

What's the Dam Problem? Breaching Four on the Lower Snake River

Salmonid stocks in the Snake River Basin have declined steadily since the completion of four federal dams between 1962 and 1975: Ice Harbor, Lower Monumental, Little Goose, and Lower Granite. The "four H's"—hydroelectric, habitat, hatchery, and harvest—have been identified as the culprits responsible for salmon decline. Combined impacts from the four H's are devastating. On the Snake River, coho salmon are extinct, sockeye salmon are listed as endangered, and spring, summer, and fall chinook are listed as threatened (Wik 1995). These dams are directly related to the high salmon mortality rate in the Snake River (Yates and Curtis 1998).

Dams such as Chief Joseph on the Columbia River and Hells Canyon on the Snake River have no adult fish passage facilities. The lack of fish ladders eliminated spawning habitat upstream of these dams (Wik 1995). However, the dam passage issue is more serious in terms of juvenile downstream migration. Dams that lack juvenile fish passage facilities such as turbine screens and bypass channels experience severe smolt mortality. It is estimated that between 7 and 32 percent of smolts die at each dam (Muckleston 1990). "Turbines do not puree these small salmon, rather they kill by creating violent pressure changes that can explode a salmon's swim bladder" (Harden 1996). The juvenile fish that survive the dam bypass system are still at great risk. Those that are not killed are usually stunned and sluggish, making them easy targets for seagulls and other piscivorous fish. Federal agencies have concentrated their efforts on transporting juvenile fish "out of river". Migrating juvenile fish are collected and put on barges or trucks and transported downstream of the last federal dam on the Columbia River, Bonneville Dam. This unnatural practice has been the U.S. Army Corps of Engineers' method of salmon restoration for the past twenty years, and it has come under severe fire from scientists and environmentalists. Distilling juvenile salmon from the river and transporting them in mass quantities cause environmental stress.

The stress makes the fish more susceptible to disease and predators upon release below Bonneville. Furthermore, transporting salmonids out of river interferes with the imprinting process that allows them to return to their natal streams (Harden 1996). There is data to support the fact that barging has yielded zero improvement on returning stocks, yet it remains a popular "mitigation" method.

Juvenile fish that remain in the river to migrate to the sea encounter more perils. The dams have created stagnant reservoirs of water, thus making the downstream journey more difficult. The low velocity of the pools causes delays in migration, requiring two to three months in slackwater compared to less than one month before dams were constructed. Temperature of reservoir water is much higher than that of free flowing water. Salmonids have a low tolerance for warm water with about 70°F being the upper lethal limit; temperatures in excess of 74°F were recorded on the Snake River during the summer of 1998 (Barcott 1999). These deep, warm water reservoirs also provide excellent habitat for non-native predators of juvenile salmon, such as smallmouth bass. Warm temperatures impair the immune system of the fish and lead to increased disease.

The incredible loss of salmon in the Snake and Columbia River Basins has prompted the federal government to act, after seeing two decades of smolt transportation fail to reverse the decline in fish stocks. A restoration plan developed by the National Marine Fisheries Service (NMFS) cites two possible courses of action. The first is to continue transporting fish with fish passage improvements and increased flow augmentation. Flow augmentation refers to the releasing of extra water (in this scenario, up to one million acre-feet) stored in Snake River Basin reservoirs to aid fish migration. The second approach is breaching the four lower Snake River dams and permanently drawing down the reservoir behind John Day Dam on the mainstem of the Columbia (Blumm et al. 1998). There is considerable support

and opposition to both of these scenarios, but science and economics dictate that the latter is the only way to save Snake River salmon.

Improving fish passage structures at many dams will allow safer in-stream migration for juvenile salmon. The additional flow augmentation will also speed up downstream migration. However, transporting fish has not proven successful over the past two decades, and there is no reason to believe that the program will ameliorate current declining conditions. The emerging consensus in the scientific community states that returning the river to "normative" conditions is the best way to recover Snake River salmon. Breaching the four lower Snake River dams would remove passage barriers, restore a more natural flow regime to aid both upstream and downstream migration, and create shoreline habitat for juvenile rearing and feeding. In fact, the Idaho Department of Fish and Game stated in May 1998 that breaching the dams and restoring natural river conditions "is the best biological choice for recovering salmon and steelhead in Idaho" (Yates and Curtis 1998). Breaching may be a misleading term for what the Army Corps of Engineers proposes to do. In fact, dam breaching is more akin to dam bypassing. A new bypass structure would be created on one side of the dam through the removal of existing earth-fill dam sections or bedrock. A new river channel would be dredged through the bypass, and flow would be diverted around the existing powerhouse. The cost of dam bypassing for all four dams is near \$5 billion and does not include mitigation, impacts to navigation and agriculture, or loss of power generation (Wik 1995).

Nonetheless, dam breaching proponents argue that the Northwest can do without the four dams on the lower Snake River. In terms of regional electricity generation, they produce only 4 percent of the total power. The permanent drawdown of John Day reservoir would amount to another 7 percent loss in power generation (Yates and Curtis 1998). The dams do not serve any flood control purpose. Three of the four lower Snake River dams do not provide agricultural irrigation; Lower Granite does provide irrigation for a golf course. Ice Harbor Dam is the only irrigation dam, and it provides water for all 13

farmers in the region (Barcott 1999). Therefore, the economic burden on the region does not outweigh the burden of salmon extinction.

There are major losers in the dam breaching scenario. The ports of Lewiston, Idaho and Clarkston, Washington would become landlocked once again. Free flowing water on the Snake River would essentially shut down the barging industry. Currently, agricultural products from Oregon, Washington and Idaho are efficiently and cheaply shipped to Portland from Lewiston and Clarkston. New methods of transporting these goods would be needed, most likely in the form of rail or truck (Yates and Curtis 1998). Goods would need to be transported to the nearest barge port on the Columbia, and barge transportation would be eliminated on the Snake. The reservoir habitat created by pooling of water behind the dams would be eliminated. Resident fish populations would be greatly affected if the river were to return to a free flowing state. In 1992, the Army Corps of Engineers executed a test drawdown of Lower Granite and Little Goose Dams. The results of the test were not very encouraging. Sediments became resuspended in the water after accumulating behind the dams. Major losses of resident fish and benthic organisms were observed (Wik 1995). The test drawdown should not be viewed as equivalent to dam breaching since two dams still existed below the test dams, and the effects of bypassing all four dams are still being researched.

People live in the Northwest for its excellent quality of life. Salmon are a part of the region's culture, as well as the ecosystem. To lose such an icon would be devastating to the quality of life in the Northwest. The Army Corps of Engineers was to have its report on dam breaching prepared by April 1999. The Corps managed to have the deadline on the report pushed back to December 1999. In the meantime, different interest groups with a stake in Snake River dams and salmon will continue the breaching debate. It is unlikely that a consensus will be reached among the various river interests. However, every citizen of the Northwest must think hard about what extinction of Snake River salmon means to them. As the old cliché goes, extinction is forever.

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