

**NWW Juvenile Fish Passage Status Report (March 1-November 1, 2022)**  
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This report summarizes juvenile fish passage, collection and transport operations through the end November 1, 2022.

**Early Start** - Juvenile Bypass Systems (JBS) water-up dates, timing of condition sampling and transport operations at NWW projects for 2022 are summarized in Table 1. Sampling at McNary Dam began approximately 1 month early in 2022 to assess whether passage timing is shifting earlier in the year due to climate change. McNary Dam collection during the March 1-31 early start-up totaled 1,948 smolts in 2022 compared to 972 in 2020. McNary Dam missed the first sample during early start-up operations due to a drain leak and had to dewater the facility. Repairs were made and the first sample was conducted on March 4<sup>th</sup>. A summary of early start collection numbers for 2018 through 2022 was sent to FPOM in June. The data in this report provides the annual collection, bypass, and transport numbers passing through the bypass systems from the start of sampling through November 1<sup>st</sup> for Lower Granite, Little Goose, Lower Monumental, Ice Harbor and McNary dams. The detailed data is typically provided as an appendix with annual Project reports and posted on the FPOM site.

Table 1. JBS water-up date, condition sample period and transport operations at NWW projects, 2022.

Location	JBS Operational	Condition Sampling	Barge Transport	Truck Transport
Lower Granite	3/14/2022	3/25-11/1	4/23-6/19	8/1-11/1
Little Goose	3/23/2022	4/1-11/1	4/23-6/19	8/1-11/1
Lower Monumental	3/23/2022	4/1-10/1	4/23-6/19	NA
Ice Harbor	3/24/2022	4/4-7/18	NA	NA
McNary <sup>1</sup>	2/25/2022	3/3-9/30	NA	NA

<sup>1</sup>Early start operation to inform passage timing.

**Spring FOP** - The 2022 spring fish passage spill operation (Spring FOP) was from 00:01 April 3<sup>rd</sup> to 23:59 June 20<sup>th</sup> at Snake River projects and from 00:01 April 10<sup>th</sup> to 23:59 June 15<sup>th</sup> at Columbia River projects. Snake River average river flow was 94% of the 10-year average from April 3<sup>rd</sup> through June 20<sup>th</sup> (Table 2). Average river flow in the Columbia River at McNary Dam was 85% of the 10-year average from April 10<sup>th</sup> through June 15<sup>th</sup>. Percent spill levels during the 2022 Spring FOP averaged 145% of the 10-year average at the three upper Snake River projects while Ice Harbor and McNary averaged 120% and 127% of the 10-year average, respectively.

Table 2. Average flow, spill and percent spill during the 2022 Spring FOP versus the 10-year average (2012-2022) at Walla Walla projects on the Snake and Columbia rivers.

Location (Spring FOP Timing)	Average Flow (kcfs)		Average Spill (kcfs)		% Spill	
	2022	10-year avg.	2022	10-year avg.	2022	10-year avg.
Lower Granite Dam (4/3-6/20)	88	93	47	36	58%	40%
Little Goose Dam (4/3-6/20)	83	90	48	36	59%	40%
Lower Monumental Dam (4/3-6/20)	86	91	52	40	64%	46%
Ice Harbor Dam (4/3-6/20)	88	94	69	61	77%	64%
McNary Dam (4/10-6/15)	241	283	171	159	70%	55%

**Summer FOP** - The 2022 summer fish passage spill operation (Summer FOP) was from 00:01 June 21<sup>st</sup> to 23:59 August 31<sup>st</sup> at Snake River projects and from 00:01 June 15<sup>th</sup> to 23:59 August 31<sup>st</sup> at Columbia River projects. Snake River average river flow (Table 3) was 122% of the 10-year average from June 21<sup>st</sup> to August 31<sup>st</sup>. Average river flow in the Columbia River at McNary Dam was 130% of the 10-year average from June 16<sup>th</sup> through August 31<sup>st</sup>. Percent spill levels during the 2022 Summer FOP averaged 91% of the 10-year average at Lower Granite Dam, 110% at Little Goose Dam, 87% at Lower Monumental Dam, 61% at Ice Harbor Dam and 97% at McNary Dam.

Table 3. Average flow, spill and percent spill during the 2022 Summer FOP versus the 10-year average (2012-2021) at Walla Walla projects on the Snake and Columbia rivers.

Location (Spring FOP Timing)	Average Flow (kcfs)		Average Spill (kcfs)		% Spill	
	2022	10-year avg.	2022	10-year avg.	2022	10-year avg.
Lower Granite Dam (6/21-8/31)	45	36	17	16	42%	46%
Little Goose Dam (6/21-8/31)	43	36	15	12	36%	33%
Lower Monumental Dam (6/21-8/31)	44	35	15	15	38%	44%
Ice Harbor Dam (6/21-8/31)	44	37	15	20	32%	52%
McNary Dam (6/16-8/31)	245	188	131	98	49%	51%

**Juvenile Fish Collection** - Collection at Lower Granite Dam in 2022 (April 1<sup>st</sup> to November 1<sup>st</sup>) was 55% of the 10-year average (2012-2021) and 50%, 75% and 39% of the 10-year average at Little Goose, Lower Monumental and McNary dams, respectively (Table 4). The lower collection in recent years is likely due to the higher levels of spill in proportion to overall river flow. A total of 3,490 smolts were sampled at Ice Harbor Dam and 940,380 smolts were collected at McNary Dam. Smolts collected at Ice Harbor and McNary dams were bypassed. The median migration timing for combined juvenile yearling Chinook salmon and juvenile steelhead was slightly later than average while juvenile sockeye, coho and combined subyearling Chinook salmon migration timing was slightly earlier (Table 5).

Table 4. Number of smolts collected in 2022 versus the 10-year average (2012-2021) at Lower Granite Dam, Little Goose Dam, Lower Monumental Dam and overall.

	April 1-June 20		June 21-November 1		April 1-October 31		
	2022	10y avg.	2022	10y avg.	2022	10y avg.	2022 vs 10y avg.
<b>Lower Granite Dam<sup>1</sup></b>	2,392,073	4,472,395	140,559	163,700	2,532,632	4,636,095	55%
<b>Little Goose Dam</b>	1,368,564	2,786,722	112,252	190,204	1,480,816	2,976,925	50%
<b>Lower Monumental Dam</b>	1,523,926	2,009,711	37,746	75,001	1,561,672	2,084,712	75%
<b>Overall</b>	5,284,563	9,268,828	290,557	428,905	5,575,120	9,697,733	57%

<sup>1</sup>Data does not include fish sampled March 25-31 (2022; 23,689 smolts).

Table 5. Median outmigration arrival timing at Lower Granite Dam in 2022 compared to the historical median (1997-2021).

	2022 median	Historical median	2022 vs Historical timing (days)
<b>Yearling Chinook salmon</b>	9-May	3-May	6
<b>Steelhead</b>	10-May	4-May	5
<b>Sockeye salmon</b>	14-May	18-May	-5
<b>Coho salmon</b>	10-May	18-May	-9
<b>Subyearling Chinook salmon</b>	9-Jun	17-Jun	-8

**Juvenile Fish Transportation** - Collection for every-other-day barge transport began April 23<sup>rd</sup> at Lower Granite, Little Goose and Lower Monumental dams, similar to 2018-2021. Daily barge trips occurred May 16 through May 24 with the last barge trip occurring on June 19. Before 2018 barge transport operations did not begin until May 1<sup>st</sup>. Historically transport methods changed from barge to truck on August 15<sup>th</sup> except in 2019 when this change occurred August 1<sup>st</sup>. In 2021, barge transport ended June 20<sup>th</sup> and truck transportation operations were implemented early, beginning on July 4 and July 6 at Lower Granite and Little Goose, respectively, due to warm water conditions. In 2022, barge transport ended June 19<sup>th</sup> and collection for truck transportation operations began on August 1<sup>st</sup>. NOAA conducted the Seasonal Effects Transport study again this year with research trips occurring on April 14<sup>th</sup> and 21<sup>st</sup>. The number of smolts transported in 2022 was 75% of the 10-year average (Table 6). The cumulative smolt passage index at Lower Granite Dam when barging ended (June 19<sup>th</sup>) was approximately 100% for yearling Chinook salmon, 99% for steelhead, 99% for sockeye salmon, 98% for coho salmon and 73% for subyearling Chinook salmon. NOAA Fisheries preliminary survival estimate memo suggests that 25.4% of the wild and 34.9% of the hatchery Snake River spring/summer Chinook salmon and 25.9% of the wild and 39.6% of the hatchery Snake River steelhead were transported in 2022.

Bypass operations at transport facilities occurred from June 20<sup>th</sup> through July 31<sup>st</sup> as recommended by Technical Management Team (TMT). During this time approximately 101,227 smolts were bypassed at Lower Granite Dam and 96,087 smolts were bypassed at Little Goose Dam. Collection for truck transport began on August 1<sup>st</sup> at Lower Granite and Little Goose dams, respectively (Table 6). No truck transport occurred at Lower Monumental Dam as recommended by TMT. The number of smolts transported by truck was 142% and 94% of the 10-year average at Lower Granite and Little Goose dams, respectively.

Table 6. Number of smolts transported in 2022 versus the 10-year average (2012-2021) at Lower Granite Dam, Little Goose Dam, Lower Monumental Dam and overall.

	Barge Transport <sup>1</sup>		Truck Transport <sup>2</sup>		Overall Transport		
	2022	10y avg.	2022	10y avg.	2022	10y avg.	2022 vs 10y avg.
<b>Lower Granite Dam</b>	2,159,088	2,708,089	47,071	33,150	2,206,159	2,737,924	81%
<b>Little Goose Dam</b>	1,355,206	2,175,767	20,800	22,084	1,376,006	2,197,850	63%
<b>Lower Monumental Dam</b>	1,328,113	1,581,460	0	1,159	1,328,113	1,582,387	84%
<b>Overall</b>	4,842,407	6,465,315	67,871	56,393	4,910,278	6,518,161	75%

<sup>1</sup> Before 2018, barge transport operations began May 1<sup>st</sup> and ended around August 15<sup>th</sup>. From 2018-2020 collection for barge transport began April 23<sup>rd</sup>. Barge transport ended August 15<sup>th</sup> in 2018, July 31<sup>st</sup> in 2019, and June 21<sup>st</sup> in 2020. Numbers of smolts from research trips prior to normal transport are included in collection and transport totals.

<sup>2</sup> Truck transport did not occur in 2017 at Lower Granite Dam or in 2020-2021 at Lower Monumental Dam and therefore those years were excluded from the 10-year average.

Table 7. Number of smolts collected and transported in 2022 versus recent history (2018-2021) at Lower Granite Dam, Little Goose Dam, Lower Monumental Dam and overall.

<b>Collected</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>10y avg.</b>
<b>Lower Granite Dam<sup>1</sup></b>	6,473,432	5,089,044	1,487,841	768,441	2,532,632	4,636,095
<b>Little Goose Dam</b>	4,607,478	3,270,406	1,225,858	453,442	1,480,816	2,976,925
<b>Lower Monumental Dam</b>	2,761,746	3,020,476	897,572	306,847	1,561,672	2,084,712
<b>Overall</b>	13,842,656	11,379,926	3,611,271	1,528,730	5,575,120	9,697,733

<b>Transported</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>10y avg.</b>
<b>Lower Granite Dam</b>	5,125,679	3,119,028	1,165,554	489,010	2,206,159	2,737,924
<b>Little Goose Dam</b>	3,669,880	2,360,042	1,046,698	351,709	1,376,006	2,197,850
<b>Lower Monumental Dam</b>	2,306,873	2,135,952	795,494	209,181	1,328,113	1,582,387
<b>Overall</b>	11,102,432	7,615,022	3,007,746	1,049,900	4,910,278	6,518,161

<sup>1</sup>Data does not include fish sampled March 25-31 (2022; 23,689 smolts).