



Lower Granite Lock and Dam Juvenile Bypass System Improvements

U.S. ARMY CORPS OF ENGINEERS

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The Walla Walla District of the U.S. Army Corps of Engineers is improving and upgrading the Lower Granite Lock and Dam Juvenile Bypass System (JBS), which transports fish around the dam to the Juvenile Fish Facility (JFF). The improvements under construction are an important part of the Corps' mission to save salmon and other endangered or threatened species. JBS improvements are intended to improve survival of juvenile fish migrating downstream and increase operational reliability of the bypass system.

As millions of juvenile fish pass over, around or through Lower Granite Dam each year, with an average juvenile survival rate of about 93 to 96 percent, these improvements to increase the survival of juveniles migrating downstream are significant.

Overall construction effort is significant. Current construction of the JBS and future Primary Bypass Outfall Pipe are divided into two phases, termed "Phase 1a" and "Phase 1b."



Lower Granite Juvenile Bypass System elevated flume under construction. It will lead fish to the downstream Juvenile Fish Facility. US Army Corps of Engineers photo.

Phase 1a – Construction of an Elevated transportation flume for Juvenile Fish

Phase 1a construction started in the fall of 2014 and is expected to be complete by March 2017. Phase 1a construction includes:

- Reconfiguring the juvenile fish transportation bypass channel so it will transition to an elevated flume outside the dam.
- The existing underground pressurized fish passage will be replaced or "daylighted" by an elevated, above-ground, screen-covered flume about 2,700 feet long, or more than half a mile. This new above-ground flume, which is longer than the current 1,800-foot underground pipe, meets current juvenile fish passage criteria and improves juvenile survival throughout the bypass system. Parts of this flume will be 25 to 30 feet above ground, or several stories tall.
- Fish passages or "gatewell orifice" openings within the dam will be enlarged to improve juvenile fish passage.
- The fish collection channel within the dam will be enlarged by removing or "mining" concrete." This mining will remove about 1,400 cubic yards of concrete, or 265 dump truck loads.
- New passive integrated transponder (PIT) tag detection will be installed throughout the new elevated fish transportation channel to provide fish research, monitoring data and validate survival rates.
- Provides additional sources of water within the juvenile and adult bypass systems.

To support these new structures, more than 65 columns will support the new flume and dewatering structures. The new primary dewatering unit is 20-25 feet above ground and will be made of about 1,700 cubic yards of concrete, or more than 200 concrete truckloads.

New water supply pipes and valves are being installed so that water drawn through the JBS can be utilized several different ways to benefit fish throughout the juvenile and adult fish bypass systems. New pipes and

valves will allow water from the new JBS dewatering units to be used to enhance adult fish ladder attraction flows. For example, work includes providing additional water supply to the adult fish trap within the adult ladder system, and installation of an emergency water supply for the Juvenile Fish Facility. In addition, a new emergency bypass system and outfall below the dam are being installed to route fish in the JBS back to the river in case of operational issues with the new dewatering units or transportation flume system.

The Phase 1a contract for \$48.3 million was awarded to Garco Construction, Inc., of Spokane, Washington, in September 2014. With included options awarded in November 2014, the total Phase 1a contract investment in enhancing juvenile bypass is about \$50 million.

Phase 1b - Design and Construction of the Primary Bypass Outfall Pipe

Because of additional time needed to complete design of a new primary bypass outfall pipe, its design was separated from Phase 1a components and named "Phase 1b." This primary bypass outfall pipe will transport juvenile fish from the new elevated transportation flume system and JFF to a better release location in the river below the dam. Similar to other bypass outfalls recently constructed by the Corps, this new primary bypass structure will contain various bird deterrent and access walkway structures. The design of this new bypass system is anticipated to be completed mid-2016 and construction completed by March 2017.

Environmental Stewardship

The Corps previously upgraded its other lower Snake River juvenile fish facilities at Ice Harbor Lock and Dam, Lower Monumental Lock and Dam, and Little Goose Lock and Dam during the past several decades. These improvements contributed to juvenile fish survival improvements, which leads to the ultimate goal of improved adult fish returns when those juveniles return from the ocean as adults several years later. This project at Lower Granite Lock and Dam continues the Corps efforts to improve and enhance fish passage and fish survival throughout the Snake River.

This construction project qualifies as a Categorical Exclusion (CATEX) under the National Environmental Policy Act (NEPA). This proposed action is considered as rehabilitation and replacement of existing structures at a completed Corps project which carries out authorized project purposes.

Funding for this Project

The Corps of Engineers provides hydropower to the Bonneville Power Administration (BPA), which is the lead federal agency for the federal power grid in the Pacific Northwest. BPA subsequently provides funding directly for, or through reimbursement to the Treasury, for various Corps projects and initiatives, including fish recovery implementation. The Lower Granite Juvenile Bypass System upgrade is one of those efforts.

This Juvenile Bypass System upgrade funding comes from the Columbia River Fish Mitigation (CRFM) Program, which is intended to address the Endangered Species Act Biological Opinion (BiOp) Reasonable and Prudent Alternative (RPA) actions identified for the Federal Columbia River Power System (FCRPS) as specified by the National Marine Fisheries Service. Funds are appropriated by Congress to the Corps Construction General account. The Bonneville Power Administration repays a significant amount of these costs to the U.S. Treasury from electric ratepayer fees during a 50-year amortization period once the project is put into service.

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