

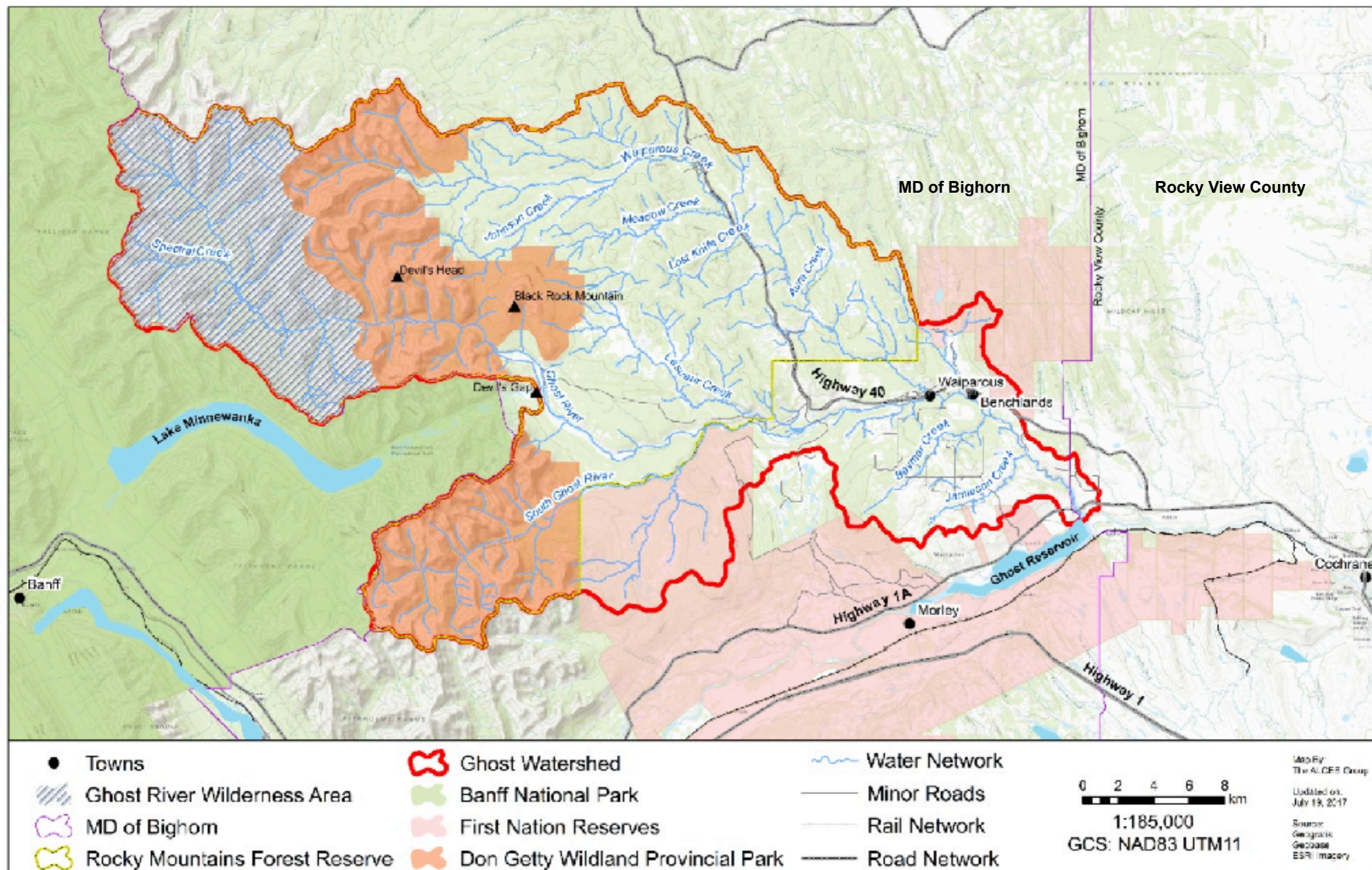
GWAS's Work in 2022

Presented by:
Marina Krainer
Executive Director

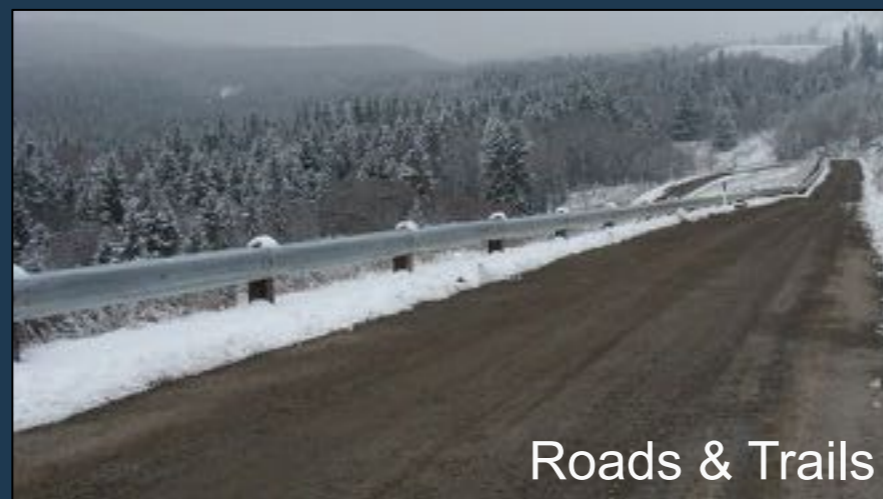
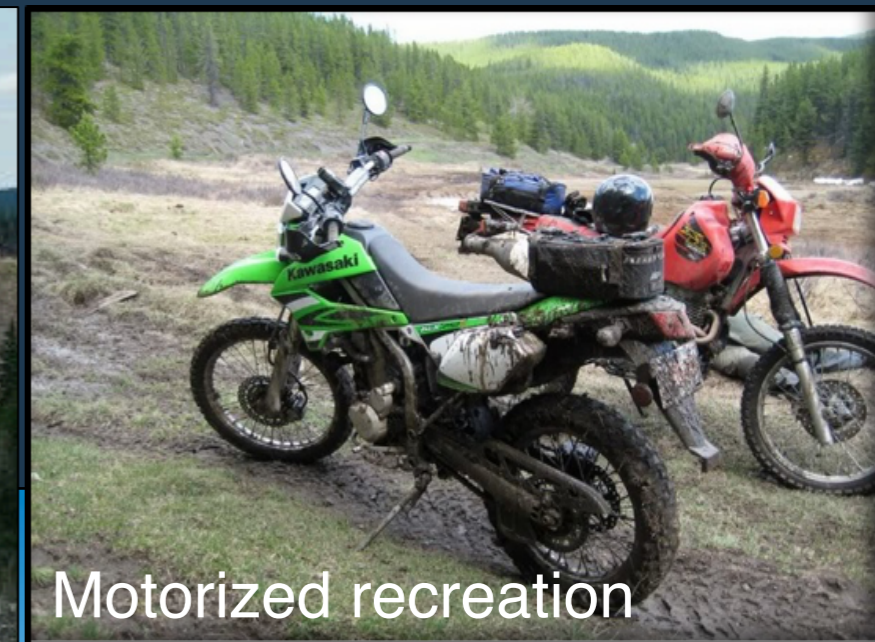
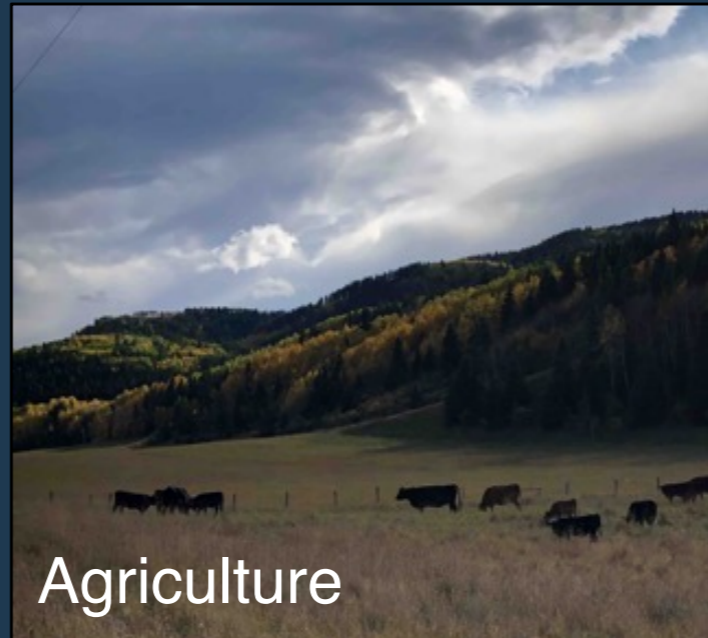
GWAS AGM
December 3, 2022



The Ghost Watershed



Land-use activities in the Ghost Watershed



Who is GWAS?

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



Photo credit: K. Unger

What does GWAS do?

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



GWAS Operations Plan - Strategic Objectives

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



Photo credit: M. Krainer

Understanding the Watershed

- ◆ Completed first State of the Watershed Report in 2018
- ◆ Highlighted challenges the watershed is facing
- ◆ Provided recommendations on how to close data gaps

GHOSH RIVER
STATE OF THE WATERSHED REPORT
2018



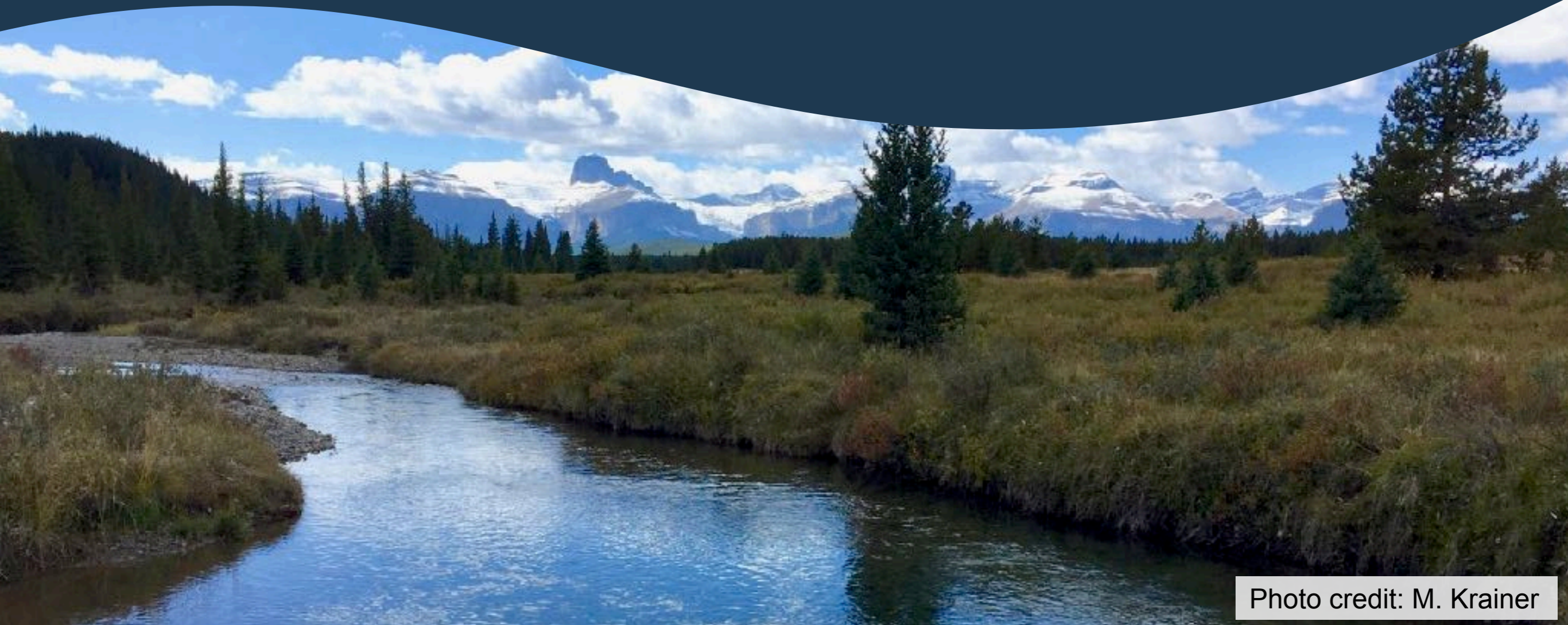
FINAL REPORT
(Revised version December 2018)

Ghost
Watershed Alliance Society

ALCES

Ghost River SOW Report

- ◆ 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.”



Ephemeroptera, Plecoptera and Trichoptera



Mayflies (E)



Stoneflies (P)



Caddisflies (T)

Sensitive



Flies and Midges (C)

Tolerant

Ratio of $EPT / EPT + C$
Indicator of water quality

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



What is CABiN?

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



Photo credit: C. Hill

How we got into Aquatic Bio-monitoring

- ◆ Presentation on CABiN by Living Lakes Canada at BRBC Forum in June 2019
- ◆ Four GWAS Directors became certified CABiN Field Technicians in 2019
- ◆ Two completed CABiN Project Manager certification



Photo credit: M. Krainer

Project Funding

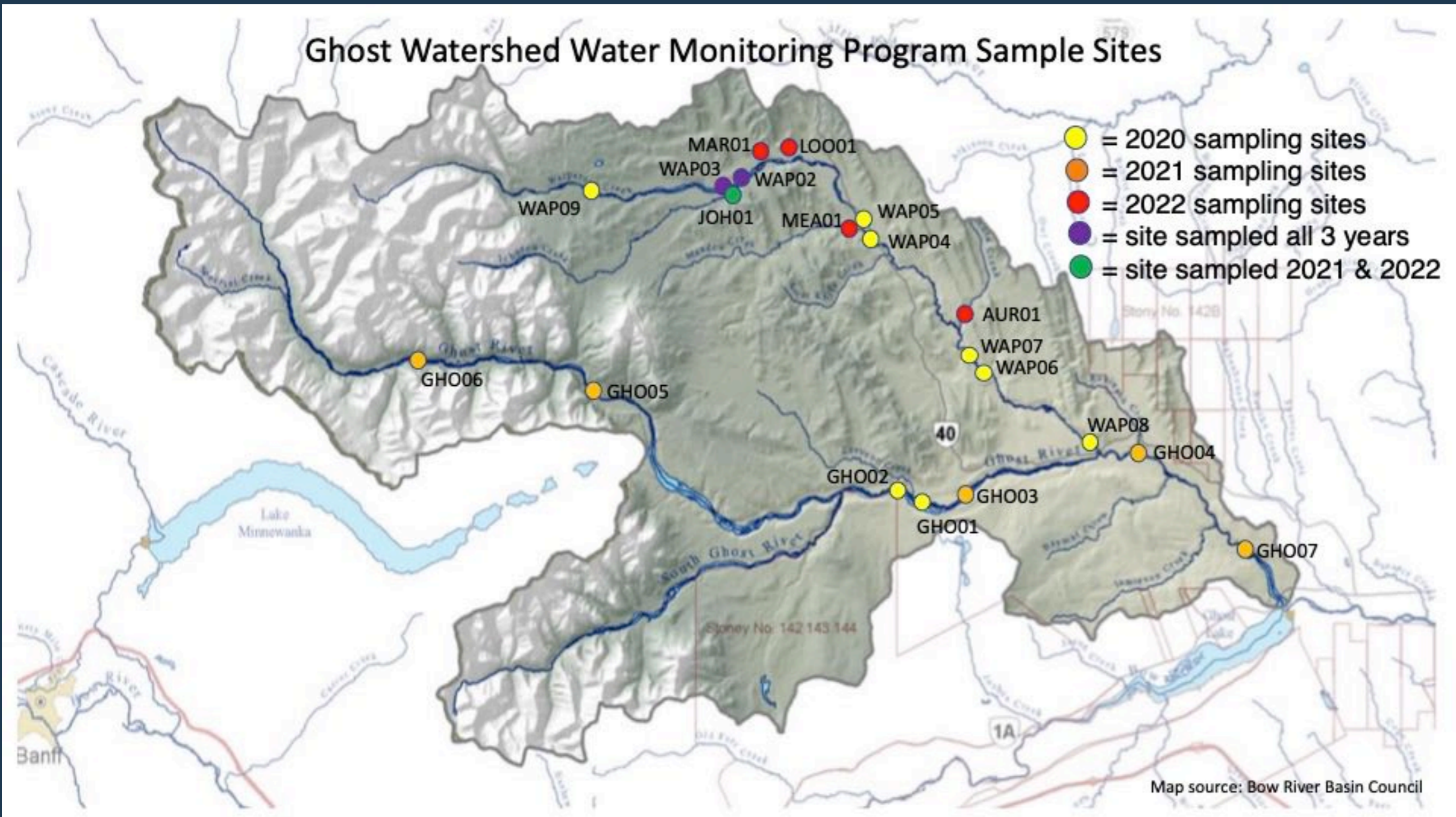
- ◆ Funded equipment purchase and first year of sampling with Casino funds and grant by Alberta Ecotrust.
- ◆ DFO – Habitat Stewardship Program (aquatic) grant 2021-24
- ◆ Forest Resource Improvement Program grant 2021 – 2024 (sponsored by SLS and BRBC)



Photo credit: C. Hill

Ghost Watershed Sampling Sites 2020 - 2022

25 sites sampled (some repeats)



Devils Head Fire - Fall 2020

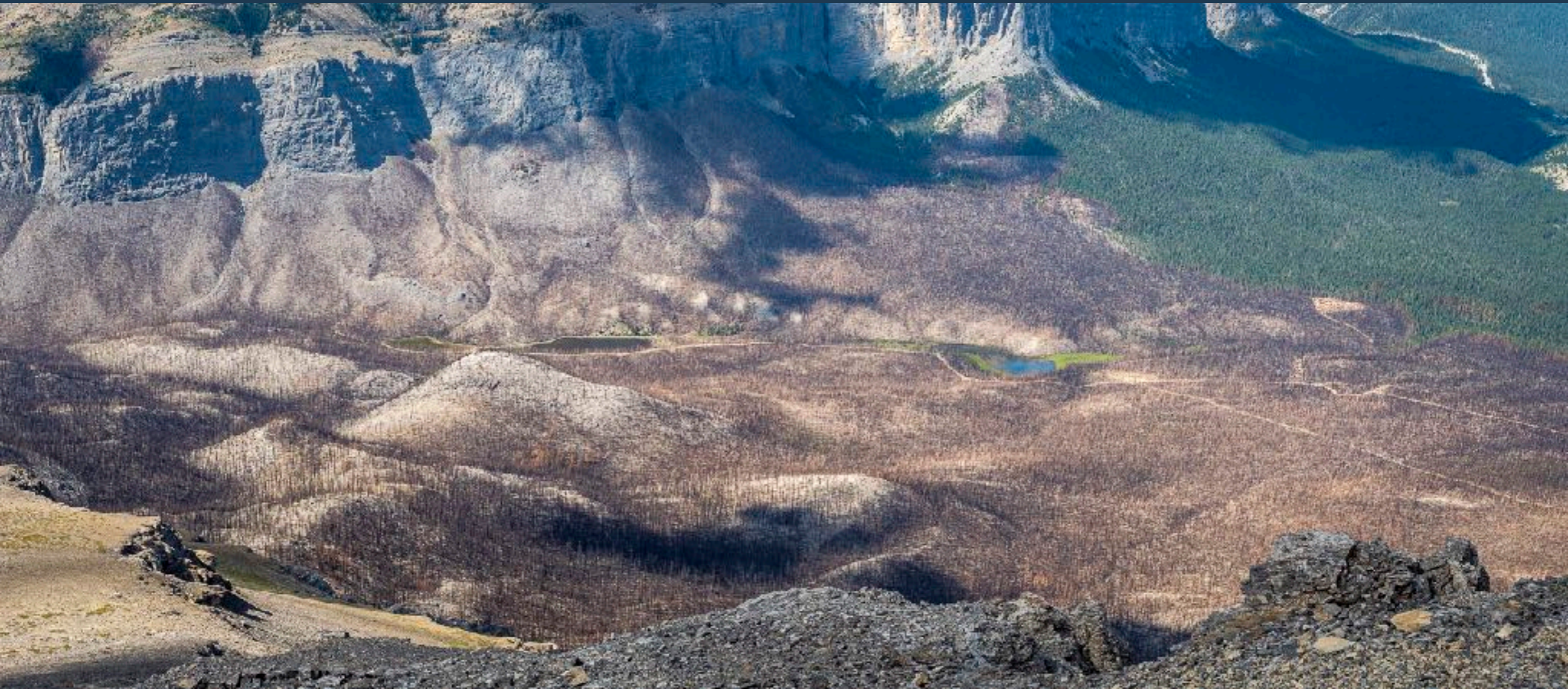


Photo credit: C. Hill

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
- ◆ Further assessment underway



CABiN - Collaboration

- ◆ Eastern Slopes Collaborative formed
 - ◆ Organizations all along Alberta's Eastern Slopes
 - ◆ Exchange information, share expertise, support each other
- ◆ 3 presentations provided on GWAS's Water Monitoring work this year



CABiN - Training

- ◆ Two more volunteers became certified CABiN Field Technicians
- ◆ Field training took place in Pincher Creek
- ◆ Volunteers completed swift water training course
- ◆ Opportunity for more volunteers to get trained next year



Photo credit: C. Hill

CABiN - Statistics (2018 - 2021)

- ◆ Across Canada: 1,117 sites, 332 samples, 99 groups
- ◆ Alberta: 151 samples, 12 groups
- ◆ GWAS sampled the highest number of sites in AB



GWAS Water Monitoring Plan

- ◆ Added stream temperature loggers in 2021
- ◆ Installed 12 stream temperature loggers in 2022
- ◆ Data will be shared with GoA Fisheries Biologists



GWAS Water Monitoring Plan

Lead testing:

- ◆ Four Mile Creek
- ◆ Samples taken in 2021 and 2022
- ◆ Small amounts of lead was found in stream sediment
- ◆ Higher values at shooting sites
- ◆ Plan to take soil samples in 2023



Photo credit: M. Krainer

Native Trout in the Ghost Watershed

- ◆ Bull trout and westslope cutthroat trout both occur in the Ghost
- ◆ Federally listed as *Threatened* under the Species at Risk Act
- ◆ Issues: habitat degradation, hybridization, over-harvesting, barriers to fish movement



Photo credit: M. Krainer

Why are we talking about fish so much?

- ◆ Indicator for watershed health and good water quality
- ◆ Or in the words of Dave Polster: “If you would breath through gills like a fish does, you’d want clean water.”



Working together on trout recovery

- ◆ Native Trout Collaborative (AEP, fRI Research, CPAWS, ACA, TUC, Cows and Fish)
- ◆ Cows and Fish Native Trout workshops
- ◆ Collaboratively work on awareness, closing data gaps and restoration



Photo credit: M. Krainer

Restoration Work

- ◆ Started with restoration projects in 2013
- ◆ Bio-engineering workshops with Dave Polster since 2017
- ◆ 6 sites restored since 2016



Photo credit: L. Petersen

What is soil bioengineering?

Uses living plant materials to perform an engineering function.



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



Benefits of Rough and Loose Technique

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



Photo credit: E. Lindsay

Improving fish habitat through bio-engineering

- ◆ Re-establish riparian vegetation
- ◆ Helps improve water quality



Photo credits: M. Krainer & F. Giesbrecht

This year's bio-engineering project

- ◆ Waiparous Creek, Forestry Trunk Road Bridge
- ◆ High-priority site for restoration



Photo credit: M. Krainer

Photo credit: J. Berlie

This year's bio-engineering project

- ◆ High sediment loads due to run-off from road and undesignated access to creek
- ◆ Permits had to be obtained from both AB Transportation and AB Parks



Photo credit: C. Hill

This year's bio-engineering project

- ◆ First planting day Oct. 1
- ◆ Bio-engineering Workshop:
 - ◆ Oct. 13 classroom at Beaupre Hall
 - ◆ Oct. 15 second planting day

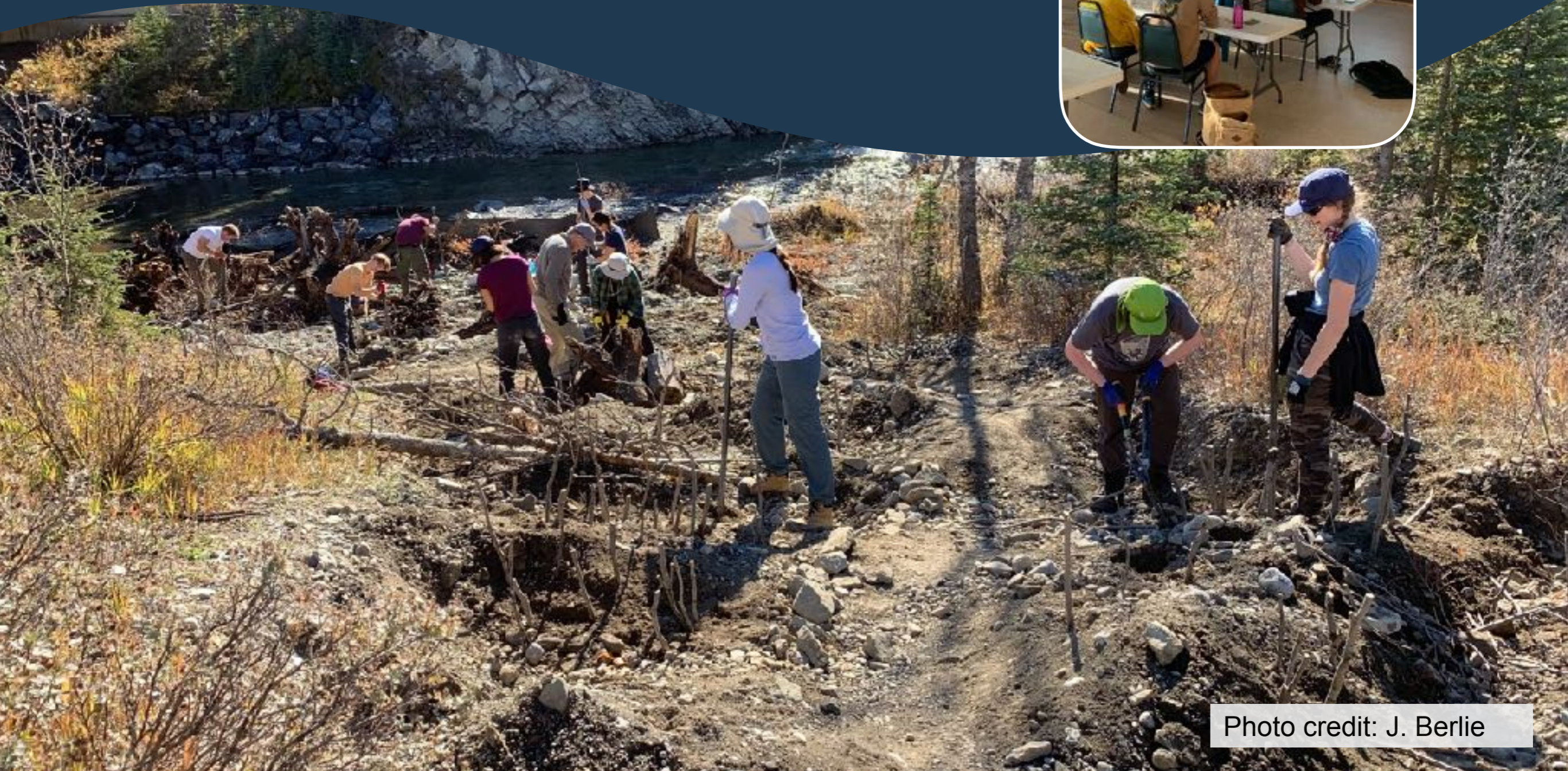


Photo credit: J. Berlie

Bio-engineering workshops

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

Generously funded by:



Bio-engineering Video

- ✦ Received funding from City of Calgary to raise public awareness on bio-engineering
- ✦ Hired StoryBrokers Media House to develop 8-10 minute long video
- ✦ Filmed both days of bio-engineering workshop in September 2021
- ✦ Online Premiere Event on January 25, 2022 (Audience: 55 people)



Photo credit: R. Singleton-Polster

Bio-engineering Video:

- ✦ Video has been watched 354 times on YouTube
- ✦ Native Trout Workshop in March 2022 (98 people)
- ✦ Classroom session of Bio-engineering Workshop 2022

Generously funded by:

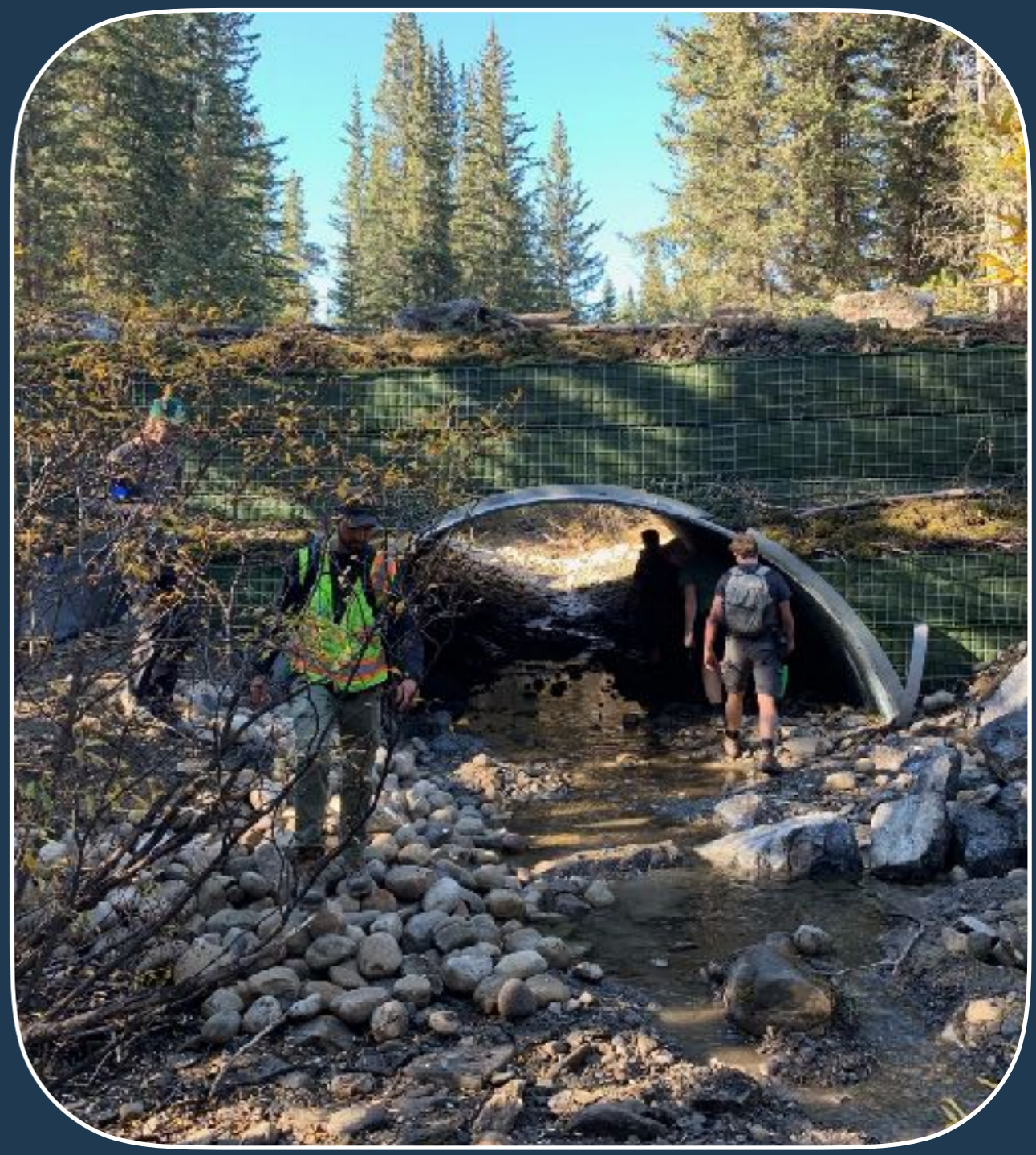
Calgary



**Working Together
to Restore our Watersheds**

TUC Culvert Replacement Project

- ◆ Whispering Pines Access Road
- ◆ Completed by Trout Unlimited Canada in 2022



Assessment and Monitoring

- ◆ Assessing CABI-N sampling results, stream crossing data, Riparian Health Inventory data
- ◆ Undertake site revisits
- ◆ Comparison over time



Photo credit: M. Krainer and K. Hull

Education & Outreach

- ◆ School field trips
- ◆ Calgary Mayor's Environmental Expo
- ◆ Support post-secondary students in completing research projects
- ◆ Presentations



Photo credit: M. Krainer

Outreach to Recreational Users

- ◆ GWAS participated in Recreational Stewardship Fair hosted by Cows and Fish in the Ghost in 2021 and 2022
- ◆ Opportunity to engage recreational users and network with motorized user groups.

Generously funded by:



Photo credit: D. Pichette

Clean-up Events

- ◆ Yearly events since 2008
- ◆ Partnered with BP Retirees and Backcountry Hunters and Anglers
- ◆ Focused on random camping and target shooting sites



Photo credits: H. Unger

Clean-up Events

- ◆ Completed two clean-up events with BP Volunteers and Backcountry Hunters and Anglers in 2022
- ◆ Focused on target shooting sites
- ◆ 1,060 kg collected this year



Photo credits: M. Krainer

Walks in the Watershed

- ◆ Connect people to nature
- ◆ Show the beauty and the challenges
- ◆ Successfully completed over 80 walks and hikes since 2004
- ◆ 3 WiWs in 2022



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 (source water education and Upstream Watershed Investment project)
- ✦ BRBC Forums and other workshops



Photo credit: W. Koning

Sharing Knowledge

- ◆ Field tours
- ◆ 9 presentations in 2022:
 - ◆ CABiN
 - ◆ Bio-engineering
 - ◆ Story Map on history of Rocky Mountains Forest Reserve

Interpreting Results - Benthic Invertebrates

- ◆ Compare to reference model?
- ◆ Compare each site at temporal level?
- ◆ Compare sites along stream length?
- ◆ Compare sites across watershed?



Photo credit: C. Hill

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

Being a Voice for the Watershed

- ◆ Raise awareness about wildfire risks
 - ◆ Shooting of explosive targets
 - ◆ Abandoned camp fires



Photo credit: AFRED and Marina Krainer

Western Toad

- ◆ COSEWIC Status: Special Concern (S3: vulnerable to extirpation or extinction)
- ◆ Found Western Toad tadpoles adjacent to Ghost River
- ◆ Reported illegal trail next to Ghost River at Richard Road (tracks through wetland with western toad and tadpoles present)



Photo credit: M. Krainer

Keys to our Success

- ◆ Bio-engineering expert Dave Polster has been a huge draw for people to participate (since 2017)
- ◆ He shared his vast knowledge gained over his career spanning more than 40 years
- ◆ Huge thanks for his dedication, kindness and making sure that everyone had fun!



Photo credit: R. Singleton-Polster

Keys to our Success

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



Photo credit: C. Hill

Plans for 2023

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



Photo credit: M. Krainer

Plans for 2023 (cont.)

- ◆ Continue participation in CreekWatch program
- ◆ Education & Outreach
- ◆ Complete work on online State of the Watershed Project
- ◆ Increase in-house GIS mapping capabilities



How can you help?

- ◆ Being a member of GWAS / Joining the GWAS Board
- ◆ Raising awareness with family and friends
- ◆ Volunteering for a stream-bank restoration day or clean-up event
- ◆ 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)

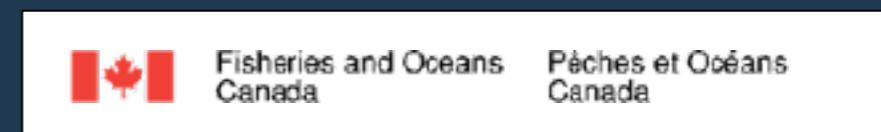
Land Stewardship Centre

MD of Bighorn

TD Friends of the Environment

Fisheries and Oceans Canada - Habitat Stewardship Program
&

our members and all the generous individual donors!



The logo for the Ghost Watershed Alliance Society is displayed against a scenic background of snow-capped mountains and evergreen trees. The word "Ghost" is in a large, blue, serif font with a 3D effect. Below it, "Watershed Alliance Society" is written in a smaller, blue, serif font.

Ghost

Watershed Alliance Society

Thank you!

Questions?

For more information please visit our website:

WWW.GHOSTWATERSHED.CA