MEMORANDUM

TO: FPAC
FROM: David Benner, FPC
DATE: August 28, 2019
RE: Mid-Year Fishway Inspection Program Update

The following memorandum will outline the Fishway Inspections at the thirteen mainstem dams with fish ladders over the first one-half of the 2019 fish passage season. In addition, other important information from COE weekly reports and/or Memorandums of Coordination at each project will be summarized. Over the spring of 2019, a pilot program using electronic inspection forms using a portable tablet was utilized at several projects. Although this program did not get fully underway, it is expected that electronic inspection forms and tablet use will continue to be fine-tuned throughout 2019 and early 2020, with the expectation that this program will be fully implemented in the spring of 2020 at all projects.

Bonneville Dam:

Several fishway inspections have been performed over the 2019 fishway inspection season. Overall, most inspections have been satisfactory, the only issue being broken or missing staff gauges. From COE weekly reports, there have been several diffuser valve/stems that are in need of repair, several of which are located on Cascade Island that has subsidence issues, which has prevented the use of cranes to fix these issues. Additionally, FV4-4 was not functioning properly on June 14, 2019 (19BON12 MFR) which caused the b-branch entrance head differential to be low and out of criteria. This issue was fixed by June 18th, 2019.

The Dalles Dam:

Multiple fishway inspections have been performed at The Dalles Dam over 2019. During these inspections, all fishways have been in criteria, with the exception of the August inspection when the auxiliary water supply at most locations was turned off due to
ongoing ROV inspections and the March inspection when AWS issues were encountered (see below).

The backup Auxiliary Water Supply (AWS) for the East ladder was completed at The Dalles Dam in late 2018. On 12/10/18, the COE distributed a coordination that described breaker work needing to be done on main fish units at The Dalles. During this work, the main fishway attraction units would be inoperable, and in place of these units, the new emergency AWS would be used. Although all entrances would not be able to keep all east fishway entrances open with the emergency AWS, the COE planned to open/close entrances in conjunction with the Fish Passage Plan when attraction water supplies are less than needed for full criteria operation. This operation would have led to less than desirable adult fishway conditions, but nonetheless East fishway attraction and passage conditions would have been quite functional.

On February 28, 2019 at 1500, the Emergency AWS was put into operation, due to the main fish units’ unavailability (breaker repair). Shortly after beginning operation, movement was noticed on the valve actuator mechanism and the valves were closed due to concerns of failure. Without either the main fishway AWS units or the emergency AWS, fishway attraction and passage conditions in the East ladder would have been poor.

After an emergency FPOM call on March 1, 2019, a decision was made to initiate 2 Kcfs of spill from 0600 to 1100 every other day for attraction at North Fishway. During the spill periods, one gate was open at Ice Trash Sluiceway (unit 3), when no spill was occurring three additional gates at ITS would be open at Unit 18. The spill as dictated by FPOM was geared toward increasing adult attraction at the North Ladder which continued to be functional.

During an FPOM conference call on 3/07/19, it was agreed to again try to open the emergency AWS after repairs were made. If repairs were successful, the emergency AWS would be used until the main units could be returned to service. If repairs to the emergency AWS were unsuccessful, then continue the 2 Kcfs spill operation and ITS operation. The repairs were unsuccessful on the emergency AWS.

The following week, FPOM revisited the issue at its meeting on 3/14/19. At this time it was agreed to increase spill to 15 Kcfs from 6am to 6pm and restore the ITS to its full Fish passage Plan operation. Again, the increase in spill was geared toward further increasing attraction to the North Fish ladder, as opposed to the East ladder which was not providing good passage condition.

On March 22, 2019, the emergency AWS was repaired and put back into service. However, on March 31, 2019, a routine inspection found the 7 ft valve room flooded, as a result the AWS again had to closed, and the 15 Kcfs spill operation resumed.

On April 2, 2019, the AWS again returned to service as repairs were successful. On April 8, 2019, the main fish units returned to service, restoring the full Fish Passage Plan fishway operations.
**John Day Dam:**

Multiple fishway inspections have been performed over the 2019 fishway inspection season at the John Day Dam. Overall, most inspections have all been within fishway criteria. At the start of the fish passage season, both fish turbines 1 and 3 were not operating correctly (19JDA06 MFR). On April 10, 2019 the John Day project began fishway operations with just one fish turbine, which per the FPP included closing floating orifice gates, NE1 was closed, NE2 was set shallower below tailwater, and the SE entrance was also set shallower than normal criteria. Fish Turbine #1 returned to service on April 25, 2019. With two of three fish turbines, the project can generally meet all fishway criteria.

**McNary Dam:**

Over the first half of 2019, fishway inspections have generally shown operations to be with criteria standards. One note of concern is the operation of only two of three fish pumps in 2019, as pump #1 has been out of service and is awaiting overhaul, hopefully to be completed before the fishways water-up in 2020. From COE weekly reports, there have been brief periods this passage season where one of the two remaining pumps have tripped off line or otherwise malfunctioned for short periods. During these periods, with only one functional pump and limited supply water, entrances need to be closed in accordance with section 3.3.2.4 iv of the 2019 Fish Passage Plan. Other areas of concern this year have been several brief periods with the tilting regulating weirs in the upper sections of the fish ladder have malfunctioned and needed to be reset, this happened in late April, Mid-June and early July.

**Ice Harbor Dam:**

Over the first half of 2019, fishway inspections have generally shown operations to be with criteria standards. During the early April inspection, all fish pumps were offline due to exceptionally high tailwater (in accordance with the FPP), causing most ladder criterion to be below standards. In mid-April, there was a malfunction of the South ladder upper ladder diffuser that required repair, the malfunction limited the water supply in the upper ladder. During the May inspection, the inspector outlined some observations during the April repair concerning the integrity of the south ladder upper diffuser grating. This grating should be on priority lists to be replaced in upcoming years, as indications are that the grating is not in excellent shape, and to repair in season would require a ladder closure for some period of time. Other notes of importance were the opening of the newly installed Lamprey entrance at SFE-2 (South Fishway Entrance 2) in mid-July.
Lower Monumental Dam:

Over the first half of 2019, fishway inspections at Lower Monumental have generally shown operations to be with criteria standards. However, during the May inspection, visual observations of staff gauges at some locations differed somewhat from electronic readouts indicating that some calibration need to be performed. Additionally, in May, the southern fish count station window was dirty and could have made it difficult to count via video, depending on video quality. Lastly, several degree temperature differences have been noticed recently (warmer periods) between the north and south collection channels. This is somewhat confusing as all the water supply to both collections channels originates from the same three pumps. This phenomenon is being explored by COE personnel. However, caution should be had when comparing exit to collection channel temperature differentials until collection channel differences between north and south can be verified.

Little Goose Dam:

Over the first portion of 2019, the majority of fishway criteria were met. Water velocities in the southern end of the collection channel did not meet the minimum criteria during the June inspection. Also noted in June were dead shad accumulating on the picketed leads; however, all picketed lead differential criteria continued to be met despite this accumulation. In May, although all fishway criteria were met, inspectors did record moderate eddies in the tailrace at both the southern and northern portions of the Little Goose Tailrace. From COE weekly reports, an electronic device that collects entrance weir depth and the North Shore Entrance 2, has been giving erroneous readings and needs to be replaced. One other more recent issue to note was that during doble testing in early August, the ladder cooling pumps could not be run. If doble testing will continue through warmer months into the future, perhaps cooling pumps should be energized by station service, instead of one transformer or another. During high spring spill periods, COE weekly reports indicate that variable tailwater elevation at ladder entrances impacted the Fish ladder Control Systems ability to maintain ladder criteria.

Lower Granite Dam:

Over the first portion of 2019, the majority of fishway criteria were met. During the May Fishway inspection, south shore readings between electronic and visual observations were variable, indicating some calibrations were needed. This problem continued throughout subsequent inspections and COE engineering is/was attempting to fix the problem. In July, collection channel velocity was below the minimum criteria. It was determined that the velocity recorder near the North Powerhouse Entrance was giving erroneous readings, inspectors were utilizing a measured distance and stop watch to determine velocity. During high spring spill periods, COE weekly reports indicate that variable tailwater elevation at ladder entrances impacted the Fish ladder Control Systems ability to maintain ladder criteria.
Priest Rapids and Wanapum Dams:

Multiple fishway inspections have taken place at Priest Rapids Dam and Wanapum dams operated by Grant County PUD. In general, all fishway inspections have shown ladders to be operating within fishway criteria.

Rock Island Dam:

Multiple fishway inspections have taken place at Rock Island Dam operated by Chelan County PUD. All fishway criteria have been met at Rock Island Dam over the first portion of 2019. The only operation to note at Rock Island Dam was the closure of TRE entrance in May when tailwater was above an elevation of 574.5 feet. At a very high tailwater elevation, head differential criteria cannot be maintained at all right bank entrances; therefore, one of four entrances are closed to provide better conditions at the other entrances.

Rocky Reach Dam:

Multiple fishway inspections have taken place at Rocky Reach Dam operated by Chelan County PUD. In general, all fishway inspections have shown ladders to be operating within fishway criteria.

Wells Dam:

Multiple fishway inspections have taken place at Wells Dam operated by Douglas County PUD. In general, all fishway inspections have shown ladders to be operating within fishway criteria.