



# Salmon River Fish Passage Project

Anchorage Field Office, Alaska

## Summary

The Salmon River is an anadromous stream that flows into the Bering Sea near Goodnews Bay on the southwest coast of Alaska. It supports all five species of Pacific salmon and several resident fish species. Placer mining during the 20<sup>th</sup> century, prior to the establishment of modern regulations and reclamation requirements, fundamentally changed the valley bottom morphology, stratigraphy, and hydrology. As a result, several stream reaches lack surface flow in the summer, disrupting upstream migration of adult salmon returning to their spawning habitats and downstream migration of juvenile salmon to the ocean. Multiple tributaries, which have the potential to be fish-bearing, are disconnected from the Salmon River by mine tailings. The Bureau of Land Management (BLM) Anchorage Field Office proposes to address these Abandoned Mine Land (AML) features to restore fish passage in the Salmon River Watershed.

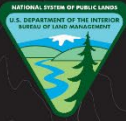
## Project Background

### Land Management Context

The Salmon River watershed contains 195 unpatented federal mining claims. The northernmost 174 claims are on federal land administered and managed by the BLM as part of the Bay Planning Area. The remaining federal mining claims are located on the Togiak National Wildlife Refuge, which is managed by the U.S. Fish and Wildlife Service (USFWS). Hanson Industries, Inc. (Hanson) is the current owner and operator of the federal mining claims, collectively known as the Platinum Mine.

### Natural Setting

The Salmon River is in the Ahklun Mountains Ecoregion known for its U-shaped valleys carved by Pleistocene glaciers, dwarf shrub-lichen tundra, and cold, seasonally moist climate driven by the Bering Sea (Nowacki et al., 2002). The Salmon River watershed includes 59 miles of perennial streams draining approximately 30 square miles. It is bounded in the west by Red Mountain, with a peak elevation of 1,887 feet, and in the east by Susie Mountain rising to 1,805 feet. The largest tributaries originate on the west side of the watershed and drain Red Mountain; Medicine Creek is the only large tributary on the east side (Figure 1). The valley width is 500 – 2,000 feet and the valley slope is about 0.6 percent. Ultrabasic rocks of Red Mountain, eroded and redistributed by glacial and fluvial processes, are the primary source of placer platinum deposits within the Salmon River valley and its tributaries (Mertie, 1976).






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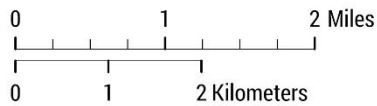
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-  Streams
-  Watershed Boundary
-  Federal Mining Claim (Active)



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**Figure 1:** Salmon River Watershed including major streams and mining claims.

## Mining History

Platinum placers were discovered in the Salmon River Watershed in 1926. Between 1927 and 1934, shallow deposits within tributaries, including Platinum, Squirrel, and Clara Creeks and on Fox and Dry Gulches, were mined by hand. In the mid-1930s, mining claims were consolidated to support mechanized operations, primarily via dragline excavator, that targeted deeper deposits. In 1937, the Goodnews Bay Mining Company began mining claims along the Salmon River with a Yuba diesel electric dredge (Figure 2). The dredge was operated in combination with a large dragline excavator. The excavator removed overburden, permitting the dredge to access deeply buried gravels overlying bedrock. Between 1935 and 1976, the company produced ~650,000 ounces of platinum and the dredge alone generated an estimated 38 million cubic yards of tailings and waste rock (Fechner, 1988). Mine operations since that time have focused on exploration with some production level mining from 2008-11 by XS Platinum. The mine site has been inactive since 2012, but there is an approved mine plan for the area incorporating 24 federal unpatented mining claims on BLM managed lands. In addition, the claimant has indicated it is planning to submit a new plan of operations soon.



**Figure 2:** Yuba diesel electric dredge where it sank in 2005 on the Salmon River near the confluence with Medicine Creek. The base of Red Mountain is visible in the background.

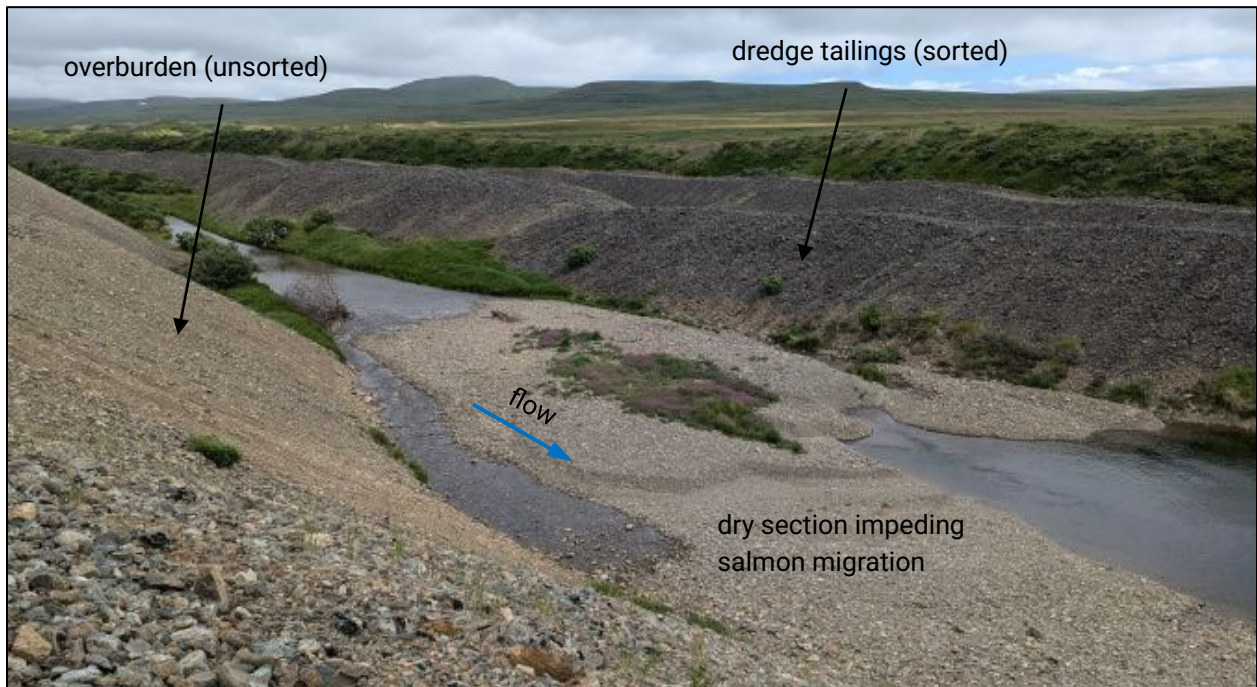
During the active mining period from 1930 to 1976, mining activities were unregulated, and reclamation was not required. The BLM's Abandoned Mine Lands Program oversees mitigation of historical mining features to ensure compliance with modern laws and policies. Abandoned Mine Lands are those that were abandoned prior to January 1, 1981, the effective date of BLM's Surface Management regulations issued under authority of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1701 et seq.).

## Legacy Impacts from Historical Mining

Historical mining in the Salmon River Watershed substantially altered the channel network and altered the movement of water and sediment that contributes to the formation and maintenance of fish habitat and provides for fish migration. Many tributary streams were straightened and are confined by large overburden and tailings piles that limit floodplain development and channel mobility. Some tributaries exhibit signs of recovery including development of a single-thread

channel pattern, stable banks, and an inset floodplain, however aquatic and riparian habitat complexity remains low. Plane-bed channels are dominant over pool-riffle types typical of reference streams. Full recovery is limited by overburden and tailings piles within floodplains. Some of these piles appear stable and are vegetated, while others may function as chronic sediment sources to stream channels when undermined during high flow events.

Dredge and dragline operations along the Salmon River mainstem had a pronounced and lasting influence on channel planform and fluvial processes. Historical aerial imagery and unmined stream sections suggest that the Salmon River was formerly an unconfined, single-thread, meandering system. The dredge made repeated passes upstream and downstream within the valley bottom converting the river into a series of parallel channels and ponded reaches up to 50 feet deep, bounded by overburden and tailings up to 70 feet tall (Figure 3). Overburden piles along the valley margins are generally taller and consist of unsorted sediments. Tailings piles are composed of gravel and cobble overlying sand and finer materials. They are highly permeable landforms between flowing channel segments. As a result of historical mining, the Salmon River no longer effectively conveys water and sediment from headwaters through the channel network – processes that are critical to both its function as an alluvial river and its potential for natural recovery following disturbance.



**Figure 3:** A channelized reach of the Salmon River mainstem on July 31, 2024, when the flow was subsurface. The river is ponded immediately downstream.

### Fish Passage Concerns

The Salmon River supports all five species of Pacific salmon and several resident fish species. Anadromous streams include Salmon River, Happy Creek, Snow Gulch, Medicine Creek, Dowry Creek, Clara Creek, and several unnamed tributaries (Wiedmer and Buckwalter, 2005). Coho salmon are the most widely distributed salmon species. Resident fish-bearing streams include Quartz Creek, Anita Creek, Platinum Creek, Squirrel Creek, and Susie Creek and these streams provide habitat for Dolly Varden and slimy sculpin. Most small tributaries are included in the

Alaska Department of Fish and Game's (ADFG's) Freshwater Fish Inventory or Anadromous Waters Catalog. These datasets can be accessed through ADFG's [Alaska Fish Resource Monitor](#) and are updated annually based on ongoing fish inventory work across the state.

Since at least the 1980s, multiple organizations including the BLM and the ADFG have documented four stream reaches of the Salmon River within the block of previously mined claims that are barriers to fish migration due to lack of surface flow from late spring through the fall (BLM, 2019). These dry reaches block adult salmon migration to spawning areas, as well as juvenile outmigration (Figure 4). During summer baseflow, they range in length from 200 feet to 1,500 feet based on aerial imagery analysis.



**Figure 4:** BLM fisheries biologists observing dead and dying salmon fry stranded in a dry reach May 16, 2019.

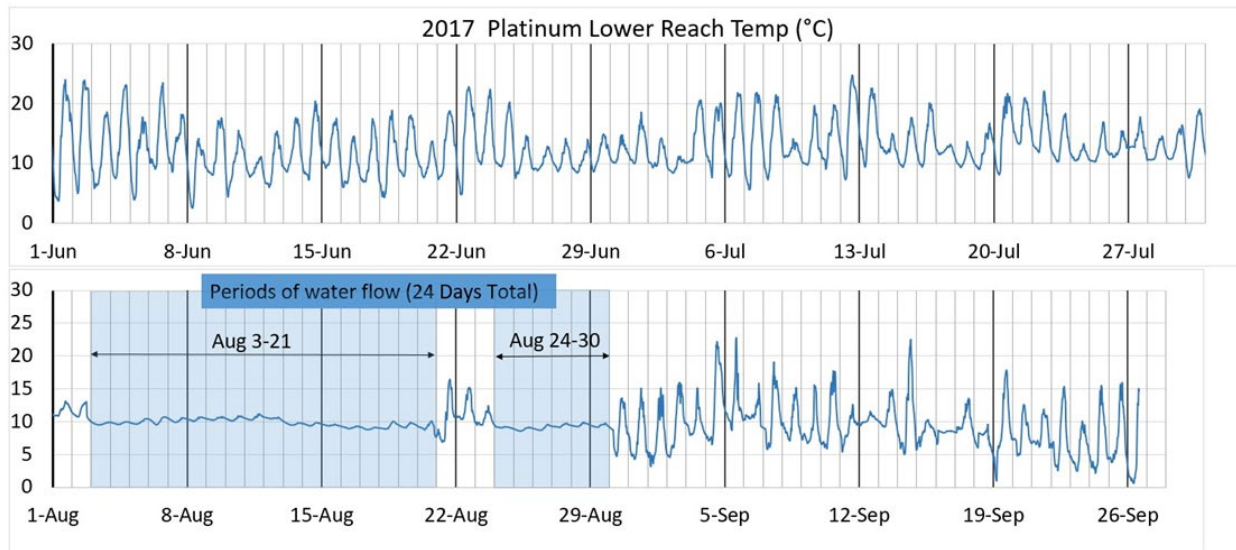
Some tributaries are disconnected from the Salmon River by tailings. Although Platinum and Quartz Creek may contribute some flow to the Salmon River through subsurface pathways, tailings completely block fish passage (Wiedmer and Buckwalter, 2005). Mining of an ancient stream bed on the east side of the Salmon River valley generated tailings piles that divert Snow Gulch, Anita Creek, and other unnamed tributaries into a channel that connects to the Salmon River downstream of historical placer mining. Fish, including coho salmon, have been sampled in these streams, indicating that adult salmon migration occurs despite the altered drainage pattern.

In the early 1990s, the mine claimant, in coordination with ADFG and the US Army Corps of Engineers, used a dragline excavator and other heavy equipment to construct a fish passageway through historical mine tailings on the west side of the Salmon River Valley. The following spring, the newly reconstructed channel was reworked by high flows, and dry reaches again blocked fish passage (M. Moyle, personal communication, January 25, 2010). Since that time, the claimant, the BLM, and the ADFG have engaged in multiple planning efforts to address fish passage concerns.

### **Proposed Project**

For over two decades, the BLM has collaborated with other agencies and the claimant to perform site assessment work and collect data in the Salmon River Watershed. The USFWS and the BLM have periodically maintained a stream gage and monitored water quality on the Salmon River below the downstream extent of mining (Winfree, 2013). Pressure and temperature

sensors deployed in dry reaches provide insight into subsurface flow duration (Figure 5). Until recently, topographic information was limited to surveys of a few cross sections and a longitudinal profile performed at a subset of dry reaches.



**Figure 5:** Hourly temperature readings from a sensor buried in the stream bed in the most downstream dry reach of the Salmon River during the summer of 2017. During most of the June 1 to September 26 deployment, the sensor was exposed to air, and the channel was not flowing. Highlighted regions of dampened diurnal fluctuations correspond to water temperatures.

Addressing fish passage concerns from historical mining in the Salmon River Watershed is a priority for the BLM. The lack of a comprehensive understanding of the extent of impacts and processes that contributed to the failure of previous reclamation work pose challenges as BLM plans for future actions. The BLM is partnering with multiple agencies to collect baseline data for the development and implementation of a plan to address these AML features.

In 2024, the BLM initiated a five-year agreement with the USFWS to assess fisheries distribution and abundance within the Salmon River Watershed. To determine baseline salmon population dynamics, the USFWS established a fish weir near the mouth of the Salmon River in 2023 on the Togiak National Wildlife Refuge. They also conducted aerial surveys via fixed-wing aircraft or helicopter to complement counts at the weir and evaluate the location and extent of spawning habitats (Walsh et al., 2022). Summer fieldwork has also included juvenile fish sampling and adult spawning surveys throughout the watershed to determine fish distribution and habitat utilization by life stage. This information will help the BLM identify and prioritize fish



**Figure 6:** BLM Fisheries biologists surveying a cross section on Smalls Creek as part of a larger effort to characterize streams at minimally disturbed sites in the area.

passage concerns and evaluate treatment efficacy.

To inform fish passage project design, stream surveys were conducted at reference sites within the Ahklun Mountains Ecoregion. Fifty-two sites were randomly selected and surveyed following the BLM's Lotic Aquatic Inventory and Monitoring (AIM) protocols. Surveys were completed by staff from the Alaska Department of Environmental Conservation (DEC) and University of Alaska Anchorage through a financial agreement between the BLM and ADEC. The BLM performed additional surveys of targeted sites within the Salmon River and adjacent Smalls Creek Watershed to support development of regional hydraulic geometry relationships and other design criteria (Figure 6, BLM, 2025). Field data will be integrated with LiDAR data acquired for the project through an agreement with the Salcha-Delta Soil and Water Conservation District.

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