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MEMORANDUM

TO: Fish Passage Advisory Committee

Michele DeHart

FROM: Michele DeHart

DATE: July 5, 2018

SUBJECT: Summary of Smolt Monitoring Program and PIT-tag data from Little Goose and John Day dams from March 2018.

In March of 2017, the U.S. District Court for the District of Oregon issued an order for injunctive relief that included earlier operation of the juvenile bypass system (JBS) and related PIT-Tag detection systems at FCRPS projects. The original desire was to start with early monitoring at Lower Granite Dam in the Snake River and McNary Dam in the Mid-Columbia River in 2018. However, due to construction at these two sites, this was not possible. After conversations with the Corps of Engineers, FPAC submitted a Joint Technical Staff Memorandum to the Fish Passage Operations and Maintenance Coordination Team (FPOM) recommending that earlier sampling in 2018 would occur at Little Goose Dam (LGS) on the Snake River and John Day Dam (JDA) in the Mid-Columbia (FPAC 2017). In response to your request, the Fish Passage Center (FPC) staff has summarized the data collected in March 2018 under the Smolt Monitoring Program (SMP) at LGS and JDA dams. In addition, FPC staff summarized March PIT-tag detection data at these two sites. Below is a summary of our findings, followed by a more detailed discussion.

- March sampling at LGS and JDA was every-other-day. Therefore, collections in March were estimated by interpolating between sample and non-sample days in order to get a more accurate estimate of the number of fish passing through the juvenile bypass systems at these sites in the month of March.
- At Little Goose, yearling Chinook, steelhead, unmarked sockeye (kokanee), and lamprey juveniles were the most abundant species in March 2018. Many of the yearling Chinook smolts that were sampled at LGS in March 2018 were holdover fall Chinook.

- A total of 29 PIT-tagged steelhead kelts were detected as they passed through the JBS at LGS in March 2018. Had the JBS not been operational, these kelts would likely have passed through the turbines, as there was virtually no spill at LGS in March 2018.
- At John Day, unmarked steelhead, unmarked coho, unmarked subyearling Chinook (fry), and Pacific lamprey macrophthalmia were the most abundant species encountered in March 2018. Similar to LGS, the majority of the unmarked yearling Chinook smolts that were sampled at JDA in March 2018 were holdover fall Chinook.
 - Large numbers of hatchery yearling Chinook smolts were observed in mid- to late March. Based on PIT-tag data, these were likely yearling fall Chinook from Bonneville Hatchery that were released into the Umatilla River in February.
- No PIT-tagged steelhead kelts were detected in the JBS at JDA in March 2018. The lack of detections in March may be due to the fact that turbine outages at JDA necessitated some level of spill throughout most of March so steelhead kelts had an alternative route of passage.

Little Goose Dam

Methods

Sampling for the SMP began at Little Goose Dam (LGS) on March 2, 2018 and continued on an every-other-day basis until the start of transportation in late April. For this request, FPC staff summarized collection counts for juvenile salmonids and lamprey from the March 2018 sampling. The collection is an estimate of the number of fish entering the juvenile bypass system (JBS). This is a more appropriate assessment of juvenile passage than the sample count, as the collection count accounts for daily sample rates. We did not use estimates of passage index for this request because there was very little spill in March 2018 and, therefore, passage indices at LGS would have been virtually identical to estimates of collection. Since sampling was every-other-day at this project, collection counts for non-sample days were interpolated based on the collection on the day before and the day after. As part of the SMP, all salmonids are enumerated based on whether they are clipped or unclipped. In addition, all unclipped Chinook, sockeye, and coho are scanned for coded-wire-tags at LGS in order to further assess rearing disposition. Unclipped steelhead are examined for eroded fins (EF), which is often associated with hatchery rearing. Based on this information, we estimated weekly collection totals for hatchery (clipped or unclipped-CWT for Chinook, coho, and Sockeye; clipped or unclipped-EF for steelhead) and unmarked salmonids.

As with the JBS, the PIT-tag detection system at LGS was also started in early March 2018. To get an idea of what fish may have been passing through the JBS during this time, the FPC staff summarized the PIT-tag detection data for this period. For this summary, we included detections of both juvenile and adult salmonids in the bypass system.

Results

Yearling Chinook, steelhead, unmarked sockeye (likely kokanee), and lamprey were the most abundant species encountered at LGS in March 2018 (Table 1, Figure 1). Collections for all four of these species appeared to increase with time. For example, by the last week (March

22-31), the collection totals for hatchery and unmarked yearling Chinook were approximately 400 and 350, respectively (Table 1). For the first three weeks of March, a large proportion of the yearling Chinook encountered at LGS were actually holdover Fall Chinook (Table 1). The unmarked sockeye collected at LGS in March are likely kokanee from Dworshak reservoir, as Dworshak Dam spilled water from January through April to meet flood control elevations. There was a very large increase in passage of unmarked sockeye/kokanee in the final week, with a total collection of approximately 1,560 (Table 1). Very few coho, subyearling Chinook, and hatchery sockeye were collected at LGS in March 2018. Finally, Pacific lamprey macrophthalmia collections increased substantially in the last week, with a total collection of approximately 1,140 (Table 1).

Table 1. Estimated weekly collection totals for yearling Chinook (CH1), steelhead (ST), coho (CO), sockeye (SO), subyearling Chinook (CH0), and Pacific lamprey juveniles (Lamp.) at Little Goose Dam, by rear type (or life stage), in March 2018. Numbers in parentheses represent the proportion of the weekly yearling Chinook collection that were holdover fall Chinook.

Species	Rear Type or Life Stage	March 1-7	March 8-14	March 15-21	March 22-31
CH1	Hatchery	11 (0.64)	11 (0.68)	16 (0.47)	402 (0.02)
	Unmarked	20 (0.73)	81 (0.91)	109 (0.84)	356 (0.24)
ST	Hatchery	9	9	36	576
	Unmarked	46	47	99	227
CO	Hatchery	0	0	0	0
	Unmarked	0	0	2	0
SO*	Hatchery	2	0	2	6
	Unmarked	44	56	53	1,557
CH0	Hatchery	0	0	0	0
	Unmarked	0	0	0	0
Lamp.	Amm.	2	0	25	266
	Macrop.	8	20	91	1,136

* Sockeye encountered in March 2018 were likely kokanee from Dworshak reservoir.

Table 2 provides a summary of the PIT-tag detection data from March 2018 at LGS. The juvenile detection data complement the data from the SMP, as there was a mixture of wild and hatchery yearling Chinook and steelhead, including detections of holdover fall Chinook (13W) (Table 2). In addition, it appears that the majority of the late arriving hatchery yearling Chinook were summer Chinook from Clearwater hatchery, which were first detected at LGS on March 22nd.

A total of 29 adult steelhead kelts were detected by the JBS PIT-tag detection system at LGS in March of 2018. The detection of steelhead kelts occurred throughout the entire month of March, with the earliest detection occurring on March 4th. Of these, 28 had detections at Lower Granite Dam in the late summer or fall of 2017 (or earlier). The one exception to this was a hatchery steelhead adult from Lyons Ferry Hatchery that was detected at Bonneville and McNary

in August and September of 2017 but never detected as an adult at Lower Granite. This steelhead adult was detected in the JBS at LGS on March 10, 2018. The detection of steelhead kelts in the JBS at LGS is important to note for two reasons: 1) these kelts were likely not part of the SMP data presented above (Table 1) and 2) had the JBS not been operational in March, these kelts would likely have passed through the turbines at LGS, as the powerhouse was the only route of passage available at this time.

Table 2. Summary of LGS juvenile bypass PIT-Tag detections in March 2018.

Life Stage	SRRT	Tag Site	Release Site	Number of Detects
Juvenile	11H	Clearwater Hatchery	Selway River	5
		Sweetwater Springs AP (NPTH)	Lolo Creek	3
			Newsome Creek	1
	12H	Clearwater Hatchery	Powell Pond	17
	11W	Grande Ronde Trap	Grande Ronde Trap	1
	15W	Snake River 4	Snake River 4	1
	13W	Clearwater River	Clearwater River	4
	32H	Dworshak NFH	Dworshak NFH	2
		Niagara Spring Hatchery	Snake River (HCD)	10
		Snake River Trap	Snake River Trap	2
	32W	Asotin Creek	Asotin Creek	2
		Grande Ronde Trap	Grande Ronde Trap	1
		Imnaha River Trap	Imnaha River Trap	2
		Lolo Creek Trap	Lolo Creek Trap	2
Adult (kelts)	32H	Lower Granite Ladder	Lower Granite Ladder	1
		Lyons Ferry Hatchery	Dayton Pond	1
			Lyons Ferry Hatchery	3
			Tucannon River	1
	32U	Bonneville AFF	Bonneville AFF	4
	32W	Lower Granite Ladder	Lower Granite Ladder	17
	34H	Columbia River 2	Columbia River 2	2

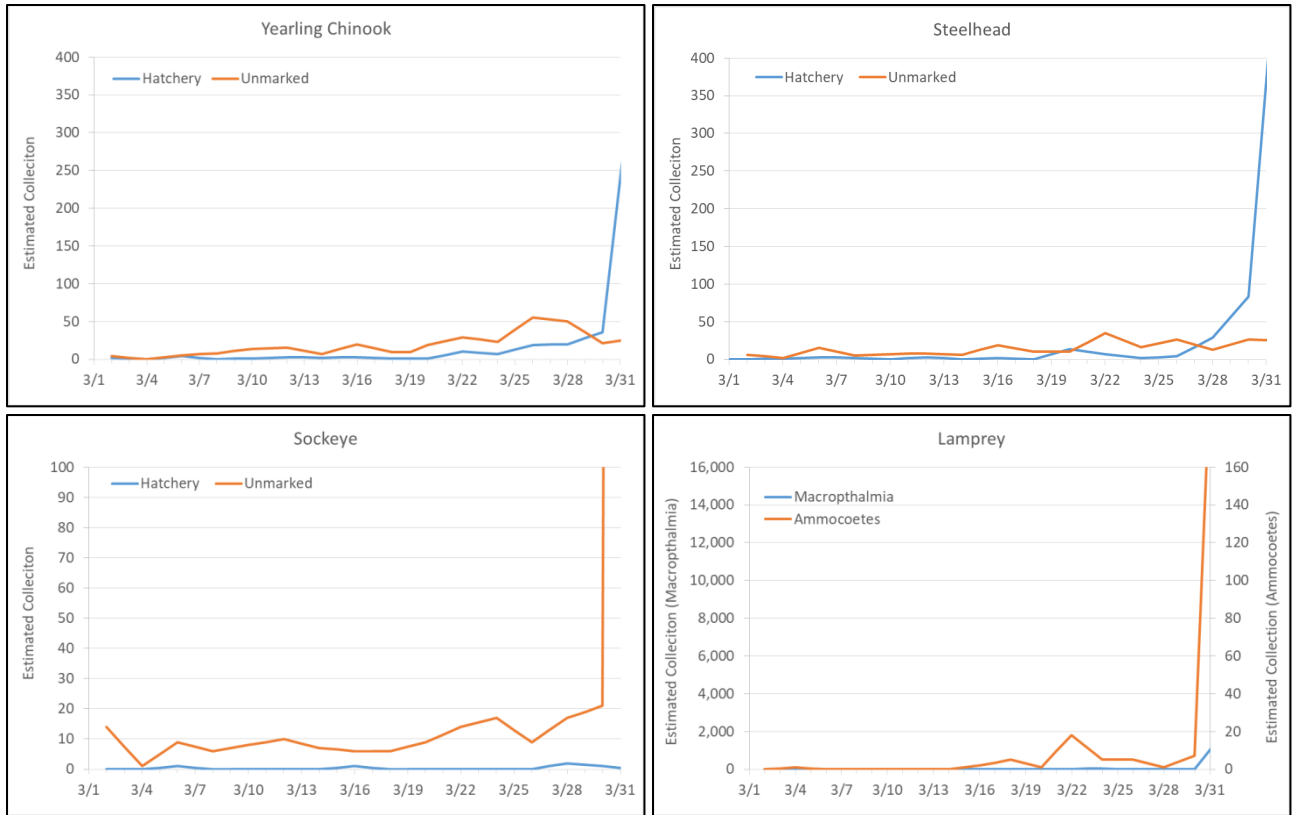


Figure 1. Daily collections of yearling Chinook, steelhead, sockeye, and Pacific lamprey (macrophthalmia and ammocoetes) juveniles at LGS in March 2018. The estimated collection for unmarked sockeye on March 31, 2018 was 1,419. Note the different scales for the y-axes.

John Day Dam

Methods

Sampling for the SMP began at John Day Dam (JDA) on March 1, 2018 and continued on an every-other-day basis. FPC staff summarized collection counts for juvenile salmonids and lamprey from the March 2018 sampling. Since sampling was every-other-day at this project, collection counts for non-sample days were interpolated based on the collection on the day before and the day after. As part of the SMP, all salmonids are enumerated based on whether they are clipped or unclipped. Unlike at LGS, SMP personnel at JDA do not examine unclipped Chinook, sockeye, or coho for coded-wire-tags. However, unclipped steelhead are examined for eroded fins (EF), which is often associated with hatchery rearing. Based on this information, we estimated weekly collections for hatchery (clipped for Chinook, coho, and Sockeye; clipped or unclipped-EF for steelhead) and unmarked salmonids.

The PIT-tag detection system at JDA also started in early March 2018. Similar to what was done for LGS, the FPC staff summarized the PIT-tag detection data for this period, including detections of both juvenile and adult salmonids in the bypass system.

Results

Yearling Chinook, unmarked steelhead, unmarked coho, unmarked subyearling Chinook (fry), and Pacific lamprey macrophthalmia were the most abundant species encountered at JDA in March 2018 (Table 3, Figure 2). Collections for yearling Chinook increased substantially as the month progressed. By the last week (March 22-31), the collection total for hatchery yearling Chinook at JDA was as high as 17,000 (Table 3). In addition, a large proportion of the unmarked yearling Chinook encountered at JDA were holdover fall Chinook (Table 3). The proportion of unmarked yearling Chinook that were holdovers seemed to decrease as the month progressed. Very few hatchery steelhead, hatchery coho, sockeye, and hatchery subyearling Chinook smolts were collected at JDA in March 2018. All of the unmarked subyearling Chinook smolts that were collected in March 2018 were fry. Finally, weekly collection totals for Pacific lamprey macrophthalmia were quite high, with an estimated weekly total collection as high as 44,700 in a single week (Table 3, Figure 2). In fact, there was one day (March 19th) where the total collection for Pacific lamprey macrophthalmia was nearly 16,000 fish (Figure 2).

Table 3. Estimated weekly collection totals for yearling Chinook (CH1), steelhead (ST), coho (CO), sockeye (SO), subyearling Chinook (CH0), and Pacific lamprey juveniles (Lamp.) at John Day Dam, by rear type (or life stage), in March 2018. Numbers in parentheses represent the proportion of the weekly collection that were holdover fall Chinook (for CH1) or fry (for unmarked CH0).

Species	Rear Type or Life Stage	March 1-7	March 8-14	March 15-21	March 22-31
CH1	Hatchery	123 (0.0)	2,683 (0.0)	13,140 (0.0)	17,055 (0.0)
	Unmarked	155 (1.0)	183 (0.84)	248 (0.62)	330 (0.50)
ST	Hatchery	10	0	0	0
	Unmarked	28	20	105	430
CO	Hatchery	0	0	0	0
	Unmarked	0	3	48	200
SO	Hatchery	0	0	0	0
	Unmarked	0	0	0	0
CH0	Hatchery	0	0	0	0
	Unmarked	25 (1.0)	0	205 (1.0)	85 (1.0)
Lamp.	Amm.	8	3	135	75
	Macrop.	9,240	2,278	44,695	7,325

Table 4 provides a summary of the PIT-tag detection data from March 2018 at LGS. From the PIT-tag data, it appears that the majority of the hatchery yearling Chinook that were collected in March 2018 were likely yearling fall Chinook that were reared at Bonneville Hatchery and released from the Pendleton Acclimation Facility (Umatilla River) in late February of 2018. Detections of these hatchery fall Chinook juveniles first began on March 10th.

Unlike LGS, no steelhead kelts were detected by the JBS PIT-tag detection system at JDA in March of 2018. It is worth noting that, unlike LGS, spill was provided at JDA for nearly all of March 2018. This spill may have facilitated passage of steelhead kelts at JDA.

Table 4. Summary of JDA juvenile bypass PIT-Tag detections in March 2018.

Life Stage	SRRT	Tag Site	Release Site	Number of Detects
Juvenile	11W	Umatilla River	Umatilla River	6
	12W	Columbia River 8	Columbia River 8	1
	13H	Bonneville Hatchery	Pendleton AP	42
	13W	Clearwater River	Clearwater River	2
	25H	Prosser Hatchery	Prosser Hatchery	3
	32H	Lyons Ferry Hatchery	Dayton AP	1
	32W	Birch Creek, Umatilla R.	Birch Creek	2
		SF John Day River	SF John Day River	1
		Meacham Creek, Umatilla R.	Meacham Creek	1
		Three Mile Falls, Umatilla R.	Umatilla River	4
		Touchet River	Touchet River	12
		Tucannon River	Tucannon River	2
		Umatilla River	Umatilla River	1

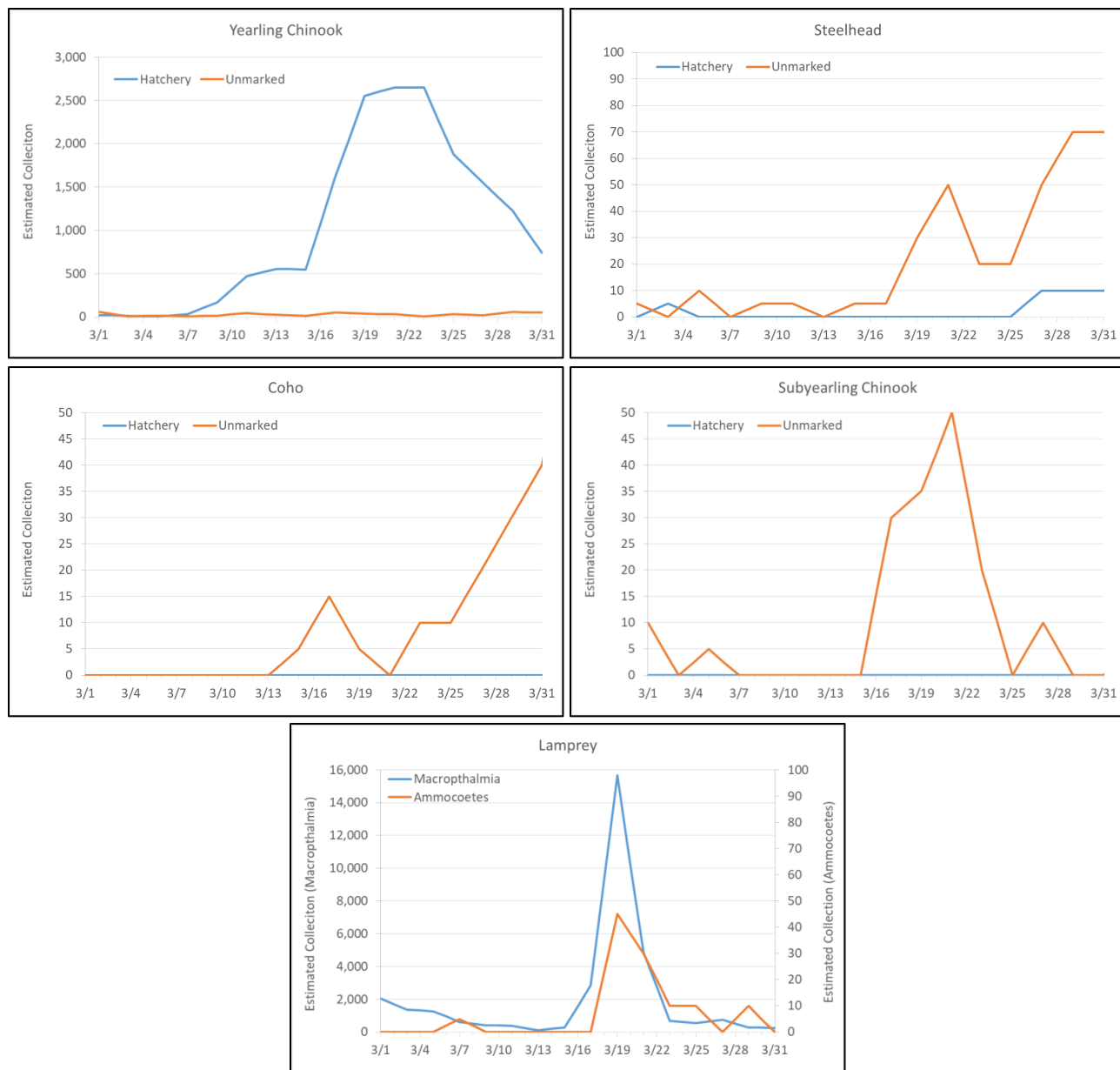


Figure 2. Daily collections of yearling Chinook, steelhead, coho, subyearling Chinook, and Pacific lamprey (macrophthalmia and ammocoetes) juveniles at JDA in March 2018. Note the different scales for the y-axes.

Literature Cited:

Fish Passage Advisory Committee. 2017. Early juvenile bypass system operation implementation – updated recommendation. State, Federal and Tribal Fishery Agencies Joint Technical Staff Memorandum. October 10, 2017 memorandum to the Fish Passage Operations and Maintenance Coordination Team (http://www.fpc.org/documents/joint_technical/47-17.pdf).