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: Ed Bowles, ODFW

FROM: FPC Staff

DATE: April 21, 2008

RE: Recent Attempts to Improve Mainstem Migration Conditions for In-river migrating salmonids

In response to your recent request to review the changes that have been implemented over the past several years to improve in-river migration conditions for juvenile salmonids, the FPC staff has prepared the following historical summary. The changes in the operation of the hydro system are a combination of structural changes, changes in the amounts and duration of spill that occurred at each project, and changes in the management application of transport criteria leading to differences in the proportion of juvenile migrants that remained in river and in the transport program.

Mainstem Passage Improvements

Structural Modifications:

Removable Spillway Weirs (RSW)

Lower Granite Dam: operational spring 2002 (tested Sept 2001)
Ice Harbor Dam: operational spring 2005
Lower Monumental Dam: operational spring 2008

Temporary Spillway Weirs (TSW)

McNary Dam: operational spring 2007
John Day Dam: operational spring 2008
Little Goose Dam: projected for spring 2010

Extended Spillway Wall

The Dalles Dam: operational spring 2004
The Dalles Dam: new larger wall projected for spring 2010

24 Hour Spring Spill (various volumes)

Lower Monumental, Ice Harbor, The Dalles, & Bonneville Dams: spring 2001 (2000 BiOp)
Lower Granite Dam: authorized for spring 2005, but first used spring 2006
Little Goose Dam: spring 2006
McNary Dam: tested against 0 day/12 hour nighttime spill spring 2005 and 2006, operational spring 2007
John Day Dam: spring 2008

Planned Spill Program:

The Planned Spill or Fish Spill Program has been modified several times over the past fifteen years. Beginning in 1989 the FCRPS planned spill followed the ten-year Fish Spill Memorandum of Agreement signed by the then established Mainstem Executive Committee. The MOA called for spill at projects that did not have bypass systems, or that had inadequate bypass systems. The spring goal was to achieve 70 % fish passage efficiency at these projects. The 1992 Biological Opinion (Opinion) modified the MOA by increasing the spill levels to meet a fish passage efficiency of 80% during the spring. Spill was managed this way until the NMFS Biological Opinion was issued in May 1993. The 1993 Opinion prohibited planned spill at the transport collection projects, limited spill at Ice Harbor Dam, and implemented MOA spill at John Day and The Dalles dams. The 1995 Opinion included planned spill at the transportation collection projects . The table below summarizes some of the major changes that have occurred beginning with the 1995 Opinion.

Table 1. Progression of FCRPS planned spill programs in place over the historic record

Project	1995 BIOP	1998 BIOP	2000 BIOP	2004 BIOP	Court Order 2005
	Kcfs				
LGR	0/80% (45Kcfs)	0/GC (45Kkcfs)	0/60Kcfs	0/GC (60cfsK)	20Kcfs/20Kcfs
LGO	0/80% (60Kcfs)	0/GC (60Kcfs)	0/45Kcfs	0/GC(42Kcfs)	30%/30%
LMN	0/81% (45Kcfs)	0/GC (40Kcfs)	40K/40Kcfs	GC/GC (27Kcfs)	GC/GC
IHR	27%/27% (25Kcfs)	45K/GC (75Kcfs)	45K/100Kcfs	45K/GC (105Kcfs)	45K/GC v 30%/30%
MCN	0/50% (120Kcfs)	0/GC (150Kcfs)	0/120-150Kcfs	0/GC (170Kcfs)	40%/40%
JDA	0/33% (60Kcfs)	0/60% to 180Kcfs	0/85-160Kcfs	0/60% (140Kcfs)	0/60%
TDA	64%/64%	64%/64%	40%/40%	40%/40%	40%/40%
BVL	75K/75K (120Kcfs)	75/GC (120Kcfs)	75K/90-150Kcfs	75/GC (105Kcfs)	100Kcfs/100Kcfs

1995 to present. Numbers in parentheses are the TDG spill cap estimates under each program.

Table 2. Summary of spring spill duration changes and maximum transport initiation flow triggers.

	1995 BIOP	2000 BIOP	2004 BIOP	Court Order
Snake Spill Dates	Apr 10 – June 20	April 3- June 20	April 3- June 20	April 3- June 20
Lower Columbia Spill Dates	Apr 20 – June 30	April 10 – June 30	April 10 – June 30	April 10 – June 30
Transport Trigger (Kcfs)	100 LGR, 85 LGO/LMN	85	70 Bypass Fish Until April 20, Max Transport/no spill Apr 20 – May 30.	70 Initiate transport between Apr 20 and May 1. Continue spill.

Proportion Transported:

As can be seen from Table 2 the seasonal flow levels that trigger maximum transport and eliminate spill have decreased from 100 Kcfs in 1995 to 70 Kcfs during the time period of interest. In addition, transport operations are delayed until April 20th at the earliest, to allow in-river migration of a portion of the annual run. These changes in strategy have significantly altered the proportion of migrants transported, when compare to past years (Table 3).

Table 3. Estimated proportion of yearling Chinook and steelhead arriving Lower Granite Dam "destined" to the transportation strategy.

Species-age group	Transport Proportion								
	2007	2006	2005	2004	2003	2002	2001	2000	1999
Yearling Chinook	0.26 (H) 0.29 (W)	0.611 (H) 0.579 (W)	0.92	0.870	0.629	0.683	0.980	0.71	0.777 (H) 0.862 (W)
Steelhead	0.47(H) 0.43(W)	0.76 (H) 0. 793(W)	0.94	0.964	0.670	0.677	0.986	0.81	0.825

In conclusion, fish have migrated through the hydrosystem since implementation of the recent Court's orders have experienced very different conditions than if they migrated a few years ago.