Examples of Fish-Friendly Mining

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Examples

• Williwaw Spawning Channel & Ponds
• Jack Wade Creek Mine
• Pogo Mine Bridge
• Red Dog Mine
Williwaw Ponds and Spawning Channel: Historic Aerial Photos

Portage Creek

Approximate future location of constructed channel

Uplands in the early 1950s
Williwaw Ponds and Spawning Channel: Historic Aerial Photos

Site of gravel mining operations in the late 1950’s
Williwaw Ponds and Spawning Channel: Historic Aerial Photos

Converted by design to salmon habitat in the 1980's
Williwaw Ponds and Spawning Channel: Historic Aerial Photos

Converted by design to salmon habitat in the 1980's
Williwaw Ponds and Spawning Channel: General Description

- About 14 acres of pond habitat
- 2900 linear feet of meandering stream channel
- Ground water and surface water fed
- Each pond drains into the channel that meanders between the ponds
- Joins natural glacial fed stream, S. Fork Williwaw Creek, which is connected to Portage Creek
- Listed in Anadromous Waters Catalogue
Upstream, the salmon pass the Williwaw Salmon Viewing Platform.

1. Williwaw Viewing Platform
Location: Portage Glacier Road - Milepost 4.0.
Parking: Paved lot on south side of road - Look for “Salmon Viewing” sign.
Description: All-accessible viewing platform overlooking Williwaw Creek. Also, 0.5 mile streamside nature trail with additional viewing opportunities and interpretive signs.
Fish: Sockeye, chum, pink, and silver salmon
Season: Early August - mid September; Best: Mid to late August

(USFS Pamphlet: May 2009)
Salmon habitat enhancements include pool and riffle sequences.

These pools and riffles are upstream of the viewing platform and downstream of Pond 1.
Each pond had an outlet that drains into a channel that meanders between the ponds.

This is the outlet to Pond 1. Fish access the ponds through these outlets.
Salmon habitat enhancements include addition of spawning gravel.

Spawning activity viewed downstream from the bridge on the Williwaw Nature Trail.
Salmon habitat enhancements include Large Woody Debris, Rocks and Boulders.

This section of stream is a bit upstream of the bridge on the Williwaw Nature Trial.
Each pond had an outlet that drains into a channel that meanders between the ponds.

This is the outlet to Pond 2. Beavers have been active.
Williwaw Spawning Channel and Ponds

This sockeye was “caught in the act” of making a redd

Sockeye and chum just downstream of the outlet of Pond 2.
Williwaw Spawning Channel and Ponds

Spawning in the constructed channel between Pond 2 and Pond 3 (2011).
Williwaw Presentation Courtesy Of

Joe Lucas
PacRim Coal
Anchorage
Photographic Updates
Jack Wade Creek Demonstration Projects
Demonstration Project 1
Demonstration Project 1

2015

2016
Demonstration Project 1

2015

2016
Demonstration Project 1

2015

2016
Demonstration Project 1

2015

2016
Demonstration Project 1

2015 (during construction) 2016
Demonstration Project 2 – Dredge Site

2007

2013
Demonstration Project 2 – Dredge Site

2015

2016
(one month after construction)
BLM Presentation Courtesy Of

Matthew S. Varner
Fisheries & Riparian Program Leader
Bureau of Land Management
Alaska State Office
Pogo Mine Bridge
Goodpaster River
(photos courtesy of Al Ott, ADFG)
East Abutment
Bridge Pier
West Abutment
Important Features

- Full span, pile supported bridge
- Minimal impact in wetted perimeter
- Preservation of riparian habitat
Middle Fork Red Dog Creek

Before Mining → (1982)

After Mining → (2005)
Source: EPA Environmental Assessment NPDES Permit (AK-003865-3) Renewal – January 2006
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Water Quality</strong></td>
<td>high metals, Most water samples (&gt;90%) exceed 5 times the acute standard for Cd and Zn.</td>
<td>somewhat elevated metals. No samples exceeded 5 times acute standard for Cd and Zn.</td>
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<td><strong>Fish Populations</strong></td>
<td>Few fish, migration only.</td>
<td>Arctic grayling spawning and rearing, Dolly Varden rearing</td>
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<td><strong>Invertebrate Communities</strong></td>
<td>No or few invertebrates observed</td>
<td>Abundant community with high taxonomic richness.</td>
</tr>
<tr>
<td><strong>Periphyton Communities</strong></td>
<td>No periphyton observed</td>
<td>Abundant community, richness represented by all three major pigments.</td>
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*source*: Scannell, PW 2005 Comparison of Mainstem Red Dog Creek, Pre-Mining and Current Conditions
“Ten years of aquatic surveys have demonstrated that aquatic productivity in the Main Stem has increased from pre-mining conditions due to effective water management practices and treatment.”

(March 2006 Alaska Department of Environmental Conservation)

http://www.dec.state.ak.us/water/wqsar/wqs/pdfs/epa_case_study_reddog.pdf
Red Dog Presentation Courtesy Of

Wayne Hall
Superintendent
Environmental & Community Relations
Teck Alaska Incorporated
PROGRAM & PROJECT HIGHLIGHTS continued...

ADF&G, Division of Habitat Receives the 2009 Tilden Award

The Division of Habitat received the Tilden Award on behalf of the department on October 1, during a reception in Anchorage. The award was given jointly to ADF&G and Fort Knox in recognition of their cooperative efforts to repair aquatic habitat altered from past mining activities in Fish Creek near Fairbanks. Their cooperative efforts established a viable Arctic grayling population in Fish Creek and reversed Fish Creek's listing as an Impaired Water Body.

Habitat Director Kerry Howard and Habitat Operations Manager Al Ott received the Tilden Award on behalf of the department.

"We are honored to receive this award," said Al. "Our Fairbanks Habitat staff are committed to continue to work with Fort Knox to maintain and enhance the aquatic and upland habitats in the Fish Creek valley for both fish and wildlife."

Though the mine has brought an estimated $250 million economic boost to Fairbanks and Alaska, the mine's restoration work can be considered priceless, according to Lorna Shaw, Community Outreach Director, Fort Knox.

"It is impossible to place a dollar value on the results of reclamation efforts, but the intrinsic value of clean water and a productive fishery cannot be overstated," said Shaw. "In addition to the current benefits realized downstream, the economic benefits will carry their strengthening influence far into the future."

The Tilden Award is a uniquely Alaskan award established to honor organizations, individuals, and/or businesses that create solutions and innovations advancing the goals of economic development and environmental protection. The Alaska Conservation Alliance (ACA) and the Resource Development Council (RDC) established the award in 2008. The ACA and RDC both agree that economic development and environmental stewardship are not mutually exclusive goals. The award celebrates resource developers whose success is measured both in their positive effect on our jobs and economy as well as our environment. It is named after long-time Alaskan conservationist Peg Tilden and her long-time husband and former state mining director Jules Tilden.

Other award recipients included Alyaska Seafoods, Westward Seafoods, and Unisea Inc., for their processing and use of high quality fish oil in their plant operations. In addition, a 50 percent blend of the oil is used in the Unalaska diesel generators and steam boilers, and is exported for other uses.

The Resource Development Council is a statewide, non-profit, membership-funded organization made up of businesses and individuals from all resource sectors, as well as Native corporations, support sectors, labor unions, and local governments. Through the Council these interests work together to promote and support responsible development of Alaska's resources.

The Alaska Conservation Alliance is the statewide umbrella group that includes 40+ member organizations with a combined membership of over 38,000 Alaskans. The Alliance unites Alaska's conservation community to speak with one strong voice in the State Capitol.