



# **Yakama Nation Adult Pacific Lamprey Collection in the Columbia River Basin, 2018**

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(Cover Photo: Lamprey resting boxes installed in front of the public viewing window at Bonneville Dam Washington Shore Ladder with one adult lamprey attaching to the window on June 27, 2018.)

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## Highlights

- This report summarizes the Yakama Nation Fisheries adult Pacific Lamprey collection (trapping and transporting) in 2018 from the Lower Columbia River hydroelectric projects, specifically Bonneville, The Dalles, and John Day dams.
- In 2018, the maximum numbers allocated for Bonneville, The Dalles, and John Day dams were calculated to be 2,060, 1,056, and 829, respectively, totaling 3,945 for each of the four CRITFC member tribes.
- In total, 1619 adult lamprey (645 from Bonneville Dam, 173 from The Dalles Dam, and 801 from John Day Dam) were collected, which was within the 2018 allocation guideline number. We had a total of 39 mortalities with a mortality rate of 2.4%.

## Abstract

This report summarizes the adult Pacific Lamprey collection (trapping and transporting) in 2018 from the Lower Columbia River hydroelectric projects, specifically Bonneville, The Dalles, and John Day dams. The translocation of adult lamprey is part of the “Tribal Restoration Plan for the Columbia River Basin” (Tribal Restoration Plan) by Columbia River Inter-Tribal Fish Commission (CRITFC) and the “Yakama Nation Pacific Lamprey Action Plan” by Yakama Nation Fisheries (YNF). The purpose of translocation is to use it as a tool to help enhance Pacific Lamprey subpopulations in the Yakama Nation Ceded Lands, primarily in the Yakima, Wenatchee, and Methow subbasins.

Allocation each year is based upon the average of the two prior years’ estimated Pacific Lamprey run size at Bonneville Dam, as outlined in the Tribal Restoration Plan under “Guidelines for Pacific Lamprey Translocation and/or Artificial Propagation.” In 2018, the maximum numbers allocated for Bonneville, The Dalles, and John Day dams were calculated to be 2,060, 1,056, and 829, respectively, totaling 3,945 for each of the four CRITFC member tribes.

Adult collection for the YNF in 2018 began on June 21, 2018, at Bonneville and John Day dams and was completed on August 13, 2018 (collection continued for all three dams until the last day). In total, 1619 adult lamprey (645 from Bonneville Dam, 173 from The Dalles Dam, and 801 from John Day Dam) were collected, which was within the 2018 allocation guideline number. The peak of the run at Bonneville Dam was late June through mid-July; our collection began just in time before this peak run made its appearance. We had a total of 39 mortalities in 2018 with a mortality rate of 2.4%. Some of the adults were lethargic and appeared to be stressed (white colored belly and sluggish movement and activity), and the majority of these were released immediately upstream of the hydro dam facility where they were collected (to minimize the risk of translocation related mortality).

## Introduction

Prior to the start of the adult Pacific Lamprey translocation work which began in 2012, the Yakima River Pacific Lamprey subpopulations have dwindled severely, extirpated in many of their historical ranges. The translocation of adult lamprey is part of the “Tribal Restoration Plan for the Columbia River Basin (Tribal Restoration Plan)” by Columbia River Inter-Tribal Fish Commission (CRITFC) and the “Yakama Nation Pacific Lamprey Action Plan” by Yakama Nation Fisheries (YNF). These programs clearly describe the need to increase natural production through adult translocation. Translocation of Pacific Lamprey is an opportunity for our program to reintroduce adults back into their natural range throughout the Yakama Nation Ceded Lands waters.

The purpose of translocation is to use it as a tool to help enhance Pacific Lamprey subpopulations in the YN Ceded Lands, primarily in the Yakima, Wenatchee, and Methow subbasins. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) and Nez Perce Tribe (NPT) lamprey programs have proven that translocated Pacific Lamprey have enhanced the production of larvae and juvenile in their translocation streams/rivers, and we have observed significant increases in larval distribution and relative abundance within the YN translocation streams/rivers based on a variety of ongoing monitoring projects (electrofishing larval surveys, irrigation diversion surveys, screw trap monitoring, juvenile fish facility monitoring, and genetic analyses). In addition, after less than 4-5 years of translocation, we have begun to see a large number of juvenile production as well as adult returns within the Yakima Subbasin.

## Allocation

Allocation each year is based upon the average of the two prior years’ estimated Pacific Lamprey run size at Bonneville Dam, as outlined in the Tribal Restoration Plan under “Guidelines for Pacific Lamprey Translocation and/or Artificial Propagation.” These allocation numbers are then submitted to USACE for the permitting processes. The guideline was updated and modified in 2017, and the following two main changes were made: 1) allocation for each tribe increased from 1% to 2% of Bonneville Dam average run size; and 2) Bonneville Dam allocation was modified to “up to 50% of the total allocation,” which equates to 1% from Bonneville Dam. Although the guideline was formally modified and ratified by the intertribal commission in spring 2017, we only incorporated the second change for the 2017 field season (increasing the proportion of Bonneville Dam allocation within the overall allocation). The preliminary maximum number of allocated adults for each of the four CRITFC member tribes in 2018 was 4,121 [ $206,052$  (Bonneville Dam 2-year average run size)  $\times$  2% = 4,121]. The maximum numbers of allocated adults for The Dalles Dam and John Day Dam were 1,056 and 829, respectively (based on the guideline of 10% of 2-year average run sizes; daily counts are doubled to account for night time counts). Due to the 50% collection upper limit for Bonneville Dam, the maximum allocation

number for Bonneville Dam was calculated to be 2,060. As a result, the maximum number allocated for each of the four Columbia River member tribes for all three dams combined was calculated to be 3,945 (Table 1).

In 2018, the CRITFC four member tribes involved in the adult collection set up a 2-month planning schedule (Table 2). Due to the need to share some of the daily collections and facility space with the University of Idaho (who was conducting an adult passage study at the Lower Columbia River dams) at Bonneville Dam, more coordination work was required at the start of the season to ensure the project was carried out smoothly.

**Table 1. Total allocation per tribe for 2018 based on updated Tribal Restoration Plan guidelines (\*guideline was updated in 2017).**

<b>Dam</b>	<b>Allocation</b>
Bonneville	2,060
The Dalles	1,056
John Day	829
<b>Total</b>	<b>3,945</b>

**Table 2. Tribal Pacific Lamprey collection preliminary schedule used during the 2018 season. The small table in the center displays the abbreviations for the CRITFC staff schedule and the small table on the right displays the abbreviations for the four member tribes.**

Day	Date	CRITFC			Project	Pick-up tribe	Trapping days	WS pick-up/tag
Mon	5/28/2018							
Tue	5/29/2018	BS	SL	GE	BON			
Wed	5/30/2018	BS	SL	GE	BON			
Thu	5/31/2018	BS	SL	GE	BON			
Fri	6/1/2018	BS	SL	GE	BON			
Sat	6/2/2018	BS	SL	GE	BON			
Sun	6/3/2018	BS	SL	OFF	BON			
Mon	6/4/2018	BS	SL	OFF	BON	CTUIR	Fri.-Sun.	
Tue	6/5/2018	BS		GE	BON			
Wed	6/6/2018		SL	GE	BON	CTUIR	Mon.-Tues.	
Thu	6/7/2018	BS	SL	GE	BON			
Fri	6/8/2018	BS	SL	GE	BON		Wed.-Thurs.	
Sat	6/9/2018	BS	SL	OFF	BON			
Sun	6/10/2018	BS	OFF	GE	BON			
Mon	6/11/2018	BS	SL		BON	CTUIR	Fri.-Sun.	
Tue	6/12/2018	BS	SL	GE	BON			
Wed	6/13/2018		SL	GE	BON	NPT	Mon.-Tues.	
Thu	6/14/2018	OFF	SL	GE	BON			
Fri	6/15/2018	BS		GE	BON	CTUIR	Wed.-Thurs.	
Sat	6/16/2018	BS	SL		BON			
Sun	6/17/2018	BS	SL	GE	BON			
Mon	6/18/2018		SL	GE	BON-TDA-JDD	CTUIR	Fri.-Sun.	WS
Tue	6/19/2018		SL	GE	BON-TDA-JDD			WS
Wed	6/20/2018	BS		GE	BON-TDA-JDD	NPT	Mon.-Tues.	WS
Thu	6/21/2018	BS		GE	BON-TDA-JDD			WS
Fri	6/22/2018	BS	SL		BON-TDA-JDD	CTUIR	Wed.-Thurs.	
Sat	6/23/2018	BS	SL		BON-TDA-JDD			
Sun	6/24/2018	BS	SL	GE	BON-TDA-JDD			
Mon	6/25/2018	BS	SL	GE	BON-TDA-JDD	NPT	Fri.-Sun.	WS
Tue	6/26/2018		SL	GE	BON-TDA-JDD			WS
Wed	6/27/2018		SL	GE	BON-TDA-JDD	YN	Mon.-Tues.	WS
Thu	6/28/2018	BS		GE	BON-TDA-JDD			WS
Fri	6/29/2018	BS		GE	BON-TDA-JDD	YN	Wed.-Thurs.	
Sat	6/30/2018	BS	SL		BON-TDA-JDD			
Sun	7/1/2018	BS	SL		BON-TDA-JDD			
Mon	7/2/2018	BS	SL	GE	BON-TDA-JDD	NPT	Fri.-Sun.	WS
Tue	7/3/2018	BS	SL	GE	BON-TDA-JDD			WS
Wed	7/4/2018		SL	GE	BON-TDA-JDD	YN	Mon.-Tues.	WS
Thu	7/5/2018		SL	GE	BON-TDA-JDD			WS
Fri	7/6/2018	BS		GE	BON-TDA-JDD	YN	Wed.-Thurs.	
Sat	7/7/2018	BS		GE	BON-TDA-JDD			
Sun	7/8/2018	BS	SL		BON-TDA-JDD			
Mon	7/9/2018	BS	SL		BON-TDA-JDD	CTUIR	Fri.-Sun.	WS
Tue	7/10/2018	BS	SL	GE	BON-TDA-JDD			WS
Wed	7/11/2018	BS	SL	GE	BON-TDA-JDD	NPT	Mon.-Tues.	WS
Thu	7/12/2018		SL	GE	BON-TDA-JDD			WS
Fri	7/13/2018		SL	GE	BON-TDA-JDD	CTUIR	Wed.-Thurs.	
Sat	7/14/2018	BS		GE	BON-TDA-JDD			
Sun	7/15/2018	BS		GE	BON-TDA-JDD			
Mon	7/16/2018	BS	SL		BON-TDA-JDD	YN	Fri.-Sun.	WS
Tue	7/17/2018	BS	SL		BON-TDA-JDD			WS
Wed	7/18/2018	BS	SL	GE	BON-TDA-JDD	NPT	Mon.-Tues.	WS
Thu	7/19/2018	BS	SL	GE	BON-TDA-JDD			WS
Fri	7/20/2018		SL	GE	BON-TDA-JDD	YN	Wed.-Thurs.	
Sat	7/21/2018		SL	GE	BON-TDA-JDD			
Sun	7/22/2018	BS		GE	BON-TDA-JDD			
Mon	7/23/2018	BS		GE	BON-TDA-JDD	NPT	Fri.-Sun.	WS
Tue	7/24/2018	BS	SL		BON-TDA-JDD			WS
Wed	7/25/2018	BS	SL		BON-TDA-JDD	CTUIR	Mon.-Tues.	WS
Thu	7/26/2018	BS	SL	GE	BON-TDA-JDD			WS
Fri	7/27/2018	BS	SL	GE	BON-TDA-JDD	CTUIR	Wed.-Thurs.	
Sat	7/28/2018		SL	GE	BON-TDA-JDD			
Sun	7/29/2018		SL	GE	BON-TDA-JDD			
Mon	7/30/2018	BS		GE	BON-TDA-JDD	NPT	Fri.-Sun.	WS
Tue	7/31/2018	BS		GE	BON-TDA-JDD			WS

BS	Brian Sharp
SL	Spencer Lejins
GE	Gerald Ellenwood
	Time off
OFF	Requested Time off

NPT	Nez Perce
CTUIR	Umatilla
YN	Yakama
WS	Warm Springs

## Collection

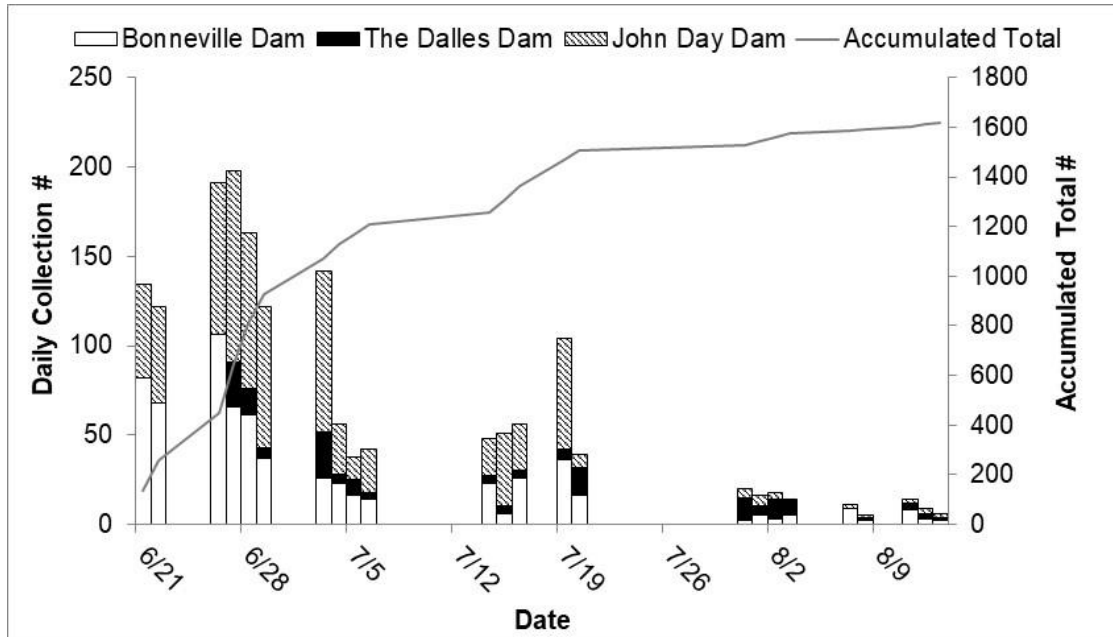
Adult collection for the YNF in 2018 began on June 21, 2018, at Bonneville and John Day dams and was completed on August 13, 2018 (collection continued for all three dams until the last day). In total, 1619 adult lamprey (645 from Bonneville Dam, 173 from The Dalles Dam, and 801 from John Day Dam) were collected, which was within the 2018 allocation guideline number (Fig. 1 and Table 3). The peak of the run at Bonneville Dam was late June through mid-July (Fig. 2); our collection began just in time before this peak run made its appearance. In future years, member tribes will make an effort to collect at an earlier date (mid-May) to ensure we can capture the early run in addition to the peak run.

We had a total of 39 mortalities in 2018 with a mortality rate of 2.4% (Table 3). Some of the adults were lethargic and appeared to be stressed (white colored belly and sluggish movement and activity). From past fish health examinations, many of these were infected with furunculosis. These conditions were observed from various dams and trapping locations, but there were more frequent in some locations (such as the John Day Dam LPS trap and Bonneville Dam AFF trap during part of the season). In 2018, more so than in previous years, we rejected more of these adults with signs of stress (primarily the white colored belly and/or slow movement, but another sign of furunculosis is the red colored mouth). Instead of risking their survival by transporting them a long distance in our transport truck, we felt they would have the highest survival by being released locally (they were released immediately upstream of the dam where they were collected by CRITFC staff).

As in previous years, some of the protocols we followed included: 1) ensure we arrive and leave as early as possible to avoid handling lamprey during the warmest period of the day; 2) minimize the time that lamprey stay in the transport totes (if they can be left in tanks with flowing water, best to leave them there and pick them up on your return trip); 3) avoid filling up the water too high in transport totes as the repetitive extra vibration caused by excess water bouncing off the lid and corners can be stressful to the lamprey (starting with a half full tote will contain it to within 3 quarters full even after we add additional river ice); 4) remove separator buckets if there are no need to separate the lamprey by source (extra source of stress); 5) ensure temperature is lowered adequately during the transport (the goal is to get it near 15-16°C in a timely fashion); and 6) start with high oxygen supply (1.0 ml/L) for 1 hour and shift down to 0.25 to 0.5 ml/L afterwards. Following Tod Sween's (Nez Perce Tribe) advice, ensuring that the oxygen is fully supplied at the beginning before placing the adults (reaching near 100% saturation levels) seem to make a large difference in reducing and minimizing stressed lamprey and associated mortality.

As in previous years, collection was closely monitored and coordinated with the Army Corps of Engineers, Confederated Tribes of the Umatilla Indian Reservation, Nez Perce Tribe, and CRITFC staff. In previous years, a small group of adults (~40) were saved as broodstock for artificial propagation and larval rearing, but due to the new collection from the Prosser Dam

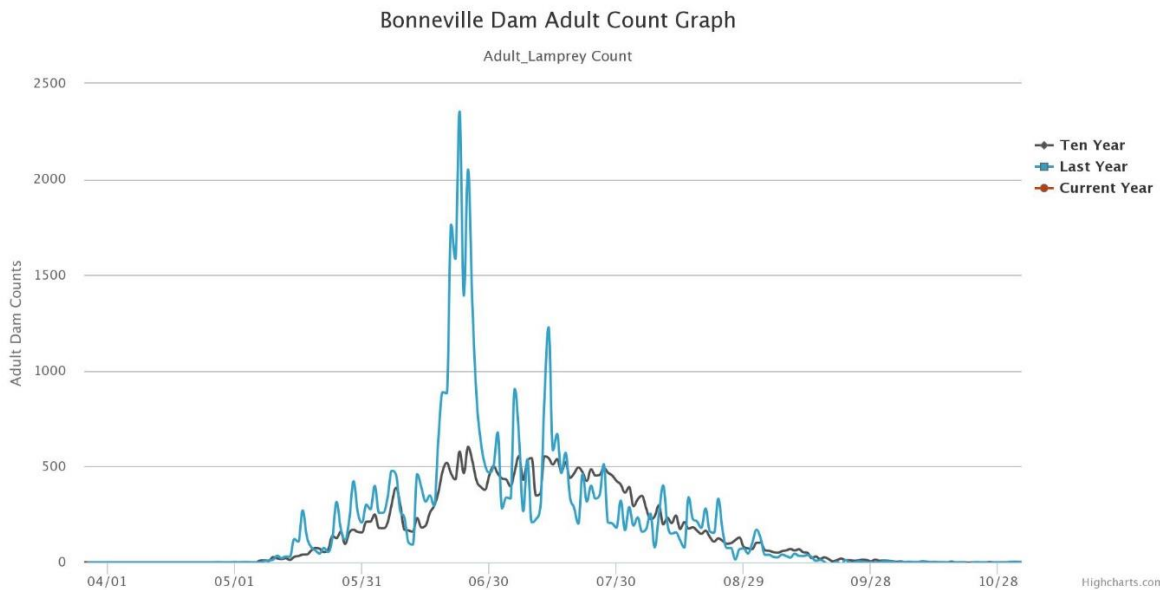
adult passage structures, we were able to use the more local wild run for the artificial propagation work. The majority of our adults are released either during the first summer/fall (2018) or during the second spring (2019) after overwintering into the Yakima Subbasin (Yakima, Ahtanum, Satus, and Toppenish) and other important waters within the Yakama Nation Ceded Lands, including the Wenatchee and Methow subbasins.



**Figure 1. Summary of adult Pacific Lamprey collection numbers (daily and accumulated numbers) from 2018 collection.**

**Table 3. Summary of adult Pacific Lamprey collection data from Columbia River hydro dams (John Day, The Dalles and Bonneville dams) in 2018. Bold dates denotes the dates that Yakama Nation actually physically picked up the lamprey. Hyphen in the trap collection sections indicates no trapping (as opposed to capturing zero lamprey).**

Date	John Day Dam	The Dalles Dam	Bonneville Dam	Daily Total	Morts	Accumulated Total
6/21/2018	52	-	82	134	-	134
<b>6/22/2018</b>	54	-	68	122	12	256
6/26/2018	85	-	106	191	-	447
<b>6/27/2018</b>	107	25	66	198	18	645
6/28/2018	87	15	61	163	-	808
<b>6/29/2018</b>	79	6	37	122	5	930
7/3/2018	90	26	26	142	-	1072
<b>7/4/2018</b>	28	5	23	56	1	1128
7/5/2018	13	9	16	38	-	1166
<b>7/6/2018</b>	24	4	14	42	3	1208
7/14/2018	21	4	23	48	-	1256
7/15/2018	41	4	6	51	-	1307
<b>7/16/2018</b>	26	4	26	56	-	1363
7/19/2018	62	6	36	104	-	1467
<b>7/20/2018</b>	7	16	16	39	-	1506
7/31/2018	5	13	2	20	-	1526
<b>8/1/2018</b>	6	5	5	16	-	1542
8/2/2018	4	11	3	18	-	1560
<b>8/3/2018</b>	0	9	5	14	-	1574
8/7/2018	2	0	9	11	-	1585
<b>8/8/2018</b>	1	2	2	5	-	1590
8/11/2018	2	4	8	14	-	1604
8/12/2018	3	3	3	9	-	1613
<b>8/13/2018</b>	2	2	2	6	-	1619
<b>Total</b>	<b>801</b>	<b>173</b>	<b>645</b>	<b>1619</b>	<b>39</b>	<b>1619</b>



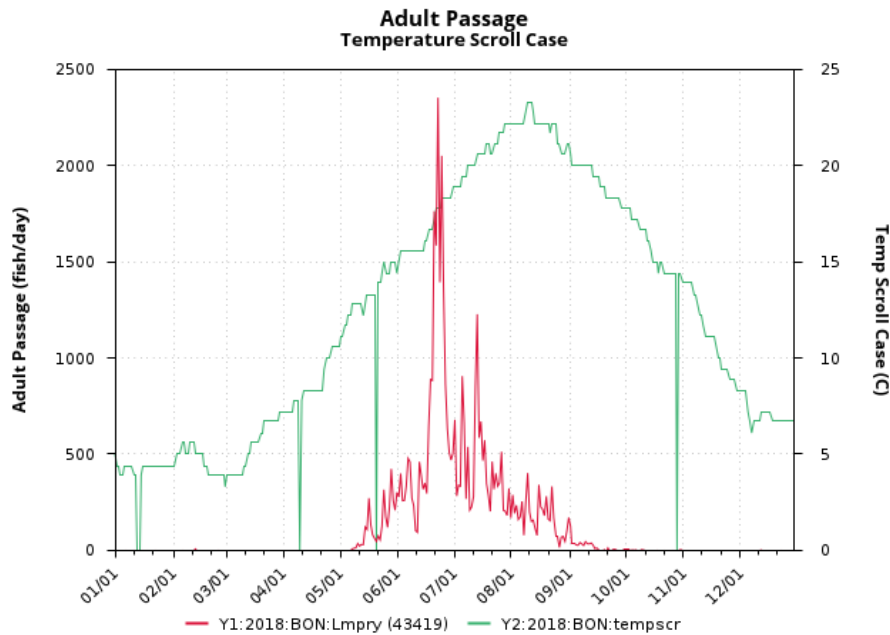
**Figure 2. Summary of adult Pacific Lamprey counts from Bonneville Dam in 2018 (light blue line) in addition to the 10-year average run between 2009 and 2018 (black line).**



## Supplemental Material

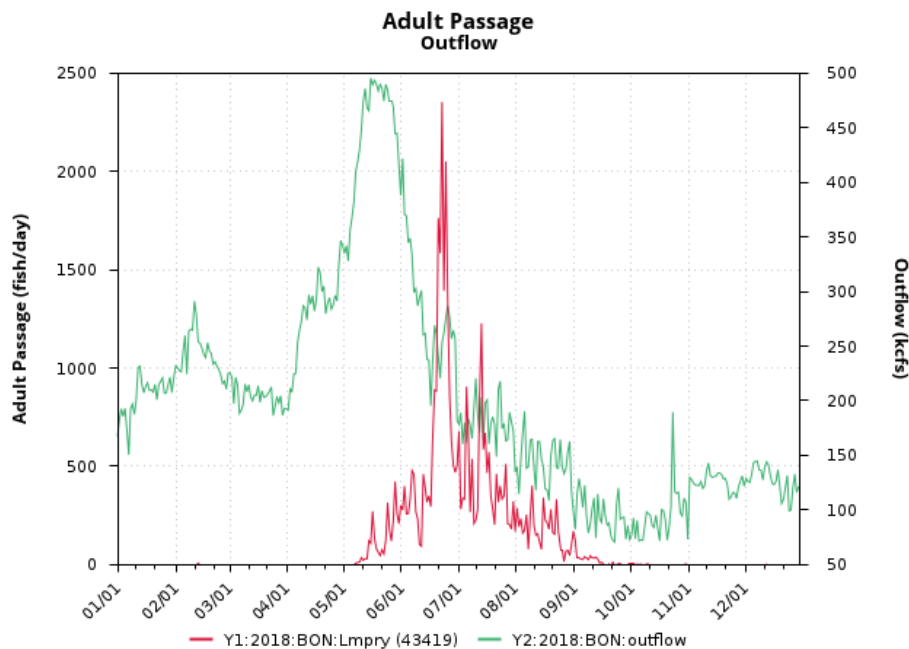
Bonneville Dam 2018 adult Pacific Lamprey counts in relation to environmental variables (temperature, flow, spill, % spill) or a 10-year average run between 1938 and 1947. The peak run appears to be >30 days earlier in 2018 compared to the historical run.

Data source: [http://www.cbr.washington.edu/dart/query/adult\\_graph\\_text](http://www.cbr.washington.edu/dart/query/adult_graph_text)



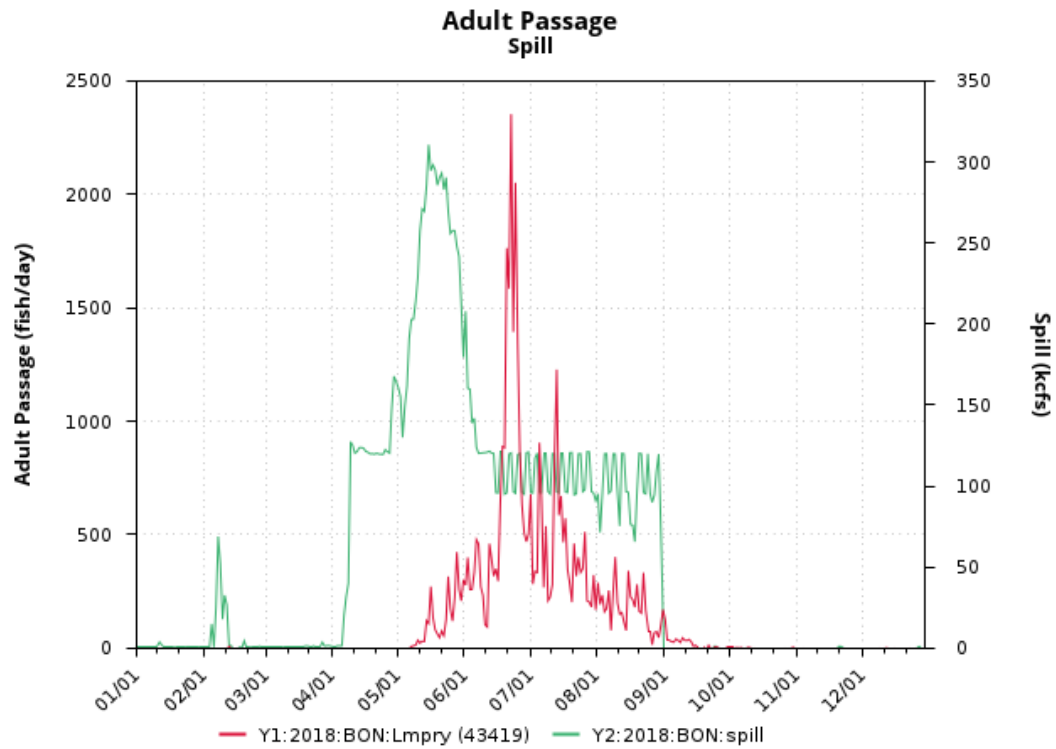
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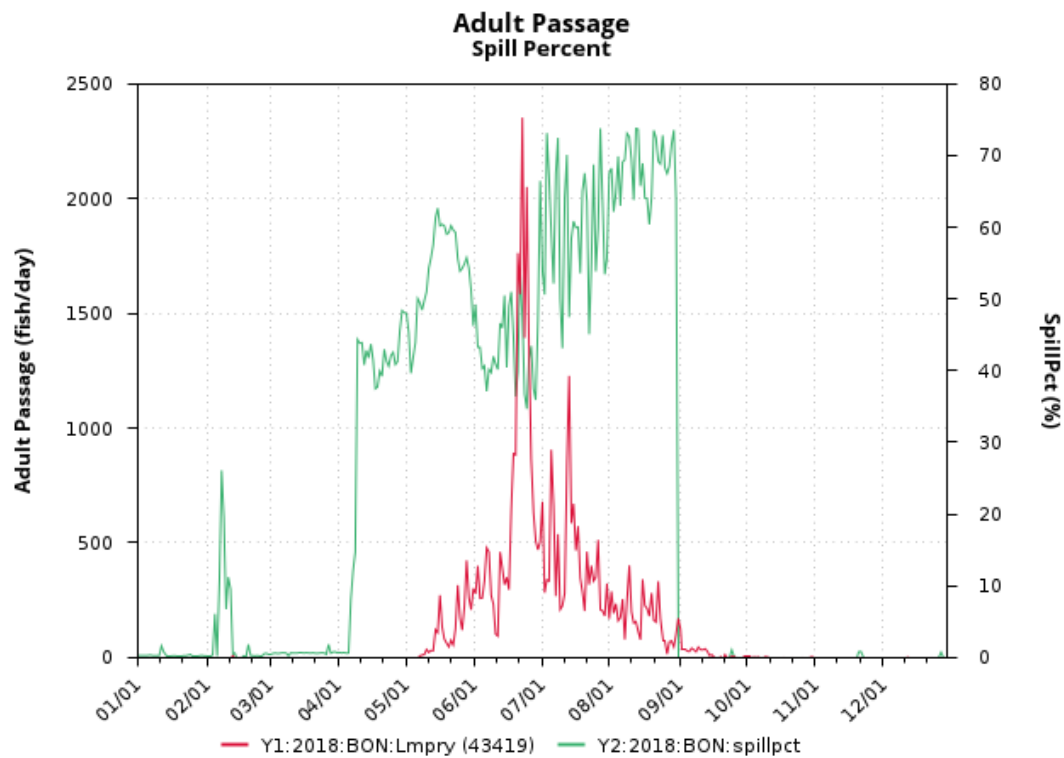
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30 Mar 2019 12:53:54 PDT



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30 Mar 2019 12:52:57 PDT



www.cbr.washington.edu/dart

30 Mar 2019 12:53:28 PDT

### Adult Passage Adult Lamprey 10YrAvg

