

AGENDA

Fish Passage O&M Coordination (FPOM) Team
August 20, 2009 (1300-1600)
St. Helens Room, NOAA Fisheries, Portland, OR

Conference line: 888-830-6260

FPOM code: 960904

Klatte/Dykstra code: 855808

1. Review/Approve Agenda and July Minutes (Klatte)

2. Action Items

2.1. [Jun 09] JDA avian array. **ACTION:** Cordie will provide an update at the July FPOM.

STATUS: To summarize the status of the avian array design:

2.1.1. We are currently completing an internal review of the 60% report.

2.1.2. 60% report will go out for regional review within a couple of days

2.1.3. The PDT has tentatively selected Alternative 2 as the preferred alternative (synthetic lines, no pole in river)

2.1.4. VE study is complete, and report should be back to the PDT in a few days. The VE team recommended that the PDT look at aluminum cables for the array lines (aluminum is used for transmission lines), and they will suggest improvements for anchoring and break joints for safety.

2.1.5. The PDT will review the VE recommendations and consider integrating the proposals into the design.

2.1.6. PDT is on schedule to send contract out in October. 90% report in September.

2.1.7. As a side note, Scott Pastere is trying to coordinate a demonstration of the LRAD technology in Hood River sometime in September. This may be in conjunction with the John Day gull predation mgmt meeting I'm organizing (if scheduling allows). If time allows, you may want to float the idea of installing eagle nesting platforms at John Day and/or at Miller Rocks.

2.2. [Jun 09] JDA avian array. **ACTION:** Cordie will provide an update at the July FPOM.

2.3. [Jun 09] BON spillway repairs. **ACTION:** Lee will provide update at next FPOM mtg.

2.4. [Jun 09] JDA fish ladder outages. **ACTION:** Kruger will inquire as to any concerns within ODFW but gives his concurrence now.

2.5. [Jul 09] Nighttime vs. lamprey counting language in the contract. **ACTION:** Moody will look at the contract language to clarify whether the counters are recording everything on the nighttime video or if they are just counting lamprey.

2.6. [Jul 09] LWG operation of fish trap. **ACTION:** Dykstra will bring the results of the inspection to the December or January FPOM.

3. Updates. (Klatte/Dykstra)

3.1. BON JMF flushing water.

3.2. BON Fish unit trashrake.

3.3. BON truck pad alterations

3.4. BON ITS automated gates.

3.5. TDA juveniles in gatewells.

3.6. NWP ROV inspection results.

3.7. MCN Temperature

3.8. MCN- fish pump 3 return

3.9. MCN – OR ladder trash rack (p 18)

3.10. IHR unit priority. (page 7)

3.11. Fish count reporting.

3.12. LWG fish trap water supply –
ROV inspection update

3.13. Start of truck transport

4. **FPOM contact information (page 4).** Please review the contact information and provide any updates to Tammy. An updated list will be provided in the August minutes.
5. **Ladder operation at MCN and IHR for improved lamprey passage (Fryer)**
6. **LWG RSW repairs – restore stow capabilities (page 20)**
7. **LGS spillbay weir – date to remove from service**
8. **LGS – Plan to address damage to NPE-3**
9. **Spill response plans for fishways (pages 5, 23-24).**
10. **Updated outage schedules (pages 6).** Check for conflicts with research, construction, FPP guidelines.
11. **BON fish counts.** (Rerecich) Due to the numbers of fish passing the dam, FPP guidance would indicate it is time to split flows. Due to the lack of water, splitting flows is not recommended at this time. Splitting flows would result in one unit operating at each powerhouse.
12. **BON stilling basin survey.** (Rerecich) NWP requests 1 hour closures for spillbays 1 and 18 on 3 September. One bay will be closed at a time while the stilling basin and shoreline is surveyed. If this action is not approved, there will be no survey of those bays and adjacent shore.
13. **BON Maintenance and CRITFC Treaty Fishery (2009-C5) (pages 21-22).** (Baus) We have a timing conflict with the proposed Bonneville maintenance activities (low forebay (72' msl) from 1-4 September from 0630-1700 each day) and CRITFC's Autumn Treaty Fishery (August 31, 2009, 6 am, Monday, through 6 pm, September 4th, 2009, Friday. Bonneville Pool: Operate the pool within 1.0 foot from full pool (msl elevation 76.5 – 75.5)). CRITFC's SOR is attached for your reference.
14. **TDA ITS operation for November through March. (page 25)** (Clugston)
 - 14.1. **TDA dive coordination.** No transducers need adjustments as of early August. Planning for a 1 day dive, with ITS closed, on 27 October. Planning an optional dive on 23 February 2010, to ensure transducers are ready for March.
15. **TDA-N AWS outage.** (Cordie or Zyndol) The PUD is proposing to shutdown their turbine for up to 6 hours on, either, 3 or 4 September. The purpose of this outage is to calibrate the new pressure transducers after they are installed on 21 August.
16. **Smith-Root research proposal for FPOM review (pages 8-14).** (Clugston/Stansell) *please note: the attached document includes sections taken from the original proposal.*
17. **Fishway improvements or impacts due to stimulus dollar projects.**
 - 17.1. BON Washington Shore FVB roof replacement. (Sawka)
 - 17.2. BON WS entrance mods for lamprey- design. (Clugston)

- 17.3. BON Lamprey PIT tag testing at WS and CI entrances. (Clugston)
- 17.4. BON PH1 ITS wall removal.
- 17.5. BON major refurbishment of fishway diffuser valve system- design.
- 17.6. BON replace wooden fishway bulkheads with concrete structures- design
- 17.7. BON Alternate energy development at BI visitor center- P&S.
- 17.8. BON BISB boat ramp and dock.
- 17.9. BON construct Strawberry Island campgrounds- P&S (*distance from chum spawning?*)
- 17.10. BON two new spillway hoists- contract documents.
- 17.11. BON spillway gate repair pit shoring and clean-up.
- 17.12. BON Dredge BI fish exit forebay.
- 17.13. TDA spillway gate drums replacement and install
- 17.14. TDA spillway gate wire rope replacement and install.
- 17.15. JDA extended deflector.
- 17.16. JDA-N entrance pumps, housing, power controls- design.
- 17.17. JDA spillway trunnion bearing lube system.
- 17.18. JDA south turbine pumps- purchase

18. 2010 FPP changes.

- 18.1. 10IHR001 Unit Priority (page 7)

19. Potential 2010 FPP changes (change forms not yet drafted)

- 19.1. Appendices J and K
- 19.2. MCN ESBS installation.

20. Next FPOM Meeting- September 10 2009 from 0900-1300 at NOAA Fisheries in Portland.

- 20.1. MCN fish pumps

FPOM Attendees Contact Information

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ENVIRONMENTAL MANAGEMENT PLAN (EMP)

EMP ID #: _____ Work Order: _____

Problem: Fishway spill protection plan that is easily accessible in project standing orders.

Activity/Service/Product: Boom/cleanups/boom material plan

Environmental Aspect: All fish primarily ESA listed 3/1 – 11/30

Environmental Impact: Fish passage delay.

Objective: Protect the adult fish ladders and auxiliary water systems (AWS) intake from spills.

Target(s), Roles & Responsibilities, Procedures, Schedule, etc. (Attach more info if needed):

The Dalles Dam:

(1) East fishway exit; deploy boom if oil sheen observed (must be easy to deploy and doesn't require a crane). Provide boom location, inventory stock, and a call list.

(2) East fishway auxiliary water system. Monitor east, west, and south entrances discharge for oil sheen, if observed, turn off FU's 1 & 2. (Provide call list).

(3) North fishway exit, deploy boom if oil sheen observed (must be easy to deploy and doesn't require a crane. (Provide boom location, inventory stock, and a call list.

(4) North fishway PUD auxiliary water system; deploy boom for auxiliary water intake trash racks. Boom must be easy to deploy and doesn't require a crane. Provide boom location, inventory stock, and a call list. Monitor tainter gate for discharge, turn off AWS if oil sheen observed.

(5) Ice/trash sluiceway; 4/1 – 7/30 cannot close.

John Day Dam:

(1) South fishway exit; deploy boom (must be easy to deploy and doesn't require a crane). Provide boom location, inventory stock, and a call list.

(2) South fishway AWS. Monitor south fish ladder entrance discharge for oil sheen, turn off south fish turbines if oil observed. Provide call list.

(3) North fishway exit; deploy boom (must be easy to deploy and doesn't require a crane). Provide boom location, inventory stock, and a call list.

(4) North fishway AWS; monitor AWS intake down stream of navigation lock, if oil observed turn off north fish pumps? Provide a call list.

(5) Smolt Monitoring Facility; switch gate to bypass. Provide a call list.

Metrics: _____

Project	Revision Date/Time: 8/11/09			BONNEVILLE LOCK AND DAM OUTAGE SCHEDULE, CY 2009		
	Power House	UNIT	MW CAPACITY	START	END	OUTAGE PURPOSE
BON	PH1	TWO	120	8/3/2009 0:00	8/7/2009 17:00	U5 Annual Maint, Bank 5/6 Bi/Ann Maint, - Requires TBL switching to OPEN A6 via SCADA to Open Disconnect ZM256
BON	PH1	8	120	8/3/2009 0:00	8/3/2009 17:00	U8 and 7/8 Transformer Bank Outage- CT Removal out of Transformer Bank
BON	PH1	3	54	8/4/2009 0:00	8/4/2009 17:00	Unit 3 outage needed to repair Upper Guide Bearing gauge line leak.
BON	PH2	TWO	26	8/4/2009 0:00	8/4/2009 18:00	Collection Channel ROV Inspection, Slip Rings, F1 and F2
BON	PH2	14	76	8/4/2009 12:00	8/4/2009 17:00	Remove fish release piping and modified trash racks.
BON	PH1	FOUR	240	8/7/2009 17:00	8/7/2009 17:30	BANK 5/6 SWITCHING
BON	PH1	1	54	8/10/2009 0:00	8/14/2009 17:00	U1 Annual Maint, Bank 1/2 Bi/Ann Maint, U2 out transfer bus
BON	PH2	12	76	8/10/2009 0:00	8/11/2009 17:00	Annual Maint.
BON	PH2	13	76	8/12/2009 0:00	8/13/2009 17:00	Annual Maint.
BON	PH2	14	76	8/17/2009 0:00	8/18/2009 17:00	Annual Maint.
BON	PH1	ONE	60	8/17/2009 0:00	8/20/2009 17:00	Bank 9/10 Repair of Calisto Oil Valves, U10 out of service during this time, U9 already out for rehab
BON	PH2	15	76	8/19/2009 0:00	8/20/2009 17:00	Annual Maint.
BON	PH1	3	60	8/20/2009 0:00	8/22/2009 17:00	Rehab to install new "Crows nest Assembly" on main unit 3
BON	PH2	11	76	8/24/2009 0:00	8/25/2009 17:00	Annual Maint.
BON	PH2	ONE	76	8/24/2009 7:00	8/27/2009 17:00	STS Inspection 11-18
BON	PH1	2	60	8/24/2009 0:00	8/27/2009 17:00	Unit 2 OOS to replace cooling water pump.
BON	PH2	18	76	8/26/2009 0:00	8/27/2009 17:00	Annual Maint.
BON	PH1	ONE	55	9/15/2009 7:00	9/15/2009 17:00	Install STS U1 and U3 for Adult Fall Back
BON	PH2	ONE	76	9/21/2009 7:00	9/24/2009 17:00	STS Inspection 11-18
BON	PH1	TWO	120	10/5/2009 7:00	1/15/2010 17:00	Gen 7 100 Day Inspection
BON	PH1	4	60	9/21/2009 7:00	11/5/2009 17:00	5 year Overhaul
BON	PH2	17	76	10/5/2009 7:00	12/3/2009 17:00	4 year Overhaul
BON	PH2	Five	380	10/14/2009 5:00	10/15/2009 17:00	Units OOS for BGS Dive Inspection; Max 2 Main / 2 Fish Units on-line during dive operations. Units available at night
BON	PH1	TWO	120	10/15/2009 7:00	10/30/2009 17:00	Special Tests Units 1 & 2
BON	PH1/2	ONE	76	10/19/2009 7:00	10/22/2009 17:00	STS Inspection 11-18
BON	PH1	0	5	10/20/2009 0:00	10/20/2009 18:00	Semi Annual
BON	PH1	9	60	11/9/2009 7:00	11/23/2009 17:00	Gatewell Orifice Removal Sluice wall removal contract
BON	PH1/2	ONE	76	11/23/2009 7:00	11/25/2009 17:00	STS Inspection 11-18
BON	PH1	10	60	11/23/2009 7:00	12/7/2009 17:00	Gatewell Orifice Removal /Sluice wall removal contract
BON	PH2	ONE	13.5	12/1/2009 0:00	2/22/2010 17:00	F1, F1 Annual - one unit at a time
BON	PH1	8	60	12/7/2009 7:00	12/21/2009 17:00	Gatewell Orifice Removal /Sluice wall removal contract
BON	PH1/2	ONE	76	12/15/2009 7:00	12/17/2009 17:00	Remove STS, Season End, Units 11-18
BON	PH1	7	60	12/21/2009 7:00	1/4/2010 17:00	Gatewell Orifice Removal /Sluice wall removal contract

Color Code

Active

Complete

Major Issue

Fish Passage Planned

Power Related Planned

Construction Planned

FPP Change Form

Change Request Number: 10IHR001

Date: August 5, 2009

Proposed by: Scott Bettin (BPA), Greg Moody, Mark Plummer and Scott Thoren (USACE)

Proposed Change: Revise section 4.1 to accommodate IHR unit priority change AFTER the Sacajawea substation transformer and the 500kV tie are back on line.

TO:

4. Turbine Unit Operation and Maintenance.

4.1. Turbine Unit Operation. When in operation, turbine units will be operated to enhance adult and juvenile fish passage from March 1 through November 30. During this time period turbine units will be operated as needed to meet generation requirements in the priority order shown in **Table IHR-4**. Model studies of Ice Harbor Dam show that spilling at lower river flows can cause eddying in front of the powerhouse. To provide the best fish passage conditions during periods of spill, it is important that the turbine units operate in a specific operating order to minimize eddying conditions. The original and desired unit prioritization is 1, 3, 6, 4, 2, 5. Turbine unit 6 transformer has an internal fault and is generating gases that are indications of arcing and the levels are increasing with time, so it is desired to run this unit in a last on, first off status.

With the new Sacajawea 500/115kV transformer in service which is connected to the Ice Harbor-Franklin No. 2 115kV line, IHR should not be run as a single or two unit project if that unit(s) is unit 3 and / or 4 without switching those units to the Ice Harbor-Franklin No. 3 115kV line, disconnecting the Ice Harbor-Franklin No. 2 115kV line from Ice Harbor and disabling the transfer trip for the Ice Harbor-Franklin No. 2 115kV line at Ice Harbor. This switching is necessary to prevent the loss of all Ice Harbor generation and the Sacajawea transformer if there is an outage of the Ice Harbor-Franklin No. 2 115kV line.

If single unit operation is necessary and switching has not occurred in the yard run unit 1, 2, 5, 6. Running units 3 and 4 alone on the Ice Harbor-Franklin No. 2 115kV line can only occur if the powerhouse operator can accomplish the needed switching. .

Table IHR-4. Turbine unit operating priority for Ice Harbor Dam.

Season	Time of Day	Unit Priority*
All year-single unit operation w/o switching	24 hours/day	1,2,5,6
Switching must occur to return to normal operating priority outlined below		
March 1-November 30	24 hours/day	1,3,4,2,5 and 6
December 1 – February 28	24 hours	Any Order for multiple unit operation

Reason for Change: Current unit priority is 3, 1, 4, 5, 2, 6.

Comments from others: Martin Ahmann, USACE, “The 1, 3, 4, 5, 2, 6 pattern looks good, given the constraints of units 2 and 6. The 2, 5, 6 pattern is less than desirable but given the circumstances would appear to be as good as we can get; I think for juveniles, it should provide good conditions for spill passed fish and acceptable conditions for by-passed fish but would be concerned with adult passage. Should probably pay close attention to adult passage monitoring should the 2, 5 ,6 pattern ever be employed.”

Record of Final Action:

Title: Development and Testing of a Non-Lethal Sea Lion Deterrence System

Study codes: BPA Project No. 200752400

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Submitted to: U.S. Army Corps of Engineers
Portland District

Performance Period: January 2010 – December 2010

Date of submission: July, 20, 2009

PROJECT SUMMARY

1. RESEARCH GOAL

The overall goal of this project is to develop a non-lethal technology to deter marine mammal predation on ESA-listed fish resources and other fish species in the vicinity of Bonneville Dam (BON) on the Columbia River. The primary objective of this proposal is to assess the effects of a prototype sea lion deterrence array on the behavior of naturally migrating adult anadromous salmonids (*Oncorhynchus spp.*). Pacific lamprey (*Lampetra tridentata*) and white sturgeon (*Acipenser transmontanus*) will also be evaluated as they encounter the test array.

This research proposal is being submitted to the Corps of Engineers, Anadromous Fish Evaluation Program in support of regional coordination for research access at BON. This project is currently being funded by the Bonneville Power Administration (BPA) through the Northwest Power and Conservation Council's Fish and Wildlife Program (BPA Project No. 200752400).

Marine mammals have been demonstrated to be extremely sensitive to electric fields at levels significantly lower than those used in typical electrofishing applications. We propose to test the effects of these reduced power levels on actively migrating salmon and steelhead passing BON. The development of this technology will provide natural resource managers with a non-lethal option for reducing sea lion predation to supplement and complement other management tools and actions.

The project is intended to evaluate the behavior of fish at BON in-situ (during realistic water flow regimes) when they encounter the mild electrical field that was successfully used to deter marine mammals. The test array is to be installed in the BON 2 UMT fishway channel. This location was selected because 1) no sea lions will be able to access this location and 2) a portion of the population of spring migrating adult fish is expected to pass this location.

Several laboratory-scale experiments have been completed to date in support of the research goals funded by the BPA for marine mammal deterrence technology. The results of these studies are summarized in Section 4a. The first step in the development of this technology was to identify the effective electrical deterrence level for California sea lions (*Zalophus californianus*). Next, the power levels equal to or greater than what is needed to deter sea lions were tested on several fish species native to the Columbia River Basin, to assess effects on fish behavior. In support of the deterrence technology development program, a series of tests at varying energy levels was performed on captive steelhead (*O. mykiss*), white sturgeon and Pacific lamprey.

The next step in this research program is to evaluate the sea lion deterrence array on actively migrating fish, to assess possible effects of the array on fish migrations during real-time flow conditions at BON. To accomplish this objective, we propose to install a test array in the Upstream Migrant Tunnel (UMT) near Powerhouse 2 at Bonneville

Dam. Fish would be allowed to volitionally migrate through the test array. The test array would be energized in a randomized, block-pair evaluation schedule and also during constant operation for comparative purposes. Fish migratory behavior would be statistically compared between array “on” and “off” blocks of time to determine whether any significant effects occurred on fish passage. DIDSON imaging cameras would be used to assess fish behavior at the test array. Visual observations would also be made at the fish counting window that exists in the UMT’s preferred deployment site.

2. STUDY OBJECTIVES AND APPROACH

To develop and install a prototype, sea lion electrical-deterrence array in the BON UMT. The behavior of actively migrating salmon and steelhead will be observed as they approach and pass through the array. The test array will be installed in the vicinity of the viewing window on the Washington side of the UMT (Figure 2). DIDSON imaging cameras would be used to observe fish behavior as they encounter the test array. This study location and viewing window would also allow visual evaluation of fish behavior at the test array, water clarity permitting. There is currently no public access to this location allowing a secure study location.

The test array would be installed on an insulated framework (Figure 3) to contain the electric field being tested. The structure is being designed to minimize any hydraulic effects of the array in the UMT. The preliminary design plans (Figures 4 and 5) illustrate the concept. The total length of the test array structure would be about 40 feet. The existing UMT channel is 68 inches wide. The water flows at a depth of about 6.4 feet in this area. The test array structure would reduce the overall width of the UMT in this area to 60.5 inches and it would slightly raise the floor of the UMT. A smooth transition plane is being engineered with aluminum “nosing” plates used to eliminate any sharp edges or abrupt contours. Minor adjustments may be needed, particularly to accommodate stock lengths of fiber-reinforced plastic material (FRP).

Framed ribs would be spaced between 4 and 5 feet apart, and the high-molecular-weight polyethylene (HMWD) and plexiglass acrylic panels would be fastened to the inside of the ribs. The rib frame would be fabricated $\frac{3}{4}$ ” narrower than the channel width for easy insertion. There are no cross members or other obstructions extending into the water column. The surface of the test array structure is smooth. The plastic panels are installed flush with each other.

When the array is inserted, the new water flow section would be reduced by 7.5 inches in width, and the floor would be raised about 4 inches. The end units will each have a shaped nosing to create a smooth flow into the lined portion.

Nylon bolts would be used to attach all liner panels and structural components. The only conductive materials in the water would be the aluminum nosings and possibly some connecting plates. We propose to fasten the prefabricated array sections by embedding eyebolts into the channel walls above the waterline and to use turnbuckles

to pull the array against the channel bottom. This design allows for removal of the array even while the UMT is watered-up. The turnbuckles would be released and the array units would be lifted out in a reversal of the installation process once the flows have been reduced. A small crane is envisioned for installation and removal of the array.

Water velocity in the test structure would increase slightly over that observed in the unmodified sections of the UMT. Corps staff have provided information from a hydraulic report on the fishways (HELCRABS) showing that calculated flow into the UMT varies from 75 to 85 cfs. At 85 cfs, water velocity in the UMT is calculated at 2.5 feet per second (fps).

At a flow of 85 cfs, water velocities through the test array are estimated to increase to just under 3 fps. However, this velocity is within the NOAA-F fish passage criteria (4 fps). This change in water velocity has been evaluated and approved by NOAA-F Engineering staff (*Larry Swenson, pers. comm., NOAA-F Engineer (503) 230-5448*). The structural design will also be submitted to the Corps for additional hydraulic review and approval.

Electrode plates would be embedded within the FRP frame prior to frame installation. The electrode design would be similar to the arrays already designed and tested on fish at the Abernathy Technology Center (sturgeon) and the Cowlitz Trout Hatchery (steelhead). One or more pulse generators would be wired to the electrodes to produce adjustable test voltage gradients. The electric field would be mapped in detail at multiple points in and near the electric array at every test setting used.

The potential for interference with PIT tag interrogation sites would be assessed prior to initiation of the study in coordination with NOAA and PSMFC personnel (Sandra Downing and Don Warf). Prior to operation, tests would be conducted to ensure no interference with PIT-tag detection electronics located elsewhere within the UMT. If any interference is detected, Smith-Root engineers would shield the electric array sufficient to eliminate the source of interference.

The electrode array and FRP frame can be easily removed at any time without entering the UMT channel. The array will be removed when feasible once the studies are complete and/or at the direction of COE personnel. A photo and some conceptual drawings of the proposed UMT array are provided in Figures 2, 3 and 4.

Objective 1 (“Soft-Start” Evaluation): Assess the effects of “soft starting” the prototype sea lion deterrence array (gradual ramp-up of power at test setting chosen) on actively migrating salmon and steelhead located within the array. Incidental species (e.g. white sturgeon and lamprey) would be evaluated if present during the test.

This objective would evaluate behavior of fish within the sea lion deterrence array when it is first activated. The “soft start” technology engineered and developed in previous research allows the deterrence array to slowly increase in voltage, providing an opportunity for fish to move from the electric field and to assess their behavioral

response. This objective would be further developed with input from the region's natural resource managers. Key considerations include:

- Observations of fish behavior and passage would be made with DIDSON imaging cameras. (Visual observations would be made when water clarity permits.)
- Operation of the "soft start" technology would be monitored in real time to remedy any adverse affects to fish.
- The sea lion deterrence array's "soft start" electronics would be activated when fish are observed in the vicinity of the deterrence array.
- The deterrence array would be operated at power levels equivalent to those used to deter sea lions.
- The number of test events would be developed after consultation with natural resource managers.
- Additional power levels could be tested as directed by the natural resource managers.
- Water conductivity would be monitored to assure consistent test conditions throughout the study.
- The electric field generated by the sea lion deterrence array would be verified during each test event.
- Research staff would be onsite during all periods of operation and evaluation.
- The electric field generated by the deterrence array would be verified during each test event.

Objective 2 (Intermittent Operation Evaluation): Assess the effects of periodic (intermittent) operation of the prototype sea lion deterrence array on actively migrating salmon and steelhead. Incidental species (e.g., white sturgeon and lamprey) will be evaluated if present during the test.

This objective will test the behavior of fish by alternating "random on" and off periods of operation in a block-pair study design, this objective mirrors the intended use of the deterrence technology in the Columbia River. This objective will be further developed with input from the region's natural resource managers. Key considerations include:

- Observations of fish behavior and passage would be made with DIDSON imaging cameras. Visual observations will be made when water clarity permits.
- The array would be activated in a randomized, block-pair test with alternating "on" and "off" time blocks, using randomly introduced pulses during the "on" test interval.
- The test schedule and duration for this objective would be developed with input from the natural resource managers.
- Water conductivity would be monitored to assure consistent test conditions throughout the study.
- The electric field generated by the deterrence array would be verified during each test event.

Objective 3 (Constant Operation): Identify the power level required to affect the passage behavior of actively migrating salmon and steelhead. Incidental species (e.g., white sturgeon and lamprey) will be evaluated if present during the test.

This objective would identify the power levels that alter the behaviors of fish passing the sea lion deterrence array. There may be a need in the future to modify the power level of the array to address changes in sea lion predation behavior. These tests would help identify the available “cushion” (or use window) and the operational parameters available for future consideration. This objective would be further developed with input from the region’s natural resource managers. Key considerations include:

- Observations of fish behavior and passage would be made with DIDSON imaging cameras. Visual observations would be made when water clarity permits.
- The sea lion deterrence array would operate constantly voltage gradients as directed by natural resource management agencies.
- The test schedule and duration used for this objective would be developed with input from the natural resource managers.
- The range of power levels would be developed with input from the natural resource managers.
- Water conductivity would be monitored to assure consistent test conditions throughout the study.
- The electric field generated by the sea lion deterrence array would be verified during each test event.

These objectives would be implemented in consultation with and following the thorough reviews and receipt of concurrence from the region’s natural resource managers. The data generated by these studies would be analyzed using commonly accepted statistics that would provide statistical levels of significance for each outcome along with biologically meaningful interpretations of all results.

5. METHODOLOGY

A detailed study plan for testing the effects of the array on fish behavior in the UMT will be developed later this summer by the USGS under a contract from the BPA. Thus, additional details of this study, including such things as experimental design, sampling technology, and data analysis, are undergoing further development. The following points, however, comprise our current thoughts on the conduct of this future research:

- Several electrical treatments will be tested, including nominal values that deterred sea lions in previous laboratory tests (e.g., 0.6 V/cm voltage gradient, 0.4 ms pulse width, and 2 Hz pulse frequency) and incrementally more severe conditions
- We will try to identify the suite of electrical conditions that effectively stops the migration of fish to document an upper threshold for range testing

- The tests will likely be some sort of block design, with monitoring of fish migrating through the UMT for a certain time with the array off and then on.
- We will record any behavioral alterations (e.g., fish encountering the array and turning around) and compare the rate of passage of different species of fish with the array on and with it off
- Tests will be conducted and replicated several times during the migration season
- DIDSON or standard underwater video cameras will be used to monitor fish behavior downstream, within, and upstream of the array
- Tests will include evaluations of the soft start technology

The focal species will include spring Chinook salmon, steelhead, and Pacific lamprey. We will also collect information on other incidental species, such as white sturgeon.












6. SCHEDULE

- December 2009:
 - Install prototype sea lion deterrence array in the BON UMT.
 - Test and map electrical field at levels that will be tested
 - Install and test DIDSON acoustic camera in vicinity of the test array.
 - Test for interference with the PIT tag detection system.
- March through August 2010:
 - Evaluate behavior of anadromous salmonids, lampreys and other incidental species at prototype sea lion deterrence array in the BON UMT.






July 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 TMT	2	3	4 Independence Day
5	6	7 FPAC	8 Happy Birthday	9 FPOM Meeting- NOAA	10	11
12	13	14 FPAC	15 TMT	16 SCT	17	18
19	20 TDA ITS mtg Performance standards mtg	21 FPAC	22 FFDRWG- NWW Happy Birthday	23 FFDRWG-NWW Hevlin to look at LGS weir	24	25
26	27	28 FPAC	29 TMT	30	31	

August 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 ERDC- MCN	4 FPAC TDA ROV ERDC- MCN	5 JDA ROV BON ROV ERDC- MCN BON trashrack mte	6 ERDC- MCN	7 ERDC- MCN	8
9	10 Corps golf tournament	11 FPAC	12 TMT SRWG- preliminary review	13 SRWG- preliminary review	14 SRWG- preliminary review	15
16	17 AFF mtg @ BON	18 FPAC	19	20 SCT FPOM- NOAA	21	22
23	24 ERDC- JDA	25 FPAC ERDC- JDA	26 TMT ERDC- JDA	27 ERDC- JDA	28 ERDC- JDA	29
30	31					

September 2009

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 FPAC	2	3 BON PH1 STSs installed by today NWP – FFDRWG	4	5
6	7	8 FPAC TDA spill wall work scheduled to begin	9 TMT Happy Birthday	10 FPOM Meeting	11	12
13 Happy Birthday	14	15 FPAC	16	17 Happy Birthday	18	19
20	21	22 FPAC	23 TMT	24 TDA spillwall call	25	26
27 Happy Birthday	28	29 FPAC	30			

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

COORDINATION DATE- 8/4/2009

PROJECT- McNary

RESPONSE DATE - Advisory notification – No response necessary.

Description of the problem – Recent windstorms and the increased presence of milfoil have increased the amount of debris present at the Oregon ladder exit. The increased debris loads have created trash rack differentials nearing 3.0 feet at the South traveling screen. The south screen is the sole source of water for the 1000 cfs Attraction Water Supply (AWS) conduit, West Extension Irrigation District (WEID) irrigation canal, and McNary Wildlife Park. The north traveling screen is currently out of service for repairs. Increased differentials indicate reduced flows through the south screen. If debris accumulation is allowed to continue, increases in differentials may cause the screen to collapse and fail.

Type of outage required - Closure of 1,000 cfs AWS conduit tainter valve is planned for 4 hours. This will allow the raking of accumulated debris and milfoil on the (AWS) trash rack.

Impact on facility operation – Will result in reduction in Oregon ladder attraction water. WEID irrigation canal and wildlife park flow will remain in service

Length of time for repairs – The outage is expected to last less than 4 hours, from 1200 hours to 1600 hours. Additional outages at a later date may be necessary should the initial cleaning prove to be unsatisfactory. These additional outages would require divers to assist with debris removal. The exact outage date is uncertain as the project must fabricate a raking device. The project plans the work as soon as practically possible. Additional rakings and outages may be required periodically for the remainder of the fish passage season.

Expected impacts on fish passage - Impact to migrating fish is expected to be minimal. The Washington shore ladder will remain in service and 2 or 3 fish pumps will continue to provide attraction water to the Oregon shore fishway. Proposed outage time is in the afternoon when daytime adult passage is at a minimum.

Comments from agencies

Final results

McNary Oregon Ladder Trash Rack Raking: On Tuesday, August 4, McNary personnel were able to clean the top portion of the AWS (Attraction Water Supply) trash racks at the Oregon ladder exit. Although screen differentials were successfully lowered to 1.0', maintenance staff noticed an increase in differentials the next day. McNary personnel believe differentials will reach 2-3 feet within a few days and again place excessive strain on the traveling screen. A more thorough cleaning of the trash rack will require divers. The divers can also help return the North traveling screen to service. This work requires a 1 - 2 day outage of attraction water conduit and the WEID (West Extension Irrigation District) canal. This outage is planned to begin Thursday, August 13 and may extend into August 14. Fish pump 3 is expected to be returned to service early next week and be able to provide additional attraction flow during the outage. The ladder and fish will continue to operate during the outage. If you have any comments, please respond by the close of business Monday, August 10.

Please email or call with questions or concerns.

Thank you,

John Bailey

NWW Operations Division

509-527-7123

john.c.bailey@usace.army.mil

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

COORDINATION DATE- 8/04/2009

PROJECT- McNary

RESPONSE DATE - Advisory Notification – No response necessary.

Description of the problem - Fish Pump 3 is being returned to service following an extended outage to repair oil leaks. This pump is needed to maintain adult fishway operating criteria. Before fish pump 3 can be placed into service, intake and discharge bulkheads removal is necessary. All 3 fish pumps need to be taken out of service before the bulkheads can be moved. McNary personnel plan to do this work as soon as possible – within the next several days.

Type of outage required - All three fish pumps to be taken out of service for 5 hours from 1200 hours to 1700 hours for one day only. The 1,000 CFS gravity conduit and fish ladder will remain in service during work period.

Impact on facility operation - Fishway entrances will be out of criteria during the work period, but still open for fish passage. Flows will be reduced within the collection channel. The Oregon ladder will continue to operate.

Length of time for repairs – Outage is expected to last approximately 4 – 5 hours.

Expected impacts on fish passage - Minimal impact to migrating fish expected as the Washington shore adult fishway will remain in operation and the Oregon ladder flow (210 cfs) and 1,000 cfs attraction flow will continue uninterrupted. Fish in the collection channel may hold. Proposed outage time is in the afternoon when daytime adult passage is at a minimum.

Comments from agencies

Final results

Please email or call with questions or concerns.
Thank you,

John Bailey
NWW Operations Division
509-527-7123
john.c.bailey@usace.army.mil

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

COORDINATION DATE- August 20, 2009

PROJECT- Lower Granite Dam

RESPONSE DATE- By conclusion of FPOM meeting on August 20, 2009

Description of the problem: Recent attempts to submerge the Removable Spillway Weir (RSW) in spillway bay 1 at Lower Granite Lock and Dam into the stowed position on the forebay floor have been unsuccessful. The inability to stow the RSW is making repairs to the structure necessary. Work would occur both in the water and out of the water of the Snake River. The in-water work generally consists of removing a portion of the existing RSW position indicator mechanism and replacing with a new cable pulley assembly, and installation of a metal cage to minimize the potential for floating and submerged debris to damage the position indicator mechanism. Workers will need to cut out two sections of 1 1/2" diameter steel pipe, drill approximately 46 holes for 1/2" diameter concrete anchors with 6" minimum embedment, and cut four existing mounting anchors and grind them flush with the concrete.

Type of outage required: Turbine units 5 & 6 outage while divers are operating in the forebay.

Impact on facility operation: The spillway should already be shut down for the season, so no special operation required there. Powerhouse unit priority begins with units 1-3, so the units 5&6 outage should have little impact.

Length of time for repairs: Duration for the in-water work should be less than two weeks.

Expected impacts on fish passage: This work is expected to have minimal impact on the water quality in the forebay in a very localized area at the upstream face of the dam near spillbay 1. The Corps would like to complete the work prior to the normal in-water work window (15 Dec – 1 Mar) in order to allow testing of the repaired system in November or early December. Request that the work be approved to take place sometime during the period 15 Oct – 14 Dec.

Comments from agencies

Final results:

Please email or call with questions or concerns.

Thank you,



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION
729 NE Oregon, Suite 200, Portland, Oregon 97232
Telephone 503 238 0667
Fax 503 235 4228

SYSTEM OPERATIONAL REQUEST: 2009 C-5

TO: Brig. General William E. Rapp	COE-NWD
James D. Barton	COE-NWD-NP-Water Management
Dan Feil, Steve Barton	COE-NWD-NP-WM-RCC
Rock D. Peters	COE-NWD-CM-F (Fish Management Ofc)
Col. Steven R. Miles	COE-Portland District
J. William McDonald	USBR—Pacific Northwest Regional Director
Steven J. Wright	BPA Administrator
Steve Oliver, Greg Delwiche	BPA-PG-5
Robyn MacKay, Scott Bettin	BPA-Operations Planning-PGPO
Stan Speaks, Keith Hatch	BIA, Northwest Regional Office

FROM: Paul Lumley, *Executive Director*

DATE: August 18, 2009

SUBJECT: Operation of the Lower Columbia Pools for the Autumn 2009 Treaty Fishery

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Reservation, the Confederated Tribes of the Warm Springs Reservation, and the Yakama Nation, requests the following reservoir operations in “Zone 6” (Bonneville to McNary dams) during the 2009 autumn ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following operations as a hard system constraint, as follows:

August 24th, 2009, 6 am, Monday, through 6 pm, August 27th, 2009, Thursday.

Bonneville Pool: Operate the pool within a 1.0 foot band.
The Dalles (Celilo) Pool: Operate the pool within a 1.0 foot band.
John Day Pool: Operate the pool within a 1.0 foot band.

August 31, 2009, 6 am, Monday, through 6 pm, September 4th, 2009, Friday.
September 8th, 2009, 6 am, Tuesday, through 6 pm, September 12th, 2009, Saturday.

Bonneville Pool: Operate the pool within 1.0 foot from full pool (msl elevation 76.5 – 75.5).
The Dalles (Celilo) Pool: Operate the pool within 1.0 foot (msl elevation 159.5 - 158.5).
John Day Pool: Operate the pool within 1.0 foot (msl elevation 264.5 - 263.5).

At this time we anticipate additional treaty fisheries in September. CRITFC will notify the Corps with specific times for the tribal fishery after each Compact hearing, via a new SOR.

Bonneville pool elevations, relative to The Dalles Spillwall Construction:

The Tribes request that any needed changes to the BON pool be made between Saturday, Sept. 5, and Monday, Sept. 7. Any changes need to be completed by the start of the Sept. 8 treaty fishery. This action will help to minimize the risk of the loss of tribal fishing gear, as a result of COE operations.

JUSTIFICATION:

The 2009 autumn Treaty fishing season is of critical importance to CRITFC's member tribes. The forecast escapement of **322,500** (Columbia at Bonneville Dam) adult fall Chinook (normal rank) and **335,800** steelhead (normal rank), will create harvest opportunities for tribal fishers, who will exercise their treaty rights by participating in this harvest, using platform and in-river methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week, starting the week of August 24, to count the number of nets in each Zone 6 pool. The survey data will be promptly shared with COE-RCC staff.

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of 1.0 foot or more disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets, (3) boat access problems, and (4) nets torn from their anchors. Nets and gear are costly to replace. Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 negatively impacts tribal incomes, food resources and cultural practices.

The fishers have also expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery cannot be replaced. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season, thus, any delays or disruptions to their fishing operations caused by the excessive pool fluctuations in Zone 6 negatively impacts tribal incomes, food resources, and cultural practices.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB Friday, August 21, 2009. Thank you for considering this request. Please contact Kyle Dittmer or Bob Heinith should you have any questions: 503-238-0667.

cc: TMT Members
Tribal staffs

Bonneville Dam Fishway Spill Response Plan

This document outlines the necessary actions to protect the adult and juvenile fishways at Bonneville Dam in a spill emergency. The Project Manager, Environmental Compliance Coordinator (ECC) and a Project Biologist should be notified as soon as possible. An assessment of the spill should be conducted by Bonneville's ECC or alternate to determine if the spill is recoverable. If spill material is determined to be recoverable the following actions should be taken to minimize impacts to fish passage systems.

Adult Fishways

1) Washington Shore

- a) Preventative measures – Install exclusion boom inside existing log boom upstream of fishway exit. Installation is planned for early 2010.
- a)b) Exit – If a recoverable quantity is reported or observed, deploy temporary exclusion boom between ladder exit and log boom. In addition, close exit gate until it is submerged 1-2' below water surface. Further actions would be determined by ECC or designee based on information and observations, in coordination with Project or District Biologists. Until permanent boom is in place, closing of gate would have to be based on what is known and observed.
- b)c) FV6-9 – If spill material is observed in the ladder exit upstream of WA shore picket leads, or in the valve slot, deploy absorbent boom if material is deemed recoverable.
- d) Fish ladder – In the event that spill material gets into the fish ladder, deploy absorbent boom at the junction of the UMT and WA Shore ladder, if sheen is deemed recoverable by ECC or alternate. (A boom will be staged at this site).
- e)e) Adult Fish Facility – If ECC or alternate deems necessary based on information and observations, and the AFF is in operation, set lab to bypass, close exit gate until it is submerged 1'.

2) Cascades Island

- a) Preventative measures – Install exclusion boom outside existing log boom upstream of fishway exit. Installation is planned for 2010.
- a)b) Exit – If a recoverable quantity is reported or observed, deploy temporary exclusion boom between ladder exit and log boom. In addition, close exit gate until it is submerged 1-2' below water surface. Further actions would be determined by ECC or designee based on information and observations, in coordination with Project or District Biologists. Until permanent boom is in place, closing of gate would have to be based on what is known and observed.
- b)c) FV5-9 – If spill material is observed upstream of CI picket leads, or in the valve slot, deploy absorbent boom if material is deemed recoverable.

3) Bradford Island

- a) Preventative measures – Install exclusion boom inside existing log boom upstream of fishway exit. Installation is planned for 2010.
- a)b) Exit – If a recoverable quantity is reported or observed, deploy temporary exclusion boom between ladder exit and log boom. In addition, close exit gate until it is submerged 1-2' below water surface. Further actions would be

determined by ECC or designee based on information and observations, in coordination with Project or District Biologists. Until permanent boom is in place, closing of gate would have to be based on what is known and observed.

b)c) _____ FV3-9 – If sheen is observed upstream of BI picket leads, deploy absorbent boom if material is deemed recoverable.

Juvenile Fishways

- 1) PH2 DSM – No action taken unless determined appropriate and necessary by ECC or alternate in coordination with Project or District Operations Biologists.
- 2) B2CC – No action taken unless determined appropriate and necessary by ECC or alternate in coordination with Project or District Biologists.
- 3) PH1 ITS – If recoverable quantity is observed in PH1 forebay, close automated chain gates.
- 4) Smolt Monitoring Facility – If recoverable quantity is observed in DSM2 or at the SMF, switch upper switchgate to bypass.

MEMORANDUM FOR THE RECORD

Subject: FY 10 TDA wintertime sluiceway operations and research planning.

The meeting was held at NWP District Office in the Summit Room., Portland OR. In attendance:

Last	First	Agency	Office/Mobile	Email
Benner	David	FPC	503-230-7564	dbenner@fpc.org
Bettin	Scott	BPA	503-230-4573	swbettin@bpa.gov
Caudill	Chris	U of I	208-885-7614	caudill@uidaho.edu
Fredricks	Gary	NOAA	503-231-6855	Gary.fredricks@noaa.gov
Volkman	Eric	BPA	503-230-3182	etvolkman@bpa.gov
Sweet	Jason	BPA	503-230-3349	jcsweet@bpa.gov
Mackey	Tammy	USACE	503-961-5733	Tammy.m.mackey@usace.army.mil
Klatte	Bern	USACE	503-808-4318	Bernard.a.klatte@usace.army.mil
Wills	David	USFWS	360-604-2500	David_wills@fws.gov
Khan	Fenton	PNNL	509-371-7230	Fenton.Khan@pnl.gov
Richards	Natalie	USACE	503-808-4755	Natalie.A.Richards@usace.army.mil
Baus	Doug	USACE	503-808-3995	Douglas.m.baus@usace.army.mil
Clugston	David	USACE	503-808-4751	David.a.clugston@usace.army.mil
Keefer	Matt	U of I	406-556-0639	

Benner, Caudill, and Keefer were on the phone.

After discussions of past and ongoing research and about potential additional research needs those in attendance came to agreement on the following;

1. An additional year of hydro-acoustic evaluations were needed before deciding on a long term operational scenario.
2. The metric used for future decision making would be the number of adult SH sized fish passing downstream through the sluiceway. Escapement effects could be estimated using these numbers and past studies.
3. We will not conduct a block test design study but a single condition evaluation.
4. The study period for evaluating sluiceway passage should be the same as last year with the addition of an evaluation of passage downstream through the powerhouse turbines during the winter months when the sluiceway is closed (Dec 16-end of Feb).
5. The single condition for the period of Dec 1-15 and Mar 1- start of spill would be with the sluiceway operating with the following gates open; 1-2, 1-3, 18-1, and 18-2. This will reduce the flow via the sluiceway by about 1 kcfs.

There was disagreement between BPA and NMFS on the single condition that should occur during the month of November. NMFS stated it should be what is already planned in the Fish Passage Plan and was supported by COE in discussions with BPA in 2006, with the same gate openings as the rest of the fish passage season. BPA wanted the same reduced gate openings planned for the December 1-15 and Mar 1- start of spill period listed above. BPA suggested that this disagreement would mean the issue may need to be elevated.

As the COE needs to deal with related dives and funding issue we will proceed to move forward with planning as if a single condition test will occur this coming winter. Fenton Khan will rewrite the proposal and present at the upcoming proposal review with two options. PNNL will evaluate the transducers along the powerhouse ASAP for any needed maintenance problems that will need a dive to be undertaken in October so we can put together a dive contract funded with FY09 dollars.