



Blackbird Mine

Remediation of Legacy Asset

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MMSA AML Symposium

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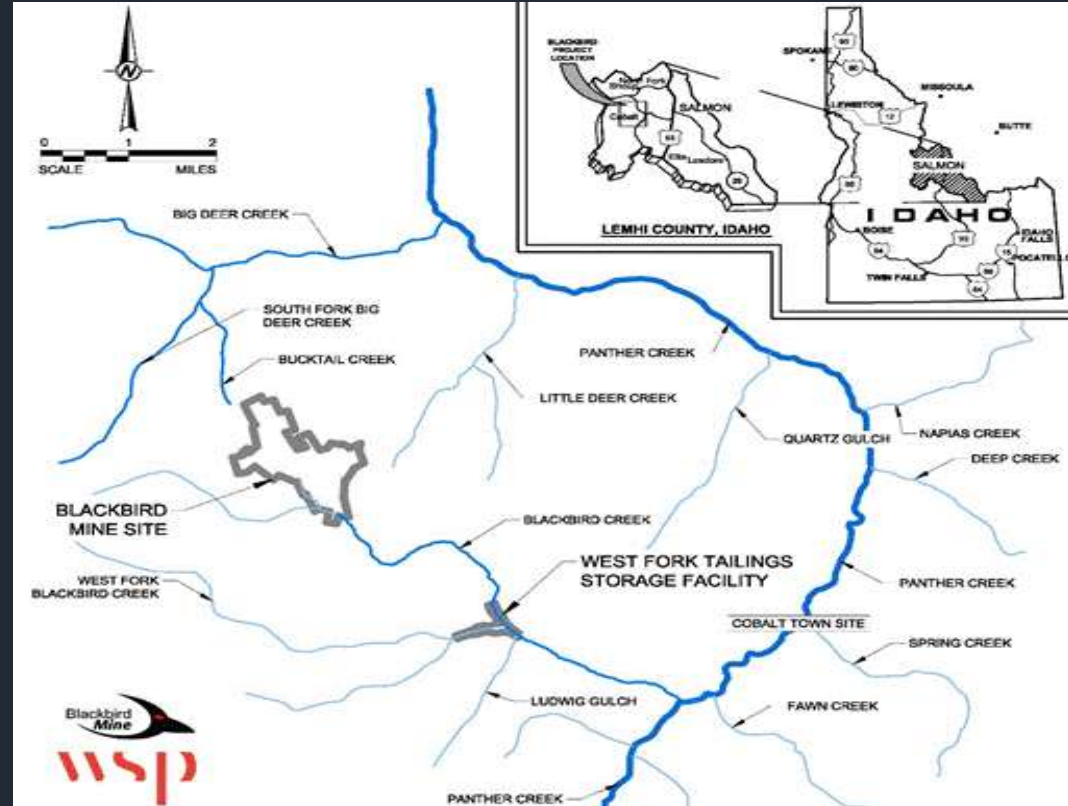




Agenda

- Background
- Mining History
- Site Remediation and Recovery
 - Time critical actions
 - Early actions
 - Additional remedial actions
 - Unique/site specific remedial actions
- Results

Blackbird Mine Site, Lemhi County Idaho, United States



Pre-Mining



Lewis and Clark Expedition circa 1805

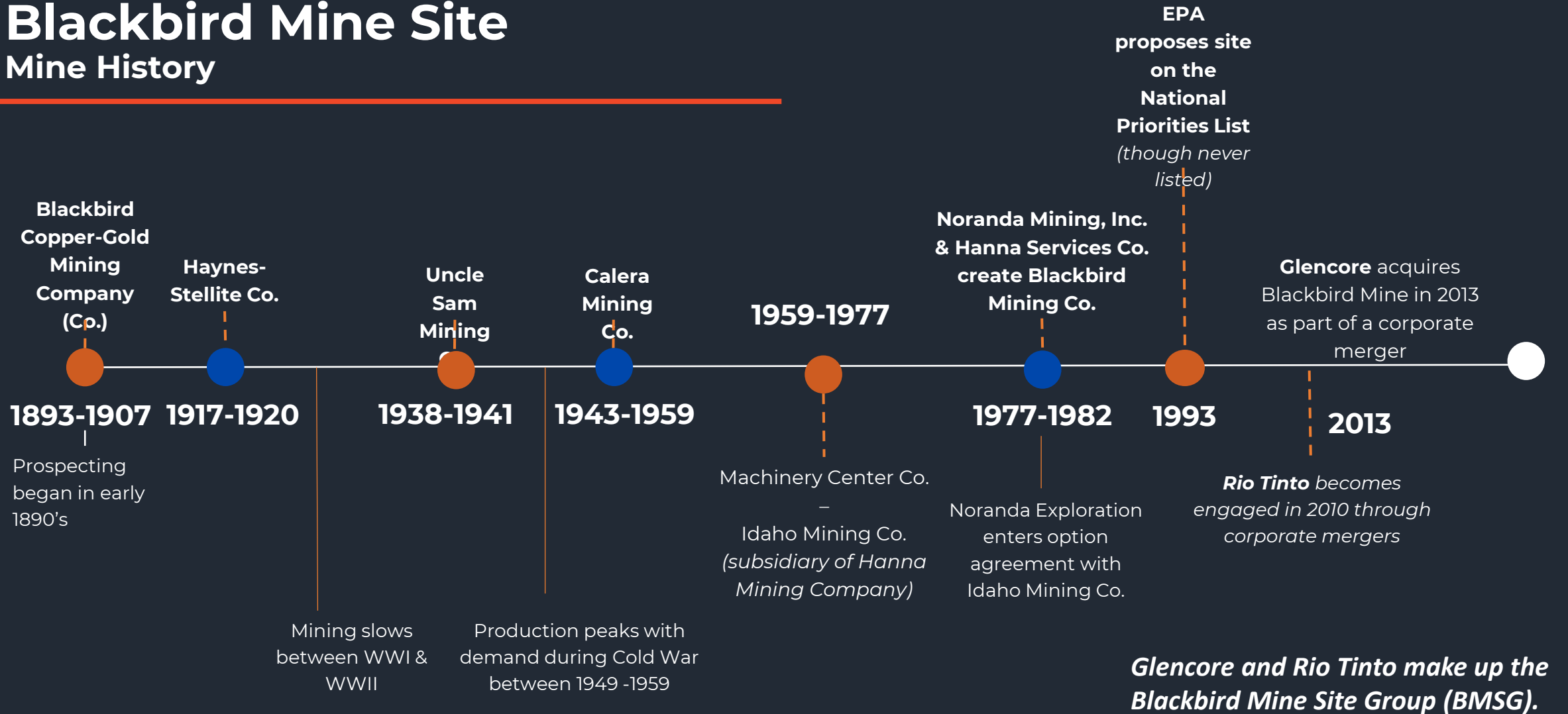


Great Basin Culture Area showing approximate Tribal locations circa 1500 (Ya-native.com)

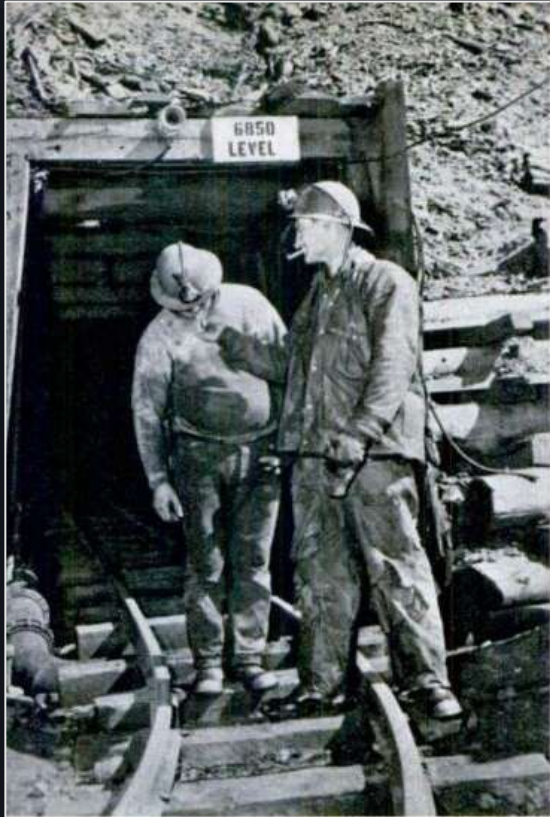


Blackbird Mine Site

Mine History



Mining History



This is the hole in an Idaho mountain which leads to mine producing cobalt — scarce and vital metal

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The **Blackbird Mine** is in rugged mountain country 107 miles from the nearest railroad at Mackay, Idaho. The production of cobalt from this mine will make the U. S. less dependent on the Belgian Congo mines



Regulatory – CERCLA Superfund

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) is a United States federal law designed to clean up sites contaminated with hazardous substances and pollutants (Otherwise known as Superfund).

- Proposed for the National Priority List in 1993
- EPA required Time-critical responses (1993-1994) and Non-time critical (1995-2002)

Agencies involved:

- Lead Agency - U.S. Environmental Protection Agency
- Natural Resource Trustees - IDEQ, USFS, NMFS, NOAA, IDWR, Shoshone Bannock Tribes
- And their consultants - CH2M Hill, Tetra Tech, Rocky Mountain Consultants



Site Remediation and Recovery Begins - Site Challenges



Dispersed Waste Rock, ARD (Upper Bucktail Basin)



High Elevation, Short Construction Season



Water Quality Issues spanning two drainages (Lower Bucktail Basin)



Impacted sediments

West Fork TSF Stabilization

Time Critical Actions (early 1990s)

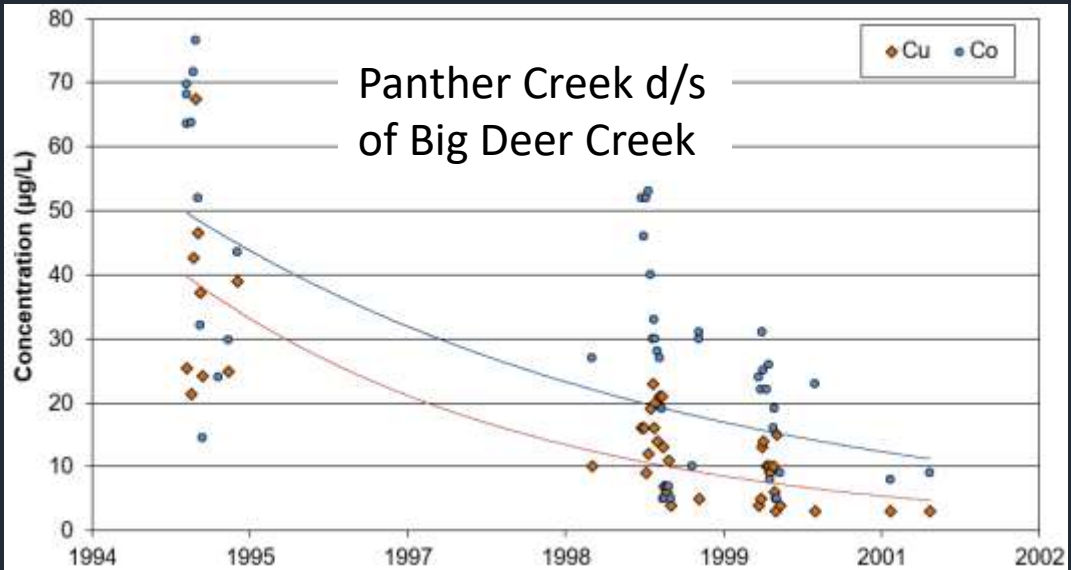
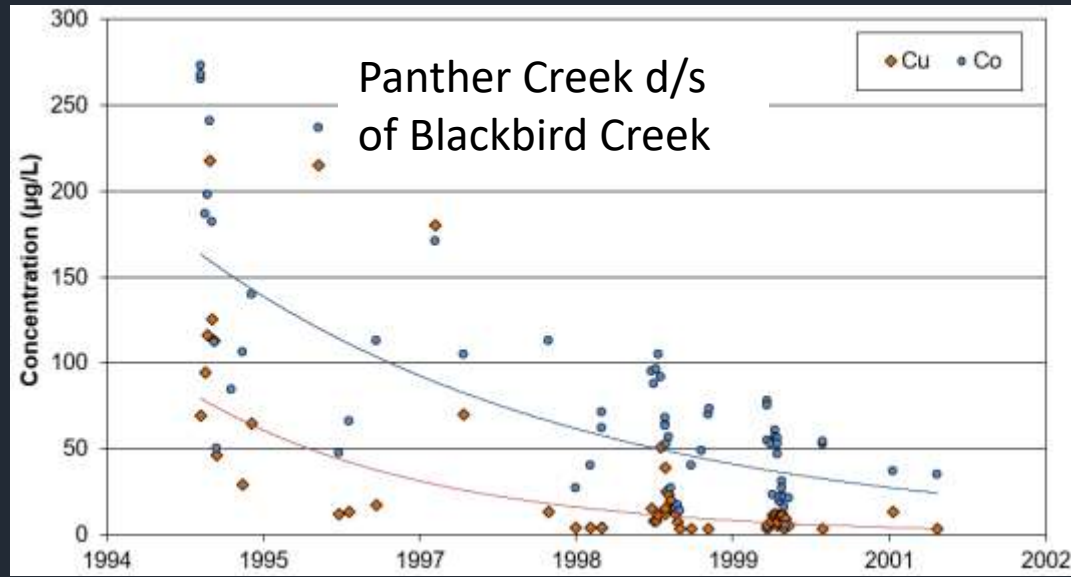




Early Actions (1995-2001)

- Early actions concurrent with site remedial investigation and feasibility study (CERCLA)
- Spanned 5 Seasons
- Source control
- Water Management
- In-stream and overbank sediments
- Water treatment upgrades





Water Quality Improvements Post Early Actions

- Performance monitoring shows significant reductions in copper and cobalt concentrations in Panther Creek
- Data shown through early actions
- 80-95% reductions in dissolved copper
- 65 – 90% reductions in dissolved cobalt

Remedial Design

Final remedy selected following the RI/FS process

Early Actions, plus

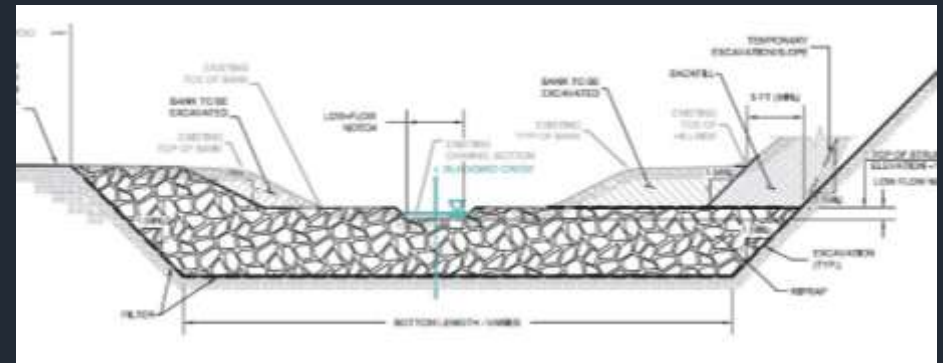
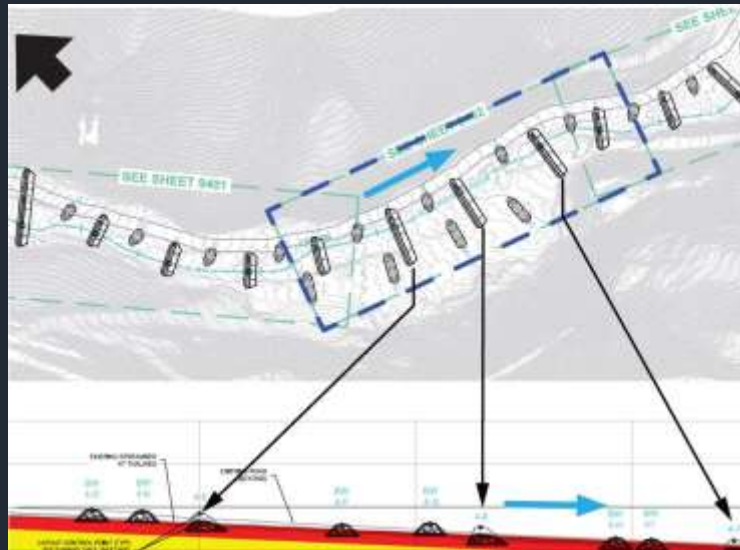
- Fine tuning water management (seepage collection)
- West Fork TSF final cover
- Overbank sediment removals
- Institutional controls
- Natural recovery of stream sediments



Waste and Water Management



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- An aerial photograph of a river bend. A black arrow in the upper left points to a black dashed rectangle on the left bank. A solid blue rectangle is located on the right bank, just downstream from the dashed rectangle. The river flows from the top towards the bottom of the image.



In-Stream Stabilization

Construction 2009 through 2010

Resulted in significant reduction in sediment migration, minimal impact to downstream land-owners

2019 ACEC Engineering Excellence Award winner



Area 4 - 2010



Area 4 - 2024



Area 1 - 2009



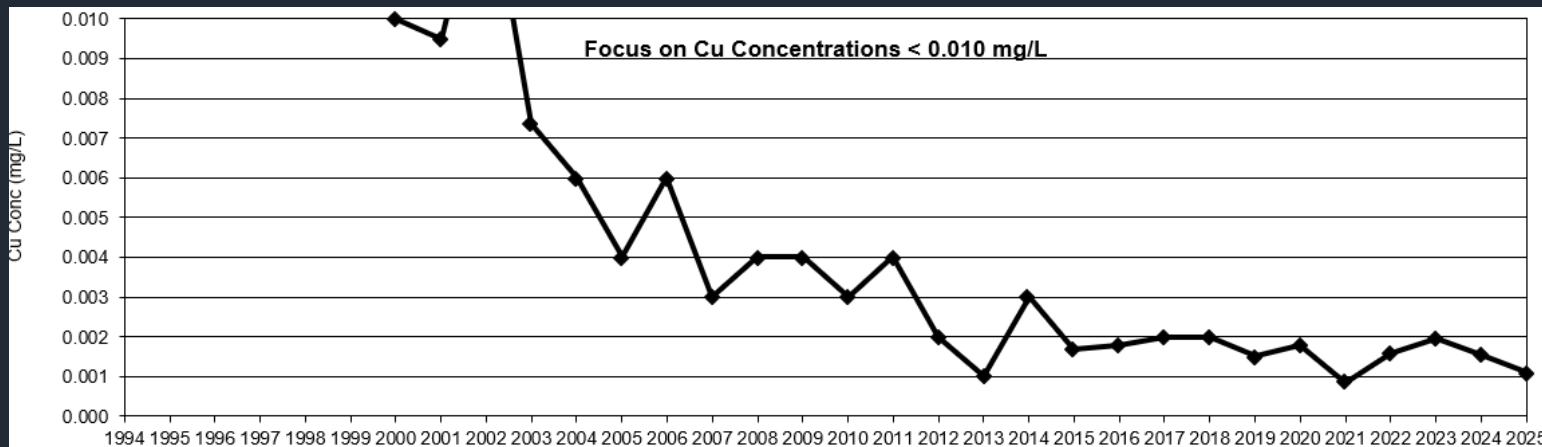
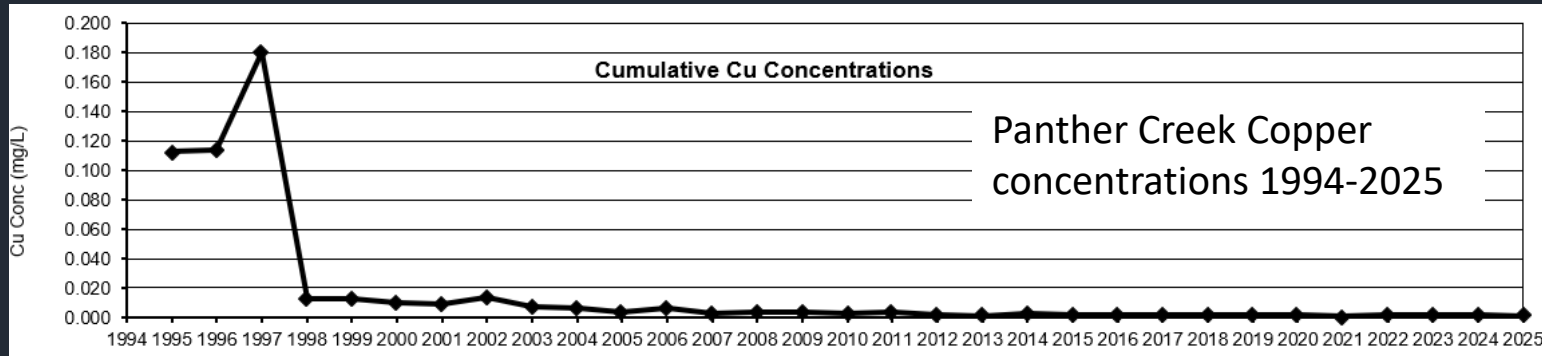
Area 1 - 2010



Area 1 - 2017

Results – Water Quality

- Significant progress made towards compliance and recovery
- 98-99% reductions in constituents of concern
- Potential risks to human health remedied
- Panther Creek “delisted” for copper



Results



Lower Bucktail Creek Pre-remedial actions (1996)



Lower Bucktail Creek post removal action (2015)



Pre in-stream stabilization (2009)



Post in-stream stabilization (2021)

Results

- Progress in Panther Creek fisheries celebrated
- All stages of salmonids restored in Panther Creek
- Panther Creek considered “fully supporting” of returning fish populations
- Fish return target of 200 met



“If there’s a river redemption story out there, it’s Idaho’s Panther Creek”

Western Rivers Conservancy, 2024

Chinook Salmon pair observed in Panther Creek in 2023



Appreciation to Glencore, Rio Tinto, US EPA, US Forest Service, Shoshone Bannock Tribes, Idaho DEQ, National Oceanic and Atmospheric Administration

