

**March Early Start NWW Projects
19 June 2023**

In accordance with court orders to provide PIT tag monitoring, USACE began early operation of juvenile bypass systems to better understand juvenile emigration patterns in 2018 (Table 1).

Table 1. Early start sampling information for NWW projects, 2018-2022.

	Lower Monumental	McNary¹	Lower Granite	Lower Granite	McNary²	Lower Monumental	Little Goose
Year	2023	2022	2021	2020	2020	2019³	2018
Screened Units	1-6	1 & 12-14	1-6	1-6	1, 10, 13, & 14	1-3 initially 4-6 on 3/27-3/28	1-6
Primary bypass operational	25-Feb	25-Feb	22-Feb	20-Feb	26-Feb	26-Feb	20-Feb
JFF watered up	25-Feb	2-Mar*	1-Mar	1-Mar	1-Mar	7-Mar*	1-Mar
1st Condition sample	2-Mar	4-Mar*	2-Mar	2-Mar	2-Mar	9-Mar*	2-Mar
Sample Frequency	Every 3 rd day	Every other day	Daily	Daily	Every other day	Every other day	Every other day
Average Daily Flow (Mar 1-31)	26.6 kcfs	161 kcfs	41 kcfs	34 kcfs	122 kcfs	50 kcfs	57 kcfs
Average Daily Spill (Mar 1-31)	0.6 kcfs	0.7 kcfs	0.5 kcfs	0.0 kcfs	1.3 kcfs	0.0 kcfs	0.0 kcfs
Max Daily Collection Date	185 3/2	688 3/30	818 3/31	3,610 3/31	396 3/24	36,100 3/25	188 3/30
Total Collection	365	1,948	2,647	8,099	972	109,576	902

¹2022 McNary missed the first sample due to a drain leak discovered upon initial water up the end of February.

²2021 McNary did not conduct early startup operations as planned due to mechanical issues.

³2019 Lower Monumental delayed sample due to low temperatures (<20°F).

Overall, collection of juvenile salmon and steelhead is relatively low until late March. In 2018 at Little Goose Dam, 645 of the 902 fish (72%) were collected from March 20-31. In 2019, at Lower Monumental Dam, 100,250 of the 109,576 fish (91%) were collected during the same timeframe. The numbers of fish collected in 2019 may have been abnormally high because of Lyon’s Ferry direct release of 150,000 yearling fall Chinook salmon on March 11th. These fish are normally trucked to release sites upstream of Lower Granite Dam, however, a winter storm prevented access to the traditional release sites. In addition, 60,000 steelhead were released early from Lyon’s Ferry Hatchery in 2019 (March 14th and 15th) due to issues with the hatchery water supply. Similarly, the largest collection at Lower Monumental Dam in 2023 occurred on the first day of sampling (185 of the total of 365 fish collected for the month) because of an early hatchery release. In 2020, total fish collected from March 20-31 include 7,814 of 8,099 (96%) at Lower Granite Dam and 788 of 972 (81%) at McNary Dam. Increased numbers of smolts collected at McNary starting March 24, 2020 was due to the passage of Walla Walla basin hatchery releases. In 2021, at Lower Granite Dam, 2,336 of 2,647 (88%) were collected between March 20-31. Total collection in March for Lower Granite was much lower in 2021 compared to 2020. McNary did not conduct early startup in 2021. In 2022, total fish collected from March 20-31 include 1,635 of the 1,955 (84%) at McNary Dam (Figure 1). Cumulatively over all early sample years, 75%, 90% and 95% of all fish were collected by 25 March, 21 March and 17 March, respectively (Figure 2).

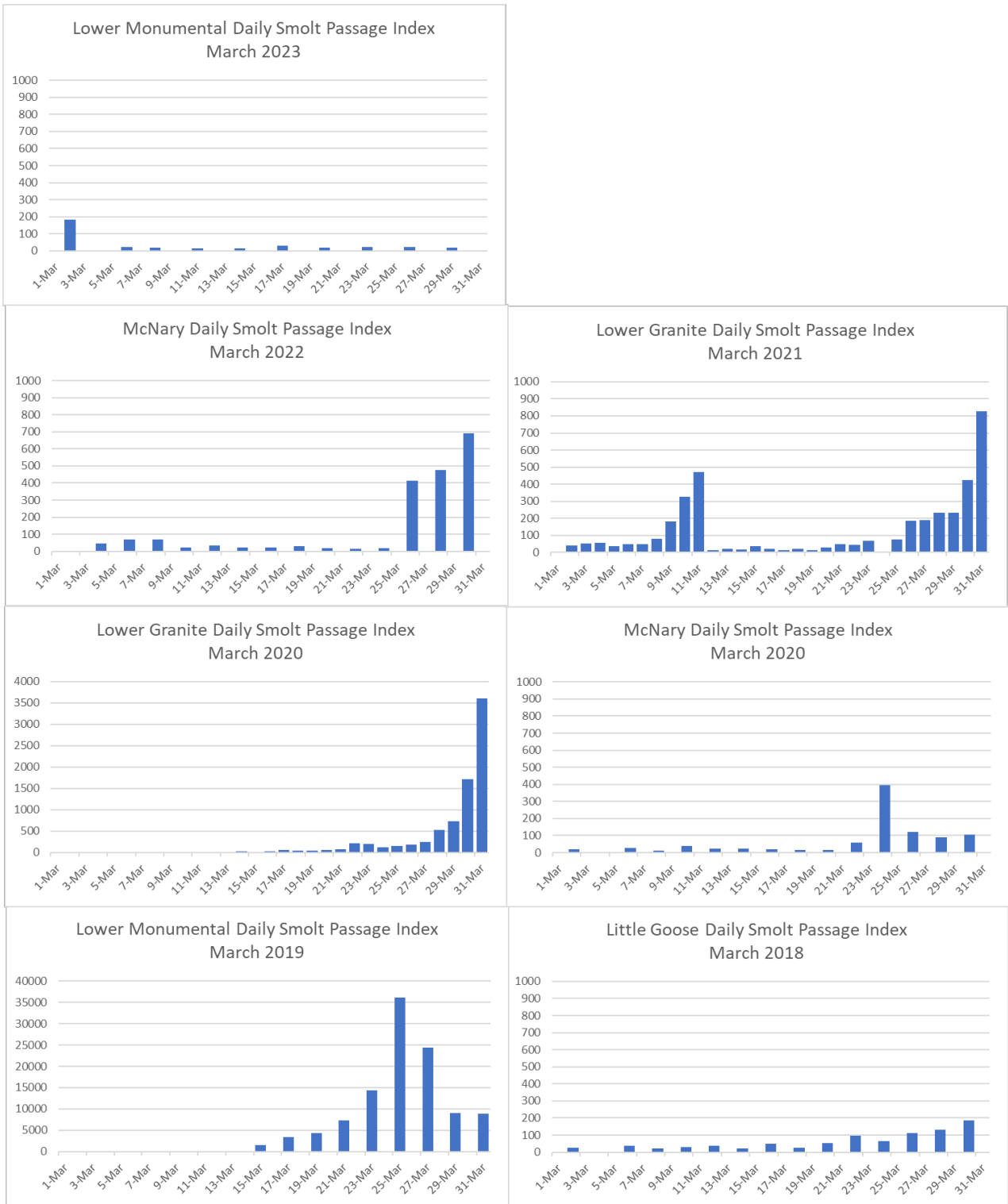


Figure 1. Daily smolt passage index at NWW Projects during March and early start-up.

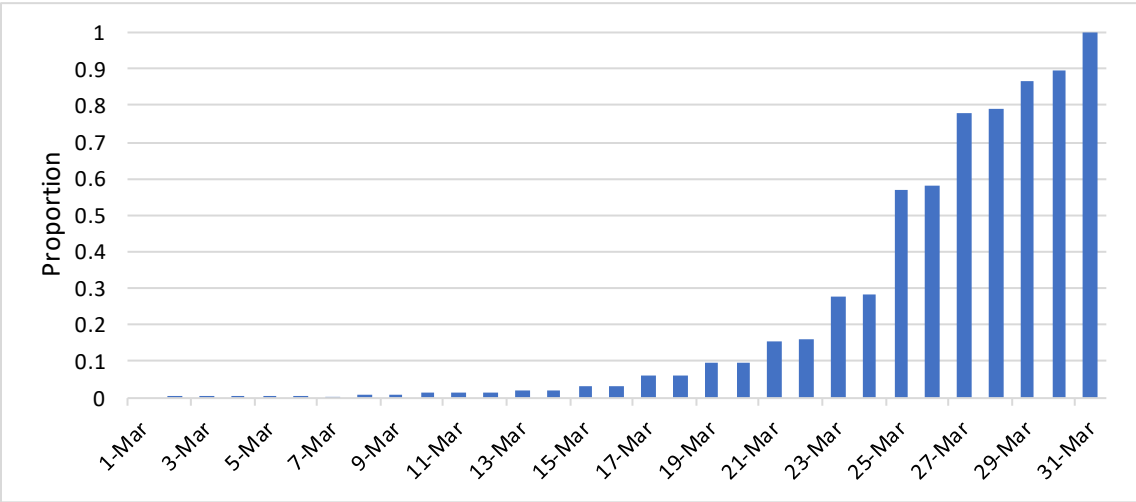
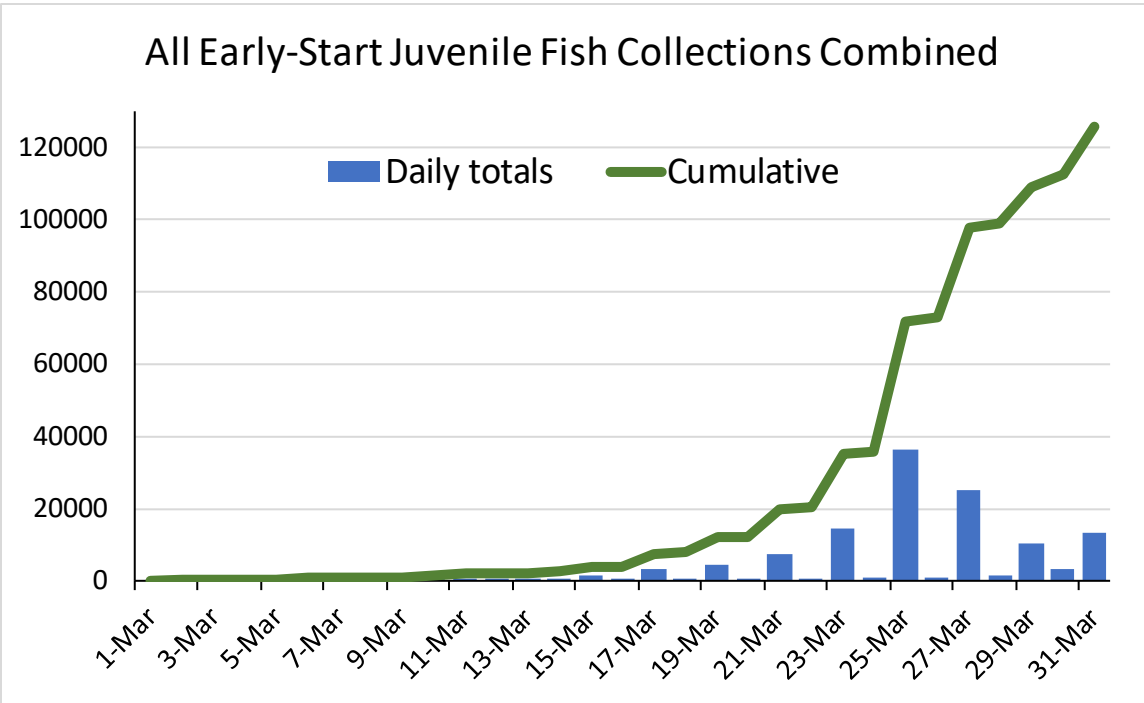


Figure 2. Cumulative and daily total of smolt collection at NWW Projects (top) and cumulative proportion of all smolt collections (bottom) during March early start-up.

Chinook salmon made up the highest proportion of PIT-tagged juveniles detected at all locations during all years of early start. Hatchery steelhead were the second highest detected at all locations during all years, except at McNary in 2020 and 2022 where wild steelhead made up the 2nd highest proportion of detections (Figure 3).

Juvenile lamprey passage index is not calculated at any smolt monitoring facility and total collection is not estimated at Lower Granite Dam. Therefore, juvenile lamprey passage was tabulated utilizing the number collected in the sample (Table 2). The number of juvenile lamprey collected at McNary in 2020 may have been influenced by a significant flood event in February.

The 2020 Columbia River System Biological Opinion calls for off-season surface spill in the fall and the spring at all NWW dams to reduce take of overshooting adult steelhead. Spring spill to support adult steelhead passage occurred through the TSW at McNary Dam during 18 days in March of 2020, through the RSW at Lower Granite Dam 3 days per week on non-consecutive days for 13 days during March, 2021, and on 14 days at Lower Monumental Dam during March 2023. The number of adult steelhead observed at the JFF separator (fallback fish) varied by year and location (Figure 4). Only about 7% of PIT-tagged juveniles and approximately 60% of PIT-tagged adults were detected over the Lower Granite Dam RSW in March. No overshoot PIT-tagged steelhead were detected within the Lower Granite Dam juvenile bypass system in March of 2021 (Table 3). However, four adult steelhead fallbacks were detected crossing the RSW, a single fish from Lyons Ferry and three from the Tucannon River. Additionally, some of the adult steelhead tagged at Lower Granite Dam as adults fell back and were detected within the Tucannon River. No PIT-tagged adult steelhead were detected within the McNary Dam juvenile bypass system in March of 2022. Four adult PIT-tagged steelhead were detected in the Lower Monumental JBS in 2023, three hatchery fish and one unclipped Tucannon River fish.

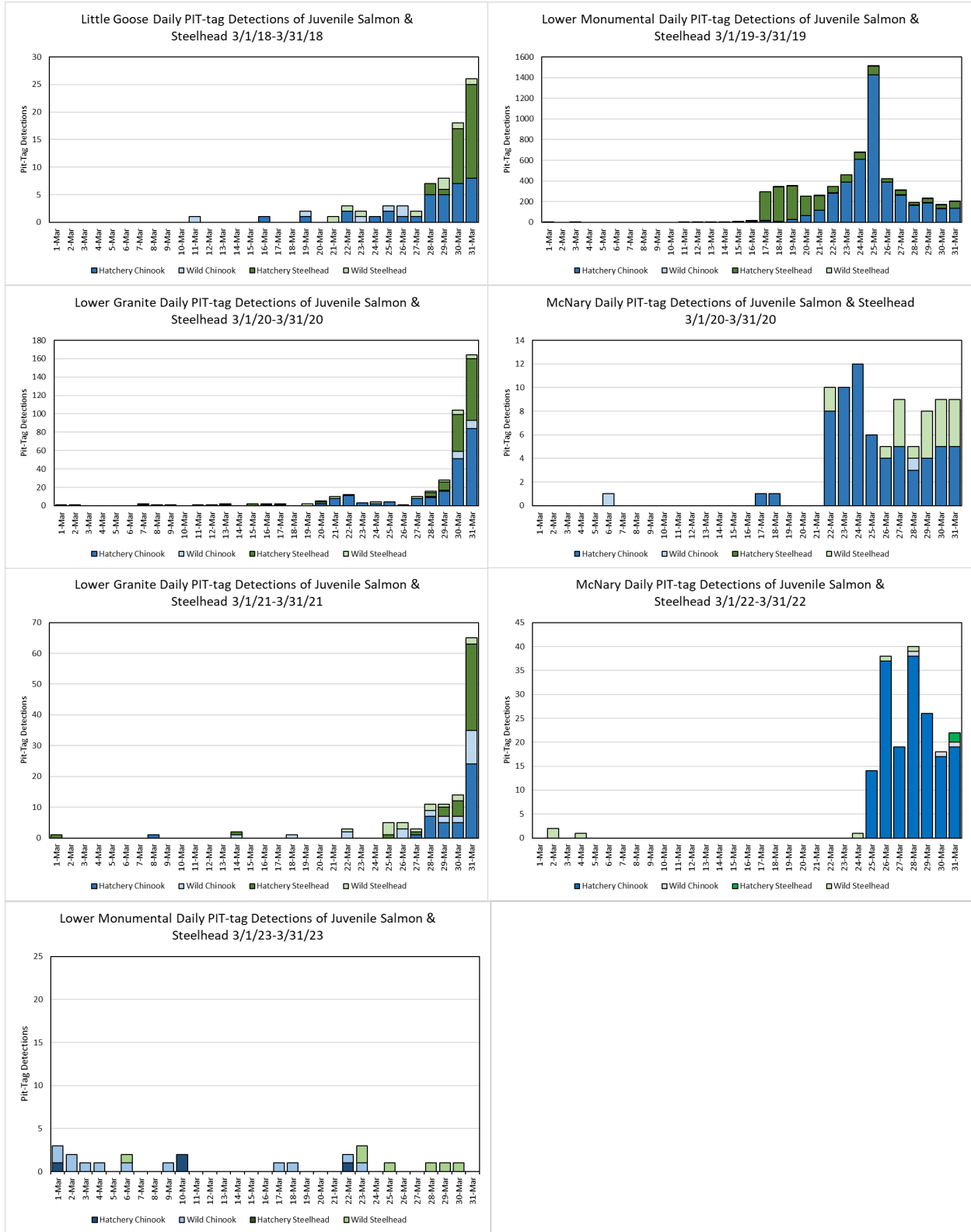


Figure 3. Daily PIT tag detections for hatchery and wild (unclipped) juvenile salmon and steelhead passing NWW Projects during March early start-up.

Table 2. Daily juvenile lamprey sample count at NWW Projects during March early start-up.

	LGS 2018	LMN 2019	LWG 2020	MCN 2020	LWG 2021	MCN 2022	LMN 2023
1-Mar			0		0	0	0
2-Mar	2		1	216	126	0	
3-Mar			2		676	0	
4-Mar	3		20	532	222	36	
5-Mar			7		108	0	0
6-Mar	0		18	976	73	540	
7-Mar			5		53	0	0
8-Mar	2		27	1148	28	1296	
9-Mar			15		32	0	
10-Mar	5		22	908	77	308	6
11-Mar			26		131	0	
12-Mar	2		21	500	84	404	
13-Mar			18		94	0	0
14-Mar	2		14	248	62	328	
15-Mar		2	4		48	0	
16-Mar	9		16	232	46	36	2
17-Mar		2	8		28	0	
18-Mar	24		9	240	43	64	
19-Mar			19		39	0	34
20-Mar	19		15	52	25	68	
21-Mar			12		72	0	
22-Mar	31		14	140	57	44	74
23-Mar			15		53	0	
24-Mar	34		18	56	0	88	
25-Mar			10		625	0	38
26-Mar	15		16	32	603	124	
27-Mar			19		352	0	
28-Mar	4		18	44	239	368	16
29-Mar			9		199	0	
30-Mar	19		19	20	113	84	
31-Mar		3	8		76	0	12
Total	171	7	425	5,344	4,384	3,788	182

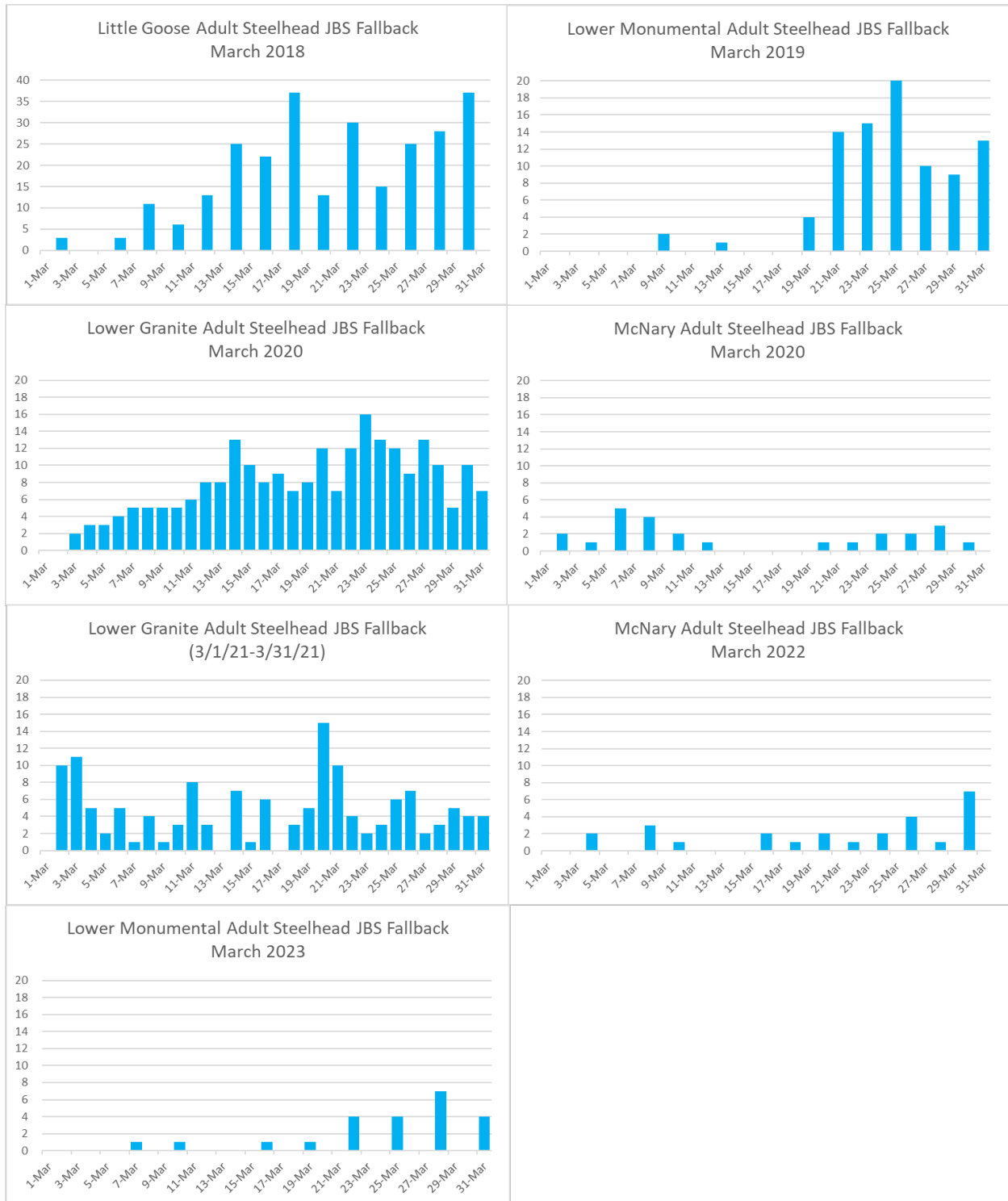


Figure 4. Daily adult steelhead fallback within juvenile bypass systems at NWW Projects during March early start-up.

Table 3. PIT tag detections of adult steelhead fallbacks within juvenile bypass systems at NWW Projects during March early start-up.

	Lower Monumental	McNary	Lower Granite	Lower Granite	McNary	Lower Monumental	Little Goose
Year	2023	2022	2021	2020	2020	2019	2018
Overshoots	0	0	0	9	3	3	15
Unknown origin	0	0	25	19	0	5	14
Not overshoots (possible kelt)	4	0	1	0	0	2	3
Total	4	0	26	28	3	10	32

Table 4. Start dates for juvenile fish facility primary bypass and condition samples.

Year	Primary Bypass Start Date					Sample Start Date				
	McNary	Ice Harbor	Lower Monumental	Little Goose	Lower Granite	McNary	Ice Harbor	Lower Monumental	Little Goose	Lower Granite
2023	27-Mar	24-Mar	25-Feb	26-Mar	26-Mar	3-Apr	3-Apr	2-Mar	26-Mar	26-Mar
2022	25-Feb	24-Mar	21-Mar	23-Mar	14-Mar	4-Mar	4-Apr	1-Apr	1-Apr	26-Mar
2021	26-Mar	24-Mar	25-Mar	22-Mar	22-Feb	3-Apr	1-Apr	2-Apr	2-Apr	2-Mar
2020	1-Mar	23-Mar	23-Mar	12-Mar	20-Feb	2-Mar	2-Apr	1-Apr	1-Apr	2-Mar
2019	28-Mar	21-Mar	16-Feb	25-Mar	8-Mar	5-Apr	1-Apr	9-Mar	2-Apr	26-Mar
2018	26-Mar	28-Mar	19-Mar	20-Feb	15-Mar	3-Apr	3-Apr	2-Apr	2-Mar	2-Apr
2017	29-Mar	22-Mar	21-Mar	20-Mar	20-Mar	7-Apr	2-Apr	2-Apr	2-Apr	26-Mar
2016	29-Mar	24-Mar	23-Mar	22-Mar	21-Mar	7-Apr	4-Apr	2-Apr	1-Apr	26-Mar
2015	30-Mar	18-Mar	24-Mar	24-Mar	17-Mar	9-Apr	6-Apr	4-Apr	2-Apr	26-Mar
2014	28-Mar	17-Mar	25-Mar	17-Mar	20-Mar	7-Apr	2-Apr	1-Apr	2-Apr	26-Mar
2013	26-Mar	12-Mar	21-Mar	19-Mar	18-Mar	7-Apr	8-Apr	1-Apr	3-Apr	26-Mar
2012	29-Mar	19-Mar	21-Mar	19-Mar	21-Mar	11-Apr	2-Apr	1-Apr	2-Apr	26-Mar
2011	27-Mar	23-Mar	14-Mar	22-Mar	21-Mar	1-Apr	11-Apr	1-Apr	1-Apr	26-Mar
2010	1-Apr	8-Mar	23-Mar	23-Mar	18-Mar	1-Apr	5-Apr	1-Apr	1-Apr	26-Mar
2009	31-Mar	16-Mar	18-Mar	25-Mar	23-Mar	1-Apr	7-Apr	1-Apr	1-Apr	26-Mar
2008	31-Mar	17-Mar	19-Mar	24-Mar	25-Mar	1-Apr	4-Apr	1-Apr	1-Apr	26-Mar
2007	28-Mar	5-Mar	19-Mar	26-Mar	20-Mar	1-Apr	10-Apr	1-Apr	1-Apr	26-Mar
2006	30-Mar	2-Mar	14-Mar	20-Mar	20-Mar	1-Apr	7-Apr	1-Apr	1-Apr	26-Mar
2005	28-Mar	24-Mar	15-Mar	28-Mar	25-Mar	2-Apr	6-Apr	1-Apr	1-Apr	25-Mar
2004	1-Apr	12-Mar	10-Mar	22-Mar	25-Mar	1-Apr	2-Apr	1-Apr	1-Apr	25-Mar
2003	31-Mar	17-Mar	24-Mar	18-Mar	19-Mar	1-Apr	8-Apr	2-Apr	2-Apr	26-Mar
2002	1-Apr	20-Mar	27-Mar	25-Mar	19-Mar	3-Apr	9-Apr	3-Apr	2-Apr	26-Mar
2001	28-Mar	19-Mar	22-Mar	27-Mar	19-Mar	2-Apr	10-Apr	2-Apr	2-Apr	26-Mar
2000	31-Mar	21-Mar	28-Mar	23-Mar	13-Mar	1-Apr	4-Apr	2-Apr	2-Apr	26-Mar
1999	29-Mar	22-Mar	23-Mar	23-Mar	16-Mar	30-Mar	6-Apr	2-Apr	2-Apr	26-Mar
1998	26-Mar	30-Mar	23-Mar	24-Mar	17-Mar	30-Mar	10-Apr	2-Apr	2-Apr	27-Mar
1997	17-Mar	1-Apr	24-Mar	20-Mar	17-Mar	5-Apr	8-Apr	2-Apr	2-Apr	27-Mar
1996	18-Apr	1-Apr	14-Mar	25-Mar	7-Mar	19-Apr	19-Apr	2-Apr	2-Apr	28-Mar
1995	23-Mar	31-Mar	1-Apr	23-Mar	20-Mar	28-Mar		2-Apr	2-Apr	29-Mar
1994	1-Apr	15-Mar	15-Mar	15-Mar	16-Mar	9-Apr		7-Apr	6-Apr	6-Apr
1993	14-Apr	1-Mar	25-Apr	8-Mar	11-Mar	15-Apr		4-May	16-Apr	15-Apr
1992						26-Mar			13-Apr	2-Apr
1991						26-Mar		2-Apr	4-Apr	28-Mar
1990						2-Apr		26-Mar	13-Apr	27-Mar
1989						24-Mar		26-Mar	4-Apr	25-Mar
1988						25-Mar		26-Mar	7-Apr	25-Mar
1987						27-Mar		27-Mar	2-Apr	26-Mar
1986						26-Mar		25-Mar	29-Mar	26-Mar
1985						29-Mar		23-May	29-Mar	27-Mar