FISH PASSAGE CENTER

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MEMORANDUM

TO: Fish Passage Advisory Committee

FROM: Michele DeHart

DATE: June 4, 2001

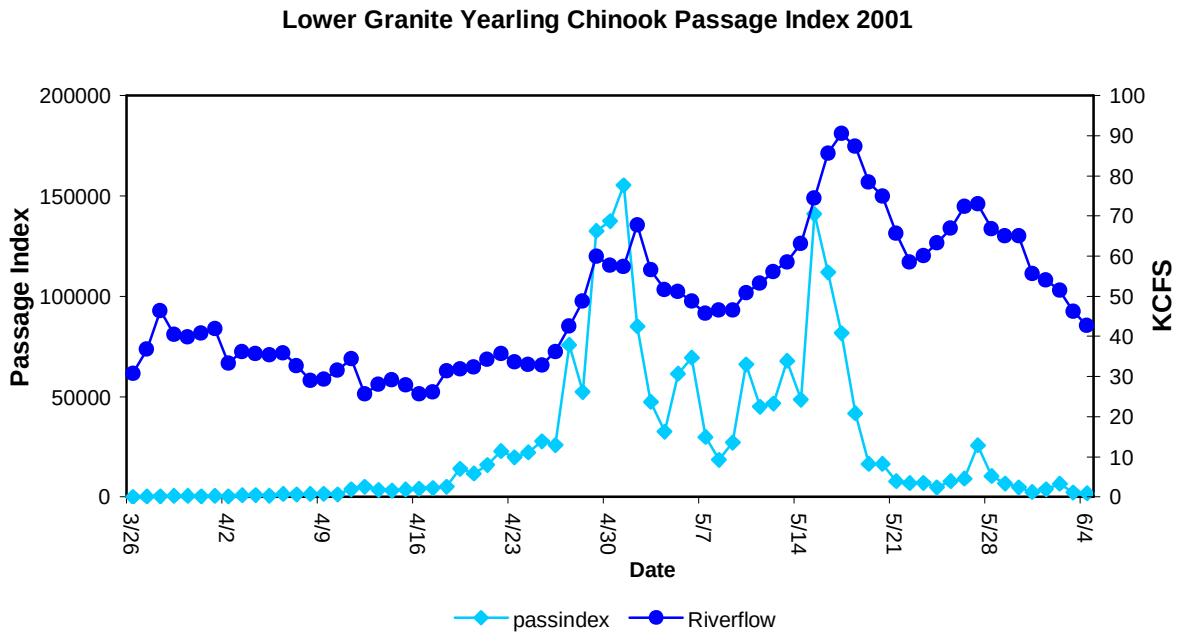
RE: UPDATE: Status of the 2001 Migration

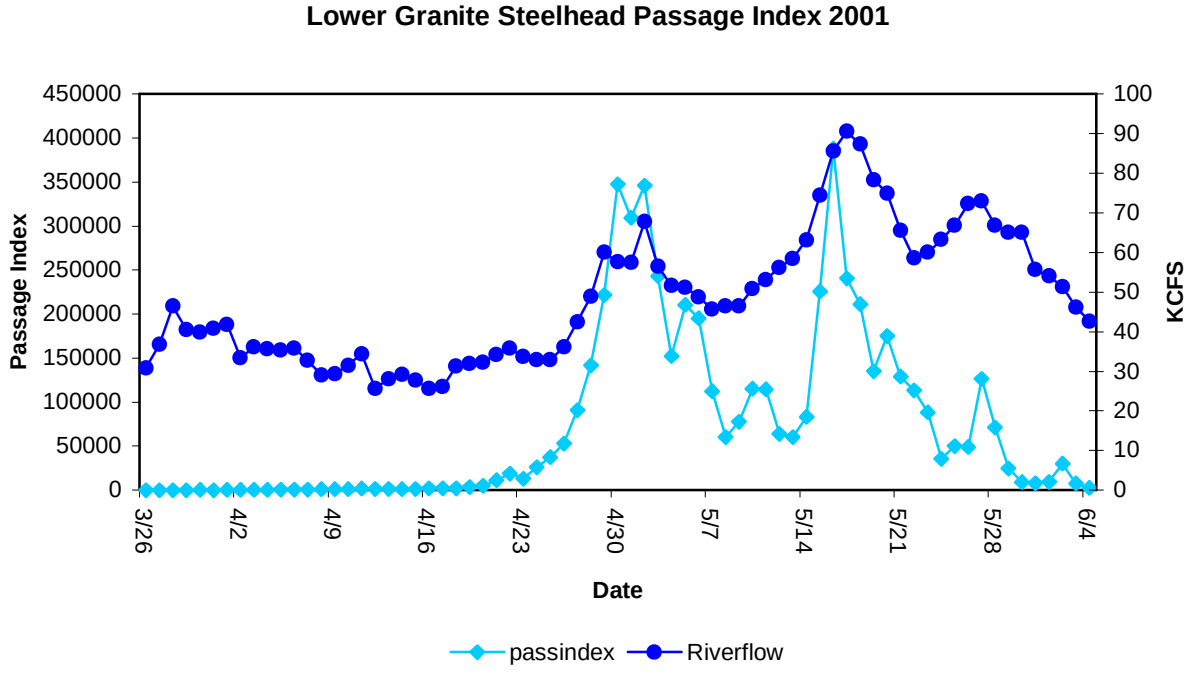
To-date:

- Yearling chinook and steelhead cumulative totals at Lower Granite Dam are more or less within the range of pre-season expectation dependent on assumptions made regarding fish guidance efficiency estimates.
- Passage indices of yearling chinook and steelhead at Rock Island responded to increases in Mid Columbia flows, but overall numbers remain less than expected.
- Comparable Mid Columbia hatchery releases from Winthrop and Leavenworth hatcheries have increased in their collection at McNary Dam in response to the increased flows in the Mid Columbia.
- Wild and hatchery fish from the Snake, Mid Columbia and lower Columbia tributaries continue to pass Bonneville Dam.
- Mortality sustained by Hanford Reach fall chinook due to stranding from project operations and flow fluctuations will likely be in the range of 7-10% of the total population. This mortality level is significantly greater than estimated in past years' of the study.
- Based on the data collected and analyses conducted to-date, the provision of flow in the Mid Columbia will provide protection to spring and summer Mid Columbia fish as well as any fish migrating through the lower Columbia.

Snake River Passage

Several factors were described in the last report on migration status that must be taken into consideration when assessing the migration status this year. Within the bounds of the assumptions used the magnitude of the fish collection at Lower Granite Dam is within the range of what was expected based on pre-season estimates. The migration primarily arrived in two bursts that coincided with increased flow from rain/snow melt events (see graphs below).





Mid Columbia Passage

Spring Chinook and Steelhead

Since the initial status report the passage index for yearling chinook at McNary Dam has improved. We looked at the passage indices at Rock Island Dam and compared them to the

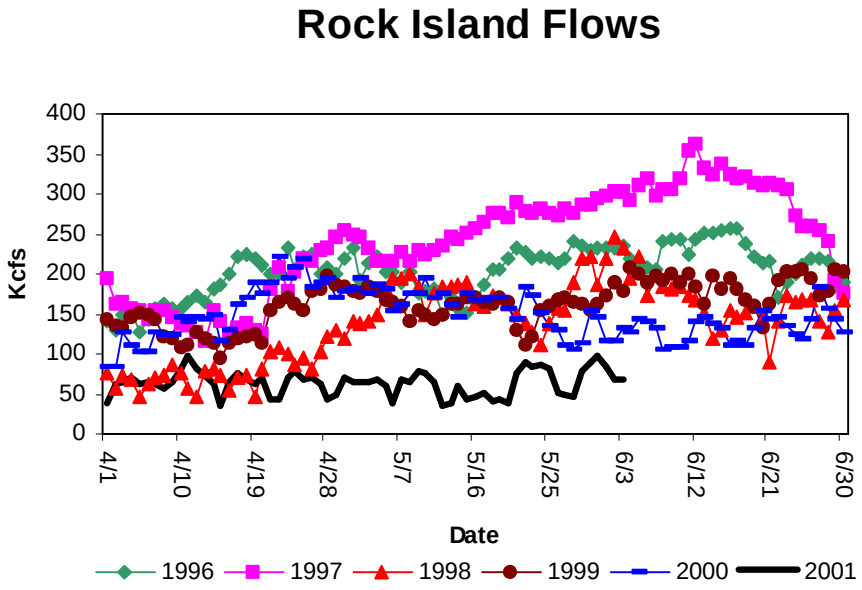
passage distribution for past years' as we did in the initial status memo. The results are presented in the following table:

Rock Island Passage Indices

	Yearling Chinook			Steelhead		
Year	Passage Index to 6/04	Hatchery release	Proportion PI/HR	Passage Index to 6/04	Hatchery release	Proportion PI/HR
1996	35404	3,243,054	0.011	24932	1,411,096	0.018
1997	48577	1,328,576	0.037	27289	1,420,394	0.019
1998	23802	3,328,869	0.007	20816	1,472,296	0.014
1999	38509	4,956,745	0.008	33130	1,726,741	0.019
2000	23661	3,939,920	0.006	22957	1,396,898	0.016
2001	7057	3,249,761	0.002	13601	1,338,847	0.010

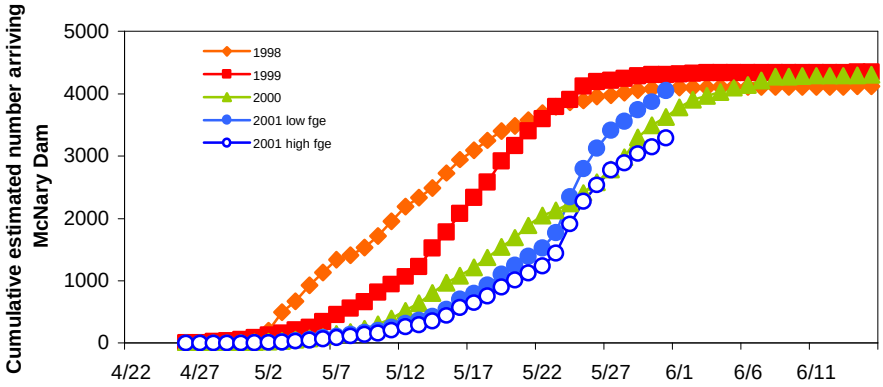
As can be seen from the table, the passage indices continue to be less than what would be expected to be collected at Rock Island Dam by this date in the data observed since 1996. However, the differences between the observed in 2001 and the expected are not as pronounced as reported in the previous status report. The increase in passage numbers can be directly associated with the increase of Mid Columbia flows. The flows in the Mid Columbia were increased due to a power exchange with California. This was the first substantial increase in flow and a response was observed in fish passage indices.

The Mid Columbia flows for 2001 are compared to the flows at Rock Island for the five previous years (see below). While there has been some improvement in flows over the past few weeks, they remain far below target flows. In addition, daily and weekly fluctuations are impacting migrating fish.

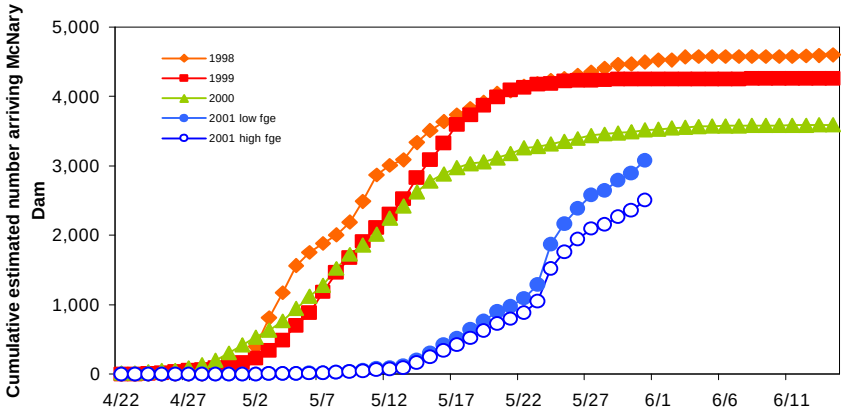


To address possible anomalies at Rock Island Dam due to sampling efficiency we investigated the passage timing and recapture rates of both the Winthrop Hatchery spring chinook and Leavenworth Hatchery spring chinook at McNary Dam. These PIT tagged fish have been released with a sample size of approximately 7500 fish per hatchery since 1998. The numbers of tags recaptured annually (1998 – 2000) at McNary was adjusted for spill and FGE using the collection efficiency generated using the Seber-Jolly Model. In 2001 and the PIT tag recaptures were expanded using the estimate of FGE adopted by NMFS for ESA estimation. The use of the FGE estimate employed by NMFS at McNary Dam (0.65)(low FGE) produces a very optimistic recovery of those tags to-date. Given the minimal spill at McNary on an alternate day basis and the extended length fish collection screens, we plotted the data with a higher estimate of FGE (0.8). The recovery of both hatchery groups is below what was recovered in past years. The two different FGE's used demonstrates the impact of the assumptions on the recovery prediction. As stated in the last status report, the data continues to suggest that flow conditions in the Mid Columbia have seriously affecting the migration of both listed and non-listed species.

PIT tagged Leavenworth H spring chinook (7,500 released): passage timing and estimated magnitude at McNary Dam in 2001 compared to past 3 years



PIT tagged Winthrop H spring chinook (7,500 released): passage timing and estimated magnitude at McNary Dam in 2001 compared to past 3 years



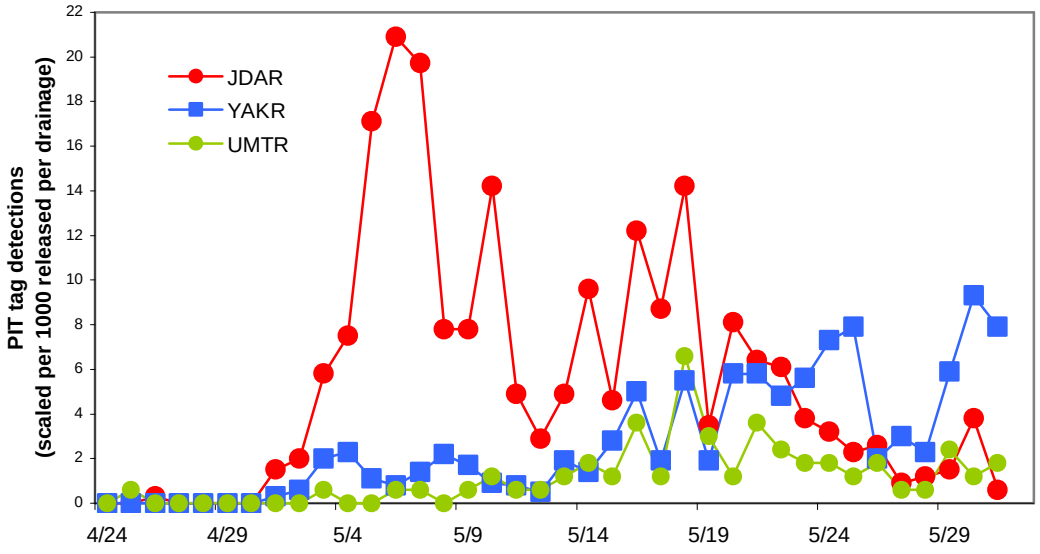
Fall Chinook

The present flow conditions and flow fluctuations in the Mid Columbia River have taken a toll on the Hanford Reach fall chinook as well as on spring chinook and steelhead. As time passes the size of the juvenile fall chinook has increased and their vulnerability to stranding has decreased. However, based on estimated mortality and population size it is predicted that the hydrosystem operations this year have resulted in the mortality of 7-10 % of the juvenile Hanford Reach subyearling fall chinook (Paul Hoffarth, WDFW personal communication).

Lower Columbia River

It important to recognize that fish released from Bonneville Pool hatcheries always dominates the passage indices and timing at Bonneville Dam. However, PIT tagged Snake River and Mid Columbia River fish have been detected at McNary Dam beginning in mid April. In addition, PIT tag recaptures at Bonneville Dam also show that wild fish from the Yakama, John Day, Deschutes, and Umatilla rivers are all passing through the lower River at this time. The following graph shows the timing of some PIT tagged groups at Bonneville Dam.

Timing distribution of wild chinook from John Day, Umatilla, and Yakima rivers at Bonneville Dam through May 31, 2001



Travel Time

Trap Sites to Lower Granite Dam

In-season travel time estimates were updated from the three tributary traps to Lower Granite Dam to include detections through midnight May 31.

Table 1 shows longer average travel times for most weekly releases from the traps in 2001 compared to 2000 for both yearling chinook and steelhead. Table 2 shows longer minimum travel times for most weekly releases from the traps in 2001 compared to 2000 for both yearling chinook and steelhead.

In general, the conclusions reached in the May 23 status memo remain the same. The travel times in 2001 are longer than in 2000, reflecting lower flows in 2001.

Table 1. Weekly average travel time for PIT tagged chinook and steelhead from Snake River basin traps to Lower Granite Dam in years 2000 and 2001, with percent increase in travel time in year 2001 (detections through May 31).

Salmon River trap average travel time to Lower Granite Dam

	Yearling Chinook				Steelhead		
week	**2000**	**2001**	**%increase**	**week**	**2000**	**2001**	**%increase**
2	29.7	32.4	9.1%	**2**			
3	20.0	27.6	38.0%	**3**			
4	18.7	20.7	10.7%	**4**	12.0	17.1	42.5%
5	13.6	15.6	14.7%	**5**	5.9	11.6	96.6%
6	14.5	13.4	-7.6%	**6**	7.0	7.8	11.4%
7	12.0	13.3	10.8%	**7**	5.7	10.7	87.7%
8	13.9	8.0	-42.4%	**8**	8.1	7.8	-3.7%

Imnaha River trap average travel time to Lower Granite Dam

	Yearling Chinook				Steelhead		
week	**2000**	**2001**	**%increase**	**week**	**2000**	**2001**	**%increase**
2	22.0	28.2	28.2%	**2**		35.6	
3	21.2	24.7	16.5%	**3**	9.7		
4	18.7	17.5	-6.4%	**4**	13.9	21.0	51.1%
5	17.2	13.0	-24.4%	**5**	12.5	11.1	-11.2%
6	9.9	11.5	16.2%	**6**	12.2	8.3	-32.0%
7	8.9	11.8	32.6%	**7**	5.8	11.6	100.0%
8		7.5		**8**	7.2	6.8	-5.6%

Grande Ronde River trap average travel time to Lower Granite Dam

	Yearling Chinook				Steelhead		
week	**2000**	**2001**	**%increase**	**week**	**2000**	**2001**	**%increase**
2	17.7	23.5	32.8%	**2**			
3	16.7	27.9	67.1%	**3**	6.5		
4	15.3	22.8	49.0%	**4**	6.1	14.5	137.7%
5	11.8	12.5	5.9%	**5**	7.4		
6	10.7	11.3	5.6%	**6**	4.5	7.2	60.0%
7	7.8	11.5	47.4%	**7**	2.9	8.3	186.2%
8	7.4			**8**	4.4	6.1	38.6%

Week legend : dates of release

2	March 26 - April 1
3	April 2 - April 8
4	April 9 - April 15
5	April 16 - April 22
6	April 23 - April 29
7	April 30 - May 5
8	May 5 - May 12

Table 2. Weekly minimum travel time for PIT tagged chinook and steelhead from Snake River basin traps to Lower Granite Dam in years 2000 and 2001, with percent increase in travel time in year 2001 (detections through May 31).

Salmon River trap minimum travel time to Lower Granite Dam

	Yearling Chinook				Steelhead		
week	**2000**	**2001**	**%increase**	**week**	**2000**	**2001**	**%increase**
2	8.6	10.4	20.4%	**2**			
3	6.9	14.6	113.0%	**3**			
4	4.6	12.3	168.5%	**4**	2.6	7.0	167.7%
5	4.3	8.0	86.6%	**5**	2.4	4.6	88.9%
6	4.9	5.5	12.5%	**6**	2.8	3.5	24.9%
7	3.5	5.4	54.3%	**7**	2.4	3.8	58.3%
8	5.5	4.0	-27.3%	**8**	2.6	3.8	46.2%

Imnaha River trap minimum travel time to Lower Granite Dam

	Yearling Chinook				Steelhead		
week	**2000**	**2001**	**%increase**	**week**	**2000**	**2001**	**%increase**
2	5.7	9.0	58.6%	**2**		6.4	
3	5.9	10.7	80.7%	**3**	3.0		
4	2.9	8.3	183.8%	**4**	2.2	5.5	147.3%
5	4.0	5.1	26.5%	**5**	1.8	4.4	143.3%
6	4.4	3.5	-21.5%	**6**	2.6	2.9	10.3%
7	4.0	5.0	25.0%	**7**	2.0	3.8	90.0%
8		3.9		**8**	2.6	2.8	7.7%

Grande Ronde River trap minimum travel time to Lower Granite Dam

	Yearling Chinook				Steelhead		
week	**2000**	**2001**	**%increase**	**week**	**2000**	**2001**	**%increase**
2	7.5	12.4	64.8%	**2**			
3	5.6	10.7	92.4%	**3**	2.5		
4	2.6	8.5	231.4%	**4**	1.6	3.6	118.0%
5	3.4	5.5	64.4%	**5**	1.4		
6	3.4	3.7	10.0%	**6**	1.6	2.4	54.5%
7	2.4	6.1	154.2%	**7**	1.5	1.8	20.0%
8	3.4			**8**	1.6	2.4	50.0%

Week legend : dates of release

2	March 26 - April 1
3	April 2 - April 8
4	April 9 - April 15
5	April 16 - April 22
6	April 23 - April 29
7	April 30 - May 5
8	May 5 - May 12