U.S. Fish & Wildlife Service

Fact Sheet
for
Fish and Wildlife Coordination Act Report
Lower Snake River Juvenile Salmon Migration Feasibility Study

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Introduction

In 1995, the National Marine Fisheries Service issued a Biological Opinion which addressed the effects of operation of federal dams on threatened and endangered salmon. The 1995 Biological Opinion required the Corps of Engineers (Corps) to evaluate alternatives to improve juvenile salmon migration through the lower Snake River and past four dams. They are accomplishing this through their Lower Snake River Juvenile Salmon Migration Feasibility Study and an Environmental Impact Statement (EIS).

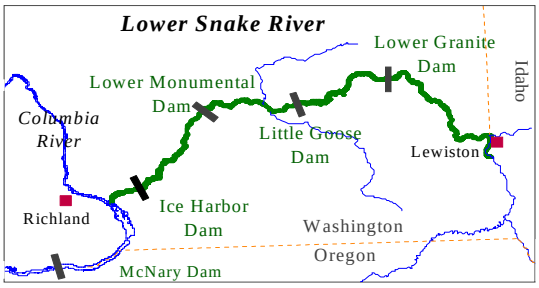
As required by the Fish and Wildlife Coordination Act (FWCA), the Corps has asked the Fish and Wildlife Service (Service) to prepare a FWCA report that evaluates the Corps' proposed hydro alternatives and their effects on fish and wildlife. The Corps must fully consider FWS recommendations in the FWCA report and fish and wildlife conservation is to receive equal consideration with other project features. The FWCA report will be included as an appendix to the Corps' EIS. This report addresses pre- and post-dam resources, potential impacts from the alternatives, mitigation measures and other recommendations for each alternative. Of the alternatives being considered, the Service preliminarily finds that the Natural River Drawdown Alternative would provide more benefits to fish and wildlife in the area of the four lower Snake River dams than the other alternatives.

The FWCA Report focuses only on the effects of four hydro alternatives on resident and anadromous fish and terrestrial resources in the area of the four lower Snake River dams and has identified which alternative has the most benefit for fish and wildlife in that context. The U.S. Fish and Wildlife Service and other Federal agencies are continuing to evaluate the four proposed alternatives in light of the broader, regional context of habitat, harvest, hatcheries, and hydropower and through the Conservation of Columbia Basin Fish paper. The final FWCA Report will incorporate the findings of that broader evaluation in its analysis of the four alternatives and will be transmitted as an appendix to the Corps' final EIS when it is released during the summer of 2000.

While the FWCA report does include information on threatened and endangered species, the Corps has to address their requirements under the Endangered Species Act (ESA) through a different process. Specifically, they must enter into consultation, under Section 7 of the ESA, with the Service and National Marine Fisheries Service (NMFS). The Corps initiated this process with the Service for bull trout and Kootenai River white sturgeon with the submission of a Biological Assessment and they have also initiated this process with NMFS for listed salmon and steelhead stocks. The end result of the Section 7 consultations would include measures the Corps will use to protect listed threatened and endangered species.

Study Area

The study area includes the 140-mile stretch of the lower Snake River impounded by four dams.



Over a period of 13 years (1962-1975), four dams were constructed on the lower Snake River. Ice Harbor, Lower Monumental, Little Goose, and Lower Granite dams are all run-of-the-river dams, meaning they pass water at about the same rate as it enters. They were constructed primarily for navigation and hydropower generation and provide almost no flood control. Also, lower Snake River water irrigates about 40,000 acres, mostly around the Ice Harbor pool.

Dam	Year Completed	Reservoir		
		Length (miles)	Surface Area (acres)	Max. Power (megawatts)
Ice Harbor	1962	31.9	8,375	603
Lower Monumental	1968	28.7	6,590	810
Little Goose	1970	37.2	10,025	810
Lower Granite	1975	39.3	8,900	810

All four dams provide for adult or upstream migration of salmon and steelhead using fish ladders. Juvenile bypass facilities exist at each dam: Lower Granite Dam has the most advanced system with traveling and vertical barrier fish screens. Ice Harbor Dam has the least advanced system, directing downstream migrants through the ice and trash sluiceway. Collection and transportation facilities, to remove the juveniles from the river and transport them downstream by barge or truck, exist at Lower Monumental, Little Goose, and Lower Granite dams.

Fish and Wildlife Facts

Pre-lower Snake River dams.—Before construction of the four dams on the lower Snake River, a dynamic riverine environment was present, although it had already been affected by upstream dams. Land use along the river consisted mainly of grazing, with scattered croplands and orchards on the fertile flats along the river. A riparian corridor was present along the river, as well as a functioning floodplain. The riparian corridor, although a small portion of the landscape, was extremely valuable to many species of wildlife in this arid environment. It also benefitted the aquatic system by filtering sediments and pollutants from water, stabilizing shorelines, and providing habitat and food for fish and other aquatic species.

Little information exists about resident fish resources present in the lower Snake River prior to impoundment. We do know white sturgeon were dispersed throughout the Snake River well into southern Idaho. Many non-native species of fish were introduced to the Columbia and Snake rivers by early settlers as 'pan fish'. For example, carp were well established in the Snake River as early as 1894 and largemouth bass, yellow perch, crappies, and bluegill were present in the Columbia River by the early 1900s.

Before the dams, anadromous fish were present throughout much of the Snake River system up to 600 miles from the confluence with the Columbia River. The Snake River was one of the major producers of anadromous salmonids in the Columbia River Basin. Species of anadromous fish present in the Snake River Basin included spring, summer and fall chinook, coho, and sockeye salmon; steelhead; Pacific lamprey; and white sturgeon. The Idaho portion of the Snake River alone is estimated to have produced 39% of the all spring chinook, 45% of all summer chinook, 5% of all fall chinook, and 55% of all summer steelhead in the entire Columbia River Basin.

Current conditions (post-dams).—With dam construction, the lower Snake River was transformed from a series of clean gravel and cobble areas interspersed with large pools, to four reservoirs. Reservoirs covered the natural floodplain which formerly existed. Water temperatures were substantially changed by the large bodies of water held behind the dams. Sediments carried down from upper watersheds settled out to cover much of the bottom substrates. Natural river habitat formerly used by anadromous salmonids for spawning, rearing, and migration has been replaced by slack water reservoirs. Riparian vegetation that contributed to the food web was inundated and replaced by unvegetated rocky shorelines and eroding banks. Migrating juvenile salmonids have been slowed in the reservoirs and at the dams, exposing them to higher water temperatures and greater levels of predation. The invertebrate community living there changed to one dominated by worms, midges, and crayfish.

Following construction of the four dams, about 15,000 acres of lands were inundated. While the majority was overgrazed grasslands and shrub-steppe, the important loss to most wildlife was the riparian habitat corridor. Considerable effort has been made to re-create riparian habitat along the reservoir shorelines; however, islands of irrigated habitat have been created with little corridor development of native vegetation. Also, upland habitats on project lands have improved with the reduction of grazing. Although some species of wildlife, such as waterfowl, have taken advantage of the reservoir habitat, less than 3/4 of the wildlife mitigation goals for losses from the dam construction have been met. Management practices have not been as successful as hoped, much of the riparian habitat is composed of non-native species, and riparian habitat occurs as small islands along the reservoirs rather than corridors along the shorelines.

Current data on resident fish in the lower Snake River suggest a diverse fish community which varies little between reservoirs. Most native species prefer areas of the reservoirs most similar to the original river: tailraces immediately below the dams, the old river channel, and other areas with free flowing water. These include northern pikeminnow (formerly squawfish), white sturgeon, mountain whitefish, chiselmouth, etc., which typically spawn in free-flowing areas or tributaries. Non-native species, such as bullhead, yellow perch, smallmouth bass, largemouth bass, and other sunfish, prefer the slower, warmer backwater and shallow areas.

Naturally produced runs of salmon and steelhead have declined drastically since the construction of dams in the Snake River Basin. Snake River coho salmon have been declared extinct and sockeye salmon are close to extinction. A major hatchery program, under the Lower Snake River Fish and Wildlife Compensation Plan, was established to mitigate losses of salmon and steelhead caused by the lower Snake River dams. Hatchery production has helped maintain returns of adult steelhead and salmon to some hatcheries. Major alterations have been made to the lower

Snake River dams and their operations to improve conditions for both juvenile and adult salmonids during their migrations, yet wild stocks of fish have continued to decline.

Current Alternatives

The four main alternatives being considered by the Corps to improve juvenile fish passage include Existing Systems, Maximum Transport, Surface Bypass/Collection, and Natural River Drawdown. These were selected after more than 20 options were screened based on technical feasibility, biological and cost effectiveness, environmental effects, and regional acceptance.

The *Existing Systems Alternative* would continue present operations under the NMFS 1995 Biological Opinion. It includes various transportation, structural, and operational changes such as extended screens, flow deflectors, and additional barges.

The *Maximum Transport Alternative* includes the existing systems alternative actions, as well as, maximizing barging and trucking of juvenile salmon and steelhead. In-river migration of juvenile salmonids would be reduced by not bypassing fish through the spillways.

The *Surface Bypass/Collection Alternative* would divert juvenile salmonids at the water surface rather than forcing them to undergo the depth and pressure changes now necessary to enter the juvenile bypass facilities. A prototype for surface bypass/collection is being tested at Lower Granite Dam.

The fourth alternative being considered is the *Natural River Drawdown Alternative*. This alternative involves breaching the four lower Snake River dams and returning the river to a 'near natural' condition by removing the earthfill portions of each dam.

Effects from Alternatives

Existing Systems Alternative—This alternative would have little, if any, effects on wildlife or resident fish species. Operations of the Snake River projects such as flow augmentation, voluntary spill, and minimum operating pool would likely continue and not appreciably change conditions for anadromous fish migration through the area of the lower Snake River. Also, this alternative would not address lamprey or sturgeon passage at the dams.

Maximum Transport Alternative—This alternative would also have little, if any, effects on wildlife or resident fish species. The number of juvenile salmon and steelhead that would be transported would increase moderately for spring migrants and essentially no change for summer migrants (fall chinook) over existing conditions because the percentage of fish presently collected is already fairly high.

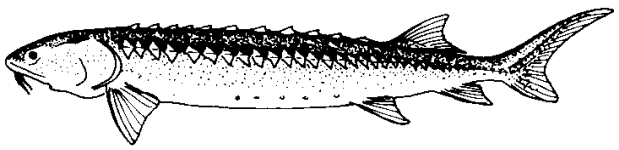
Surface Bypass/Collection Alternative—This alternative, also, would have little if any effects on wildlife or resident fish species. While testing of the prototype SBC system at Lower Granite Dam has shown some promise, additional testing and refinement would be necessary before it could be proven for full scale installation. Testing to date has shown that the surface bypass collector will not be able to adequately collect fish on its own. The SBC alternative may improve juvenile fish passage at the dam, but it does not address migration of juvenile fish through the reservoirs or lamprey and sturgeon passage needs. This alternative would require continuation of the existing flow augmentation and minimum operating pool programs to aid juvenile fish migration through the lower Snake River reservoirs.

Natural River Drawdown Alternative—Short-term effects to wildlife would be mostly negative, as riparian habitat would either dessicate and die or be several hundred yards to 1/4 mile from the river's shoreline. Also, several hundred acres of wetlands which were created with the reservoir construction would be lost. Those habitat areas currently being irrigated by the Corps to create riparian habitat would continue to be irrigated, at least in the short term. The habitat provided would no longer be riparian, nor as valuable. Long-term effects to wildlife would be mostly positive, assuming a functioning riparian corridor is re-established along the river. This also assumes project lands would continue to remain in public ownership and be managed to restore a functioning riverine ecosystem and an adequate buffer zone along the riparian corridor. While positive effects from a drawdown would begin accruing soon for some wildlife species, benefits to species which depend on a mature riparian habitat (for example, western screech owl), would take at least 50 years.

Overall, effects of natural river drawdown on resident fish would be beneficial for native species which evolved in a large river ecosystem. Most native fish species are dependent on flowing water and would benefit from the increased habitat complexity and invertebrate community associated with a river. Many of the non-native species, which in the past capitalized on a reservoir habitat would decline in abundance. Channel catfish and smallmouth bass are two exceptions since both can do well in rivers.

The Natural River Drawdown alternative would have short term impacts to anadromous fish through such things as increased turbidity, stranding of fish, and blockage of fish access to tributaries. Also, adult fall chinook salmon and steelhead would be present in the Snake River during dam breaching and would be affected by this activity. These impacts could be mitigated by various measures.

The long term effects of natural river drawdown would be beneficial to anadromous fishes since it would restore the lower Snake River to a functioning riverine ecosystem. Upstream and downstream migration for all salmonids, lamprey and sturgeon would be unimpeded through the lower Snake River. This alternative would additionally benefit fall chinook salmon by restoring spawning and rearing habitat in the lower Snake River.



Mitigation measures

Implementing the Existing Systems, Maximum Transport and Surface Bypass/Collection alternatives would not require significant, if any, additional mitigation. However, there are existing measures addressing fish and wildlife losses from the dam's construction that would need to be continued.

Natural River Drawdown—-The mitigation measure most important to anadromous fish, resident fish, and wildlife with a natural river drawdown is the restoration of a functioning riverine ecosystem, including a healthy riparian corridor. A river restoration effort of this scale has not been attempted before. It will require innovative restoration techniques and flexibility in implementation and management to account for relative unknowns, such as weather conditions and the fate of existing sediments. Considerable effort would be needed to preclude the establishment of weeds and encourage establishment of native plant communities.

There are several other measures that should be considered to avoid or reduce impacts to fish and wildlife from the natural river drawdown. Some of these mitigative measures include timing of dam demolition operations, monitoring of potential problem areas, and implementing structural measures such as fishway extensions.

Other recommendations

A variety of measures are recommended to monitor habitat conditions and fish and wildlife populations. These would

help determine effectiveness of mitigation measures, determine if adjustments in management plans are warranted, and facilitate understanding of large-scale stream restoration efforts. There are also some recommendations that address ongoing mitigation for losses from reservoir construction.

Conclusion

The Service preliminarily finds that the *Natural River Drawdown Alternative* would provide many more benefits to fish and wildlife than the other three alternatives, including:

- restoration of a near natural riverine system, including a more complex habitat structure, functioning floodplain, and associated increase in biodiversity
- unimpeded migration for juvenile, as well as, adult salmon and steelhead, and others including lamprey, bull trout and sturgeon through the area of the lower Snake River
- increase in rearing and spawning habitat for fall chinook salmon
- decrease in predation on fall chinook salmon
- improved habitat conditions for native resident fish
- restoration of riparian habitat and associated wildlife in the long term

The final FWCA report would further evaluate the alternatives within the broader regional context of habitat, harvest, hatcheries, and hydropower. It will be released as an appendix to the Corps' final EIS in the summer of 2000.

The draft FWCA report will be posted on the Internet at the Walla Walla District Corps of Engineers website at www.nww.usace.army.mil and hard copies of the report can be obtained from the Corps by calling (509) 527-7263.

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