

A photograph of the Clark Fork River flowing through a lush, green landscape. The river is in the foreground, reflecting the sky. The banks are covered in tall grasses and shrubs, with a dense line of trees in the background under a clear blue sky.

# Clark Fork River Operational Unit of the Milltown Reservoir/Clark For River Superfund Site

Project Update  
November 7, 2017



# New Clark Fork Team

## DEQ, EPA, NRD, FWP, NPS, and Weston Solutions

- **Montana Department of Environmental Quality (DEQ): Lead agency**
- **EPA: Oversight agency**
- **Natural Resource Damage Program: Responsible for restoration and partners with DEQ**
- **Montana Fish, Wildlife & Parks: Assists with wildlife monitoring**
- **National Park Service: Land administrator**
- **Weston Solutions: Contracted to assist with the Community Involvement Plan**

# Clark Fork River Cleanup Goals



**Remediation** - Protect public health and welfare and the environment through implementation of the cleanup

**Restoration** - Restore, replace or acquire the equivalent of injured natural resources covered under the lawsuit

- Aquatic Resources
- Terrestrial Resources



# Clark Fork River History

Contaminants present in the CFR OU are from historic mining and smelting processes upstream of the Clark Fork River. In the Butte area, mining companies routinely disposed of mining and milling wastes directly into Silver Bow Creek. These mining wastes were carried away and mixed with river bed sediments by the various high seasonal flow events in Silver Bow Creek, and much waste subsequently was carried into the upper Clark Fork River.



Smelter Hill and Stack  
Anaconda 1902-1980



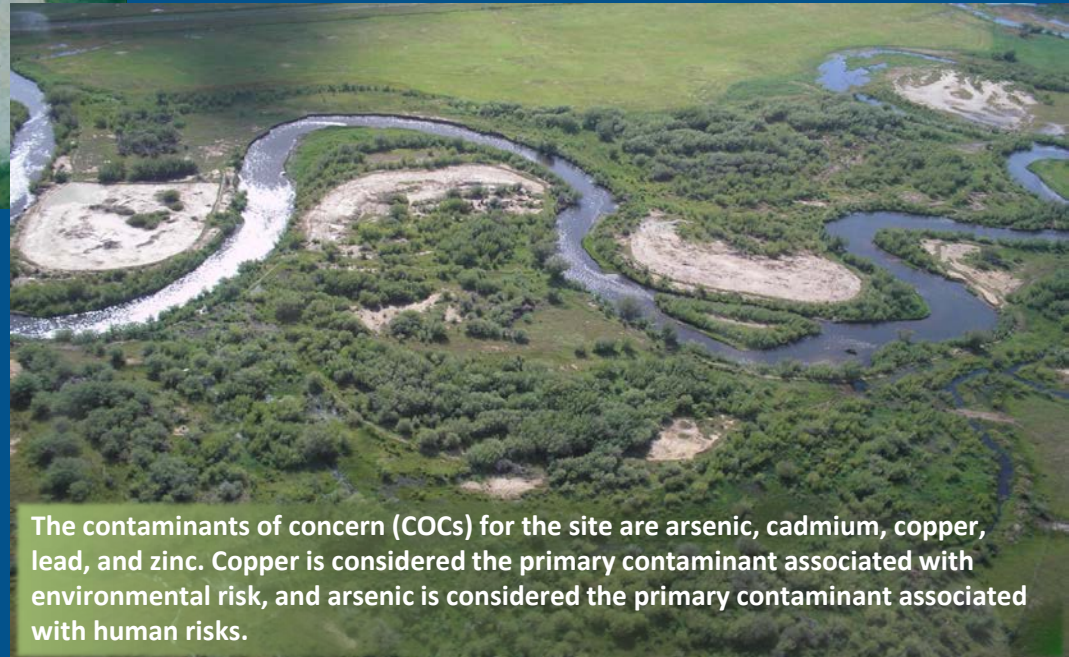
Butte – 1890s



In the Anaconda area, large quantities of wastes from the Anaconda Company's operations also reached the Clark Fork River through Warm Springs Creek and other tributaries. In early 1908, the largest flood event on record for the Clark Fork River drainage occurred. This resulted in flooding down the entire Clark Fork River drainage. During this event, extensive quantities of waste, contaminated soils, and contaminated sediments were deposited within the Clark Fork River floodplain.



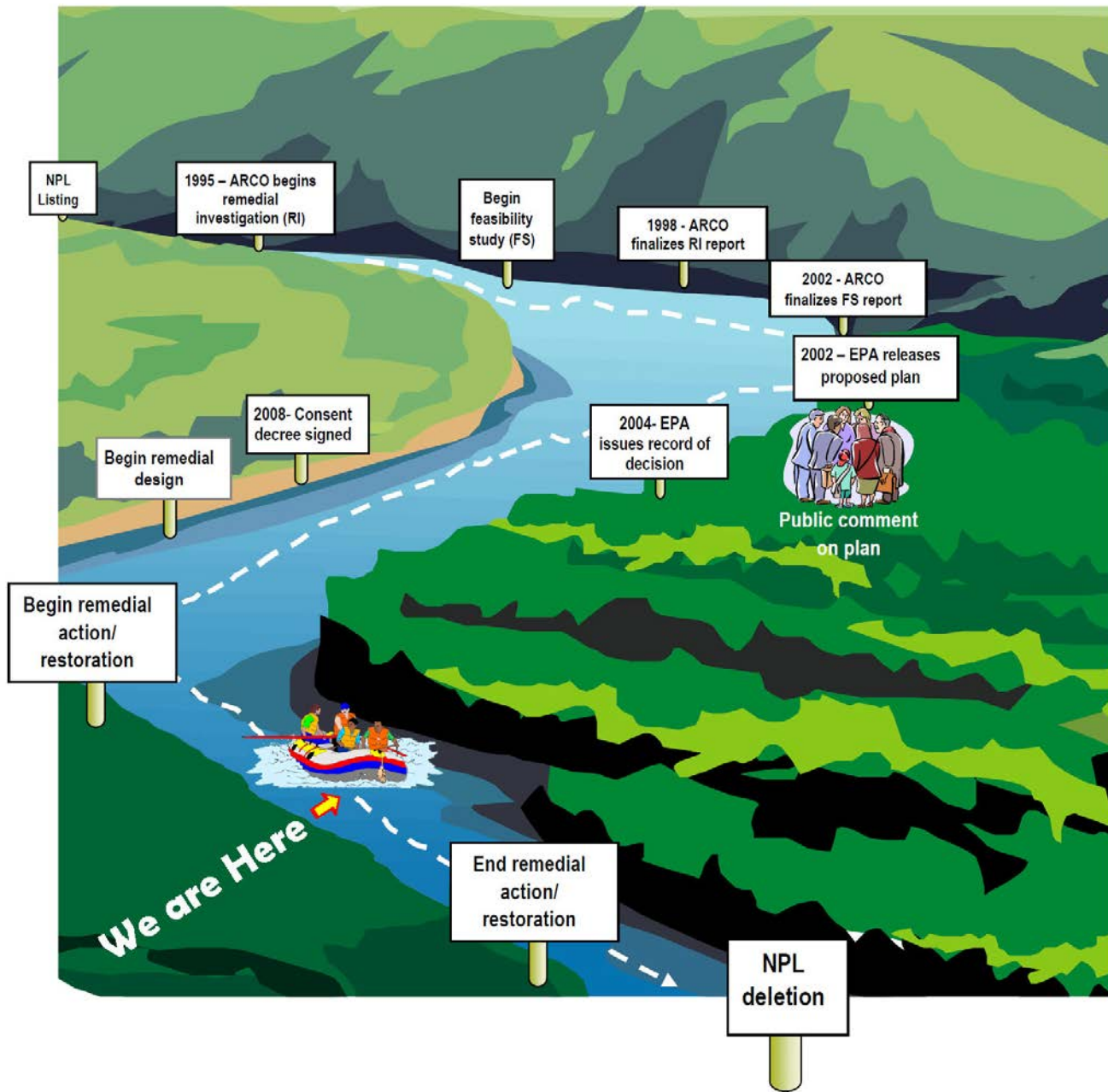
# Mine waste along Silver Bow Creek



# Mine waste along the Clark Fork River



The contaminants of concern (COCs) for the site are arsenic, cadmium, copper, lead, and zinc. Copper is considered the primary contaminant associated with environmental risk, and arsenic is considered the primary contaminant associated with human risks.



# Site History

## Record of Decision

The 2004 Record of Decision or the ROD outlined the Remedial Action Objectives (RAOs) for floodplain tailings and impacted soils:

- To prevent or inhibit ingestion of arsenic-contaminated soils/tailings where ingestion or contact would pose an unacceptable health risk.
- To prevent or reduce unacceptable risks to ecological (including agricultural, aquatic, and terrestrial) systems degraded by contaminated soils/tailings.

## Consent Decree

In 2008 the Consent Decree was signed. ARCO provided funding for three accounts:

- Clark Fork Site Response Action Account: \$95 million. DEQ shall use the Clark Fork Site Response Action Account solely to finance the work at or in connection with the Clark Fork Site, including state oversight of the Remedial Design, Remedial Action, and Operation and Maintenance.
- CFR Reserve Account: \$12.5 million for potential remediation and restoration cost overruns. The Account shall be maintained by the state to ensure payment of further and additional response costs and for additional costs for restoration of the Clark Fork Site and tributaries to the Clark Fork River upstream of the historic location of the Milltown Dam, and for other remedial or restoration obligations related to the Clark Fork Site, such tributaries, the state property remedial commitments, and the state's other obligations under State CD II.
- CFR Restoration Account: \$26.7 million managed by the Natural Resource Damage Program. The state shall use the Clark Fork State Restoration Account solely to restore, rehabilitate, replace or acquire the equivalent of the injured natural resources as provided in the Clark Fork River Aquatic and Riparian Resources Restoration Plan.

# Residential Yards

## During Cleanup



## Completed



The Trestle Area Cleanup was carried out in the fall and winter 2011-2012, with planting in spring 2012. The trestle cleanup involved removal of residential soils with elevated levels of arsenic, and reconstruction and revegetation of 1,000 feet of streambank. In the fall and winter of 2012, DEQ performed the remedial action for pasture areas that were historically irrigated with Clark Fork River water.



# Phase 1 Below Warm Springs Ponds

## Before Remediation



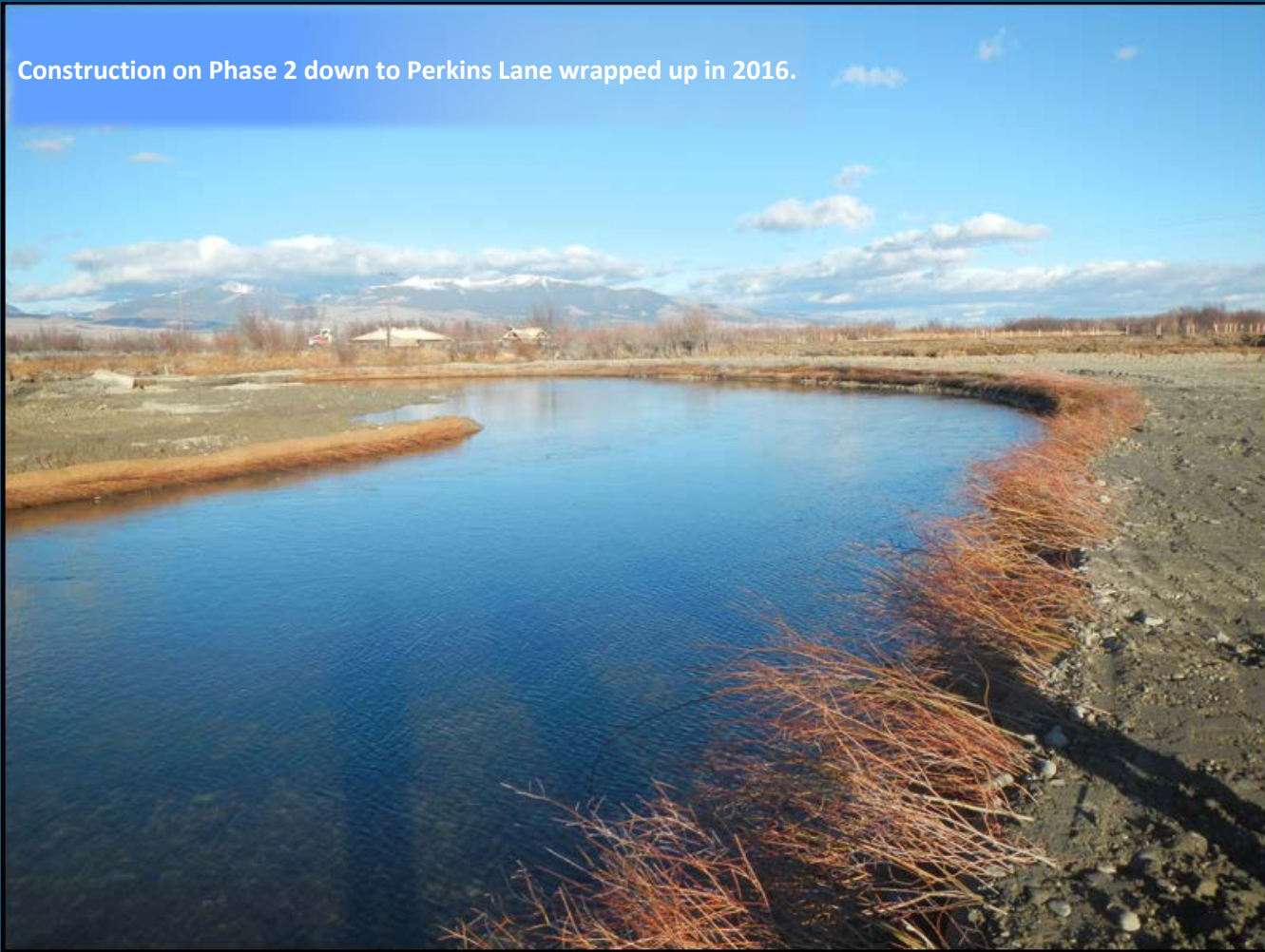
# Phase 5&6 Gemback – Galen Road

Phases 5&6, which are on the Dry Cottonwood Ranch between Gemback and Galen Road, began in 2014 and wrapped up in 2016.



# Phase 2 to Perkins Lane

Construction on Phase 2 down to Perkins Lane wrapped up in 2016.



# Upper Clark Fork Basin Fisheries Monitoring

Nathan Cook  
FWP



# Mainstem electrofishing

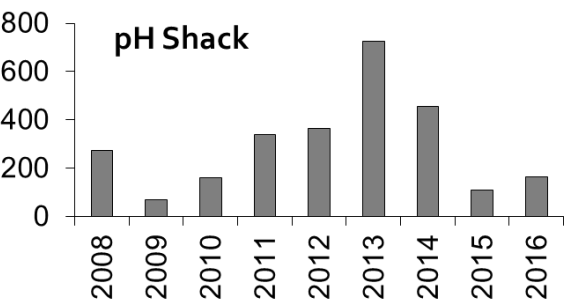
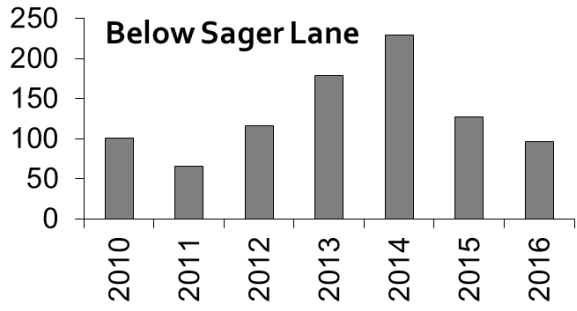
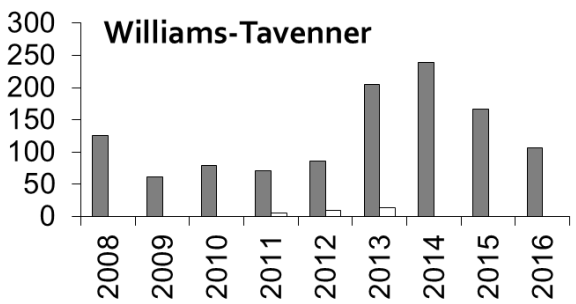
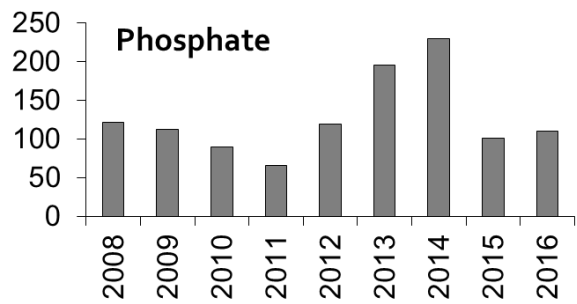
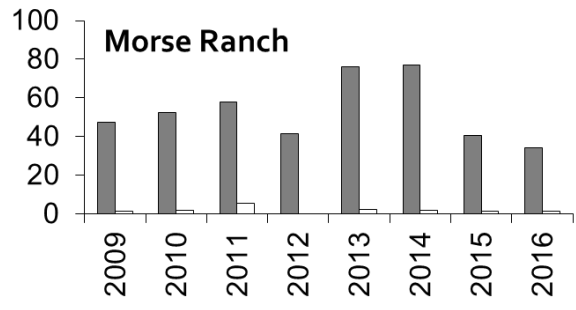
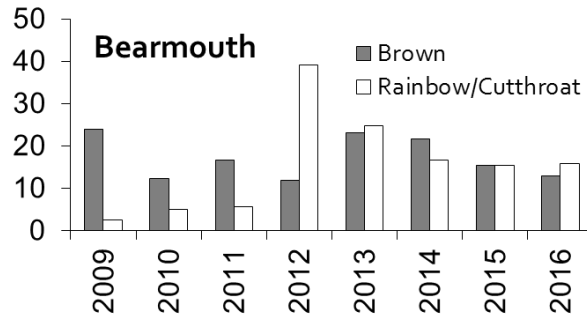
- 6 sections sampled annually. FWP samples trout at six sections on the mainstem Clark Fork River each year. Some of the sections have been sampled every year since 2008.
- Trout population estimates



Trout numbers are much lower in the downstream sections (Bearmouth and Morse Ranch) compared to upstream sections (pH Shack, Sager Lane, Williams-Tavenner).

Trout numbers also go down from year-to-year. These annual fluctuations are at least in part related to river flow and drought. For example, most sections had the highest estimates in 2013 and 2014 which is related to high survival of young trout hatched in 2010 and 2011, which were good flow years.

These estimates will provide a baseline to compare to when metals cleanup is completed.

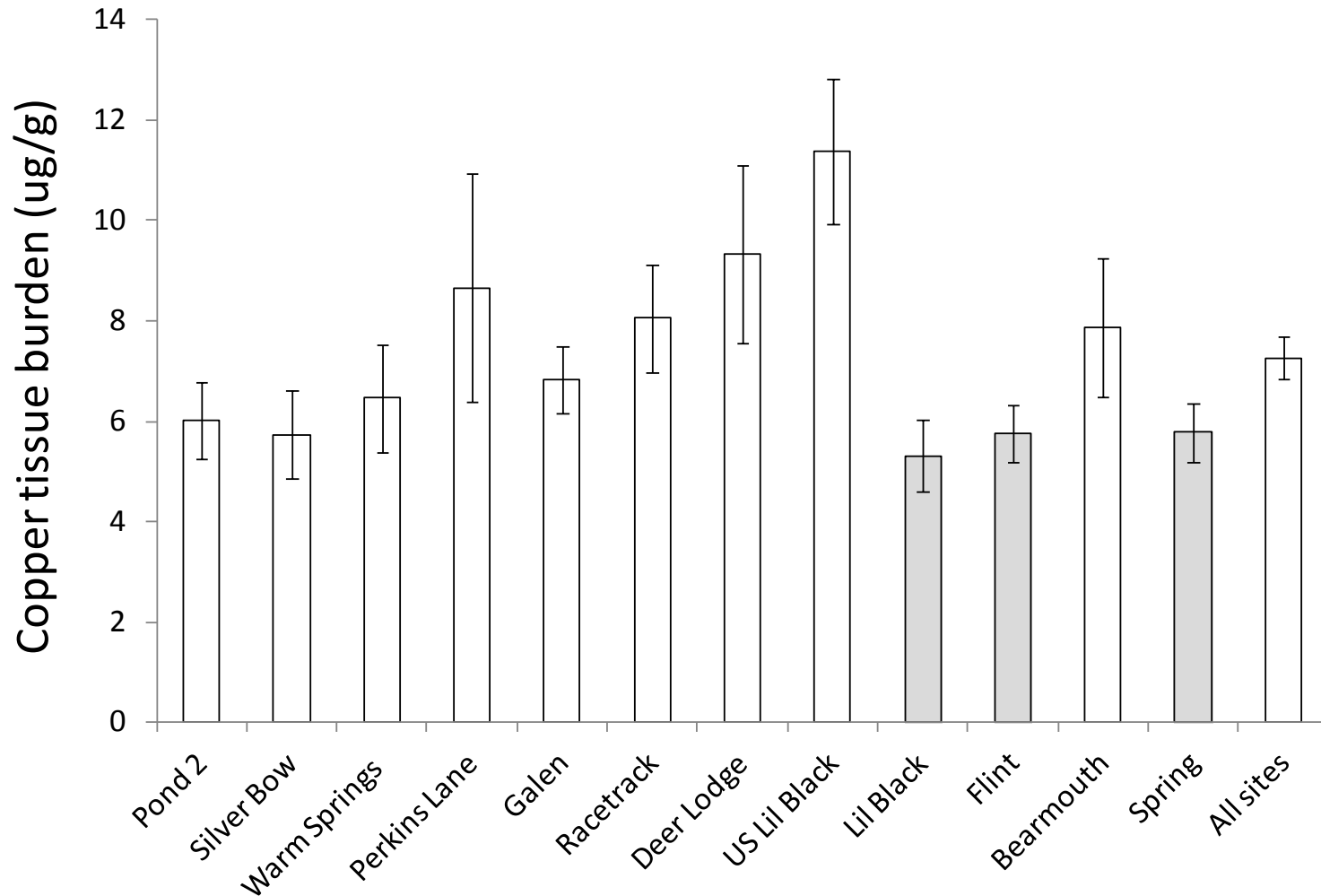


# Fish metals monitoring



FWP has also been monitoring the amount of heavy metals (Copper, Zinc, Cadmium, Arsenic, and Lead) in fish tissues. One way we have been doing this is with caged fish studies where hatchery brown trout are held in these boxes over the spring and summer.

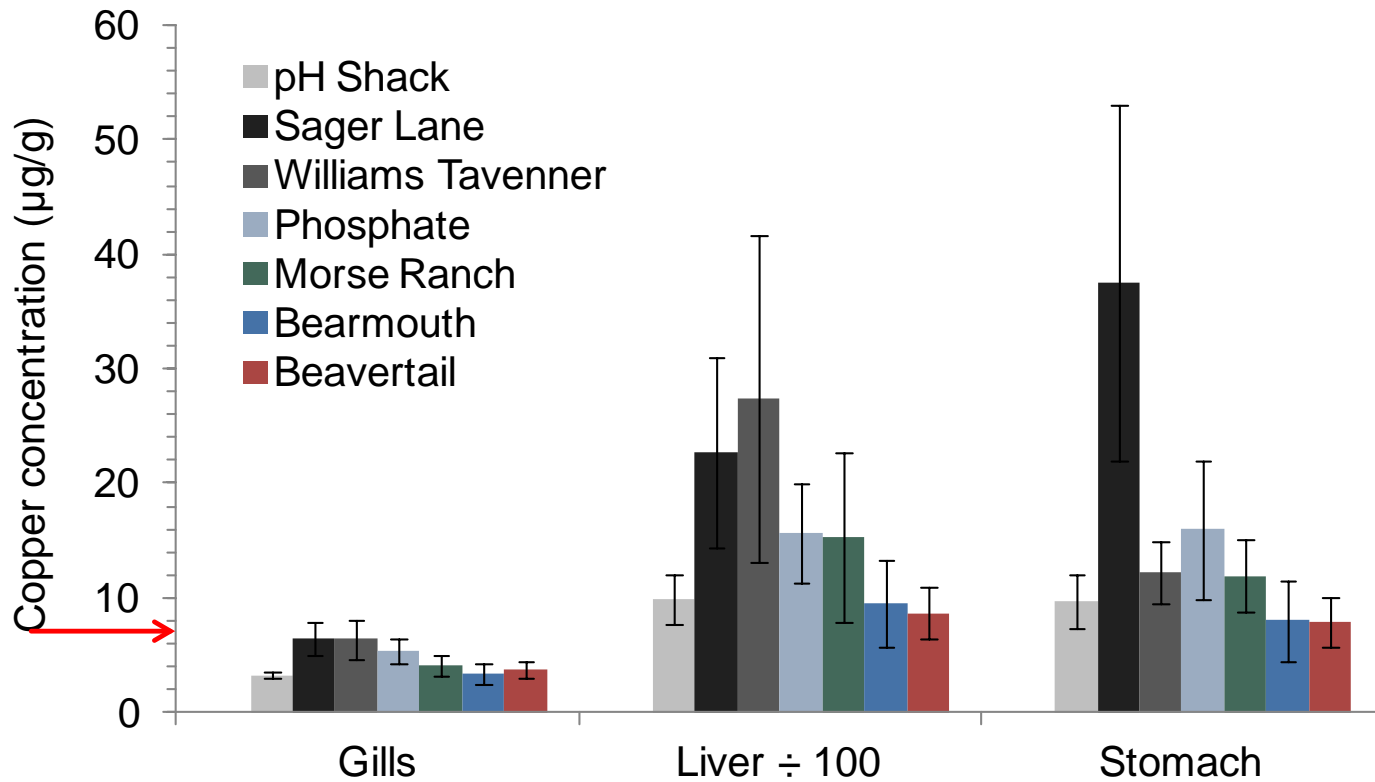
# Caged fish whole body copper



Copper concentrations in caged brown trout increase from the Warm Spring area (the Pond 2 Site) to the Deer Lodge area. Copper levels are lower downstream of the Little Blackfoot and in tributaries (grey bars).

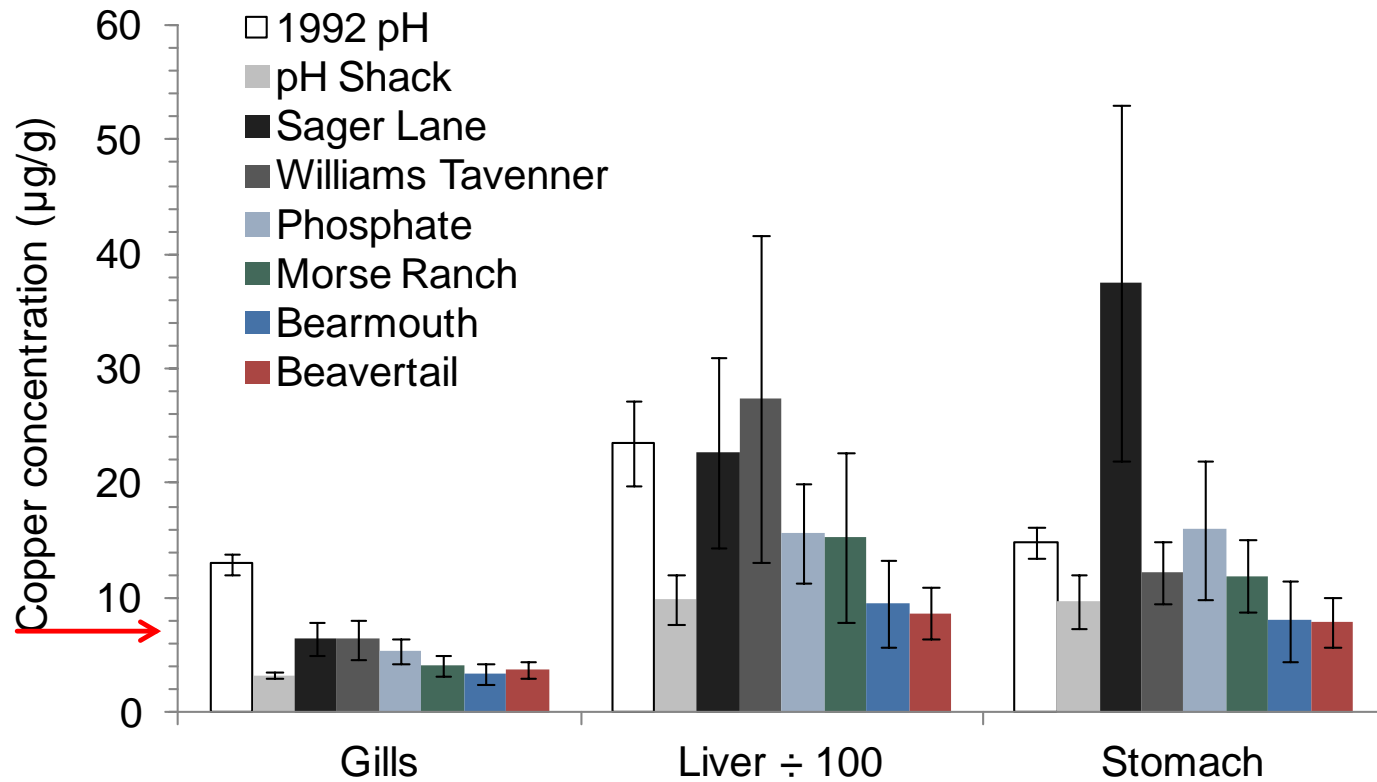


# Wild brown trout tissues: copper



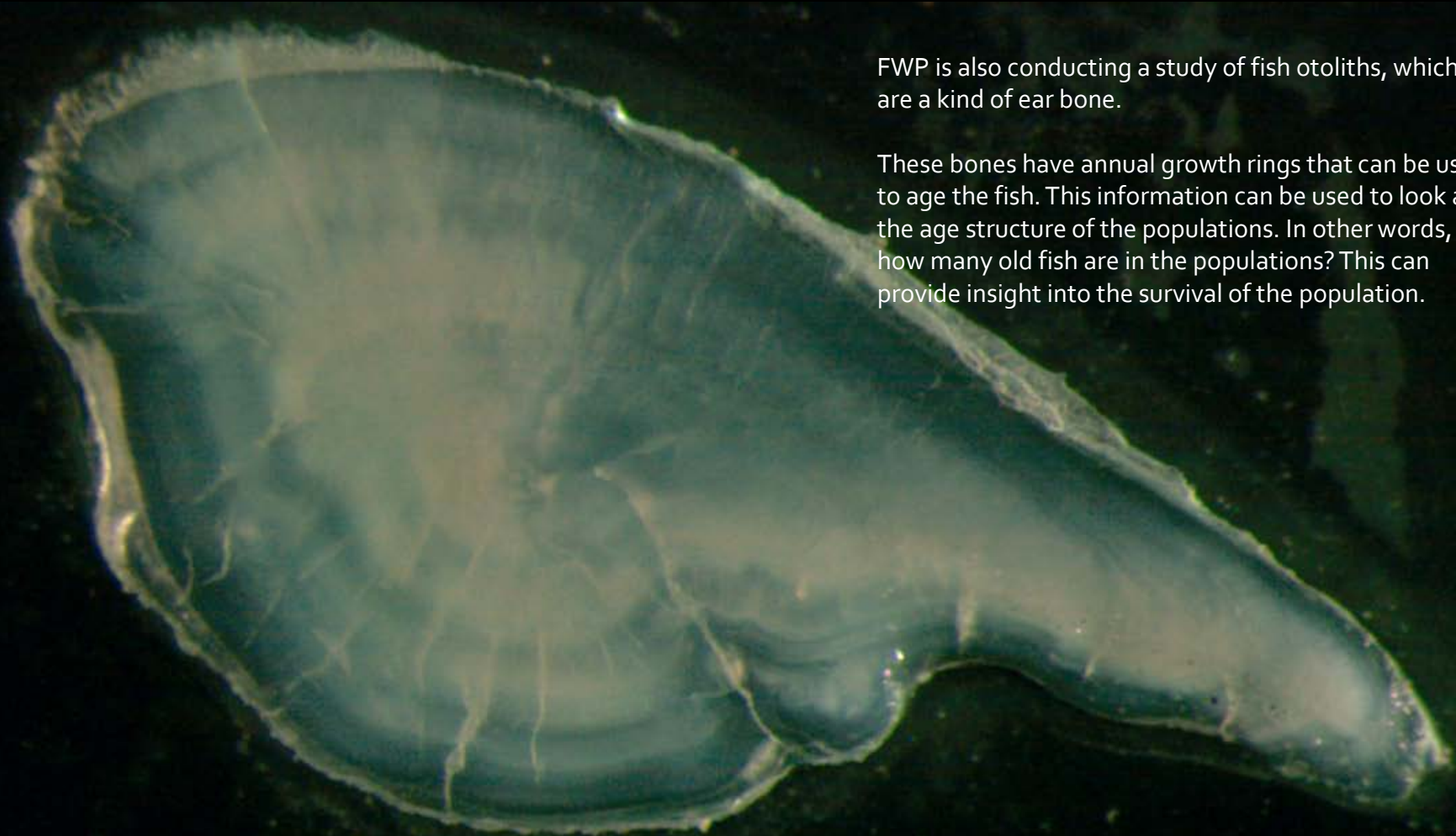
FWP also examined metals in wild brown trout from the Clark Fork River. These fish also showed more copper just upstream of the Little Blackfoot compared to other parts of the Clark Fork River.

# Wild brown trout tissues: copper



Copper levels in brown trout appear to have declined since the early 1990s in the Clark Fork River near Warm Springs (pH Shack section).

# Otolith study



FWP is also conducting a study of fish otoliths, which are a kind of ear bone.

These bones have annual growth rings that can be used to age the fish. This information can be used to look at the age structure of the populations. In other words, how many old fish are in the populations? This can provide insight into the survival of the population.

Thank you



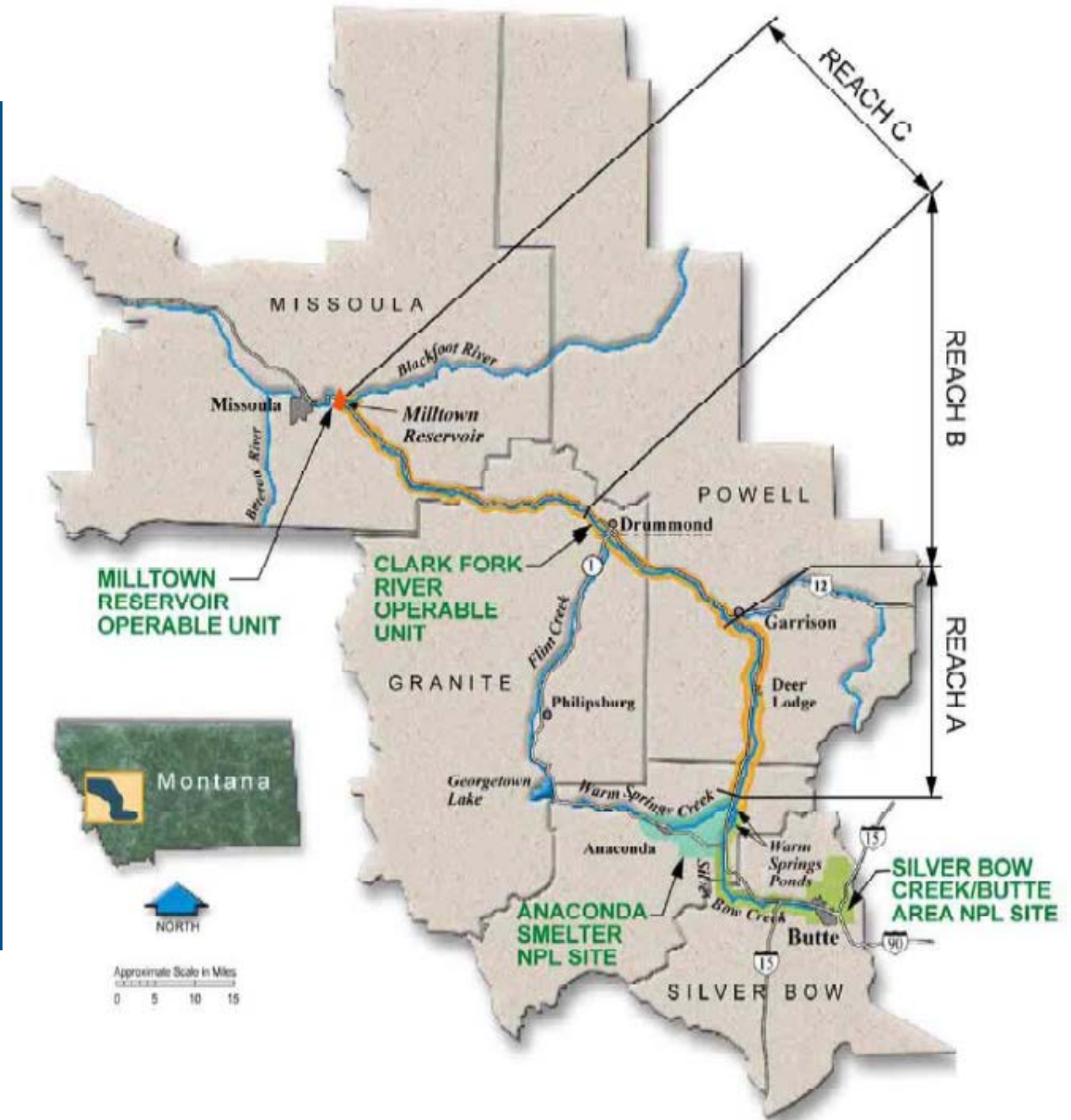
# Monitoring and Flood Impacts

Ben Quiñones  
Project Manager



# Clark Fork River Operable Unit

DEQ is responsible for monitoring surface water, ground water, vegetation and suitability for aquatic life, as defined in the ROD.



## Monitoring Stations By Reach

DEQ monitors 10 locations:

Reach A – Seven (correct?) sites between Warm Springs and Garrison.

Reach B – One site below Drummond

Reach C – Two sites between Drummond and Milltown (correct?)

Monitoring locations include the main Clark Fork and some tributaries.

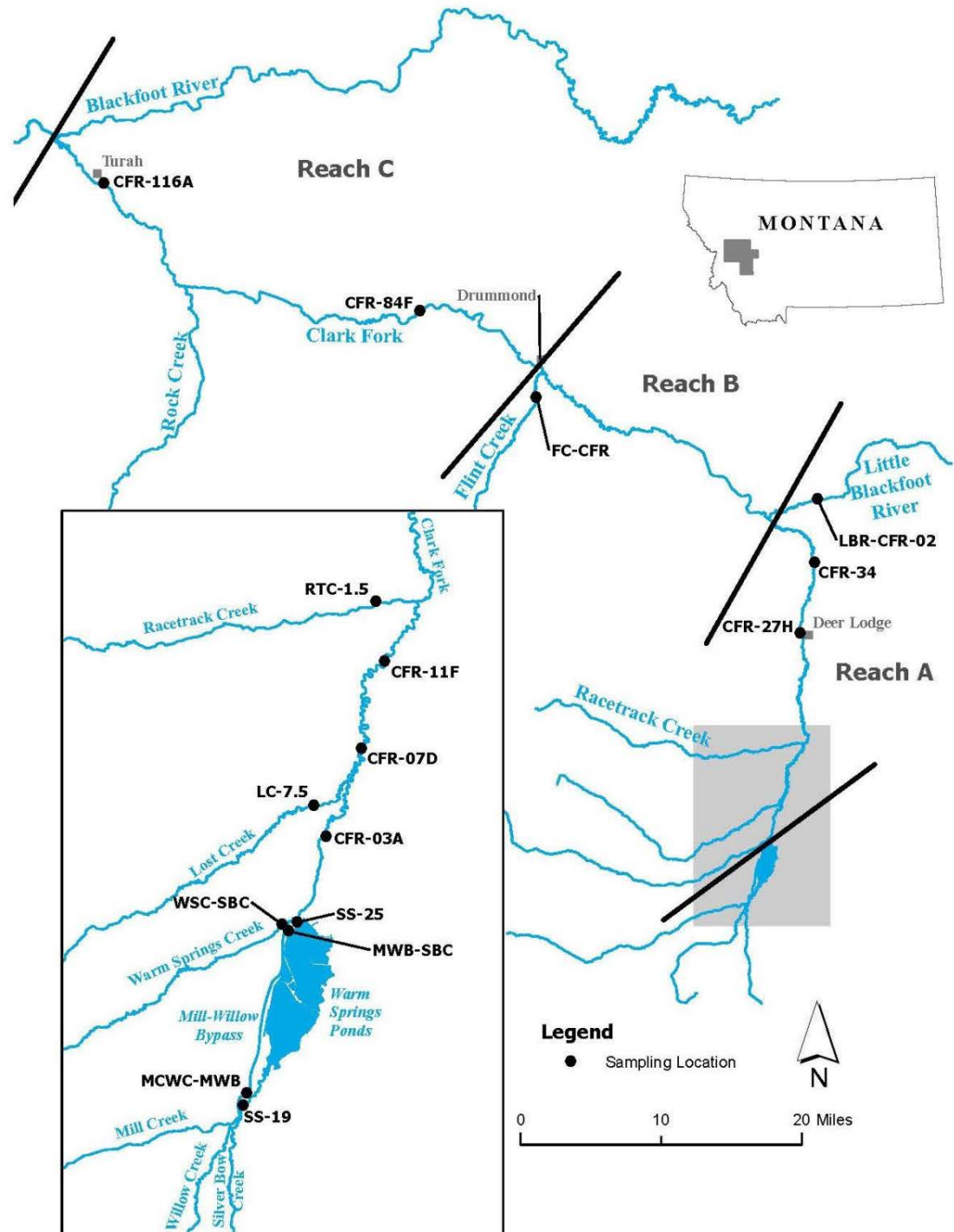
DEQ monitors year round. Starting in 2010, DEQ began monitoring six times a year:

Jan – March: Sample water and sediment.

April – June: Three sampling events to capture high water.

July – September: Water and sediment sampling.

October – December: Water sampling.



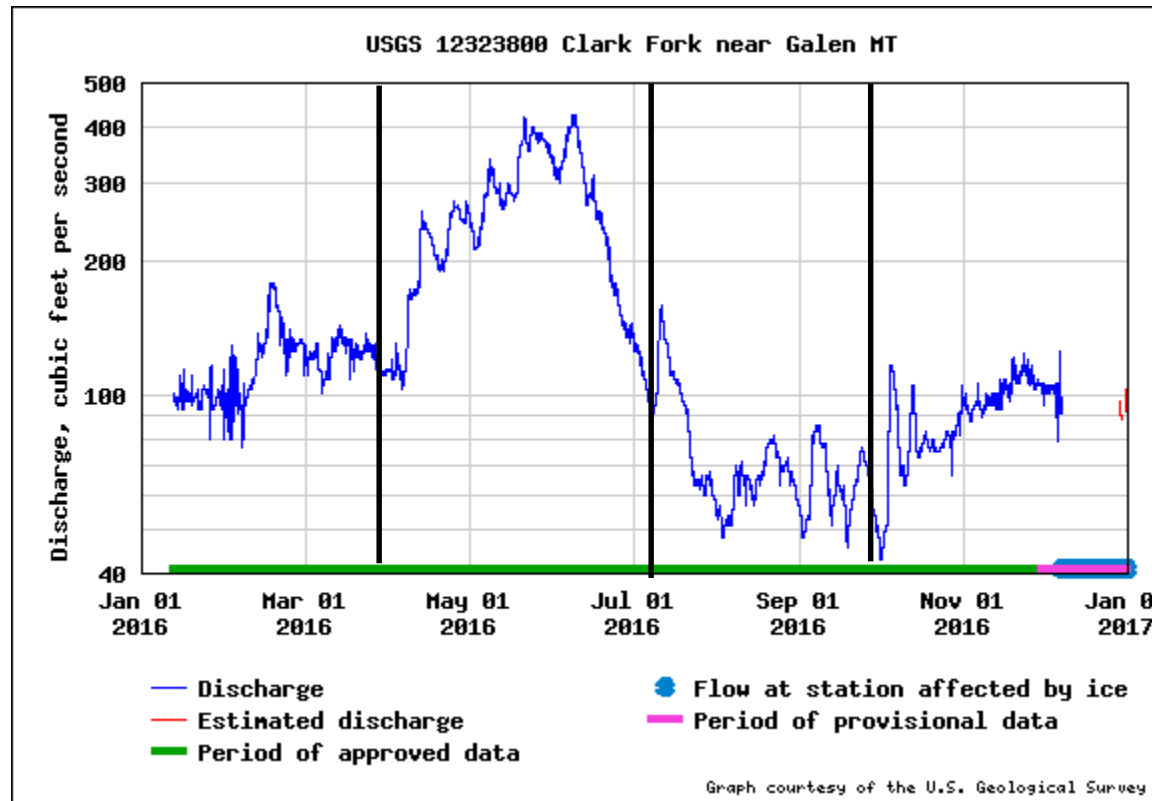
# Water and Sediment Monitoring

1st Quarter  
Water  
and Sediment

2nd Quarter  
Water  
X 3

3rd Quarter  
Water  
and Sediment

4th Quarter  
Water





# Water & Sediment Monitoring

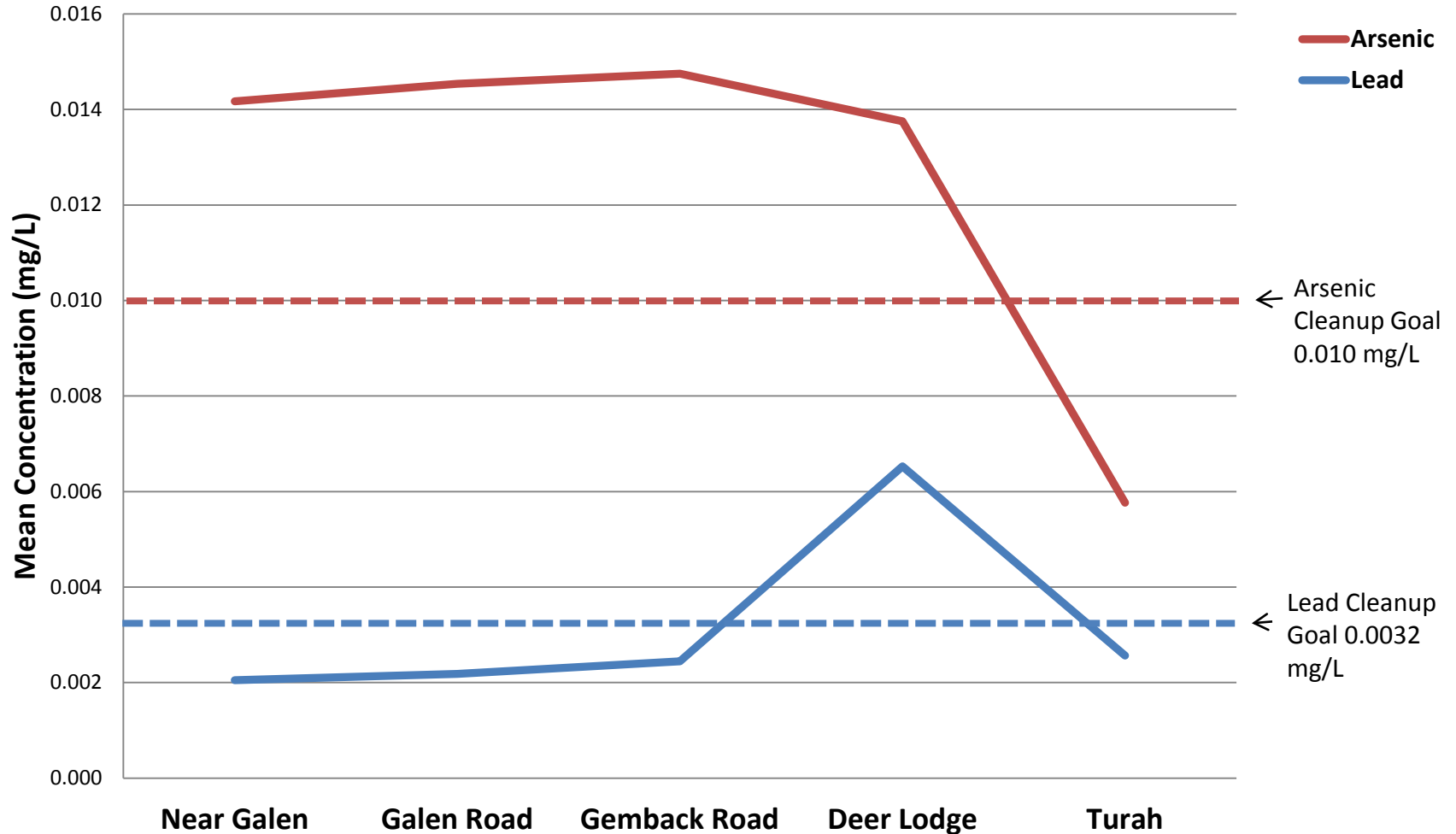
## What we've found

More than seven years years of (SW??) data has shown no definitive trend from year-to-year. However we have noticed decreases in AS (arsenic?) and PB?? as we move downstream. Similar trends are noted with sediment for all of the contaminants. Levels are high at the headwaters and tail off as we move downstream.

The complete set of monitoring reports is available at XXXXXXXXXXXXXXXXXXXXXXXX

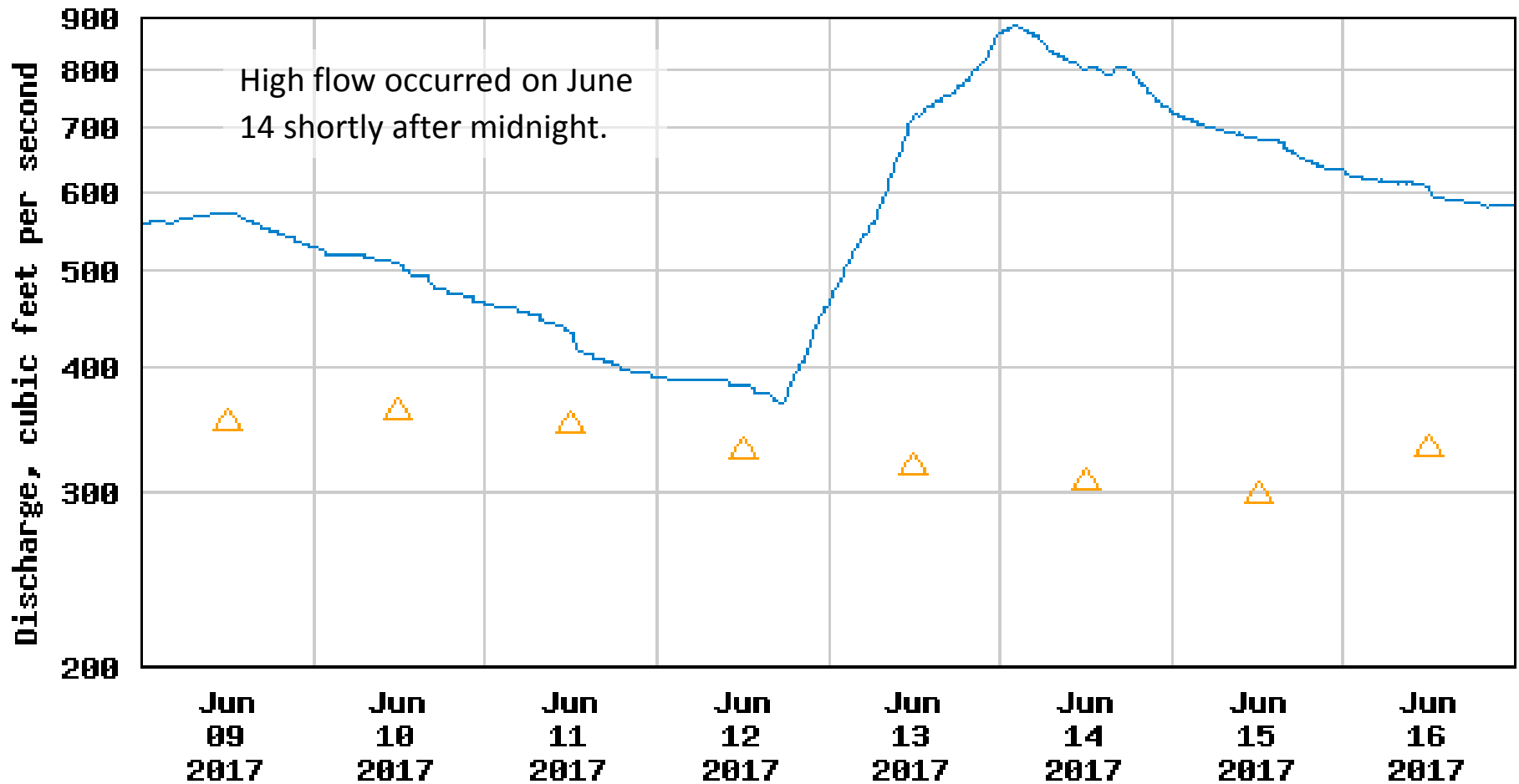
# Water and Sediment Monitoring

**Arsenic and Lead Concentrations  
Clark Fork River Monitoring Sites  
2010-2017**



# 2017 High Water

USGS 12323800 Clark Fork near Galen MT

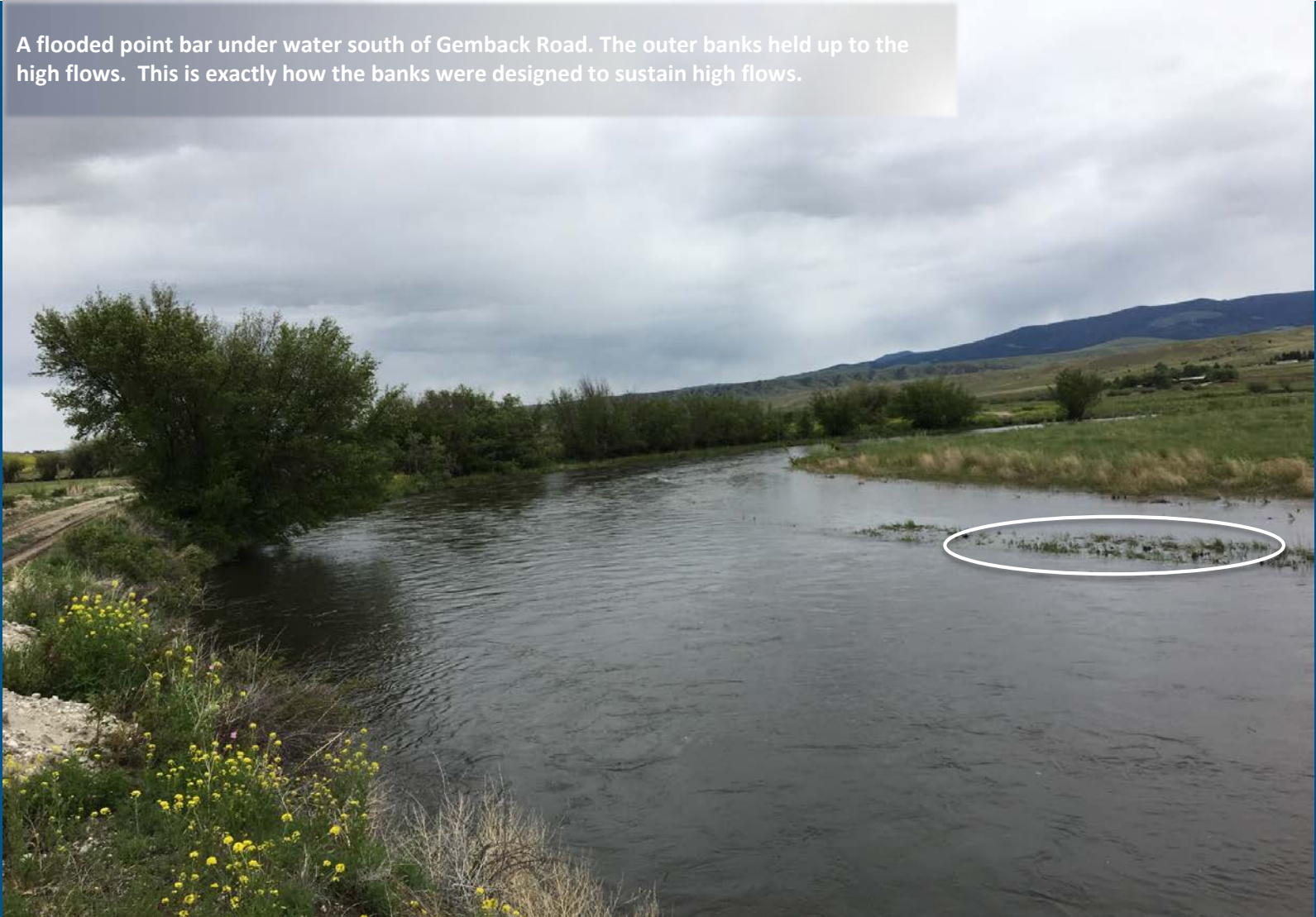


---- Provisional Data Subject to Revision ----

△ Median daily statistic (28 years) — Discharge

# 2017 High Water

A flooded point bar under water south of Gemback Road. The outer banks held up to the high flows. This is exactly how the banks were designed to sustain high flows.



# 2017 High Water

This photo taken south of Gemback road shows a flooded point bar under water with outer banks holding up to high flows. This is exactly how the banks were designed to sustain high water.

Ben: Is this  
the point  
bar  
(circled)?



# 2017 High Water

Woody transplants hold firm against high water.  
The river and floodplain behaved as designed.

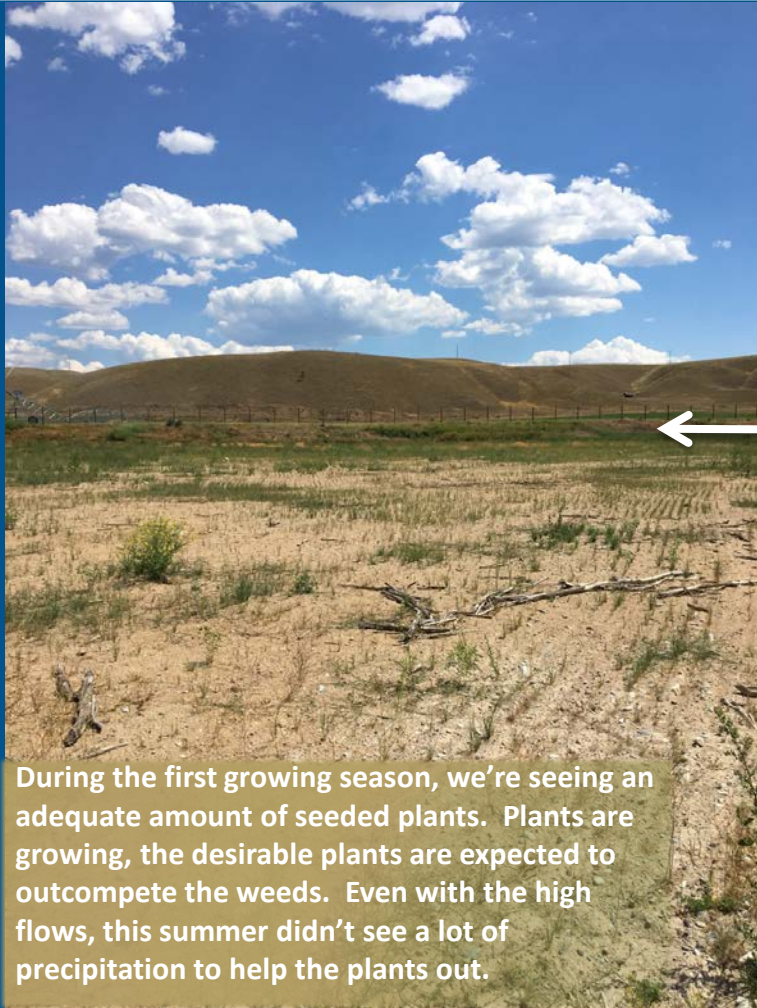


# 2017 Vegetation Monitoring



This summer, we monitored vegetation in the completed phases. Generally, two years after seeding we saw excellent plant coverage and diversity. The mature trees in the photo were preserved during the remediation.

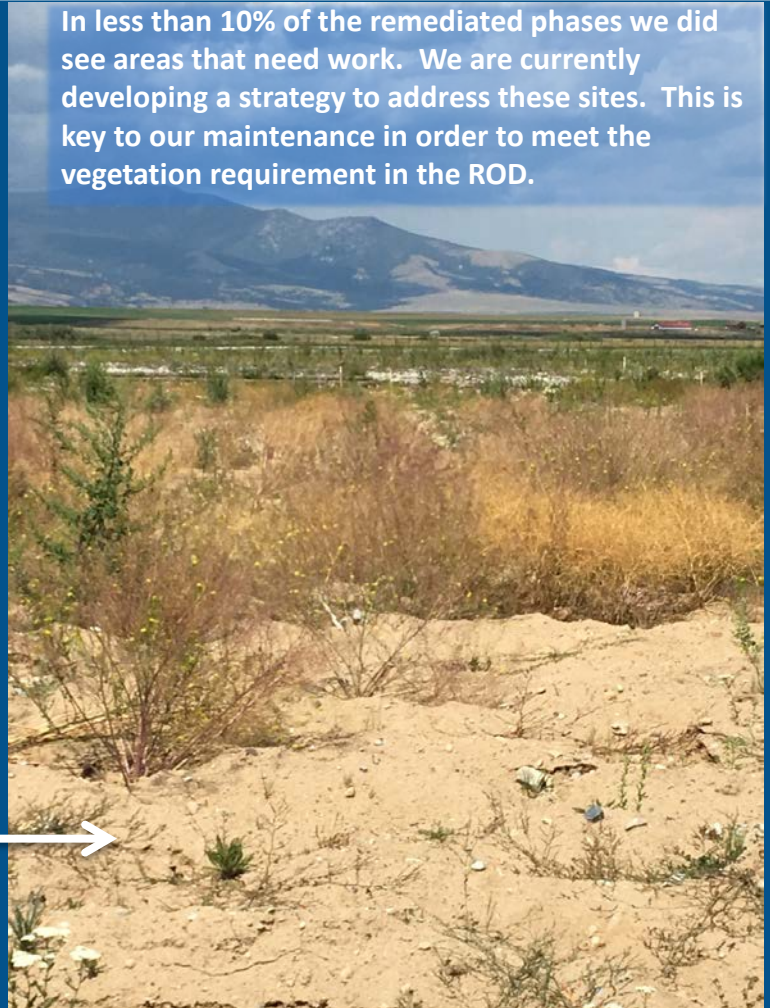
# 2017 Vegetation Monitoring



During the first growing season, we're seeing an adequate amount of seeded plants. Plants are growing, the desirable plants are expected to outcompete the weeds. Even with the high flows, this summer didn't see a lot of precipitation to help the plants out.

ONE  
SUCCESSFUL  
GROWING  
SEASON

NEEDS  
MAINTANCE



In less than 10% of the remediated phases we did see areas that need work. We are currently developing a strategy to address these sites. This is key to our maintenance in order to meet the vegetation requirement in the ROD.



# Weed Treatment

DEQ is responsible for weed control on completed phases. DEQ began spraying when work began in the valley. Annually, DEQ sprays two full passes with a third abbreviated pass on hot spots.

We target noxious weeds including Canada thistle, leafy spurge, spotted knapweed, and whitetop, but spray for all noxious weeds on the county list at a cost of a quarter of a million dollars a year.

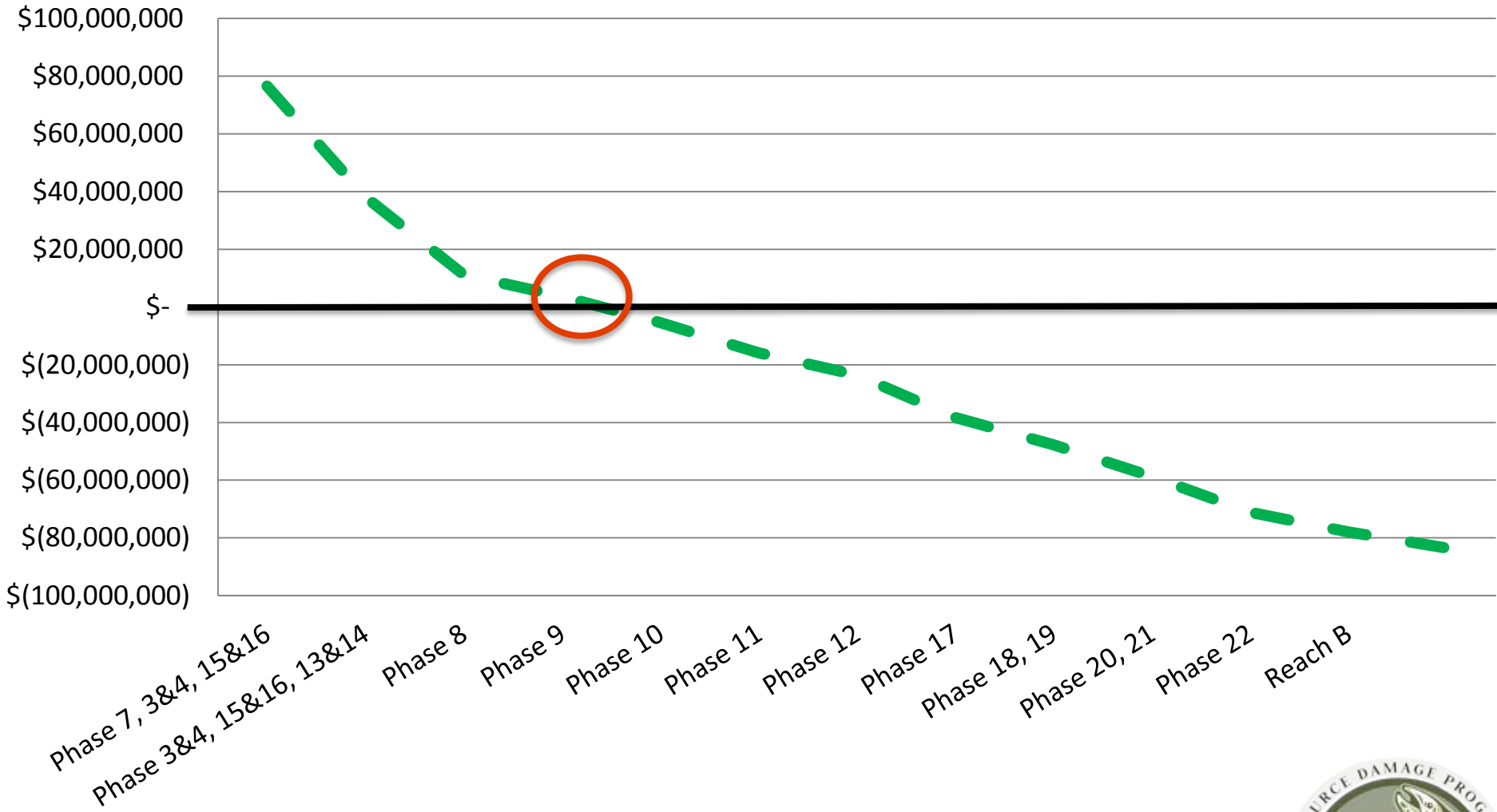


# New DEQ Team

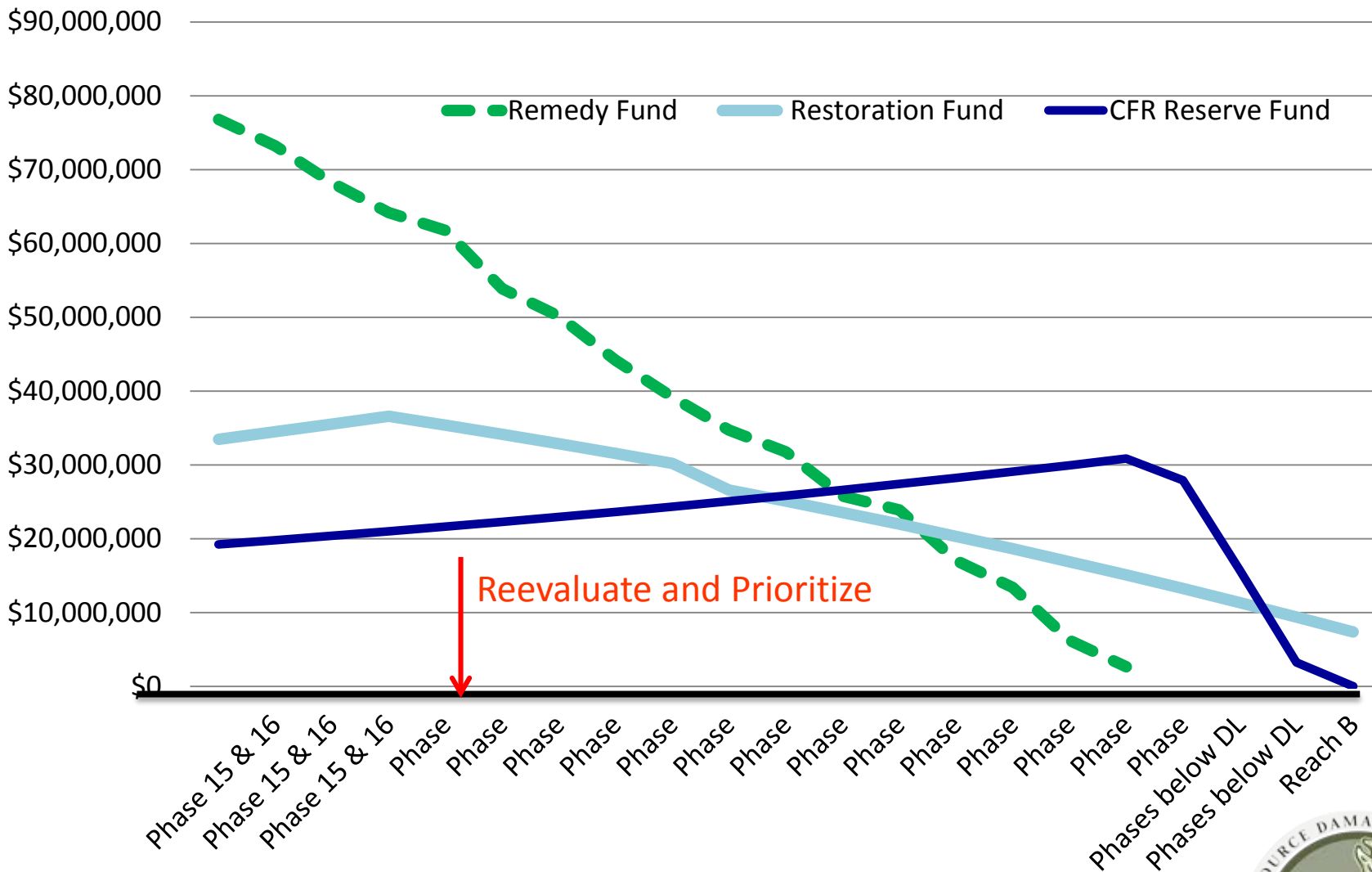
- Autumn Coleman
- Joel Chavez
- Ben Quiñones
- Tim Reilly
- Devin Clary
- Karen Ogden



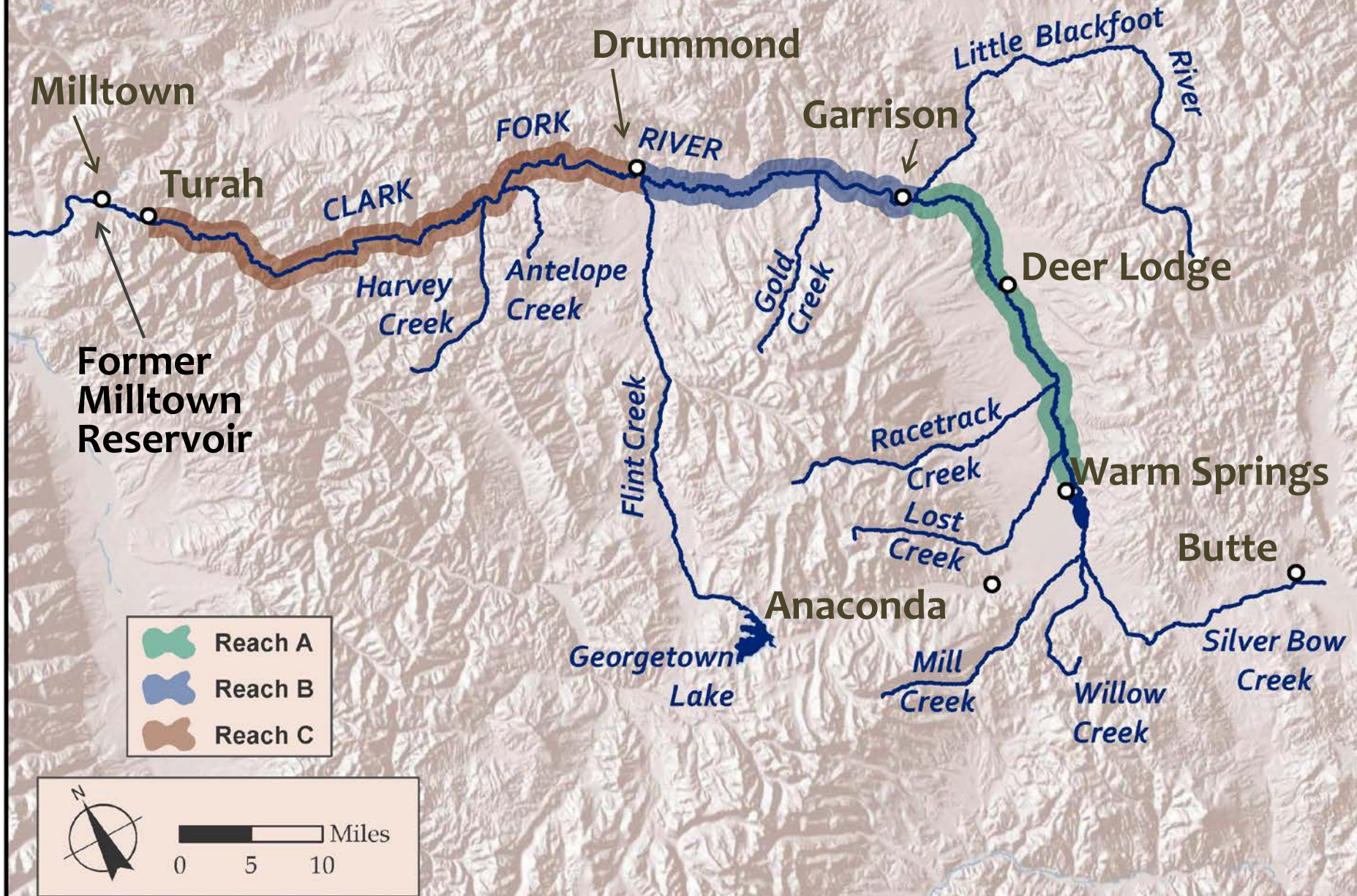
# Clark Fork Remedy Fund Balance (Old)



# Clark Fork Fund Balances (New)



# Upper Clark Fork River



## Community Involvement Plans

The U.S. Environmental Protection Agency (EPA) Superfund Community Involvement Program advocates for and strengthens meaningful and ongoing community participation in environmental clean-ups.

The Clark Fork 2017 Community Involvement Plan is intended to:

- Involve the public in program responses being considered under the ROD requirements.
- Inform the public of progress being made to implement the ROD requirements.
- Identify the **frequency**, **means**, and **methods** for DEQ to best disseminate information about the Clark Fork project.



## Community Interviews

From June – August 2017, we interviewed 21 people:

- Area residents
- Community advisory group members
- Business owners
- Adjacent landowners



## Common Responses

Of those interviewed:

- There are some very active consumers of information about the CFROU
- Many parties have attended numerous meetings about the CFROU over the past decades
- The majority of individuals want to receive regular updates, even if there is no activity at the site
- The DEQ project listserv newsletter was identified by the majority of respondents as the preferred method to receive information
- There was a moderate concern about lack of communication and outreach from EPA
- There was praise for MDEQ's use of non-technical language
- There was a repeated desire for the MDEQ website to be more user-friendly







## For More Information

Hayden Janssen, Weston Solutions, Inc.

406-502-1570 x2507 - office

406-437-4220 - cell

[Hayden.Janssen@WestonSolutions.com](mailto:Hayden.Janssen@WestonSolutions.com)

**CFRTAC**

CLARK FORK RIVER  
Technical Assistance Committee



**WHAT KIND OF RIVER DO YOU WANT?**

CFRTAC is a volunteer citizens' organization whose mission is to help residents make informed choices and participate in the Superfund remediation, restoration and redevelopment of the Clark Fork River and its affected communities from Butte to Missoula.

#### CONTACT INFORMATION

**Technical Advisor:** Katie Garcin [katherine.garcin@westonsolutions.com](mailto:katherine.garcin@westonsolutions.com) or call 406-502-1570

**Board Member:** Andy Fischer [andy@clarkfork.org](mailto:andy@clarkfork.org) or call 406-542-0539 x 201



THANK YOU FOR  
COMING

Questions & Answers

[deq.mt.gov/Land/fed-superfund/cfr](http://deq.mt.gov/Land/fed-superfund/cfr)

