



MEMORANDUM FOR THE RECORD

Subject: FINAL minutes for the 09 April 2009 FPOM meeting.

The meeting was held at the McNary Auditorium at McNary Dam. In attendance:

Last	First	Agency	Phone	Email
Ahmann	Martin	USACE	509-527-7538	<a href="mailto:Martin.L.Ahmann@usace.army.mil">Martin.L.Ahmann@usace.army.mil</a>
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Klatte	Bern	USACE	503-808-4318	<a href="mailto:Bernard.a.klatte@usace.army.mil">Bernard.a.klatte@usace.army.mil</a>
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Mackey	Tammy	USACE	541-374-4552	<a href="mailto:Tammy.m.mackey@usace.army.mil">Tammy.m.mackey@usace.army.mil</a>
Martinson	Rick	PSMFC	541-296-8989	<a href="mailto:rickdm@gorge.net">rickdm@gorge.net</a>
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Wills	David	USFWS	360-604-2500	<a href="mailto:David_wills@fws.gov">David_wills@fws.gov</a>

Hausmann, Lorz, Scott, and Wills were on the phone. Gary Fredricks was absent, but FPOM members in attendance acknowledged his grandmother’s 100<sup>th</sup> birthday and considered what that meant for Gary’s life expectancy and continued participation in FPOM.

1. 0900- Tour of the TSWs. The TSWs are not yet operating so there was no interest in going on a tour. No tour of the JBS watering screens after the meeting either, since Larry Swenson was not able to make it.
2. **Introductions, Review of the Agenda, approval of the March minutes.** Everyone introduced themselves. The March minutes were approved. The final minutes will be sent to FPOM.
3. **SMP condition sub-sampling numbers.** Since FPC wasn’t going to be available all day, the SMP condition agenda item was moved to the beginning of the meeting.
  - 3.1. A Memo was submitted to Klatte, Dykstra, and FPAC asking for clarification on condition sub-sampling fish numbers. Dykstra indicated a response is being drafted but there are a couple of items that need to be discussed, such as the 200 fish per clip type that must be sub-sampled each day. This will result in, potentially, 800 fish being sub-sampled. USACE didn’t request that so the question is, where did that requirement come from.



- 3.2.** McCann responded that those numbers came from his interpretation of what USACE was requesting in the SMP condition metrics meetings. He stated that it is not his preference to sub-sample that many fish and if that is not what is wanted, then it is easy for him to change that. McCann stated that as far as FPC was concerned, it was a USACE recommendation. Dykstra stated that the 800 fish was not a USACE recommendation. McCann said “let’s say it’s not and move on”. Dykstra clarified that we could do more than say it’s not; it is NOT a USACE recommendation. The FPP states that each Project will sub-sample 100 fish of the dominant species.
- 3.3.** McCann asked for a definition of “dominant species”. Dykstra provided a math lesson on how to determine the dominant species. He said “let’s say 90% of the fish are steelhead, 5% are sockeye and 5% are chinook. The detailed condition monitoring would consist of 100 steelhead and a few chinook and sockeye encountered while getting to 100 steelhead.” This example was given twice.
- 3.4.** The next question was what if there are 50% chinook and 50% steelhead? Dykstra replied that this would result in two dominant species and there would be about 100 of each. McCann didn’t seem satisfied with the explanation. The WDFW monitors chimed in with the process that they currently use. They target 100 of the dominant species, but will continue to sub-sample other species if there are still some in the sample tank. Ideally the sub-sample is random so the fish are taken from each batch until the entire sample tank is empty.
- 3.5.** McCann expressed concern about not knowing what the dominant species is until after the sample has been worked up. Mensik and Tudor explained that they can see the reader board and know what the techs have sorted already. Based on that, they get a pretty good idea of what the distribution of fish is in the sample.
- 3.6.** Richards brought up the A-side and B-side tanks. Tudor explained that she wouldn’t take all of her sub-sample fish from one side if she knows there are fish sitting in the other side as well. Richards asked how many she would do from each side. Tudor explained that she would try to get a percentage from each side based on the percentage of fish in each side. Mensik expressed a bit of frustration in that the confusion tends to come from people not knowing how the samples are worked up. If people would visit the sites, they would get a better understanding of how things worked.
- 3.7.** Martinson asked how many fish are needed to determine injuries based on Project operations. With some discussion, it was determined by the WDFW monitors that they only need about 30 fish for that, but all fish are examined for descaling. Martinson asked if it would be possible to look at fewer fish.
- 3.8.** Dykstra brought the conversation back to the fish passage plan. He suggested that if FPOM wanted to get away from the dominant species and just examine 100 fish total, we could do that. Spurgeon cautioned that if you limit the numbers too much, you may miss some impacts. Morrill commented that for smolt monitoring, you are targeting 500-800 fish total and a condition sub-sample is just a portion of those fish.
- 3.9.** Hevlin expressed confusion as to why we are trying to change the way the condition sub-sampling is done. Martinson explained that we are talking about this due to a change detailed in the FPC memo.
- 3.10.** Dykstra said he has not knowledge of where clip type came from and we can remove the clip type requirement from the SMP protocols. He then asked how often 400 fish would be sub-sampled. Tudor and Mensik said only in the spring but not very often. They are constrained by the barge schedules and to look at 800 fish is outside the realm of reason.
- 3.11.** McCann attempted to clarify that the recommendation is 100 fish of the dominant fish and...how many of the other species? He was asked if he wants a number for the other fish because that is dependant on what is in the river. McCann explained that he wants to know how many fish he needs to tell people to collect so they can do their job.



- 3.12. Klatte said that the JDA and BON protocols should not change from last year. That would be 100 steelhead and 100 sockeye on one day and 100 chinook and 100 coho on the next day.
- 3.13. The conversation continued back and forth between McCann and Dykstra as to what the other species will total and what a target number would be.
- 3.14. Martinson asked if the 100 fish requirement could be reduced to 50 fish. He explained that the new protocols have increased his crews' sampling time by 40%.
- 3.15. Lorz and Wills said they were ok with 100 fish. Lorz would like to find ways to minimize handling.
- 3.16. **NWP and NWW will NOT have identical sub-sample sizes. FPOM is ok with this.**
- 3.17. Martinson asked if there are equal portions of chinook and coho, can 50 fish of each be collected and it be considered a good sample. Richards asked how long it takes to work up 50 fish. There isn't a good answer to that since it depends on how you look at it. It may take all day to get 50 fish if you are taking a few from each batch, but each fish takes about 15 seconds.
- 3.18. Mackey asked Martinson if JDA and BON are weighing fish even though they are non-transportation sites. Martinson said yes. Mackey then asked if that requirement could be done away with at those two sites.
- 3.19. McCann said he felt the information was useful and FPC gets requests from researchers for that information. He didn't feel that collecting the weight is a significant increase in handling. Mackey suggested that Martinson just indicated it was a significant increase in handling time and is the information worth that additional handling time, especially when water temperatures increase? McCann said he didn't have an answer.
- 3.20. Klatte said if we don't need the data, then why collect it? Dykstra asked if the weights are now collected due to standardization. Klatte said USACE doesn't need the information and if there is a researcher request then it can come through FPAC to USACE.
- 3.21. Martinson asked if the inclusion of weights was Michelle DeHart's interpretation from FPAC. Lorz clarified that the standardization was for disease reporting, not weights. Wills thought the weight information would be useful, though he didn't know who was using the information, at JDA and BON but not worth it if it increased the handling time for personnel.
- 3.22. **FPOM agreed to 100 fish of the dominant species and not more than 100 of the non-dominant species for the NWW sites. For the NWP sites there will be 100 of each species (two sampled one day, two the next) with no weights taken on any.**

#### 4. Action Items

- 4.1. [Nov 08] IHR Sacajawea sub-station transformer. **ACTION:** Bettin to draft the FPP change form detailing the unit operation needed to keep the system operating correctly. **STATUS:** *Bettin suggests writing the language for the unit priority once the bank is back in service. Rather than write a unit priority for now, then re-writing it when the bank returns to service in a couple of months. NWW and Bettin will work on that language.*
- 4.2. [Nov 08] WDFW fish count lights. **ACTION:** Stephenson will draft a write-up detailing what the fish counters are seeing and what they are requesting. It should include what are they seeing, how improvements will be assessed, etc.
- 4.3. [Feb 09] FPP Appendix L comments from the Region. **ACTION:** FPOM will provide comments through Mackey. For now, they will be posted on the FPP website. **STATUS:** *no comments. This action is going to be deleted.*
- 4.4. [Mar 09] BON PH1 Grizzlies. **ACTION:** Klatte will look for money to fund the grizzlie modifications. **STATUS:** *Small Projects is working on this. It is the same engineer as the Hurson Memorial fish release site. There is no money currently, but he will continue to work on it. Eby asked was a grizzlie is. Mackey suggested it was a gravity floor drain. Meyer clarified that the grizzlie is the rack over the drain.*
- 4.5. [Mar 09] Entrance gate elevations/openings. **ACTION:** Wills will complete his table and send to Mackey. **STATUS:** *This dropped off the radar. He will work on it for the 2010 FPP.*



- 4.6. [Mar 09] Lamprey at IHR and JDA. FPOM recommended torpedo screens with airburst systems. **ACTION:** Zyndol and Moody will follow up with Swenson. **STATUS:** *Moody working with the lamprey group. A PDT (Project Development Team) has been pulled together because this modification will require a bit more work than just attaching a screen to the opening. Miro Zyndol reported (via e-mail) that he has checked with the mechanical crews at TDA and JDA with the idea of determining if and how often the plugging of the two types of coolers occurs. The more numerous are the turbine coolers; 22 at TDA and 16 at JDA. And the other type are transformer coolers; 8 at TDA and 2 at JDA. Starting with the turbine coolers (each turbine has one, intake is located in scroll case), it appears that at TDA, the plugging of their strainers has been occurring a few times a year but the culprit are juvenile shad. The strainers here are opened/cleaned/inspected regularly twice a year while the units are OOS for semi-annuals. Additionally, to make their work easier, the mechanics are in the process of replacing the old strainers with the new "grinding" ones (similar to a food disposal on ships etc.) which dispose of the offending fish as indicated by their name... No juvenile lamprey have been ever found in the turbine coolers' strainers at TDA. The JDA turbine coolers don't have any record of plugging with anything and therefore the mechanics here do open them only once every 5 years or so. As far as the transformer coolers are concerned, I am still in process of gathering information from the mechanical departments and will let you more facts soon.*
- 4.7. [Mar 09] Hurson Memorial truck pad. **ACTION:** Bailey will present a new operating plan to FPOM prior to the start of trucking.
- 4.8. [Mar 09] FPP changes. There were many comments on Appendix B. **ACTION:** Moody will update Appendix B and send it to Feil. **STATUS:** *completed.*
- 4.9. [Mar 09] FPP change forms. Appendix J temperature protocols. Fredricks wanted the temperature protocols more clearly described in the appendix. **ACTION:** Hausmann will write up the language to clarify how temperatures are taken and when.
- 4.10. [Mar 09] FPP change forms. Appendix K temperature protocols. Fredricks wanted the temperature protocols more clearly described in the appendix. **ACTION:** Cordie will write up the language to clarify how temperatures are taken and when.
- 4.11. [Mar 09] JDA stand pipe in the fishway. FPOM would like the Project to look at options for moving the standpipe so it is not in the fishway. **ACTION:** Cordie to check on the buffering of the sensors. **STATUS:** *The standpipe was moved behind the screens so checking on the buffering is no longer needed.*
- 4.12. [Mar 09] BON AFF. Fredricks requests another AFF meeting as a follow up to the August 2008 meeting. He would like to check on the commitments made by CRITFC in return for leniency with the picket leads. **ACTION:** Klatte will set up another AFF meeting in May. Since the last meeting, there have been changes made. CRITFC has put together some passage numbers on adults; USACE has installed new picket leads.
- 4.13. [Apr 09] IHR unit priority. **ACTION:** Bettin and NWW will work on drafting unit priority language for the 2010 FPP.
- 4.14. [Apr 09] MCN ESBS installation. **ACTION:** NWW will draft a change form for 2010 FPP.
- 4.15. [Apr 09] MCN entrance tests for lamprey. **ACTION:** Dykstra to send the entrance test results to Mackey for inclusion in the minutes. **STATUS:** *sent on 10 April.*
5. **Updates.**
- 5.1. BON TIE Crane repairs. The heat treatment process has gone through a second round of testing and has passed. USACE is waiting for a heat treat submittal for the entire boom and we hope to have it by summer.
- 5.1.1. Bettin asked if the 65 ton crane will be stationed on the Washington side once the TIE crane returns to service. Mackey said the crane will be moved back to Washington but not sure what will happen once the TIE crane returns to service.



- 5.2. BON Unit 11 return to service date. BON unit 11 will not return to service until September. This may impact spring and summer research on the BGS.
- 5.3. JDA STS crane. The crane blew off the rails on 31 March. The Project has jacked it up and returned it to the rails. The damage appears to have been confined to the decking surface. New brakes are being installed.
- 5.4. MCN ESBS installation. ESBS installation was started on 7 April. Units 1-3 are complete. The Project is on target to have all ESBSs installed by 16 April.
  - 5.4.1. Bettin asked if this would be a standard operation. Dykstra said he thought it would be but the difficulty is tying the dates to the work week rather than just dates. **ACTION: NWW will draft a change form for the 2010 FPP.**
- 5.5. MCN TSW gate hoist. The modified gate hoist seemed to be flexing in the wind. Project personnel noted it and started working on strengthening the hoist so spill can start as expected at 0001 on 10 April. Bettin asked if the hoist wasn't completed, spill would still start but the TSW flow would be dispersed to the other bays.
- 5.6. MCN Entrance velocity test result for improved lamprey passage. Dykstra reminded FPOM of the request sent a few weeks ago to test lowering the velocities at the fish ladder entrance. The goal was to find a method for lowering velocities without shutting the fish pumps on and off.
  - 5.6.1. Fryer and Ahmann discussed the results of the test. Fryer gave some background, saying the Accords specify looking at ways to lower velocities at entrances for lamprey. At MCN, it was determined that messing with the hydraulics wouldn't be a good idea, but dropping the weirs to the lowest elevation would reduce velocities without impacting hydraulics up the ladder. The test was only performed on the south ladder.
  - 5.6.2. Ahmann said they started by reducing flows through various means but those actions were not determined to be efficient nor effective and could potentially impact equipment operation. Lowering the weir reduced velocities by 50% and the logistics were very simple. The weirs could be automated through programming the PLC to raise and lower the weir at specific times. The concern now is that as tailwater decreases, the reduction in flow may not be as great, also, changes in operations as per the FPP could change how effective lowering the weir may be.
  - 5.6.3. Bettin asked if the gates could be raised. Ahmann said they could be fully lowered or raised. Bettin asked if you could back off the pumps and raise the gates. Ahmann stated part of the idea was to get the entrances low. Meyer commented that if the pumps were backed off, it would impact the hydraulics in the ladder and the smaller cross-section of the entrance wouldn't compete as well with the greater flow from the powerhouse.
  - 5.6.4. Ahmann said they will be looking at long and short-term operational improvements, including a new gate design for the entrance.
  - 5.6.5. There were more questions about the results of the test. Fryer had only a couple of copies. He said he would email the results so FPOM could review them.
  - 5.6.6. Martinson asked what velocity stops lamprey passage. He asked if they stopped due to velocity or attachment points. Fryer said the research is still on-going but there is an attempt to try to reduce flows and provide better attachment points. He also mentioned that the test at MCN was different than the test at BON, where they reduced flows to reduce velocities. There were also a lot of confounding variables at BON.
  - 5.6.7. Fryer would like to present a recommendation to move forward with further studies to ensure the conditions for adult salmon are not negatively impacted by operations for lamprey. No plan to biologically test lamprey due to low sample sizes.
  - 5.6.8. Meyer suggested the recommendation from Fryer be written up and presented to FPOM. He said Gary Fredricks will need to weigh in and there needs to be an evaluation of benefits.
  - 5.6.9. Dykstra said we could wait a year until more information on lamprey could be gathered, but there is a desire to move forward with investigating the potential impacts on adult



salmon this year. Ladder counts would be used to determine if there is an impact. Bettin asked what off-ramps would be in place if impacts were seen. He wanted to know when the test would start as well. Fryer didn't have all of that information yet.

**5.6.10.** Bettin asked if the test should occur when salmon are moving through to determine if there is an impact to salmon migration. Discussion about whether the test should be restricted to night or to include some daytime hours to see if there is an impact to salmon. Meyer and Dykstra clarified that the test is not to see if they can impact salmon but if the nighttime operation would impact salmon passing at that time. Bettin suggested that if the lamprey are collected by researchers in the middle of the night at BON, it is possible they enter the fishway during the evening hours.

**5.6.11.** Richards asked if University of Idaho would have a feel for entrance times. Fryer said he has data available, he just hasn't had time to go through it yet, but University of Idaho does have that information for entrance timing at BON.

**5.6.12.** Stephenson asked if Fryer considered the changes in daylight hours. Meyer said he is not inclined to adjust the weirs during salmon passage times since it will reduce the attractiveness of the ladder and it will impact salmon passage. Bettin said at some point we will have to make hard decisions about the trade-offs for the two species. Meyer didn't think we were at that point yet, but Bettin suggested we might be.

**5.6.13. ACTION:** Dykstra will email the test results to Mackey for inclusion in the minutes.

**5.6.14. ACTION:** Fryer will get a write-up to Dykstra, to send to FPOM, by 1 May. FPOM will review the proposal and be prepared to discuss at the May FPOM meeting.

**5.7.** Lamprey nighttime counts. Moody said the nighttime counts will occur at MCN, BON and LWG. BON will start 15 June, MCN will start 1 July, and LWG will start when the sockeye counts begin. All counts will end on 30 September. Still discussing the turn-around time on the counts. Bettin asked if each lamprey would be counted or if the square feet of the window would be counted instead. It was suggested Moody discuss counting protocols with University of Idaho. Moody said he had and they continue to explore methods.

**5.8.** Coordination activities completed prior to FPOM.

**5.8.1.** BON JMF head box outage on 19 March.

**5.8.2.** BON spill gate 17 setting. Set at two dogs until summer.

**5.8.3.** BON ITS outage on 10 April. Mackey taking the clearance for the scaffolding removal.

**6. BON Bank 7/8 outage.** Hausmann explained what the outage would entail. Mackey said that comments are due today. FPOM had no additional comments. The Project will move forward as coordinated.

**7. TDA spill wall early start date.** Comment period closes 15 April. No additional comments provided at FPOM. A darker shade of concrete was requested and there was a question if we would be dropping any cranes. Lorz brought up a concern Dave Benner had about the forebay elevation during October and November. The question Benner had was if the forebay could be reduced due to chum spawning requirements. Bettin said the issue was brought to TMT so the Region is aware of the issues but there is not go work around at this time. The contractor will need the BON pool up since they will be working over the shallowest areas. **UPDATE:** via phone call, Dave Benner clarified his question. He wanted to know if the work that needs to be done while the forebay elevation is high could be done earlier so the overlap with the chum restrictions could be minimized. Bob Wertheimer said all of the work will be in shallow water and, considering the size of the equipment the contractor will be using, the forebay restriction will need to remain in place throughout the work window.

**8. Cascades Island entrance TDG levels.** Lorz expressed concern about the amount of gas coming from BON; it is more than what has been seen in the past. He asked if anyone was looking at the



new entrance to see if that might be the problem. Klatte said the entrance weir hasn't been installed yet. Lorz said the gas levels seen this year have been up to 113%.

## 9. Task Groups.

9.1. Lamprey. (*Chair-Cordie, Clugston, Dykstra, Lorz, Mackey, Meyer, Moody, Moser, Peery, Rerecich, Zyndol*). CTUIR planning on trapping at JDA this season. NWP and tribes plan to visit JDA to determine a location for a new LPS.

9.2. Pinnipeds. (*Chair-Stansell, Bettin, Benner, Brown, Fredricks, Hausmann, Kruger, Richards, Stephenson, Tackley, Wills*). Trapping of sea lions occurs Tues- Thurs. Thus far 13 sea lions have been trapped. Of those, seven were euthanized, two relocated, two tagged and released and two held pending blood work results. Richards asked if the euthanized animals had additional issues with them, aside from the cancerous lesions. Weekly reports are posted on the TMT website.

10. **FPP. Hard copies ready to be handed out.** The FPP went to press on a couple of days ago. It will be available at the May FPOM. The final is on the web at <http://www.nwd-wc.usace.army.mil/tmt/documents/fpp/2009/>

11. **Cascades Island entrance weir installation.** There is a request to install the new weir on 4 May instead of 6 May. **FPOM didn't see any issues with the date change.**

## 12. FPP changes for 2010

12.1. TDA 5.5. talks about the unit priority when operating outside the 1%. Is this still needed and if so, is the priority still correct?

13. **Next Meeting-** May 14<sup>th</sup>, 2009 from 0900-1300 at NOAA Fisheries in Portland.

## 14. Finalized results from this meeting.

14.1. For the SMP sub-sample size discussion, FPOM agreed to 100 fish of the dominant species and not more than 100 of the non-dominant species for the NWW sites. For the NWP sites there will be 100 of each species (two sampled one day, two the next) with no weights taken on any.

14.2. FPOM didn't have any issues with moving the Cascades Island entrance weir installation to 4 May instead of 6 May.

## 15. The following documents were provided or discussed.

15.1. *Agenda, Fish Passage O&M Coordination Team.*

15.2. *Trip report from Ahmann regarding the MCN weir test. Pages 8-10*

15.3. *BON Bay 17 coordination form. Pages 11-12*

15.4. *BON ITS outage coordination form. Page 12*

15.5. *BON Bank 7/8 outage coordination form. Pages 12-13*

15.6. *TDA spill wall early start date coordination form. Pages 13-16*

15.7. *FPC memo regarding sub-sampling numbers. Page 17*

15.8. *Fisheries Calendar Mar- May. Pages 18-20*

## 16. May agenda items-

16.1. **Spill response plans.** Review of NWW and NWP spill plans.

16.2. **Pikeminnow dam angling.** John Skidmore to explain the anticipated plan for 2010.



McNary Site Visit  
March 30, 2009  
Trip Report

**Purpose** - To investigate the effect of lowering the McNary SSE and NFE weir gates on fishway entrance hydraulics.

**Background** - As part of the NWW-NWP Lamprey program, NWW has been tasked with investigating operational measures to reduce the velocity of flow through the McNary south shore fishway entrances (SSE). It is believed that lamprey passage efficiency may be improved at McNary by reducing the entrance velocities during nighttime operations. The velocity of flow is primarily driven by the head differential across the control weirs. The head differential is determined by the difference in water surface elevation between that of the entrance channel and the tailwater. This head differential, and subsequently the velocity, can be reduced by decreasing flow and/or increasing the depth of flow over the weir. An evaluation of reducing velocity by reducing flow has recently been completed. Flow to the South shore fishway system can be reduced by: 1) shutting off or reducing flow from one or all three of the fishway supply pumps, 2) partially or completely closing the tainter valve which supplies gravity flow from the forebay to the fishway diffusers, and/or 3) raising the control weirs at the upper end of the fish ladder near the fishway exit. None of these alternatives were found to be desirable, either because of operational difficulties and/or ineffectiveness (reference by title and date Simeon's report).

A brief analysis of the system operations and system hydraulics was conducted to determine the feasibility of lowering the entrance weir gates to achieve lower velocities. It was estimated that entrance velocities could be reduced to 4 to 5 fps depending on tailwater elevations. A field test of lowering the weir gates to the lowest possible position was recommended. The goal of this test was to verify the expected response and to work through the process of lowering the gates to clearly identify any logistical and hydraulic concerns. This recommendation was presented by Tim Dykstra to the FPOM committee for approval. The test was approved for March 31st, prior to adult passage counting at McNary, which was to begin on April 1.

**Departure and Attendance** - Martin Ahmann, Derick Fryer, Simeon Francis and Brett Morris left the NWW District office at 9:30 and arrived at McNary around 10:45

**Activities** - The NWW team met with Brad Eby (McNary Project Biologist) to discuss the objectives of the study. The study team then met with the Project Operators to coordinate the lowering of the SSE gates followed by lowering the NFE gates. It was decided to manually lower the weir gates at the gate hoist rather than from the control room. This precaution would be taken to prevent a slack cable situation.

The study team returned to the SSE gates for pre-test conditions (condition 1), photographed the exit flow, recorded the gate position, channel water surface elevation, and tailwater surface elevation; differential across the weir gates was calculated (see table 1.)

The SSE gates were lowered to elevation 251.0 fmsl. The top of the weir gate at elevation 251.0 is level with the top of the segmental gate and is the lowest possible effective gate position. Photographs of the exit flow were taken and the water surface elevations were again recorded and the head differential determined (condition 2).





The study team was driven to the north end of the powerhouse where the NFE gates would be lowered in an effort to further reduce the flow and head across the SSE gates (condition 3). Initial gate position and water surface elevations were recorded and the head differential determined (table 1). Photographs were also taken. The NFE gates were then lowered and the fishway system was allowed to stabilize for approximately 15 minutes. The NFE 2-3 gates position and the water surface elevations were recorded; the head differential for the NFE gates in the lowered position was then determined. It should be noted that the NFE conditions prior to lowering the SSE gates were not recorded. However the study team did observe and photograph the exit conditions of the NFE gates prior to lowering the SSE gates.

The study team was then driven back to the South end of the powerhouse where the effect of lowering the NFE gates on head and flow across SSE gates was observed. The water surface elevations were recorded and the head differential across the SSE gates was determined.

Water surface elevations, gate positions and head differentials determined for all conditions are provided in Table 1.

**TABLE 1**

Condition	Entrance Gates	Gate Position	Channel WSE	Tailwater WSE	Gate Depth	Differential
Condition 1	SSE 1-2	Raised (258.3)	268.3	267.4	9.1	0.9
Condition 1	NFE 2-3	Raised (257.3)	N/A	266.6	9.3	N/A
Condition 2	SSE 1-2	Lowered (251.0)	267.8	267.4	16.4	0.4
Condition 2	NFE 2-3	Raised (257.3)	267.4	266.6	9.3	0.8
Condition 3	NFE 2-3	Lowered (253.5)	266.9	266.5	13.0	0.4
Condition 3	SSE 1-2	Lowered (251.0)	267.7	267.4	16.4	0.3

Photographs of each condition are provided in the attachments. The reduction in velocity is apparent from these photos.

**Conclusions** - There were no problems observed when lowering or raising the weir gates. Project Operators are able to lower the gates manually at the gate hoist or from the Operators' control room. Although some concern was expressed with the lowering of gates below their limits, this was not a problem during the test and would not appear to be an un-resolvable problem should lowering of the weir gates during nighttime hours become a routine operation. It is possible the operation could be automated.

Lowering the SSE 1-2 weir gates is an effective means of reducing head and subsequently the velocity of flow through the entrance gates. The head and velocity of flow through the SSE 1-2 weir gates can be further reduced by lowering the NFE 2-3 gates. The velocity of flow through SSE 1-2 entrances was calculated from the measured head differentials, however the approach velocity to the entrances was not known, so the calculated values represent estimates only. The velocity was also calculated from estimates of discharge through the entrance and the depth of flow over the weir. The estimated velocity of flow through the SSE 1-2 gates using both methods is approximately 4 fps. Neither method was refined enough to accurately determine the difference in velocity of flow with and without the NFE 2-3 gates lowered; if necessary this could be determined.



The evaluation was conducted under one tailwater condition. The tailwater elevation measurements indicate a gradient in elevation from the South to North end of the Powerhouse. The tailwater elevation is dependent upon total river flow and control of the downstream pool elevation at the John Day Dam. The gradient in the tailwater elevation below the McNary powerhouse is driven by Project operation. Both the tailwater elevation and the gradient will influence the SSE 1-2 conditions. As the tailwater elevation drops the velocity of flow through the SSE 1-2 entrances will increase, if the tailwater elevation increases and the gates remain lowered the velocity of flow will decrease. If the gradient from South to North shifts, there is a possibility of reverse flow from the NFE 2-3 gates, which would increase flow out the SSE gates and could possibly increase the discharge and velocity through SSE 1-2 entrances. This test was conducted with the tailwater elevation at 267.4 below the SSE gates and 266.6 below the NFE gates; the tailwater elevation during the fish passage season at McNary ranges from a low of 262.5 to a high of 270.8 fmsl. If lowering the SSE and NFE weir gates becomes a routine operation, similar test should be conducted to assure acceptable conditions over this wide range of tailwater elevations.

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Photos 1 & 2 Water velocity before test conditions



Photos 3 & 4 Water velocity under test conditions





**OFFICIAL COORDINATION REQUESTS and NOTIFICATIONS FOR  
NON-ROUTINE OPERATIONS AND MAINTENANCE**



**COORDINATION DATE-** 20 March 2009

**PROJECT-** Bonneville Lock and Dam

**RESPONSE DATE-** 2 April 2009

**Description of the problem-** Spill gate 17 does not have a working hoist. To include spill gate 17 in the 2009 spring spill patterns, the gate will need to be dogged at a set position. The pattern has the gate open at 3.5'. Since the gate has to be set on dogs, it needs to be set at either two or three dogs. Two dogs appear closer to the recommended spill pattern opening of 3.5 feet, both in opening and in flow. Later this spring, further discussion will need to occur to establish the setting of bay 17 for the 2009 summer spill patterns.

Two dogs = 2.98 feet and Q= 5993 cfs

2009 spill pattern = 3.5 feet and Q = 7020 cfs

Three dogs = 4.89 feet and Q = 9738 cfs

**Type of outage required-** No additional outage is required. The spill bay 17 hoist is out of service and will remain in this condition for the 2009 spill season and maybe the 2010 spill season. The Project would like to coordinate an early opening of spill bay 17 since 10 April is a Friday. If agreed to by FPOM, they would like to open the bay late in the afternoon on 9 April.

**Impact on facility operation-** The spill gate will need to be manually set on dogs instead of automatically controlled by the operators. Once set, it will remain that way until manually adjusted for emergencies or summer spill patterns. The gate would be opened about eight hours earlier than the start of spill season.

**Length of time for repairs-** a rebuilt gear box will take 32 weeks and a new gear box will take 64 weeks. At this time the Project does not have a return to service date for the hoist.

**Expected impacts on fish passage-** Many hours went in to developing the BON spill patterns. Deviations from those patterns will have an affect on tailrace flows and possibly fish survival, however, two dogs is fairly close to 3.5' and should provide similar conditions as the original spill pattern setting.

**Comments from agencies**

**BON Chief of Ops (Schwartz) -** I think because bay 17 is on the south side, three dogs may be too much flow. We have fishway entrance issues during the day with almost five feet of opening. I would like to have more discussion on this. I am not comfortable with three dogs.

**NOAA- I** agree that flow from the two dog setting is closest to the original pattern and should be used for gate 17. However, the remaining 1027 cfs spill flow that would be necessary to achieve the 100 kcfs BiOp spill should be provided in the other adjacent bays. This should be possible since I believe these bays have gates that hang from the hoists (as opposed to dogged off gates). Thanks, Gary

**Response from Schwartz-** Gary, thanks for your support on setting bay 17 at 2 dogs. I don't see a problem of quickly developing a 100K spill pattern and shifting that 1K somewhere else that won't change egress conditions. Thanks, Dennis



**FPC-** My thoughts on this operation would be:

1. To use the 2 dog setting but make-up spill loss at Bay 17 in other bays
2. If you cannot make up spill at other bays then go to the 3 dog setting and monitor adult entrance conditions. If issues with adult entrance conditions appear with more flow through Bay 17- can the hoist from another, less crucial bay for adult attraction be put in bay 17, and dog off another gate? Dave

**Final results-** Bay 17 will be set on two dogs in the afternoon of 9 April. Two dogs provide 1027cfs less flow than the normal spill pattern. The 1027cfs will be compensated through other bays.



**COORDINATION DATE-** 19 March 2009

**PROJECT-** Bonneville Dam

**RESPONSE DATE-** 2 April 2009

**Description of the problem-** The electrical contractors working on the PH1 Ice and Trash Sluiceway (ITS) automated gates have completed their work. They have scaffolding straddling the ITS and PH1 downstream migration channel (DSM1) in four locations. They need to remove the scaffolding and have asked to do so on 10 April 2009.

**Type of outage required-** The PH1 ITS end gate would be closed during scaffolding removal. Removal is expected to take one twelve hour day. The outage is proposed for 0700 until 1900.

**Impact on facility operation-** The ITS end gate will be closed. DSM1 is already out of service, and will remain so, until 3 September 2009.

**Length of time for repairs-** Removal will not take more than twelve hours.

**Expected impacts on fish passage-** Spill will have started and the B2CC will be opened by the time the ITS is taken out of service. In normal years, the river flows during the early days of spill do not allow units to run at PH1.

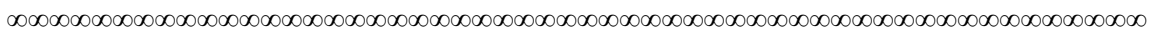
With that in mind, there will be few fish attracted to PH1 and multiple bypass routes at PH2. There are few impacts to fish expected.

**Comments from agencies-**

**NOAA-** We are ok with the outage as long as no main units are running in the first powerhouse during the outage. As the request mentions, this shouldn't be a problem given the relatively low river flow and spill. Thanks, Gary

**BON Chief of Ops-** No guarantees that we won't be operating any PH1 units unless river cooperates but we need to prepare the contractor for this chance. Dennis

**Final results-** The contractor will remove the scaffolding on 10 April. The Project will attempt to keep PH1 units from operating during the ITS outage.



**COORDINATION DATE-** 3/26/2009

**PROJECT-** Bonneville Lock and Dam

**RESPONSE DATE-** 4/9/2009



**Description of the problem-** BON is requesting a bank outage for 7/8 from 0000 on 13 April until 1159 on 16 April 2009 for bank repairs.

**Type of outage required-** This bank outage will take unit 8 out of service from 0000 on 13 April until 1159 on 16 April. Unit 7 will remain out of service due to turbine rehab.

**Impact on facility operation-** The outage will begin after spill has started, to minimize the impacts. Unit 8 is seventh on the list for PH1 priority units.

The T11 & T 12 outages are also scheduled for that week. During the 2 hour T11/12 outages Project capacity to pass water will include 100K spill plus approximately 64K at PH1 and with three units available at PH2 at 45K. With miscellaneous flow, the Project can safely pass 215K without needing additional spill.

Per the STP runs from March 23rd flows are expected to be between 147-156K for that week in April. The Project will have no problems passing that amount even during this T 7/8 outage and the T 11/12 one as well.

**Length of time for repairs-** One week.

**Expected impacts on fish passage-** There is no expected impact on fish passage. While Unit 8 is out of service, the next available priority unit will be operated.

**Comments from agencies**

**NOAA-** No concerns with this. You might recheck that forecast since flows might be a bit higher. Even so, I doubt there will be involuntary spill. Thanks, Gary

**Final results-** FPOM did not express any additional concerns. The Project will move forward as coordinated.



**COORDINATION DATE-** 3/26/2009

**PROJECT-** The Dalles Dam

**RESPONSE DATE-** 4/15/2009

**Description of the problem-** Construction of The Dalles Bay 8/9 Spill wall has fallen behind schedule. A variety of factors affected construction activities including slower than expected production rates, weather delays and other factors. Given the various problems and delays the wall construction during this first season was stopped short of the planned 2009 downstream limit at station 193.5', instead of station 290.5' as expected.

The currently approved In Water Work (IWW) period (which is extended from the normal duration) – allows for General Spill wall work from Oct 1 – March 31 and Leveling Slab work from Nov 1 – Feb 28. Given this IWW, the contractor has developed a schedule that shows all the remaining wall being completed at the end of next year's IWW season, however; there is '0' float (e.g., flexibility to meet major unanticipated obstacles) in that schedule. Therefore, we are formally requesting an even earlier start to the spill wall for the 2009-2010 construction season; this will help ensure spill wall completion success and gaining the biological benefit in the 2010 spill season as anticipated.

The early start was discussed with members from the region present during the ERDC trip the week of February 9<sup>th</sup>, where the general thought was that the only area of concern was for in-the-wet concrete placements – both within the spill wall precast and forms, and for the leveling slab (within the moon pool). Therefore it was requested that the environmental data collected by



the contractor as part of the water quality certificate from the first season's concrete placements be provided to enable an informed determination of the effects these activities have on the environment.

These data were compiled and provided at the TDA Construction Task Force Tour/FPOM meeting at The Dalles on March 12<sup>th</sup>, (see summary of data chart below – entire data set was sent out prior to the FPOM meeting and distributed/discussed at the meeting). Data indicates very little effect on both pH and Turbidity from the concrete placements, when the sample points 300' downstream of the activity are compared to the background. A comment was provided that this same scenario occurred at Lower Monumental a few years back when the stilling basin there was repaired, and that a paper was written to document impacts to fish due to this type of activity. This paper was later circulated for all to review, and also indicated very little impact to the environment from the concrete placement activities.

**Type of outage required-** Therefore it is requested that work activities on The Dalles Bay 8/9 Spill wall be allowed to commence as follows:

1) September 8, 2009 (from 1 October),

The spill wall work will commence at station 192.5', which is on the existing apron, approximately 800-1000' upstream from the thalweg and 480' from the North Fishladder entrance. The initial work for the wall construction will consist of setting alignment steel, precast concrete units, temporary bracing and formwork. Spill wall concrete placements in the river can not take place until all this setup work is completed on the first section of season 2 wall. It is anticipated that this setup activity could take a week or longer before a concrete placement in the river inside of forms occurs. However, once the concrete placements begin, they will continue at regular short intervals (every 3 days or so) as the wall construction proceeds down the length of the wall, as set-up work will continue ahead of and during the concrete placement, in a linear fashion.

2) October 1, 2009 (From 1 November),

The leveling slab work will commence at station 552.42', which is approximately the start of the curve section ~500' from the thalweg. Although this work is closer to the thalweg, the initial work of setting the moon pool, and modifying it to adapt to the river bottom is more intensive, and in season 1 took approximately 3 weeks from set-up to a concrete placement, with each concrete placement being a one day event. Therefore it is anticipated that the first in the river leveling slab placement with the moon pool would not take place before October 1, 2009, and the next would follow approximately 2-3 weeks after that. This equates to only 2-3 leveling slab placements that could take place prior to the previously agreed upon November 1<sup>st</sup> start date.

**Impact on facility operation-** The in-water work would start about a month early.

**Length of time for repairs-** The in-water work would begin 8 September 2009 and continue until 31 March 2010.

**Expected impacts on fish passage:** Water quality monitoring data indicate minimal impacts on water quality as a result of construction activities. Based on the location of requested activities on the spillway shelf; negligible impacts on fish passage & timing are expected due to the requested IWW extensions.



**SUMMARY OF ENVIRONMENTAL DATA - SEASON 1 CONCRETE PLACEMENTS**

Activity	Current Allowed Start Date of Activity	Segment Number	Date	Average Daily Background pH	Average Daily pH 300' D/S of Construction	Avg Daily pH Delta from Background	Average Daily Background TURBIDITY (NTU)	Average Daily TURBIDITY (NTU) 300' D/S of Construction	Avg Daily TURBIDITY Delta from Background
Seal Pour (Tremie Plug)	1-Oct	1	1/16/2009	8.25	8.28	0.03	5.83	6.06	0.22
		2	1/5/2009	8.27	8.29	0.03	0.17	0.28	0.11
		3	1/21/2009	8.58	8.55	-0.03	17.75	17.83	0.08
		4	2/13/2009	8.30	8.30	0.00	4.33	4.56	0.22
Closure Pour (to Top of Precast)	1-Oct	1	1/22/2009	8.32	8.37	0.06	9.50	9.39	-0.11
		2	1/12/2009	8.24	8.25	0.02	6.88	6.42	-0.46
		3	2/3/2009	8.10	8.18	0.08	4.40	4.40	0.00
		4	2/20/2009	8.26	8.23	-0.03	1.39	1.39	0.00
Leveling Slab	1-Nov	6	11/19/2008	8.23	8.23	0.01	0.75	1.38	0.50
		7/8	12/15/2008	8.27	8.33	0.06	0.29	0.62	0.33
		8/9	1/13/2009	8.24	8.27	0.02	7.14	7.10	-0.05
		9/10/11	2/14/2009	7.92	7.92	0.00	5.17	5.11	-0.06
Erosion Undercut Repair	1-Nov	6	1/23/2009	8.70	8.80	0.1	9.00	8.83	-0.17
		6	1/24/2009	8.35	8.42	0.07	7.00	7.33	0.33



**Comments from agencies**

**NOAA-** I've spent some time considering the extended in-water work period request and believe the extensions into October and September are acceptable and pose little risk to migrating adult salmonids for the following reasons:

1. A relatively low percentage of the adult runs use the north ladder after spill is ended at the end of August. The following table lists the north ladder usage percentages for the past three years. The seasonal averages are weighted by the monthly fish passage abundance. These numbers are for adults only (jacks excluded, however the story was the same for jacks).

Dart Data	The Dalles Dam North Ladder Percent Passage		
Date	Chinook	Steelhead	Coho
<b>2008</b>			
Sept Ave	4.7%	7.8%	12.2%
Oct Ave	3.7%	6.3%	15.7%
Season Ave	4.6%	7.6%	13.5%
<b>2007</b>			
Sept Ave	3.2%	6.8%	13.3%
Oct Ave	5.9%	9.6%	24.0%
Season Ave	3.6%	7.3%	18.3%
<b>2006</b>			
Sept Ave	2.5%	7.4%	21.8%
Oct Ave	3.3%	5.5%	21.4%
Season Ave	2.6%	7.0%	21.7%

From the table we can see that chinook would likely be the least effected and coho the most effected by activities in the vicinity of the north entrance. However, even for Coho, 80% or more normally use the east fishway to pass the dam. The planned activities may shift a few more percent over to the east fishway, but it is unlikely that this will pose a significant delay issue for those fish since we seem to have good passage rates at this project even with the heavy use of the east ladder. That being said, I still think it would be a good idea to try to get a better balance (balance the risk) in adult passage at this project once the wall is completed.

2. This activity will be well away from the east entrance and most of the early work will be well off the river thalweg (~500'). As such, the activity should have little if any effect on the routes fish normally use to pass this dam. Also, most of this work will be several hundred feet from the north ladder entrance. We anticipate some impact to this route however, the entrance will still be open and we anticipate some continued fish passage through this route.

3. The risks posed to adult passage from changes in water quality seem minimal given the data provided from earlier work in this area (a few hundredths of a unit change in pH). I am assuming that there will be continued monitoring during the next in-water season to assure pH levels don't exceed those seen in the past.

4. Finally, we need to get the wall done in the next year. Additional construction delay will only delay obtaining the benefits of the wall for juvenile outmigrants and delay obtaining BiOp performance goals at this project. Thanks for the chance to comment. Gary

**IDFG-** We have no objections and request a reminder be sent out just prior to work beginning so that we can monitor adult passage. Russ





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**MEMORANDUM**

TO: Tim Dykstra, Walla Walla District COE, Bernie Klatte, Portland District COE, FPAC  
FROM: Michele DeHart  
DATE: March 31, 2009





RE: Standardized Sample Size requirements for SMP condition sampling and transportation Barge loading data requirements and weight calculations

The FPC has invested considerable effort over the past year in standardizing the Smolt Monitoring Program (SMP) data collection and recording procedures among the SMP sites. In addition, in response to requests from the fishery management agencies and tribes the FPC has worked with the region to develop a standard fish condition monitoring protocol for data collection and reporting. The COE and site personnel requested that their data bases for COE sampling of facility fish impacts and barge loading remain unchanged in this process. The FPC staff expended considerable efforts to build individual tools for each site to maintain their present COE data and procedures. As a result of this process we have noted several issues that can only be addressed by the COE and the fishery management agencies regarding inconsistencies in data collection for COE facility monitoring and transportation program barge loading. We believe that there are opportunities to standardize these efforts among sites and reduce fish handling and fish impact. Since this is the last year of the COE three year contract for sampling for facility impacts and transportation implementation, it may be appropriate to address these issues at this time. There are opportunities to reduce sampling and handling impacts. Specifically:

- Although the management question of barge loading is the same at each transportation site, different data are collected at each site to determine barge loading. For example at LGR poundage is reported for barge loading by species type, and clip type, whereas LGS reports poundage by steelhead clip type and salmon combined. These different procedures require different sample sizes. The management application is the same, and sample size requirements could be reviewed in terms of reducing sampling and handling and standardization among sites.
- Currently the condition monitoring protocol, as determined by the FPOM subgroup on fish condition monitoring, was set at 100 fish of each species and clip type. This means that during the spring, when potentially four species (clipped and unclipped) of juvenile migrants are present, up to 800 juvenile salmon could be examined on a daily basis for injury and disease information. There may be ways to reduce this amount of handling for detailed condition information and still get necessary information on fish condition.
- Neither rationale nor calculations of sample size requirements for fish condition data collection at individual sites is available. As mentioned above, these sample sizes for each site are currently not consistent. The COE and fishery agencies should consider and review guidelines used to select the target sample sizes, relative to the management application of the data. This should include consideration of the 100 fish criteria per clip type objective, such as detecting a particular incidence of occurrence of injuries or descaling.
- The rationale for different condition sampling at transportation sites versus non-transportation sites is unclear. The rationale for collecting injury information on clipped and non-clipped fish is unclear, specifically as it relates to the resulting management action and whether or not the existing data suggest that injury levels are different enough to warrant the additional sampling and handling.
- Procedures and codes differ among sites. For example, MCN collects weight and length data on incidental fish, but other sites do not. Sample codes differ among sites.






cc. Charlie Morrill, WDFW      Rick Martinson, PSMFC      Pat Kiniry, ODFW

# March 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1 Adult Passage Season Begins – Start counting at Lower Granite Dam	2 JDA avian array construction begins	3 FPAC NWD F/W meeting- ID JDA navlock OOS JDA fish pump trashrack dive	4 NWD F/W meeting- ID  BON B2CC open for debris flush.	5 NWD F/W meeting- ID  TDA AWS mtg	6 BON ITS OOS for U7/8 dive  Happy Birthday	7
8  Daylight Savings	9	10 FPAC Hydraulic scale assessment- RDP	11 TMT  BON BGS dive	12 TDA spill wall site visit FPOM Meeting- TDA BON BGS dive	13 BON ITS OOS for automated gates.  Happy Birthday	14 BON ITS OOS for automated gates.
15	16 SRWG- lamprey & adult salmon	17 FPAC SRWG- passage and survival	18	19 SCT B2CC triggers mtg	20 SRWG- Transportation and delayed mortality	21
22	23	24 FPAC	25 TMT	26 TDA spill wall call	27	28
29	30	31 FPAC				



# April 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 Adult Fish Counting Starts Juvenile Bypass Season Begins SRWG- Biological index testing	2 Juvenile Spill Starts Snake River Dams – Pools to MOP  SRWG- Avian Predation	3	4
5	6  TDA avian line install  ERDC- NWP	7 FPAC  TDA avian line install  ERDC- NWP	8 TMT  TDA avian line install  ERDC- NWP	9 TSW tour FPOM meeting- MCN MCN JBS tour  TDA spillwall call ERDC- NWP	10 NWP spill begins BON ITS OOS  ERDC- NWP	11
12  Easter	13 BON bank 7/8 OOS	14 FPAC BON bank 7/8 OOS B2CC PIT test CI weir mtg- USACE	15 SCT BON bank 7/8 OOS B2CC PIT test BON T11/12 OOS	16 BON bank 7/8 OOS SCT tour-LGS/LMN BON T11/12 OOS MCN ESBSSs installed	17	18
19  Happy Birthday	20 Snake River Juvenile Transport Begins	21 FPAC FFDRWG- JDA FFDRWG- BON 30%	22 TMT	23 TDA spill wall call  FFDRWG- NWP	24	25
26	27  Happy Birthday	28 FPAC	29 FFDRWG- NWW	30 FFDRWG- NWW		



## May 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31					1	2
3	4 ERDC trip- JDA	5 FPAC ERDC trip- JDA	6 TMT ERDC trip- JDA	7 TDA spill wall call ERDC trip- JDA	8 ERDC trip- JDA	9
10	11	12 FPAC	13	14 FPOM Meeting	15	16
17	18	19 FPAC	20 TMT	21 TDA spill wall call	22	23
24	25 Memorial Day HOLIDAY	26 FPAC	27	28	29	30

**FISH PASSAGE O&M COORDINATION TEAM**  
**Adult and Juvenile Fish Facilities Status Report**  
**U.S. Army Corps of Engineers, Walla Walla District**  
*April 9, 2009*

**Construction**

**McNary:**

- Turbine units 1 and 2 returned to service March 13 following transformer 1 work.
- Turbine units 9 and 10 out of service 8.4 hours for transformer 5 work on March 17.

**Ice Harbor:** All 6 turbine units are in service.

**Lower Monumental:**

- All 6 turbine units are in service.
- Turbine unit 2: out of service March 30 -31 due to relay problem.

**Little Goose:**

- Turbine units 5 and 6 forced out of service due to an electrical bus grounding error.
- Full flow PIT tag detector provisionally accepted from contractor as some minor repairs needed. Some detection is taking place, some additional adjustments are needed.

**Lower Granite:** All 6 turbine units are in service.

**Operations and Maintenance - Juvenile Fish Facilities**

**McNary:**

- Trash racks raked March 16 - 18. 250 cu yards of debris removed.
- ESBS installations began April 6 and will be completed by April 16.
- TSW moved from spill bay 19 to spill bay 4 the week of March 20 – 26.
- Juvenile Collection Channel placed in emergency bypass on March 30, and then switched to primary bypass on March 31.

**Ice Harbor:**

- Trash racks raked March 19 – 23. Ten – 13 cu yards of debris removed.
- Bypass watered up March 16.
- STS deployments completed, all currently in cycle mode operation.
- First sample scheduled for April 7.

**Lower Monumental:**

- Bypass watered up March 18.
- STSs deployed on March 24 and 25, all currently in cycle mode.
- Fish condition sampling began April 1.
- Outfall sprinkler repaired March 29. Previously damaged last fall by freezing temperatures.

**Little Goose:**

- Bypass watered up March 24.
- All ESBSs deployed by March 31.

**Lower Granite:**

- Trash racks raked in late February.
- ESBSs deployments took place from March 23 – 26.
- Primary Bypass watered up March 23.
- Sampling began March 25. All fish being routed to tailrace.

**Operations and Maintenance - Adult Fish Facilities** **Note:** Visual ladder counts began at all facilities on April 1.

**McNary:**

- Oregon Ladder: exit weirs and AWS in manual operation due to electrical service upgrades.



- Fish Pumps: Pumps #1 & #2 are in service. Both of these pumps were down for 30 minutes on March 13 when transmission line 1 was returned to service. Fish Pump #3 is currently unwatered and out of service for oil leak repairs.
- Oregon South Powerhouse Entrance Weirs lowered to sill March 30 to see if flows could be reduced at night in support of adult lamprey passage.

**Ice Harbor:**

- North Shore Fish Pumps: Fish pumps #1 & #2 in service. Fish pump #3 currently removed and taken off site for repairs. Reinstallation tentatively set for early April.
- South Shore Fish Pumps: all available for service.
- NFE2 entrance weir motor replaced April 2.

**Lower Monumental:**

- Fish Pumps 1 & 2 in service. Fish Pump #3 out of service for diffuser assembly repairs and bearing housing replacement. Fish pump 3 is “bulkheaded off” to improve efficiency of 2 pump operation.

**Little Goose:**

- Ladder in service.

**Lower Granite:**

- Fish pumps 1 and 3 in operation. Fish pump being held in reserve.

**Other**

**Ice Harbor:**

- RSW now in operating position, was in stowed position for repairs to seals, fish tracking antennae installation and other minor work. Antenna installations took place March 23.

**Lower Monumental:**

- RSW test dive and research equipment installation took place March 13.
- Juvenile fish began to be collected for avian research on April 5.

**Little Goose:**

- Direct injury study delayed due to high pool elevations and late award of research contract. Some tests took place the week of March 20 – 26.
- Equipment installed in support of Smolt Passage and Survival Study – study to begin April 16.

**Lower Granite:**

- Adult trap in operation.
- Kelt sampling began March 29.