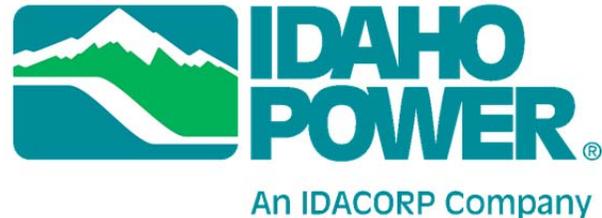


IDAHO POWER COMPANY'S FALL CHINOOK SALMON HATCHERY PROGRAM

Stuart Rosenberger, Paul Abbott, James Chandler
1221 W. Idaho St., Boise, Idaho



Background

The current Idaho Power Company (IPC) fall Chinook salmon program was established to provide mitigation for losses associated with the construction and operation of Brownlee, Oxbow, and Hells Canyon dams which together form the Hells Canyon Complex. IPC's current mitigation goal is to produce 1 million fall Chinook salmon smolts annually (see Origination of Idaho Power Company's Hatchery Mitigation Program section for more details). Oxbow Hatchery, funded by IPC and operated by the Idaho Department of Fish and Game, is responsible for the incubation and rearing of up to 200,000 subyearling fall Chinook salmon. The hatchery is located on the Snake River downstream of Oxbow Dam near the IPC village known as Oxbow, Oregon (Figure 1). IPC also contracts with the Oregon Department of Fish and Wildlife (ODFW) for the production of an additional 800,000 subyearling fall Chinook salmon that were originally reared at ODFW's Umatilla Hatchery and are now reared at ODFW's Irrigon Hatchery, both of which are located near the town of Irrigon, Oregon. Fish reared at both Oxbow and Umatilla/Irrigon hatcheries are released into the Snake River directly below Hells Canyon Dam with the exception of brood years 2003 to 2005 in which some of the production was released at the Nez Perce Tribe's Pittsburg Landing acclimation facility.

Similar to other fall Chinook salmon programs in the Snake Basin, Oxbow and Umatilla/Irrigon hatcheries receive eyed eggs from Lyons Ferry Hatchery, as it is one of only two broodstock holding and spawning facilities for fall Chinook salmon in the Snake Basin. Because Umatilla/Irrigon and Oxbow hatcheries are not broodstock collection facilities and only receive eyed eggs from Lyons Ferry there will not be any discussion of broodstock collection or composition in this summary. Please refer to the Lyons Ferry Hatchery portion of this review for details regarding fall Chinook salmon broodstock.

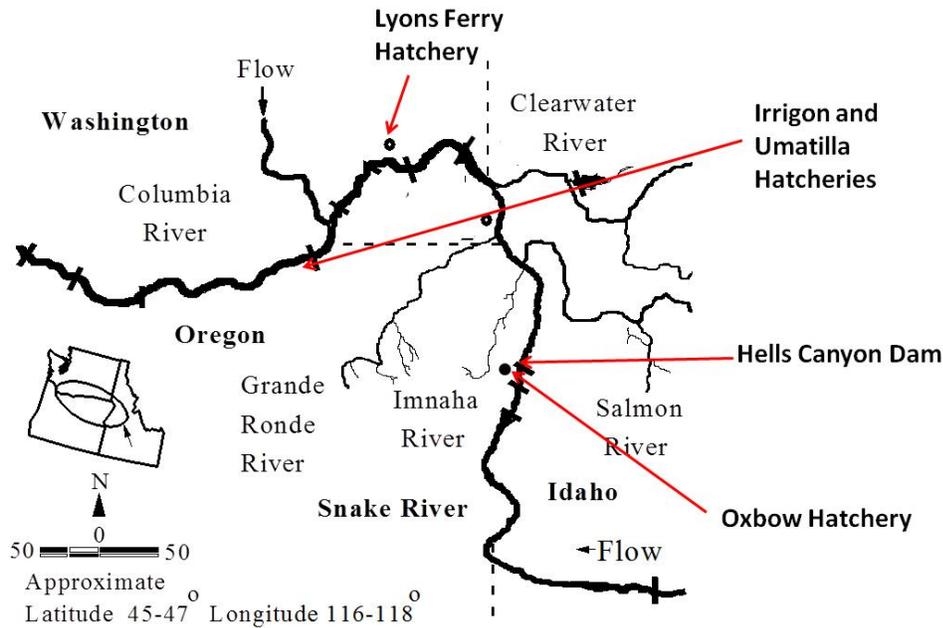


Figure 1. Map of project area

Monitoring and Evaluation Objectives

The objective of the IPC fall Chinook salmon hatchery program, beyond meeting its' mitigation goal, is to assist in the restoration and maintenance of sport and tribal fisheries as well as minimizing impacts on the natural populations in the Snake River. In addition, IPC continues to evaluate rearing and release strategies that will maintain or increase juvenile survival rates as well as maximize adult returns. IPC also emphasizes the importance of regional coordination and participates in regional planning meetings, as well as continuing to play an integral role in the Snake River fall Chinook salmon run reconstruction effort.

In-Hatchery and Post Release Survival

In-hatchery performance at both Oxbow and Umatilla/Irrigon hatcheries over the life of the current program has been good, with eyed egg to release survival rates exceeding 90% most years (Figure 2). A single exception to this was in brood year 2012 when coagulated yolk caused the eyed egg to release survival rate to drop to 84%.

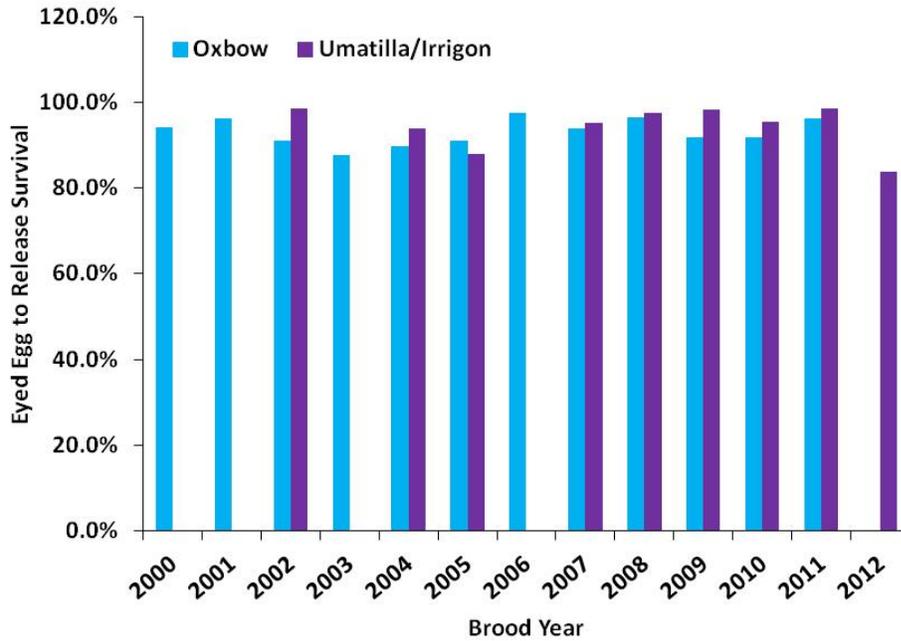


Figure 2. Fall Chinook salmon eyed egg to release survival at Umatilla/Irrigon and Oxbow hatcheries, 2000-2012 brood years.

Eyed egg requests from WDFW’s Lyons Ferry Hatchery have been consistent throughout the life of the program, however the number of eyed eggs received has been highly variable from year to year and reflects the availability of fall Chinook salmon eggs at Lyons ferry Hatchery (Figure 3). Egg availability at Lyons Ferry Hatchery is outlined in the current 2008-2017 *US vs. Oregon* management agreement which currently lists IPC egg requests as priorities 9, 13, and 15. Therefore, the number of fish released as part of IPC’s fall Chinook salmon program has fluctuated from 115,220 in brood year 2000 to 1,006,324 in brood year 2008 (Figure 4).

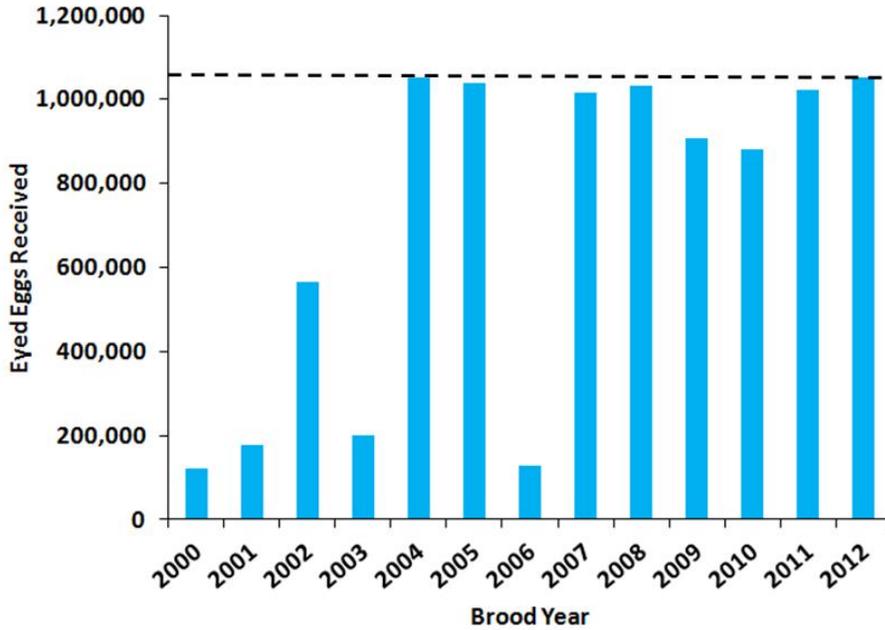


Figure 3. Fall Chinook salmon eyed eggs requested (dotted line) and received for the IPC program, 2000-2012 brood years.

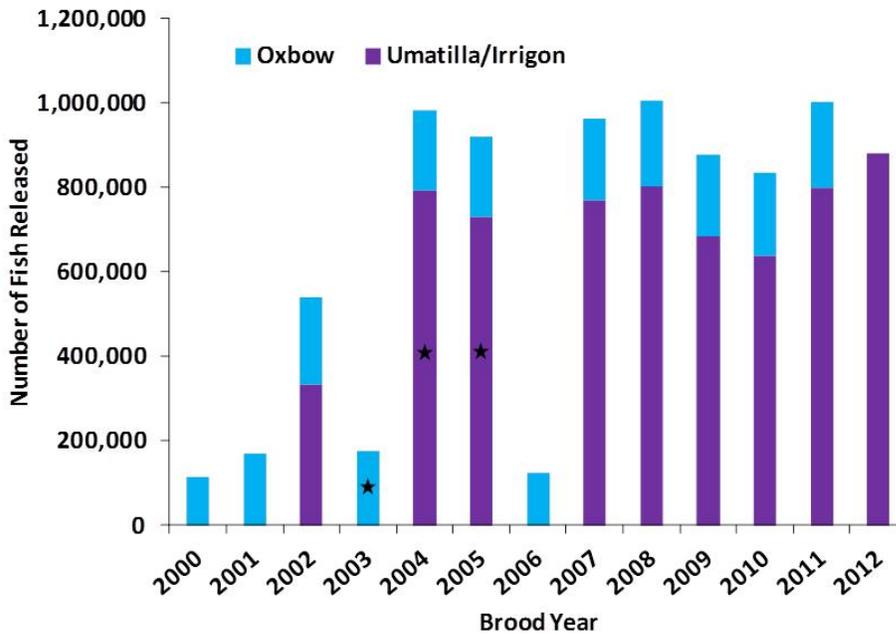


Figure 4. Number of fall Chinook salmon released from Umatilla/Irrigon and Oxbow hatcheries below Hells Canyon Dam, 2000-2012 brood years. Stars indicate years in which a portion of the hatchery production was released at Pittsburg Landing.

Passive integrated transponder (PIT) tags and subsequent downriver PIT tag detection systems have been used to estimate juvenile survival rates from release to Lower Granite Dam beginning in brood year 2002. Survival rates have fluctuated from 43.8 % to 81.8% and in most years are similar to other fall Chinook salmon releases in the Snake Basin (Figure 5).

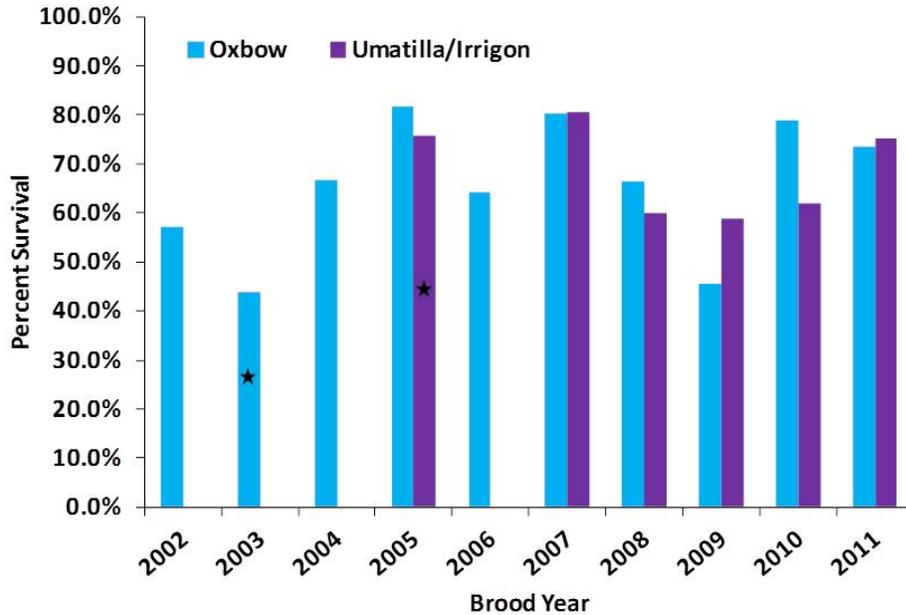


Figure 5. Juvenile survival rates of fall Chinook salmon reared at Umatilla/Irrigon and Oxbow hatcheries released below Hells Canyon Dam, 2002-2011 brood years. Stars indicate years in which a portion of the hatchery production was released at Pittsburg Landing.

Origination of Idaho Power Company’s Hatchery Mitigation Program

Over the years, questions about IPC’s fall Chinook salmon mitigation responsibility have arisen in various local and regional forums. The following is a description of where IPC’s anadromous mitigation goals originated and how they were calculated.

The current mitigation goal for IPC’s anadromous hatchery program originates from the 1980 Hells Canyon Settlement Agreement (HCSA 1980). In 1976 the following agencies filed a petition with FERC seeking compensation for losses associated with the construction and operation of the Hells Canyon Complex: the National Marine Fisheries Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, and the Washington Department of Game. Several other parties intervened in the proceeding, including the Secretaries of Agriculture and Interior, the Confederated Tribes and Bands of the Yakama Indian Nation, the Nez Perce Tribe, and the Hells Canyon Preservation Council. In 1980, the original petitioning agencies and IPC presented an

uncontested settlement proposal to FERC. FERC approved the settlement by order date February 27, 1980.

Estimates of fish lost above Oxbow Dam were made based on the highest number of returns between 1957 and 1977 and included 17,800 fall Chinook salmon in 1958, 2,700 spring Chinook salmon in 1960, and 5,000 steelhead in 1958 (Haas 1977).

In addition to fish lost above Oxbow Dam, agencies formally requested further compensation for anadromous fish lost between Oxbow and Hells Canyon dams. The construction of Hells Canyon Dam blocked fall Chinook salmon access to spawning sites in the main Snake River, as well as spring Chinook salmon and steelhead access to Pine and Indian creeks. Estimates of spring Chinook salmon and steelhead lost between Hells Canyon and Oxbow dams was calculated based on the difference in fish counts between Oxbow Dam in 1964 and Hells Canyon Dam in 1967 (Haas 1977) and totaled 1,400 spring Chinook salmon from Pine Creek and 5,000 steelhead from Pine and Indian creeks. Estimates of 6,600 fall Chinook salmon lost in this reach of river were made by using redd counts made prior to the onset of the adverse affects of Oxbow Dam construction (Haas 1977, Richards 1978).

Based on the above estimates, agencies proposed that the total loss of anadromous fish upstream of the project included 24,400 fall Chinook salmon, 4,100 spring Chinook salmon, and 10,000 steelhead (Haas 1977).

In calculating proposed compensation for losses incurred by the construction of the Hells Canyon Complex, agencies proposed the substitution of fall Chinook salmon for spring Chinook salmon. Citing difficulties in establishing a fall Chinook salmon hatchery program, the early success of the Rapid River spring Chinook salmon program, and the desire of the agencies to develop a spring Chinook salmon sport fishery, petitioners proposed the substitution of fall Chinook salmon for spring Chinook salmon on a one-to-one basis (Haas 1977). Thus the total compensation for losses incurred to anadromous fish upstream of Hells Canyon Dam consisted of 28,500 adult spring Chinook salmon and 10,000 adult steelhead.

A smolt-to-adult survival rate was calculated for spring Chinook salmon based on the average return rate recorded at Rapid River Hatchery during the years 1966, 1967, and 1968 (Holubetz 1977). A 0.71% smolt-to-adult survival rate was applied to 28,500 spring Chinook salmon resulting in 4,000,000 smolts to be released. The number of steelhead smolts to be released was calculated using a 0.32% smolt-to-adult survival rate. The 0.32% smolt-to-adult survival rate applied to 10,000 adults yields 3.2 million smolts or 400,000 pounds of smolts (Holubetz 1977). The 0.32% survival rate was chosen by agencies because it was the same rate used to initially develop the Niagara Springs Hatchery.

What about Fall Chinook Salmon?

Petitioners also believed that IPC had a responsibility to mitigate for potential losses of fall Chinook salmon downstream that were associated with the construction and operation of the Hells Canyon

Complex. The fall Chinook salmon fishery estimates used by the parties to determine the mitigation level contained in the Agreement are as follows (Richards 1979): A total of 32,000 adult fall Chinook salmon were estimated to have returned to the Snake River in 1958. The Oxbow count of 17,800 adults, as well as 5,000 fish that were to spawn in future Army Corps of Engineers (COE) projects (Lower Snake River Dams), was subtracted from Snake River totals in 1958 leaving 9,200 adults in the Snake River between Hells Canyon Dam and Lewiston, Idaho. A total of 4,600 redds were calculated as the potential number of redds and was determined by dividing 9,200 by two. This assumes a 1:1 male/female ratio and that every female builds one redd. A maximum estimate of 20% of redds dewatered below Hells Canyon Dam was applied to 4,600 redds, resulting in a maximum of 920 redds potentially dewatered. Based on 5,000 eggs per redd and 10% egg to smolt survival, it was estimated that 460,000 smolts could be lost as a result of operations of the Hells Canyon Complex. This number was then doubled to reflect unquantifiable losses due to changed water temperatures, other water quality impairment, and differential survival between hatchery and wild smolts (Richards 1979). Therefore, IPC's current mitigation goal is the release of one million smolts annually. Unlike other hatchery programs in the Snake Basin, IPC does not have adult mitigation goals, nor does it have any in-hatchery or post release survival goals.

A lesser known agreement that has impacted the IPC fall Chinook salmon program is an agreement between IPC and the COE. This agreement, signed May 31st, 1984, stipulated that IPC would share in a portion of the construction cost of the COE's Lyons Ferry Hatchery in exchange for sufficient broodstock holding and egg incubation capacity within the new Lyons Ferry complex to ensure availability of approximately 1.3 million eyed fall Chinook salmon eggs annually. Due to the critically depleted size of the fall Chinook salmon population in the Snake River at that time, the agreement further states that IPC would not be entitled to any eggs in any year until such time that Lyons Ferry had obtained 80% of its' annual quota of eggs. Because of this qualifier, IPC did not receive any fall Chinook salmon eggs to meet its' mitigation obligation until December 7, 2000.

Future Outlook

The IPC anadromous hatchery program will continue to mitigate for lost sport and tribal fishing opportunities while incorporating the best science available. Recommendations from the Hatchery Scientific Review Group (HSRG) as well as objectives outlined in the Snake River Hatchery Genetic Management Plans (HGMP) will be implemented as the programs move forward. As new technologies emerge such as Parental Based Tagging (PBT), expanded use of in-river PIT tag arrays, and others, the monitoring and evaluation component of the program will continue to adaptively manage with the goal of improving both in-hatchery and post-release performance. Participation in regional coordination efforts and data sharing will remain a priority.

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HCSA 1980. Hells Canyon Settlement Agreement. Submitted to the Federal Energy Regulatory Commission. Idaho Power Company Project No. 1971, Docket No. E-9579.

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Richards, M. 1978. Testimony before the United States Federal Energy Regulatory Commission. Idaho Power Company Project No. 1971, Docket No. E-9579.