

**MEMORANDUM FOR THE RECORD – 17 TDA 15 Fish Unit 2 forced out of service**

**SUBJECT: F2 outage and fishway impacts**

Fish unit 2 was forced out of service Apr 23 at 1838 due to exciter trouble. Operations tried to restart but the unit continued to trip off line. Operations increased discharge on fish unit 1 to maximum closed one south entrance weir per Fish Passage Plan. The following morning, fisheries decreased depth on east entrance and west entrance closer to 8' to achieve 1' differential. Total fish unit discharge for auxiliary water decreased from ~4500cfs for both fish units to ~2600cfs for one fish unit.

**Analysis of potential impacts to fish**

**Upstream Migrants** – Chinook passage is presently about 2% of 10 year average and Steelhead ~5% of 10 year average. North fishway entrance passage is blocked to high levels of spill so all passage is occurring via east fishway. Total attraction water discharge decreased to approximately 57% of normal under one fish unit operation. Passage impact of reduced attraction will be difficult to determine due to the already low passage numbers.

**Downstream migrants** – None. Affects only east adult fishladder.

**Lamprey** – Minimal impact. Not during normal migration timing.

**Bull Trout** – Minimal if any. Bull trout sightings very rare.

**Update 4/25;** Maintenance is still in process of trouble shooting. Suspect exciter failure. They are looking into options if confirmed. Return to service unknown. Another fish unit outage was scheduled for night of 4/26, 2200 – 0300 for breaker measurements which will now result in no attraction flow during this period.

**Update 4/26;** Maintenance continues to trouble shoot. Return remains unknown. Fish passage appears to be relatively normal under 1 fish unit operation. Fish passage analysis;

	Chin	Steelhead	
Fri 4/21	17	1	2 fish unit operation
Sat 4/22	29	1	2 fish unit operation
Sun 4/23	36	5	2 fish unit operation
Mon 4/24	32	2	1 fish unit operation
Tues 4/25	29	1	1 fish unit operation

Entrance analysis

East entrance - 1' differential, E1 closed, E2 at 8' depth, E3 at 8' depth

West entrance – 1.2' differential, W1 closed, W2 at 8.5' depth, W3 at 8.5' depth

South entrance – 1.6' differential, S1 closed, S2 at 9' depth

Fish unit 1 discharge at 2,620cfs

**Update 5/1;** F2 trouble shooting continues with Hydraulic Design Center involvement. Unit was spun on Thursday, but continues to trip off line. F1 continues to operate at maximum capacity. Fish passage analysis;

	Chin	Steelhead
Wed 4/26	60	2
Thur 4/27	40	1
Fri 4/28	79	1
Sat 4/29	67	3
Sun 4/30	102	1

Entrance analysis;

East entrance – 0.8' differential, E1 closed, E2 at 6' depth, E3 at 8' depth

West entrance – 1.4 differential, W1 closed, W2 at 8' depth, W3 at 8' depth

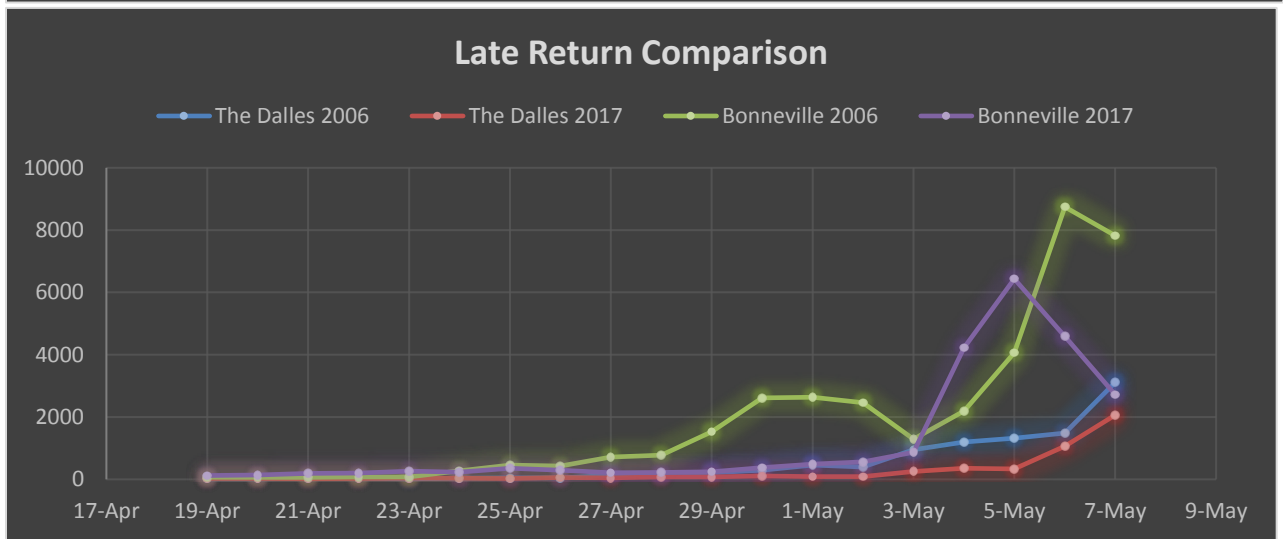
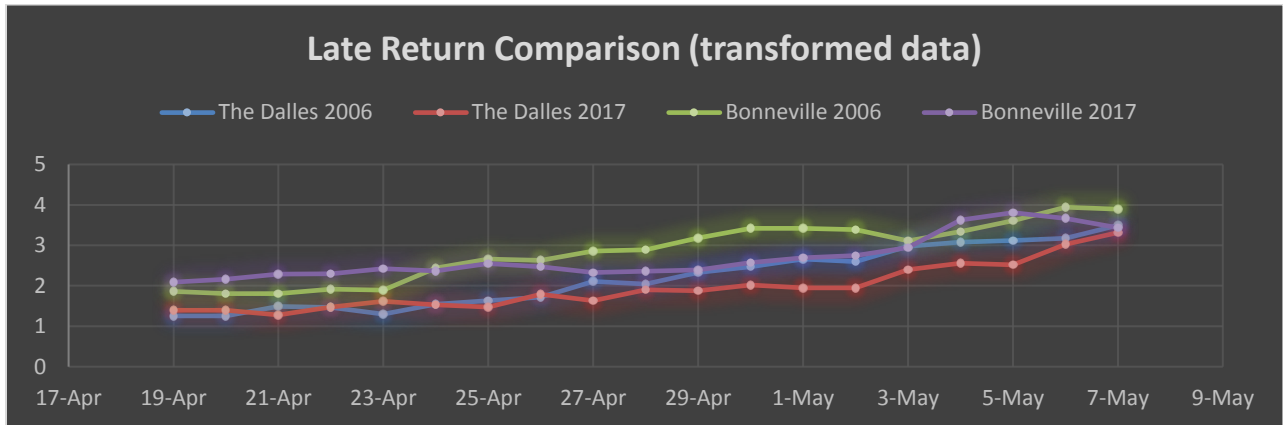
South entrance – 1.6' differential, S1 closed, S2 at 8.5' depth

If F2 return is expected long term, we will close some of west and south diffusers to increase flow to the east. We'll also explore option of F1 speed no load operation, which will require benefit/risk consideration.

**Update 5/2;** Fish unit 2 was returned to service 5/2 at 1530. A loose wire was found that shorted one of the control boxes (crowbar thyristor) for the exciter. It was immediately replaced with a spare one on hand. Further analysis of fish passage during this outage will be done for a final update.

**Update 5/10;**

We analyzed count data to try and determine if there was a noticeable affect to fish passage under one fish unit operation. We compared 2017 to a similar late spring chinook return of 2006, which was still considerable more fish. There was no noticeable difference during that period (Apr23 – May2). However, due to the extremely low passage numbers, it would be difficult to identify passage delay. The log graph was an attempt to show the low numbers better in graph form.



Sincerely,  
Bob Cordie  
Project Fisheries