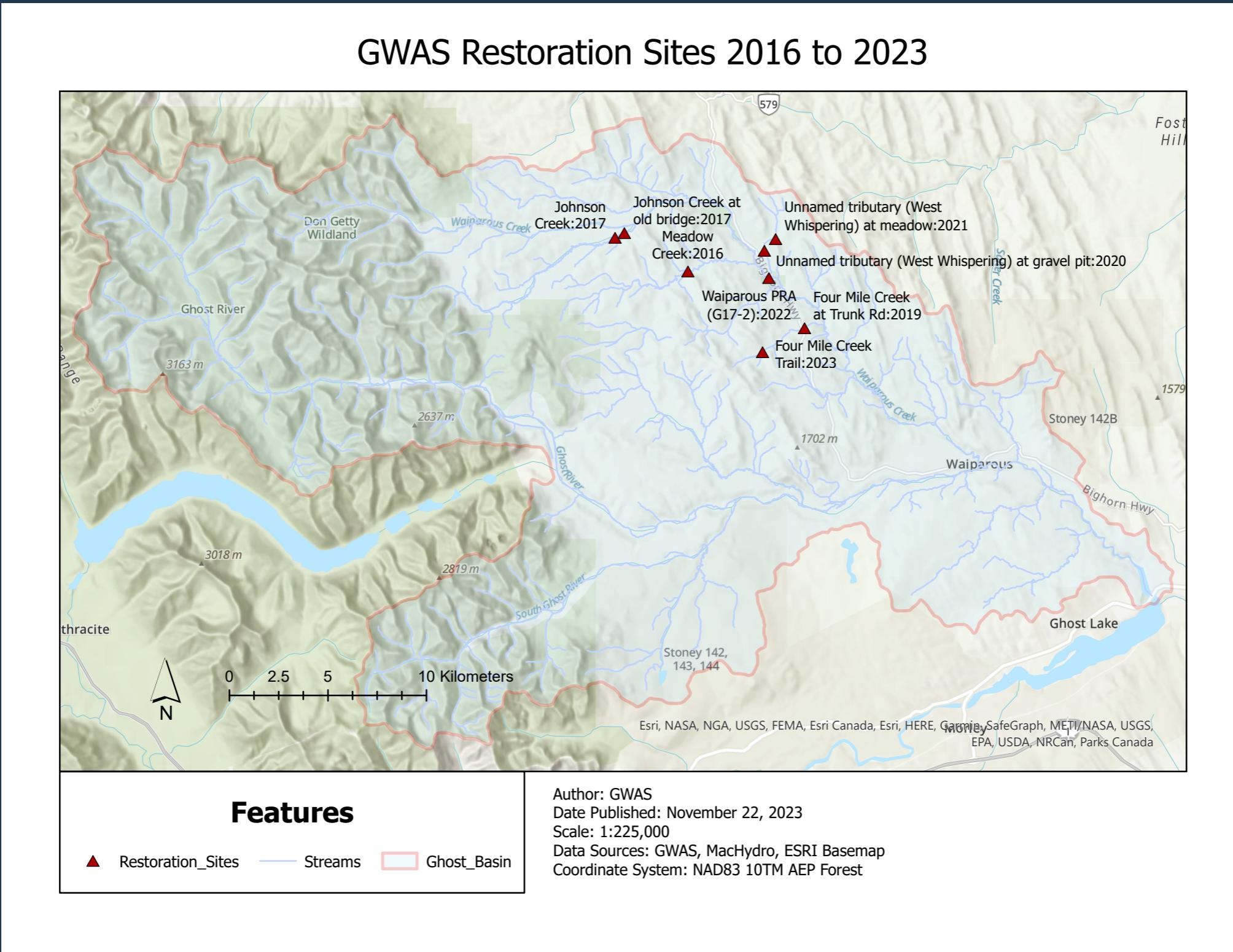
# Why do we undertake bioengineering?

- ◆ Control erosion
- ◆ Prevent channeling of run-off
- ◆ Prevent excessive amounts of sediment from ending up in streams
- ◆ Re-establish riparian vegetation



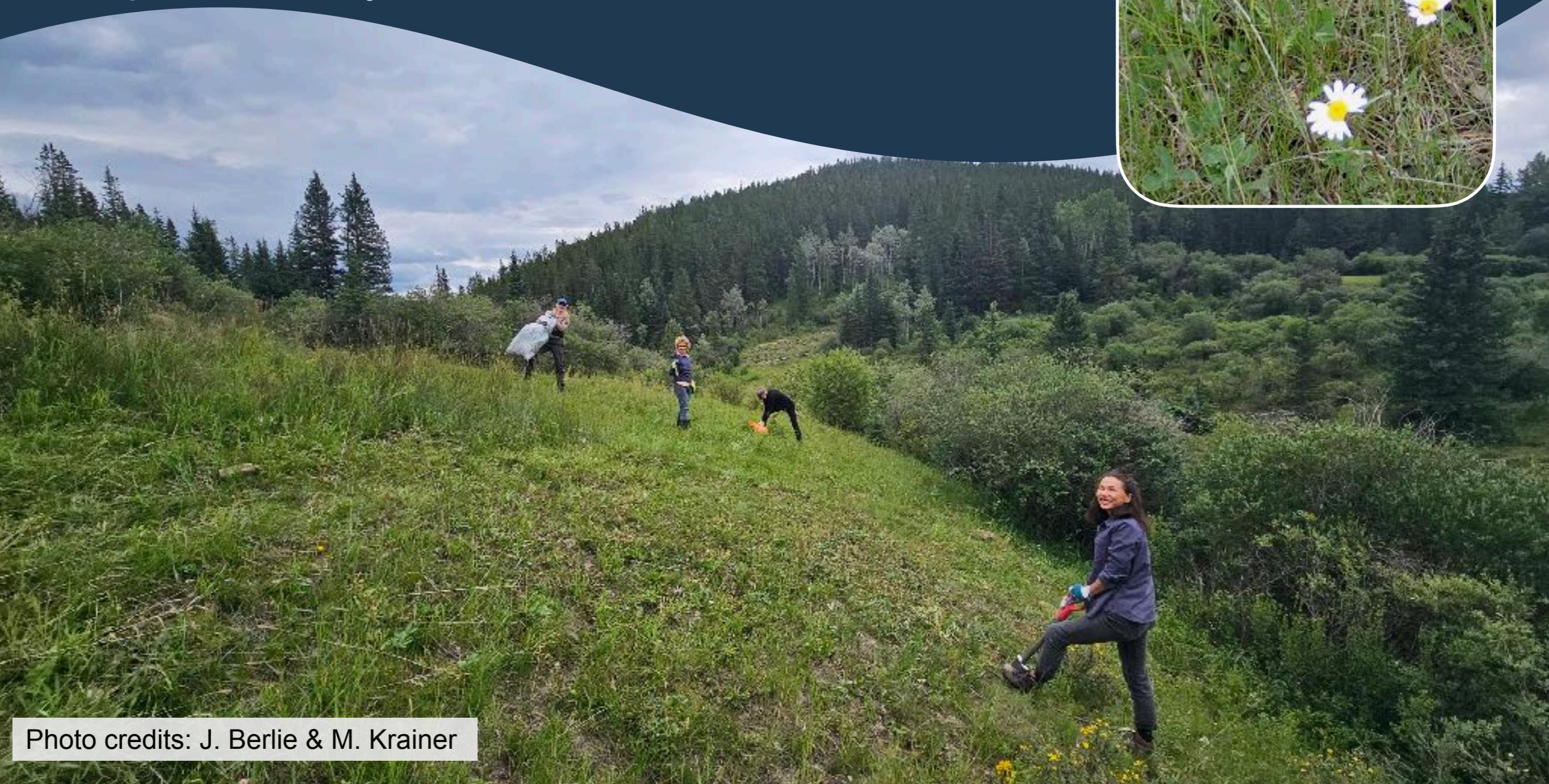
# Bioengineering Sites

- ♦ Undertaken in partnership with many organizations.
- ♦ BHA, BTFR, CARA, T4T, TUC, C&F, AEPA



# Bio-engineering Site Maintenance

- ◆ July 27: Field day at 2019 and 2022 restoration sites
- ◆ Four Mile Creek site (2019): pulled ox-eye daisies and thistles



# Bio-engineering Site Maintenance

- ◆ Waiparous Creek bridge site (2022):
  - ◆ Pulled perennial sow-thistle
  - ◆ Collected and spread local native seeds
  - ◆ Added some woody debris



# Bio-engineering Workshop

- ◆ Held virtually on Sept. 28
- ◆ Presentations by Elliot Lindsay (TUC), bio-engineering specialist Jon Berlie and GWAS ED
- ◆ 5 attendees



The image is a composite of two parts. On the left is a presentation slide for a 'Bio-engineering Workshop' titled 'Using Bio-engineering For Erosion Control'. The slide features the logo of 'Ghost Watershed Alliance Society' with a background image of a mountainous landscape. The text on the slide includes the workshop title, date ('September 28, 2023'), and presenter ('Presented by: Marina Krainer, Executive Director, GWAS'). On the right is a photograph of a riverbank. The bank is made of gravel and has several small, young trees or shrubs planted in it, supported by vertical stakes. In the background, a body of water with some floating debris is visible.

**Ghost Watershed Alliance Society**

**Using Bio-engineering For Erosion Control**

Bio-engineering Workshop:  
Techniques to improve recreational trail systems  
September 28, 2023

Presented by:  
Marina Krainer  
Executive Director, GWAS

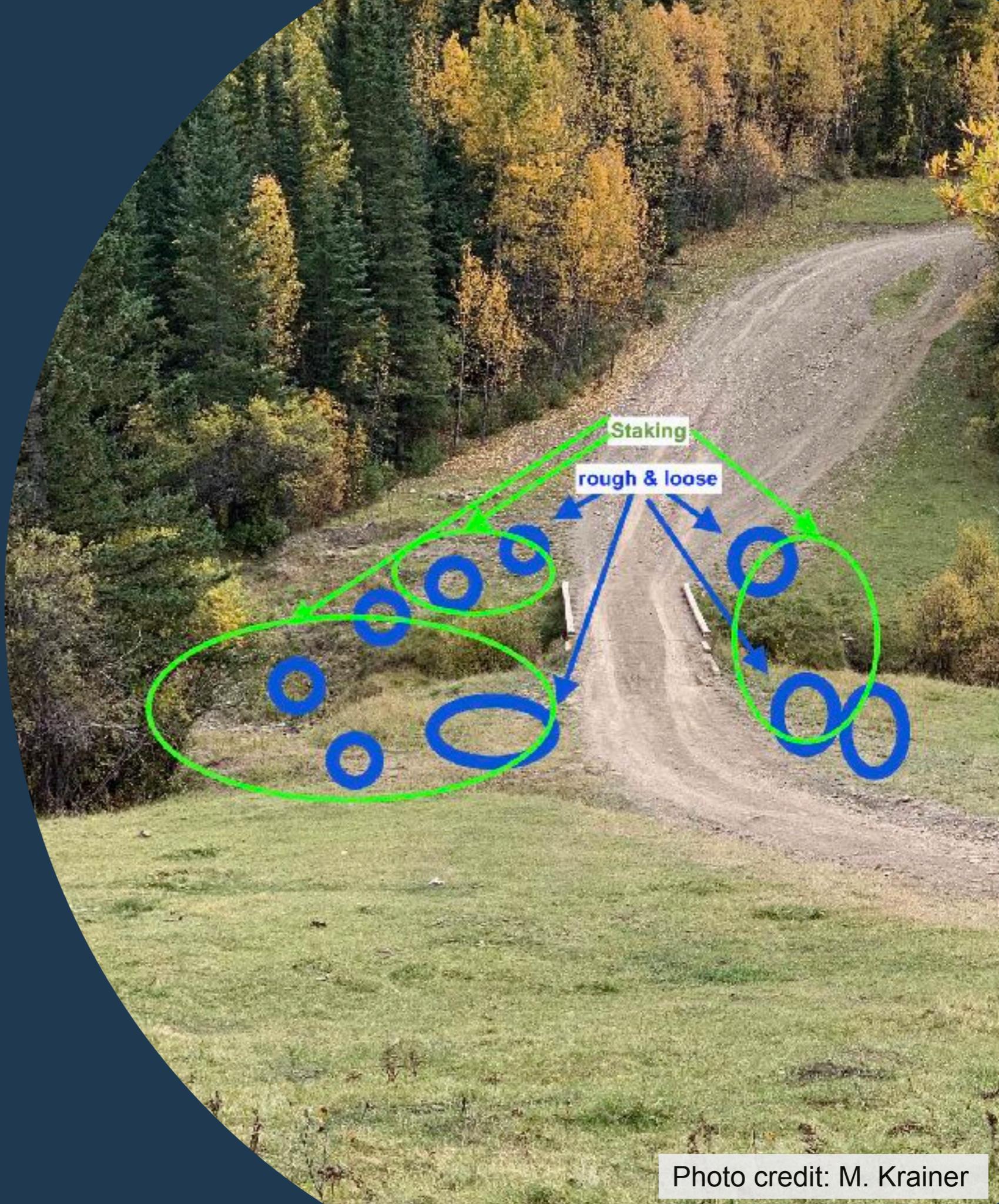
# This year's bio-engineering projects

- ◆ 2 sites in 2023
- ◆ Four Mile Creek, Lost Knife Trail bridge
- ◆ Waiparous Creek, PRA OHV bridge



# Lost Knife Trail Bridge Site

- ◆ Designated 4x4 trail
- ◆ Site was identified as high priority for restoration by TUC
- ◆ Originally planned for Sept. 30
- ◆ Rescheduled to Oct. 15 due to poor weather
- ◆ Permit (TFA) obtained from Lands Division – Forestry and Parks



# Benefits of Rough and Loose Technique

- ◆ Prevents overland flow
- ◆ Promotes infiltration
- ◆ Prevents erosion
- ◆ Provides diverse habitat



Photo credit: E. Lindsay

# Lost Knife Trail Bridge Site

- ◆ 7 volunteers
- ◆ 1 excavator with operator, rough and loose
- ◆ App. 600 willow stakes planted

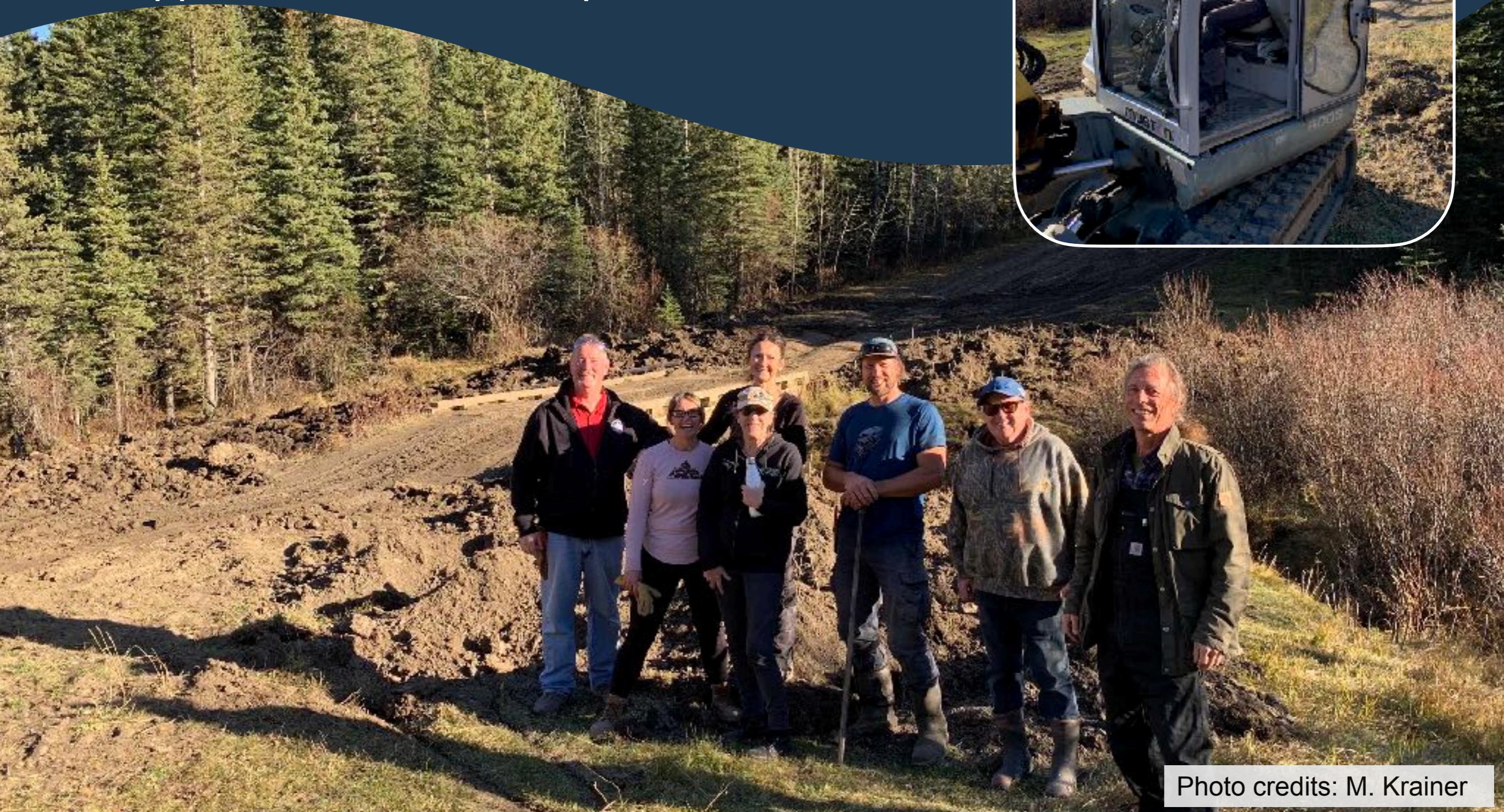


Photo credits: M. Krainer

# Waiparous Creek PRA - OHV Bridge Site

- ◆ Noticed tracks into creek next to designated OHV bridge this summer
- ◆ Discussed issue with AB Parks and applied for permit
- ◆ Received permit on Friday at 4pm!



# Waiparous Creek PRA - OHV

- ◆ 5 volunteers
- ◆ 1 excavator with operator, rough and loose
- ◆ App. 500 willow stakes planted



Photo credits: M. Krainer

# Bio-engineering workshops

- ◆ Promote collaboration
- ◆ Team-building
- ◆ Opportunity to share knowledge and perspectives
- ◆ Improve watershed health and fish habitat

Generously funded by:



# Thank you to our Bio-engineering Specialist!

- ◆ Jon Berlie -  
Burly Creations
- ◆ Diploma in restoration  
of natural systems,  
University of Victoria
- ◆ Certified ecological  
restoration practitioner  
with the Society for  
Ecological Restoration



Photo credit: M. Krainer

# Assessment and Monitoring

- ◆ Comparison over time
- ◆ CABiN
- ◆ Riparian Health Inventories
- ◆ Undertake site revisits



# 2022 Bio-engineering Site Monitoring

- ◆ Significant survival and growth despite very dry fall and spring!
- ◆ Rough and loose captured lots of sediment



Photo credit: M. Krainer

# 2022 Bio-engineering Site Monitoring

2022



2023



Photo credits: J. Berlie

# 2022 Bio-engineering Site Monitoring

2022



2023



Photo credits: J. Berlie & M. Krainer

# Education & Outreach

- ◆ School field trips
- ◆ Calgary Mayor's Environmental Expo
- ◆ Field tours with partners, funders, government staff
- ◆ Presentations
- ◆ and more



Photo credit: J. Langbein

# Outreach to Recreational Users

- ◆ GWAS participated in Recreational Stewardship Fair hosted by Cows and Fish for the third year
- ◆ Opportunity to engage recreational users and network with motorized user groups.

Generously funded by:



# Walks in the Watershed

- ◆ Connect people to nature
- ◆ Show the beauty and the challenges
- ◆ Successfully completed over 80 walks and hikes since 2004
- ◆ 6 WiWs in 2023



Photo credit: M. Krainer

# Collaborative Work

- ◆ Bow River Basin Council (BRBC) Online State of the Basin
- ◆ BRBC Watershed Stewardship Coordinating Committee
- ◆ City of Calgary Source Water Protection Plan
- ◆ BRBC Forums and other workshops



Photo credit: W. Koning

# Being a Voice for the Watershed

- ♦ SLS forest harvest plans for Ghost Watershed
- ♦ On-going communication with GoA lands department on recreation issues (target shooting, random camping and trails)



Photo credits: K. Hull & M. Krainer

# Forestry

- ◆ First learned about new logging plans at May 2022 SLS Open House.
- ◆ Area was last logged in 2013/14 and areas to the north of it in 2020.

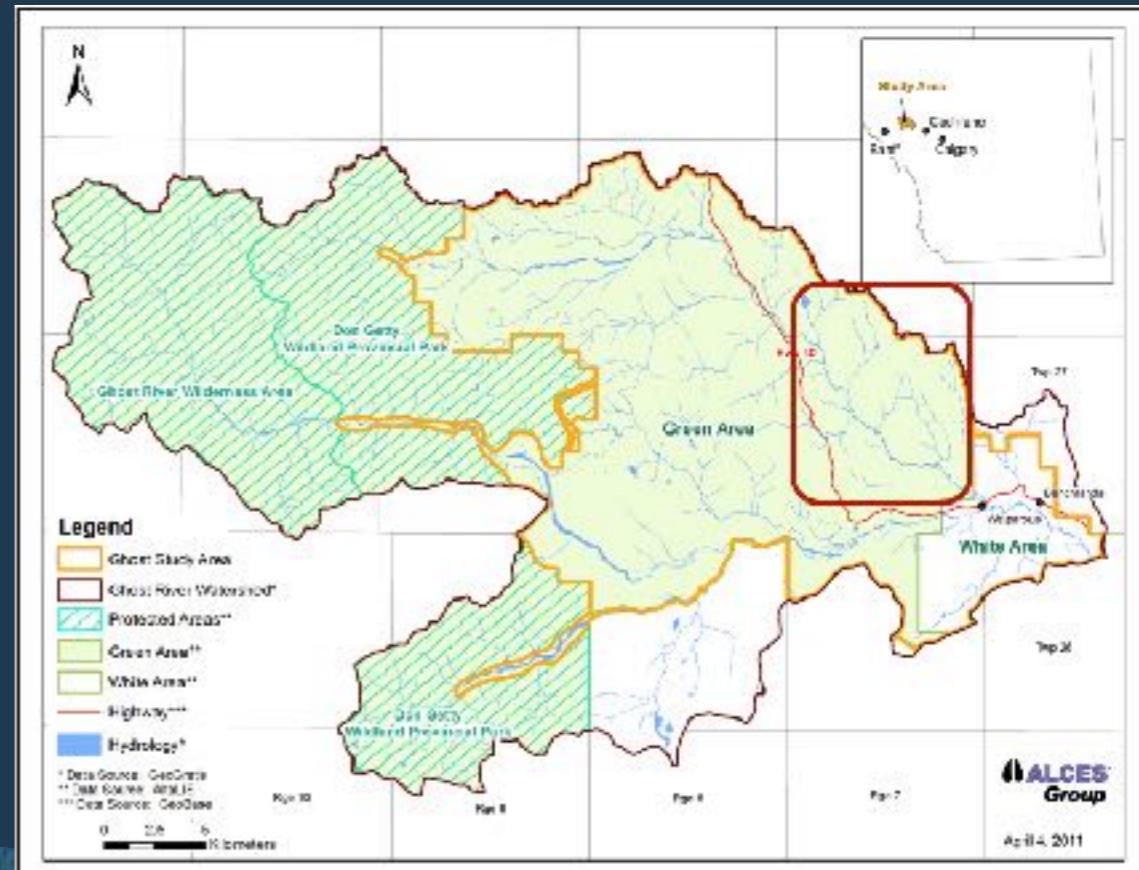


Photo credit: C. Hill

# Forestry

- ◆ New blocks right next to the 2013/14 blocks and around Sand Hills. Concentration of cut blocks in a relatively small area.
- ◆ Concerns about ecological integrity and function.

2013 Cut Block  
Photo taken: August 2023

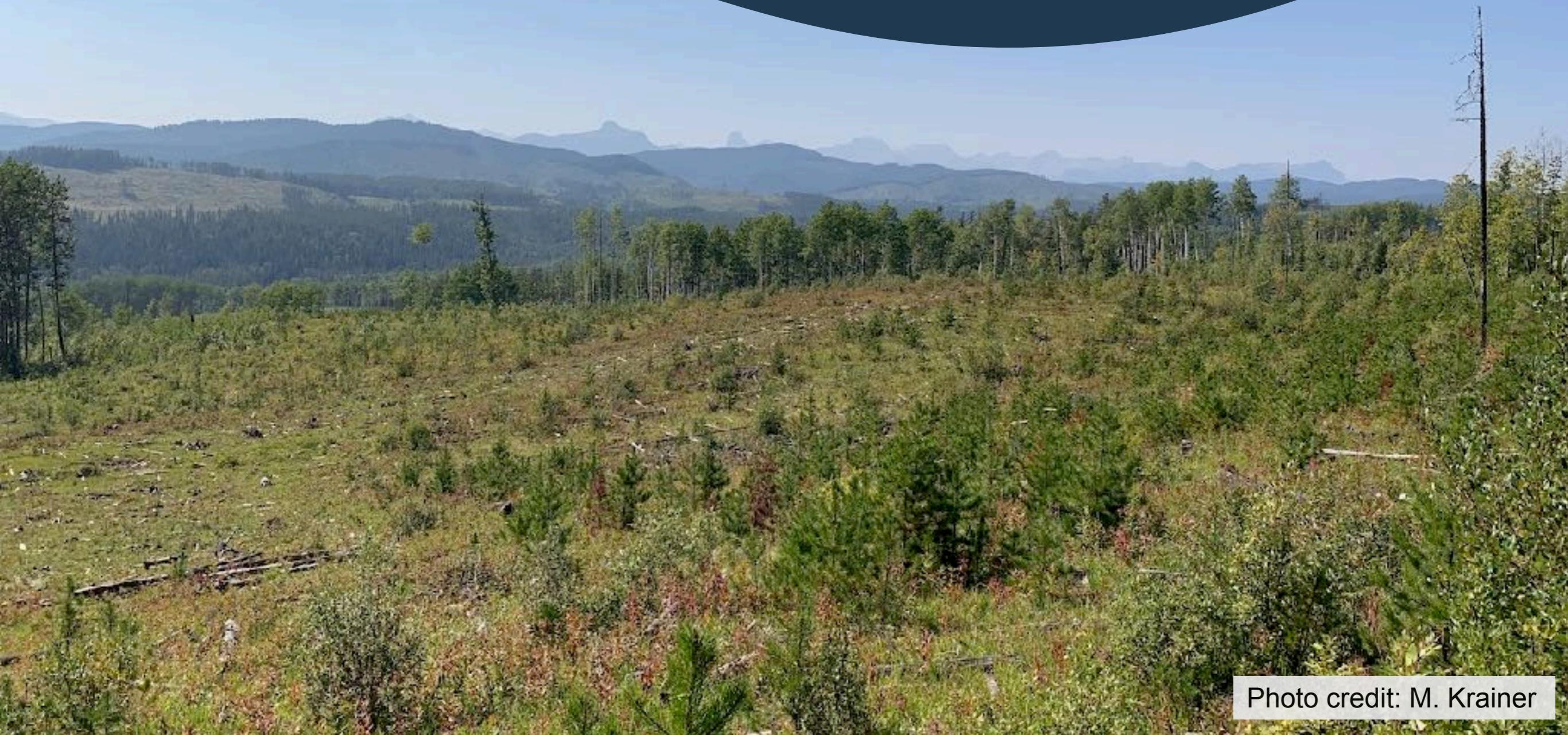


Photo credit: M. Krainer

# Forestry

- ◆ Sent letter outlining concerns to SLS in Sept 2022
- ◆ Met with AB Forestry staff in November 2022 and June 2023
- ◆ Red tape reduction expedited approval process
- ◆ Met with SLS in June and in the field in August 2023

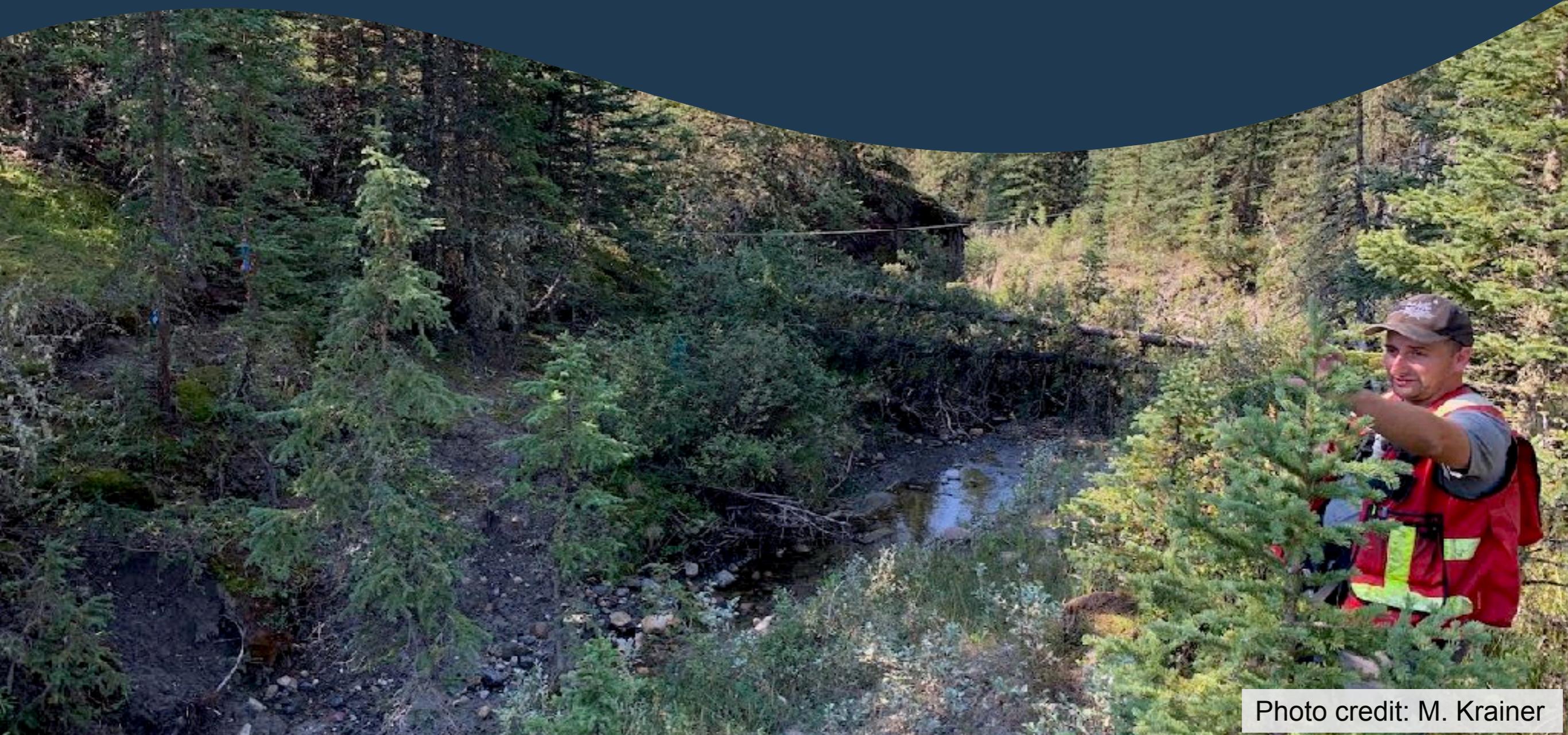
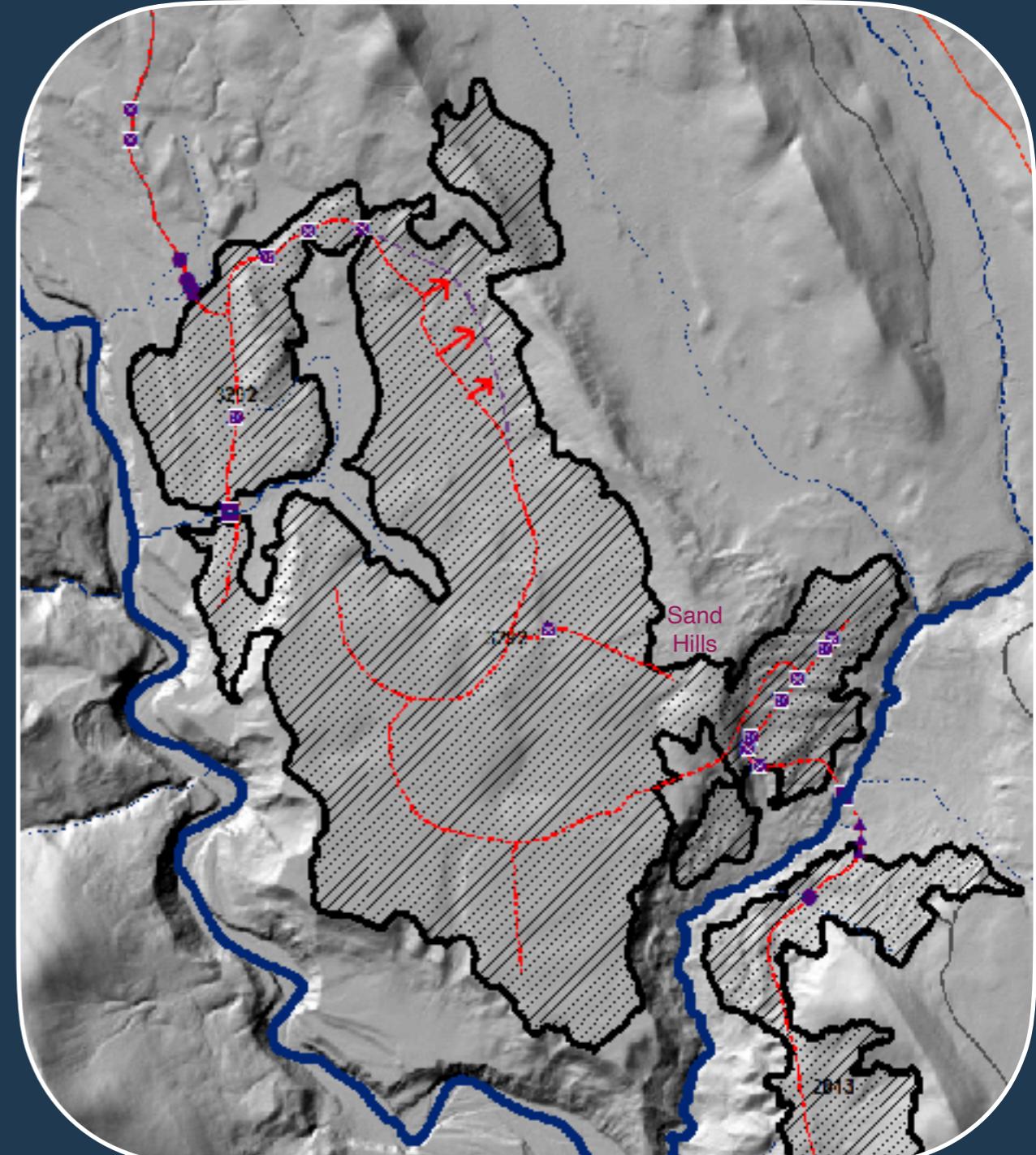
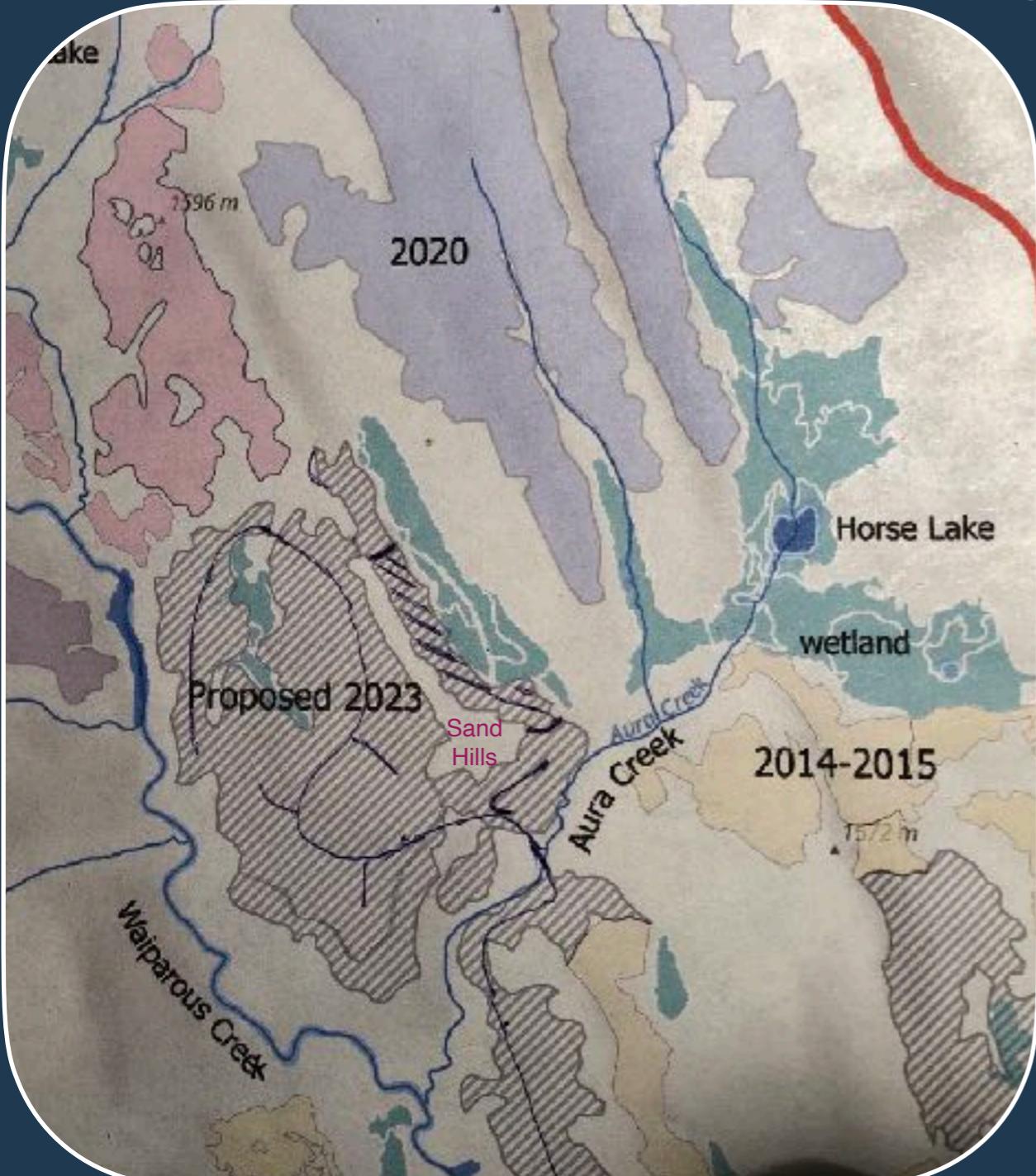


Photo credit: M. Krainer

# Changes to Logging Plans

- ♦ SLS agreed to reroute haul road away from areas with highly erodible soils at The Cache and the Sand Hills.
- ♦ Portion of block to the NE of Sand Hills removed from harvest plan.
- ♦ SLS will revisit location of bridge across Aura Creek.



# Western Toad

- ◆ COSEWIC Status: Special Concern (S3: vulnerable to extirpation or extinction)
- ◆ Found Western Toad tadpoles adjacent to Ghost River



Photo credit: M. Krainer

# Western Toad

- ◆ Reported illegal trail next to Ghost River at Richard Road (tracks through wetland with western toad and tadpoles present)
- ◆ Conservation officers are patrolling the area more frequently now



Photo credit: M. Krainer

# Western Toad

- ◆ Technical report produced by Peter Balagus, B.Sc., P.Biol., QWSP Wildlife - Wetlands Ecologist:  
*“Breeding Ecology of the Western Toad in the Ghost River Watershed” (2023)*
- ◆ Data submitted by Peter Balagus to AB government database
- ◆ Significant in-kind contribution by Peter. A big thank you to him!



Photo credit: M. Krainer

# Western Toad

- ◆ Contacted MD of Bighorn to propose bio-engineering project to protect breeding grounds near Richards Road
- ◆ Well received by MD. Planning on working collaboratively on this project in 2024.



Photo credit: M. Krainer

# Ghost River Diversion

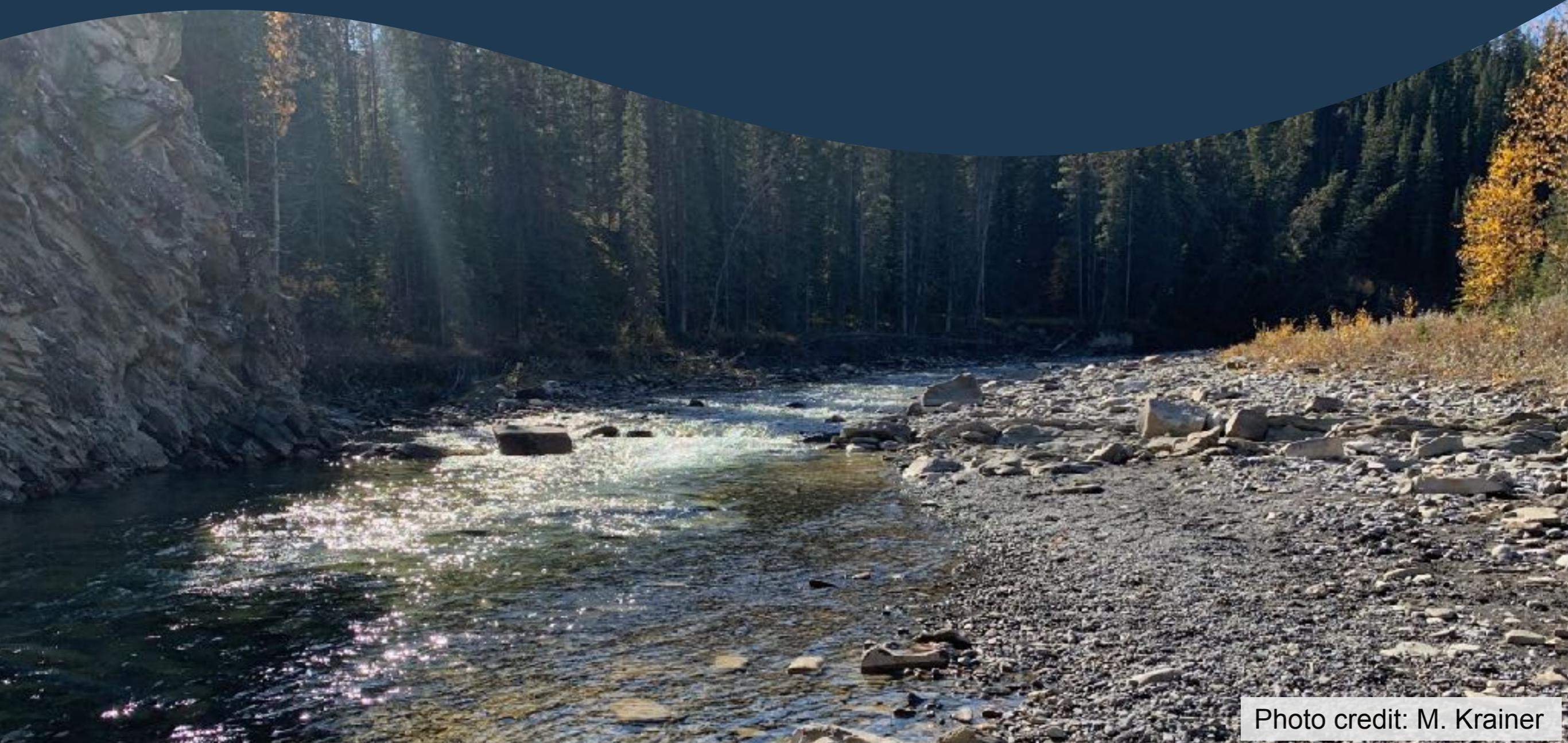
- ◆ Old diversion structure has been inoperable since 2013 flood
- ◆ TransAlta is proposing to rebuild the diversion with a new design
- ◆ Water Act application planned for 2024
- ◆ North Ghost River is home to a population of bull trout



Photo credit: H. Unger

# BRBC Groundwater Monitoring Program

- ◆ Looking for domestic groundwater well owners to participate.
- ◆ Equipment will be provided by BRBC.
- ◆ Detailed well log from when the well was drilled will be needed to find suitable wells.
- ◆ If you are interested in participating, we can provide more details!



# Thank You to our Volunteers!

- ♦ A dedicated, skilled and enthusiastic Board of Directors
- ♦ Passionate volunteers



Photo credit: C. Hill

# Plans for 2024

- ◆ Continue Water Monitoring Program,
- ◆ More Walks in the Watershed,
- ◆ On-going collaboration with partners,
- ◆ Bio-engineering,



Photo credit: M. Krainer

# Plans for 2024 (continued)

- ◆ Education & Outreach,
- ◆ Working with CARA and Trails4Tomorrow on projects and outreach,
- ◆ Continue to be a voice for the watershed.



Photo credit: M. Krainer

# How can you help?

- ◆ Being a member of GWAS / Joining the GWAS Board
- ◆ Raising awareness with family and friends
- ◆ Volunteering for field work (WQ sampling, bio-engineering, etc.)
- ◆ Helping with educational events
- ◆ Taking photos in the Ghost Watershed



Photo credit: M. Krainer

# Thanks to our Partners

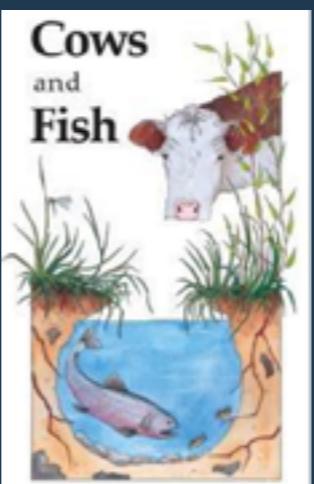


Photo credit: M. Krainer

# Thank you to our funders!

Alberta Conservation Association

Alberta Ecotrust

BP Volunteers

City of Calgary

Forest Resource Improvement Association of Alberta  
(FRIP grant sponsored by SLS and BRBC)

Land Stewardship Centre

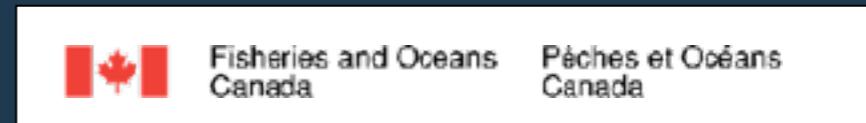
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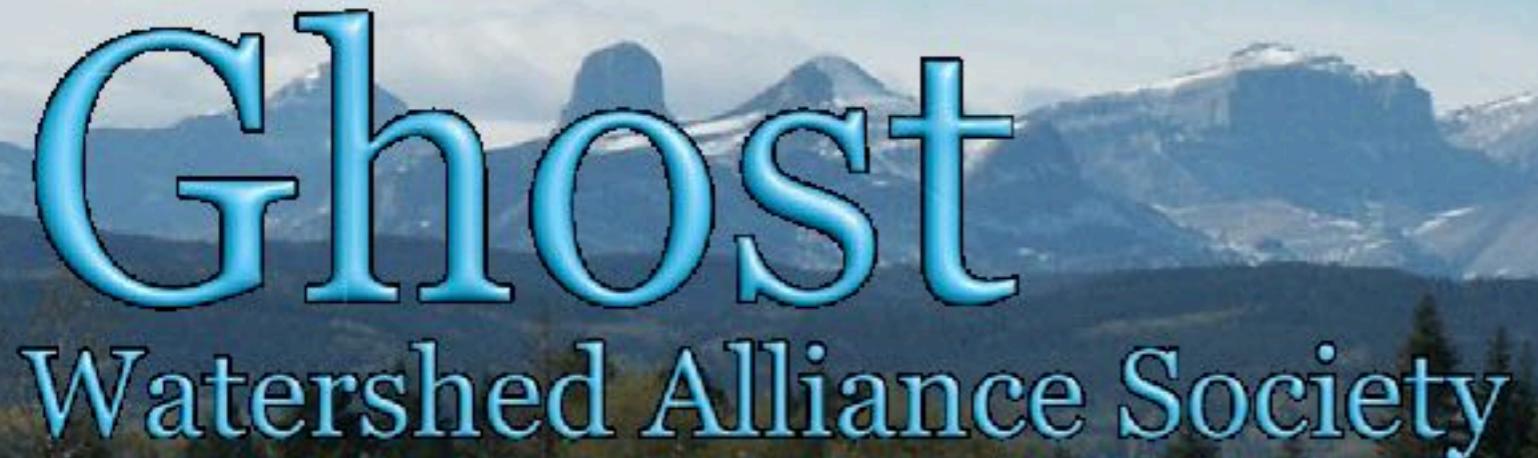
TD Friends of the Environment

Fisheries and Oceans Canada - Habitat Stewardship Program

&

our members and all the generous individual donors!





Thank you!

Questions?

For more information please visit our website:  
[WWW.GHOSTWATERSHED.CA](http://WWW.GHOSTWATERSHED.CA)