**OFFICIAL COORDINATION REQUEST FOR**
**NON-ROUTINE OPERATIONS AND MAINTENANCE**

**COORDINATION TITLE-** 19 LWG 01 Unit 2 Model Validation
**COORDINATION DATE-** 20 March 19
**PROJECT-** Lower Granite Dam
**RESPONSE DATE-** April 2, 2019

**Description of the problem-** LWG Unit 2 model validation is required to verify the generator capability curve following the completion of digital governor installation. Model validation ensures the unit operates and responds correctly and is required prior to returning the unit to service. LWG 18 MOC 10 coordinated for OPTO 22 and digital governor installation and testing but did not identify the time needed for model validation. Model validation is schedule to occur April 4 with the unit operating at various loads over a four hour period to generate the capability curve. This will require operating unit 2 at the low and high ends of its range resulting in a deviation from 1% operating range. Unit 2 will be operated outside of unit priority order during modeling. Dates coordinated in LWG 18 MOC 10 for OPTO 22 and on digital governor installation/testing are shown in table 1.

Table 1. Tentative Unit OPTO 22 Upgrade Schedule.

| **Unit** | **Dates** |
|---|---|
| 1 | February 11-20, 2019 |
| 2 | March 25- April 5, 2019 |
| 3 | November 19-30? (TBD) |
| 4 | January 7-18, 2019 |
| 5 | October 1-12, 2018 |
| 6 | September 10-21 |

**Type of outage required-** N/A

**Impact on facility operation** (FPP deviations) – Model validation will require deviating from unit priority order and the 1% operating range while the unit is operated at different MW loads. Unit priority will be impacted during modeling.

**Impact on unit priority-** Model validation will require unit 2 to be brought on line outside of unit priority for starts, stops, and load changes as coordinated in LWG 18 MOC 10.

**Impact on forebay/tailwater operation-** Tailwater conditions while change as MW loading changes during the model validation.

**Impact on spill-** N/A

**Dates of impacts/repairs-** April 4, 2019.

**Length of time for repairs-** Model validation is expected to take up to four hours to complete with unit 2 intermittently operated outside the 1% operating range.

**Analysis of potential impacts to fish**

1. 10-year average passage by run during the period of impact for adults and juvenile listed species, as appropriate for the proposed action and time of year; Steelhead and fall Chinook return rates are expected to be below the 10 year average during 2018 and 2019 return seasons. Ten year daily averages adult fish passage is 186 steelhead. Ten year average juvenile passage for April 4 is 15,824 juvenile salmonids.

Table 2. Estimated ten year daily average adult fish passage and daily percent of adults that may be impacted by species.

| LGR ADULTS | | 10 Year Daily Average Passage | | | Percent of Run Impacted | | | |
|---|---|---|---|---|---|---|---|---|
| Unit | Outage Date | Steelhead | Chinook | Coho | Steelhead | Spring Chinook | Fall Chinook | Coho |
| 2 | 25Mar-05Apr 2019 | 204 | 0 | 0 | 0.12% | 0.00% | 0.00% | 0.00% |

*Note model validation 4 hours and averages and percent of runs are calculated for the full 24 hour day.

Table 3. Estimated ten year daily average juvenile fish passage and daily percent of juvenile fish passage by species.

| LGR JUVENILES | | 10 Year Daily Average Passage* | | | | | Percent of Run Impacted* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit | Outage Date | CH1 | CH0 | STH | SOC | Coho | CH1 | CH0 | STH | SOC | Coho |
| 2 | 25Mar-05Apr 2019 | 6385 | 102 | 9494 | 248 | 34 | 0.18% | 0.12% | 3.52% | 4.91% | 0.04% |

*Note model validation 4 hours and averages and percent of runs are calculated for the full 24 hour day.

2. Statement about the current year's run (e.g., higher or lower than 10-year average); Steelhead and fall Chinook are expected to return at a rate below the 10 year average during the 2019 fish passage seasons due to poor ocean conditions. As of March 16 adult steelhead passage is 10.7% of the ten year average passage at Lower Granite.
3. Estimated exposure to impact by species and age class (i.e., number or percentage of run exposed to an impact by the action); The percent of adult passage that may be impacted by model validation are listed by species in Table 2 and the percent of juvenile fish passage by species are listed on Table 3.
4. Type of impact by species and age class (increased delay, exposure to predation, exposure to a route of higher injury/mortality rate, exposure to higher TDG, etc.); Operating times at each MW interval will be brief lasting enough time to bring the unit up to the MW required for modeling. Changes in tailrace conditions related to commissioning the units may result in brief adult fish passage delays. Impacts

to juvenile passage are expected to be minimal as modeling will take place during the day and passage/collection generally increases at night.

**Summary statement - expected impacts on:**

**Downstream migrants:** Minimal impacts are expected.

**Upstream migrants (including Bull Trout):** Minimal impacts are expected.

**Lamprey:** Minimal impacts are expected.

## Comments from agencies:

**From:** Kiefer,Russell
**To:** Setter, Ann L CIV USARMY CENWW (US)
**Subject:** [Non-DoD Source] RE: 19 LWG 01 coordination
**Date:** Thursday, March 21, 2019 9:53:15 AM

Ann,
While we agree that impacts to listed fish will likely be low, why can't we do this type of testing before fish passage
season?
Russ

**From:** Erick VanDyke

**Subject:** [Non-DoD Source] RE: 19 LWG 01 coordination
**Date:** Thursday, March 21, 2019 10:22:48 AM

Hi Ann and Elizabeth,
The timing on this is not great. I respectfully request that this testing be completed before April 3. Given low flow forecasts, it would be helpful to either do the work before spill operations being April 3 (preferred) or if workable during the power flex operation periods (less preferred). If forecasts play out, it seems likely that you will be operating at unit minimums while spill the rest.
Erick

**From:** Morrill, Charles (DFW)
**Subject:** [Non-DoD Source] RE: 19 LWG 01 coordination
**Date:** Thursday, March 21, 2019 10:40:45 AM

Ann, Elizabeth et al.
I agree with Erick's request ...
Charlie

**From:** Holdren, Elizabeth A CIV CENWW CENWD (US)
**Subject:** RE: 19 LWG 01 coordination
**Date:** Thursday, March 21, 2019 1:47:24 PM

Erick/Folks,
I agree it would be ideal to perform the model validation prior to spill beginning April 3. LWG is pushing to possibly complete the modeling prior to April 3 but it seems unlikely. LWG plans to work with BPA and perform the model validation during flex spill hours. Model validation was complete on units 1, 3, 4, 5, and 6 between February 19-28 (Unit 2 was not available at this time due to outage). Unit 2 is out of service for annual maintenance and digital governor installation completed between February 11-
March 20 and OPTO 22 upgrade which is scheduled to be completed by April 5. Model validation cannot commence until Digital Governor upgrades are complete and the unit is available to run
after OPTO 22 I/O upgrades commissioned. Model validation is needed to stay on schedule with electricians, HDC, and District Operations, begin the long process of developing the reliability curve, and is a WECC requirement.
Smile,
Elizabeth Holdren
USACE Supervisory Fisheries Biologist

Walla Walla District
Lower Granite Project
(509) 843-2263
**From:** Erick VanDyke
**Subject:** [Non-DoD Source] RE: 19 LWG 01 coordination
**Date:** Thursday, March 21, 2019 2:40:54 PM
Thanks Elizabeth. Hope all effort is expended to test before April 3. Best of wishes.
Erick

**From:** Tom Lorz
**To:** Setter, Ann L CIV USARMY CENWW (US)
**Cc:** Trevor Conder - NOAA Federal
**Subject:** [Non-DoD Source] RE: 19 LWG 01 coordination
**Date:** Thursday, March 21, 2019 1:54:07 PM
If I read this right unit 2 would operated for 4 hours out of criteria and would be first on? If so could we do this later in the day to reduce impacts to the entrance. If there is plenty of flow and unit 1 will be operated I am fine with any time but if we only have one unit on and spill it would be better from an adult stand point to do later in the day. Will see if trevor thinks I am full of it.
Thanks
Tom Lorz

**From:** Trevor Conder - NOAA Federal
**To:** Tom Lorz
**Cc:** Setter, Ann L CIV USARMY CENWW (US)
**Subject:** [Non-DoD Source] Re: 19 LWG 01 coordination
**Date:** Thursday, March 21, 2019 2:25:13 PM
Completing the work prior to the spill season would be best, but if that is not possible, I agree with this strategy to minimize impacts.

**From:** Setter, Ann L CIV USARMY CENWW (US)
**To:** "Trevor Conder - NOAA Federal"; Tom Lorz
**Subject:** RE: [Non-DoD Source] Re: 19 LWG 01 coordination
**Date:** Friday, March 22, 2019 8:32:00 AM
Trevor, Tom:
I will verify with LWG project but I believe they can meet your request by doing this during the afternoon flex spill treatment. Thanks for the comments.

Ann

Personal communication from Ann Setter: March 25, 2019- Called Tom, Trevor and reached Trevor and received agreement to proceed with testing during the AM flex spill period rather than push this out later into juvenile migration period. Received agreement also from maintenance engineering to perform the testing work during this AM flex spill period on April 4.

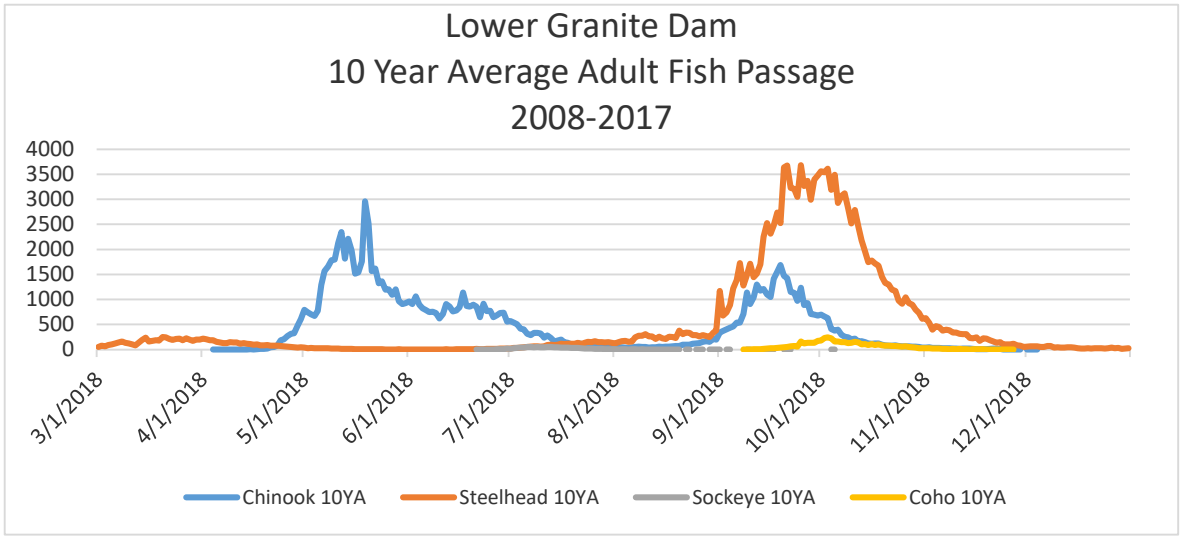
**Final coordination results:** Corps will proceed with testing on April 4 during the AM flex spill period.

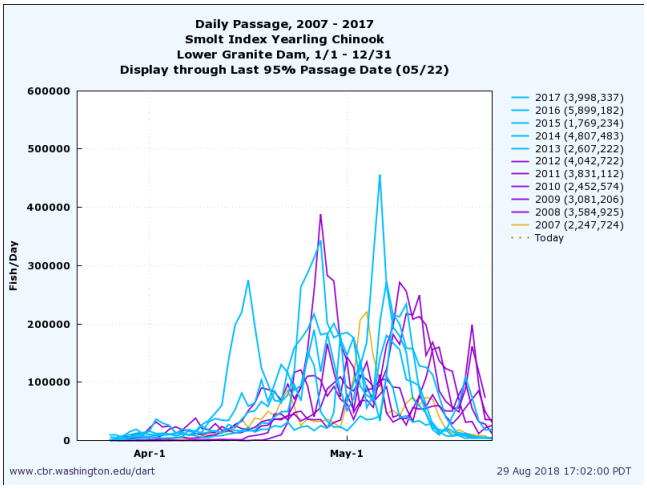
**After Action update:** Unit 2 model validation was completed between 0614-1100 hours April 4. The unit was operated briefly above and below the 1% efficiency range four times between 0701-0804 hours and below the 1% range twice between 1042-1057 hours. Unit 1 remained in operation and model validation was completed during power flex operation. Total adult fish counts for April 4 included 80 steelhead and 1 Jack Chinook with 41 of the adult steelhead counted between 0600-1100 hours. Lower Granite

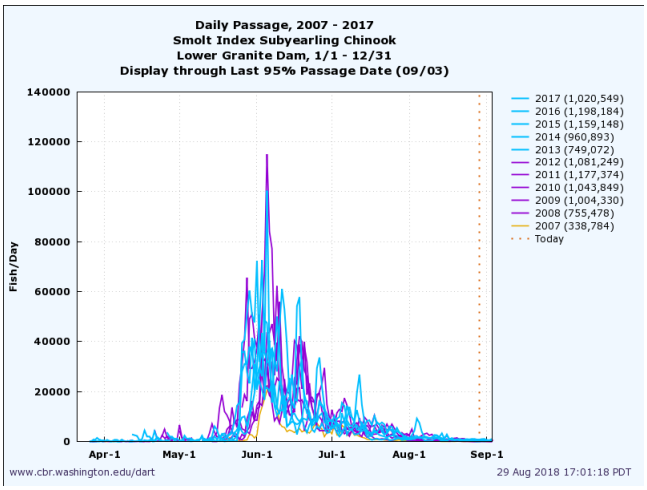
juvenile fish facility collected a total of 8700 juvenile salmonids April 4 with 3100 of these collected between 0600-1100 hours.

Please email or call with questions or concerns.

Thank you,
Elizabeth Holdren
Supervisory Fisheries Biologist
Lower Granite Lock and Dam
Ph. 1(509)843-2263
Elizabeth.a.holdren@usace.army.mil


Lower Granite Dam
10 Year Average Adult Fish Passage
2008-2017
4000
3500
3000
2500
2000
1500
1000
500
0
3/1/2018
4/1/2018
5/1/2018
6/1/2018
7/1/2018
8/1/2018
9/1/2018
10/1/2018
11/1/2018
12/1/2018
Chinook 10YA
Steelhead 10YA
Sockeye 10YA
Coho 10YA


Daily Passage, 2007 - 2017
Smolt Index Yearling Chinook
Lower Granite Dam, 1/1 - 12/31
Display through Last 95% Passage Date (05/22)
Fish/Day
600000
500000
400000
300000
200000
100000
0
Apr-1
May-1
2017 (3,998,337)
2016 (5,899,182)
2015 (1,769,234)
2014 (4,807,483)
2013 (2,607,222)
2012 (4,042,722)
2011 (3,831,112)
2010 (2,452,574)
2009 (3,081,206)
2008 (3,584,925)
2007 (2,247,724)
Today
www.cbr.washington.edu/dart
29 Aug 2018 17:02:00 PDT


Daily Passage, 2007 - 2017
Smolt Index Subyearling Chinook
Lower Granite Dam, 1/1 - 12/31
Display through Last 95% Passage Date (09/03)
Fish/Day
140000
120000
100000
80000
60000
40000
20000
0
Apr-1
May-1
Jun-1
Jul-1
Aug-1
Sep-1
2017 (1,020,549)
2016 (1,198,184)
2015 (1,159,148)
2014 (960,893)
2013 (749,072)
2012 (1,081,249)
2011 (1,177,374)
2010 (1,043,849)
2009 (1,004,330)
2008 (755,478)
2007 (338,784)
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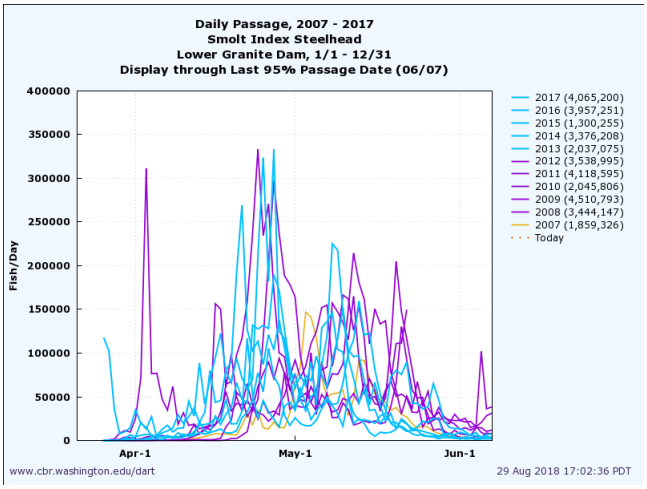
Daily Passage, 2007 - 2017
Smolt Index Steelhead
Lower Granite Dam, 1/1 - 12/31
Display through Last 95% Passage Date (06/07)
Fish/Day
400000
350000
300000
250000
200000
150000
100000
50000
0
Apr-1
May-1
Jun-1
2017 (4,065,200)
2016 (3,957,251)
2015 (1,300,255)
2014 (3,376,208)
2013 (2,037,075)
2012 (3,538,995)
2011 (4,118,595)
2010 (2,045,806)
2009 (4,510,793)
2008 (3,444,147)
2007 (1,859,326)
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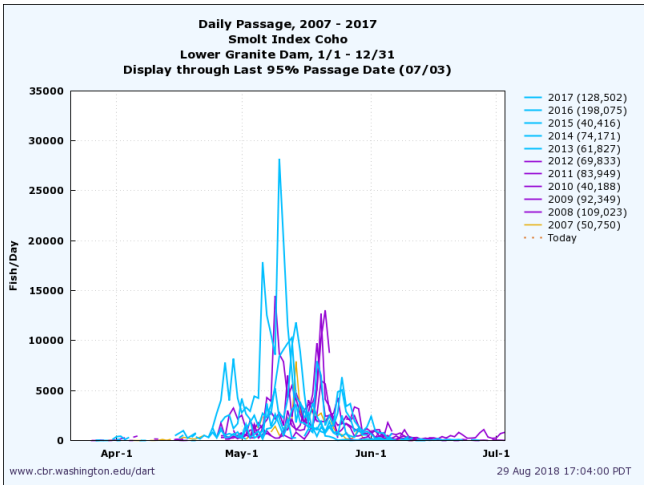
Daily Passage, 2007 - 2017
Smolt Index Coho
Lower Granite Dam, 1/1 - 12/31
Display through Last 95% Passage Date (07/03)
Fish/Day
35000
30000
25000
20000
15000
10000
5000
0
Apr-1
May-1
Jun-1
Jul-1
2017 (128,502)
2016 (198,075)
2015 (40,416)
2014 (74,171)
2013 (61,827)
2012 (69,833)
2011 (83,949)
2010 (40,188)
2009 (92,349)
2008 (109,023)
2007 (50,750)
Today
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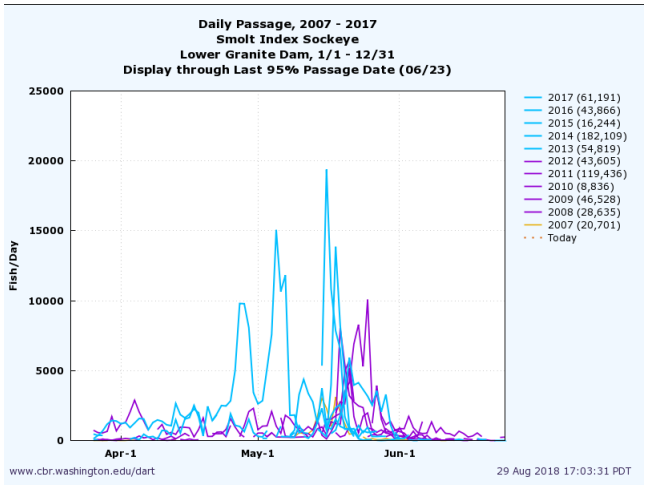
29 Aug 2018 17:04:00 PDT


Daily Passage, 2007 - 2017
Smolt Index Sockeye
Lower Granite Dam, 1/1 - 12/31
Display through Last 95% Passage Date (06/23)
Fish/Day
25000
20000
15000
10000
5000
0
Apr-1
May-1
Jun-1
2017 (61,191)
2016 (43,866)
2015 (16,244)
2014 (182,109)
2013 (54,819)
2012 (43,605)
2011 (119,436)
2010 (8,836)
2009 (46,528)
2008 (28,635)
2007 (20,701)
Today
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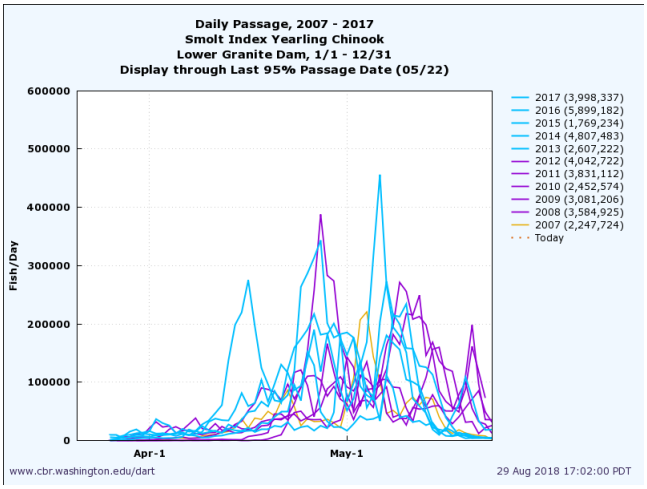
Daily Passage, 2007 - 2017
Smolt Index Yearling Chinook
Lower Granite Dam, 1/1 - 12/31
Display through Last 95% Passage Date (05/22)
600000
500000
400000
300000
200000
100000
0
Fish/Day
Apr-1
May-1
2017 (3,998,337)
2016 (5,899,182)
2015 (1,769,234)
2014 (4,807,483)
2013 (2,607,222)
2012 (4,042,722)
2011 (3,831,112)
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2008 (3,584,925)
2007 (2,247,724)
Today
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29 Aug 2018 17:02:00 PDT