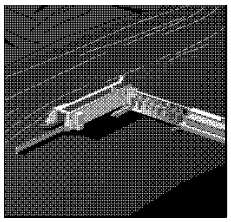

The Lower Snake River Juvenile Salmon Migration Feasibility Report/ Environmental Impact Statement

Natural River Drawdown Engineering

Information on natural river drawdown engineering

The U.S. Army Corps of Engineers (Corps) continues to study ways to improve juvenile salmon passage through the hydropower system on the Snake River. As part of this effort the Corps released the Draft Lower Snake River Juvenile Salmon Migration Feasibility Report/Environmental Impact Statement (FR/EIS) in December 1999. These information sheets discuss specific topics covered in the FR/EIS. The entire FR/EIS can be found on line at http://www.nww.usace.army.mil. For more information contact Dave Dankel, Walla Walla District Corps, at (509) 527-7288, dave.a.dankel@nww01.usace.army.mil.

What is Natural River Drawdown?

The FR/EIS compares the effectiveness of four courses of action: maintaining the existing system with planned improvements, maximizing the transport of juvenile salmon, making major system improvements to fish bypass facilities, and breaching the dams, also know as natural river drawdown. If the dam breaching alternative were chosen, a portion of each dam would be removed and the four lower Snake River reservoirs would be drawn down to the level of a natural river, creating a free-flowing 140-mile stretch of river. This process is known as natural river drawdown. This Information Sheet provides a summary of natural river drawdown engineering and an overview of the effects of dam breaching. For a detailed discussion of the engineering process, see *Technical Appendix D—Natural River Drawdown Engineering*.

Drawdown Engineering

Significant preparatory actions would be necessary in order to draw down the reservoirs in a manner that is safe, economical, and timely. The required actions fall into the five categories below.

1. Reservoir Evacuation

Reservoir drawdown could not begin until August of most years at which time the spring runoff season is complete and river flows have reduced to a manageable level. The reservoir water must be discharged and the embankment segment of the dam must be fully excavated by the end of December of most years at which time winter storms have a high probability of creating high river flow conditions. High river flows threaten the systematic lowering of the reservoirs and create rapid drawdown conditions that could endanger workers and property and can destabilize many highway and railroad embankments bordering the reservoirs. Since low level outlets do not exist at each of the dams, the existing turbines and turbine passages would need to be modified to allow them to be used as short-term low-level outlets.

2. Embankment Removal and River Channelization

Removal of the embankment portion of the dam would be performed concurrently with reservoir drawdown. The work would be performed during the time period between the end of the spill season in August and the start of the next high flow season in January.

The construction of channelization levees would follow immediately and be completed in March of the same season. The goal of river channelization is to create a smooth

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transition for the river channel around concrete lock and dam structures remaining in the natural river channel.

3. Equipment and Structural Disposal

The concrete structures such as the powerhouses, navigation locks, and the non-overflow sections would remain within the channelization levees and be secured against public access. The remaining steel, mechanical, and electrical structures and equipment would be disposed as scrap or would remain at the site.

4. Modifications in the Reservoirs

Modification of the reservoir infrastructure would be necessary as a result of lowering the reservoirs. Up to 25 bridge piers would require protection from erosion due to higher velocity river water. Railroad and highway embankments would need to be protected from erosion due to higher velocity river flows. Drainage structures, originally designed to allow passage of water through embankments into reservoirs, would need to be protected so that discharge water does not erode the embankment. Large quantities of rock would be necessary to stabilize the critical sections of embankments. Repairs to roads and rail beds would be needed as a result of settlement and slope failures of embankments.

Modifications related to fish, wildlife, recreation, and cultural resources would be needed in each reservoir. Extensive modifications to the Lyons Ferry Hatchery would be necessary to maintain limited production during the drawdown process. Alternate irrigation facilities at habitat management units would be needed to maintain short-term operation. During and following drawdown, exposed land masses would be re-vegetated and habitat management units would be re-fenced. Recreation areas would be modified or, in some cases, closed. A significant cultural resources protection program would be implemented to protect over 300 known sites that would be exposed after drawdown.

A number of major agricultural and industrial modifications would be required by drawdown. For example, the Corps developed concepts for a corporate irrigation system for the major irrigators now using the Ice Harbor Reservoir. Modifications to existing water wells may be necessary to maintain current water yields. Other actions that may be necessary include modifications to water intakes for industrial and municipal use, modifications to an industrial effluent diffuser, and replacement of a river crossing for a gas pipeline.

5. Schedule and Cost

The recommended sequence for implementing drawdown would be to concurrently breach the embankment segments of Lower Granite and Little Goose dams in one construction season followed by concurrent breach of embankment segments of Lower Monumental and Ice Harbor dams the following construction season. Numerous engineering and construction activities would precede and follow dam breaching. The timeframe for implementing drawdown is estimated to extend over 9 years. The drawdown of the reservoirs would occur during years 6 and 7 of this 9-year schedule. The cost of all Federal engineering and construction activities to implement the design and construction actions for drawdown is estimated at $1 billion. Detailed cost estimates can be found in *Technical Appendix D- Natural River Drawdown Engineering*.

Summary of Some of the Actions and Effects the Dam Breaching Alternative

Action

- Removal of dam embankment
- Elimination of reservoirs
- Shut down of navigation lock
- Shut down of powerhouse
- End of juvenile fish transport program on the lower Snake River
- New fish and wildlife mitigation
- Protection of cultural resources
- Modifications to some reservoir facilities

Effects

- Moderate reduction in extinction risks for fall chinook and steelhead (CRI)
- Slight reduction in extinction risks for spring/summer chinook (CRI)
- Loss of hydropower generation; raised electric rates
- Loss of navigational capacity; impacts on other transportation systems; increased transportation costs
- High sediment movement
- Impacts to irrigation and water supplies
- Short-term gain and long-term loss of jobs and income
- Gain in recreation opportunities