

CENWP-OD

12 September 2013

MEMORANDUM FOR THE RECORD

Subject: Final minutes for the 12 September 2013 FPOM meeting.

The meeting was in the Columbia Room (12th floor) at the new CRITFC building. In attendance:

Last	First	Agency	Office/Mobile	Email
Baus	Doug	USACE-RCC	503-808-3995	Douglas.m.baus@usace.army.mil
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Lorz	Tom	CRITFC	503-238-3574	lort@critfc.org
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Zorich	Nathan	NWP-FFU	541-374-8801	Nathan.a.zorich@usace.army.mil
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Fielding, Gumpert, Hall, Kiefer, Johnson, Marsh, Meyer, Moody, Ogden, Pinney, Plummer, Schneider, Statler, Trachtenbarg called in.

September birthdays include: J. Fryer, Rerecich, Stansell, Bissell, Martinson, Kovalchuk.
HAPPY BIRTHDAY!!!!

1. Finalized results from this meeting.

1.1. August FPOM minutes approved.

- 1.2. No Operational changes may occur without concurrence from Operations Division and FPOM.
 - 1.3. LWG roof repair work. FPOM generally agreed that operating the units two hours longer (9:30-11:30) will likely result in an extension of the roofing contract completion date by one or two days. FPOM would prefer operating units 1 and 2 in the early hours, if there is enough flow to operate both units. FPOM asked NWW to look into whether or not the roof contract work could be suspended a few days to see if more fish would pass. NWW will ask contracting if that would be possible. Setter also said that the annual maintenance on unit 1 would be completed in time for it to run on Saturday. FPOM agreed with the change in unit priority allowing it to run first.
 - 1.4. LWG fish ladder and trap. Laughery said they are not finding the hydraulic reason for the reduction in water pressure. He would like to do a field test next Tuesday. Setter said a daytime field test is not approved for next week. Lorz said it could be done at night. Laughery said they could do it at night as long as the water surface could be seen and staff is available. FPOM approved a night time test.
 - 1.5. BON PH1 ITS. FPOM requested the ITS be returned to service as quickly as possible to provide safe passage for any fallback at PH1. PH1 is operating per FPP split flows criteria due to fish numbers.
 - 1.6. TDA ROV report. Sloughing area. Cordie said TDA could do a scan of the area against next year if FPOM wanted. FPOM agreed it would be useful to monitor sloughing.
 - 1.7. JDA blown deck plate. It is assumed that it was caused by air pressure. The project will look at a way to vent the solid plate so that it will not happen again. FPOM asked the project to do a visual inspection and plunking if possible. With a high volume of fish passage they did not want to go forward with this inspection at this time. FPOM agreed to an inspection on 23 September.
 - 1.8. TDA fish unit outage. One fish unit at a time out for 8 – 10 hours for interlock testing. Cordie said the work would occur at night in late October or early November. FPOM Thanked Bob for scheduling the work at the appropriate time and agreed with the outage going forward. .
 - 1.9. FPP Appendix G picket lead protocols. FPOM will re-look at the AFF picket leads this winter to accommodate the unprecedented fish numbers being see at this time.
 - 1.10. BON AFF dead fish test. FPOM was in agreement with PIT tagging dead fish, releasing them just below the count window, and seeing where they end up. Lamprey would be kept and released later in the season.
2. The following documents were provided or discussed. Documents may be found at <http://www.nwd-wc.usace.army.mil/tmt/documents/FPOM/2010/>
- 2.1. *Agenda, Fish Passage O&M Coordination Team.*
 - 2.2. *Cooling Water Strainers Lamprey Counts.xls.*
 - 2.3. *LGS tailscreen powerpoint and videos.*
 - 2.4. *Coordination/Notification Forms (NWW/NWP)*
 - 2.5. *FPP change forms. (NWW/NWP)*

3. Action Items

3.1. NWW Action Items.

- 3.1.1. [Sep 13] LWG roof repair work. **ACTION:** Setter will send an email to FPOM once negotiations with the contractor are concluded. **STATUS:** *13LWG18 was sent on 13 September.*

- 3.1.2.** [Sep 13] LWG roof repair work- delaying the contractor. **ACTION:** Setter will report back to FPOM as to the ability to delay the contract until 14 September. **STATUS: 13LWG18 was sent on 13 September.**
- 3.1.3.** [Sep 13] Snake River temperatures. **ACTION:** Hevlin will ask Graves to talk to Idaho Power about minimizing releases for five days.
- 3.1.4.** [Sep 13] Snake River fish condition. **ACTION:** Lorz asked for fish condition in the Snake River. Moody will talk with the fish counters and report back on whether or not fish passing LWG showed additional signs of stress. **STATUS: provided by Setter on 13 September.**
Snake River Fish Condition update from 9/12/13
Lower Granite - Fish counters have seen dark fish as they passed the window at LWG. One dead fish was seen floating downstream a couple days ago but none on 9/12.
Ice Harbor and Lower Monumental - Nothing out of the ordinary as far as fish stress was seen at either of these projects.
Little Goose - Overall the large majority of fish look in good to very good condition. Last week a larger percentage of fish had gash injuries. This week fish are looking much better. A few fish have one to several round 1" diameter injuries, not lamprey bites but more like skin sliced off and not very fresh. Not bleeding but pink tissue visible. We had 11 fallbacks today, three fallbacks with injuries, not fresh, two with the skin shaved type injury and one with a cut near the dorsal fin area. One observation is the fish look darker than normal to me, but it could be the water clarity. Some nice 4 year old Chinooks."
- 3.1.5.** [Sep 13] LWG Unit 1 return to Kaplan. Conder asked about re-welding the blades at a different angle. **ACTION:** Bettin said he will look into that and report back at the October FPOM.

3.2. NWP Action Items

- 3.2.1.** [Feb 13] BON AFF PIT tag detector. **ACTION:** Fryer will have detailed drawings, an operating plan, and monitoring plan for FPOM review in October.
- 3.2.2.** [Sep 13] 13BON51. **ACTION:** the action agencies will bring back an operation that offers as much protection for juveniles and adults that may be attracted to PH2 when operating the PH2 units.

3.3. Action Items completed or to be discussed later in the agenda.

- 3.3.1.** [Aug 13] AFF modifications/mortalities. **ACTION:** Rerecich will send a meeting invite for 20 August. **STATUS: completed.**
- 3.3.2.** [Aug 13] 13BON 51 North monolith lamprey structure repairs. **ACTION:** Hausmann will confirm the monolith gates can be closed and bulkheads won't be needed. He will also inquire about the possibility of turning the DSM on/off each day. **STATUS: discussed with 13BON51.**
- 3.3.3.** [Aug 13] Sturgeon kill between TDA and JDA. **ACTION:** Lorz will email Mackey the report CRITFC put together. Mackey will post and send to FPOM. **STATUS: completed.**
- 3.3.4.** [Aug 13] LGS Unit 1 low flow. **ACTION:** NWW will draft a change form to get the needed language in the FPP. In addition, the engineers will evaluate the tainter gate to see if it is suitable for opening and closing the TSW. **STATUS: NWW drafted a MOC. Discussed with 13LWG17.**

4. Updates

4.1.NWW Updates

4.1.1. LWG adult fish passage numbers. Roof work may be completed on the 17th rather than the 22nd. Moody sent an email with temperature information. He said LWG was running units 2 and 3 until 1000 and from 1000 to 2100 LWG ran only station service and spill. This was to accommodate the roofing work. This operation has continued since 5 September. Setter asked when the strongest passage starts. Moody said from about 0600 to 1000. Immediately after 1000 passage does drop off. Hevlin said NOAA would like to see two more hours added to the operation. In return they would be willing to see a delay in completion of the roof. FPOM discussed operating U2 and U3 or just U2. General consensus was operating U2 and U3 rather than U2 heavy. Setter said the plan would be to run U1 overnight until it has to be turned off to facilitate the roof work. **FPOM generally agreed that operating the units two hours longer will likely result in an extension of the roofing contract end time a day or two. FPOM would prefer operating units 1 and 2 in the early hours (0500-1200), if there is enough flow to operate both units. ACTION: Setter will send an email to FPOM once negotiations with the contractor are concluded.** Johnson asked if the roof repair work could be delayed until after the bulk of the fish have passed. She noted that the cold water from DWR will end in the next couple of days so fish will not have the benefit of the cooler water. She wanted to stress that this is a record year for fish runs as well. Hall reported that DWR is currently releasing 4.8kcfs and this amount will be decreased incrementally. Hall said if the desire is to affect temperatures, applying pressure to Idaho Power may be appropriate. Statler said on a real-time basis we are not getting relief from DWR that were anticipated due to the hot spell the Region is currently experiencing. Hall and Statler discussed the DWK plan and current conditions. Johnson said she has seen fish gasping for air at LWG and stressed the importance of alleviating conditions there. Setter asked if we want to put the emphasis on the fish that are at the dam now as opposed to waiting until the bulk of the fish come up from BON. Lorz said there are about 10K fish between LGS and LWG and the fish at LWG are looking pretty rough. He wanted to know if all the Snake fish look rough or just LWG. He expressed concern about losing 10K fish. **FPOM asked if the roof contract can be delayed a few days. NWW could not answer that question immediately. ACTION: Setter will report back to FPOM as to the ability to delay the contract.** Setter and Lorz discussed whether action now would compromise the ability to take action in the future.

4.1.1.1. Lorz asked if anyone has the authority to talk to Idaho Power.

Hall said he suggested asking them to minimize their releases for three days, if it were possible. Hevlin said he would talk to Ritchie Graves to see what is possible. Conder asked if it is worth removing spawning habitat in the Snake to lower water temperatures at LWG. Bettin said they don't start spawning until mid-October. Hall said the temperatures at Anatone are between 73-74F. These temperatures are controlled by Hells Canyon. Orofino is about 70F. 2/3 of the water comes from the Snake and 1/3 from the Clearwater. Snake River water significantly dilutes the cooler water from the Clearwater. Hall

said if Idaho Power has the ability, they could help allow water to cool. He said they have permits to adhere to as well and he does not recommend them violating their permits. **ACTION: Hevlin will ask Graves to talk to Idaho Power about minimizing releases for five days.** In addition, Lorz asked for fish condition in the Snake River. **ACTION: Moody will talk with the fish counters and report back.**

- 4.1.1.2.** Kiefer reported Idaho Power plans to release about 10K.
- 4.1.2.** LWG ladder and trap operation. Setter explained NOAA Fisheries operates the trap at LWG. Due to temperatures, the trap has not been operated. Setter said the water temperatures are higher than the AWS pump water. This creates a thermal barrier for fish passage. Ogden added that when the AWS pumps are operating there is not enough water pressure to trap fish. When the pumps are off, the water pressure and temperatures increase. Hevlin said he asked Pinney to look into this dilemma. **Laughery said they are looking into this but are not finding the hydraulic reason for the reduction in water pressure. Setter said a field test is not approved for next week. Lorz said it could be done at night. Laughery said they could do it at night as long as the water surface could be seen and staff is available. FPOM said that is ok.** Statler added that there needs to be a clear description from FPOM of operational issues for discussion at FFDRWG and with the engineers. Setter said operational changes should not occur without running those through Operations Division and/or FPOM. Setter said NWW and Ogden will draft an Operations Manual for the trap, but this won't happen until the winter. It was also noted that there is a gate that needs repaired as it may possibly fall off and impact the operation of the trap.
- 4.1.2.1.** Johnson added that Nez Perce use the trap to collect broodstock and this is the latest they have been able to collect broodstock. She stressed that they would rather wait than operate the trap if it means killing fish.
- 4.1.3.** LWG Unit 1 return to service and return to Kaplan. Unit 1 should return to service on 14 September. Bettin said it looks like the unit will return to Kaplan in 2016 or 2017. There is a balancing act between crane maintenance and turbine maintenance. Conder asked about re-welding the blades at a different angle. **ACTION: Bettin said he will look into that and report back at the October FPOM.** This will remain an Update item.
- 4.1.4.** LGS AWS pump RTS 20 August. There was a one day delay for dole testing. The project will be raking Unit 5 and Unit 6 due to an increase in fish descaling over the past couple of days. The proposed action from the August FPOM is going to be followed, just a day late.
- 4.1.5.** LMN raceway perforated plate tail screen monitoring. Spurgeon provided a powerpoint. Spurgeon gave some background on the deteriorated condition of the tailscreens. The powerpoint will be available on the FPOM website. He also showed a video of the lamprey moving through the screen. FPOM was impressed and thanked Spurgeon for a job well-done.
- 4.1.6.** LMN fish condition/transport operations. Spurgeon said he felt we were passing some fish that may be better transported. Fone said there have

been no morts in the last couple of days. Wright asked about columnaris. Spurgeon said he hasn't seen any so afflicted they would survive 48 hours holding, but they have seen some with what could be the start of Columnaris on the fins.

- 4.1.7. LMN and IHR spill pattern adjustments in August. Hevlin said this will be looked at ERDC.
- 4.1.8. MCN juvenile fish channel side dewatering screen brush repair. Dugger reported they are still looking at this. He will report back what the problem was, once they figure it out.

4.2. NWP Updates

- 4.2.1. BON Updated Dewatering Plans. Hausmann will bring this to the October FPOM.
- 4.2.2. BON PH1 ITS status. *BON maintenance completed removal of both the upper and lower I&T Sluiceway gates. The upper gate will require bearing replacement on two of the eight guide wheels. More significantly, the lower gate will require bearing replacement on all ten guide wheels to include complete fabrication of a guide wheel as one wheel was missing. Additionally, machine work will be required on two of the remaining nine wheels. Furthermore, the lower gate is suspended on a "dog bone" like linkage and attached to the upper portion of the lower gate from overhead cable sheave blocks. The south side dog bone will require machine work and keeper plate fabrication as it has broken off and missing. The I&T Sluiceway Control Gates will not be repaired and reinstalled by mid-October. I have directed the maintenance crews to begin focusing on fabricating and installing plates over the gate slot in the floor of the I&T sluiceway. This will allow the I&T to be watered up by mid-October so as to not impact Washington Shore Lamprey Flume work. **FPOM requested the ITS be returned to service as quickly as possible to provide safe passage for any fallback at PH1. PH1 is operating per FPP split flows criteria due to fish numbers.***
- 4.2.3. Cascades Island diffuser FG6-18 and FG6-19. Hausmann provided a photo. He suggested that the back diffusers not be operated since the condition of other diffusers may be in similar condition to FG6-18. Klatte gave kudos to the NWP Dive Safety team for getting the work done in a timely manner. Hausmann stressed there was minimal impact and everything looked good. No fish were found in the diffuser.
- 4.2.4. TDA ROV report. Cordie said this is the report that shows the sloughing area found during last month's ROV inspection. Lorz asked if this would be an annual inspection to see if the area is growing. **Cordie said TDA could do it against next year if FPOM wanted. FPOM agreed it would be useful.**
- 4.2.5. JDA potential ROV inspection in September. Zyndol handed out a photo of a raised cover that may indicate issues in the AWS. Cordie said the cover used to be grating; part of the PIES program was to replace with solid plating. After the first year, a couple popped up and the project realized the grating provided venting. Zyndol said this is a new one and JDA maintenance has suggested the mysterious force may have been transferred to the diffuser grating. It is assumed the force was air as there was no indication of water. **FPOM said they do not want to go forward with this inspection given the number of fish in the river**

right now. FPOM said going forward with an inspection on 23 September. Lorz and Fredricks recommends plunking the diffusers and walking the area looking for signs of blown diffuser grates before going to the ROV inspection. Zyndol clarified the inspection would be at night and wouldn't occur until the 23rd of September due to availability. Plunking wouldn't be possible since the grates are under the powerhouse deck. Bettin asked if the deck plates could be vented.

- 4.2.6. NWP winter maintenance schedules
- 4.2.7. TDA fish unit outage. Cordie said this is part of the digital governor upgrades. Part of the testing still needed is interlock testing. This will require a full 8-10 hour outage. Cordie said they are looking at late October – early November at night. **FPOM says ok to doing the work at night that late in the season.**
- 4.2.8. JDA JDA-N variable width weir (VWW) inspection. 13JDA05 coming. Zyndol gave a brief background.
- 4.2.9. BON AFF picket leads. Hausmann reported that only two leads are allowed down at this time. Fish are getting backed down around the corner and when the leads are pulled for 30 minutes, fish just don't have enough time to move through. Hausmann noted that the AFF may hit the temperature threshold in the next day as well. Fredricks described what he had seen when he was there on 11 September. Fish were on top of fish in the pool below the picket leads. **FPOM will re-look at the FPP criteria.** CRITFC will report how their trapping went with two leads down.

4.3. Research/FFDRWG updates. Approval letters, permits, etc located at www.nwd-wc.usace.army.mil/tmt/documents/FPOM/2010/NWP%20Research/Research.html

- 4.3.1. Fredricks explained that on 11 September, he and Conder were at the AFF. One of the morts had been PIT tagged. Looking at the detection history, it appears to have made it up to the count window, fell back through the ladder, died, and ended up on Valve 15 drain. **FPOM was in agreement with tagging dead fish, releasing them just below the count window, and seeing where they end up.** Zorich said he would like to see lamprey added to the test. Rerecich expressed concern about including lamprey due to the idea that dead lamprey may scare off live lamprey. McIlraith said he is less concerned about the lamprey since we are on the tail end of the lamprey run, however, we can freeze the lamprey morts and do this later this month. Conder said there was a radio tagged mort as well. He suggested UI might be able to give us that fish history as well. Meyer said he wonders if the fish might not have backed down the ladder into the AFF. Conder mentioned that the configuration of the AFF exit and the Washington Shore ladder doesn't have any resting areas.

4.4. RCC update.

Project	Previous day average (kcfs)	5 day forecast average (kcfs)	10 day forecast average (kcfs)
LWG	24	20	19
MCN	117	90	94
BON	131	97	101

4.5. Lamprey updates. Zorich said no updates at this time, other than the Washington Shore Lamprey Flume is shutdown.

- 4.6. Avian. To be discussed at the task group meeting.
 - 4.6.1. Avian predation deterrent alternatives.
 - 4.7. Critical Infrastructure.
 - 4.7.1. TDA list updated on website.
 - 4.8. BPA updates. No updates this month.
5. **FFU Kelt monitoring plan.** This will be held over until October.
6. **Zebra mussel control.** Cordie reported that Steve Wells (PSU) is inquiring about the feasibility of painting the diffuser grates with a mussel deterrent. **FPOM requested Wells present at the October FPOM.**
7. **Coordination/Notification forms (need concurrence).**
- 7.1. 13BON51 Washington Shore Lamprey flume repairs. Bettin explained that the B2CC running 24 hours hasn't been approved by BPA. BPA recommends running the B2CC only when units are running. NOAA Fisheries doesn't want to see the B2CC turned on and off every day. NOAA Fisheries and CRITFC are willing to talk about a period of time the B2CC would need to run after PH2 has been turned off. FPOM discussed the appropriateness of powerhouse priority. It may be better to prioritize PH2 when units are available (at night only) with the B2CC open than running PH1 with the ITS. Bettin noted it could be \$500,000 in mitigation for a \$1 million repair. Agreement could not be reached. **ACTION: the action agencies will bring back a modified operation that offers protection for juveniles and adults that may be attracted to PH2 when operating the PH2 units.**
 - 7.2. 13BON73 BON Spillway Tailrace survey. **Approved with one bay open at a time.** Hausmann explained the difficulties with the clearance and making tweaks to it, however, with the numbers of fish that may still be passing BON, only one attraction flow bay may be closed at time.
 - 7.3. 13JDA03 Line 1 outage. Zyndol described the need for this outage. **Approved.**
 - 7.4. 13JDA04 JDA-S two-week extension. More information needed about the type of grout and cure time. **Pending.**
 - 7.5. 13LMN04 SSE rehab pre-work inspection. Completed on 11 September.
 - 7.6. 13LWG16 temporary spill pattern change. Pushed off until 16 September. Ongoing. As changes are made to the roof repair work, this MOC may change as well. Hevlin recommends closing off all spill, pool the water and have more powerhouse water during the morning hours. There is an 11.5K minimum flow. Baus pointed out that this could be in conflict with the end of MOP operation coordinated with the TMT. The intent of the end of MOP operation was release any stored water that was stored above the MOP range during the release of water associated with the Nez Perce agreement. This agreement could likely be modified if the change would benefit adult passage. **ACTION: RCC and NWW will look at this option.**
 - 7.7. 13LWG17 Juvenile Fish Collection Channel Upgrade. Fielding explained the MOC. He would like to see an extension to the collection channel outage so the work would be completed all at one time. Hevlin said we really need to be careful with this as it could get us into a fix with having poor tailrace conditions for upstream passage. **Pending.**
8. **Fish Passage Plan:** The Draft 2014 FPP and Change Forms website is at: <http://www.nwd-wc.usace.army.mil/tmt/documents/fpp/2014/changes/index.html>. All change forms reviewed to date have been posted. See the "Production Schedule & Deadlines" document for a

timeline of events and due dates for change forms to be included the printed version of the 2014 FPP:

- Friday, 01 NOV 2013 – all Corps change forms due to Wright.
- Friday, 13 DEC 2013 – all change forms due to Wright.
- Tuesday, 31 DEC 2013 – final draft sections and change forms will be posted online for regional review.
- Appendix A (Special Project Operations and Studies) sections will be drafted by NWW and NWP as soon as final study designs and operations are finalized (via FFDRWG and/or FPOM), and are due to Wright by mid-February for inclusion in the final print version of the 2014 FPP.

8.1. 14BON001 PH2 Mid-Range Operation. *Pending NWD policy/legal review.*

8.2. 14BON005 6.6. navlock dewatering verbiage

8.3. 14BON006 facts and figures

8.4. 14BON007 avian and pinniped hazing

8.5. 14BON008 Diel graphs

8.6. 14TDA004 6.6. navlock dewatering verbiage

8.7. 14TDA005 facts and figures

8.8. 14TDA006 avian and pinniped hazing

8.9. 14TDA007 SCO unit priority

8.10. 14TDA008 Diel graphs

8.11. 14JDA002 6.6. navlock dewatering verbiage

8.12. 14JDA003 2.2.1. TSW removal

8.13. 14JDA004 facts and figures

8.14. 14JDA005 avian and pinniped hazing

8.15. 14JDA006 Diel graphs

9. Potential 2014 FPP changes.

9.1. Fredricks suggested including a calendar of dates when specific actions are scheduled to occur.

9.2. All Projects: Adult salmon diel passage data added to guide decision-making during scheduling of O&M activities. FPP location to be determined. Proposed at FPOM June 13.

9.3. BON: ITS operation when Unit 1 gates are OOS.

9.4. BON: Fish unit trashraking and dredging.

9.5. BON: Fredricks recommended discussion about splitting flows at BON to address ladder density.

9.6. TDA: Fredricks recommended discussion about attraction spill at TDA to address ladder density.

9.7. JDA: JDAS lamprey trap operations in Lamprey Appendix.

9.8. MCN: Debris spill protocol prior to TSW removal. Proposed at FPOM June 13.

9.9. MCN: remove language regarding transportation.

9.10. MCN: sawtooth model methodology.

9.11. LGS TSW: add criteria that SW will be closed no earlier than August 1 to ensure closure doesn't occur during subyearling migration. If low-flow criteria are achieved prior to August 1, the TSW will remain in service until August 1 unless an adult passage delay is observed or if necessary due to turbine unit operational constraints at low flows. Closing the TSW prior to August 1 will be coordinated with FPOM via an MOC.

9.12. LGS Unit 1 low flow: language to help clarify Unit 1 operation to help push out the back eddy.

- 9.13. **Appendix B:** remove language regarding MCN transport.
 - 9.14. **Appendix or new section:** Guidelines for Avian & Pinniped Hazing. Proposed at FPOM April 11 and May 9.
 - 9.15. **Appendix G:** picket lead protocols.
 - 9.16. **NWW:** Lorz requested project stats, such as number of turbine units, MW, max/min forebay, etc.
 - 9.17. Lorz asked about the navlock operation at MCN. He wanted to know if the downstream gates are kept closed until needed. There is an idea that the navlock may be the route some sockeye pass without going through the count window.
- 10. Task Group Updates.**
- 10.1. Fish counting task group (Setter). Team members include Klatte, Mackey, Rerecich, Setter, Tackley, and Wills. This task group has been disbanded. NWP and NWW will draft recommendations for potential changes to the count program and present to FPOM as needed.
 - 10.2. Avian task group. Chaired by NWW. Team members include: Cordie, Dugger, Fone, Fredricks, Hausmann, Madson, Setter, Skidmore, Trachtenbarg, Zorich, Zyndol. NWW will hold a meeting after the September FPOM. Zorich asked about the objectives of this task group. Fredricks suggested going dam by dam and looking at the effectiveness of our avian abatement program at each project. Klatte suggested bringing in the Port of Portland avian guy as well.
 - 10.3. Sea Lion task group. (Stansell). Team members include: Conder, Cordie, Fredricks, Hausmann, Mackey, J. Skidmore, Whiteaker, VanderLeeuw. Meeting at CRITFC on 18 September.
 - 10.4. AFF mods (Rerecich). Team members include: Benner, Fredricks, Lorz, Mackey, Meyer, Rerecich, Stephenson, Whiteaker. Team met on 20 August. Rerecich reported the release pipes will be reconnected. Fredricks said he would like to take a look at the head over the exit ladder weirs to make sure there is a streaming flow over them. Valve 15 raking will be looked at as well. Appendix G will be modified to reflect the recommended raking level and the recommended water elevation.
- 11. Calendar items/ next FPOM agenda items. (Check the CY13 on the website)**

Memorandums of Coordination



COORDINATION TITLE: 13BON51 NDE Lamprey Flume repairs

COORDINATION DATE: 24 July 2013

PROJECT: Bonneville Lock and Dam – Washington Shore Fish Ladder

RESPONSE DATE: 30 August 2013

Description of the problem- During the 2012-2013 IWW period, the U.S. Army Corps of Engineers (USACE) installed a prototype adult Pacific lamprey passage structure designed to improve lamprey passage at the Bonneville WA Shore north downstream entrance. Shortly following installation, one of the rods that provides structural support for the new Lamprey Flume System (LFS) failed, prompting installation of temporary bracing for adjacent rods and an investigation of the problem (**Figure 1**). USACE determined that vibration due to unanticipated hydraulic loading fatigued the broken rod and adjacent rods and that the mounting system for the LFS must be revised no later than Winter 2013-2014 to avoid complete failure of the system.

Structural failure could result in the system falling into the tailrace. This would create unacceptable hazards for fish passage, alter exit flow conditions for PH2 turbines, necessitate complex salvage operations, and result in increased time and resources lost in meeting important 2008 Columbia Basin Fish Accords obligations with respect to Pacific lamprey passage improvements.

The USACE design team and a contractor are working on a revised design for the mounting system, but details on this design and the required construction schedule are not yet available. As such, USACE must estimate, based on previous experience with LFS installation in the Powerhouse 2 (PH2) tailrace, operational requirements for construction. Key requirements that impact normal operation of fish passage structures and PH2 include:

- *Periods of no ~~PH2~~-powerhouse flow* (no turbine operations) during dive operations. Turbine flow, as this flow may creates tailrace conditions incompatible with the construction activities and creates unacceptable dive safety risks.
- *No operation of the juvenile bypass system during dive operations.* Outlets from the system create a boil in the construction area, resulting in unsafe diving conditions. Given the complexity of turning the system on and off, this means the bypass system must be OOS for the duration of the work period.
- *No operation of the North Downstream or North Upstream entrances (NDE and NUE, respectively) of the Washington Shore Fish Ladder during the work period.*

In addition to the mounting system modifications, USACE intends to address a variety of smaller-scale modifications to the LFS and adjoining Lamprey Passage Structure (LPS) during the requested outage. These include securing HDX-PIT antenna conduit, installation of permanent LPS pump brackets, and minor modifications to the LPS.

USACE requests the following operations:

1. Modified operation of the WA Shore Fish Ladder from October 15 – November 12:
 - a. Partial operation, including South Upstream and Downstream entrances (SUE, SDE), with the North Downstream Entrance (NDE) and North Upstream Entrance (NUE) closed. Normal operation would resume beginning November 12.

- b. Floating Orifice Gates (FOGs) at the north end of the powerhouse (gates 14, 15, 17, and 18) must be closed to accommodate dive work. Normal operation would resume beginning November 12.
 - c. Anticipated work may include use of a floating plant at the north end of Powerhouse 2 and a crane mounted on the tailrace deck.
2. Powerhouse 1 will be priority from October 9 – November 14 during modified PH2 operations. Powerhouse 2 priority will resume when the juvenile bypass system resumes normal operation (item #3 below).
- a. Powerhouse 2 units will be in and out of service to allow for safe dive operations and removal/installation of juvenile bypass screening.
 - b. The following dates/times are subject to change but at this time, USACE anticipates 27 days needed to complete dive operations between the dates of October 15 – November 10. The daily duration of dive operations is anticipated to be 16 hours (approximately 0500 – 2100 hours). Of the remaining 8 hours in the day, 3 hours will be available for generation because approximately 5 hours will be needed to complete required procedures associated with taking PH2 turbine units in and out of service. Specific operations (minimum 2 days advanced notice) must be coordinated throughout the construction period to ensure dive safety. The following is an example of a dive operation that occurred February 26, 2013, associated with the LFS installation: 1) 0600 hours shutdown PH2 and lock out/tag out units, 2) 0830 – 1930 hours dive work, 3) no later than 2000 hours divers release clearances off lock box, and 4) no later than 2200 hours clearances lifted and generating.
 - c. Per item #3 below, all units will be screened and the PH2 Downstream Migration Channel (DSM2) will be back in service no later than November 14.
 - d. If PH2 units are operated from October 15 – November 12, main units on the south end of the powerhouse will be prioritized to provide attraction flow to SUE and SDE. (suggest removing this piece, units 13, 14 and 17 will likely be the unscreened units.)
3. Modified PH2 Juvenile Bypass System operation:
- a. OOS from October 14 – November 12: Begin taking juvenile bypass system out of service on October 9 (removal of STSs), and have DSM2 ~~dewatered~~OOS by October 14 to allow staging of a floating plant and dive operations to begin on October 15. This assumes that it takes 4 days to remove STSs and 1 day to take the DSM2 OOS. (we may only need 2-3 units unscreened)
 - b. Reinstall STSs and have DSM2 back in service (through December 15, per FPP) no later than November 14. (switch to three screened units on the 12th)
 - c. From October 15 – November 14, operate the PH2 Corner Collector (B2CC) if Powerhouse 2 units are operated without STSs to provide a PH2 surface passage route.
4. ~~The B2CC shall be operated 24 hours per day from October 15—November 12 (or until the juvenile bypass system is operating and PH2 resumes normal operation) to provide a surface bypass route for adult and juvenile fish. (See 3 c. above)~~
5. If PH1 capacity is fully utilized ~~(as per current FPP guidelines within 1% of best efficiency and within cavitation limits, until October 31 per FPP)~~ and PH2 units are OOS during the day for dive safety, water exceeding PH1 capacity will be passed via the Spillway. Spill may or may not result from implementing this special operation

depending on inflows, [forebay space](#) and powerhouse availability. ~~When it#~~ PH2 is OOS, BON would likely spill 0 - 23 kcfs (this assumes 9 units available at PH1 operating within 1% of best efficiency plus miscellaneous flows) in order to provide total project discharge of 100 - 125 kcfs needed to achieve an 11.5 ft chum tailwater elevation. *See comments below from Doug Baus (RCC, 8/12/2013).

6. Additional light construction activities, including modification of LPS components on the tailrace deck, handrail work, and other relatively benign/quiet activities, may occur within 50 ft of the fishway through the end of the normal Bonneville Dam IWW period (February 28).

Type of outage required- 1) Decreased ladder operation from October 15 – November 12 (outside of normal IWW period); 2) Restricted unit operations at PH2 from October [159](#) – November 14; 3) Modified juvenile bypass system operations from October 9 – November 14; 4) Operation of B2CC [when unscreened units are run](#); 5) Spill to accommodate work; 6) Work within 50 ft of a fishway.

Impact on facility operation- Outage of the Washington Shore Fish Ladder and the PH2 juvenile bypass system requires assessment of impact on upstream and downstream fish passage. PH2 unit operations will be affected by this construction.

Throughout the repairs, the project will continue to operate the tailwater elevation within the established limits for wintertime rates of change (hourly limit of 3.0 ft/hour, normal daily limit of 7.0 ft/day, maximum daily limit of 10.0 ft/day).

Length of time for repairs- 9 October 2013 – 14 November 2013; Additional light construction activity in this location through 28 February 2014.

Expected impacts on fish passage- The proposed operations will likely increase fallback of and may result in minor migration delays for ESA-listed adult salmonids. Proposed operations were designed to reduce potential impacts. There will be little to no impact on Pacific lamprey.

1. Adult Salmonid Passage

General Comments:

The proposed operation involves partial operation (NDE and NUE entrances closed, reduced number of open FOGs) of the Washington Shore Ladder from October 9 – November 12. All entrances will be open and normal operations will resume beginning November 12, with limited tailrace deck activity through the end of the normal IWW period (February 28). Coho salmon passage is the most important activity during the proposed work period, with fall Chinook and steelhead passage declining through October (**Figure 3**).

Upstream Passage From 15 October through 12 November:

Fall salmon and steelhead runs typically decline through the end of October at Bonneville Dam, though the proposed work would coincide with the latter half of the coho run. From October 15-21, daily passage averaged 1,375 for coho, 275 for steelhead, and 569 for Chinook since 2004 (**Figure 3**). Mean total passage during this week was 9,623 for coho, 1,928 for steelhead, and 3,981 for Chinook. By November 5-11, daily passage averaged 99 for coho, 77 for steelhead, and 83 for Chinook, with incidental chum passage. About 70.4% of total passage during October 15 – November 12 was via the

Washington Shore Fish Ladder in recent years, though this was generally under a Powerhouse 2 priority operation (**Table 1**).

Upstream Passage from 12 November through 28 February:

During this period, the Washington Shore Ladder would be in full operation, with only relatively quiet construction activity conducted on the tailrace deck area. A crane positioned on the roadway deck may be used for light construction activities, such as modifications to the LPS and deployment of LPS pumps (**Figure 2**). This activity is not expected to impact salmon or steelhead passage.

Upstream Passage Mitigation Measures: Powerhouse 1 priority during this period (attraction flow), partial operation of the Washington Shore Ladder, and continued operation of the Bradford and Cascades Island fish ladders should help alleviate potential delay impacts on adult salmon and steelhead. USACE will monitor adult fish passage at the Washington Shore and Bradford Island count stations during this period.

Fallback of Adult Salmonids:

The primary concern regarding effects of the proposed operation on adult salmon and steelhead is increased risk of fallback via PH1 turbines or via the Spillway relative to normal FPP operations. Adult salmon and steelhead sometimes fall back over the dam via the Spillway, turbines, Juvenile Bypass System, B2CC, PH1 Ice and Trash Sluiceway, or the Navigation Lock. Several factors affect fallback behavior at Bonneville Dam, notably route of passage (Washington Shore vs. Bradford Island), spill operations (particularly for PH1-passed fish), guidance efficiency of bypass routes such as the B2CC and the PH1 Ice and Trash Sluiceway, and variations in behavior among species.

Data on route-specific fallback of salmon and steelhead at Bonneville Dam are limited.

Boggs et al. (2004) summarized results of passage and fallback monitoring of adult Chinook salmon and steelhead at Bonneville Dam in 2000 (normal water year in the fall) and 2001 (low water year in the fall). This was prior to removal of the PH1 juvenile bypass system and improvements to the PH1 ITS. Fallback for fall Chinook and steelhead was positively correlated with increasing flow and spill and the authors noted that in 2001, spill never exceeded 50 kcfs during the passage season and didn't occur at all in the fall.

Overall fallback rates for fall Chinook and steelhead were lower for Washington Shore Ladder-passed fish (1.6-4.6% for fall Chinook, 1.5-2.5% for steelhead) than for Bradford Island-passed fish (5.7-6.3% for fall Chinook, 7.8-13.6% for steelhead) (Boggs et al. 2004). The most commonly used likely route of passage for steelhead was the Spillway in 2000 (83%) and the Navigation Lock in 2001 (37%). For fall Chinook, it was the Navigation Lock in 2000 (41%) and the spillway in 2001 (32%). Due to configuration changes at PH1 and small sample sizes, it is difficult to relate the 2000-2001 results to anticipated route use during the proposed construction period. However, 1.7-11.4% (n=1-4) of steelhead fallbacks occurred via the (pre-modification) PH1 ITS, compared to 11.4% (n=4, 2001 monitoring only) via the now-gone PH1 juvenile bypass channel. Similarly, 8.3-14.8% (n=3-5) of fall Chinook fallbacks occurred via the PH1 ITS, compared to 5.6% (n=2) via the juvenile bypass channel. If we assume that "juvenile bypass channel" fish would have passed via turbines if the bypass system were removed, this suggests a PH1 ITS fish guidance efficiency of approximately 50% for adult steelhead fallbacks and 60% for adult fall Chinook fallbacks at PH1.

Similar estimates are not available for estimating B2CC guidance efficiency for adult fall Chinook or steelhead, but survival and injury tests of balloon-tagged steelhead at the PH1 ITS and the B2CC suggested that both routes are benign (Normandeau Associates, 2011).

Fallback Mitigation Measures: Operation of the B2CC when during operating unscreened PH2 units construction would provide an additional surface passage route for adult salmonid fallbacks at PH2. Improvements to the PH1 ITS have likely improved guidance and possibly survival of fall salmon and steelhead fallbacks through this relatively benign passage route. The PH1 ITS will be operated during the proposed construction period. The proposed spill pattern is attached at the end of this MOC.

2. Juvenile Salmonid Passage

The official juvenile migration season occurs from March 1 through November 30, though most downstream migration past Bonneville Dam between April 1 and September 1. Thus, the proposed juvenile bypass system outage and operation of Powerhouse 1 during the work period should have little impact on out-migrating juvenile salmonids. Operation of the B2CC when unscreened units at BON2 are operating during the proposed work period will provide an alternative passage route for adult fallbacks and juvenile fish.

3. Chum Salmon Spawning

The minimum tailwater elevation required to provide adult chum salmon access to spawning habitat located downstream of the dam is expected to be approximately 11.5 ft. This tailwater level requires approximately 110-130 kcfs total project discharge depending on tidal and Willamette River influences. USACE will monitor TDG impacts of spill operations and will make best efforts to maintain TDG within State water quality standards. Any potential deviations from these standards will be coordinated through FPOM, TMT, and/or Oregon DEQ as appropriate. If these conditions are met, no impacts are expected. Chum spawning flows may be delayed until November 10th.

4. Bull Trout

This activity is not likely to impact bull trout, which are only occasionally seen at Bonneville Dam. Fish passage data from the Bonneville Dam fish ladders (Corps, unpublished) show only three sightings of bull trout moving through the fish ladders for 2000 through 2011 during the fish counting season (April 1 through October 31). These sightings occurred between May 30, 2009 and June 2, 2009 and were reported as '12-inch bull trout moving upstream' through the count window on each occasion.

5. Pacific Lamprey

Adult lamprey passage at Bonneville typically peaks in June-July and declines through October, when most upstream lamprey passage activity ceases. Based on RT studies, continuing the Powerhouse 1 priority may provide some minor benefit for the few adult lamprey migrating during the proposed work period. Successful operation of the LFS is a priority for COE lamprey passage improvement efforts. Impacts of this operation on juvenile lamprey are unknown.

Comments from USACE NWD Reservoir Control Center (RCC).

From Doug Baus (8/12/2013): With 10 units in service PH1 hydraulic capacity would be 100 kcfs. During this operation only 9 units will be available (Unit 5 will be out of service) therefore hydraulic capacity will be reduced to 90 kcfs. Operating PH1 available

units at Best Operating Point with the 115 kv line restriction would increase capacity 5 kcfs therefore PH1 hydraulic capacity operating at BOP could be 95 kcfs (9 units + BOP operation). During this period if we do not operate at BOP PH1 capacity with 9 units would be 90 kcfs. BON miscellaneous flows are 12 kcfs (B2CC, PH1 ITS, BI Fish Ladder, CI Fish Ladder, WA Shore Fish Ladder). Total project discharge (PH 1 @ 9 units + BOP + misc flows) would be 107 kcfs. Achieving an 11.5 ft tailwater for the chum operation that starts the first ten days of 1st week of November ~~or~~ when a sufficient number of chum arrive requires BON project discharges of 100-125 kcfs depending on tidal effects/Lower River inflows. If the chum operation is initiated prior to the anticipated flume repair date of November 12 BON will be required to maintain a minimum 11.5 ft tw.

Comments from agencies.

NOAA Fisheries (Fredricks)-

If PH1 capacity is fully utilized (within 1% of best efficiency and within cavitation limits, per FPP) and PH2 units are OOS for dive safety, water exceeding PH1 capacity will be passed via the Spillway. *I would not want to see BOP operation at this time since this would have the tendency to increase adult fallback through the turbine units.*

The proposed operations will likely increase fallback of and may result in minor migration delays for ESA-listed adult salmonids. Proposed operations were designed to reduce potential impacts *There is little doubt that running PH1 hard during the day and stopping PH2 will result in increased fallback of adults through turbine units. We just don't know to what extent. Also, if we were to minimize the impacts, we wouldn't run PH1 as hard (something like 50 kcfs spill with remainder thru the powerhouse). This would minimize fallback while providing a better route for fallback. Gas levels at this spill level would not be an issue for chum or any other listed species in the river at this time. I not suggesting you have to proposed this, just that there are likely lower (fish) impact approaches to this issue.*

Improvements to the PH1 ITS have likely improved guidance and possibly survival of fall salmon and steelhead fallbacks through this relatively benign passage route. The PH1 ITS will be operated during the proposed construction period.

These two should be turned around. I would expect the higher ITS flow to improve guidance but likely not improve survival since we did nothing to improve the transport conditions through the drop in the channel.

August 2013 FPOM- 13BON51 Washington Shore Lamprey flume repairs. Tackley and Welton introduced the MOC. Welton covered the planned installation of the new hangers. This work requires divers. Fredricks asked why the DSM must be out. Welton explained the discharge is a problem for divers. NUE and NDE will need to be closed as well. **ACTION: Hausmann will confirm the monolith gates can be closed and bulkheads won't be needed. He will also inquire about the possibility of turning the DSM on/off each day.**

Baus discussed the chum tailwater requirements and when those requirements go into effect. Baus asked if BOP was being coordinated as well. It was noted BOP wasn't mentioned in the MOC... but it should be. If we need to maintain 11.5' tailwater the first week of November, then that water may need to pass through the spillway. Baus also noted the B2CC gasses the river and is there a need for a special spill pattern. Bettin asked about the end date of 12 November instead of the November 9th date being discussed in other forums. Tackley responded that he calculated the amount of time the work would take and it ran all the way until the 12th.

Fredricks disagreed with the Fish Impacts section. He said there is going to be an impact. There will be increased fallback through unscreened units. Fish passage efficiency without screened bypass at PH2 will be impacted. Fredricks isn't as concerned about the 105% gas limit during the proposed time of year. He wants the adult and juvenile impacts acknowledged in the MOC. He suggested running the B2CC could mitigate the juvenile impacts. Fallback must be considered and recognized. Fredricks noted there is still a fair amount adult fish passage during the first two weeks of November. He expressed concern about operating turbine units at night and then turning them off during the day. This could potentially strand them in the PH2 tailrace.

Bettin asked how the structure would fail, if it did. Welton said when hanger rod 5 broke, the flume dropped onto the lateral supports and displaced some weight on hanger rod 6. Bettin asked "if you cannot accomplish all of the work in the work window being discussed are you considering an option of waiting until the following winter maintenance period and risk failure?" Bettin also asked about how long the structure is expected to be in place. Tackley said we need to have it in place at least three years to test passage efficiency. Bettin asked if there would need to be an outage to remove the structure as well.

Bettin asked if it was possible to leave screens in and turn the DSM on and off each day. **Hausman said he would look into that.** Another thing to explore if flows are low is to leave some screens in place and not run those units. This would allow the project to return to full operation of the second powerhouse sooner at the end of the lamprey flume repair. . A decision to move forward or not needs to be made soon.

Baus asked about the fluctuations of tailwater elevation. The contracts usually state there will be normal tailwater fluctuations and during the fall/winter months, this could be several feet. Welton said he isn't sure but what the contractor will use as far as barges and cranes.

Coordination call scheduled for 1500 on 12 August.

NOAA Fisheries- From: Gary Fredricks - NOAA Federal [mailto:gary.fredricks@noaa.gov]
Sent: Friday, August 23, 2013 10:04 AM
To: Trevor Conder - NOAA Federal; Sean Tackley; Bettin, Scott W (BPA) - KEWR-4; Ritchie Graves - NOAA Federal
Subject: Re: BON Lamprey flume BPA edits

Ok, I've reviewed the suggested changes and there are a few issues that concern me and I want to make clear the items in the coordination that I am most concerned about: 1. There should be no operation of unscreened units at PH2 without the bypass in operation, 2. the corner collector needs to be in operation the entire calendar period during which PH2 is being operated without screens (i.e., it needs to be running even when the units are not running if units are run at any time during the day). Turning it on and off all the time doesn't adequately provide for fish pulled into the forebay by any previous unit operation. 3. PH1 shouldn't operate at BOP or any other level above the 1% range during this altered (non FPP) operation. This is to minimize the pull of adults to PH1 (which normally wouldn't operate at this time). As a reminder to everyone, ESA coverage for lamprey work is a bit on the thin side and the burden of proving that this work will not result in unanticipated take is on the action agencies. Thanks, Gary

NWP Dive Safety-

-----Original Message-----

From: Benoit, Richard A NWP

Sent: Tuesday, September 03, 2013 9:39 PM
To: Richards, Natalie A NWP; Apple, Scott A NWP
Cc: Tackley, Sean C NWP; Manny, D. Todd NWP; Schwartz, Dennis E NWP; Mackey, Tammy M NWP; Welton, Brent C NWP; Moynahan, Kevin NWP
Subject: BONN WA Shores Lamprey Flume - no-flow diving condition (UNCLASSIFIED)
Importance: High

Classification: UNCLASSIFIED
Caveats: NONE

Natalie, Scott and Team:

After extensive team discussions and careful work-plan review, the NWP Office of Dive / ROV Operations and Safety has determined in-water work by divers during execution of the upcoming Bonneville Washington Shore Lamprey Flume modification contract must be facilitated in a "NO-FLOW" environment.

This decision is based on:

1. Safety of divers and dive-support team;
2. Review of in-water work execution during original flume installation;
3. Review of water conditions and associated challenges during project's caisson installation / removal;
4. Situational awareness regarding dangers to divers in work area due to spontaneous upwelling's and unpredictable movement of reciprocating currents;
5. Unacceptable dangers to divers created by water movement during tool use, critical lifts and installation of:

- Supports weighing approximately 1,000-1,100 pounds;
- Hanger rod assemblies weighing approximately 90 pounds;
- Placement of installation jig (approximately 1,000 pounds);
- Installation of 28 Undercut Anchors;
- Application of splash zone epoxy for coating repairs on lifting tabs;
- Use of Tools; Hammer drill, under cut tool, core drill, oxy lance, torque wrench;
- Installation of conduit and anchor clips for PIT Tag Antenna;
- Multiple wedge anchors;
- Aluminum I-beam (2 beams side by side);
- Guide sleeves;
- Orifice plates; 16 inches OD, ID- varies.

The dive office understands and appreciates the challenges of providing divers and their support team a "NO-FLOW" work environment during in-water work. However, we are all in agreement that worker safety must take precedence over all considerations. Given the complexities of this project, the only acceptable environment conducive to a required level of worker safety is a "NO-FLOW" water condition in the diver's work area.

If you have any questions, please feel to contact me. Please feel free to forward as appropriate.

Thank you

Ad Vitam ... Rick

Final results-

Figure 1. Isometric rendering of the Lamprey Flume System (LFS) with gravity flow water supply system. During the proposed work period, COE intends to modify the mounting/support system for the LFS, secure HDX-PIT conduit, and install permanent mounting hardware for the pumps that supply water to the adjacent LPS (not shown).

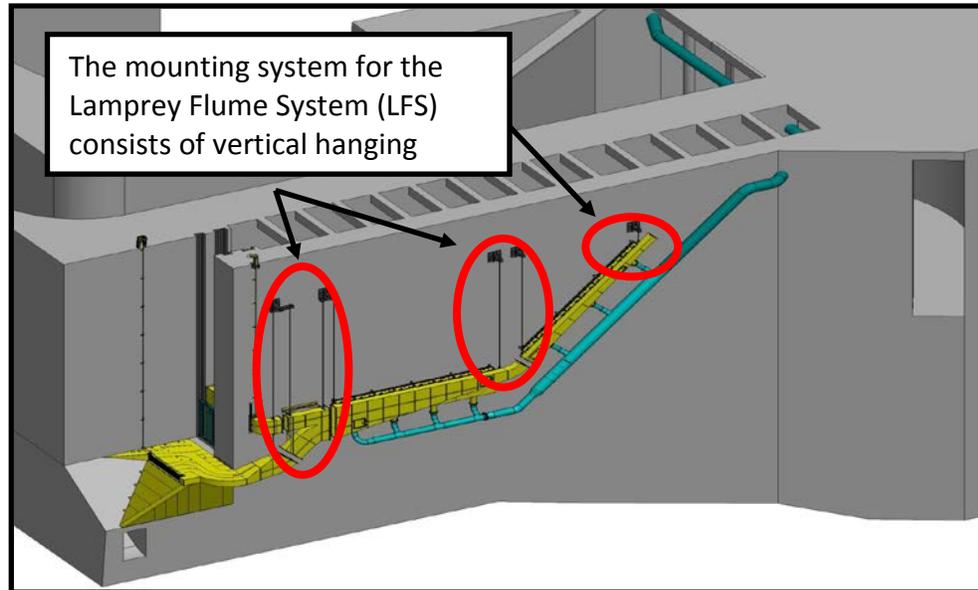


Figure 2. Conceptual design for permanent LPS pump system. A davit will be used to raise and lower pumps (including hoses shown in green and electrical conduit shown in purple) down i-beams via trolleys. Pumps supply water to the LPS ramp and collection tanks at the top of the Lamprey Flume System. Installation during the proposed work period would involve securing i-beams to the west wall of the WA Shore monolith (in place of current temporary pump system). Design details will be shared with FPOM as they are developed.

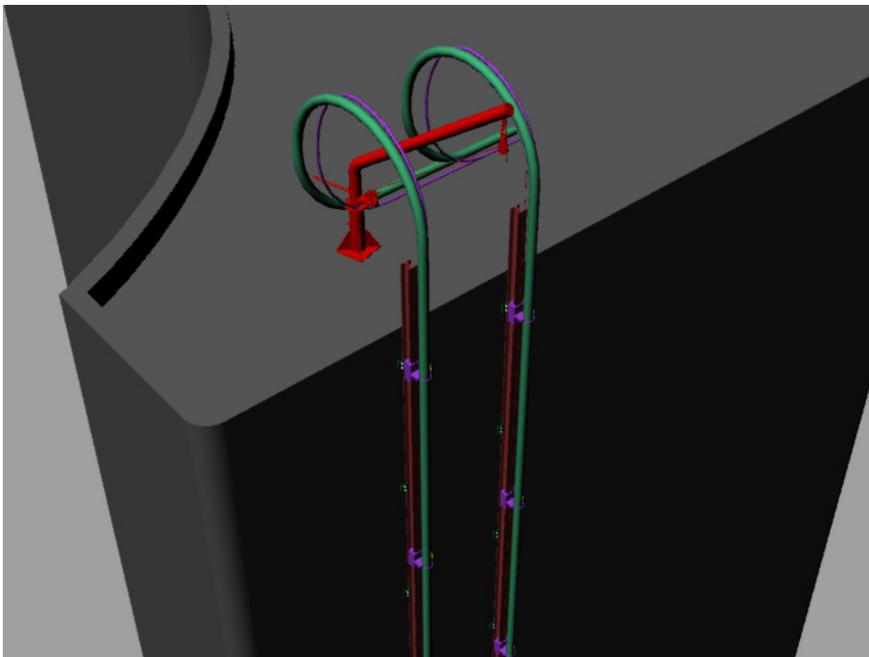
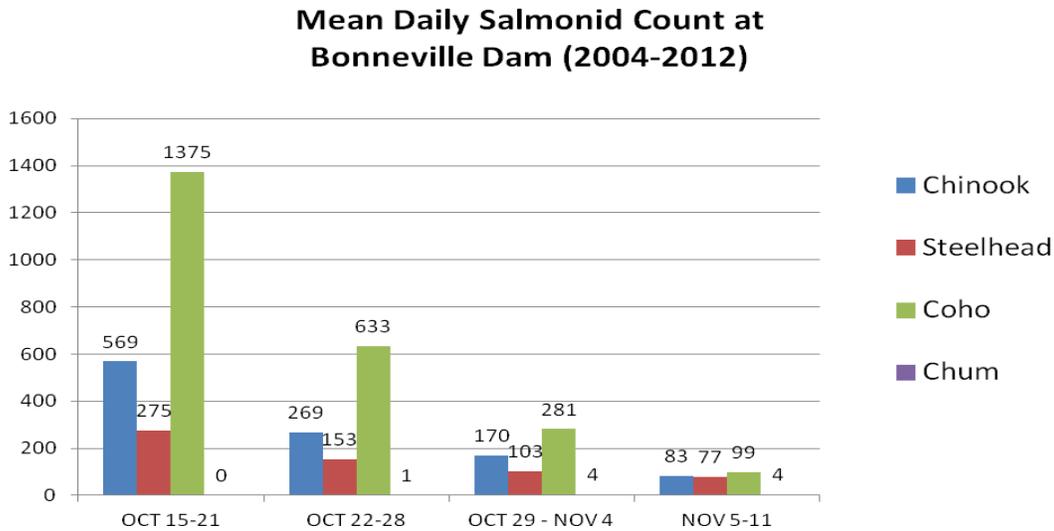


Table 1. Passage of adult salmonids at Bonneville Dam from October 15 through November 12 (2004-2012 counts).

Passage at Bradford Island Fish Ladder (October 15 - November 12)							
Year	Chinook	Steelhead	Coho	Chum	Ladder Total	BON Total	% of Total BON
2004	3218	1083	2293	4	6598	27881	23.7%
2005	3512	2719	2781	87	9099	20594	44.2%
2006	4044	1296	5005	11	10356	35310	29.3%
2007	1938	712	3160	21	5831	28855	20.2%
2008	1201	537	2977	17	4732	20083	23.6%
2009	1040	1171	6419	12	8642	53011	16.3%
2010	1561	783	5315	16	7675	31455	24.4%
2011	5945	1853	3682	11	11491	19074	60.2%
2012	1656	1578	1648	4	4886	19835	24.6%
<i>Mean</i>	<i>2679</i>	<i>1304</i>			<i>7701</i>	<i>28455</i>	
<i>% Mean Passage</i>							<i>29.6%</i>
Passage at Washington Shore Fish Ladder (October 15 - November 12)							
Year	Chinook	Steelhead	Coho	Chum	Ladder Total	BON Total	% of Total BON
2004	6624	2806	11853	0	21283	27881	76.3%
2005	3710	3430	4327	28	11495	20594	55.8%
2006	7766	5817	11272	99	24954	35310	70.7%
2007	4252	2802	15925	45	23024	28855	79.8%
2008	2921	1818	10571	41	15351	20083	76.4%
2009	4235	5389	34682	63	44369	53011	83.7%
2010	4790	1891	17022	77	23780	31455	75.6%
2011	4354	660	2563	6	7583	19074	39.8%
2012	5675	2363	6869	42	14949	19835	75.4%
<i>Mean</i>	<i>4925</i>	<i>2997</i>			<i>20754</i>	<i>28455</i>	
<i>% Mean Passage</i>							<i>70.4%</i>

Figure 3. Mean daily salmon and steelhead passage at Bonneville Dam during the proposed work period (2004-2012).



Use for Lamprey Repair Work

Note: The gate openings are provided in 1/2 foot increments of verticle lift. One gate stop equals a 1/2 foot gate opening. The total discharge is based on the spillway rating curves revised in February 2005.

Bonneville Spillway
Discharge Distribution Patterns

Spillway Bay Number																		Gate Stops	FB=74.0 Total Spill (cfs)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
vertical gate opening (ft.)																			
0.5	0																	1	1,150
1	0																	2	2,275
2	0																	4	4,456
2	2																	8	8,913
2	2	2																12	13,369
2	2	2	2															16	17,825
2	2	2	2	2														16	17,825
2	2	2	2	2	2													20	22,281
2	2	2	2	2	2	2												24	26,738
2	2	2	2	2	2	2	2											28	31,194
2	2	2	2	2	2	2	2	2										32	35,650
2	2	2	2	2	2	2	2	2	2									36	40,107
2	2	2	2	2	2	2	2	2	2	2								40	44,563
2	2	2	2	2	2	2	2	2	2	2	2							44	49,019
2	2	2	2	2	2	2	2	2	2	2	2	2						48	53,476



COORDINATION TITLE- 13BON73 BON Spillway survey

COORDINATION DATE- 10 September 2013

PROJECT- Bonneville Lock and Dam

RESPONSE DATE- 12 September (FPOM)

Description of the problem- NWP would like to conduct their annual survey of the BON Spillway; focusing on the repaired sections. They would like to conduct the survey sometime between 30 September and 9 October (to avoid conflict with the lamprey flume repairs scheduled at PH2), with 30 September as the preferred date.

Type of outage required- The Project would prefer all 18 spill bays be out of service for the entire survey. This makes the clearance easier to administer.

If that is not acceptable with FPOM, bays 2-17 would be out of service for the entire survey. Bay 1 would be out of service while the survey boat is in the north half of the spillway and Bay 18 would be out of service while the survey boat is in the south half of the spillway.

Impact on facility operation- The spillway will not be available to pass flows while the survey boat is in the tailrace.

Dates of impacts/repairs- Preferably 30 September.

Length of time for repairs- One work day.

Expected impacts on fish passage- In late September and early October there are normally over 1000 adult salmonids passing BON per day, however, minimal delay is expected for adults, as long as either spill bay 1 or 18 is open. Cascades Island and B-branch fishways will remain within FPP criteria.

Comments from agencies

Final results



COORDINATION TITLE- 13JDA03 LINE 1 OUTAGE

COORDINATION DATE- 8/26/13

PROJECT- John Day Dam- Miro Zyndol, POC

RESPONSE DATE- September 2013 FPOM

Description of the problem: JDA line 1 (units 1-4) outage is required by JDA to perform necessary bus/switching gear maintenance. This maintenance needs to be performed in dry/warm weather and cannot occur during the winter maintenance period.

Type of outage required: Line 1 will be out of service. This will take units 1-4 out of service at a time when they are still priority units.

Impact on facility operation : Units 1-4 will be OOS and will not be providing flushing flow for the JBS outfall. In addition, there will not be additional attraction flow from Unit 1 for the JDA-S SE1.

Dates of impacts/repairs: November 4- 7, 2013

Length of time for repairs: four days.

Expected impacts on fish passage:

Downstream migrating salmonids- Due to the timing of this outage to occur so late in the fish passage season, the expected impact on the juveniles should be minimal. Smolt Monitoring no longer monitors fish at this time of year. The flume is in bypass to allow for PIT tag detection of any adults passing. There will not be flushing flow from Units 1-4 but adults should be able to actively swim downstream or migrate back upstream if they so choose.

Upstream Migrating salmonids- While the impacts are expected to be minimal due to the fishway remaining in FPP criteria, there is the potential for many fish to still be migrating through JDA. If the flow from units 1-4 are critical to those fish keying in on the south fishway, several thousand fish could be delayed during the duration of the Line 1 outage.

Expected impacts on fish passage-

Downstream migrants- The outage is for the adult fishway, the juvenile bypass system will operate within FPP criteria.

Upstream migrating salmonids-

Note- fish passage numbers available for March from 2003 - 2007					
Date	2003	2004	2005	2006	2007
4-10 March					
JDA-S CH	2	0	0	0	0
JDA-S STHD	2168	308	480	0	418
JDA-N CH	6	0	0	0	0
JDA-N STHD	1008	84	179	163	306
11-17 March					
JDA-S CH	52	2	0	0	0
JDA-S STHD	1321	695	324	2	423
JDA-N CH	241	0	1	0	1
JDA-N STHD	1731	184	483	79	283
18-24 March					
JDA-S CH	107	25	5	0	0
JDA-S STHD	545	445	168	15	428
JDA-N CH	1378	24	10	0	0
JDA-N STHD	1454	291	431	314	510
25-31 March					
JDA-S CH	328	44	0	0	2
JDA-S STHD	198	280	137	73	565
JDA-N CH	1837	32	-1	0	0
JDA-N STHD	1357	307	236	599	386

Minimal impact expected for Chinook, due to their timing doesn't typically coincide with the proposed extended outage.

There are impacts expected for steelhead. The majority of steelhead tend to pass JDA-S during March. These fish may be delayed as they seek the JDA-N entrance.

Bull Trout-

Lamprey- no expected impacts due to timing of the outage does not coincide with historical timing of adult lamprey passage.

Comments from agencies

Final results



COORDINATION TITLE- Lower Granite Juvenile Fish Collection Channel Upgrades

COORDINATION DATE- September 10, 2013

PROJECT- Lower Granite

RESPONSE DATE- September 12, 2013 FPOM meeting

Description of the problem Construction activities associated with the Lower Granite fish bypass system upgrade will require extensive onsite efforts over an approximate 36 to 86 month construction schedule. While many of the construction activities can occur during normal project operations, some activities may require alteration of normal project operations. The time necessary for completion of construction activities will be directly correlated with the construction methods employed. The existing collection channel within the powerhouse will require extensive concrete mining to expand the channel from 6 ft. to 9.5 ft. and the potential

replacement of 10" orifices with 14" orifices. The construction method for concrete mining has yet to be determined but the USACE is approximating 6-10 months to complete the task which likely translates into three un-watered work windows (15 December to 24 March). On the other end of the spectrum for construction schedules, a single un-watered work window of 1 August to 24 March is anticipated to allow for construction activities without interruption and benefit the collection mining process. All potentially anticipated construction scenarios have various pros and cons on project operations, fish passage, and overall project costs.

The USACE's Fish Passage Plan (2013) calls for the collection channel to be operated from 25 March to 31 October for juvenile passage and collection and 1 November to 15 December for adult fallback passage. Spill operations typically begin 2 April and end 31 August. The proposed extended un-watered work window would alter the normal operations of the collection channel and as a result limit the available passage routes to the spillway and turbines during the month of August. Available passage route for September to December would be via the turbines. The Corps proposes that the RSW operate from 1 September to 15 December to allow alternate passage routes for juvenile and adult salmonids. The RSW would operate under the following scenario:

1. Operate the RSW 12 hours per day (6am to 6pm) from 1 September to 15 December.

Operating the RSW during the extended un-watered work window would require discharge through the RSW of 6.83 kcfs. During low to average river flow years, minimum generation requirements through the turbines may result in a lack of water to operate the RSW and maintain minimum operating pool. In that case, the RSW would need to be closed and spill distributed among the other bays.

Table 1. – Average inflows and turbine discharge at Lower Granite Dam, 2006 to 2012. Inflow and powerhouse discharge are reported as kcfs.

Month	Inflow (kcfs)	Powerhouse (kcfs)
August	31.05	13.20
September	24.77	23.95
October	21.07	20.60
November	21.73	20.70
December	24.03	23.65

Type of outage required- The removal of ESBS's and the closure of the collection channel from 1 August 2015 to 24 March 2016. Unit outages to dip fish out of the corresponding gatewell slots will be needed at least every 48 hours when fish are going into the slots. Open the RSW for fish passage from 1 September to 15 December.

Impact on facility operation- The impact to facility is the early closure of the collection channel and the de-watering of the Juvenile Fish Facility in August 2015 instead of December as typical. Fish may enter the gatewells even with ESBSs removed, which would require dipping of fish from the gatewell slots during the August 1 to December 15 period. Maximum fish holding time in the gatewell slots is 48 hours. This would require unit outages to dip the corresponding gatewells.

Dates of impacts/repairs- 1 August 2015 to 24 March 2016

Length of time for repairs- The construction of the Juvenile Bypass System is anticipated to begin in the fall of 2014 with completion in the spring of 2016. The extended un-watered work window is expected to occur from 1 August 2015 to 24 March 2016.

Expected impacts on fish passage- The closure of the collection channel may impact juvenile salmonids (Table 2) and adult fallbacks (Table 3) and require the passage through the spillway or turbines. Fish that are entrained in the gatewells will need to be dipped out and transported to the boat ramp for release downstream of the dam.

Table 2. – Juvenile salmonid collection at Lower Granite Dam Juvenile Fish Facility, 2006 to 2012. Data collected by USACE.

Year	August	September	October
2006	1,841	2,107	4,219
2007	2,056	1,124	10,407
2008	21,047	9,220	8,731
2009	3,044	2,002	2,115
2010	8,907	8,436	11,436
2011	6,498	14,307	5,721
2012	8,121	6,443	12,255

Adult fish passage will tailrace flow conditions will need to be monitored. If necessary, unit operation or spill distribution and timing may need to be adaptively managed as appropriate, within the constraints of water availability, to improve adult fish passage conditions.

Table 3. – Adult salmonid fallback at Lower Granite Dam, 2006 to 2012. Data collected by USACE personnel as adult salmonids cross the JFF separator.

Year	August	September	October
2006	51	335	630
2007	67	270	846
2008	275	798	2,253
2009	247	3,462	2,940
2010	477	1,202	1,919
2011	179	1,547	2,787
2012	81	752	2,090

Comments from agencies

Final results