How does the Tulsequah Chief Mine affect salmon populations in the Taaltsuxéi Héen?

Tulsequah Chief Mine Technical Working Group, November 2025

One of the most common questions received by the Technical Working Group is, "How does pollution from the Tulsequah Chief Mine affect salmon populations?" This summary provides the current state of knowledge used to answer this question. This document does not summarize a complete history of the mine's impacts and only focuses on work conducted in the 2000s.

How does pollution occur?

The main pathway by which Tulsequah Chief Mine pollutes the Taaltsuxéi Héen (Tulsequah River) is through acidic water flowing from the mine's underground tunnels to the surface. Naturally occurring sulphide-bearing rocks—which are common in mining operations because they are associated with economically valuable metals such as gold—react with air and water to create acidic water. This dissolves metals in rock such as copper and iron and carries them downstream. Currently, most acidic water from the underground tunnels flows into a surface water management pond that subsequently overflows and drains into the river.

Discharge from the Tulsequah Chief Mine enters the Taaltsuxéi Heen and flows downstream. The downstream path of acidic water is represented by a white line. This pathway may change at times due to glacier lake outburst flooding. Credit: Chris Miller, September 2022.

How can this type of pollution harm salmon?

Direct harm

Lethal: In high concentrations, dissolved metals can kill fish that are stuck in the polluted area with no escape route.

Sublethal: More commonly, dissolved metals can harm fish but not kill them. For example, high amounts of copper damage a salmon's sense of smell, decreasing their ability to detect predators or smell their birth stream and migrate back to it.

Ecosystem harm

Reduced food supply: Pollution can decrease the abundance of aquatic insects and other organisms that fish eat.

Habitat loss: Contamination can damage or degrade habitat that fish would otherwise use for feeding, resting, or spawning

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What Current Monitoring Shows

Studies over the past two decades have measured the amounts of metals in water, sediment, aquatic insects, and fish, along with aquatic insect abundance and diversity of aquatic insects

→ Depending on river flows, elevated metals in sediment and water can be detected up to 3 km downstream (see images below)

→ After 3 km downstream, water and sediment characteristics tend to match sites on the river unaffected by the mine

→ Metals sometimes elevated above natural background levels in slimy sculpin & insects include aluminum, arsenic, cadmium, copper, iron, and zinc

→ Aquatic insects are much less abundant 0-2 km downstream in areas exposed to mine runoff in comparison to other river sites

→ Adult salmon spawning near the mine are unlikely to have elevated metal levels, as they gain most of their muscle mass in the ocean

→ Without pollution from the mine, it is likely that more juvenile and adult salmon would use habitats 0-3 km downstream of the mine

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In some years, most of the Taaltsuxéi Héen flows directly past Tulsequah Chief Mine (left), while in other years the flow shifts away from the mine, and rust-colored acidic runoff is more obvious (right). The red circle denotes the same spot in both images. Credit: Chris Sergeant.

Future outlook for salmon

Studies conducted by the TRTFN's Salmon Resiliency Team have demonstrated that the Taaltsuxéi Héen is changing rapidly. As the Tulsequah Glacier continues to retreat, the river is expected to become warmer and clearer with more trees growing in the floodplain. **In the coming decades, as the Tulsequah Glacier retreats and habitats change, the river will likely support even more abundant salmon populations upstream of current extents.** Cleaning up pollution from Tulsequah Chief Mine will support current and future populations of salmon.