

**MEMORANDUM FOR THE RECORD**

**SUBJECT: 15BON31 MFR** – Pacific Lamprey and Sockeye Salmon mortalities at Bonneville's Adult Fish Facility (AFF).

On 30 June 2015, prior to sampling CRITFC researchers contacted Project Fisheries to report one Pacific Lamprey and one Sockeye Salmon mortality had been raked off the valve 15 trash rack (Picture 1). After sampling, CRITFC again notified Project Fisheries to report that six more Pacific Lamprey were retrieved from the trash rack (Picture 2). All fishes were returned to the river.

Information collected is provided below:

Picture 1:

- A. Species – Sockeye Salmon (*Oncorhynchus nerka*) and Pacific Lamprey (*Entosphenus tridentatus*)
- B. Origin – Unknown. Sockeye was unclipped.
- C. Length – SOC: 49 cm, PL: 64 cm
- D. Marks and tags – None.
- E. Marks and Injuries found on carcass – No visible marks or injuries.
- F. Cause and Time of Death – Unknown.
- G. Future and Preventative Measures – None.

Picture 2:

- A. Species – Pacific Lamprey (*Entosphenus tridentatus*).
- B. Origin – Unknown.
- C. Length – From bottom of picture to top: 74 cm, 61 cm, 60 cm, 70 cm, 64 cm, 61 cm
- D. Marks and tags – No marks or tags were observed.
- E. Marks and Injuries found on carcass – No visible marks or injuries were observed.
- F. Cause and Time of Death – Unknown.
- G. Future and Preventative Measures – None.

Picture 1:



Picture 2:



Sincerely,  
Bonneville Fisheries

Comments –

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

From: Caudill, Christopher (caudill@uidaho.edu) [mailto:caudill@uidaho.edu]

Sent: Tuesday, July 14, 2015 12:06 PM

To: Mary Moser; Tackley, Sean C NWP; Kinsey Frick - NOAA Federal

Cc: Bissell, Brian M NWP; Royer, Ida M NWP; Hausmann, Ben J NWP; Zorich, Nathan A NWP; Mackey, Tammy M NWP; Keefer, Matthew (mkeefe@uidaho.edu)

Subject: Re: [EXTERNAL] Re: FW: 15BON31 MFR (UNCLASSIFIED)

Late to the party here as I was out last week on annual leave. Spoke to Matt about RT possibilities and Mary's idea about recaps is a good one. However, given the distances involved between the RT antennas, we don't really have the resolution to say much beyond we know they are milling above the transition area and below the count station. As Matt pointed out, some FDX-PIT-tagged adults would provide some interesting info though :)

Thanks,  
C

On 7/8/15, 8:22 AM, "Mary Moser" <[mary.moser@noaa.gov](mailto:mary.moser@noaa.gov)> wrote:

Hi Sean,

I see. It might be possible to look at the telemetry data for fish known to have entered the AFF channel (i.e., recaps) and see whether they had extended periods of residence between NBO (WA-shore transition area) and time of capture relative to fish not known to have entered the AFF (i.e., time between detects at OBO and NBO without a recap). Just a thought. I agree that the structures in these pictures look very lamprey unfriendly and could be addressed pretty easily.

My two cents,

Mary

On 7/8/2015 7:23 AM, Tackley, Sean C NWP wrote:  
Classification: UNCLASSIFIED  
Caveats: NONE

Thanks, Mary. Most of these morts (lamprey and salmon) are - and have been in previous years - showing up on the AFF drain trash racks. The mystery is whether these mortalities are occurring somewhere in the AFF and/or AFF exit ladder or whether they are washing down from the main fishway. If it is occurring within the AFF facilities, then it is a question of the mechanism. Attached are a couple of photos of some of the unfriendly features in the AFF exit ladder. Again, I suspect that one of the reasons the AFF exit trap works so well is that lamprey congregate in this area because it is a side channel, and perhaps because of these features and the presence of the trap itself (prevents passage over the weir?).

Though there's potential to impact trapping success, I'd really like to have BON and/or our Minor Fishway Mods PDT make the exit ladder and the area around the AFF drain trashracks a little friendlier.

Best,  
Sean

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

From: Mary Moser [<mailto:mary.moser@noaa.gov>]  
Sent: Tuesday, July 07, 2015 9:25 PM  
To: Tackley, Sean C NWP; Caudill, Christopher; Kinsey Frick - NOAA Federal  
Subject: [EXTERNAL] Re: FW: 15BON31 MFR (UNCLASSIFIED)

Hi Sean,

Where are these dead lamprey being found? I get that there were two in the sample tank. Were the others associated with trapping activities? Over the years we have seen very few morts....none that I know of in the traps and only a handful from holding tanks (usually these are associated with longer than 24 h holding and high temperature). Reducing trap soak times (we always aimed for <12 h) and the length of holding periods in the tanks is critical. There is no info that I know of on "natural" pre-spawning mortality.

Mary

On 7/6/2015 8:24 AM, Tackley, Sean C NWP wrote:  
Classification: UNCLASSIFIED  
Caveats: NONE

Any other thoughts on this phenomenon? Are you aware of any information on pre-spawn mortality rates for Pacific lamprey in unimpounded systems? I've had concerns about some of the sharp angles in the AFF exit ladder for a while, and I can't shake the suspicion that one reason for the great trapping success at that AFF exit trap is due to disproportionate accumulation of lamprey in this area (nice off-ladder area for lamprey seeking refuge, combined with challenging exit).

Thanks,  
Sean

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

From: Tackley, Sean C NWP  
Sent: Monday, July 06, 2015 8:06 AM  
To: Mackey, Tammy M NWP; Zorich, Nathan A NWP; Royer, Ida M NWP; Hausmann, Ben J NWP  
Cc: Wertheimer, Robert H NWP  
Subject: RE: 15BON31 MFR (UNCLASSIFIED)  
Classification: UNCLASSIFIED  
Caveats: NONE

Hi Tammy,

The temperature criteria were based on experience of our researchers and the tribal folks who handle these fish on a regular basis. The morts are definitely something to be concerned about, but there are a number of factors that may be affecting the what we're seeing at the AFF and elsewhere:

1. More monitoring for morts (likely poor documentation by AFF users in past years)
2. Higher river temperatures and/or poorer fish condition overall - We're seeing morts elsewhere too, (LPSs, etc), like last year.
3. Location - The AFF is half-way up the ladder and provides a nice side-channel for exhausted lamprey looking for a break. Furthermore, the sharp angles in the AFF exit may contribute to accumulation of lamprey in this area. Also, could the physical presence of the trap contribute to retaining lamprey in the AFF exit area?
4. Sampling operations - I saw Ida's observation below. Can you think of how AFF operations might create the pulses of morts on the trash rack?

Overall...Lamprey are pretty damned durable, and (to steal a Caudill phrase) have a big gas tank when they are in migration mode. You wouldn't expect many morts at this point in their lifecycle. Of course, the telemetry studies show that about half of them find our fishways to be too cumbersome to pass and we know from Mesa's work that there are many fishway features with velocities greater than their UCRIT. So perhaps the warmer temps + challenging fishways = more stress and mortalities. As far as I know, no one knows how much pre-spawn mortality occurs in unimpounded systems and no one has done a targeted temperature tolerance evaluation. It may be worth considering an evaluation of temperature tolerance in 2017, when we plan to do another round of telemetry studies.

Not sure this helps in terms of making any operational decisions.

Sorry!

Sean

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

From: Mackey, Tammy M NWP  
Sent: Thursday, July 02, 2015 3:03 PM  
To: Zorich, Nathan A NWP; Tackley, Sean C NWP  
Cc: Wertheimer, Robert H NWP  
Subject: FW: 15BON31 MFR (UNCLASSIFIED)

Classification: UNCLASSIFIED

Caveats: NONE

This total was from a couple of days ago so it is even higher now. Are we sure lamprey are more heat tolerant than salmon? How many morts are too many?

T

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

From: Royer, Ida M NWP  
Sent: Tuesday, June 30, 2015 11:19 AM  
To: Mackey, Tammy M NWP  
Cc: Hausmann, Ben J NWP  
Subject: RE: 15BON31 MFR (UNCLASSIFIED)

From the AFF: 24 PL morts plus 2 sample tank morts (26 total)