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MEMORANDUM

TO: FPAC

Michele Sethart

FROM: FPC Staff

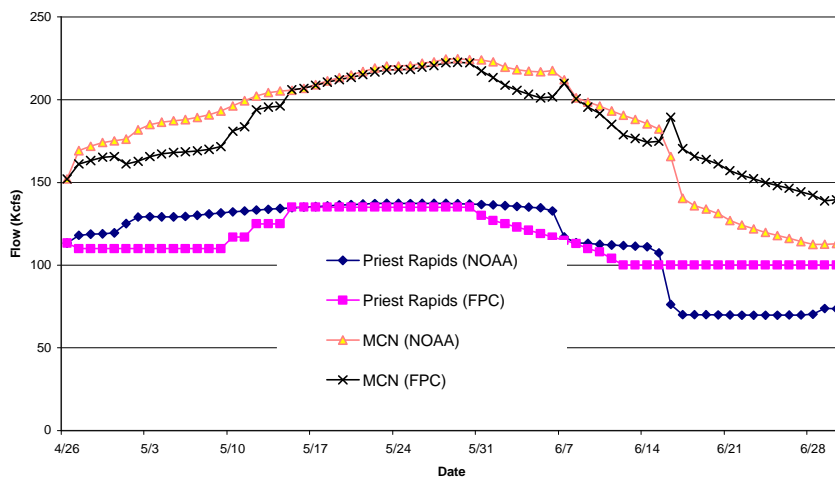
DATE: April 29, 2004

RE: Proposed Flow Shaping Recommendation based on Steelhead and Subyearling Chinook Timing at McNary Dam

Based on our review of the timing of steelhead at McNary and Rock Island dams the FPC has developed an alternative flow shaping for the Mid-Columbia in May and June, for consideration by the salmon managers. Our proposal takes into account what appears to be a late start to the steelhead migration from the Mid-Columbia at McNary Dam, to provide flows during the peak of the run and then ramps down gradually to June 30 to provide higher flows for Hanford subyearling chinook passage at McNary during June.

Our recommendation is as follows: Ramp up from 110 kcfs beginning May 10 to 135 kcfs on May 15. Maintain 135 kcfs through May 31 and then gradually reduce flows to 100 on June 12 and then maintain 100 kcfs through June 30. See Figure 1 for a comparison of this flow regime to the NOAA proposal.

Figure 1. Proposed flow shaping alternatives.



Our review of steelhead timing data at McNary Dam included comparison of passage timing for run-at-large wild steelhead as well as timing of wild steelhead PIT-tagged at Rock Island Dam (see figures 2 through 5 and tables 1 through 3). While the run-at-large wild fish timing shown in Table 2 had an average 50% passage date of May 10 based on the years 1995 to 1999, the average timing of PIT-tagged fish marked at Rock Island Dam had a 50% passage date of May 17 based on data from 1989 to 2002. Also, 2004 is shaping up to be a relatively low flow year, and comparing the wild steelhead timing during other low flow years suggests that the migration may well be delayed a week or more. For example in 1993, a relatively low flow year, the 10% passage date for PIT-tagged fish from Rock Island occurred on May 15, while in 2001 it occurred on May 12. It is likely that McNary timing of wild steelhead will be delayed in 2004 based on low flows to date and low passage indices to be consistent with the late migration pattern seen in other low flow years.

We also looked at hatchery release timing of steelhead in the Mid-Columbia River in 2004 compared to releases in the years 1999 to 2003. In general releases this year appear to be a few days ahead of other recent years. However, because releases are volitional it is hard to pinpoint when the bulk of fish leave the acclimation ponds or other facility. But using the middle of release as a guideline, releases in the Methow River appear a week to two weeks earlier than other recent years with the middle of the release date range between April 22 and 29. Similarly, releases in the Wenatchee River appear 4 to 7 days earlier than in other recent years with the mid-release date for two releases occurring on April 24, whereas other recent years the mid-point of releases occurred between April 28 and May 7. On the other hand releases from Ringold Hatchery are the latest in recent years with the middle date of release falling on April 16 in 2004, while releases in other years were a few days to 3 week earlier.

By delaying the start of increased flows at Priest Rapids until mid-May, and then ramping down flows after the end of May, we are able to provide higher flows to subyearling chinook in June. Under the present run-off volume forecast this approach adds additional volume in June it also provides some assurance of avoiding extremely low flows in June, in the event that flow forecasts were again adjusted downward. Subyearling chinook passage indices at McNary Dam show that nearly 50% of the passage occurs in June, with the average 50% date occurring on July 2 (based on the years 1995 to 2003) Table 4.

Figure 2. Combined Steelhead Timing at McNary Dam 2000 to 2003.

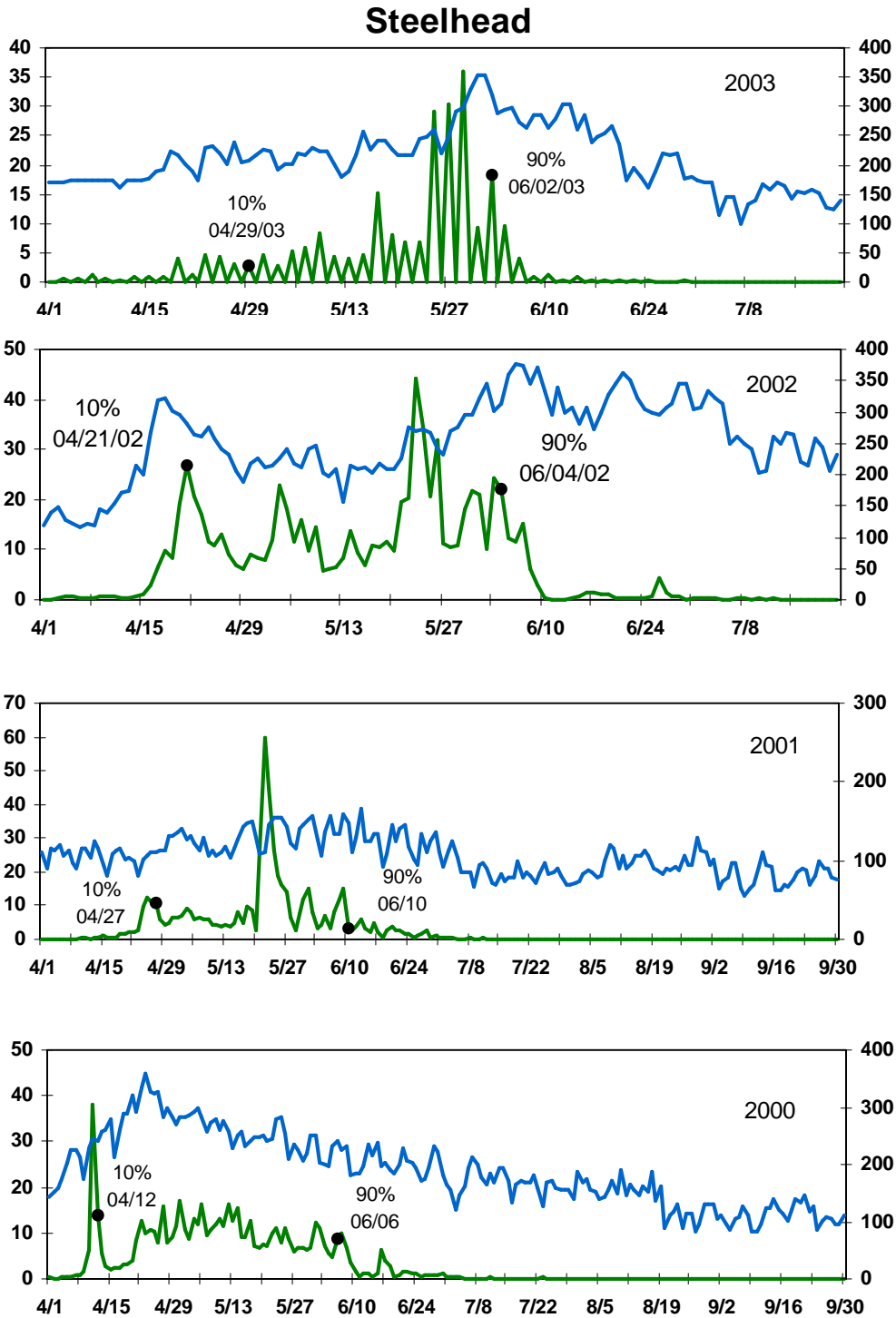


Figure 3. Wild Steelhead Timing at McNary Dam 1998 and 1999.

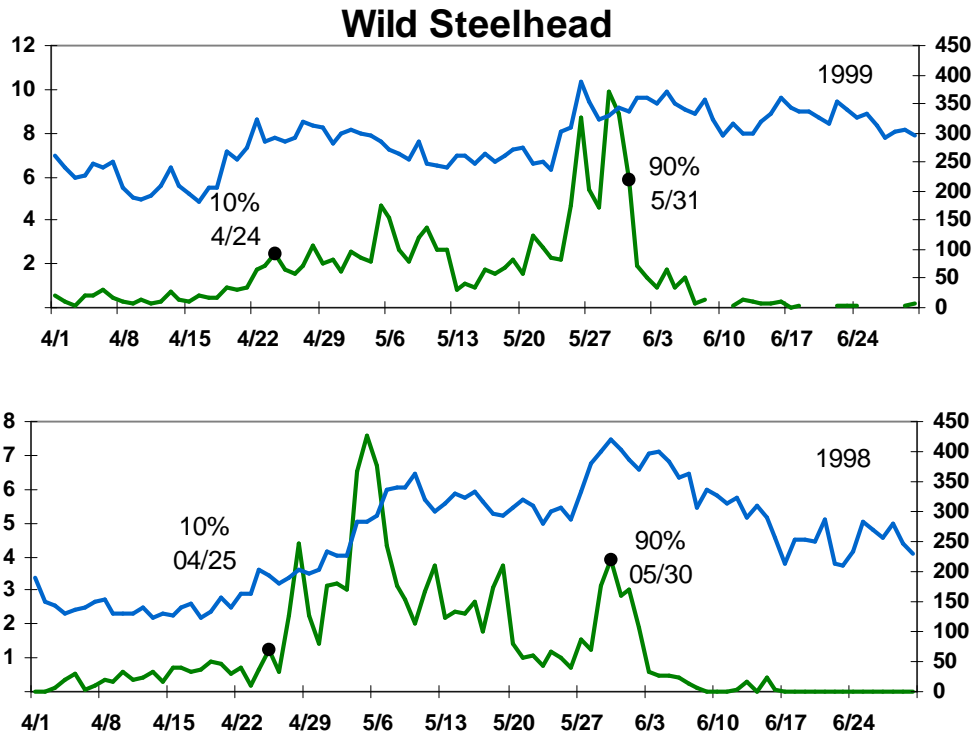


Figure 4. Subyearling Chinook Timing at McNary Dam 2000 to 2003.

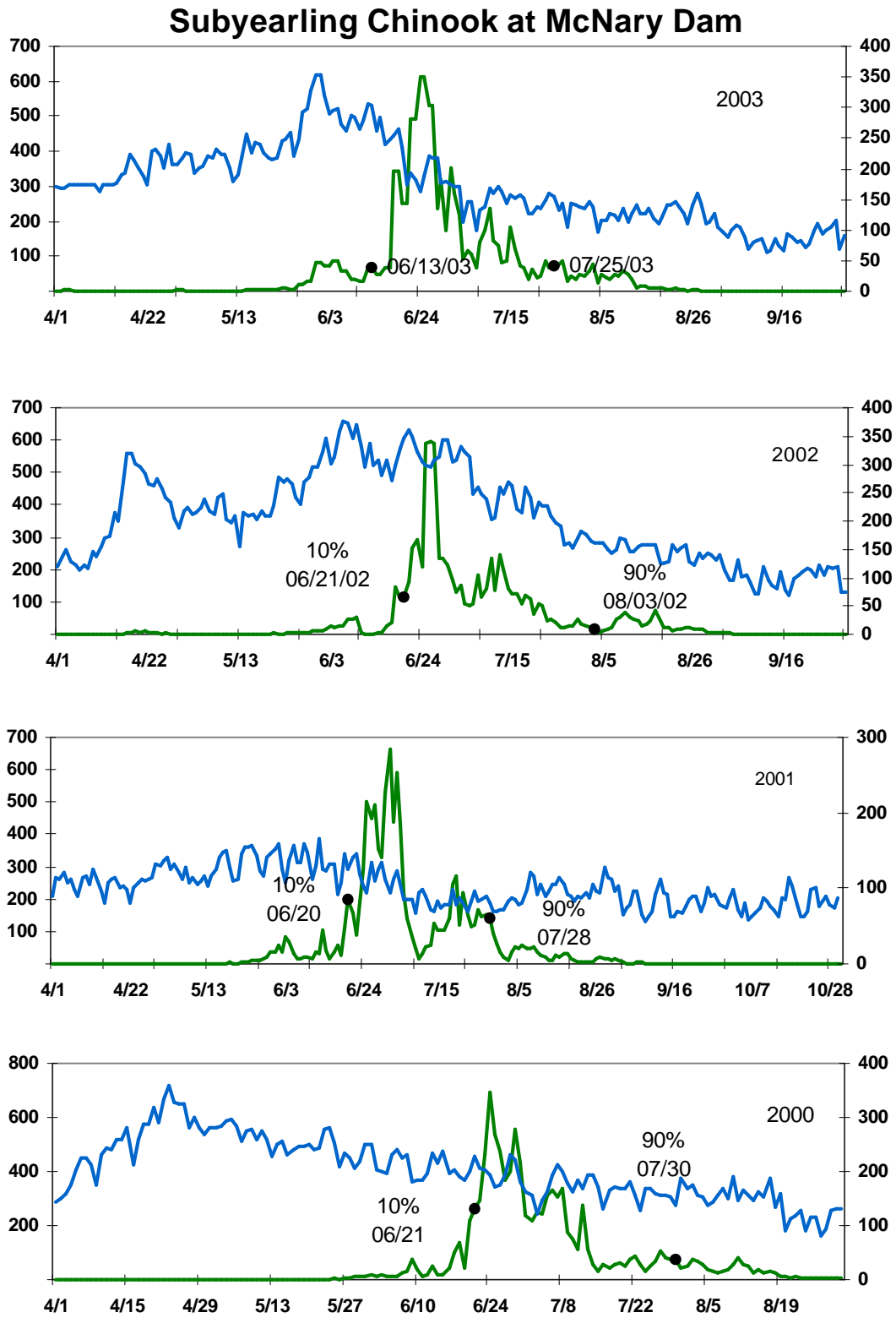


Figure 5. Subyearling Chinook Timing at McNary Dam 1998 and 1999.

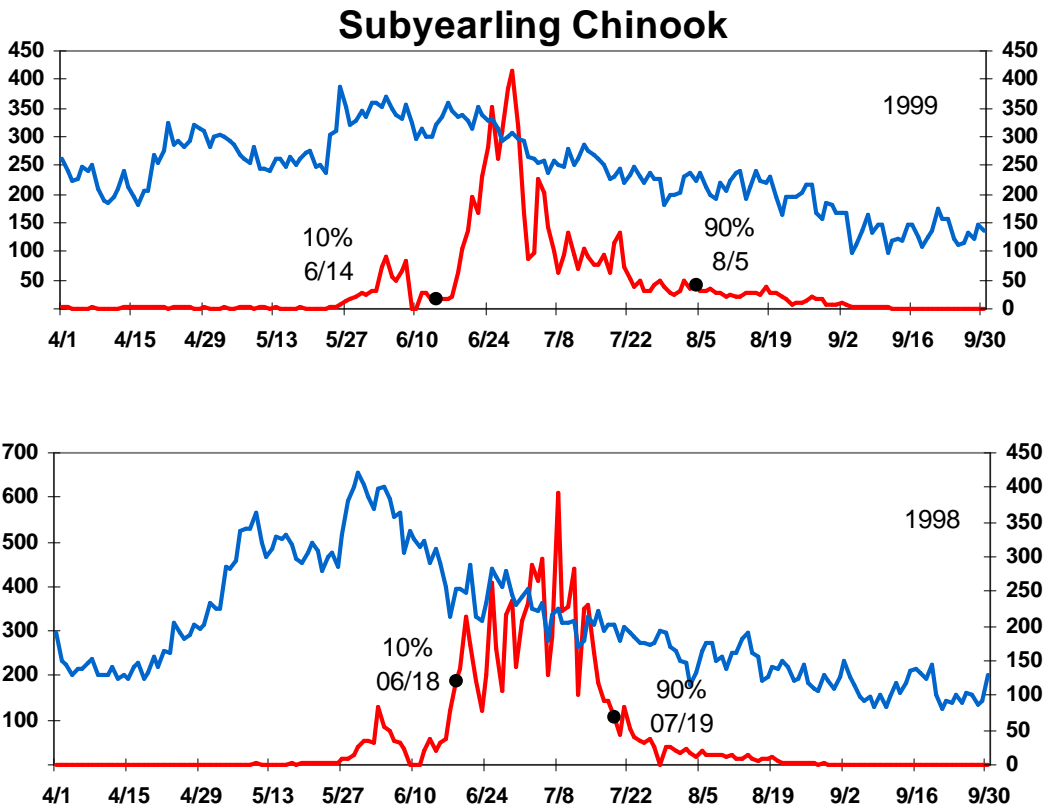


Figure 6. Combined Steelhead Timing at Rock Island Dam 2000 to 2003.

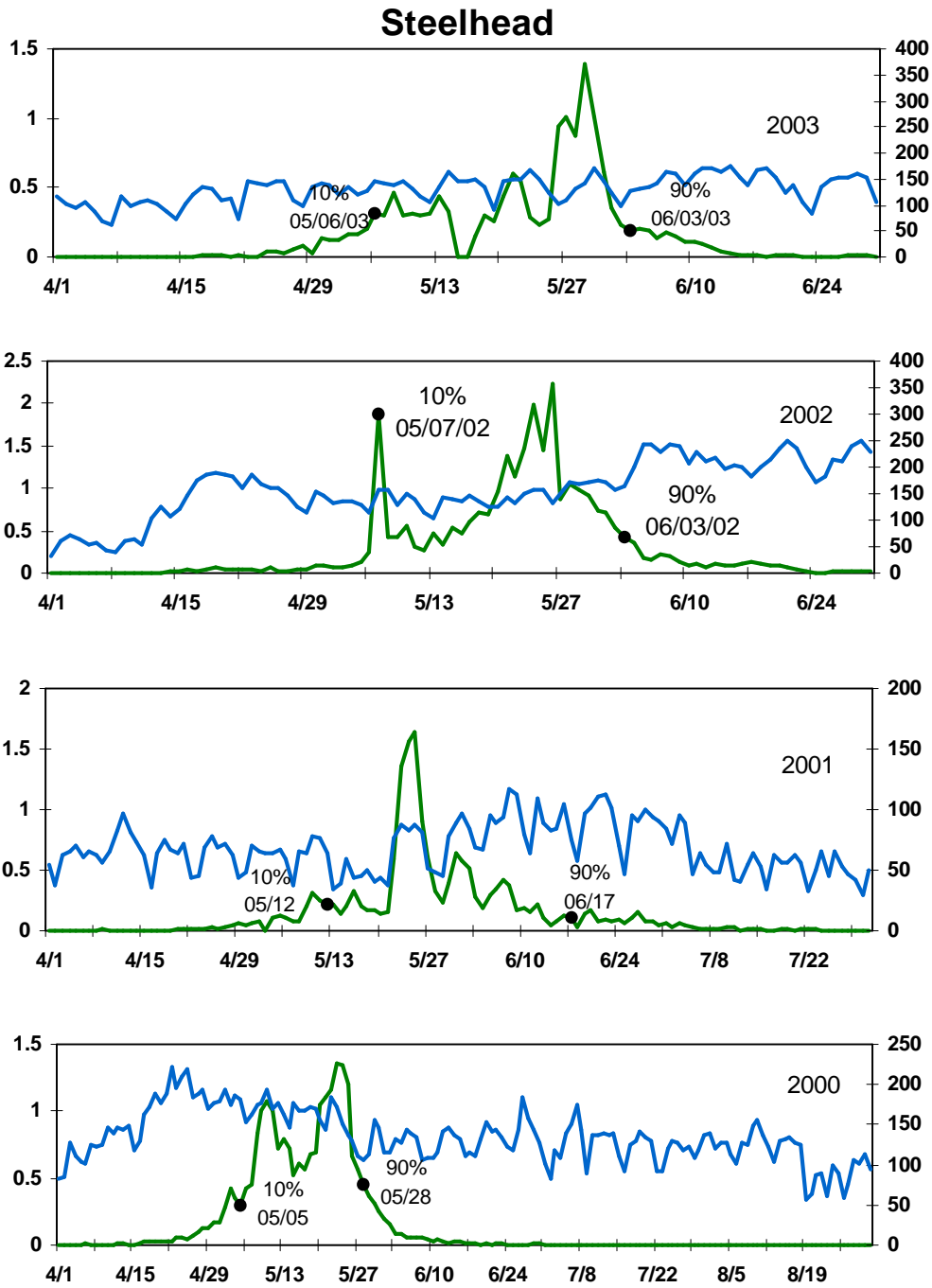


Figure 7. Wild Steelhead Timing at Rock Island Dam 1998 to 1999.

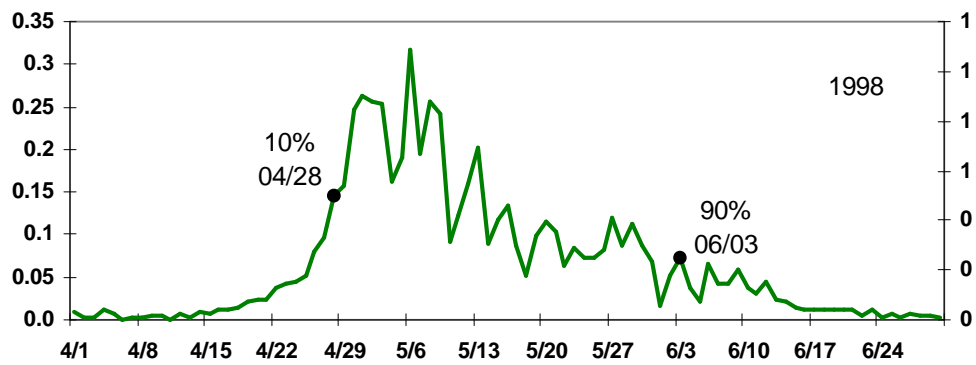
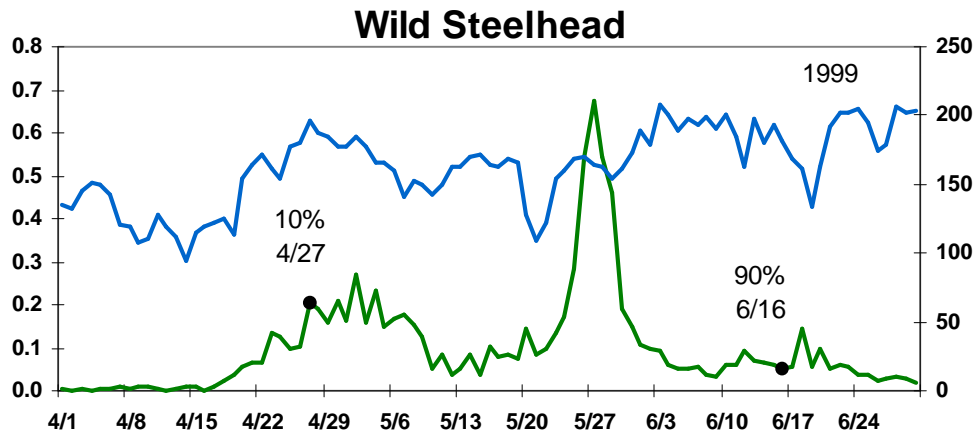


Table 1. Wild Steelhead Timing at McNary Dam 1995 to 1999.

Year	5%	50%	95%
1995	04/19	05/14	06/02
1996	04/21	05/05	05/31
1997	04/18	05/07	06/01
1998	04/17	05/08	06/01
1999	04/17	05/19	06/04
Avg	04/18	05/10	06/01

Table 2. Hatchery Steelhead Timing at McNary Dam 1995 to 1999.

Year	5%	50%	95%
1995	04/24	05/16	06/01
1996	04/22	05/12	06/01
1997	04/23	05/09	06/01
1998	04/20	05/10	06/01
1999	04/01	05/22	06/03
Avg	04/18	05/22	06/03

Table 3. Combined Steelhead Timing

At McNary 2000 to 2003

Year	5%	50%	95%
2000	4/11	5/10	6/12
2001	4/25	5/23	6/19
2002	4/20	5/20	6/7
2003	4/23	5/25	6/4

**Table 4. Subyearling Chinook Timing
At McNary Dam.**

Year	5%	50%	95%
1995	06/03	07/04	07/25
1996	05/30	07/04	08/18
1997	05/24	07/05	08/18
1998	06/05	07/04	07/29
1999	06/04	06/30	08/18
2000	06/17	06/30	08/11
2001	06/11	07/02	08/08
2002	06/25	06/30	08/16
2003	06/06	07/01	08/07
Average Date 1995 to 2003	06/06	07/02	08/10

Percent Passage by Date at McNary Dam of wild steelhead PIT-tagged at Rock Island Dam 1989 to 2002

month-day	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	14-yr Avg.
4/18	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4/24	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
4/26	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.7%	0.0%	0.0%	0.0%	0.7%	2.7%	0.0%	0.5%	0.4%
4/27	0.0%	1.1%	0.0%	0.0%	0.0%	0.3%	0.7%	0.0%	1.3%	0.0%	2.2%	3.6%	0.0%	0.5%	0.7%
4/28	0.0%	1.1%	0.0%	0.0%	0.0%	0.3%	0.7%	0.0%	2.7%	0.0%	4.3%	5.4%	0.0%	2.5%	1.2%
4/29	0.0%	1.9%	0.0%	0.3%	0.0%	0.3%	0.7%	0.0%	6.7%	0.9%	5.0%	6.3%	0.0%	3.0%	1.8%
4/30	0.0%	5.0%	0.0%	0.3%	0.0%	0.9%	0.7%	0.0%	6.7%	1.8%	8.6%	11.7%	0.0%	3.0%	2.8%
5/1	0.0%	7.3%	0.4%	0.5%	0.0%	1.9%	0.7%	0.0%	12.0%	7.3%	14.4%	12.6%	0.0%	5.0%	4.4%
5/2	0.0%	8.4%	0.4%	1.9%	0.0%	3.7%	0.7%	2.6%	16.0%	9.1%	20.1%	13.5%	0.0%	8.0%	6.0%
5/3	1.3%	11.8%	0.8%	2.9%	0.0%	9.9%	0.7%	4.3%	20.0%	10.0%	25.2%	16.2%	1.1%	11.6%	8.3%
5/4	2.1%	15.3%	0.8%	4.5%	0.0%	14.2%	0.7%	6.1%	25.3%	15.5%	28.8%	18.0%	1.6%	16.1%	10.6%
5/5	5.5%	17.2%	1.6%	6.9%	1.0%	22.2%	0.7%	9.6%	32.0%	28.2%	29.5%	25.2%	2.2%	17.6%	14.2%
5/6	7.6%	18.7%	2.4%	8.5%	1.0%	26.9%	0.7%	12.2%	36.0%	36.4%	30.2%	25.2%	3.8%	22.1%	16.5%
5/7	11.8%	22.1%	4.1%	9.9%	2.0%	34.9%	4.2%	16.5%	41.3%	38.2%	34.5%	30.6%	5.4%	24.6%	20.0%
5/8	15.1%	23.7%	8.1%	13.3%	2.0%	42.3%	6.9%	19.1%	41.3%	40.9%	40.3%	36.9%	5.4%	29.6%	23.2%
5/9	19.3%	27.5%	14.2%	15.7%	2.0%	48.5%	10.4%	24.3%	44.0%	45.5%	43.9%	43.2%	6.5%	30.7%	26.8%
5/10	23.1%	30.9%	17.9%	17.6%	2.0%	52.2%	11.1%	25.2%	52.0%	49.1%	46.0%	45.9%	8.2%	33.7%	29.6%
5/11	27.3%	32.4%	22.0%	21.1%	3.0%	55.2%	12.5%	26.1%	56.0%	53.6%	48.9%	53.2%	8.7%	37.2%	32.7%
5/12	30.7%	34.7%	25.6%	24.8%	7.1%	56.5%	18.1%	29.6%	60.0%	55.5%	49.6%	60.4%	10.3%	40.7%	36.0%
5/13	31.5%	37.4%	30.5%	28.8%	9.1%	61.1%	22.9%	33.0%	61.3%	56.4%	50.4%	66.7%	10.9%	45.7%	39.0%
5/14	35.3%	38.9%	36.6%	32.3%	9.1%	63.9%	23.6%	39.1%	62.7%	57.3%	51.8%	72.1%	14.1%	47.7%	41.7%
5/15	39.5%	42.0%	43.1%	37.1%	13.1%	65.4%	29.9%	42.6%	65.3%	60.0%	56.1%	75.7%	17.4%	50.3%	45.5%
5/16	42.9%	46.2%	46.7%	42.7%	14.1%	66.7%	34.0%	42.6%	73.3%	60.9%	57.6%	78.4%	19.0%	54.8%	48.6%
5/17	45.4%	50.4%	51.2%	47.2%	18.2%	67.0%	40.3%	45.2%	74.7%	67.3%	60.4%	80.2%	19.0%	60.3%	51.9%
5/18	51.3%	54.2%	56.9%	54.9%	18.2%	69.4%	52.1%	46.1%	80.0%	70.9%	60.4%	81.1%	22.8%	63.3%	55.8%
5/19	61.3%	59.2%	61.0%	57.6%	19.2%	72.2%	53.5%	50.4%	84.0%	73.6%	63.3%	81.1%	26.1%	64.8%	59.1%
5/20	67.2%	59.9%	67.1%	61.1%	24.2%	74.4%	57.6%	52.2%	84.0%	74.5%	64.7%	81.1%	28.3%	67.3%	61.7%
5/21	72.3%	60.7%	74.0%	63.7%	26.3%	77.2%	63.9%	56.5%	84.0%	76.4%	68.3%	87.4%	29.3%	71.4%	65.1%
5/22	78.6%	63.0%	75.6%	70.9%	26.3%	82.4%	66.7%	61.7%	84.0%	78.2%	73.4%	91.0%	31.5%	73.4%	68.3%
5/23	81.9%	64.9%	80.9%	74.1%	30.3%	85.2%	68.1%	77.4%	86.7%	79.1%	74.1%	96.4%	32.6%	74.9%	71.9%
5/24	84.0%	67.9%	85.4%	76.5%	34.3%	89.8%	68.1%	80.0%	88.0%	80.0%	74.8%	97.3%	39.1%	76.4%	74.4%
5/25	89.1%	73.7%	89.4%	77.6%	37.4%	92.9%	71.5%	84.3%	89.3%	81.8%	77.7%	99.1%	43.5%	78.9%	77.6%
5/26	90.8%	78.2%	93.9%	79.7%	41.4%	93.5%	73.6%	88.7%	89.3%	83.6%	78.4%	99.1%	47.8%	78.9%	79.8%

month-day	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	14-yr Avg.
5/27	91.2%	79.8%	96.3%	81.9%	45.5%	94.1%	74.3%	92.2%	90.7%	85.5%	79.9%	99.1%	51.6%	82.9%	81.8%
5/28	94.1%	82.1%	98.4%	84.8%	50.5%	94.8%	78.5%	93.0%	90.7%	86.4%	82.0%	99.1%	54.3%	89.4%	84.1%
5/29	95.4%	85.1%	98.4%	85.9%	56.6%	94.8%	79.2%	93.9%	90.7%	89.1%	82.7%	100.0%	56.5%	93.0%	85.8%
5/30	96.6%	90.5%	98.4%	90.1%	63.6%	94.8%	84.0%	95.7%	92.0%	93.6%	85.6%	100.0%	60.3%	95.5%	88.6%
5/31	97.9%	90.8%	98.8%	92.5%	68.7%	95.7%	85.4%	95.7%	93.3%	94.5%	87.1%	100.0%	67.4%	98.0%	90.4%
6/1	97.9%	95.4%	99.2%	93.6%	72.7%	97.2%	87.5%	96.5%	94.7%	97.3%	89.9%	100.0%	73.4%	99.0%	92.5%
6/2	99.2%	97.7%	99.2%	94.4%	77.8%	97.5%	94.4%	99.1%	97.3%	99.1%	95.0%	100.0%	75.0%	99.5%	94.7%
6/3	99.2%	98.9%	99.6%	94.7%	80.8%	98.1%	97.2%	99.1%	100.0%	100.0%	97.1%	100.0%	75.0%	99.5%	95.7%
6/4	99.2%	99.2%	99.6%	94.9%	83.8%	98.8%	97.9%	99.1%	100.0%	100.0%	97.8%	100.0%	75.5%	100.0%	96.1%
6/5	99.2%	99.2%	99.6%	95.2%	88.9%	98.8%	97.9%	100.0%	100.0%	100.0%	98.6%	100.0%	76.6%	100.0%	96.7%
6/6	99.6%	100.0%	100.0%	95.7%	93.9%	99.1%	97.9%	100.0%	100.0%	100.0%	99.3%	100.0%	81.0%	100.0%	97.6%
6/7	99.6%	100.0%	100.0%	96.0%	97.0%	99.1%	97.9%	100.0%	100.0%	100.0%	99.3%	100.0%	83.7%	100.0%	98.0%
6/8	99.6%	100.0%	100.0%	96.0%	98.0%	99.1%	98.6%	100.0%	100.0%	100.0%	100.0%	100.0%	90.2%	100.0%	98.7%
6/9	100.0%	100.0%	100.0%	96.3%	98.0%	99.4%	98.6%	100.0%	100.0%	100.0%	100.0%	100.0%	91.3%	100.0%	98.8%
6/10	100.0%	100.0%	100.0%	96.3%	99.0%	99.4%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	91.3%	100.0%	98.9%
6/11	100.0%	100.0%	100.0%	96.5%	99.0%	99.4%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	92.4%	100.0%	99.0%
6/12	100.0%	100.0%	100.0%	97.1%	100.0%	99.4%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	100.0%	99.4%
6/13	100.0%	100.0%	100.0%	97.3%	100.0%	99.4%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%	100.0%	99.4%
6/14	100.0%	100.0%	100.0%	97.3%	100.0%	99.4%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	96.7%	100.0%	99.5%
6/15	100.0%	100.0%	100.0%	97.6%	100.0%	99.4%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	97.3%	100.0%	99.5%
6/16	100.0%	100.0%	100.0%	97.6%	100.0%	99.4%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	97.8%	100.0%	99.6%
6/17	100.0%	100.0%	100.0%	97.6%	100.0%	99.7%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	97.8%	100.0%	99.6%
6/19	100.0%	100.0%	100.0%	97.9%	100.0%	99.7%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	98.4%	100.0%	99.7%
6/21	100.0%	100.0%	100.0%	97.9%	100.0%	99.7%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	98.9%	100.0%	99.7%
6/23	100.0%	100.0%	100.0%	98.4%	100.0%	99.7%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	98.9%	100.0%	99.7%
6/24	100.0%	100.0%	100.0%	98.4%	100.0%	99.7%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	99.5%	100.0%	99.8%
6/25	100.0%	100.0%	100.0%	98.4%	100.0%	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	99.5%	100.0%	99.8%
6/26	100.0%	100.0%	100.0%	98.4%	100.0%	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.8%
6/27	100.0%	100.0%	100.0%	98.7%	100.0%	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%
6/30	100.0%	100.0%	100.0%	98.9%	100.0%	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%
7/22	100.0%	100.0%	100.0%	99.2%	100.0%	100.0%	99.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%
7/23	100.0%	100.0%	100.0%	99.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%
8/5	100.0%	100.0%	100.0%	99.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
8/20	100.0%	100.0%	100.0%	99.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
11/2	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Summary of Hatchery Releases in the Mid-Columbia 1999 to 2004

MigrationYear	Hatchery	ReleaseSite	RelRiver	AgencyCode	RelStartDate	RelEndDate	NumReleased	ESU
	2004Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/19	5/14	192000	listed
	2004Lyons Ferry Hatchery	Walla Walla River	Walla Walla River	WDFW	4/15	4/15	100000	not listed
	2004Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	4/1	4/30	85000	not listed
	2004Lyons Ferry Hatchery	Baileysburg Bridge	Touchet River	WDFW	4/15	4/15	60000	listed
	2004Ringold Springs Hatchery	Ringold Springs Hatchery	Mid-Columbia River	WDFW	4/12	4/20	161147	listed
	2004Turtle Rock Hatchery	Wenatchee River	Wenatchee River	WDFW	4/19	4/30	121000	listed
	2004Turtle Rock Hatchery	Nason Creek	Wenatchee River	WDFW	4/19	4/30	65000	listed
	2004Wells Hatchery	Omak Creek	Okanogan River	COLV	4/26	4/30	9000	not listed
	2004Wells Hatchery	Twisp River	Methow River	WDFW	4/15	4/30	140000	listed
	2004Wells Hatchery	Chewuch Acclim Pond	Methow River	WDFW	4/15	4/30	76042	listed
	2004Wells Hatchery	Methow River	Methow River	WDFW	4/15	5/14	76042	listed
	2004Wells Hatchery	Okanogan River	Okanogan River	WDFW	4/19	5/14	55000	listed
	2004Wells Hatchery	Similkameen Acclim Pd	Okanogan River	WDFW	4/15	5/7	45000	listed
	2004Winthrop NFH	Winthrop Hatchery	Methow River	USFW	4/15	4/30	117000	listed
	2003Lyons Ferry Hatchery	Walla Walla River	Walla Walla River	WDFW	4/15	4/17	102975	not listed
	2003Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	4/15	4/30	100445	not listed
	2003Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	4/21	4/21	31440	listed
	2003Priest Rapids Hatchery	Ringold Springs Hatchery	Mid-Columbia River	WDFW	4/11	4/22	171645	listed
	2003Turtle Rock Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/28	4/29	33528	not listed
	2003Turtle Rock Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/28	4/29	112387	listed
	2003Turtle Rock Hatchery	Nason Creek	Wenatchee River	WDFW	4/29	5/1	156145	listed
	2003Wells Hatchery	Chewuch River	Methow River	WDFW	4/23	5/16	117495	listed
	2003Wells Hatchery	Twisp Acclim Pond	Methow River	WDFW	5/1	5/16	105323	listed
	2003Wells Hatchery	Methow River	Methow River	WDFW	4/23	5/19	162340	listed
	2003Wells Hatchery	Okanogan River	Okanogan River	WDFW	5/8	5/19	65920	listed
	2003Wells Hatchery	Similkameen Acclim Pd	Okanogan River	WDFW	5/9	5/19	50860	listed
	2003Wells Hatchery	Omak Creek	Okanogan River	WDFW	5/7	5/14	25110	listed
	2003Winthrop NFH	Winthrop Hatchery	Methow River	USFW	4/15	4/28	119370	listed
	2002Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/29	5/15	120055	listed
	2002Eastbank Hatchery	Nason Creek	Wenatchee River	WDFW	4/29	5/3	75276	listed
	2002Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/29	5/15	92487	listed
	2002Eastbank Hatchery	Nason Creek	Wenatchee River	WDFW	4/29	5/3	48115	listed
	2002Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	4/1	4/30	125391	not listed
	2002Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	5/2	5/2	45501	listed

MigrationYear	Hatchery	ReleaseSite	RelRiver	AgencyCode	RelStartDate	RelEndDate	NumReleased
2002	Lyons Ferry Hatchery	Walla Walla River	Walla Walla River	WDFW	4/16	4/18	99859not listed
2002	Ringold Springs Hatchery	Ringold Springs Hatchery	Mid-Columbia River	WDFW	4/10	4/17	164556listed
2002	Wells Hatchery	Okanogan River	Okanogan River	WDFW	4/29	5/23	126855listed
2002	Wells Hatchery	Twisp River	Methow River	WDFW	5/1	5/23	84475listed
2002	Wells Hatchery	Chewuch Acclim Pond	Methow River	WDFW	5/1	5/23	85615listed
2002	Wells Hatchery	Methow River	Methow River	WDFW	4/29	5/23	94020listed
2002	Winthrop NFH	Winthrop Hatchery	Methow River	USFW	4/15	4/30	150488listed
2001	Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/24	5/3	33475listed
2001	Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/24	5/3	57716listed
2001	Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/24	5/3	48029listed
2001	Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/24	5/3	45477listed
2001	Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	3/26	4/30	102765not listed
2001	Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	5/1	5/1	36487not listed
2001	Lyons Ferry Hatchery	Walla Walla River	Walla Walla River	WDFW	4/16	4/24	103980not listed
2001	Priest Rapids Hatchery	Ringold Springs Hatchery	Mid-Columbia River	WDFW	4/1	4/18	210000listed
2001	Wells Hatchery	Okanogan River	Okanogan River	WDFW	4/18	5/9	228770listed
2001	Wells Hatchery	Chewuch Acclim Pond	Methow River	WDFW	4/27	5/22	99490listed
2001	Wells Hatchery	Twisp River	Methow River	WDFW	4/27	5/22	109950listed
2001	Wells Hatchery	Methow River	Methow River	WDFW	4/27	5/22	116840listed
2001	Winthrop NFH	Winthrop Hatchery	Methow River	USFW	4/11	4/30	98834listed
2000	Chiwawa Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/26	5/15	25600listed
2000	Chiwawa Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/26	5/15	43400listed
2000	Chiwawa Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/17	4/24	30600listed
2000	Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/26	5/8	45153listed
2000	Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/26	5/8	30710listed
2000	Eastbank Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/26	5/8	23241 listed
2000	Lyons Ferry Hatchery	Dayton Acclim Pond	Touchet River	WDFW	3/25	4/30	124654not listed
2000	Lyons Ferry Hatchery	Walla Walla River	Walla Walla River	WDFW	4/17	4/26	165500not listed
2000	Ringold Springs Hatchery	Ringold Springs Hatchery	Mid-Columbia River	WDFW	4/3	4/7	181000listed
2000	Wells Hatchery	Twisp River	Methow River	WDFW	4/25	5/23	136680listed
2000	Wells Hatchery	Chewuch Acclim Pond	Methow River	WDFW	4/25	5/23	138300listed
2000	Wells Hatchery	Methow River	Methow River	WDFW	4/11	4/18	139900listed
2000	Wells Hatchery	Similkameen Acclim Pd	Okanogan River	WDFW	5/1	5/3	68580listed
2000	Wells Hatchery	Okanogan River	Okanogan River	WDFW	5/5	5/26	76070listed
2000	Wells Hatchery	Bel. Wells Dam	Mid-Columbia River	WDFW	5/1	5/24	62000listed

MigrationYear	Hatchery	ReleaseSite	RelRiver	AgencyCode	RelStartDate	RelEndDate	NumReleased
2000	Winthrop NFH	Winthrop Hatchery	Methow River	USFW	4/12	5/22	105510listed
1999	Chiwawa Hatchery	Chiwawa Hatchery	Wenatchee River	WDFW	4/26	5/18	172078listed
1999	Lyons Ferry Hatchery	Dayton Acclim Pond	Walla Walla River	WDFW	3/25	4/30	124651 not listed
1999	Lyons Ferry Hatchery	Walla Walla River	Walla Walla River	WDFW	4/19	4/23	176000not listed
1999	Ringold Springs Hatchery	Ringold Springs H Game	Mid-Columbia River	WDFW	3/17	3/26	181000listed
1999	Turtle Rock Hatchery	Wenatchee River	Wenatchee River	WDFW	4/20	5/15	145000not listed
1999	Turtle Rock Hatchery	Entiat River	Entiat River	WDFW	4/24	4/24	45080not listed
1999	Turtle Rock Hatchery	Turtle Rock Hatchery	Mid-Columbia River	WDFW	4/24	4/24	1000not listed
1999	Wells Hatchery	Wells Hatchery	Mid-Columbia River	WDFW	4/27	5/12	34099listed
1999	Wells Hatchery	Effy Bridge	Methow River	WDFW	5/12	6/9	180600listed
1999	Wells Hatchery	Methow River	Methow River	WDFW	5/7	5/14	139650listed
1999	Wells Hatchery	Okanogan River	Okanogan River	WDFW	4/27	5/11	78891 listed
1999	Wells Hatchery	Similkameen Acclim Pd	Okanogan River	WDFW	5/5	5/7	71820listed
1999	Wells Hatchery	Chewuch Acclim Pond	Methow River	WDFW	4/21	6/7	96225listed
1999	Wells Hatchery	Twisp River	Methow River	WDFW	4/21	6/8	127513listed
1999	Wells Hatchery	Methow River	Methow River	WDFW	4/20	5/12	40226not listed
1999	Winthrop NFH	Winthrop Hatchery	Methow River	USFW	4/15	6/10	112908listed