

MEMORANDUM FOR THE RECORD 19 LGS 01 Auxiliary Water Supply (AWS) Pumps**SUBJECT: Little Goose Auxiliary Water Supply Pumps Intermittently Out of Service****Updated After Action: March 27, 2019****Background**

Little Goose adult fish ladder was watered up on February 14. In accordance to the Fish Passage Plan, Little Goose will operate the adult fish ladder and associated entrances within a given set of criteria from March 1 through December 31 (Chapter 8, section 2.4.2). Two of the three auxiliary water supply (AWS) pumps that provide water to the adult channel were returned to service on February 19. AWS pump 1 remained out of service for winter maintenance. Numerous leaks on the cooling water lines were reported on the two AWS pumps as well as some oil leaks. Project staff decided to repair one AWS pump at a time (Table 1) in order to maintain adult fishway entrance criteria. During adult fishway inspections, the fishway was found to be out of criteria on multiple occasions (Table 2). Additionally, AWS pump 2 tripped offline due to high bearing temperature on the speed reducer (Table 1).

Diffuser 13, the uppermost diffuser in the adult ladder, was not placed in automatic control mode when put back into service on February 14 which caused the depth over weirs to be out of criteria (Table 3). The diffuser was shifted to automatic control on March 08 and the weir depth is now in criteria.

Path Forward

Currently, all AWS pumps are in operation and the adult fishway is in criteria. Project staff is currently awaiting a new temperature probe (RTD) for the speed reducer for AWS pump 2. Sensing equipment, such as an RTD, provide data on operation which is used to properly maintain and safeguard equipment.

Relevance to Adult Fish Passage

Adult passage at Little Goose is typically very low during the month of March, predominately made up of adult steelhead. The most recent adult counts occurred in 2016, with the daily average adult count of 67 steelhead per day (Figure 1). Adult fish counts are not currently being conducted at Little Goose and will resume on April 01.

Estimated mortalities by species, and origin:

A. Species – N/A

- B. Origin – N/A
- C. Length – N/A
- D. Marks and tags – N/A
- E. Marks and Injuries found on carcass – N/A
- F. Cause and Time of Death – N/A
- G. Future and Preventative Measures – N/A

Table 1: Auxiliary water supply pump repair schedule.

AWS Pump	OOS Date	OOS Time	RTS Date	RTS Time	Description
1	01/03/2019	09:38	02/25/2019	12:05	Cooling water and oil leak
2	02/26/2019	07:00	03/04/2019	07:40	Cooling water and oil leak
2	03/12/2019	13:45	03/12/2019	13:50	Speed reducer high temp
2	03/12/2019	16:25	03/12/2019	16:35	Speed reducer high temp
2	03/13/2019	06:55	03/13/2019	16:48	Speed reducer high temp
3	03/04/2019	07:45	03/07/2019	09:40	Cooling water and oil leak

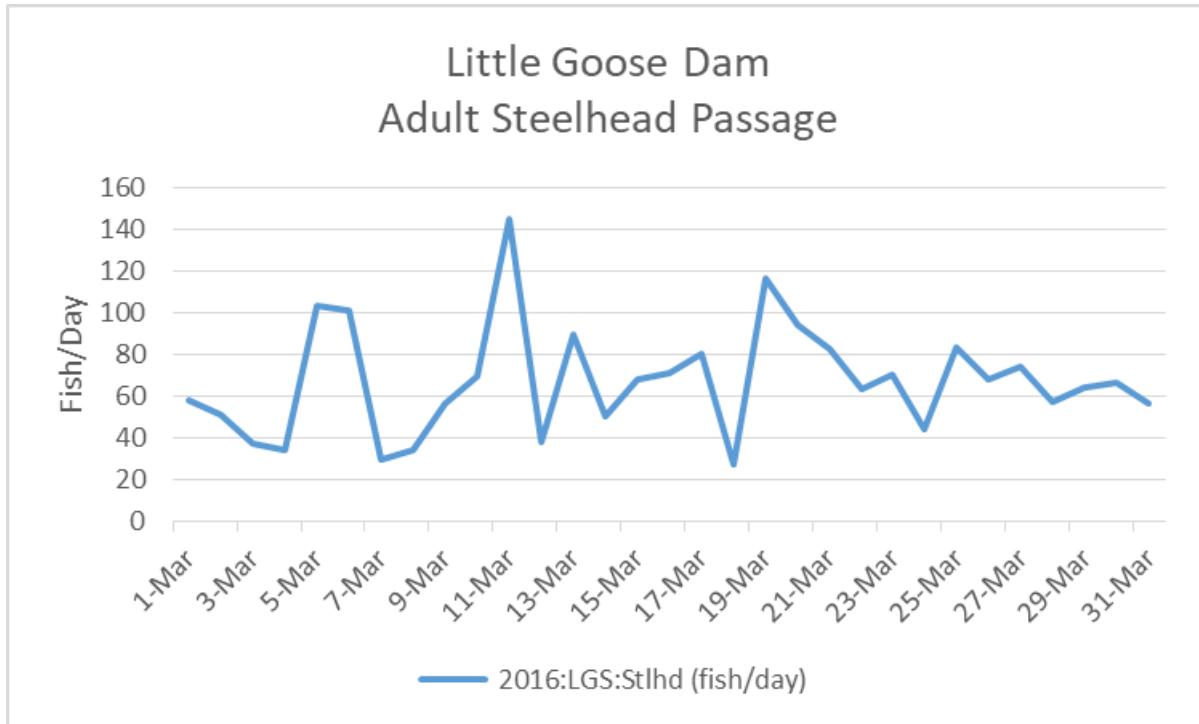
Table 2: Adult channel/entrance inspections for March 4, 6 and 7, 2019.

Yes	No	Sill	Location	Criteria	Measurement
	X		South Shore Entrance (SSE-1) Weir Depth	$\geq 8.0'$	6.6, 7.0, 6.4
	X		South Shore Entrance (SSE-2) Weir Depth	$\geq 8.0'$	6.6, 7.0, 6.4
	X		South Shore Channel/Tailwater Differential	$1.0' - 2.0'$	2.1
	X		North Powerhouse Entrance (NPE-1) Weir Depth	$\geq 7.0'$ or on sill	6.8, 6.4
	X		North Powerhouse Entrance (NPE-2) Weir Depth	$\geq 7.0'$ or on sill	6.9, 6.4
X			North Powerhouse Entrance Channel/Tailwater Differential	$1.0' - 2.0'$	
	X		North Shore Entrance (NSE-1) Weir Depth	$\geq 6.0'$ or on sill	5.3, 5.7, 5.1
	X		North Shore Entrance (NSE-2) Weir Depth	$\geq 6.0'$ or on sill	5.5, 5.4
	X		North Shore Channel/Tailwater Differential	$1.0' - 2.0'$	0.9, 0.8
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	1.4, 1.3

Table 3: Adult ladder inspections for March 4, 6 and 7, 2019.

Yes	No	NA	Location	Criteria	Measurements
X			Fish Ladder Exit Differential	Head $\leq 0.5'$	
X			Fish Ladder Picketed Lead Differential	Head $\leq 0.3'$	
X			Fish Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	0.7, 0.8, 0.7
	X		Fish Ladder Cooling Water Pumps in Service		
	X		Fish Ladder Exit Cooling Water Pumps Operating Satisfactorily		

Figure 1: Adult steelhead counts at Little Goose Dam, March 2016.



After Action update: Pump 2 was OOS March 18 from 12:15 to 13:20 while electricians replaced the RTD. During the outage of Pump 2 the North Shore Entrance (NSE) Weir Depths was out of criteria. After Pump 2 returned to service NSE Weir Depths were in criteria and all three fish pumps were in service.

Sincerely,
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