2018 ANNUAL FISHWAYS STATUS REPORT

JOHN DAY DAM

Installing a Temporary Dock for 2018 Avian Lines Replacement (December 2017)

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Date: January, 2019

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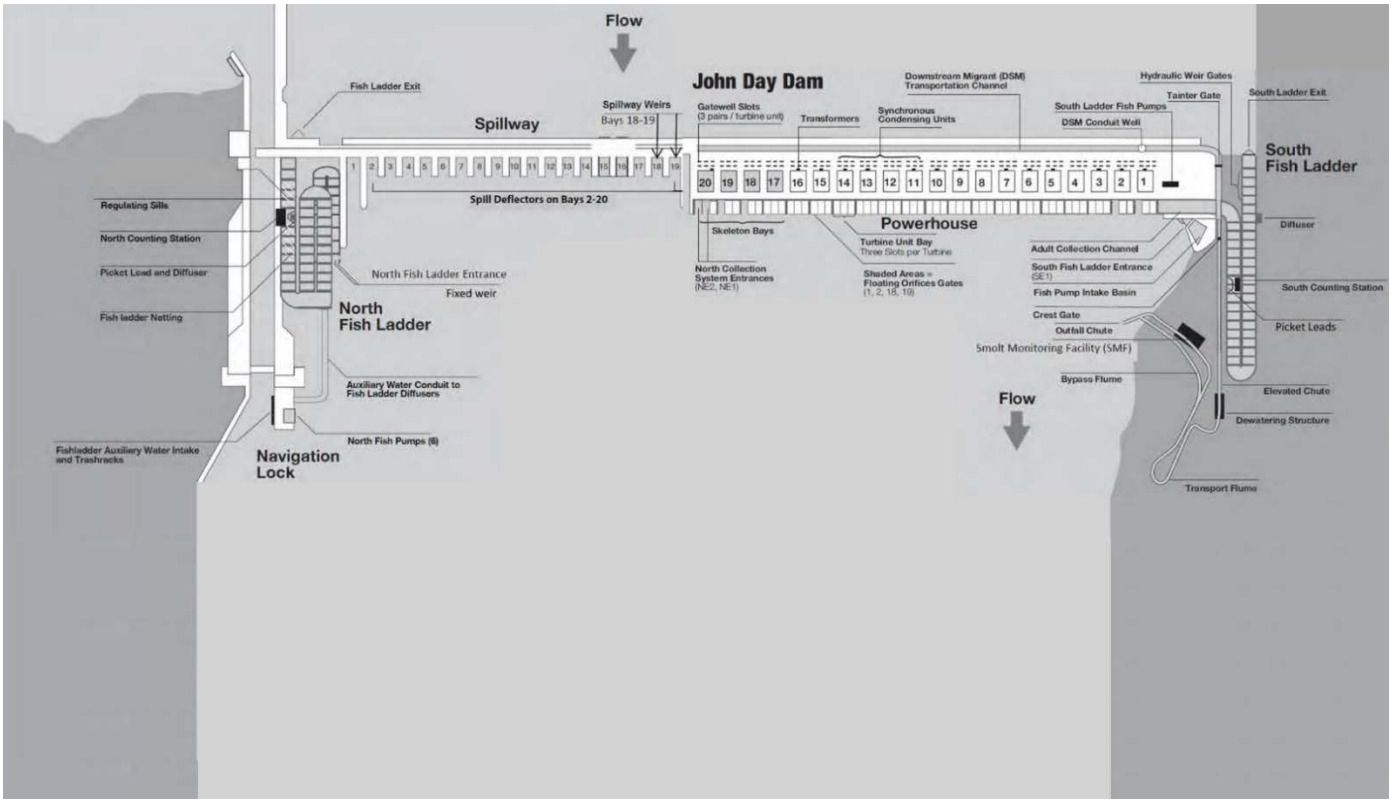

Figure 1: John Day Dam Layout

2018 JOHN DAY FISHWAYS' OPERATING SCHEDULE	
PERFORMANCE STATUS	TIME
NORTH ADULT FISHWAY	
REGULAR OPERATION W/ AWS	January 1st - November 29th
AWS OFF HALF DAY FOR ROV INSP.	August 1st
ON ORIFICE FLOW - NO AWS OPERATION	November 30th - December 3rd
DEWATERED FOR MAINTENANCE	December 3rd - December 31st
SOUTH ADULT FISHWAY	
REGULAR OPERATION W/AWS	[January 1st - January 8th] [February 28th - December 31st]
AWS OFF HALF DAY FOR ROV INSP.	August 1st
DEWATERED FOR MAINTENANCE	January 8th - February 28th
SMOLT MONITORING FACILITY	
DEWATERED FOR MAINTENANCE	[January 1st - February 27th], [November 28th - December 31st]
LIMITED SAMPLING; WATER TEMP > 70F	July 23rd - September 1st
REGULAR SAMPLING MODE (every other day)	[March 1st - July 22nd] and [September 1st - September 15th]
BYPASS FOR PIT DETECTIONS	September 16th-November 28th
JUVENILE BYPASS SYSTEM	
REGULAR OPERATION WITH ALL STSs DEPLOYED	March 1st - December 15th (for kelt protection)
SPILLWAY WITH 2 TSWs (at bay 18 &19)	
ON SEAL	[January 1st - February 5th] [March 31st - April 8th]
FISH SPILL PER FPP SCHEDULE	April 10th - August 31st
1.5 KCFS, BAY 2 ONLY FOR NFL ATTRACTION	September 1st - November 30th
EARLY TSW SPILL (due to HIGH FLOWS)	N/A
ON SEAL	December 1st - December 31st

Table 1: Operating Schedule for John Day Fishways in 2018.

Fishway Inspections' Summary

Adult Fishways and Juvenile Bypass (JBS) were inspected twice per day during the adult fish passage season (March 1st - November 31st), and once per day during the winter maintenance season (December 1st- February 28th. The John Day Dam (JDA) Smolt Monitoring Facility (SMF) inspections were conducted every two hours, 24/7 throughout the juvenile sampling season (April 1st - Sept 15th)

TOTALS FOR :	2018		2017		2016		2015		2014	
	Total #	% OOC	Total #	% OOC	Total #	% OOC	Total #	% OOC	Total #	% OOC
John Day Dam										
Number of inspections	639		640		641		613		634	
NORTH FISHWAY										
Exit differential	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Exit regulating weirs position	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Count station differential	0	0.00%	**2**	**0.31%**	0	0.00%	0	0.00%	0	0.00%
Weir crest depth	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Entrance differential	0	0.00%	0	0.00%	0	0.00%	**1**	**0.16%**	**1**	**0.16%**
SOUTH FISHWAY										
Exit differential	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Exit regulating weirs position	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Count station differential	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Weir crest depth	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
South entrance differential	**1**	**0.16%**	**6**	**0.94%**	**12**	**1.87%**	0	0.00%	0	0.00%
Entrance weir SE1	**3**	**0.47%**	**4**	**0.63%**	**7**	**1.09%**	0	0.00%	**1**	0.16%
Collection channel velocity	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Bay 1 differential	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
N. Entrance PH(Bay 19)differential	**1**	**0.16%**	**3**	**0.47%**	**2**	**0.31%**	0	0.00%	0	0.00%
Entrance weir NE1	**2**	**0.31%**	0	0.00%	**9**	**1.40%**	**5**	**0.82%**	**1**	0.16%
Entrance weir NE2	**2**	**0.31%**	0	0.00%	**5**	**0.78%**	**5**	**0.82%**	**1**	0.16%
JUVENILE PASSAGE										
Forebay/bypass conduit differential	0	0.00%	**10**	**1.56%**	0	0.00%	0	0.00%	0	0.00%
Submersible traveling screens	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Turbine trash rack drawdown	0	0.00%	0	0.00%	0	0.00%	0	0.00%	2	0.32%
Vertical barrier screen drawdown	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Spill volume	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Spill pattern	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Turbine Unit Priority	**7**	**1.10%**	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Turbine 1% Efficiency	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%

Table 2: John Day FPP Criteria Discrepancies 2014-2018

Fish Salvage Procedures

Fishway Dewatering Procedures

During fishways dewaterings, bulkheads were installed and drain valves were opened. After the areas were dewatered, fisheries personnel entered and salvaged any stranded fish (see table 3). Salvaged fish were transported to either the forebay or tailwater (depending on circumstances such as fish species, dewatering location, age class, or stress levels). Follow up inspections were performed to account for any overlooked fish. Efforts were made to provide continual water supplies throughout the operation, to minimize fish stress. Minimal fish handling practices were utilized throughout the process. Fishway areas not listed were inspected by a Remote Operated Vehicle (ROV). There were no mortalities encountered during any of the 2018 JD Fishway dewaterings.

Turbine Dewatering Procedures

When following operational guidelines, turbine dewatering requires minimal fish handling. If a turbine unit fails, operational guidelines cannot always be followed, which may result in stranded fish. Fish removed from these areas face higher risks, due to increased handling. Procedures are continually evaluated to determine the best methods to reduce fish stress and mortality. Currently, fish are removed from scroll cases and draft tubes with fish bags. Prior to fish salvage, transport tanks are prepped for fish transport. If fish numbers are higher than the two bags can safely handle, the transport tanks are used to remove fish. The fish are then released by crane.

2018 John Day Fish Salvage Report

Key; adult=a, juvenile=j, carp=cp, catfish=ct, sculpin=sp, small mouth bass=smb, crappie=cr, whitefish=wf, perch=pr, bluegill=bg, walleye=we, Sturgeon=st, shad-sh, Chinook-Ch, steelhead-STH, coho-co, sockeye-so, lamprey-la Released In Good Conditon=RIGC

Date	Event	CH	STH	SO	CO	LA	Shad	Other	Comments	Mort	Cause
1/8	SFL-Upper Dewater	0	3J	0	0	180A	0	0	RIGC forebay, STH ~8", Lamprey 18-28"	0	N/A
1/23	JBS	0	2A	0	0	0	0	1-ST	RIGC STH(~27") ST(~30")	0	N/A
3/4	Nav Lock	0	0	0	0	0	0	1 SMB	Fished lateralls and conduits	0	N/A
3/15	MU 1 Scrollcase	0	0	0	0	0	0	0	None	0	N/A
9/4	MU 2 Scrollcase	0	0	0	0	0	0	0	None	0	N/A
9/4	MU 2 Draft Tube	0	0	0	0	0	0	0	None	0	N/A
11/15	MU 14 Scrollcase	0	0	0	0	0	0	0	None	0	N/A
11/15	MU 14 Draft Tube	0	0	0	0	0	0	173	173-ct (~12" - 28")	0	N/A
11/28	SMF Dewatering	60	15	0	0	2	0	2-smb, 5cp, 20ct, 2st	STH/CH(~20-30"); LA(18-28"); CT/CP (12-34") ST(24")	0	N/A
12/3	North upper	0	1J	0	0	2	few	1 STH J, 3 ST bagged	Few ST along with adult shad pushed into lower pool.	0	N/A
12/6	North lower	0	1J	0	0	8	few	1STHJ and 8 La bagged	All released into nearby tailrace.	0	N/A

Table 3: John Day Dam's 2018 fish salvage results

Fish Counting

Visual fish counting was conducted April 1st – October 31st during the 2018 adult fish passage season through a contract with Normandeau Associates Inc. and all fish count data was sent electronically to an online database. Prior to the 2013 adult fish passage season, the vast majority of fish passage occurred at the South Fishway (~ 95 %.) The improvements to the North Fishway Entrance (2010-2012) resulted in a more balanced fish passage distribution (20-40% use the NFL annually since modifications) (See figure 2.)

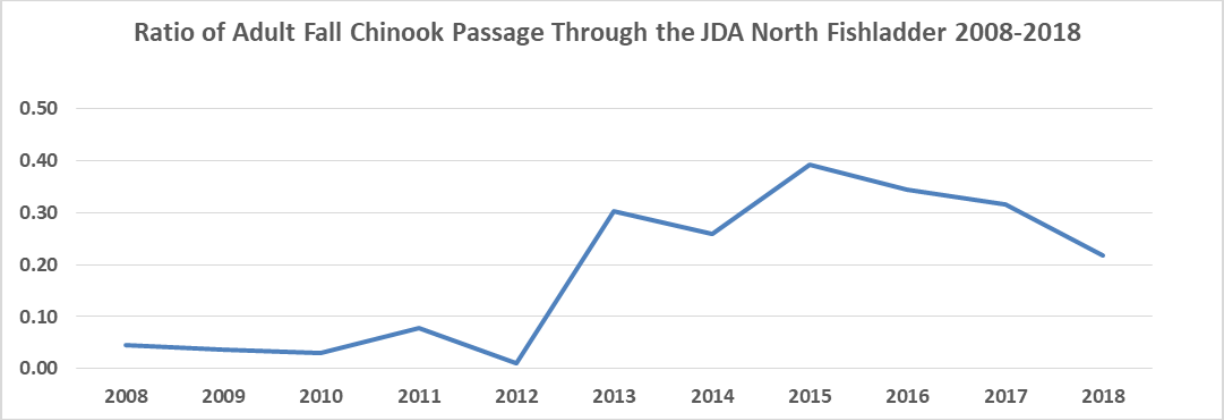

Figure 2: Ratio of adult fall Chinook salmon that migrated through the JDA North Fishway versus South Fishway 2008-2018 (September 1st through November 1st).

Pikeminnow Abatement

Northern Pikeminnow (NPM) angling at the John Day powerhouse tailrace was performed by the Washington Department of Fish and Wildlife crew under contract from Pacific States Marine Fisheries Commission. The 2018 total catch was 3,089. Previous catch totals were as follows; 2017 (3,472), 2016 (3,002), 2015 (3,127), 2014 (4,250), 2013 (2,370), 2012 (2,217). This year's angling effort began May 1st, and ended on October 7th.

Avian Predator Abatement

Bypassing smolts through spill has become a critical part of JDA fish passage operations since 2006. As a result, the piscivorous bird predation in the Spillway, Boat Restricted Zone (BRZ), has increased significantly and become a serious factor in total dam mortality of passing smolts. In response, a comprehensive grid of 125 avian lines was designed and installed at the JDA tailrace BRZ in 2010 (Figure 3) In addition to the avian lines supplemental boat hazing, by U.S. Department of Agriculture (USDA-APHIS), has occurred annually since 2010. The 2018 hazing season occurred April 16th – July 31st.

Although American White Pelican (pelican) impacts on smolts is unknown, it should be noted that pelican observations at JDA have seen significant increases since 2012 (Figure 4).

A complete grid of 125 avian lines re-installed for 2018, combined with the USDA boat hazing were effective in deterring gull predation on smolts at JD (Figure 5). Increased spill volume may have helped protect smolts from avian predators. It needs to be emphasized that only gulls are a significant and proven avian predator impacting the JD smolt passage.

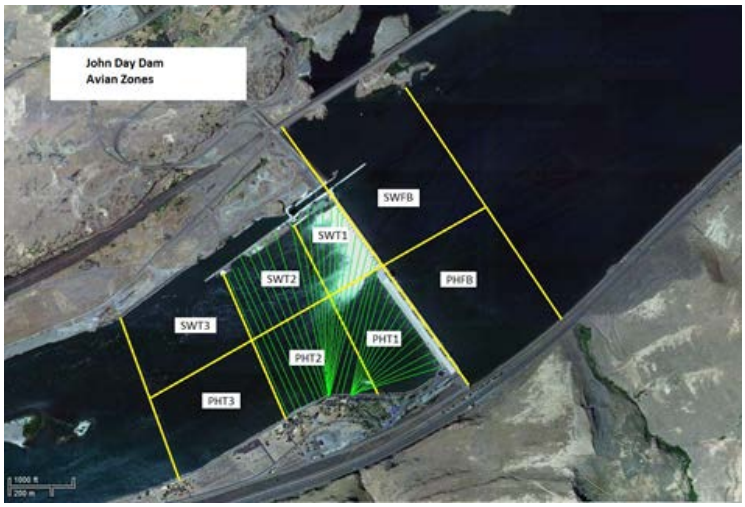

Figure 3: Avian array at JDA Tailrace BRZ installed in 2010 (Powerhouse Forebay-PHFB, Spillway Forebay-SWFB, Spillway Tailrace zones 1-3 [SWT1-SWT3], Powerhouse Tailrace zones 1-3 [PHT1-PHT3]).

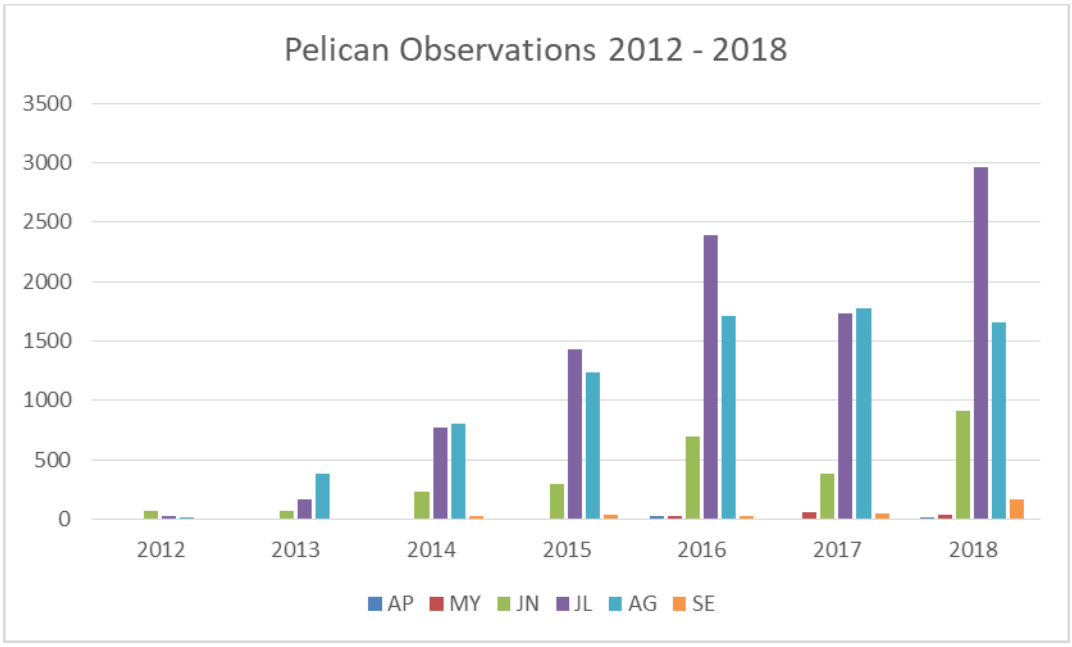

Figure 4: Monthly White Pelican Observations (2012 – 2018). [AP=April, MY=May, JN=June, JL=July, AG=August, SE=September].

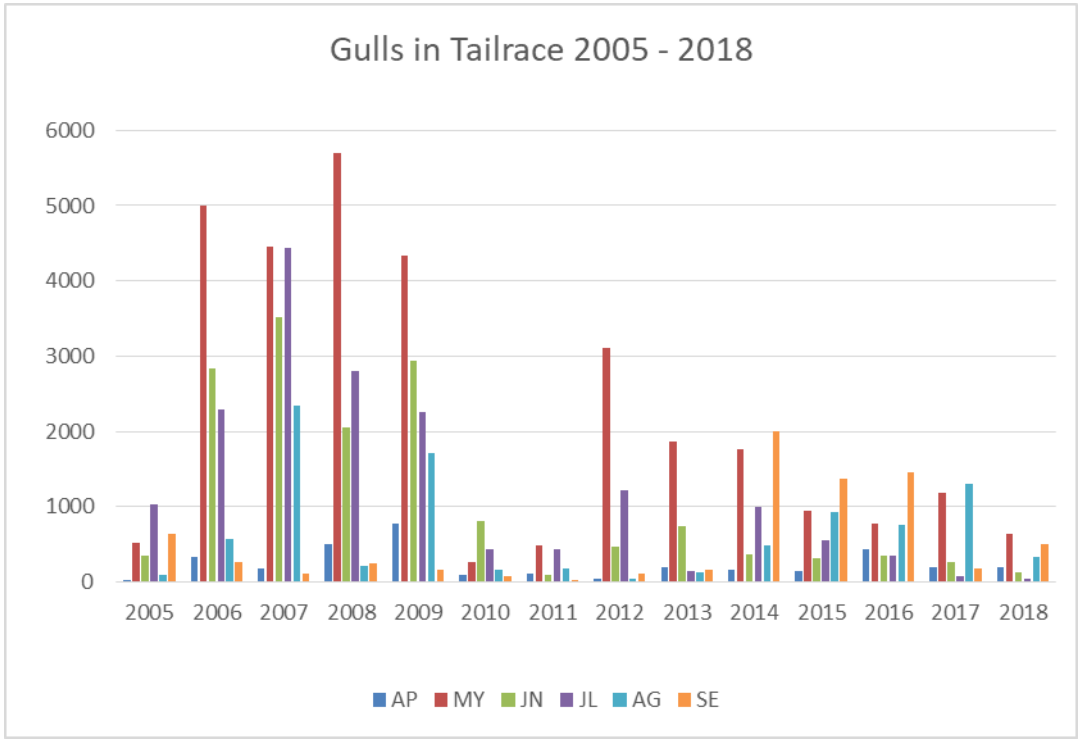

Figure 5: Monthly gull foraging observations (2005 - 2018) at JDA. [AP=April, MY=May, JN=June, JL=July, AG=August, SE=September].

Water Quality

JDA river temperatures were obtained from the United States Geological Survey's (USGS) sensor, located in the Forebay at the tip of the upstream navigation lock's guide wall (Figure 6). Additionally, water temperatures were collected by JDA Fisheries at the entrances and exits of both fish ladders using HOBO data loggers (April 1st – Nov. 30th), and sent to the Fish Passage Center (FPC). Water clarities were measured by Secchi disc at the North Fish Ladder counting station daily, throughout the 2018 passage season.

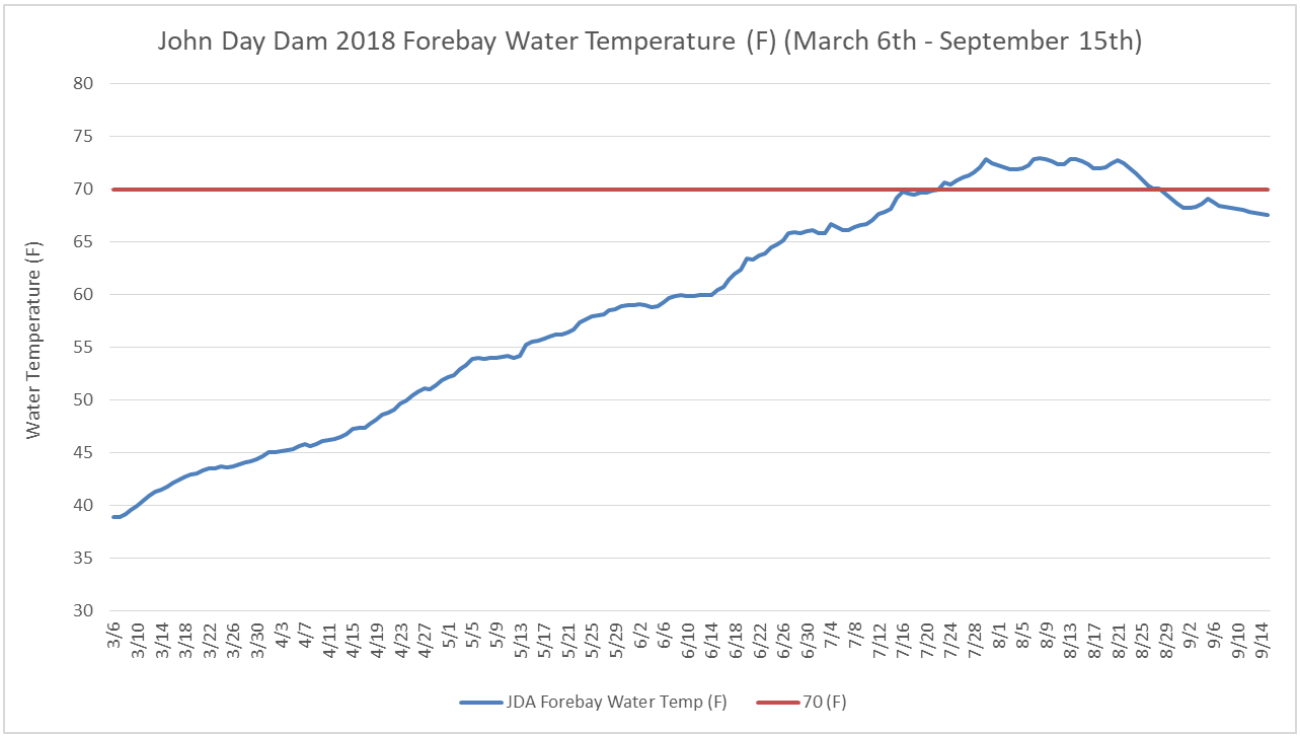

Figure 6: John Day Dam average daily forebay water temperatures for 2018. The red line represents the 70 degree threshold for juvenile sampling.

Fishway Velocities – Collection Channel

Similar to the previous years, the 2018 JDA SFL Collection Channel velocities were all within the Fish Passage Plan (FPP) criteria (1.5 - 4.0 feet per second) (See Figure 7).

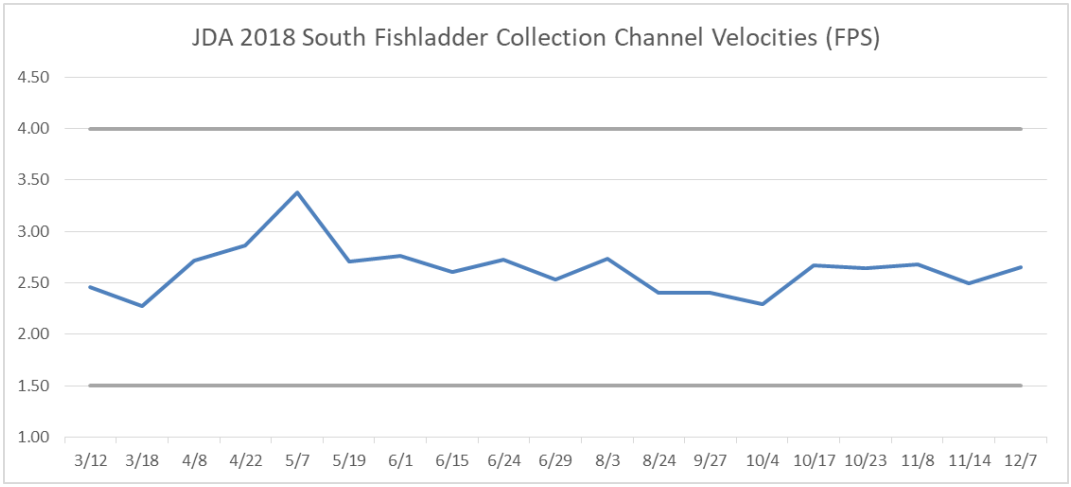

Figure 7: JDA South Fishway collection channel velocities during the 2018 Adult Fish Passage Season (Mar. 1st – Dec. 1st). Grey lines represent FPP criteria range.

Discussion

The following are the highlights of 2018 JD Fish Passage Season:
- South AWS turbine 2 operated without any issues for the third year after its lower bearing/shaft were repaired in 2016. JD South AWS turbine 1 continued OOS and as a backup only in 2018 while waiting for funding to accomplish its major overhaul. Despite the two AWS turbines' operations (with # 2 & 3 in service), JD South Fishway had only a few minor OOCs related to the SE1 Tailwater Sensor's location in an outdated still well. SE 1 Weir was in Manual mode requiring its frequent oversight and adjustments by the diligent JD Fisheries personnel. JD Project plans to relocate the SE1 sensor in February 2019.
- North Fishway performed flawlessly, without any OOCs in 2018.
- JBS orifice 8B was found plugged up on 23April, 2018 resulting in 51 juvenile chinook and 21 juvenile steelhead mortalities recovered from the Gatewell (see 18JDA01MFR for details.) This was the only issue with JBS during 2018 passage season.
- There were no failures or issues at SMF in 2018 in spite of the ageing/ outdated SCADA which is planned to be updated by JD Electrical & JD Engineering crews for the 2019 fish passage season.

Kudos to all JDA Maintenance, Operations, and Fisheries personnel for their dedication and hard work on improving the fish passage at John Day Dam!

Research

Oregon Dept. of Fish and Wildlife – Ongoing BPA funded research associated with the Northern Pikeminnow Management Program. The fish stomachs' sampler collected the diet and other biological data from NPMs caught by the PSMFC dam anglers.

Oregon Department of Fish and Wildlife/ Fish Passage Center- Continued to perform the monthly, FPOM-directed inspections of all JD adult and juvenile fishways (see the FPC's annual report.)

CRITFC- Collected adult Pacific lamprey for the tribal restocking projects. The Umatilla, Nez Perce, Warm Springs, and Yakama tribes were all involved in 2018.

Pacific States Marine Fish Commission – sampled juvenile salmonids at JD SMF 1 March through 15 September. Please see the FPC report for results and details.

Approved by: Ron Twiner, John Day/ Willow Creek Operations Manager (Acting)