OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS AND MAINTENANCE

COORDINATION TITLE- 17 MCN FOG's
COORDINATION DATE- 3/16/17
PROJECT- McNary
RESPONSE DATE- 3/30/17

Description of the problem: Due to long term severe winter weather and unforeseen issues (a freeze broken navigation lock tainter valve plate and issues rewatering the navigation lock are examples), winter maintenance crews have had difficulty staying on schedule.

The Oregon ladder floating orifice gates (FOGs) returned from Bonneville, where heavy metals were removed, on February 9. The FOGs could not be repainted and rehabilitated in time for installation during the February ladder outage, which has passed. At this time, we have scheduled August 14 to 16 per e-mails below as the dates the FOGs could be installed.

When rehabilitation is complete, the FOGs are scheduled to be installed in slots W41, W43 and W44. Slots W8 and W 21 would then be bulk headed off so these FOGs could be removed. W14 will remain bulk headed one more season.

After coordination with the region, the following blended option was agreed to for August:

1. Try to install the FOGs and move slot bulk heads with fish pumps running on August 14 to 16, 2017 starting after 1200 hours for 1 to 2 hours with one FOG installed each day.
2. If the flow does not allow bulk heads to be removed, reduce the fish pumps' blade angles to zero degrees for 1 to 2 hours after 1200 hours with one FOG installed each day from August 14 to 16, 2017.
3. We will try to swap the FOGs with both fish pumps on. If that does not work, we try to swap the FOGs with one fish pump on. Finally, if that does not work, we will swap the FOGs with both fish pumps' blade angles set at zero degrees. Work will be after 1200 hours but might extend for 2 to 3 hours each day.

Type of outage required: If the FOG exchange does not occur in 2017, no outage will be required for 2018. If option 2 is tried and is successful, no outage would be required. If option 3 has to be used, the fish pump discharge would be reduced to zero for 1 to 2 hours each day. Use option 3, which will have 0 to 2 fish pumps out of service.

Impact on facility operation: With option 2, work would be occurring at five FOG slots for 1 to 2 hours over 3 days with no impact on operations. With option 3, the same work would require the fish pumps to be, in essence, out of service. Diffusers 1 to 6 and the

powerhouse diffusers would be without flow. The 1000 cfs auxiliary water supply will remain open. Diffusers 7 to 14 will continue to have flow. The juvenile facility would be supplying 450 cfs to the north powerhouse entrance. However, the Oregon ladder will most likely be out of criteria during this time.
Impact on unit priority: None.

Impact on forebay/tailwater operation: With option 2, there would be none. With option 3, fish pump discharge into the ladder and out to the tailwater will be zero for 1 to 2 hours each afternoon on 3 days.

Impact on spill: None.

Dates of impacts/repairs: August 14 to 16 with the FOG and bulkhead exchange occurring in the afternoon.

Length of time for repairs: The exchange should take 1 to 2 hours over 3 afternoons.

Analysis of potential impacts to fish:

1. The table below has the McNary's Oregon ladder 10-year average fish passage data for June 1 to 10 for the years 2007 to 2016 as we compiled from the DART website. (http://www.cbr.washington.edu/dart)

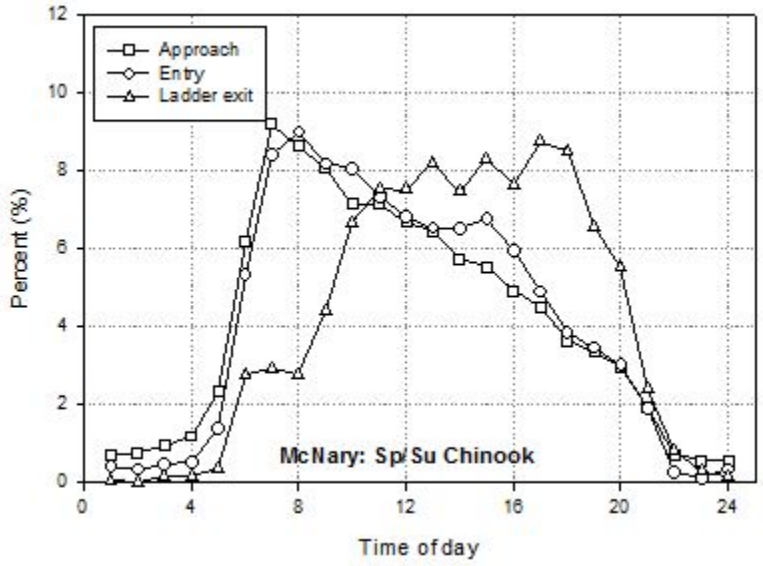
mm/dd	Chinook (fish/day)	Jack Chinook (fish/day)	Steelhead (fish/day)	Wild Steelhead (fish/day)	Coho (fish/day)	Sockeye (fish/day)
6/1	680	220	7	1	0	1
6/2	636	189	9	2	0	2
6/3	614	182	8	1	0	8
6/4	726	173	10	1	0	9
6/5	900	203	12	2	0	15
6/6	805	201	12	2	0	23
6/7	828	243	12	1	0	30
6/8	839	193	15	1	0	53
6/9	825	198	15	2	0	80
6/10	863	206	17	3	0	92

The DART website appears not to allow for the generation of a 10 year average by ladder so we compiled the data. From the table above, spring Chinook appear to be the species most affected by the FOG exchange during the dates of interest. Summer steelhead and coho runs would be affected minimally. Also, sockeye runs would be affected minimally but the work cannot be delayed otherwise the impact on the sockeye run would increase and required more analysis.

2. There is limited data on this year's run as video counting has occurred only 15 days so far in March.

3. In options 2 and 3, from June 5 to 7, a small percentage of the adult spring Chinook run would be affected by the work at five FOG slots for 1 to 2 hours each day in the afternoon. The 10-year average adult Chinook passage is 844 fish per day over those three days. Over a 16 hour count day, if fish passage was even over the day, 53 to 106 Chinook adults could be affected during a FOG exchange, which would occur in 1 to 2 hours.

   Citing Context-dependent Diel Behavior of Upstream-migrating Anadromous Fishes (*Keefer & Caudill 2008*), which is also cited in the FPP on page MCN-8 in Figure 2, Diel Distribution of Adult Salmonids at McNary Dam Fishway Entrances and Exits, "Time-of-day distributions are presented graphically in Figures 1-8 below. Results were generally similar across runs and dams, with the vast majority of tagged fish detected during daylight hours at each site. Distributions for fishway approaches typically showed a rapid increase in detections after dawn, often followed by a slight lull in mid-day and another increase in late afternoon. Distributions for fishway entrances were very similar to those for approaches, but averaged slightly later than approaches. Top-of-ladder distributions were later overall, reflecting the time fish used to pass through fishways and up ladders. At some dams, peak top-of-ladder passage occurred in the afternoon. At other sites, there was some evidence for two peak passage times, with a lull in mid-day. Differences between runs were relatively limited, and were likely related more to day length or water temperature at different seasons than to biological differences. It is possible that differences in swimming ability had an effect (e.g., the relatively late timing of sockeye salmon)."



The number of Chinook salmon affected by the FOG exchange would possibly be less than the hourly average estimated above due to the work occurring in the early afternoon when there is a lull in fish entering the ladder. Also, the south entrance would be undisturbed, which would reduce the number of fish directly affected by the FOG exchange. In option 2, the adverse effect will be mainly noise and vibration caused by the work at the FOG sights. With option 3, there will additionally be the reduction of attraction flow.

4. All effects listed above could delay adult fish passage for spring Chinook, summer steelhead and sockeye for 1 to 2 hours over a three day period.

Summary statement - expected impacts on: Adult spring Chinook, sockeye and summer steelhead.

Downstream migrants: None.

Upstream migrants: Possibly 1 to 2 hours passage delay each afternoon.

Lamprey: Minimal as lamprey passage is greatest at night.

Comments from agencies

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-----Original Message-----
From: Johnson, Bobby R CIV CENWW CENWD (US)
Sent: Tuesday, March 21, 2017 1:39 PM
To: Setter, Ann L CIV USARMY CENWW (US) <Ann.L.Setter@usace.army.mil>;
Peery, Christopher A CIV (US) <Christopher.A.Peery@usace.army.mil>
Cc: Gary Fredricks - NOAA Federal <gary.fredricks@noaa.gov>
Subject: FW: [EXTERNAL] Re: Coordination

FYI
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-----Original Message-----
From: Tom Lorz [mailto:lort@critfc.org]
Sent: Tuesday, March 21, 2017 1:30 PM
To: Johnson, Bobby R CIV CENWW CENWD (US)
<Bobby.Johnson@usace.army.mil>
Subject: RE: [EXTERNAL] Re: Coordination

that works for me.

thanks

>>> "Johnson, Bobby R CIV CENWW CENWD (US)"
<Bobby.Johnson@usace.army.mil> 3/21/2017 1:36 PM >>>

Gary,

Thanks. So August 14 to 16. I'll request that time frame.

Bobby

-----Original Message-----
From: Gary Fredricks - NOAA Federal [mailto:gary.fredricks@noaa.gov]
Sent: Tuesday, March 21, 2017 1:02 PM
To: Johnson, Bobby R CIV CENWW CENWD (US)
<Bobby.Johnson@usace.army.mil>
Cc: Setter, Ann L CIV USARMY CENWW (US) <Ann.L.Setter@usace.army.mil>;
Peery, Christopher A CIV (US) <Christopher.A.Peery@usace.army.mil>;
Lorz, Tom <lort@critfc.org>
Subject: Re: [EXTERNAL] Re: Coordination

Bobby, Based on the overall project 10 yr average passage numbers of Chinook and sockeye, I'd chose Monday, August 14 as best. If that doesn't work, then perhaps start Monday, August 7. My 2 cents worth.

On Tue, Mar 21, 2017 at 11:10 AM, Johnson, Bobby R CIV CENWW CENWD (US)
<Bobby.Johnson@usace.army.mil <mailto:Bobby.Johnson@usace.army.mil> >
wrote:

Gary,

On Thursday, the project will talk about August. What days would you suggest? We need three in a row Monday to Thursday.

I will tell them we will try with pumps on, then one pump down, then two pumps down as needed. We will try to keep it inside the two hour window each day.

The FOG in slot 26 appears jammed. I know we set out to have a rotation but it could be that we might have to remove FOGs from slots other than what we planned since the ladder is not out of service.

Thanks,

Bobby

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

From: Gary Fredricks - NOAA Federal [mailto:gary.fredricks@noaa.gov <mailto:gary.fredricks@noaa.gov>]
Sent: Monday, March 20, 2017 2:59 PM
To: Johnson, Bobby R CIV CENWW CENWD (US) <Bobby.Johnson@usace.army.mil <mailto:Bobby.Johnson@usace.army.mil> >
Cc: Setter, Ann L CIV USARMY CENWW (US) <Ann.L.Setter@usace.army.mil <mailto:Ann.L.Setter@usace.army.mil> >; Peery, Christopher A CIV (US) <Christopher.A.Peery@usace.army.mil <mailto:Christopher.A.Peery@usace.army.mil> >; Lorz, Tom <lort@critfc.org <mailto:lort@critfc.org> >
Subject: Re: [EXTERNAL] Re: Coordination

Bobby, I like your approach for August. Try first with the pumps "on", then go with whatever works. Regarding the data, I didn't have the Oregon ladder separated from the total project. That's why our numbers differed (and yours would be more appropriate for this issue). I'm still floundering a bit on the adult numbers since losing the Corps page. I downloaded a bunch of the annual data before the web site went down, but not the ladder splits. Hopefully, the new FPC page will work as well as the old Corps page. Gary

On Mon, Mar 20, 2017 at 1:07 PM, Johnson, Bobby R CIV CENWW CENWD (US) <Bobby.Johnson@usace.army.mil > > > wrote:

Gray,

You are probably right about river flows. With about 1 foot of head pressure on the gates when the pumps are running, we cannot guarantee we can remove a FOG with the pumps on. We will try but if the FOG does not move, then we would need to reduce the blade angle on the pumps. We could try just one pump at zero degrees then the second pump only if needed. Even for this, August might be a better time because of the flow.

On the data, we still cannot get into the COE website so we went with DART. We could not find where DART divides the counts by ladder for a ten year average so we worked up the OR side with DART data. We could have miss calculated, thus the numbers being off a little.

Thanks for the help,

Bobby

-----Original Message-----
From: Gary Fredricks - NOAA Federal [mailto:gary.fredricks@noaa.gov > >
Sent: Monday, March 20, 2017 12:24 PM
To: Johnson, Bobby R CIV CENWW CENWD (US) <Bobby.Johnson@usace.army.mil > > >
Cc: Setter, Ann L CIV USARMY CENWW (US) <Ann.L.Setter@usace.army.mil < <mailto:Christopher.A.Peery@usace.army.mil> > >; Lorz, Tom <lort@critfc.org <mailto:lort@critfc.org>

Subject: Re: [EXTERNAL] Re: Coordination

Bobby, Just so I understand, what is the issue with the pump flows. I was thinking the lower river flows and tailwater in August would be better but maybe I'm missing something here? In any case, I'd like to see the work done so if necessary, I'd pick option 3 in August. That way we'd have the best situation (relatively speaking) in place for the fall run. Thanks, Gary

On Mon, Mar 20, 2017 at 11:26 AM, Johnson, Bobby R CIV CENWW CENWD (US) <Bobby.Johnson@usace.army.mil <mailto:Bobby.Johnson@usace.army.mil> > > wrote:

Gary,

The project is open to other dates. We would just like to get the work done so we stay on "schedule" for next winter.

If we cannot do option 2 due to fish pump flows in early August, can we go to option 3 or do we slide back to winter for the exchange?

Thanks,

Bobby

-----Original Message-----
From: Gary Fredricks - NOAA Federal [mailto:gary.fredricks@noaa.gov <mailto:gary.fredricks@noaa.gov> > >]
Sent: Monday, March 20, 2017 11:17 AM
To: Setter, Ann L CIV USARMY CENWW (US) <Ann.L.Setter@usace.army.mil <mailto:Christopher.A.Peery@usace.army.mil > > >
Cc: Johnson, Bobby R CIV CENWW CENWD (US) <Bobby.Johnson@usace.army.mil . l> > > >; Lorz, Tom <lort@critfc.org <mailto:lort@critfc.org> > > > >
Subject: [EXTERNAL] Re: Coordination

Ann/Chris, I've reviewed the MOC and have a couple of concerns. I couldn't reproduce the passage numbers for early June, either with my passage spreadsheets (Corps data) or from the Dart website. It's not a big difference but you guys might want to look into it. Overall, I agree with the analysis but I have to wonder why we wouldn't do this work in early to mid August when numbers of Chinook are lower. Sockeye numbers have dropped way off by this time and, while steelhead numbers are rising, but I'm not too worried about delay for them this time of year. Also, given the forecasts, flows may be huge in early June this year, making option 2 a bit difficult. So I guess I would chose a date-modified option 2. We wouldn't have the improved orifices in in time for the Sockeye migration but at least they would be in for the fall run. Thanks, Gary

Final coordination results

FOG Installation will be moved to 14-16 August, as noted above.

After Action update: Even after all the planning, there was still confusion. The general maintenance staff had to be reminded we only asked for three in water work days. Unfortunately, due to work load, the FOGs were moved to the deck on August 14. No in water work occurred that day. We were down to two work days left.

On August 15, after 1200 hours, the three rehabilitated FOGs were assembled and installed in 14, 43 and 44 slots behind the bulkheads. They have to be assembled in the slot as only two large bolts hold the sections together. No fish pump outage was required. That day, the biologist was asked about the fish pump outage as the mechanics want to test the fish pump cooling water supply line back flow preventers. Also, the mechanical planner asked for a camera inspection of the fish pump trash racks, which could prove critical to the design work on replacement fish pumps. With only one day left, the biologist decide to remove the fish pumps from service together instead of trying a phased outage approach to expedite the FOG work and to allow for the two other request, which if done at a later date, would have required more fish pump outages.

On August 16, from approximately 1254 to 1708 hours, all three fish pumps were out of service. This allowed the general maintenance staff to remove the stop logs from slots 14, 43 and 44. The logs were moved to slots 8 and 41. The FOG in slot 8 was removed. The staff tried to minimize crane movement to expedite the process.

During the first hour of the outage, the back flow preventers were tested. Also, the trash racks at fish pump 3 were examined. We found the racks were setting on two concrete stop logs, which greatly reduces the intake area. The new fish pump design team will have to reevaluate their data.

With not all the work having been completed, the biologist informed the district biologists that our third in water work day would have to be August 17.

That day, at 1030 hours, the biologist found the general maintenance staff installing stop logs at slot 37. With the guard rail removed and the work begun, the biologist let them complete the work. Installing the logs takes about 30 minutes. The staff was reminded that the in water work was to occur after 1200 hours. From 1200 to 1430 hours, the FOGs in slots 41 and 37 were removed. No fish pump outage was required. All FOGs were taken to the yard so disassembly could begin.

FOG recap:

Slots 1, 3 and 4: rehab FOGs in winter 2016.

Slots 14, 43 and 44: rehab FOGs installed August 2017.

Slots 8, 37 and 41: rehab FOGS in winter 2018.

Slots 21, 26 and 32: rehab FOGs in winter 2019. FOG rehab complete.

Please email or call with questions or concerns.

Thank you,

Bobby Johnson
Project Fishery Biologist, McNary Dam
Phone: (541)-922-2212
Email: bobby.johnson@usace.army.mil
Or
Denise Griffith
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