



# FISH PASSAGE

## SUMMARY

Midas Gold designed the Stibnite Gold Project specifically to provide a way for migrating fish to reach historical spawning grounds for the first time in 80 years. At first, a temporary fish passage system will provide access during the early years of operations and the final river restoration will provide permanently restored passage.

## THE PROBLEM TODAY

- Bull trout and anadromous fish such as Chinook salmon and steelhead have been cut off from miles of additional high-mountain spawning and rearing habitat in the East Fork South Fork of the Salmon River since the river was diverted around the Yellow Pine pit in 1938.
  - The East Fork South Fork of the Salmon River was diverted (in 1938) to access antimony, tungsten and gold in the Yellow Pine pit before, during and after World War II.
  - The river was initially diverted into a surface channel and then (in 1943) into a tunnel, and the Yellow Pine pit was continuously mined through the early 1950s.
  - When mining was completed, the river was allowed to flow back into the pit but passage upstream of the pit remained impossible for migrating fish right through to today.
  - Today, adult Chinook salmon are periodically stocked in Meadow Creek, a tributary of the upper East Fork South Fork Salmon River, so that spawning can occur there. Juvenile salmon resulting from this stocking must navigate downstream and pass over the rocky cascade at Yellow Pine pit on their way to the ocean, and those that return to spawn several years later must rely on the continuation of future collection and stocking to access their natal spawning grounds.

## THE SOLUTION

- Midas Gold designed the Stibnite Gold Project specifically to provide a way for migrating fish to reach historical spawning grounds on their own within the first year of operations and then provide permanent access to approximately 25 miles of perennial stream and 6 miles of anadromous fish spawning habitat above the existing barrier at the Yellow Pine pit. (*See: U.S. Forest Service, Draft Environmental Impact Statement (DEIS); Appendix D and J-3*)
- After years of analysis, the U.S. Forest Service Draft Environmental Impact Statement (DEIS) concludes that removing existing barriers to fish migration will help Idaho's bull trout, chinook and steelhead:
  - Long-term access to historically blocked critical habitat would result in increased productivity; (*DEIS; Ch 4.12; Fish Resources – pg. 4.12-39*)
  - Free movement and access to habitat can improve genetic diversity of isolated populations; (*DEIS; Ch 4.12; Fish Resources – pg. 4.12-39*)
  - Increased access to feeding and refuge areas in critical habitat can improve overall productivity. (*DEIS; Ch 4.12; Fish Resources –pg. 4.12-39*)

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- Additionally, the report identifies that removing legacy waste from historic mining will improve water quality.
  - Removing legacy tailings and managing water quality provides long-term reduction in metal loading in ground and surface water; *(DEIS; Ch. 4; Section 4.9)*
  - Removing legacy tailings and waste lowers concentrations of antimony and arsenic in the East Fork South Fork of the Salmon River; *(DEIS; Ch 4; pg. 4.9-70)*
  - Removing legacy tailings and waste improves water quality in Meadow Creek Valley. *(DEIS; Ch. 4; 4.12 pg. 103-104)*

## INITIAL TEMPORARY PASSAGE

- For its own operational purposes, Midas Gold only needed to design a tunnel to reroute the river away from the Yellow Pine pit during mining. However, the company has committed millions of extra dollars into designing, building and operating a system specifically engineered to help these critical species reach their historical spawning grounds and jump-starting population recovery in the East Fork South Fork of the Salmon River at the start of operation of the proposed mine, rather than at closure. *(See: PRO; Section 8.1)*
- Initially, upon the tunnel fishway being activated, approximately 6 miles of stream would be opened to migratory and anadromous fish, including steelhead, Chinook salmon, and bull trout. Much of the newly accessible stream habitat is located in higher elevation and relatively cooler reaches of the river that could provide essential habitat for generations to come.
- Midas Gold engineered a temporary 0.9-mile fish passageway based on examples of successful systems around the globe.
  - Using best practices, the tunnel was designed to accommodate a wide range of flow (including low flow of under 10 cubic feet per second (cfs) and a 500-year flood event of 721 cfs);
  - The tunnel fishway uses a pool and weir system designed to NOAA Fisheries guidelines that takes into consideration the sustained and burst swimming speeds of each species;
  - The design accommodates upstream passage of adult salmon, steelhead, and bull trout and downstream passage of adults and juveniles of all species;
  - The tunnel will include lighting similar to ambient conditions to ease the transition at the entrance and exits;
  - Midas Gold evaluated eleven fishway designs from around the globe for feasibility, passage performance, constructability, operating costs, and accessibility for maintenance;
  - The tunnel slope has an overall slope of approximately 3.8%, split into two segments of 1.5% and 4.5%, to accommodate expected geologic/tunneling conditions and still ensure fish passage;
  - Research indicates that a system built with concrete weirs and pools provides the most successful model for all three species found at the project location;
  - The weir-pool fishway, combined with a control structure at the tunnel's upstream entrance, allows for fish passage over a wide range of river flows with excess flood flow overflowing onto the accessway during the highest anticipated flows;

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- Detailed hydraulic studies indicated that all three species can successfully navigate the passageway as designed during their respective migration windows (spring high flow for steelhead, moderate to low summer/fall flow for Chinook salmon and bull trout).

## PERMANENT SOLUTIONS

- At the completion of mining at the Yellow Pine pit, around Year 7 of operations, Midas Gold will begin the restoration of the East Fork of the South Fork of the Salmon River, starting with backfilling the pit and culminating in a fully restored EFSFSR across the backfill by Year 10-11. (*See: PRO; Section 14*)
- The world-class restoration design for the East Fork of the South Fork of the Salmon River over the backfilled Yellow Pine pit is based on maximizing habitat and creating a dynamic river system that closely mimics natural conditions. It is also specifically designed to provide permanent passage for salmon and bull trout to miles of additional spawning and juvenile habitat that is currently blocked.
- Restoring the East Fork of the South Fork of the Salmon River is at the core of the Stibnite Gold Project. The plan removes multiple physical barriers to passage and includes uplift in streambank conditions, in-stream woody debris, pool frequency and quality, and floodplain connectivity. It also includes improvements to side channels that are essential juvenile rearing habitat. Passage improvements will open approximately 25 miles of perennial stream habitat, roughly 6 miles of which are large enough for Chinook salmon and steelhead.
- Midas Gold also prioritized solving the largest source of sedimentation in the watershed, which has been an ongoing issue since 1965 following the dam failure at Blowout Creek. While this legacy feature is not within the footprint of the proposed mining operations, Midas Gold is investing in a solution to stop the sedimentation and subsequent water quality and fish habitat degradation during the first years of the Project. By addressing Blowout Creek, the habitat and water quality of the region will be improved. (*PRO; pg. 5-3*)
- Midas Gold also plans on enhancing other sections of the East Fork of the South Fork of the Salmon River within the project area that have been impacted by mining. (*PRO; Section 2.4*)
- In the introduction of the Plan of Restoration and Operations (PRO) submitted by Midas Gold in 2016, the company outlines **guiding conservation principles** used to design the project. Including:
  - “Conduct restoration, mining, milling and reclamation activities in an environmentally responsible manner” (*PRO; pg. 2-1*);
  - “Design and construct facilities to minimize impacts to aquatic and terrestrial wildlife, improve habitat across the project site and protect anadromous and local aquatic populations” (*PRO; pg. 2-1*);
  - “Protect and improve local surface water and groundwater quality”
  - “Repair, relocate or construct new ecologically diverse stream channels and wetlands to mitigate those disturbed by legacy and new mine development.”
- In the Plan of Restoration and Operations Midas Gold also identifies **sustainability goals** for the Stibnite Gold Project. These include:



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- “Remove existing barriers to fish migration and re-establish salmon and steelhead passage to the headwaters of the East Fork of the South Fork of the Salmon River (EFSFSR) and Meadow Creek as a beneficial environmental outcome” (*PRO; Section 2.4*);
- “Re-establish fish habitat and spawning areas in the newly accessible EFSFSR and Meadow Creek” (*PRO; pg. Section 2.4*);
- “Restore stream channels and riparian habitat that were altered or impacted by previous mining, to improve fish habitat, fish spawning and fish passage, in support of developing a robust population of natural migratory fish, a net benefit resulting from the Project” (*PRO; Section 2.4*).