

## **SYSTEM OPERATIONAL REQUEST: #2009-03**

*The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR:, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, the Shoshone-Bannock Tribes, the Columbia River Inter-Tribal Fish Commission, and the Nez Perce Tribe.*

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**FROM:** Tom Lorz, Vice Chairperson, Salmon Managers

**DATE:** July 21, 2009

**SUBJECT:** McNary Dam Project Fish Emergency Operations

### **SPECIFICATIONS:**

Immediately reduce the McNary powerhouse flow to project minimum. Increase the McNary spill to twenty four hour spill to the gas cap. Immediately begin bypassing fish back to the river on non-transportation days to avoid holding fish in raceways for extended periods at elevated temperatures.

### **JUSTIFICATION:**

The objective of this operation is to immediately maximize the proportion of fish passing the project via the spillway and reducing the proportion of fish entering the McNary Juvenile Bypass facility to avoid being subjected to elevated temperatures in excess of water quality standards and that place fish at risk of mortality and injury.

On July 16, 2009, McNary Dam switched from every-other-day sampling to every day sampling for transportation. During this operation, fish are no longer bypassed to the river and are, instead, routed to the raceways for every-other-day transportation. Since this operation began,

increased levels of mortality (facility and sample) have occurred. According to personnel on site, these dead fish are coming into the raceways or sample trough already dead. Condition monitoring during this period does not indicate increased levels of disease or injury. From July 16<sup>th</sup> to present, daily average mortality (sample and facility mortality combined) for subyearling Chinook was 4,845, with a high of 11,153 on Saturday, July 18<sup>th</sup>. These daily mortalities equate to a daily average mortality rate of 9.3% for subyearling Chinook (percent of the collection total) (Table 1). The highest mortality rate seen to date was 17.1% on July 18<sup>th</sup>. Coincidentally, collection for transportation began at the same time the mortalities increased.

**Table 1.** Collection totals, sample mortalities, and facility mortalities of subyearling Chinook at MCN.

<b>Sample End Date</b>	<b>Total Collection</b>	<b>Sample Mortalities</b>	<b>Facility Mortalities</b>	<b>Percent Mortality</b>	<b>Daily Average Mortality Rate</b>
7/4/2009	56,951	6	1	0.0	
7/6/2009	57,226	25	228	0.4	
7/8/2009	109,750	50	503	0.5	
7/10/2009	86,563	30	467	0.6	
7/12/2009	105,453	34	311	0.3	
7/14/2009	56,132	37	135	0.3	0.36
7/16/2009	68,195	66	5,160	7.7	
7/17/2009	81,000	127	7,046	8.9	
7/18/2009	65,100	52	11,101	17.1	
7/19/2009	30,900	29	978	3.3	
7/20/2009	22,150	39	3,546	16.2	
7/21/2009	34,625	25	906	2.7	9.30

Historically, higher mortality tends to occur at McNary during periods of high temperature. In the past, it has been hypothesized that fish passing through the juvenile collection channel are encountering areas of cool water followed by areas of warm water depending on which turbine units are in operation. The abrupt temperature change in the collection channel increases juvenile fish stress and proclivity to disease and other impacts. Juvenile collection channel and gatewell temperatures are now predominately affected by turbine operations.

Spill has been shown to be highly effective at McNary Dam with survival of nearly 100% at spill levels of 60%. Spill is the only passage option available when conditions in the Juvenile Bypass System create a high mortality rate. Spill is an important tool to implement as an emergency adaptive management action when powerhouse conditions create temporarily unsafe fish passage conditions.

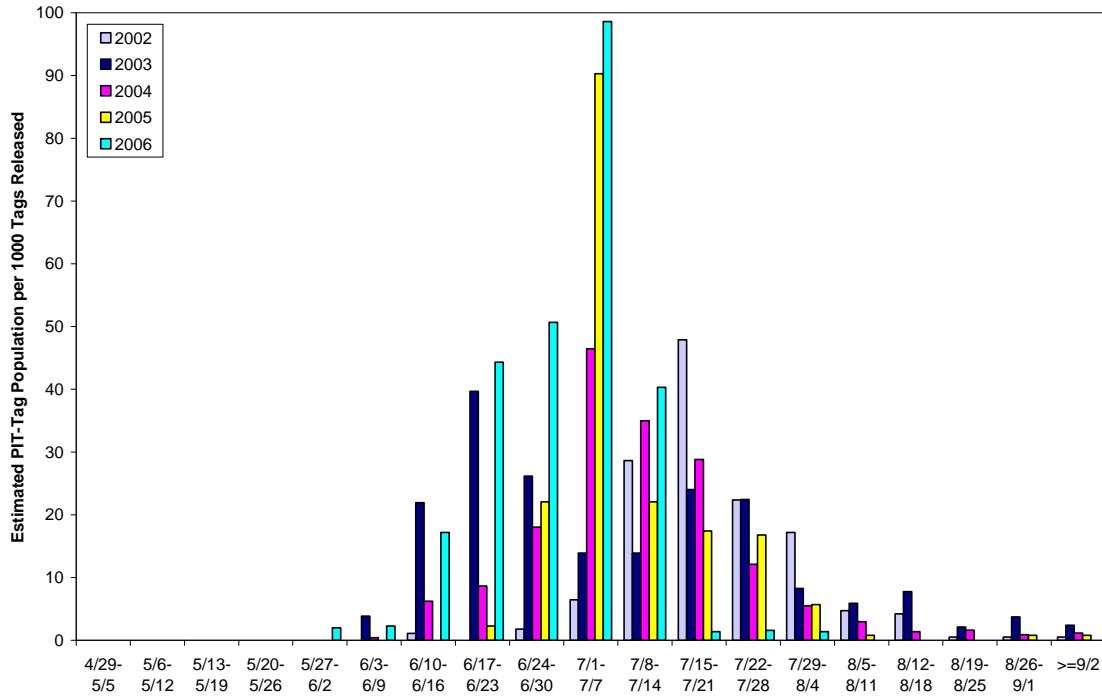
Historical passage timing data indicate that Snake River wild Chinook, Clearwater Hatchery fall Chinook, wild Hanford Reach fall Chinook, and Mid Columbia River Hatchery fall Chinook are all present at McNary dam during the last two weeks of July (attached plots). The passage indices at McNary Dam have averaged over 100,000 sub-yearling chinook per day over the past week. Although PIT tag detections at McNary or other projects are not indicators of populations because PIT tags are not applied proportionally to the populations and are not applied across the entire population distribution, the PIT-Tag detection data at McNary Dam indicate that a large proportion of PIT-tagged fall Chinook release groups that have been detected this year have been detected over the past week (7/15-7/20). This is particularly true of the Snake River wild fall

Chinook ESU, as 13.6-28.8% of the PIT-tag detections for this group at MCN have been detected since July 15<sup>th</sup> (Table 2). Those PIT-tagged groups that have had high detection rates over the past week are likely large contributors to the fall Chinook run passing McNary Dam at this time and into the near future.

**Table 2.** PIT-tag detections at McNary Dam from June 1 to July 20, 2009 and the proportion of these detections that occurred since July 15, 2009.

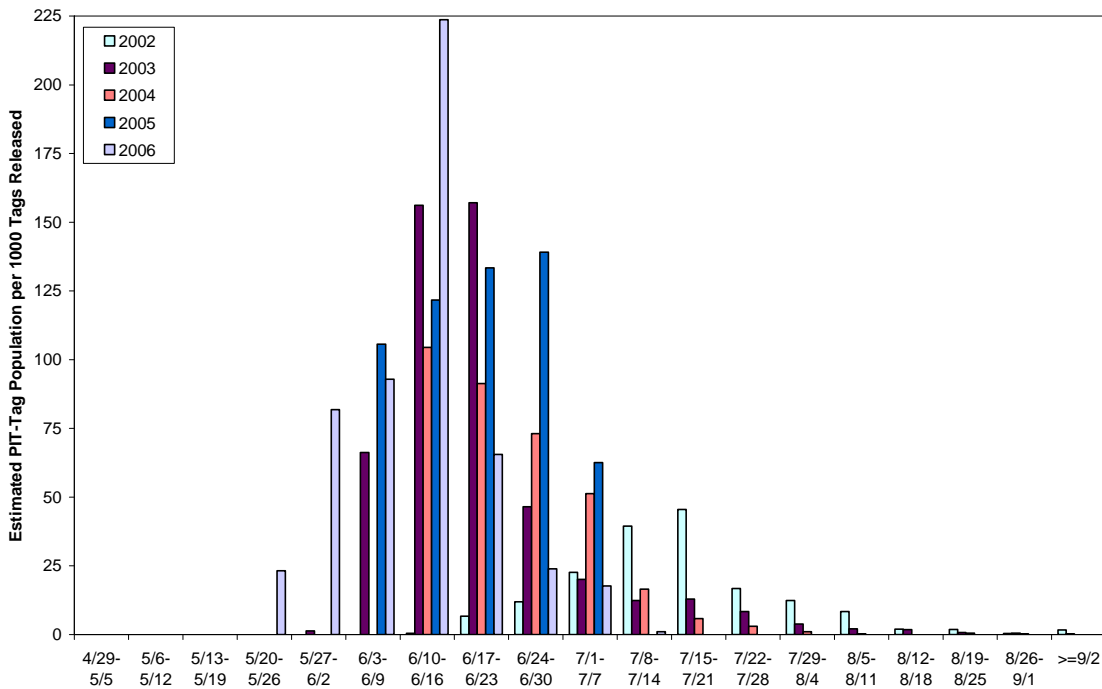
Release Group	Tag or Rel_site	Number Released	Release Dates	Number of Detections (6/01-7/20)	Percent of Release Detected Thus Far	Number of Detections Since 7/15	Percent of Detections Occurring Since 7/15
Mid-Columbia Wild	Hanford Reach	13,728	6/02-6/08	904	6.6%	118	13.1%
Mid-Columbia Hatchery	Priest Rapids Hatchery	2,994	6/11-6/19	446	14.9%	9	2.0%
Snake River Wild	LGR to Clearwater	2,991	4/29-7/03	146	4.9%	42	28.8%
	Clearwater to Salmon	3,699	4/08-7/07	220	8.2%	51	23.2%
	Salmon to HCD	3,168	4/09-6/18	110	3.5%	15	13.6%
Snake River Surrogates	Clearwater to Salmon	237,741	5/18-6/05	7,156	3.0%	1,575	22.0%
Snake River Hatchery	Hells Canyon Dam	27,764	?	2,582	9.3%	58	2.2%
Clearwater River Hatchery	Nez Perce Tribal Hatchery	2,963	?	2,963	9.1%	25	9.3%
	Lukes Gulch Acc. Pond	14,006	?	1,494	10.7%	36	2.4%
	Cedar Flats Acc. Pond	13,497	?	1,154	8.6%	110	9.5%

Snake River Wild Fall Chinook Passage Timing at McNary Dam



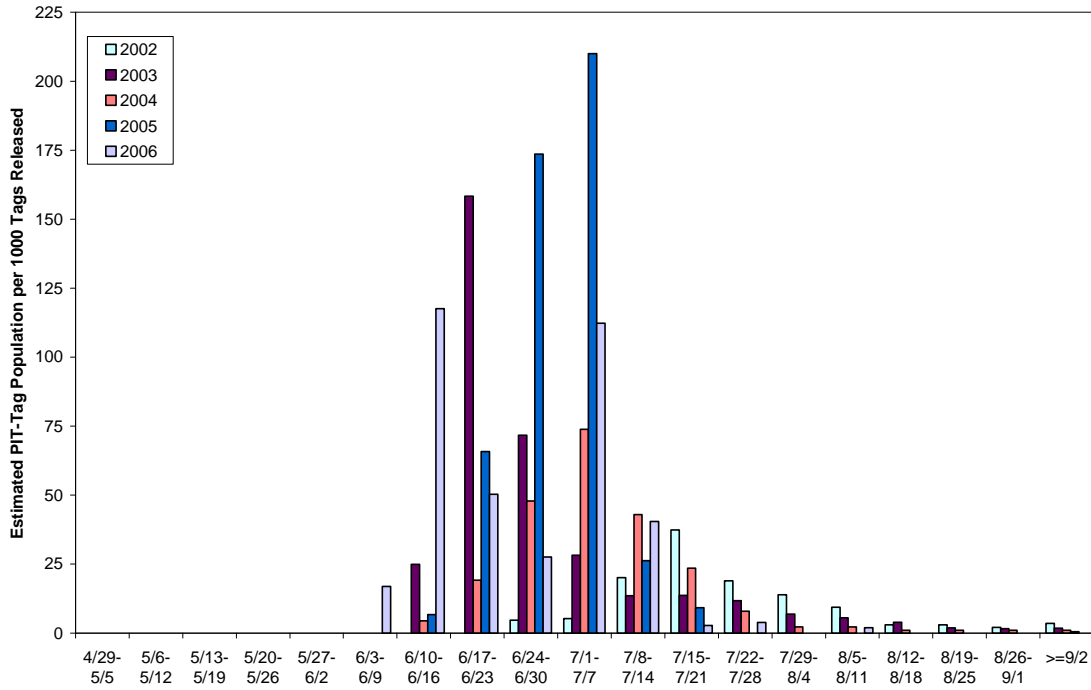
Passage timing of Snake River wild fall Chinook passing MCN (MY 2002-2006).

Snake River Hatchery Fall Chinook Passage Timing at McNary Dam (Acclimation Ponds)



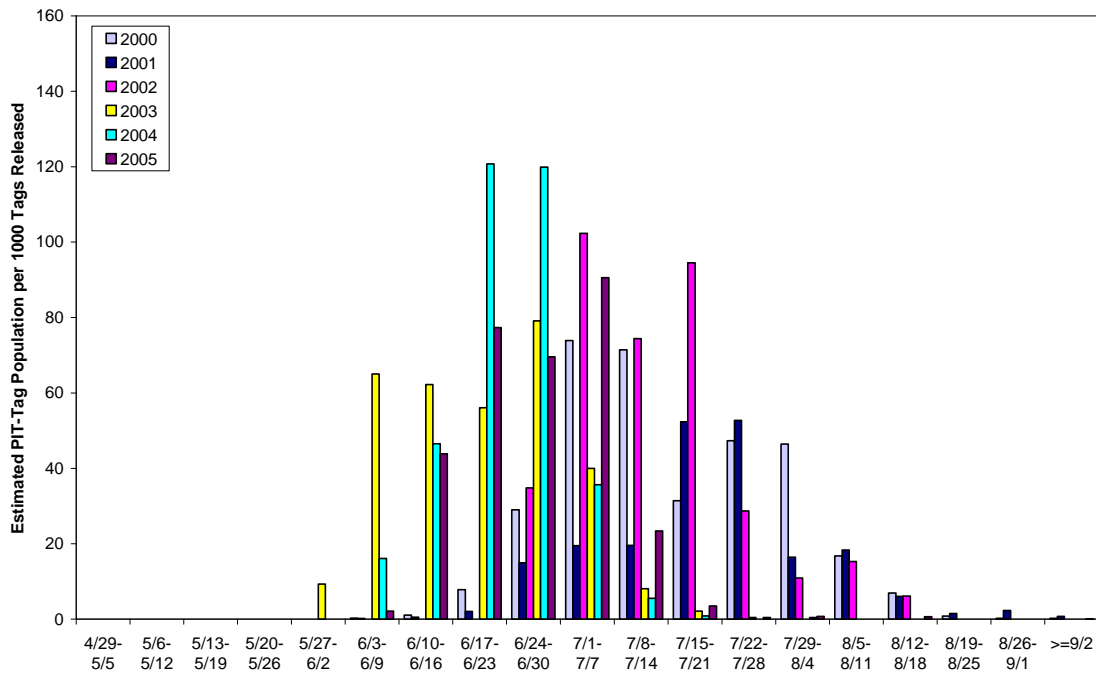
Passage timing of Clearwater River wild fall Chinook passing MCN (MY 2003-2006).

**Clearwater River Hatchery Fall Chinook Passage Timing at McNary Dam (Acclimation Ponds)**



Passage timing of Clearwater River hatchery fall Chinook passing MCN (MY 2002-2006).

**Wild Hanford Reach Fall Chinook Passage Timing to McNary**



Passage timing of wild Hanford Reach fall Chinook passing MCN (MY 2000-2005).