

2020-22 BLACKFOOT CONFEDERACY-ABORIGINAL FUND FOR SPECIES AT RISK NATIVE TROUT RECOVERY PROJECT

"Blackfoot shared leadership and capacity support in native trout recovery addressing climate change, non-native species, and habitat loss"

Workshop for Building Drought Resilience in a Changing Climate with Upper Columbia and Missouri Basin Tribes

September 26-28, 2023 Kwataqnuq Resort & Casino | Polson, MT

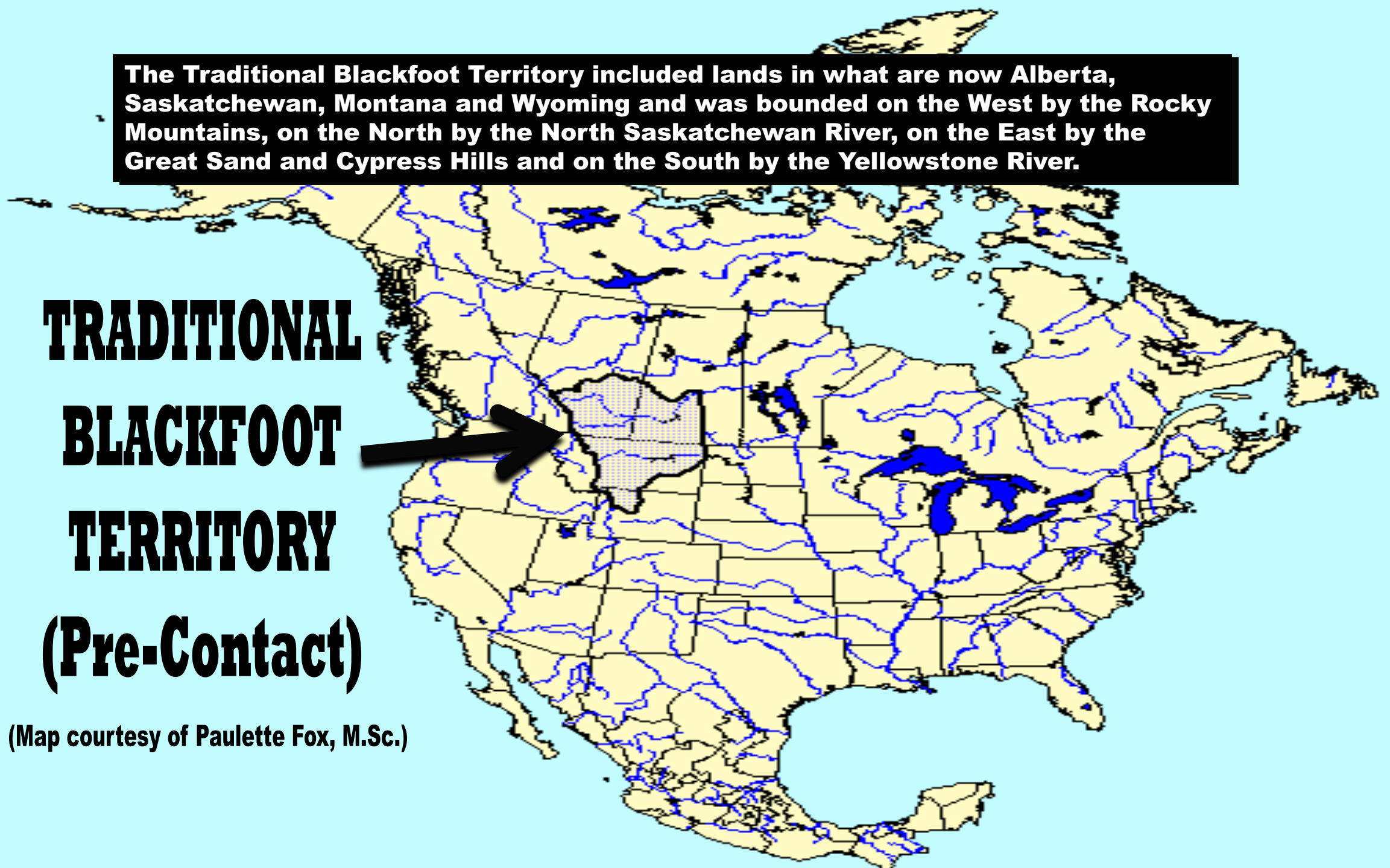


The Traditional Blackfoot Territory included lands in what are now Alberta, Saskatchewan, Montana and Wyoming and was bounded on the West by the Rocky Mountains, on the North by the North Saskatchewan River, on the East by the Great Sand and Cypress Hills and on the South by the Yellowstone River.

**TRADITIONAL
BLACKFOOT
TERRITORY
(Pre-Contact)**

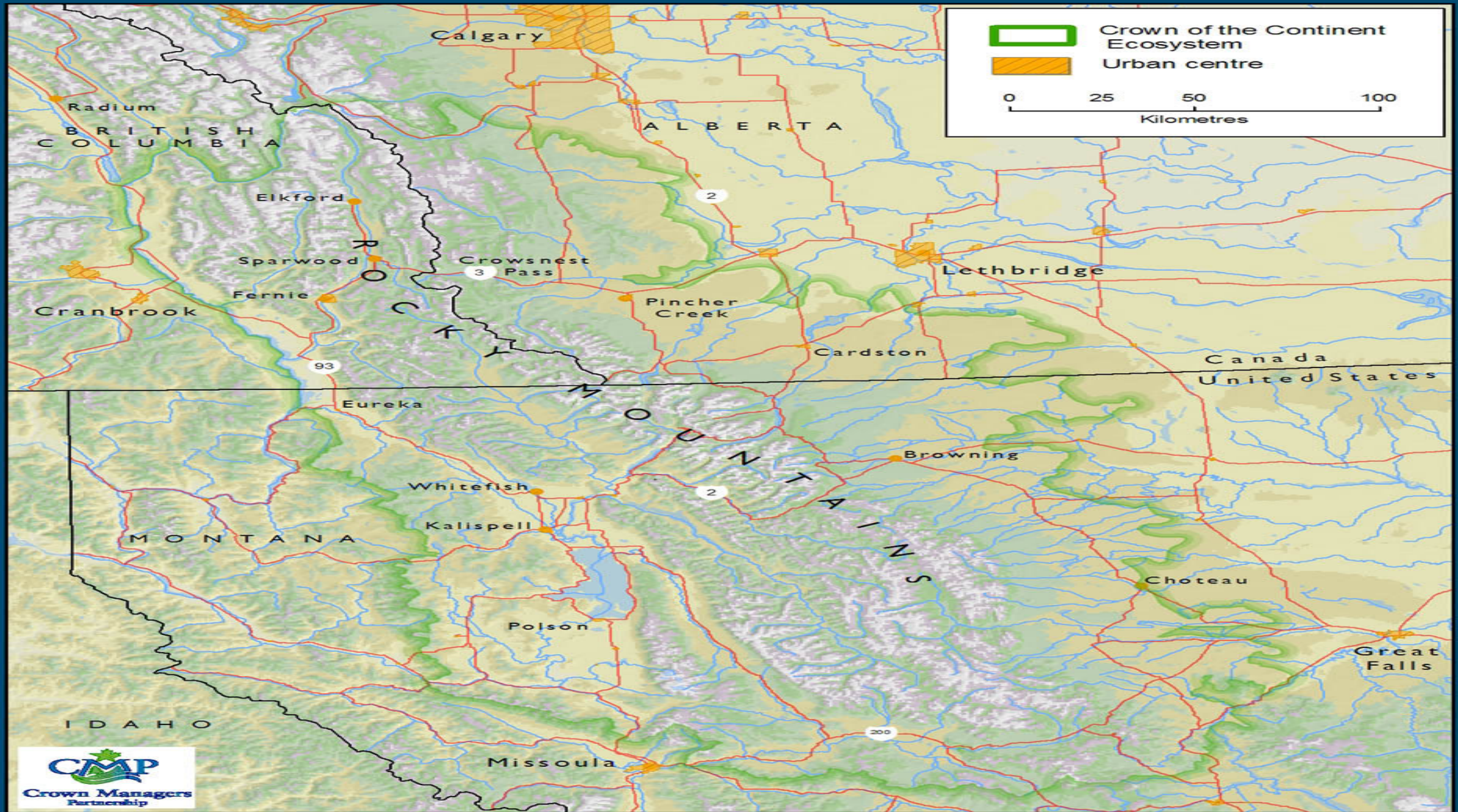


(Map courtesy of Paulette Fox, M.Sc.)

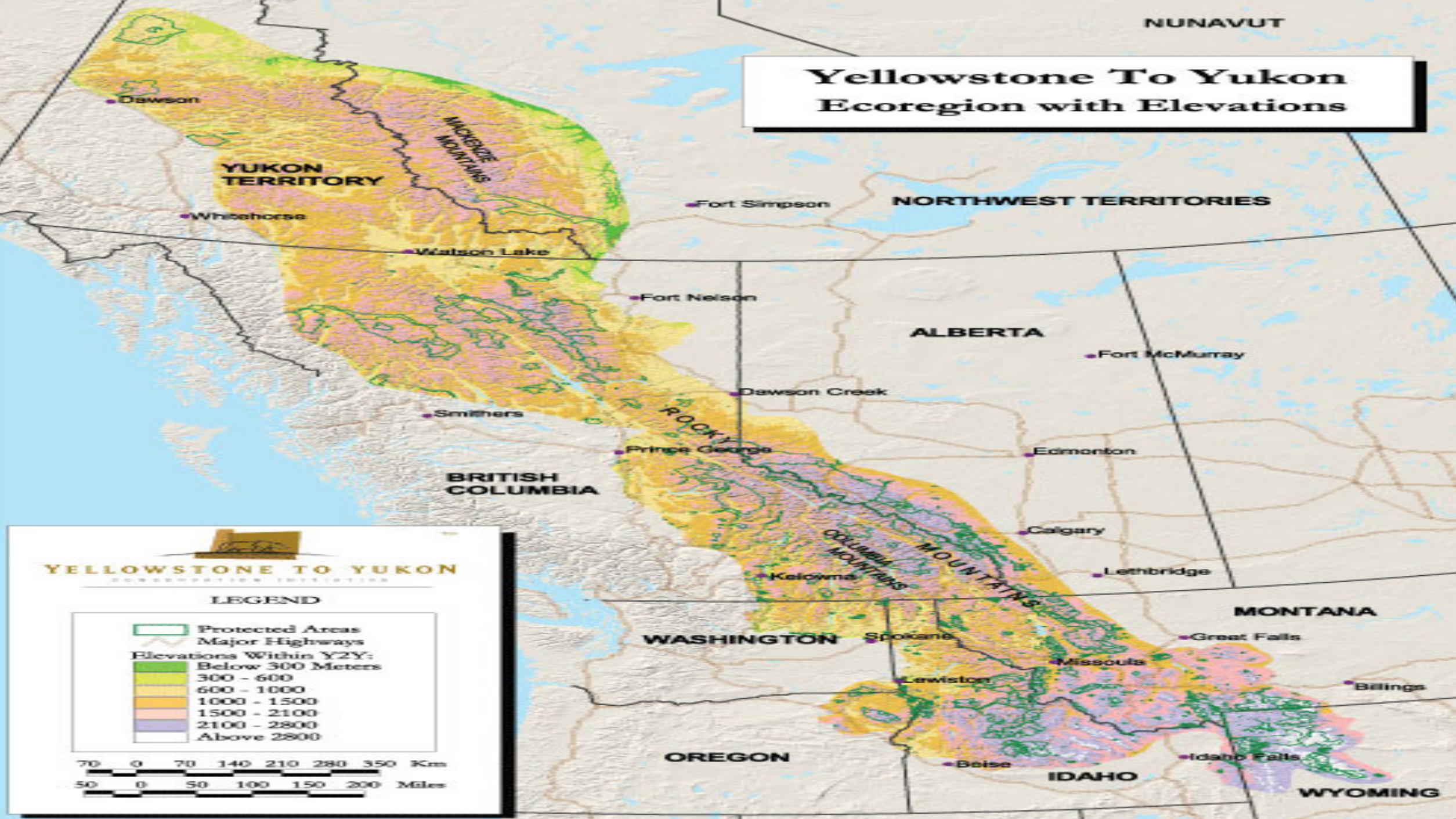




CROWN OF THE CONTINENT ECOSYSTEM



Yellowstone To Yukon Ecoregion with Elevations



YELLOWSTONE TO YUKON CONSERVATION INITIATIVE

LEGEND

- Protected Areas
- Major Highways
- Elevations Within Y2Y:
 - Below 300 Meters
 - 300 - 600
 - 600 - 1000
 - 1000 - 1500
 - 1500 - 2100
 - 2100 - 2800
 - Above 2800



BFC NATIVE TROUT RECOVERY PROJECT STUDY AREA

Bow and Oldman watersheds



Continental Divide

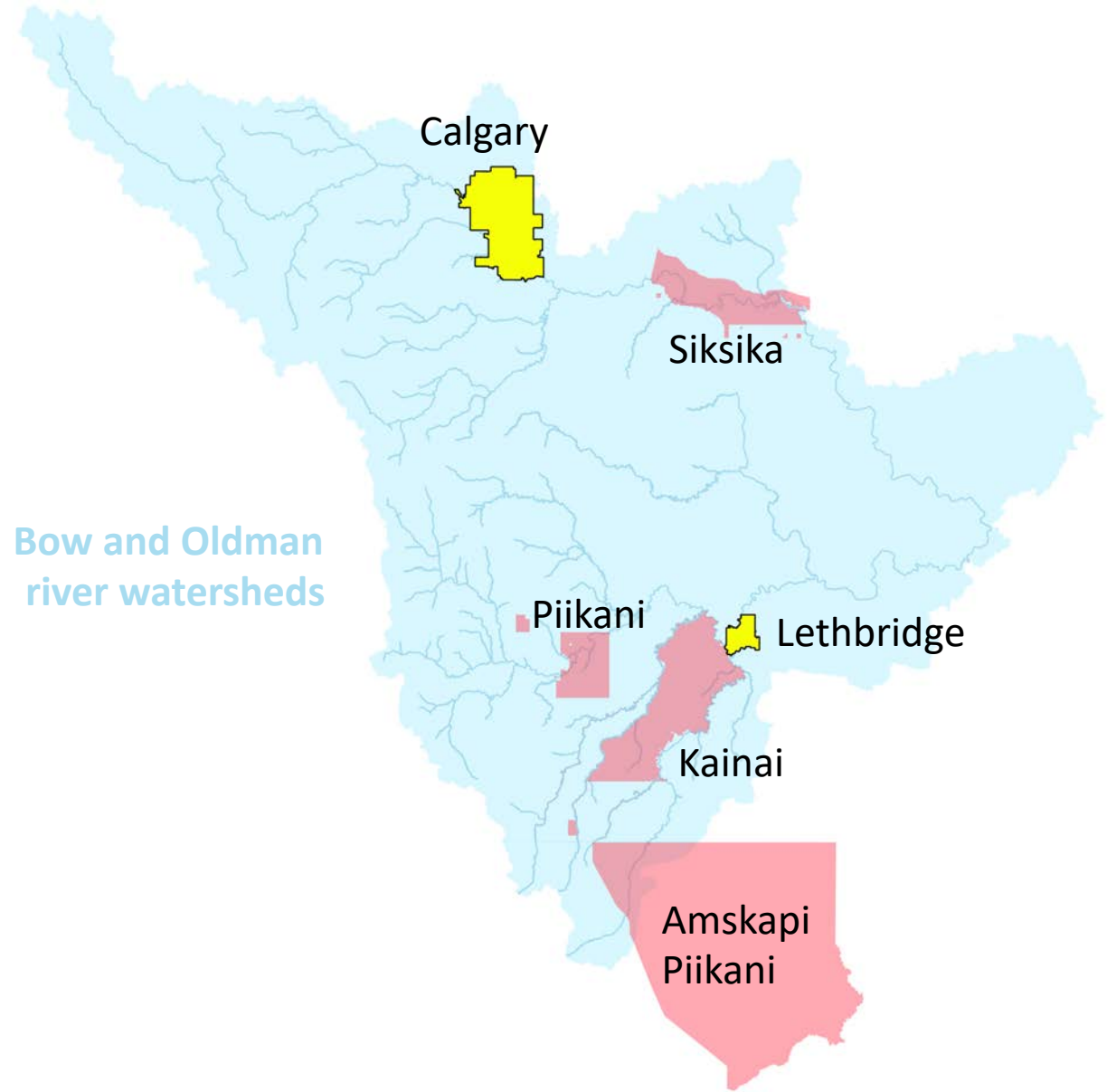
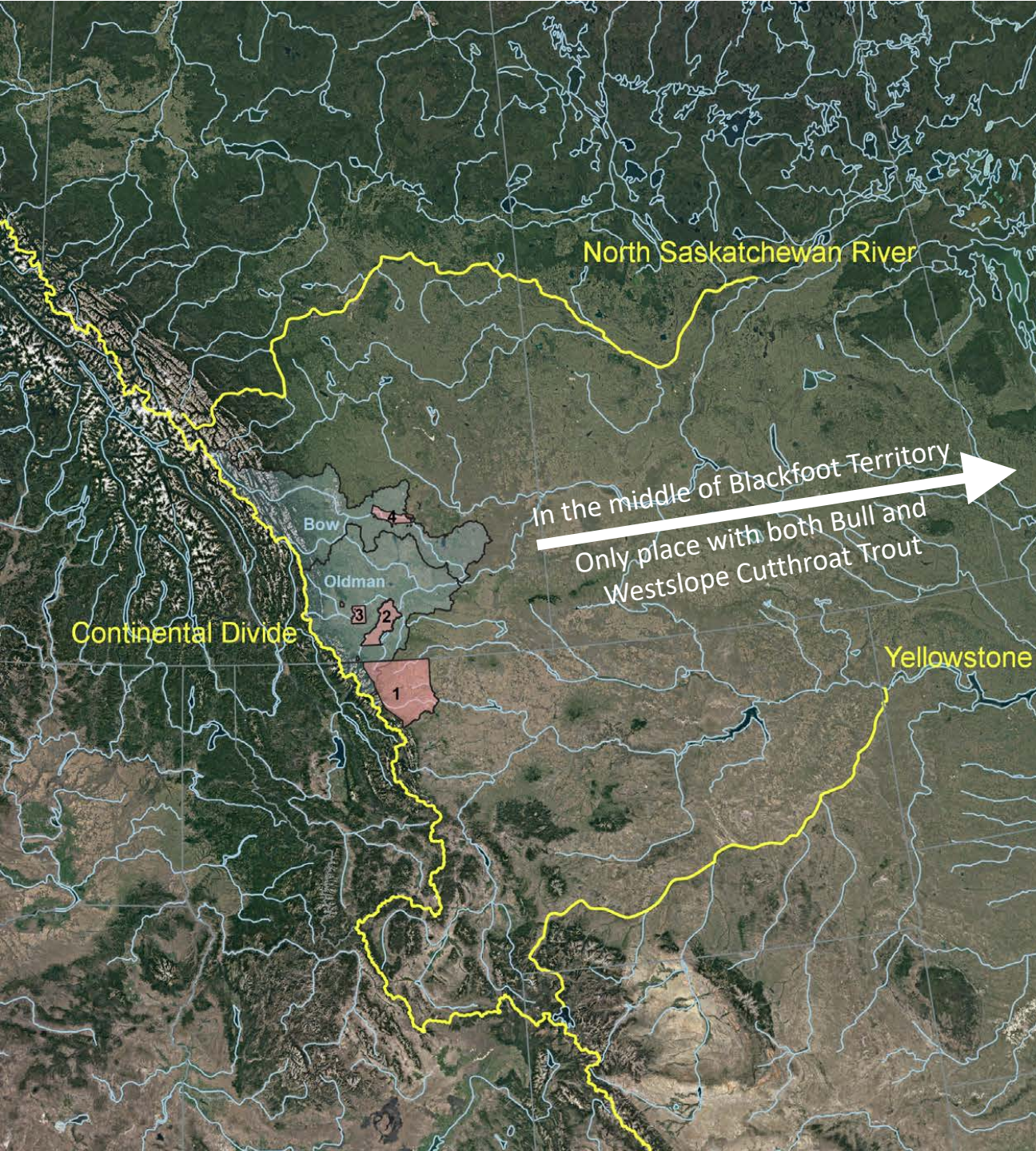
4 Blackfoot reserves



North Saskatchewan River

Yellowstone River





Study Area

Project background



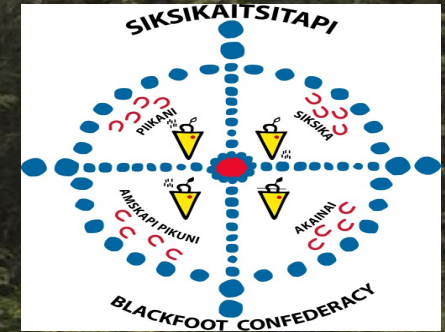
- Blackfoot Confederacy Tribal Council serves 4 Blackfoot Nations:

- Siksika
- Piikani
- Kainai (Blood Tribe)
- Amskapi Piikani (Blackfeet)



- Their reserve lands overlap the Bow and Oldman watersheds, the only watersheds east of the continental divide where both Bull Trout and Westslope Cutthroat Trout are native
- Funding from Department of Fisheries and Ocean's Aboriginal Fund for Species At Risk has been used in 2020, 2021, and 2022

DESCRIPTION & MISSION OF THE BLACKFOOT CONFEDERACY (BFC)



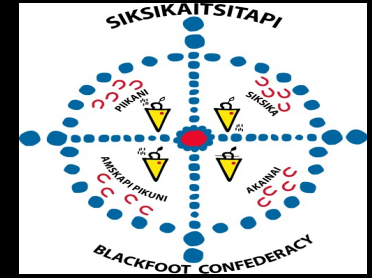
The Blackfoot Confederacy (BFC) Tribal Council is a not for profit regional managing organization representing the Blackfoot Confederacy Nations of Kainai-Blood Tribe, Siksika, Piikani and Aamskapi Piikani. Our mission is to collaborate, restore, protect, honor and enhance the collective culture, language and self-identity of the Blackfoot People; and to establish political and economic sovereignty over Blackfoot Territory, including natural resources, for the benefit of current and future generations of the Blackfoot People.

DESCRIPTION OF THE GOV'T OF CANADA'S ABORIGINAL FUND FOR SPECIES AT RISK (AFSAR)



- The Government of Canada is transforming its approach to species at risk conservation and recovery by shifting to ecosystem-based, multispecies initiatives. This approach includes providing funding towards the protection and recovery of aquatic and terrestrial species at risk. Fisheries and Oceans Canada (DFO) is responsible for aquatic species at risk and supports stewardship of these species through various programs, including the Aboriginal Fund for Species at Risk (AFSAR).
- Established in 2004, the Aboriginal Fund for Species at Risk (AFSAR) program facilitates active participation by Indigenous communities in the implementation of the Species at Risk Act (SARA). It invests in organizational capacity, encourages activities that conserve and/or recover species at risk (SAR), and supports community-led documentation and management of Indigenous Knowledge
- The objectives of the AFSAR aquatic program are to:
 - Promote the conservation and recovery of aquatic SAR and their habitats;
 - Support the engagement and participation of Indigenous Peoples in SAR stewardship and SARA implementation.

BFC NATIVE TROUT RECOVERY PROJECT OBJECTIVES:



- 1) One (1) Field Technician from each Blackfoot Nation to participate (Due to the COVID-19 pandemic, the Blackfeet Tribe in Montana was unable to participate in the field activities until year 3 of the project, due to border crossing issues) in project field activities to learn methods and build capacity;
- 2) To conduct eDNA sampling in various tributaries of the Oldman & Bow River watersheds to determine the presence/absence of cutthroat and bull trout (and other introduced trout species);
- 3) To install water temperature loggers in various tributaries of the Oldman & Bow watersheds;
- 4) To conduct stream habitat assessments and work with various government & environmental non-government agencies (eNGO's) to restore stream habitat that's been negatively affected by human development;
- 5) To conduct cutthroat and bull trout redd surveys in various tributaries of the Oldman and Bow watersheds, to confirm cutthroat & bull trout spawning activity (due to the COVID-19 pandemic, the start of the project was delayed until mid-August. As a result, Cutthroat Trout redd surveys weren't conducted);
- 6) To interview elders from each of the four (4) Blackfoot nations to document Traditional Ecological Knowledge regarding the significance of native trout, water & Blackfoot place names in traditional Blackfoot Territory.

BFC NATIVE TROUT RECOVERY PROJECT PURPOSE:

1) Build Blackfoot capacity and expertise as guardians of East Slope watershed integrity through training and mentorship in assessing, managing, and restoring instream and riparian native trout habitat;



Napi's Playground, Hidden Creek spawning survey
– September 2020

2) Gather Blackfoot values and holistic ways of knowing about the study area, water, and native trout and bring this together with scientifically derived watershed values in a respectful manner that increases Blackfoot engagement in native trout conservation and restoration activities;

Project Focal Species

Listed as *Threatened* in
Canada and Alberta

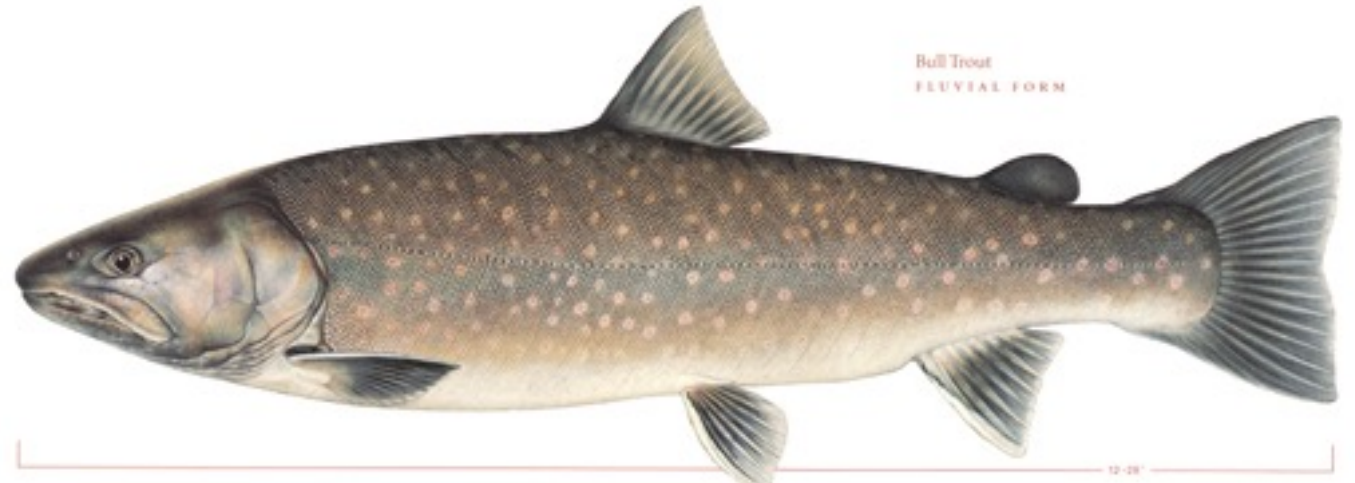
1. Westslope Cutthroat Trout

Listed as “*species of concern*” in Montana



2. Bull Trout

Listed as *Threatened* in US under the ESA



CHALLENGES FACING NATIVE TROUT (Bull & Westslope Cutthroat Trout)

1. Habitat loss resulting from human activities (mining, logging, grazing in unfenced headwater streams, random camping, off highway vehicle use).
2. Interaction of land use with climatic extremes (floods, droughts).
3. Competition & hybridization with introduced, non-native species (Rainbow, Brook & Brown Trout).



Bull Trout native range



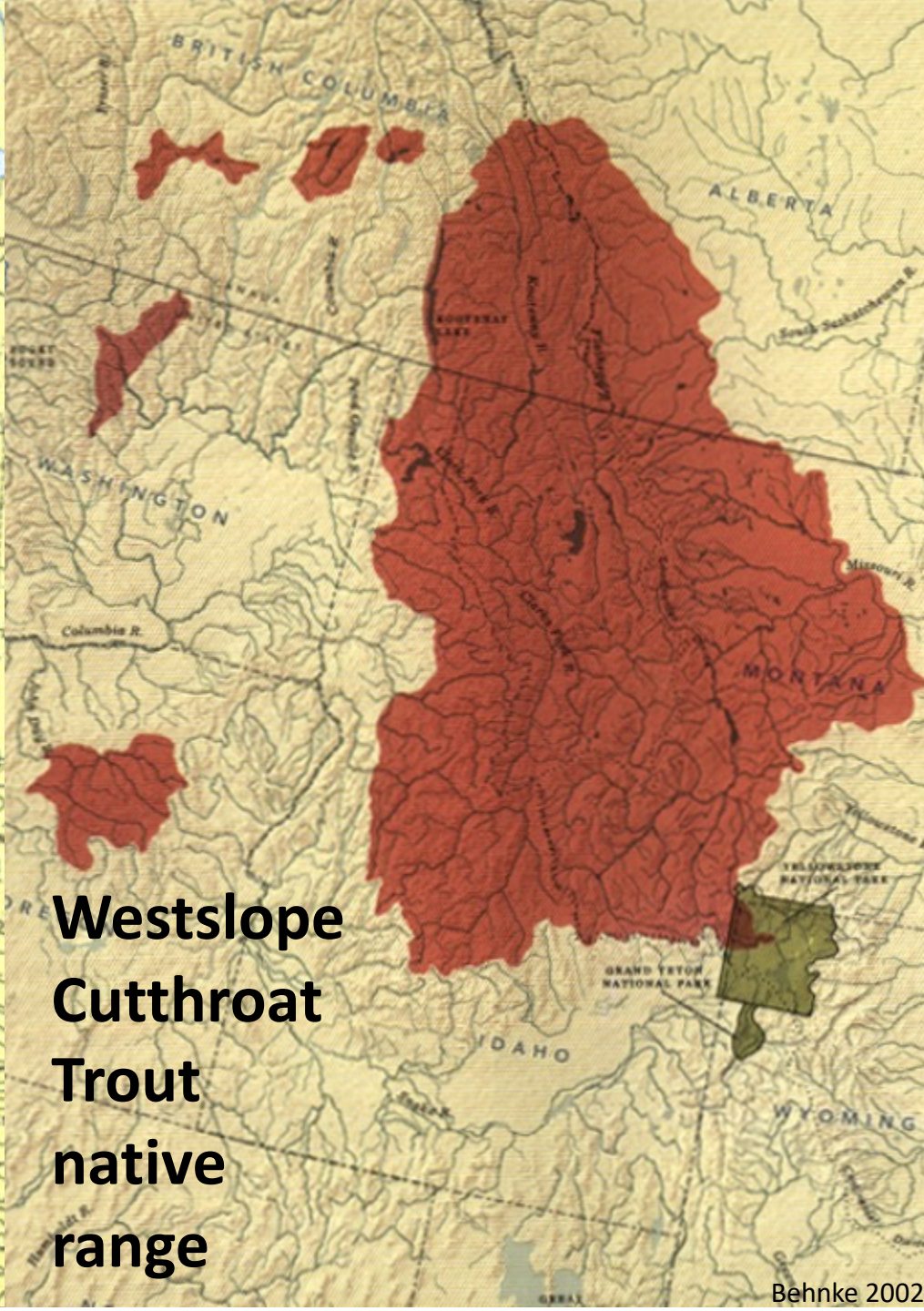
Mountain Whitefish native range



14 cutthroat species native range



Westslope Cutthroat Trout native range



PROJECT FIELD WORK & DATA COLLECTION



- In 2020, a total of 19 days were spent in the field from July 1 to November 3.
- In 2021, a total of 33 days were spent in the field from June 30 to November 4 for a total of 52 field days.
- Participation from the 3 Canadian Blackfoot Nations in all of the different types of work performed.

PROJECT FIELD WORK & DATA COLLECTION



2020-22 eDNA Sampling – Bull Trout:

- 36 environmental DNA samples were collected:
- Oldman Watershed – 30 samples:
 - including 7 in the St. Mary River watershed (1 sample collected on reserve, 6 upstream from reserve land),
 - 4 in the Waterton River watershed (North & South Drywood Creek, Yarrow Creek & Waterton River);
 - 3 in the Belly River (Belly River, United Irrigation District Canal, Belly-St. Mary Diversion Canal Weir);
 - 16 in the Oldman River watershed proper (2 samples collected on reserve, 14 upstream from reserve land),
- Bow River watershed – 6 samples, all upstream from reserve land. 1 of note was taken on Evan-Thomas Creek near the Kananaskis Lodge, which Siksika has part ownership of. The Evan-Thomas Creek Westslope Cutthroat Trout population has disappeared in the last 5 years. No cutthroat environmental DNA was detected. AEP suspects the population is extirpated.
- A previously undocumented population of Westslope Cutthroat Trout was identified during environmental DNA sampling on Shale Creek, which is adjacent to a coal exploration project in the upper Oldman watershed.

PROJECT FIELD WORK & DATA COLLECTION



2020-22 eDNA Sampling - Westslope Cutthroat Trout (or Rainbow Trout in some cases):

➤ 18 environmental DNA samples were collected:

Oldman Watershed – 12 samples

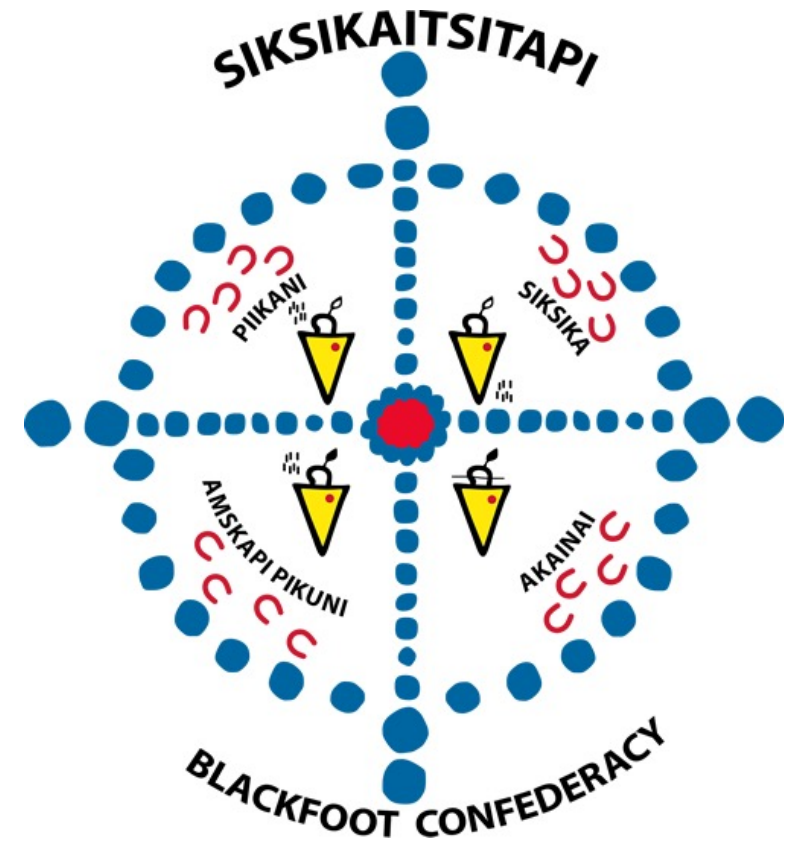
- Porcupine Hills (5 sites: Trout Creek, Honey Coulee, Kingbolt Creek, Beaver Creek);
- Callum Creek on Waldron Ranch (4 sites)
- York Creek above water supply dam in Crowsnest Pass (1 site)
- Castle River (2 sites: West Castle and Syncline):

Bow Watershed – 6 samples

- Ghost River/Waiparous (4 sites: Whispering Pines West, Lesueur, Ghost, and Waiparous)
- Sheep River (2 sites: above and below Sheep Falls)

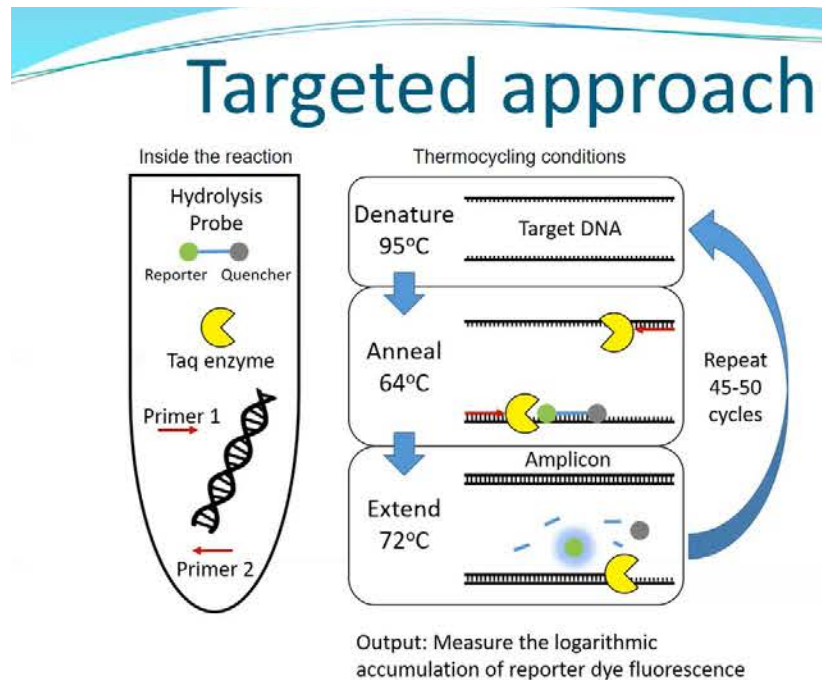
Environmental DNA (eDNA)

- eDNA is an invisible trail of DNA that organisms leave behind.
- Organisms leave a trail of tissue behind them when they shed scales, skin, or hair or other dead cells.
- DNA is made up of 4 nucleotides.
- Each species has its own unique DNA sequence.
- By collecting water samples and filtering the water, DNA from all the plants and animals in the water is captured on the filter.
- All the DNA from the filter is isolated and tested to see if any of it matches the genetic codes for the trout BFC is looking for.



Partnership with Helbing Lab for eDNA analysis

- Using 'targeted' species-specific quantitative qPCR assays
- Helped develop and evaluate the sensitivity and specificity of assays for Bull Trout, Brook Trout, Westslope Cutthroat Trout, and Rainbow Trout
- Detection efficiency of these assays appears to be high



Helbing and Hobbs (2019) Canadian Standards Association





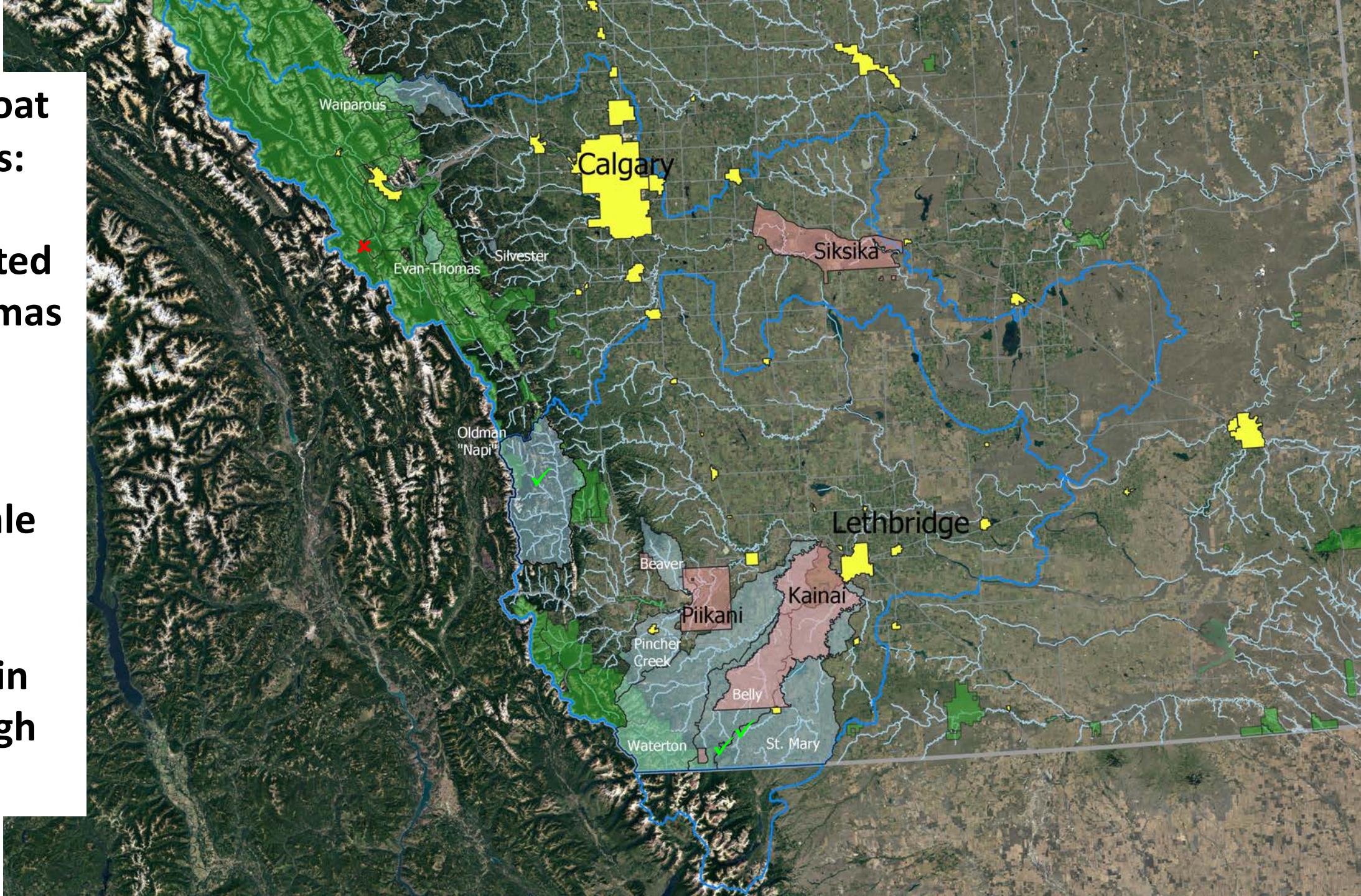
2020 Cutthroat eDNA results:

x

1. not detected in Evan-Thomas

2. new population found in Shale Creek

3. Detected in Lee and Tough creeks

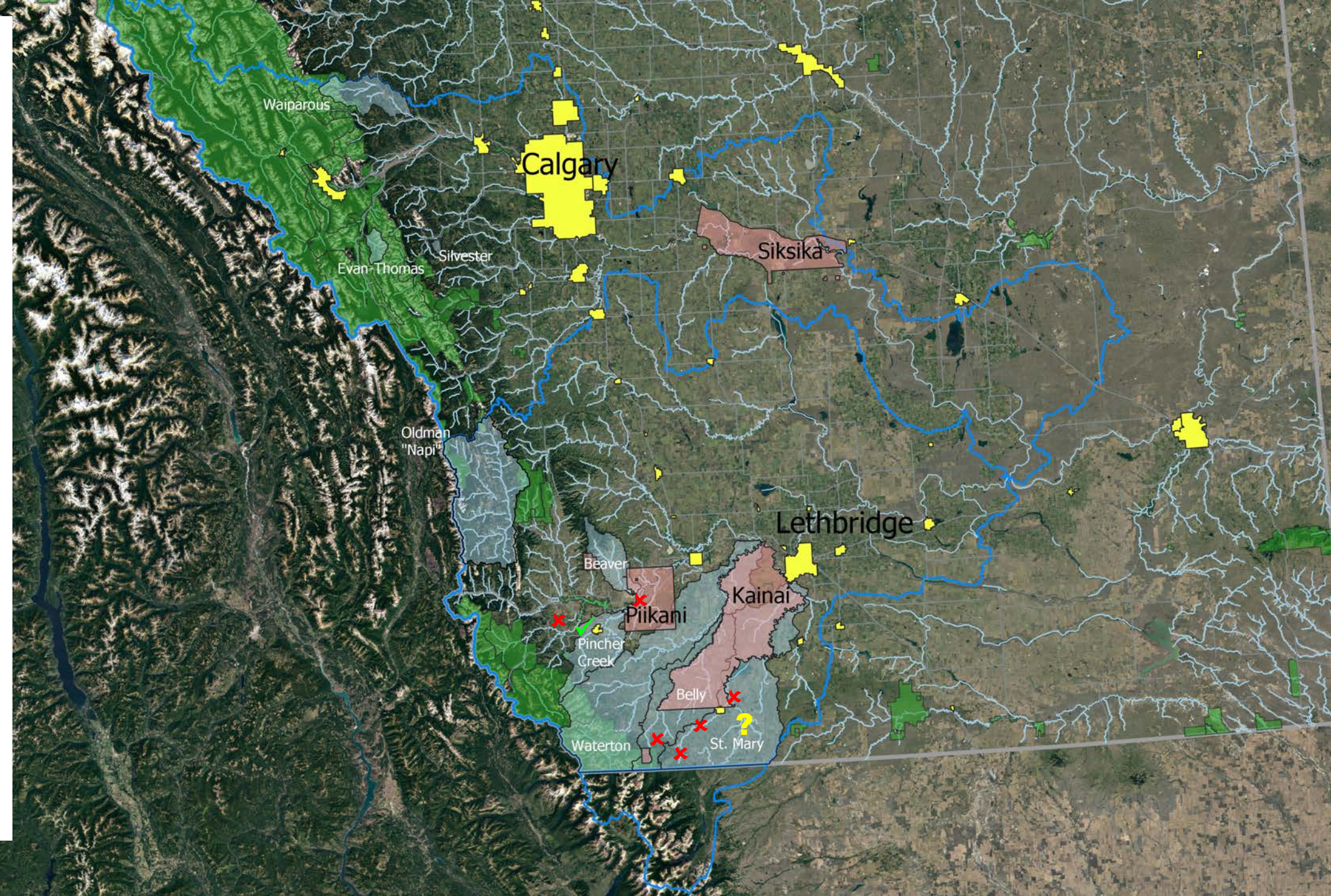


2020 Bull trout eDNA results:

➤ only detected upstream of Pincher Creek

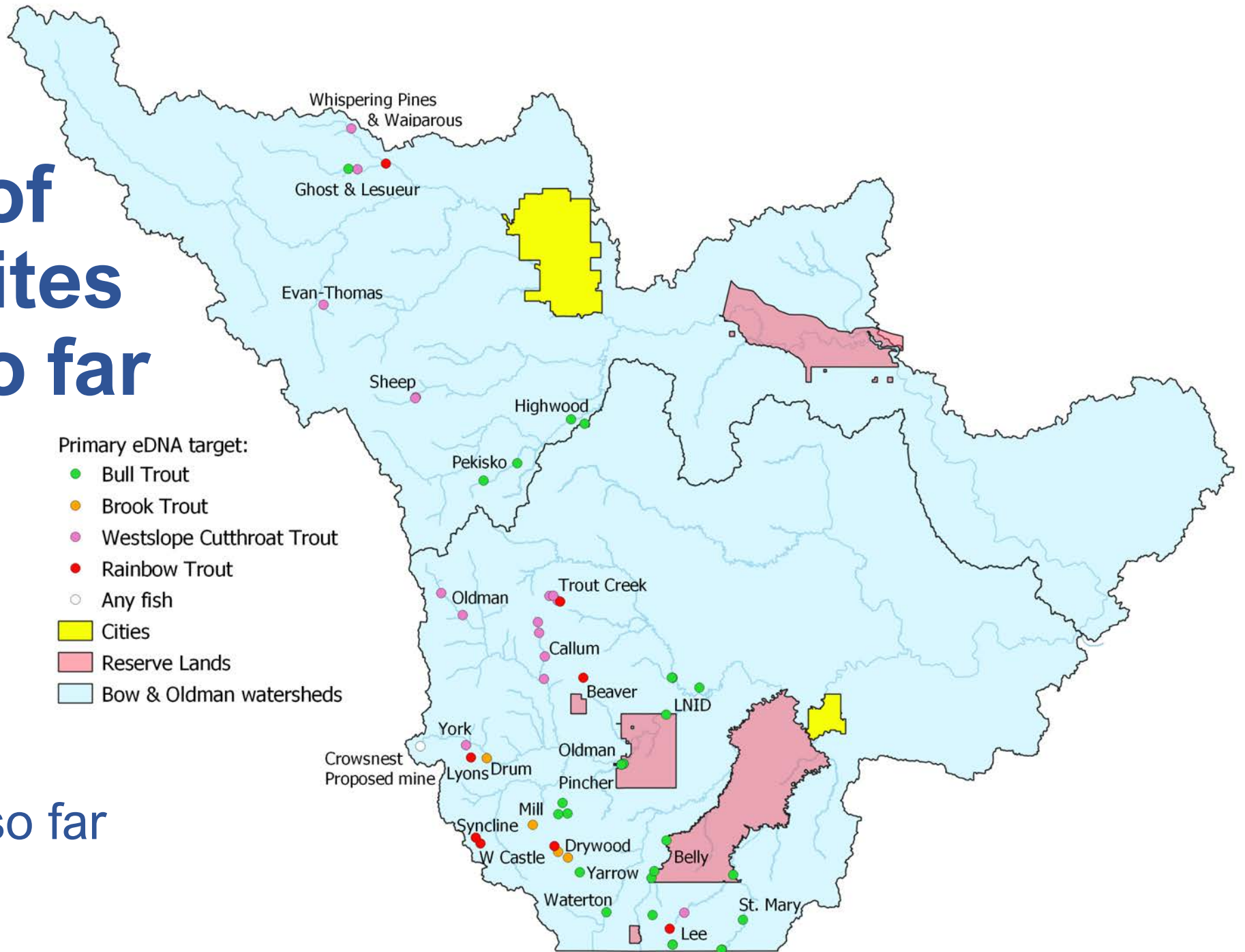


➤ weak signal detected upstream of Cardston

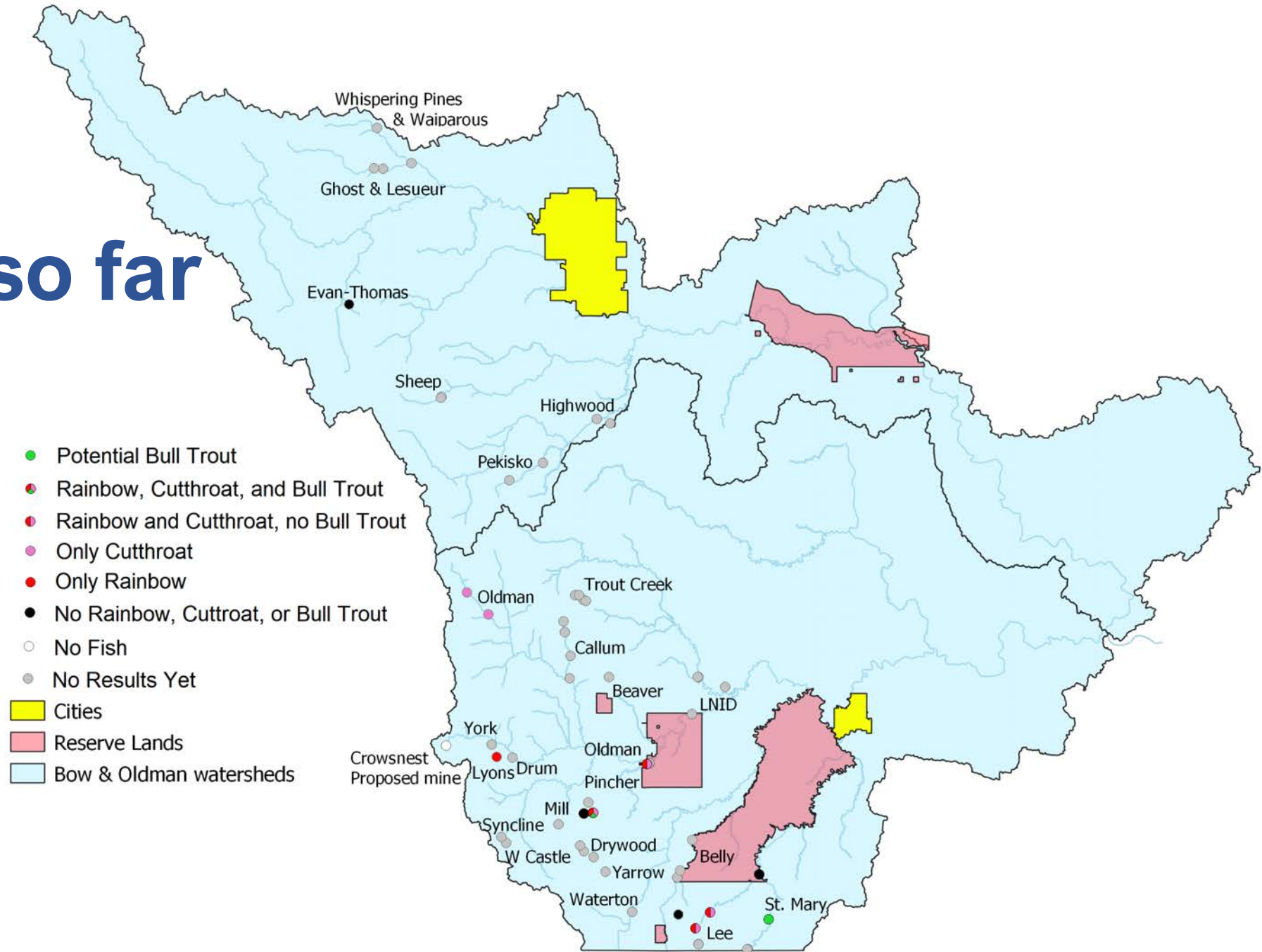


Overview of 60 eDNA sites sampled so far

- 13 sites in 2020
- 43 sites in 2021
- 4 sites in 2022 so far



Results so far

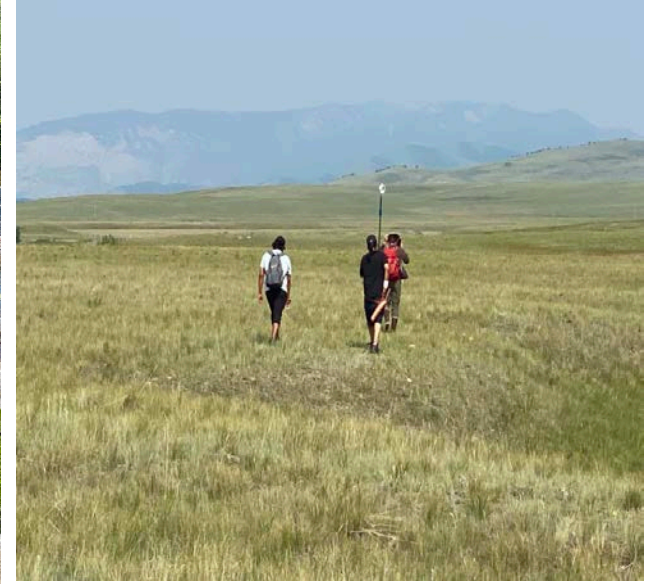


Shale Creek – discovered new cutthroat population



**Cabin
Ridge
coal
exploration
in 2020
above
Shale
Creek**



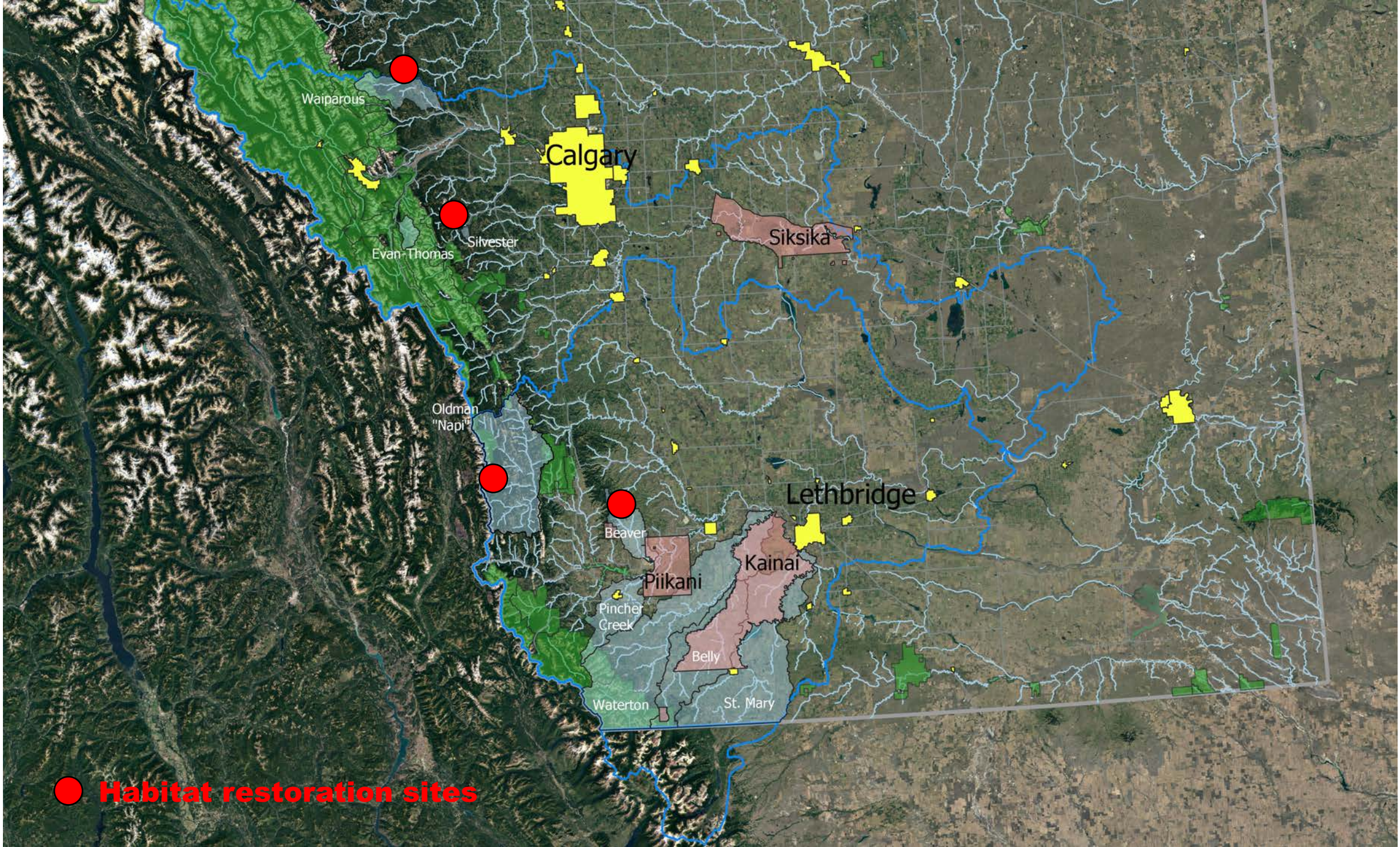


PROJECT FIELD WORK & DATA COLLECTION



2020 Habitat Restoration:

- Habitat restoration was conducted on 6 streams:
- 4 streams in the Oldman River watershed upstream of the Piikani Nation (Dutch Creek & Beaver Creek) & 1 on the Piikani Reserve (Crow Lodge Creek) & 1 on the Blood Reserve (Belly River);
- 2 streams in the Bow River watershed upstream of the Siksika Nation (Silvester Creek & Waiparous Creek);
- Habitat restoration training involved hands on training by an expert in the field, Dave Polster;
- It involved a variety of bioengineering techniques using live willow stakes.



● Habitat restoration sites





PROJECT FIELD WORK & DATA COLLECTION



2020 Spawning (Redd) Surveys:

- Spawning surveys were conducted by counting redds, the nest the trout build.
- 7 streams were surveyed for bull trout spawning activity:
 - North Belly River upstream of the Blood Timber Limit;
 - 6 streams that flow into the Oldman River upstream of the Piikani Nation (Hidden Creek, Dutch Creek, Upper Oldman, Livingstone River, Daisy Creek, Racehorse Creek);
- Spawning was observed and confirmed in all streams surveyed for Bull Trout spawning activity.
- * On July 1, prior to the start of the project, Matt & Elliot travelled to the Porcupine Hills and confirmed Cutthroat spawning in Beaver Creek.

PROJECT FIELD WORK & DATA COLLECTION



2021 Spawning (Redd) Surveys:

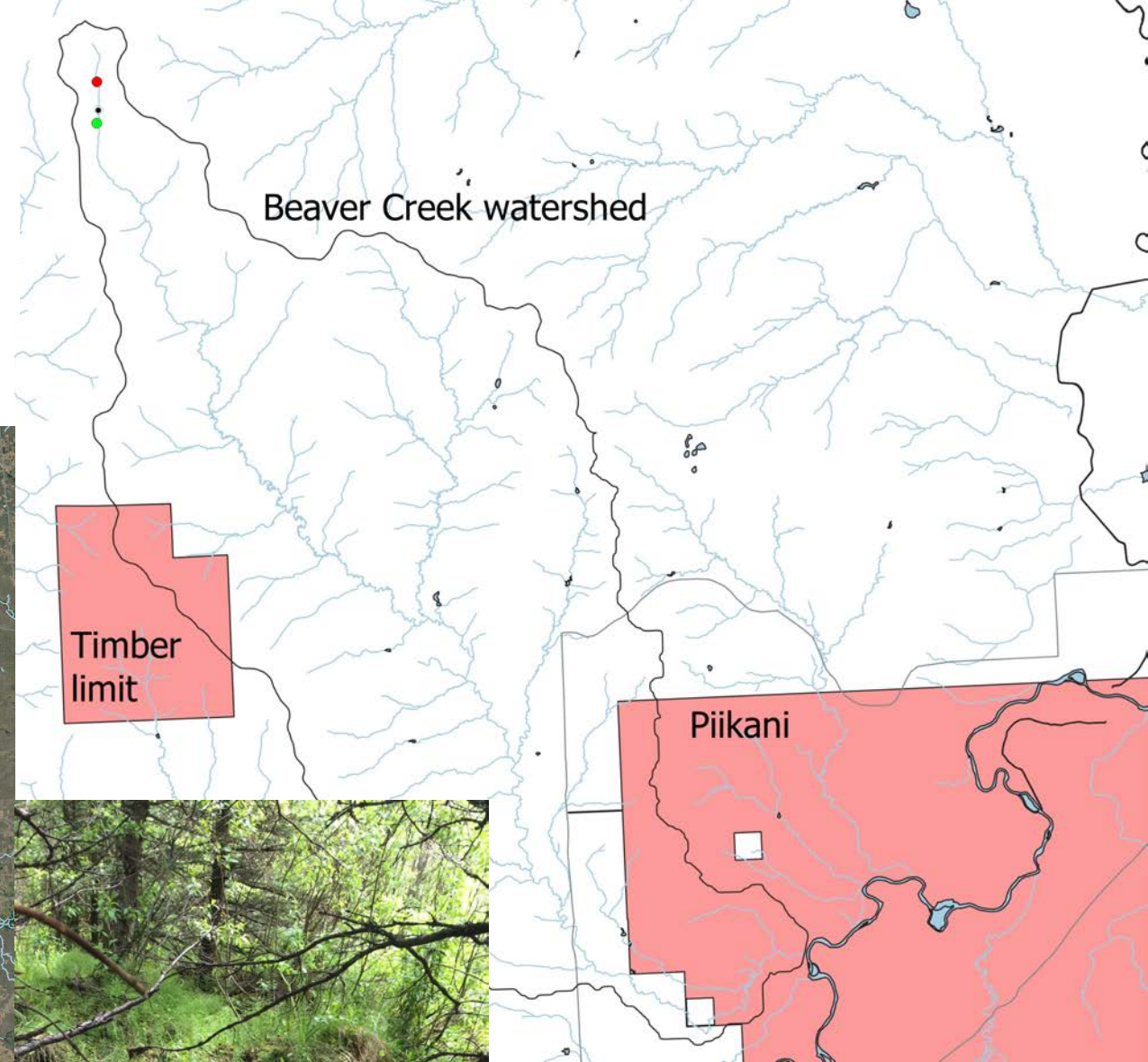
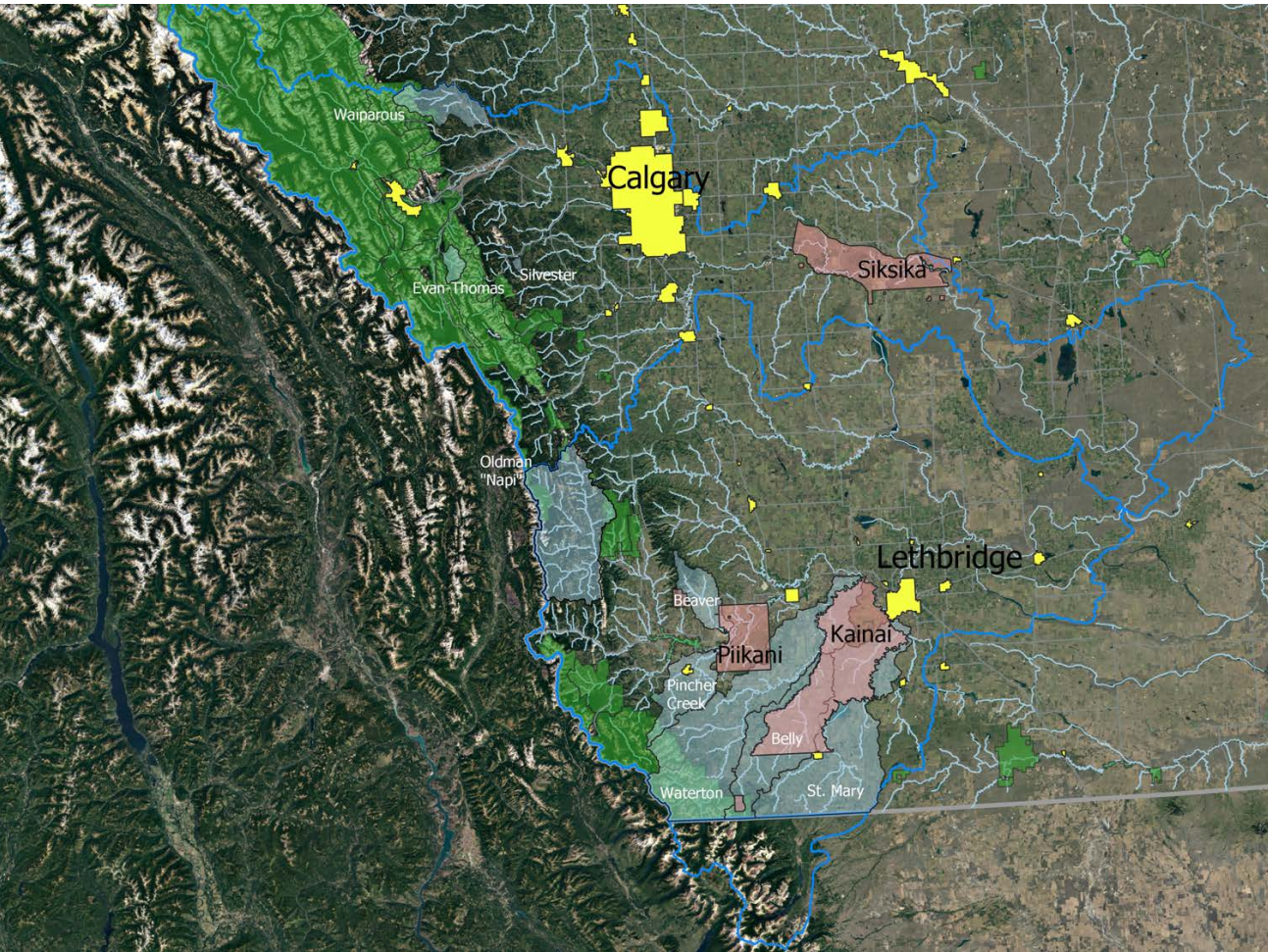
- Westslope Cutthroat Trout spawning surveys occurred on 3 streams in the Oldman River Watershed:
- Honeymoon Creek ([spawning video here](#)), Beaver Creek, and Star Creek.
- 4 streams were surveyed for bull trout spawning activity in the Bow & Oldman River Watersheds:
- Highwood River, Smith-Dorrien Creek, Pincher Creek, Spionkop Creek ([spawning video here](#)) & the North Belly River upstream of the Blood Timber Limit;



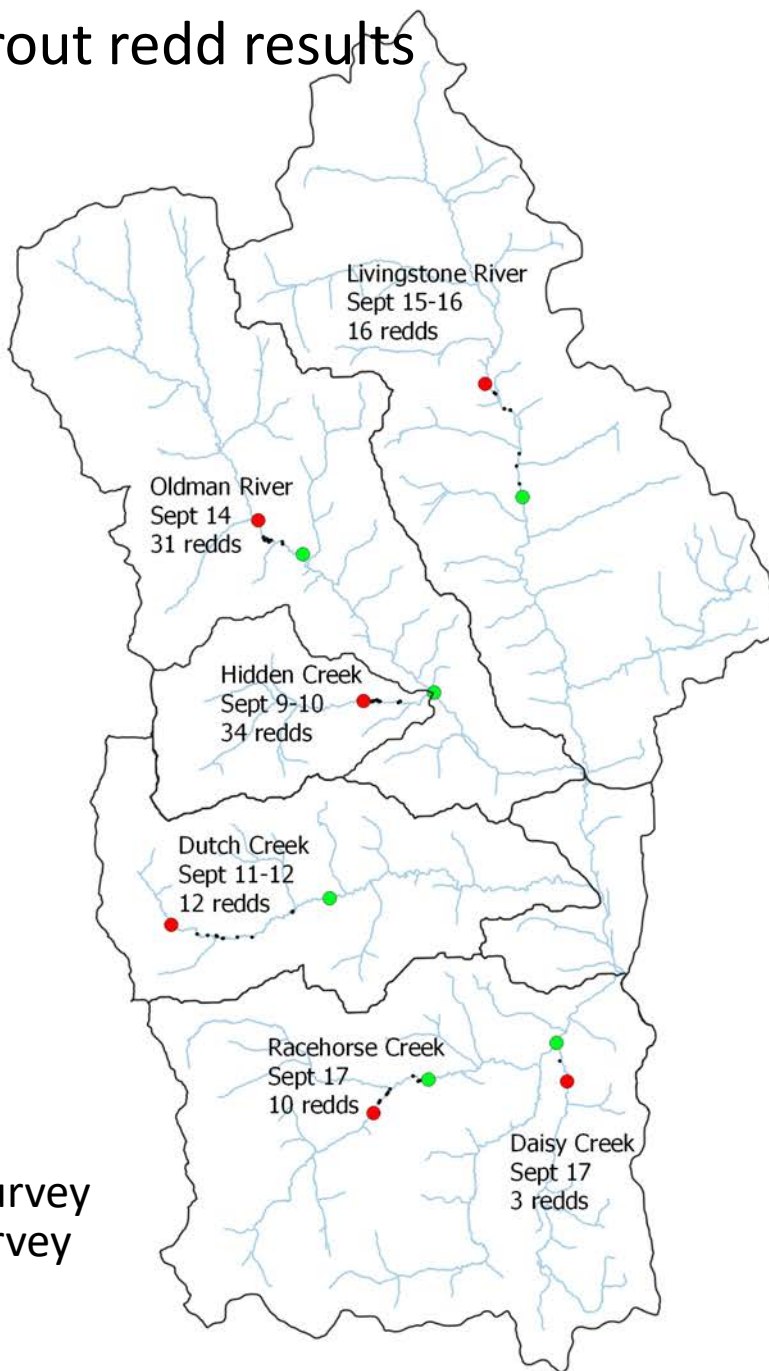


2020 Westslope Cutthroat Trout redd results

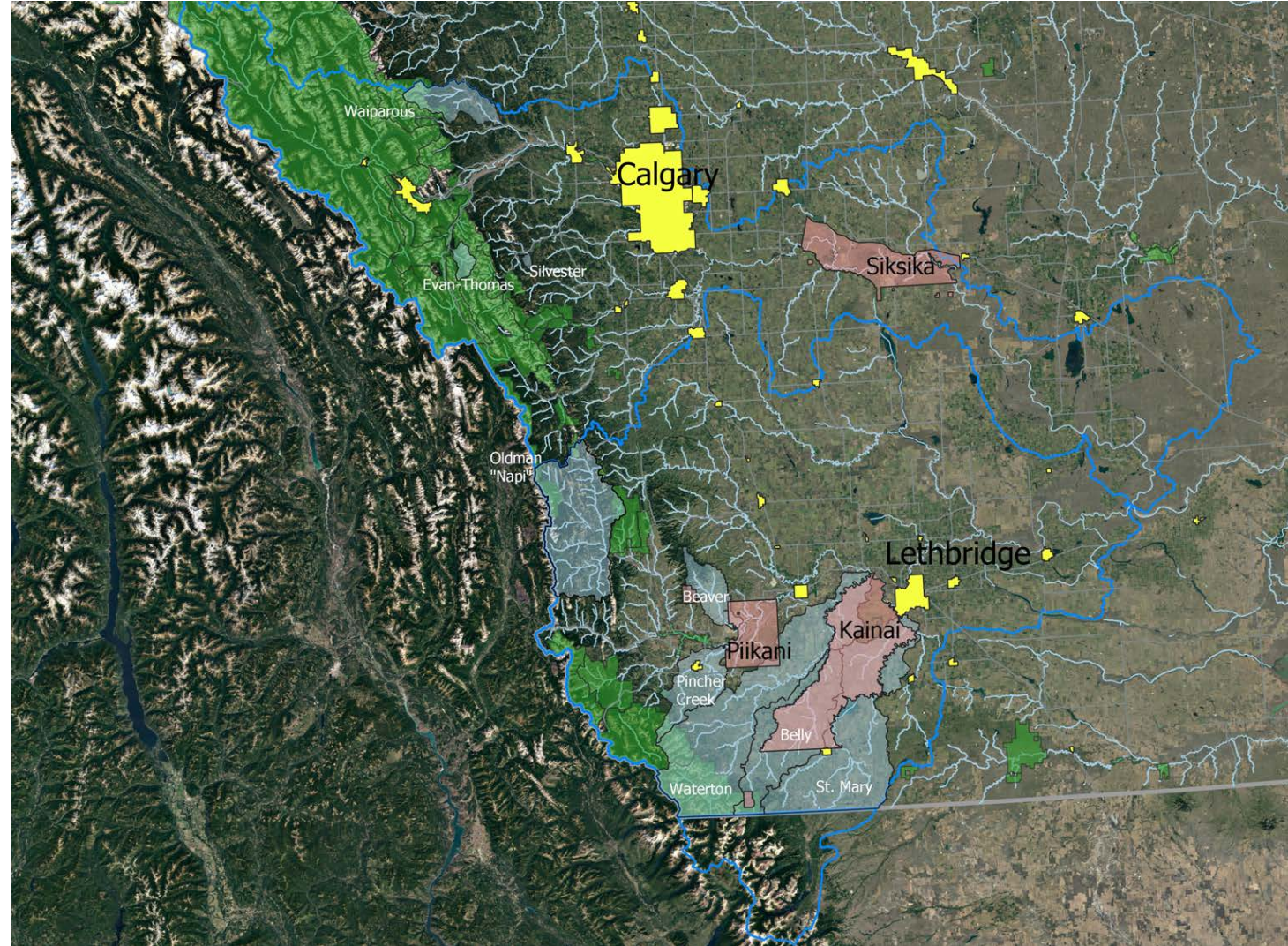
- Start of survey
- End of survey
- Redds



2020 Bull Trout redd results



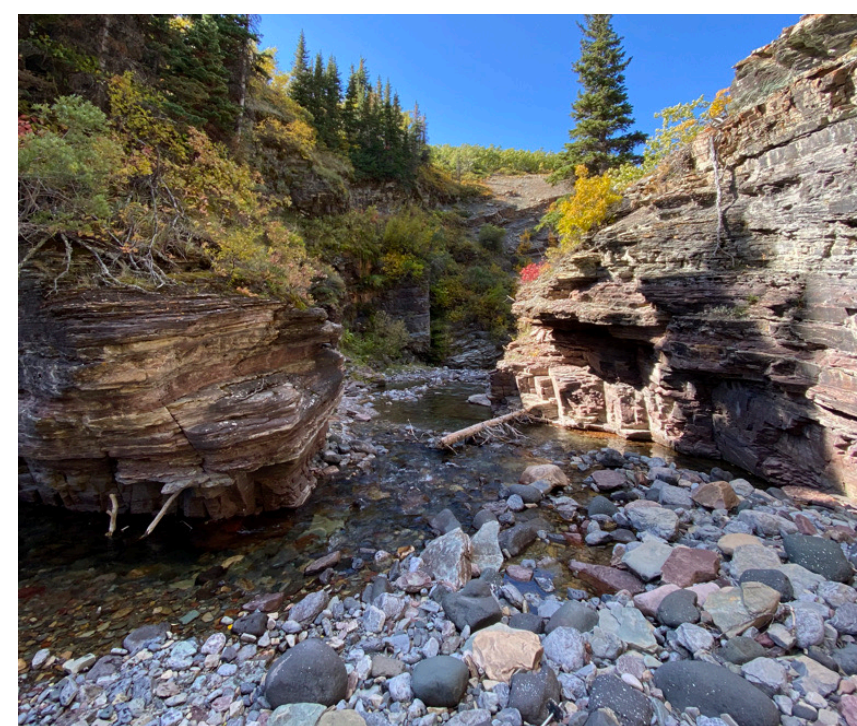
- Start of survey
- End of survey
- Redds



2020 Belly River: 24 Bull Trout redds counted





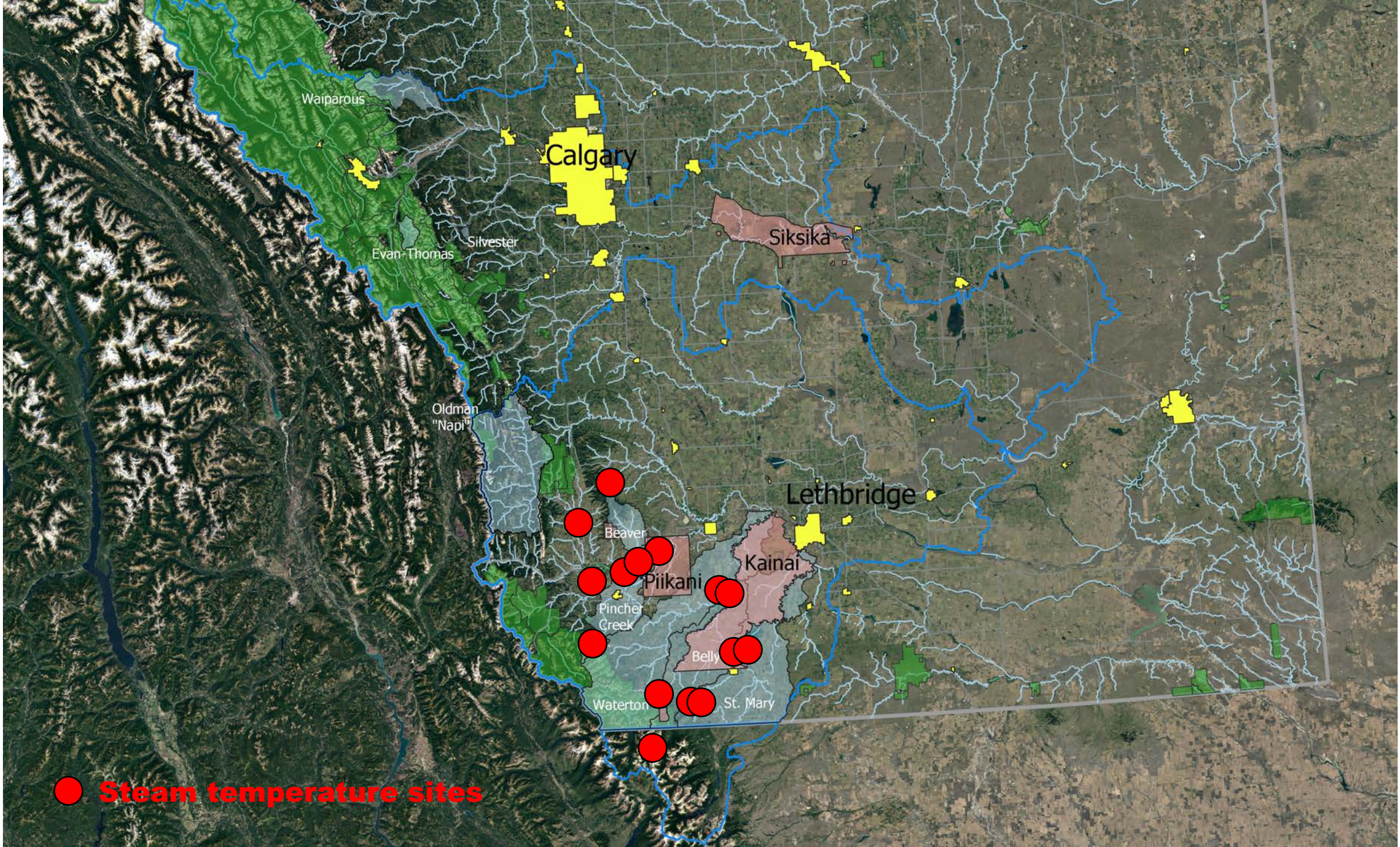


PROJECT FIELD WORK & DATA COLLECTION

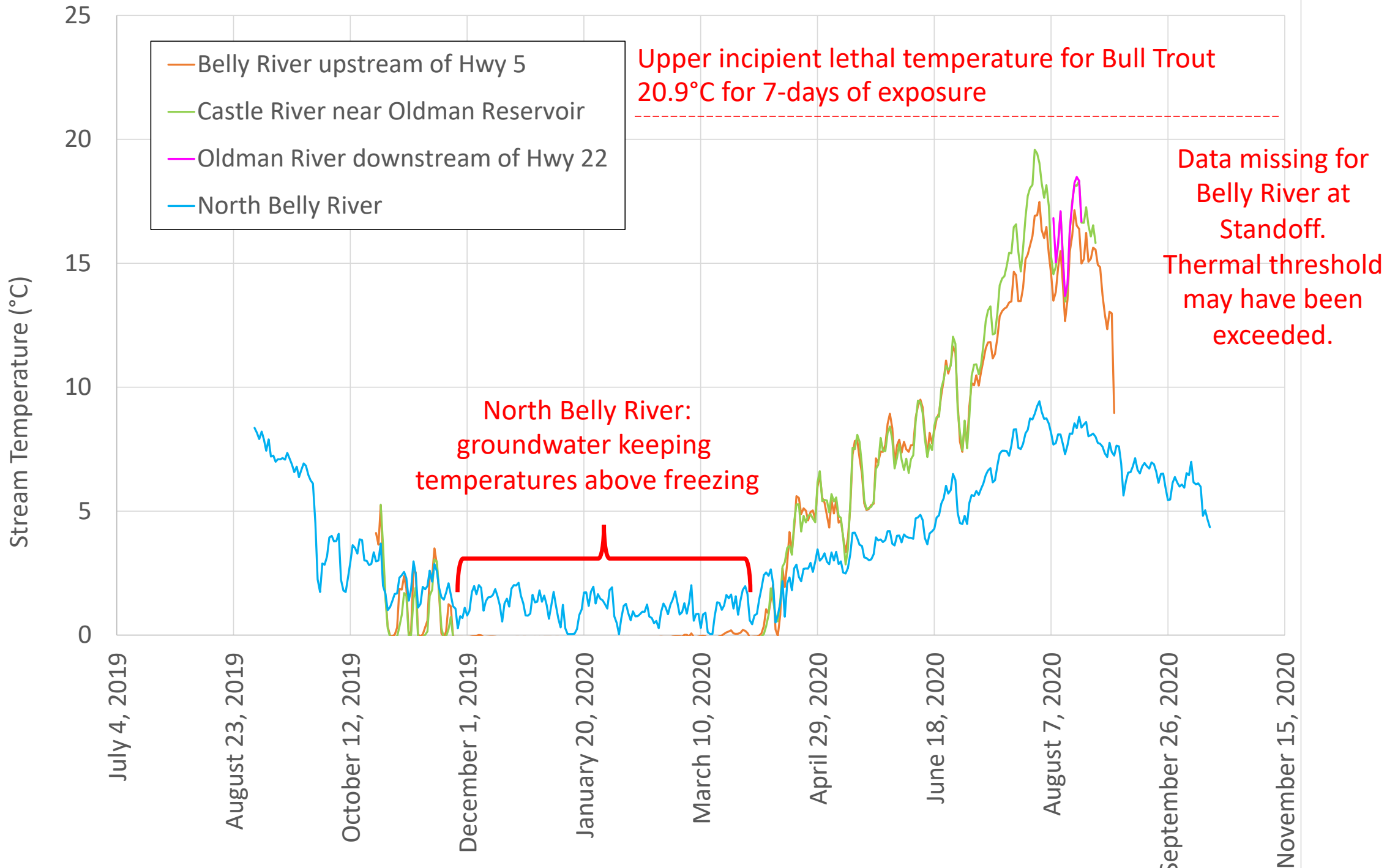


2020 Water Temperature Data Loggers:

- New stream temperature monitoring sites were set up with data loggers deployed at 15 new sites;
- Including one on the Blood Reserve and two on the Piikani Reserve;
- Stream temperature data were downloaded from an additional 4 stream temperature monitoring sites previously established by Alberta Environment and Parks;
- These data will help identify where temperatures are cold enough for native trout and help assess the risk of the spread of whirling disease.
- In 2021 stream temperature loggers were installed and checked in the Bow and Oldman watersheds



● Steam temperature sites



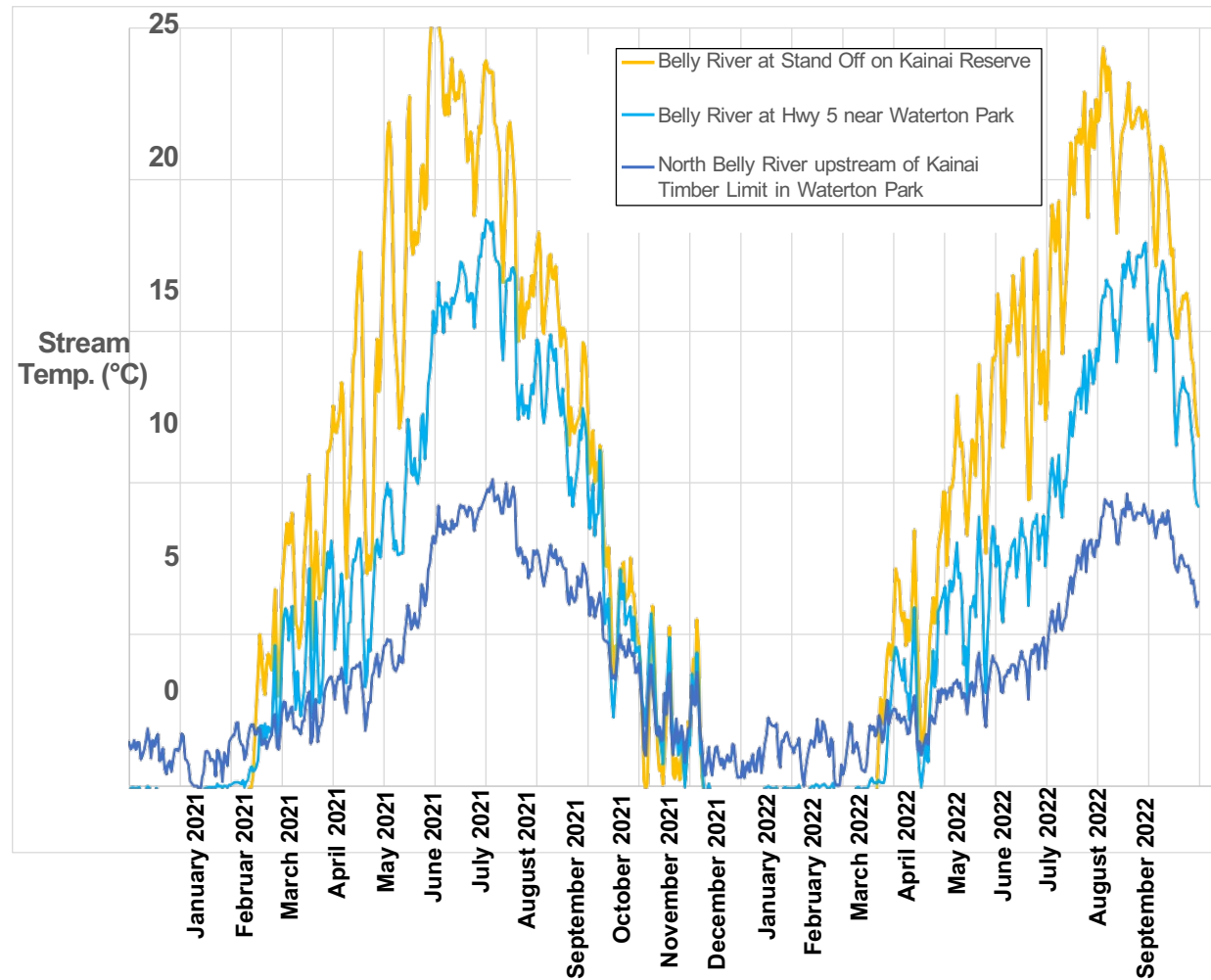


Figure 3.14 Daily average stream temperature at three sites on the Belly River from upstream of the Kainai Timber Limit to Stand Off on the Kainai Reserve near the Waterton-Belly river confluence



PROJECT FIELD WORK & DATA COLLECTION



2021 Fish Rescues in Irrigation Diversion Canals:

- Fish rescues occurred on Piikani lands at the Oldman River flume, Carseland canal, Lethbridge Northern Irrigation District canal, and Belly-Waterton canal.

Connectivity to Bull Trout spawning habitat

- Irrigation dams fragment river habitat in southern Alberta
- eDNA is being used to look for evidence Bull Trout in the river downstream of a dam are accessing Pincher Creek to spawn



**NO BULL OR CUTTHROAT TROUT!
PEIGAN FRIENDS ALONG THE RIVER – 31ST ANNUAL FISH RESCUE**



PEIGAN FRIENDS ALONG THE RIVER – 31ST ANNUAL FISH RESCUE

TROUT UNLIMITED CANADA LNIID IRRIGATION CANAL RESCUE – OCTOBER 2021



Fish Rescues



- Between 2017-2020 a total of 8 large migratory Bull Trout with an average fork length of 552 mm were rescued from the LNID canal
- Staff from each BFC Nation participated in fish rescues organized by TUC and Harley Bastien in 2021



COLLABORATION WITH THE BLACKFEET NATION POST COVID



BLACKFOOT ELDER INTERVIEWS



- One of the components of the 2020-21 Blackfoot Confederacy (BFC) Native Trout Recovery Project was to interview elders and traditional knowledge holders from each of the four nations of the BFC, with the objective of acquiring information on the traditional and current significance of fish, water and place names within Blackfoot Territory, to determine any connections with these objects and the Blackfoot landscape.

BLACKFOOT ELDER INTERVIEWS



- Six (6) respected elders from each of the four nations of the Blackfoot Confederacy, Kainai (Blood Tribe), Piikani (Peigan Nation), Siksika (Siksika Nation) and Aamskappi Piikunni (Blackfeet Nation, Montana, USA) were interviewed.
 - Mike Bruised Head – Kainai;
 - Shirlee Crowshoe – Piikani;
 - John Murray – Amskappi Piikunni;
 - David Striped Wolf – Kainai;
 - Clarence Wolf Leg – Siksika;
 - Wilfred Yellow Wings – Piikani.

YEAR 1 - BLACKFOOT ELDER INTERVIEWS



- Elder Mike Bruised Head (Ninna Piiksii – Chief Bird) - Kainai



YEAR 1 - BLACKFOOT ELDER INTERVIEWS



- Elder Shirlee Crowshoe (Misumminiskimm – Ancient or Long Time Buffalo Stone) - Piikani



YEAR 1 - BLACKFOOT ELDER INTERVIEWS



- Elder John Murray - linnii Pootaa (Fly's Down) – Aamsappi Piikunni



YEAR 1 - BLACKFOOT ELDER INTERVIEWS



- Elder David Striped Wolf - Aapotskinaiyii (White Horn) - Kainai



YEAR 1 - BLACKFOOT ELDER INTERVIEWS



- Elder Clarence Wolfleg- Miiksiikum (Red Crane) - Siksika



YEAR 1 - BLACKFOOT ELDER INTERVIEWS



- Elder Wilfred Yellow Wings – Namoaatsikassi (Courageous to Try Something Out) - Piikani



BLACKFOOT ELDER INTERVIEWS



The six elders were asked three questions:

1. How are fish significant to the Blackfoot people?
2. How is water significant to the Blackfoot people?
3. What are some traditional Blackfoot place names in Blackfoot Territory?

BLACKFOOT ELDER INTERVIEWS



SUMMARY:

1. How are fish significant to the Blackfoot people?

- All of the elders said they heard that some of our old people said we traditionally didn't eat fish, but all of them also said they heard some of our old people ate fish. Some ate fish frequently, others didn't eat fish much or at all;
- Most (4/6) of the elders said that some of their family members were avid fisherman;
- Most (4/6) of the elders said the Blackfoot people ate fish in times of starvation and all of the elders mentioned the Fish Eater clan from the Kainai Nation.

BLACKFOOT ELDER INTERVIEWS



SUMMARY:

2. How is water significant to the Blackfoot people?

- All of the elders said that water was very sacred, powerful and a gift to the Blackfoot people;
- Three of the elders said that the Blackfoot people received the Beaver Bundle from the water beings and that it was the most powerful medicine bundle with 100 plants, animals and songs;
- Two of the elders said that water and fire are what we need to survive, without them, we would not be here;
- Four of the elders said that our people always knew where the water was when they travelled and they would camp close to the water.



WORKING WITH BEAVERS

Positive Impacts of Beavers

Beavers mitigate the impacts of flood and droughts, which they do by storing and delivering water. Beaver dams act as speed bumps, slowing moving water, allowing it to seep into ground water during times of high and normal water levels, later releasing cool water during the hot, dry times in later summer as well as through the frozen months of the year.

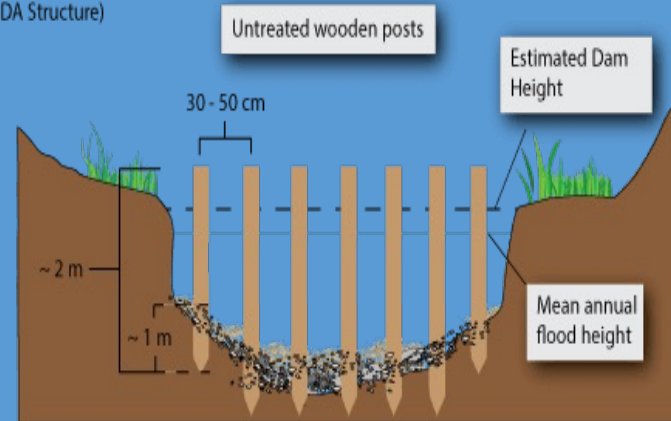


BEAVER DAM ANALOG (BDA) INSTALLATIONS



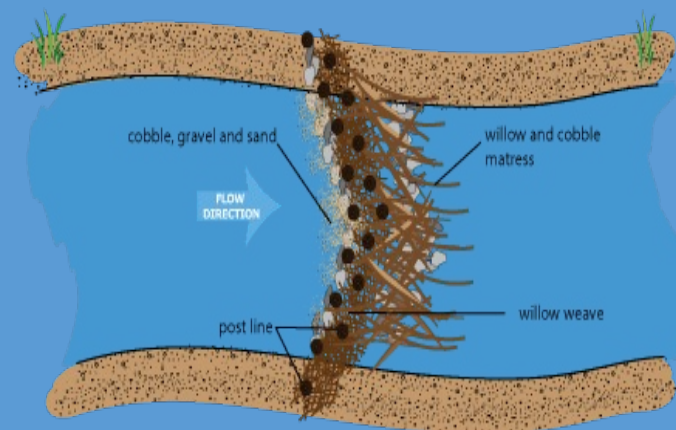
➤ A BDA is a man-made structure designed to mimic the form and function of a natural beaver dam.

Cross Section View
(Generic BDA Structure)



➤ Beaver's have largely disappeared from regions where they used to reside.

Plan View
(Convex Primary Dam)







ACKNOWLEDGEMENTS



On behalf of the Project Management team, we'd like to thank the following:

- Project Partners: Blackfoot Confederacy & the 4 nations, DFO Canada, Parks Canada, Alberta Environment & Parks, Cows & Fish, Oldman Watershed Council, University of Victoria, Helbing Lab, Trout Unlimited Canada, Fintegrate Fisheries & Watershed Consulting Ltd.
- The following individuals: BFC CEO - Jack Royal, BFC Environment Director - Kimmy Houle, Fintegrate Biologist – Matt Coombs, Assistant Project Manager - Elliot Fox, Technicians – Alvin First Rider, Colby Sanspariel, Truman Big Swallow, Zach First Rider, Blair & Brent Little Mustache, Juaquin Four Horns, Lance Breaker, Blaine Solway, Detroit Maguire, Levitt Ayoungman, Joe Many Fingers, Carleigh Grier-Stewart, Jeremiah North Peigan, Ryan Running Wolf, Brandon Kittson & Nation Managers – Mike Oka, Kansie Fox, Ira Provost, Noreen Plain Eagle, Cedric Solway, Hester Breaker, John Murray, Gerald “Buzz” Cobell.