



FISH PASSAGE CENTER

1827 NE 44th Ave., Suite 240, Portland, OR 97213

Phone: (503) 230-4099 Fax: (503) 230-7559

<http://www.fpc.org/>

e-mail us at fpcstaff@fpc.org

MEMORANDUM

TO: Joan Dukes, NPCC

FROM: Michele DeHart

DATE: August 5, 2009

RE: Data Request

In response to your request, the Fish Passage Center reviewed adult return data in order to address whether the larger numbers of returning adults, particular sockeye in the Snake basin, are the basis for assuming that goals have been met for rebuilding salmon stocks in the Columbia River Basin, and to address the factors that contribute to the recent increase in adult returns. The conclusions of our review are:

- Overall abundance goals established in the NPCC fish and wildlife program have not been met.
- Smolt to adult return goals established in the Fish and Wildlife Program have not been met.
- Analyses indicate that the most important factors contributing to the increased return of sockeye salmon adults to the Snake River are the Court ordered spill for fish passage program and the significant decrease in the proportion of juvenile sockeye smolts collected and transported at Snake River dams.
- Although the sockeye hatchery program in the Snake River has contributed to the increase in sockeye smolt production, other hatchery programs that have been in place for decades for both sockeye and other salmonids indicate that it is unlikely that the hatchery program alone is the primary factor in the recent sockeye adult return

Overall abundance goals established in the NPCC fish and wildlife program have not been met

In order to address your request we have reviewed goals outlined by the Northwest Power and Conservation Council over the years as well as estimates of stock abundance and return rates. For this review, we utilized NPCC documents to establish the target goal. The NPCC originally established a goal of doubling the existing run of salmonids to the Columbia River. The NPCC estimated that pre-development 10 to 16 million salmonids entered the Columbia River annually. The estimated 1977 to 1981 (the five years prior to the Council's adoption of the first Columbia Basin Fish and Wildlife Program in 1982) adult returns were 2.5 million, which the NPCC used to develop a doubling goal of 5 million salmonids returning to the Columbia River Basin. The original doubling goal was carried through to the 2009 Fish and Wildlife Amended Program. The 2009 Amended Program states that the doubling goal is to be achieved by 2025 with salmonids returning to the Columbia, emphasizing stocks that originate above Bonneville Dam and support tribal and non-tribal harvest.

We utilized the actual run size estimates to the mouth of the Columbia River developed by the Technical Advisory Committee (TAC) for the US v Oregon process, to determine if the doubling goals at Bonneville Dam established by the NPCC have been met to date. Figure 1 shows the TAC run size estimates to the mouth of the Columbia from 1985 to 2008. The highest estimated adult salmonid return to the mouth of the Columbia River, based on the TAC estimates from 1985 to the present, was 3.1 million combined salmonids in 2001. The average over this time period is 1.6 million salmonids, with returns below that average in 2006 through 2008. This average is below the 2.5 million originally established to determine the doubling goal. Figure 1 shows that there is no consistent increasing pattern in adult returns from 1985 through 2008.

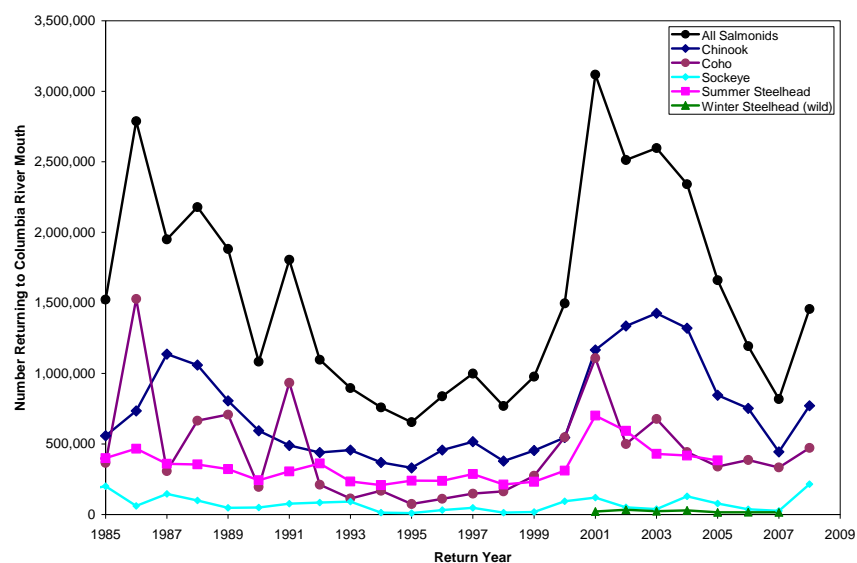


Figure 1. Run size estimates to the mouth of the Columbia developed by the Technical Advisory Committee of the US v Oregon process.

Smolt to adult return goals established in the Fish and Wildlife Program have not been met State, Federal and Tribal Fish and Wildlife managers expressed their concern that using an overall abundance goal as a primary objective could mask serious declines of individual, at-risk natural populations while overall abundance reflected increases in large hatchery programs. As a result, in the 2003 Mainstem Amendments to the Fish and Wildlife Program the Council established an interim objective of achieving smolt-to-adult survival rates (SARs) in the 2-6 percent range (minimum 2 percent; average 4 percent) for listed Snake River and upper Columbia salmon and steelhead.

Snake River spring/summer Chinook and steelhead wild populations are not consistently meeting the NPCC 2-6% interim SAR objective (Comparative Survival Study 10 Year Report.) The SARs of Snake River wild spring/summer Chinook were less than NPCC interim objectives (2% minimum, 4% average) in most years, achieving the minimum in only 1 of 11 years during 1994-2004. SARs for Snake River wild steelhead were closer to the NPCC minimum 2% SAR objective than were those of wild spring summer Chinook, but the geometric mean was only 1.56%. Annual estimated SARs ranged from 0.31% to 2.91%. The estimated SARs for Snake River wild steelhead exceeded the NPCC minimum 2% SAR objective in four of seven years, but were consistently less than the NPCC 4% recommended average.

For Upper Columbia River stocks, the NPCC's current 2-6% goal is not being met and based on the Interior Columbia River Technical Recovery Team's analysis, the NPCC goal appears to be the minimum necessary to achieve the 5% risk of extinction curve.

Analyses indicate that the most important factors contributing to the increased return of sockeye salmon adults to the Snake River are the Court ordered spill for fish passage program and the significant decrease in proportion of juvenile sockeye smolts collected and transported at Snake River dams.

Specifically, 2008 was a record return year for both mid-Columbia sockeye at Priest Rapids Dam and Snake River sockeye at Lower Granite Dam. Returns for Snake River sockeye at Lower Granite Dam in 2009 have already surpassed those in 2008. Extensive analyses by the Fish Passage Center (FPC 7/14/08; 7/21/08; 8/06/08; 8/18/08; Fish Passage Center Draft Annual Report 2008) indicate that flow, spill and the reduction of the proportion of fish transported during the juvenile life stage are primary factors contributing to the increase of adult returns of sockeye.

- In order to determine how the Court Ordered spill program may have influenced the 2008 and 2009 adult sockeye returns, FPC staff analyzed in-river environmental conditions in 2006, 2007, and 2008 compared to past years (1998-2005) for both Mid-Columbia and Snake River sockeye.
 - Of these years, migration years 2006, 2007, and 2008 had among the highest estimates of juvenile reach survival for both mid-Columbia and Snake River sockeye.
 - For both Mid-Columbia and Snake River sockeye, weighted regression analyses revealed a significant relation between water transit time and juvenile reach survival; such that, as water transit time decreases (i.e., flows increase), reach survival increases

- For Snake River sockeye, fish travel time and average percent spill were also found to significantly effect juvenile reach survival. As fish travel time decreases, juvenile reach survival increases. As average percent spill increases, juvenile reach survival also increases.
- Compared to the other years, the estimated proportion of juvenile fish transported in migration years 2006, 2007, and 2008 were among the lowest.
- Hatchery production in the Mid-Columbia significantly increased in recent years due to increased releases of sockeye fry into Lake Skaha by Fisheries and Oceans Canada. Hatchery production in the Snake River has been more consistent in recent years with more predominant smolt releases.

Although the sockeye hatchery program in the Snake River has contributed to the increase in sockeye smolt production, other hatchery programs that have been in place for decades for both sockeye and other salmonids, indicate that it is unlikely that the hatchery program alone is the primary factor in the recent sockeye adult return

Hatchery programs have been in place and increasing for years for other species of salmonids in the Columbia basin. Annually, millions of juvenile salmonids are released from hatcheries above Bonneville Dam (Figure 2). However, even with these hatchery augmentation programs in place goals for returning adult salmonids have not been met.

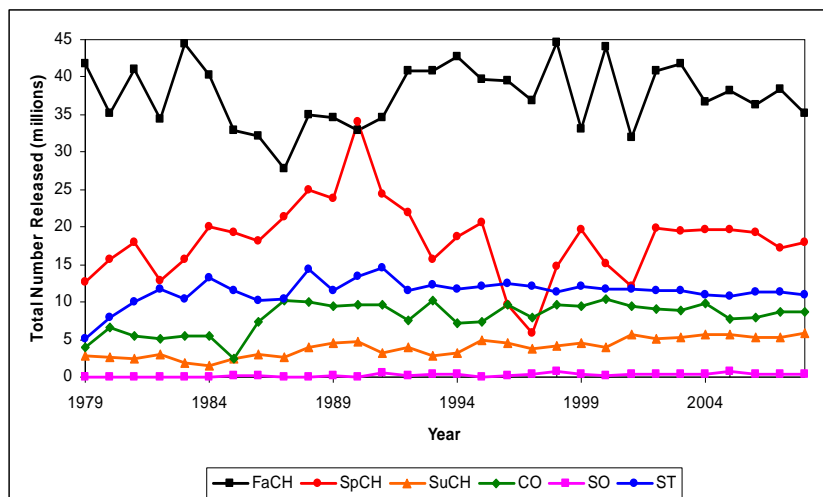


Figure 2. Total production releases in Columbia River Basin (above Bonneville Dam) for migration years 1979 to 2008.

Other hatchery programs established for sockeye have been in place such as the hatchery facility on the Cedar River that provides sockeye fry into Lake Washington. This program has been in place since the mid 1990's. The hatchery was credited with playing a major role in the strong sockeye return to Lake Washington in 2006, along with good ocean conditions. However, the hatchery production was not able to preclude the significant population decline that occurred in the Lake Washington population over the past three years, illustrating that hatchery production alone is unlikely to recover stocks.

References:

Fish Passage Center, Memo to Liz Hamilton, Northwest Sportfishing Industry Association (7/14/08). <http://www.fpc.org/documents/memos/109-08.pdf>

Fish Passage Center, Memo Scott Bettin, Bonneville Power Administration (7/21/08). <http://www.fpc.org/documents/memos/111-08.pdf>

Fish Passage Center, Memo Ritchie Graves, NOAA National Marine Fisheries and Doug Taki, Shoshone Bannock Tribe (8/06/08). <http://www.fpc.org/documents/memos/121-08.pdf>

Fish Passage Center, Memo to Scott Bettin , Bonneville Power Administration and Fish Passage Center Oversight Board (8/18/08) . <http://www.fpc.org/documents/memos/132-08.pdf>

Fish Passage Center, Draft Annual Report 2008.
http://www.fpc.org/documents/annual_FPC_report/FPC%202008%20Annual%20Report--DRAFT.pdf

Schaller, H. et al., 2007. Comparative Survival Study (CSS) of PIT-Tagged Spring/Summer Chinook and Steelhead In the Columbia River Basin Ten-year Retrospective Analyses Report. <http://www.fpc.org/documents/CSS/FINAL%20COMPLETE%2010%20YEAR%20CSS%20REPORT-8-31-07withfrontpage.pdf>



FISH PASSAGE CENTER
 1827 NE 44th Ave, Suite 240, Portland, OR 97213
 Phone: (503) 230-4099 Fax: (503) 230-7559
<http://www.fpc.org>
 e-mail us at fpcstaff@fpc.org

DATA REQUEST FORM

Request Taken By: Michele De Hart Date: 7/17/09

Data Requested By:

Name: Joan Dukes, NPCC Phone: _____
 Address: _____ Fax: _____
 _____ Email: _____

Data Requested:

Address the Question "Are we there yet? Are the
larger members of returning Adults, particularly
sockeye in the Snake basin, the basis for declaring
victory?"
Assess Adult returns over the past 20 years

Data Format: Hardcopy Text Excel
 Delivery: Mail Email Fax Phone

Comments:

Data Compiled By: mfilardo Date: 8/5/08

Request # 52