FINAL

Conference Call Minutes

Aquatic Settlement Work Group

To: Aquatic SWG Parties **Date:** March 10, 2021

From: John Ferguson, Chair (Anchor QEA, LLC)

Re: Final Minutes of the February 10, 2021, Aquatic SWG Conference Call

The Aquatic Settlement Work Group (SWG) met by conference call on Wednesday, February 10, 2021, from 10:00 a.m. to 1:15 p.m. Attendees are listed in Attachment A of these conference call minutes.

I. Summary of Action Items

1. Douglas PUD will distribute the dimensions (width and thickness) of the metal plating installed to minimize gaps throughout the Wells Dam fishways (Item VI-7). *(Note: Chas Kyger provided these dimensions on February 22, 2021, which Kristi Geris distributed to the Aquatic SWG that same day.)*
2. Aquatic SWG members will review the presentation titled *Summary of Douglas PUD Adult Lamprey Passage Studies 2007–2020* in preparation to further discuss next steps during the Aquatic SWG conference call on March 10, 2021 (Item VI-9).
3. The Aquatic SWG meeting on March 10, 2021, will be held by conference call (Item VII-1).

II. Summary of Decisions

1. Aquatic SWG members present approved the study plan, *Bull Trout Passage and Take Monitoring at Wells Dam and Twisp River Weir* (2021–2022 Bull Trout Radio Telemetry Study Plan), as revised (Item VI-3).
2. Aquatic SWG members present approved the report, *2020 Annual Report Total Dissolved Gas Abatement Plan* (2020 TDG/GAP Annual Report) (Item VI-4).
3. Aquatic SWG members present approved the plan, *Wells Hydroelectric Project 2021 Total Dissolved Gas Abatement Plan* (and appended *Wells Bypass Operating Plan*) (2021 GAP/BOP), as revised (Item VI-4).
4. Aquatic SWG members present approved the *2021 Aquatic Settlement Agreement and Workgroup Action Plan* (2021 ASA Action Plan), as revised (Item VI-5).

III. Agreements

1. There were no agreements discussed during today's conference call.

IV. Review Items

1. The presentation titled *Summary of Douglas PUD Adult Lamprey Passage Studies 2007–2020* was distributed to the Aquatic SWG by Kristi Geris on February 10, 2021, and is available for review in preparation for further discussion during the Aquatic SWG conference call on March 10, 2021 (Item VI-9).
2. The Washington Department of Fish and Wildlife (WDFW) briefing, *Sturgeon Pathogen Surveys*, was distributed to the Aquatic SWG by Kristi Geris on March 8, 2021.

V. Documents Finalized

1. The final 2021–2022 Bull Trout Radio Telemetry Study Plan was distributed to the Aquatic SWG by Kristi Geris on February 10, 2021 (Item VI-3).
2. The final 2021 ASA Action Plan was distributed to the Aquatic SWG by Kristi Geris on February 10, 2021 (Item VI-5).
3. The final 2020 TDG/GAP Annual Report was distributed to the Aquatic SWG by Kristi Geris on February 23, 2021 (Item VI-4).
4. The final 2021 GAP/BOP was distributed to the Aquatic SWG by Kristi Geris on February 25, 2021 (Item VI-4).

VI. Summary of Discussions

1. **Welcome, Review Agenda, Meeting Minutes Approval, and Review of Action Items (John Ferguson):**

   John Ferguson welcomed the Aquatic SWG members (attendees listed in Attachment A). Ferguson asked for any additions or changes to the agenda. Ralph Lampman added an update on the most recent Pacific Lamprey Information Exchange Webinar.

   The revised draft January 13, 2021, conference call minutes were reviewed. Kristi Geris said edits and comments received from members of the Aquatic SWG were incorporated into the revised minutes. Aquatic SWG members present approved the January 13, 2021, conference call minutes, as revised.

   Action items from the Aquatic SWG conference call on January 13, 2021, are as follows (Note: the following italicized item numbers correspond to agenda items from the January 13, 2021, meeting):

- *Douglas PUD will provide a presentation summarizing the 2013 and 2016–2017 Pacific Lamprey studies conducted in the Wells Project, during the Aquatic SWG conference call on February 10, 2021 (Item VI-1).*
  This will be discussed during today's conference call.
- *U.S. Fish and Wildlife Service (USFWS) will forward monthly weblinks to attend the Pacific Lamprey Conservation Initiative's Lamprey Technical Workgroup 4th Annual Lamprey Information Exchange Monthly Webinar Series, which will convene on the second Tuesday of each month from January to June 2021 (Item VI-2).*
  A flyer containing these monthly weblinks was distributed to the Aquatic SWG by Kristi Geris on January 14, 2021.
- *Douglas PUD and the Yakama Nation (YN) will produce a comprehensive table summarizing Pacific Lamprey translocation efforts completed to date by Douglas PUD, the YN, and the Colville Confederated Tribes (CCT), for discussion during the Aquatic SWG conference call on February 10, 2021 (Item VI-9).*
  Andrew Gingerich provided an edited translocation table to Ralph Lampman, which Lampman verified with the CCT and distributed to the Aquatic SWG prior to the conference call on February 10, 2021.

2. COVID-19 Updates (John Ferguson):

John Ferguson asked if Aquatic SWG members had any new updates to share regarding impacts of coronavirus disease 2019 (COVID-19) on Aquatic SWG-related monitoring and evaluation (M&E) activities. The Aquatic SWG had no new COVID-19 updates to announce.

3. DECISION: 2021–2022 Bull Trout Radio Telemetry Study Plan (Andrew Gingerich):

Andrew Gingerich said the draft 2021–2022 Bull Trout Radio Telemetry Study Plan was distributed to the Aquatic SWG for review by Kristi Geris on December 3, 2020, and a revised draft plan in tracked changes was distributed on January 19, 2021. Gingerich said the plan was revised, as discussed, and no additional edits or comments have been received. He recalled that tags for the study have been ordered and the vendors are conducting maintenance on the receivers, as approved by the Aquatic SWG on December 9, 2020.

Steve Lewis agreed the revised draft plan reflects what was discussed, and he said USFWS is ready to approve unless RD Nelle (USFWS) has concerns. Nelle said he has no concerns but wants to verify he has the correct draft for approval. *(Note: Geris forwarded Nelle the revised draft plan that was distributed on January 19, 2021.)*

Aquatic SWG members present approved the 2021–2022 Bull Trout Radio Telemetry Study Plan, as revised. The final study plan was distributed to the Aquatic SWG by Geris following the Aquatic SWG conference call on February 10, 2021.

4. DECISION: 2020 TDG/GAP Annual Report and 2021 GAP/BOP (Andrew Gingerich):

Andrew Gingerich said the draft 2020 TDG/GAP Annual Report was distributed to the Aquatic SWG by Kristi Geris on January 12, 2021, and was available for review with edits and comments due to Gingerich by February 8, 2021. Gingerich recalled that this document reports TDG compliance for the Wells Project throughout 2020. Aquatic SWG members present approved the 2020 TDG/GAP Annual Report. The final report was distributed to the Aquatic SWG by Geris on February 23, 2021.

Gingerich said the draft 2021 GAP/BOP was distributed to the Aquatic SWG by Geris on January 8, 2021, a revised draft plan was distributed on January 27, 2021, and edits and comments were due to him by February 8, 2021. He recalled that this document is used to meet water quality standards throughout 2021. He said to note that the revised draft 2021 GAP/BOP addresses a request from the Wells Project Superintendent to not use Spillway 7 as the primary spillway under high flows due to needed maintenance. Gingerich explained further that the *Wells Hydroelectric Project Spill Playbook* (as appended to the *2021 Total Dissolved Gas Abatement Plan*) was revised so that under certain high river flows spill will be concentrated through Spillway 5 (instead of Spillway 7). He said this configuration has been used in the past and Douglas PUD expects no change to the efficiency of the bypass. Gingerich said Douglas PUD discussed these changes with Breean Zimmerman, and he received indication of no comment from Jason McLellan. Gingerich said no additional edits or comments have been received on either document. Zimmerman thanked Gingerich for the update and clarification that was provided regarding the revised plan. Aquatic SWG members present approved the 2021 GAP/BOP, as revised. The final plan was distributed to the Aquatic SWG by Geris on February 25, 2021.

5. DECISION: 2021 ASA Action Plan (Andrew Gingerich):

Andrew Gingerich said the draft 2021 ASA Action Plan was distributed to the Aquatic SWG by Kristi Geris on January 26, 2021. Gingerich recalled that this document is not a Federal Energy Regulatory Commission requirement; rather, it is a tool to help with planning and communicating activities with the Aquatic SWG. He said the only comments received were from Jason McLellan, which he projected on the WebEx. The Aquatic SWG discussed these and additional comments, as follows.

<u>White Sturgeon Management Plan</u>

Gingerich said McLellan provided comments on the upcoming *Adult M&E – Reproductive Assessment*. Gingerich recalled beginning these discussions in 2020, including recently (approximately 1 week before today's conference call) convening offline with McLellan and Laura Heironimus to discuss possibly using egg mats in addition to acoustic telemetry work. Gingerich said, based on these discussions, Douglas PUD is proposing to conduct the first of

five adult reproductive assessments in 2022, which might involve using egg mats in the Chief Joseph Dam tailrace or conducting larval drift collection. He said there is debate about the pros and cons of each method, but there seems to be agreement that there are likely not many adults present in the Wells Project. He said the number of adults should increase through time, and the opportunity to collect will potentially increase as the number of adults on the spawning grounds increase. He said in 2021 Douglas PUD is proposing to develop a draft study plan for the upcoming *Adult M&E – Reproductive Assessment* for Aquatic SWG review by the end of the year, probably with the help from a contractor. He said additionally, for the 4-week M&E effort, Douglas PUD proposes in June or July 2021 (shortly after the White Sturgeon spawning period) either collecting and tagging additional adults to increase the number of acoustic tags in the reservoir or conducting another stock assessment to compare to data collected 2 years ago. He said the Aquatic SWG will need to discuss these details in the coming months. John Ferguson suggested including study plan development to the 2021 ASA Action Plan that would be due in December 2021, based on the understanding that McLellan and Heironimus support postponing the actual collection of eggs or larvae to 2022. Ferguson also suggested adding adult and subadult stock assessment or adult acoustic tagging in 2021. He noted a comment from McLellan about ideal timing for targeting adults, and McLellan said he would be supportive of language stating that Douglas PUD and the Aquatic SWG are open to modifying dates. Gingerich suggested inserting 'to be determined.' Heironimus said she supports these edits.

Pacific Lamprey Management Plan

Chas Kyger said McLellan provided a comment to add starting discussions about the Pacific Lamprey passage study planned for 2022. Kyger said he plans to kick off these discussions during today's conference call, and this can be added to the action plan. Ralph Lampman asked if a timeline can be included. Gingerich suggested approving the study plan by December 2021, which should give Douglas PUD plenty of time to prepare to tag study fish by July 2022. Lampman agreed with this suggestion.

Bull Trout Management Plan

Steve Lewis noted that only aspects of the 2021–2022 Bull Trout Radio Telemetry Study Plan are listed, but the study itself is not listed. Gingerich clarified that No. 7 under *Bull Trout MP* in the draft action plan (*Track study fish throughout study range*) is the physical act of conducting the study. He said this will continue into 2022, but this is not shown because this action plan is for 2021. Lewis said this makes sense. He also asked if setting up radio telemetry sites includes the site in the Chelan River, in coordination with Chelan PUD. Gingerich replied yes, and he said some sites are already being installed at Wells Dam. He

said the remote sites, which operate on solar power, will be installed in March and early April 2021, including the site across the river at the mouth of the Chelan River.

Resident Fish Management Plan

Kyger said McLellan provided a comment about the *Resident Fish Seasonal Movement and Habitat Use Study* (Resident Fish Assemblage Study). Kyger recalled in 2020 Douglas PUD started conducting electrofishing in preparation for the upcoming Resident Fish Assemblage Study and then COVID-19 restrictions were put in place. He said that, due to the uncertainties surrounding COVID-19, a study plan was ultimately not developed. He said he was able to acoustically tag Smallmouth Bass during the electrofishing effort and leverage the White Sturgeon acoustic telemetry arrays installed around the Wells Reservoir to begin collecting data on predator species movements; however, he has not yet been able to obtain a download from the receivers since the fish were tagged. He said he plans to provide an update to the Aquatic SWG once these data are downloaded, and Douglas PUD also plans to continue electrofishing and tagging more resident fish in 2021. He clarified that the electrofishing and tagging in 2020 and the planned effort in 2021 will not be a part of the Resident Fish Assemblage Study; rather, this is a pilot effort to obtain a better understanding of seasonal movements by predators to help develop a more focused study plan. He said listing the study in the draft 2021 ASA Action Plan is to notify the Aquatic SWG that this study is forthcoming. McLellan said this explanation is helpful.

Lampman noted that Columbia River Inter-Tribal Fish Commission (CRITFC) and partners want to conduct a predation study for Pacific Lamprey and are interested in understanding what resident fish studies are occurring and by which agency, so this notification is also helpful for that effort. Lampman said the YN and partners are also interested in conducting a pilot study involving collecting eDNA samples from resident fish guts to analyze for Pacific Lamprey presence. He said if there are specimen in guts with morphologically identifiable Pacific Lamprey present, they are interested in conducting a more standard molecular analysis (DNA sequence analysis). He said once the Resident Fish Assemblage Study Plan is developed, he would like to see if there is a way to collaborate on a pilot study.

Additionally, Gingerich said the annual Douglas PUD Northern Pikeminnow Removal Program involves conducting stomach analyses on a proportion of captured fish to monitor for smolt presence, and there might be data on Pacific Lamprey presence through these efforts. Kyger agreed and said the 2020 Northern Pikeminnow Removal Program Annual Report is still being drafted, but this report should include these data. He said he will distribute the report when it is available.

Lampman asked in what time frame will Douglas PUD be conducting the pilot effort for the Resident Fish Assemblage Study. Kyger said this will take place from April to August 2021. Ferguson suggested that Lampman contact Douglas PUD to coordinate pilot efforts. Lampman agreed.

Lewis asked how the YN study differs from Douglas PUD study. Lampman explained that often times it is difficult to discern whether Pacific Lamprey have been consumed because Pacific Lamprey have no bones and digest quickly. He said while it can be beneficial to analyze stomach contents, genetic samples can provide additional information. He said the YN has conducted a predation study where stomach contents from a variety of predators were analyzed, and some fish with no apparent remnants of Pacific Lamprey in the stomach contents returned positive genetic results for Pacific Lamprey. He said there are other methods, such as metabarcoding, to monitor for species presence; however, these can be slightly more expensive.

Lewis asked if the CRITFC study is focused only on the Mid-Columbia River Basin. Lampman said no, CRITFC is interested in coordinating with any ongoing predation study.
Lewis suggested adding coordination with CRITFC to the action plan. Gingerich added this, as requested.

Water Quality Management Plan

Ferguson recalled in 2020 Douglas PUD also conducted preliminary research on resident fish to meet upcoming requirements under the new TDG rule. Gingerich said this is correct, and in 2021 Douglas PUD will conduct weekly sampling for resident fish from April 1 to August 31, 2021, in compliance with the biological monitoring required under the new TDG rule that was adopted by Washington State Department of Ecology at the end of 2019.

Aquatic SWG members present approved the 2021 ASA Action Plan, as revised. The final plan was distributed to the Aquatic SWG by Geris on February 10, 2021.

6. Wells Fish Hatchery Brood Year 2020 White Sturgeon Rearing Update (Andrew Gingerich):

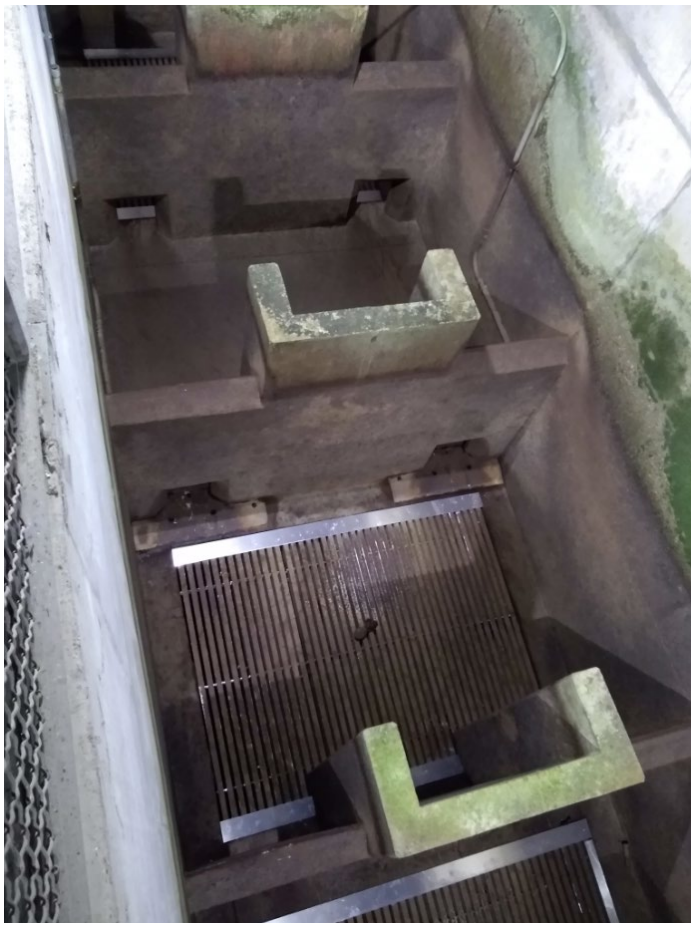
Andrew Gingerich said Wells Fish Hatchery brood year 2020 White Sturgeon were passive integrated transponder (PIT)-tagged during the first week of January 2021, and there have been no mortalities since. He said rearing is going well and average fish size is ranging from 372 to 540 grams each. He said feed rates have been scaled back to under 2% and water temperatures have been reduced to 61°F. He said fish are converting well and will be weighed and measured again at release, and no additional mortality is expected.

7. 2020/2021 Wells Dam Winter Maintenance (Andrew Gingerich):

Andrew Gingerich recalled that the Wells Dam west fishway was dewatered for annual winter maintenance in early January 2021. He said on January 5, 2021, the upper fishway was dewatered, and on January 6, 2021, the lower fishway was dewatered. He said a fish salvage memorandum for the west fishway was distributed to the Aquatic SWG by Kristi Geris on January 8, 2021. Gingerich said there was an error in the Pacific Lamprey numbers, which is being resolved. He said efforts to minimize the gaps in the west fishway are now complete and 15 photographs of the dewatered west fishway were distributed to the Aquatic SWG by Geris on January 25, 2021. Gingerich said the west fishway was rewatered on January 21, 2021, and the east fishway was taken out of service for annual winter maintenance on February 1 (top portion) and February 3, 2021 (bottom portion). He said crews will continue to close gaps in the east fishway, as has been completed in the west fishway, and the radio telemetry antennas will also be serviced while the east fishway is down for maintenance.

Gingerich shared photographs of the newly installed plating on the diffuser grating located in the west fishway. He recalled that this grating is used to maintain a specific head differential through the fish ladders. John Ferguson asked how the plating is attached, and Chas Kyger said it is anchored to the concrete with bolts. Gingerich noted in Photograph _20210122_1142b.jpg, fish can pass over the overflow weir or through the orifice located at the bottom of the weir.

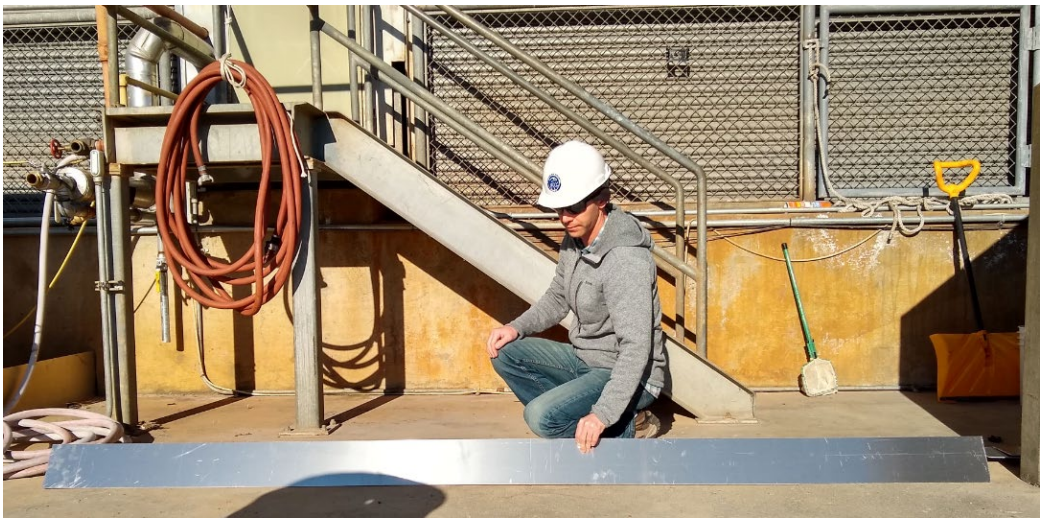
Photograph
_20210122_1142b.jpg



Gingerich said the opening at the bottom can be flush with the floor (lower fishway weirs) or slightly perched off the floor with a chamfered edge (upper fish way weirs). He also said in the weir there is electrical conduit on the right-hand wall leading to a PIT-tag reader installed in the orifice, which can be used to monitor Pacific Lamprey passage through the orifice. Steve Lewis asked why there is plating installed along the right edge in one weir but not on the other, and he noted that it appears there is a large gap in the grating without the plating. Gingerich explained that the grating is casting a shadow because the gating is slightly submerged relative to the concrete edge, and he said he knows the crews measured each gap to determine what was out of specifications to identify where to install the plating. Kyger added that the grating panels do not align in each weir and in every other weir the gap was smaller. Lewis asked about the width of the plating installed along the right edge in the lower weir. Gingerich said it is roughly half the size of the larger plating, and Kyger estimated it is

approximately 1.5 inches wide. Gingerich said, for perspective, Photograph _20210122_1146.jpg shows the larger plating.

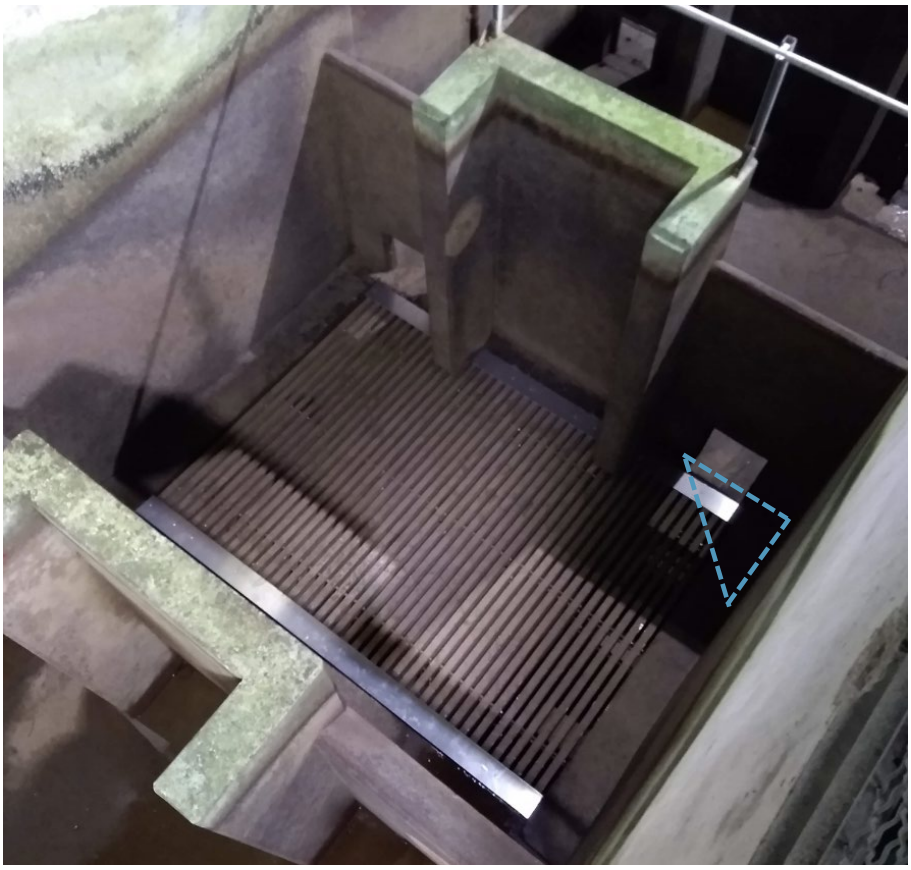
Photograph _20210122_1146.jpg



Lewis asked if it appears the newly installed plating has no effect on salmonid passage. Gingerich said Douglas PUD has not conducted a study with the new plating installed, but the engineering specifications were designed to have no effects on flow rates through the diffuser and therefore no effect on salmonids and the plating was installed to bring the gratings back into specifications. Ralph Lampman asked that Douglas PUD distribute the dimensions (width and thickness) of the metal plating installed and Gingerich said he can do this. *(Note: Kyger provided these dimensions on February 22, 2021, which Geris distributed to the Aquatic SWG that same day.)*

Lampman asked Gingerich to share Photograph_20210122_1142d.jpg.

Photograph
_20210122_1142d.jpg



Note:
The blue hatched triangle was inserted on the photograph to show what Lampman was suggesting.

Lampman suggested replacing the rectangular plating through the orifice with triangular plating on the upstream side of the weir to help guide Pacific Lamprey to the concrete edge of the weir. Gingerich said triangular plating would cover more grating than specified in the engineering designs, which could affect velocity through the area and would require Wells Habitat Conservation Plan Coordinating Committee approval. He suggested in future studies evaluating how fish perform with the currently installed plating and making decisions from there. He also noted that the plating will be inspected during each winter maintenance outage and there may be an opportunity to replace the plating in the future, as needed.

8. **White Sturgeon Adult Reproductive Assessment (Andrew Gingerich):**
Andrew Gingerich said he covered this discussion under review and approval of the 2021 ASA Action Plan, but he asked Jason McLellan and Laura Heironimus if there was

anything more to add to the discussion. McLellan and Heironimus both agreed there was nothing additional to add for discussion today.

9. Pacific Lamprey – Past Studies, Translocation, and Study Plan Development (Chas Kyger and Ralph Lampman):

Chas Kyger shared a presentation titled *Summary of Douglas PUD Adult Lamprey Passage Studies 2007–2020* (Attachment B) which was distributed to the Aquatic SWG by Kristi Geris following the Aquatic SWG conference call on February 10, 2021.

Slide 1 of Attachment B

Kyger recalled Douglas PUD and the Aquatic SWG beginning discussions about a Pacific Lamprey study in 2022 and agreeing a good starting point would be to review past studies to date. He said today's presentation provides an overview of studies since 2007 and focuses on methods and findings to help guide development of a study plan. He encouraged Aquatic SWG members to review the individual plans and reports for specific details about the respective studies.

Slides 2 to 3 of Attachment B

Kyger reviewed the goal and objectives of the Pacific Lamprey Management Plan, which he said are the framework for all studies conducted in the past and how to proceed in the future.

Slide 4 of Attachment B

Kyger reviewed the studies conducted from 2007 to 2016. He noted that the 2013 radio telemetry study was designed to evaluate issues identified by the previous 2007–2008 radio telemetry study and 2009–2010 Dual-frequency Identification Sonar (DIDSON) study. He said in 2015 a series of unavoidable issues ultimately postponed this study to 2016; however, Douglas PUD was able to participate in a Grant PUD study, which helped inform the 2016 acoustic study plan.

Slide 5 of Attachment B

Kyger reviewed key methods and findings from the 2007–2008 radio telemetry study. He said this year turned out to be a low Pacific Lamprey run, which resulted in a low sample size. Further, he said the results associated with the lower portion of the fishway were questionable due to possible trap operation biases and there were enumeration issues due to study fish bypassing the count window, uncounted, via the picketed leads that bypass water through the count window area.

Slide 6 of Attachment B

Kyger said the 2009–2010 DIDSON study implemented a more passive study approach and evaluated how changes in head differential affected passage efficiency. Again, he said there were very few Pacific Lamprey counted at Wells Dam in both years; therefore, no strong conclusions could be drawn with such a low sample size.

Slides 7 to 14 of Attachment B

Kyger reviewed the objectives of the 2013 passage and enumeration study, which used radio telemetry to evaluate the passage and enumeration issues identified in the previous studies. He said that, in preparation for the study, grating was installed to exclude Pacific Lamprey from bypassing the count window, aluminum ramps were installed leading into and out of the count station, and PIT antennas were installed to improve detection in the lower fishway. He said most study fish were released in the Wells Dam tailrace, and about half of these fish were never detected at the dam. He said some of these fish were later detected during mobile tracking efforts, and he guessed these fish may have been overwintering in the Rocky Reach Reservoir. He said a high proportion of study fish that were released in the fish ladder were detected upstream. He said those fish that did pass did so fairly quickly, and more than half went into the Methow or Chewuch rivers based on instream PIT detections. He said the graphic on Slide 11 of Attachment B depicts the study results, and he noted that the biggest losses occurred in the lower fishway. He said regarding fixing the passage and enumeration issues identified in past studies, it seemed fish were no longer bypassing the count window via the picketed leads; however, fish were still finding alternate routes around the count window because enumeration efficiency was still low. He said the photograph on Slide 13 of Attachment B shows an example of an area where Pacific Lamprey could bypass the count window, likely to avoid the bright lights in the count window. He said the photograph on Slide 14 of Attachment B shows a rubber gasket that was installed to fill gaps in the count window area. He said originally, brushes were installed here, but the brushes deteriorated quickly. He said there have been no studies with the rubber gasket installed, but it seems to be holding up well.

Slide 15 of Attachment B

Kyger said in 2015 Grant PUD acoustically tagged 100 Pacific Lamprey and released these fish above Priest Rapids and Wanapum dams, and Douglas PUD tracked how many of these fish passed Rocky Reach Dam. He said this was during the time when Douglas PUD was developing a study plan for 2016. He said based on these results and the past radio telemetry study where a large proportion of fish never approached the dam, Douglas PUD decided to shift the approach for the 2016 study.

Slides 16 to 23 of Attachment B

Kyger reviewed the objectives of the 2016 approach, passage, and enumeration study, which used acoustic telemetry to evaluate approach to Wells Dam and the use of newly installed low-level entrance boxes. He said the photograph on Slide 17 of Attachment B shows the low-level entrance box next to the schematic of the low-level side entrance. He said these entrances were designed as an alternate route for salmon passage, but there were issues with salmon cycling in and out of each entrance, so the entrances were closed around 2005. He said the Aquatic SWG thought Pacific Lamprey might prefer to use these side entrances because the area is away from higher flow and provides a dark area for passage. He said the entrances were reopened, and low-level entrance boxes were installed with PIT detectors to provide a low-velocity route into the side entrances. He said study fish included fish tagged and released by both Douglas PUD and Grant PUD. He said of the 84 fish total, 21 fish were detected in the Wells Dam tailrace (10 in the fall and 11 in the following spring), including 16 of the 21 fish being detected at the fishway entrances. He noted that 80% of the study fish overwintered in the Rocky Reach Reservoir, moved upstream towards Wells Dam quickly in the spring, and then all fish migrated downstream out of the study area. He said the graph on Slide 20 of Attachment B shows the gradual loss of fish through the Rocky Reach Reservoir, by river kilometer. He said the graph on Slide 21 of Attachment B is an example of the typical overwintering behavior that was observed. He said this fish initially moved upstream after tagging, held in one area, had another upstream movement around April 2017, then quickly migrated downstream in June and July 2017. He said the use of the low-level side entrances could not be evaluated because not many fish reached this area. He said it turned out this area has issues with accumulating sediment. He said Douglas PUD wanted to retest the entrances, but for safety reasons the entrances were closed. He said the low-level entrance boxes are still installed, so the entrances would just need to be reopened and the sediment issues resolved. He said that, while the low-level side entrances were open, there were no detections of PIT-tagged Pacific Lamprey using the low-level entrance boxes. He said the issue with approach to Wells Dam was discussed at length within the Aquatic SWG, including convening Pacific Lamprey workshops to review hypotheses. He said some hypotheses included lack of pheromone attraction, predation by White Sturgeon, mainstem spawning, or maybe just low region-wide abundance.

Slides 24 to 25 of Attachment B

Kyger said these discussions lead to a discussion of translocation efforts. He said Douglas PUD and the Aquatic SWG developed a Statement of Agreement (SOA[1]) on

[1] Aquatic SWG SOA, titled *To translocate adult Pacific Lamprey from Priest Rapids Dam to areas within or upstream of the Wells Project and postpone passage evaluations*, and approved June 13, 2018.

translocation to bolster the population and increase pheromone attraction above Wells Dam. He said Douglas PUD also continued maintenance in the fishways to benefit Pacific Lamprey passage. He said going forward, per the SOA[1], the plan is to retest approach and passage in 2022 to determine if translocation was effective. He said when the approach rates are high enough, efforts can focus towards studying the fishways. He reviewed translocation numbers to date, as summarized on Slide 25 of Attachment B. He recalled the goal for translocating approximately 75% of fish to the Methow River and 25% to the Okanogan River, as well as targeting an average of 500 fish per year. He said the current average is a little below this and he noted that each year of translocation conducted to date (2018 to 2020) has had low run counts.

Slides 26 to 27 of Attachment B

Kyger said probably the biggest consideration for future studies is sample size. He also suggested considering source of study fish and asked is translocating fish affecting migratory behavior, is there still not enough pheromone, and how do the data on approach behavior inform where to release study fish. He said at this point Douglas PUD and the Aquatic SWG need to assess what effects the translocation program has had. He noted the inconsistent data on juvenile catches from screw traps located in the Methow River, which have not been useful to gauge the effects of the translocation effort on abundance, but he said that Douglas PUD and the Aquatic SWG need to determine whether or not to continue translocation.

Slides 28 to 29 of Attachment B

Kyger reviewed different strategies on how to proceed. He said Douglas PUD is not advocating for any one of these; rather, he is just outlining options for discussion. He said the translocation SOA[1] includes language to retest whether approach improves or not. He said another option is to shift strategies to test multiple release sites above, below, and within the fishways using PIT detection. He said this might inform overall effects of the dam and behavior of translocated fish, including whether approach to the tributaries occurs at the same rate as approach to the dam. He said this would be easy to do alongside of translocation efforts but might require multiple years of data to show anything conclusive. He said another option is to wait until numbers increase to get back to more traditional studies. He said maybe there is no way to effectively study passage at Wells Dam. He said maybe the Aquatic SWG will want to consider how to continue the translocation program. He said fishway improvements but can be problematic because the goal of the Pacific Lamprey Management Plan is to use data to guide modifications and then determine how effective the modifications were. He said that, if the Aquatic SWG decides to move away from this, regulatory coverage will be needed.

Discussion

Kyger suggested reviewing this presentation and past study plans and reports, and to contact him with any questions. He said he thinks this is a good starting point to begin study plan development for 2022.

Laura Heironimus said, first she thinks eDNA might be evolving to a point where it can be used to calculate abundance. She said researchers are starting to do this with Eulachon on the coast. She said, secondly in the 2009–2010 DIDSON study, she is curious why only seven Pacific Lamprey were surveyed. She asked if fish were bypassing the survey area like in the radio telemetry study or were fish too difficult to see on the DIDSON? Kyger said the DIDSON cameras were aimed at the fishway entrances, specifically at a concrete sill that Pacific Lamprey use to pass into the main collection chamber. He said it happened to be a low run year where counts were only in the single digits, and he added that there were no tagged fish for this study. Heironimus asked if Douglas PUD would still consider DIDSON as a useful tool for future studies. Kyger said yes, the methodology has been proven as a viable method, especially as a passive monitoring technique, and he thinks the technology has improved since the study. He said as far as passage efficiency goes, DIDSON might be the best option. He said the fishway entrance is a large area and he is not sure installing a PIT antenna here would result in the best detention efficiency. Heironimus announced that Monica Blanchard (WDFW) just joined the call. Heironimus said she hopes to share this presentation with Blanchard, as Blanchard is the new WDFW Pacific Lamprey Technical Expert.

Steve Lewis asked about the level of coordination that has occurred between Douglas PUD and Chelan PUD regarding diet analyses of White Sturgeon stocked in the Rocky Reach Reservoir under the Chelan PUD White Sturgeon Supplementation Program. Kyger said this was discussed during a workshop in 2016, but he is unsure if any analyses have been conducted. Andrew Gingerich said he believes Lance Keller (Chelan PUD) and Blue Leaf planned to try conducting stomach analyses of White Sturgeon, but he has not seen these results. Gingerich said he seems to recall the issue with White Sturgeon is these fish have a spiral stomach that requires lethal removal to thoroughly analyze the contents. He said Douglas PUD had one indexing mortality during M&E, a stomach analysis was conducted, and no evidence of Pacific Lamprey was observed. Heironimus said she recently watched a presentation on stomach analyses and the challenge with Pacific Lamprey is these are cartilaginous species that digest quickly making it difficult to find evidence of these fish in the stomach. She said eDNA has been used for stomach content analyses, but generally gastric lavage is difficult. She said a potential workaround would be if a sports fishery was set

up for gastric lavage; otherwise, lethal removal is opposite of the goal of a supplementation program.

Jason McLellan said he does not recall any observations of Pacific Lamprey in the stomach contents of White Sturgeon collected from the Rocky Reach Reservoir. He said that, early in the program for the Wanapum Reservoir, there was one large fish mortality that did have Pacific Lamprey in the stomach (note: these were juvenile Pacific Lamprey). He said this is not surprising, White Sturgeon eat Pacific Lamprey when given the opportunity, and this is proven in the literature. He said the question is if the Chelan PUD White Sturgeon Supplementation Program has effects on Pacific Lamprey passage at Wells Dam. He said to note that the Pacific Lamprey migration timing does not match well with the Chelan PUD White Sturgeon Supplementation Program. Additionally, he said there are large numbers of White Sturgeon in high densities below every hydropower project in the system and questioned why this issue would be singular to Wells Dam. He said he is not advocating there is no issue, but he thinks this is all speculative at this point.

Lewis asked if gastric lavage might be a viable option for a future study. McLellan said that, even if gastric lavage was effective at detecting Pacific Lamprey in the stomach contents of White Sturgeon, the question is how important is this? He said okay, so White Sturgeon eat Pacific Lamprey, but in what proportion of the entire Pacific Lamprey population? He said he does not think gastric lavage is a good approach unless the study can be designed to come up with meaningful answers. Lewis said he thinks gastric lavage could be used at some level, but he is not sure how. He said he wants to minimize chances of a scenario where the PUDs blame each other for low Pacific Lamprey numbers. McLellan said he is not opposed to euthanizing hatchery fish to analyze stomach contents. He said he believes part of the reasoning for stocking fish is to facilitate M&E and research. He said if it is a well-designed, thought-out experiment, he has no issues with this. Lewis agreed and said he believes this will inform detectability in the Wells Dam tailrace. He said he is not aware of any conclusive evidence that White Sturgeon are eating Pacific Lamprey in the Wells Dam tailrace.

Gingerich said he thinks he understands the concern. He said what is difficult is, if a study identifies White Sturgeon eating adult and juvenile Pacific Lamprey in the Rocky Reach Reservoir, what baseline of predation can this be compared to? He said all this says is that there are more hungry fish in the reservoir compared to 10 to 15 years ago. He said to extrapolate what this predation means will be difficult. He said this is why the ASA management plan does not include fish passage metrics for Pacific Lamprey because it is hard to know what level of conversion to expect. He said he understands what Lewis is saying but he does not know how to apply these data.

McLellan asked if Douglas PUD has considered predation acoustic tags, and he said Vemco makes predation tags. He said with predation tags it would be known if the fish was preyed upon or not, and maybe this is the first question before conducting gastric lavage. Heironimus said this makes much more sense in terms of study design, and she recalled how quickly Pacific Lamprey breakdown. She questioned how many White Sturgeon would need to be sacrificed to obtain a robust dataset using gastric lavage and agreed using predator tags is a good suggestion if these work for Pacific Lamprey.

Ralph Lampman said he thinks there are pros and cons to each detection method (i.e., radio telemetry, acoustic telemetry, and PIT). He said with translocation it is normal for fallback to occur in the initial years, but after a few years, larvae become established and fish will migrate upstream. He said he thinks there may be a potential benefit to continuing translocation longer than 4 years. He said he likes the idea of a PIT-tag study with releases above, below, and within the fish ladders. He said this will provide an initial look at fish behavior and is fairly cheap to implement. He said he agrees with Heironimus' comments about eDNA. He said absolute abundance might be difficult, but relative abundance might be doable (i.e., to compare levels among areas). He said the initial 2018 eDNA study was promising and he would like to continue this data collection. He recalled these results indicating high Pacific Lamprey abundance up to Rocky Reach Dam, but then no Pacific Lamprey presence in the Upper Columbia River above Wells Dam except at the mouth of the Methow River. He recalled attempting, but ultimately not obtaining, funding for further eDNA studies through the Pacific Lamprey Conservation Initiative. He said the YN and partners are still seeking funding to continue this effort. He said eDNA sampling coupled with a PIT-tag study can help inform the next study.

Lewis asked how eDNA sampling compares to bile acid sampling. Lampman said researchers are trying to determine if eDNA and bile acid numbers correlate, and if there is a relationship between the two, how related are they. He said if the two are related, studies can use just eDNA as a surrogate instead of doing both, which is cheaper. Lewis said he understands that eDNA has limitations, but he is not sure about bile acid as a priority method. Lampman said bile acid is one step closer, but there are still unknowns for how it exactly works for Pacific Lamprey. He said eDNA is more of an assessment of genetic breakdown to understand how many Pacific Lamprey (or biomass of Pacific Lamprey) might be present in a system.

RD Nelle said USFWS is conducting a lot of eDNA work, and there are issues with using it to calculate relative abundance. He said if there is a Pacific Lamprey mortality upstream of where the sample is collected, there will be a high eDNA count, but this does not mean there are a lot of juveniles in the system. He said then trying to tie into bile acid counts, the science

is not quite there yet. He agreed about the need to measure pheromone levels to get an idea about what appears to be happening, but if there is an increase in levels and still no fish upstream there may be something else going on.

Lampman said, regarding the process of identification, modification, then evaluation, as stated in the Pacific Lamprey Management Plan, when the plan was drafted the idea was to make sure decisions were not made based on an assumption that it will work. He said that, now that there is more experience and other Pacific Lamprey literature about fishway modifications increasing passage rates, he thinks it is clear what works and what is important for Pacific Lamprey. He said he does not think this language should preclude Douglas PUD and the Aquatic SWG from doing what is working in other places. He agreed anything novel may need more research, for example the Pacific Lamprey-specific side-entrance modification. Regarding the White Sturgeon discussion, he does not believe White Sturgeon are the cause for direct mortality in the past studies. He said, if anything, it is more a behavioral effect, so seeking only direct predation may not fully provide an answer to the White Sturgeon question at hand.

Lewis asked Lampman about his thoughts on fish source. Lampman said he does not think source is an issue. He said these fish are not salmon; rather, Pacific Lamprey are a homogeneous species that can go from Russia to the United States. He said in past studies in the Yakima River Basin, USFWS released fish upstream and downstream of dams. He said those released upstream moved up and those released downstream struggled. He said that, initially, many of the Pacific Lamprey released in tributaries were not interested in moving upstream, but over the years more and more of these fish are staying in the tributaries or moving up. He said he thinks this is a sign of a change in attraction queues in these systems, and a similar phenomenon were observed in Okanogan River tributaries in the Upper Columbia River region. He said it is bound to happen at Wells Dam, whether it is here now or after more years of translocation. He said he thinks eDNA and bile acid assessment is a key thing to do. He said he understands the science is not yet quite there to get at absolute abundance, but he thinks these methods will get there eventually, which is why he thinks it is important to at least collect samples. He said, again, he also supports the PIT-tag approach.

John Ferguson said there has been a lot of good discussion, and he asked Douglas PUD about next steps. Kyger said he thinks the Aquatic SWG should take some time to think about what was discussed today, and during future meetings flush out these ideas and try to reach consensus on how to move forward. Ferguson asked if Douglas PUD would be ready to come to the next meeting with a proposal to move forward, or is more time needed. Lewis said, at a minimum, these discussions need to continue. He said it has been documented that

White Sturgeon delay Pacific Lamprey passage to some degree, and he thanked McLellan and Heironimus for proposing use of acoustic tags that can detect a predation event as a potential tool to provide context. Ferguson said a lot of ideas were shared today and summarized these as follows: 1) using a predation tag to assess whether predation by White Sturgeon in the Rocky Reach Reservoir is an issue; 2) continuing translocation alongside a multiyear PIT study; and 3) eDNA and bile acid sampling. He said he did not hear anyone indicate a desire to stop translocation. He suggested that Aquatic SWG members review the presentation titled *Summary of Douglas PUD Adult Lamprey Passage Studies 2007–2020* in preparation to further discuss next steps during the Aquatic SWG conference call on March 10, 2021.

Lampman asked about the location of the PIT arrays in the Wells Dam fish ladder. Kyger said there is an array in the lower fishway in Pool 19 and another above the count window toward the exit of the fish ladder in Pool 67. Lampman asked if there are other PIT arrays other than in the tributaries. Kyger said there are a lot of instream arrays in the lower Methow, Twisp, and Chewuch rivers and tributaries. He said he is not as familiar with the Okanogan River, but he knows the tributaries have instream arrays.

Lampman asked if there is still a possibility for the 2021–2022 Bull Trout Radio Telemetry Study to go for another year. Ferguson said this is to be determined pending the results of the study this year using the agreed upon sample size. Lampman said in this case it would be a low-cost option to keep the arrays in place and to conduct a radio telemetry study.

Lampman said, lastly, he had an action item to provide a summary table of translocation to date. He said he coordinated with Grant PUD, the CCT, and Douglas PUD, and distributed this table via email to the Aquatic SWG during today's conference call.

10. Pacific Lamprey Information Exchange Webinar (Ralph Lampman):

Ralph Lampman said the second Pacific Lamprey Information Exchange Webinar[2] included four discussions, mostly focused on the ecological function of lamprey. He said three discussions focused on the role of adult lamprey carcasses in streams, and one discussion focused on the role of isotopes. He said one discussion on Sea Lamprey reviewed redd construction, impacts on insects, and the role of carcasses. He said the discussion on isotopes suggested that stable isotopes from a carcass can have an impact on larval lamprey for up to 10 years. He said two discussions focused on carcass studies on the west coast. He said one compared differences and similarities between Pacific Lamprey and Pacific salmon, notably that Pacific salmon spawn in the fall and winter while Pacific Lamprey spawn in summer, and

[2] Pacific Lamprey Conservation Initiative's Lamprey Technical Workgroup 4th Annual Lamprey Information Exchange Monthly Webinar Series, which will convene on the second Tuesday of each month from January to June 2021.

what the resulting impacts are. He said another study used radio telemetry to monitor spawning fish and habitat use, most of which included pools and deposition areas, similar to salmon. He said that a lot of carcasses in riffle areas ended up outside the streams in riparian areas, likely picked up by scavengers, birds, racoons, or bears. He said another discussion focused on the impacts of Pacific Lamprey carcasses on juvenile salmon. He said the webinar ended with a 30-minute discussion and included a lot of good questions.

John Ferguson thanked Lampman for the update and recalled that these webinars will occur monthly through June 2021. Lampman said the next webinar will focus on the juvenile life stage and will include a lot of discussion on screw trap collection and monitoring.

VII. Administration

1. **Upcoming Meetings (John Ferguson):**
   The Aquatic SWG meeting on March 10, 2021, will be held by conference call.

   Other upcoming meetings include April 14 and May 12, 2021 (TBD).

List of Attachments

Attachment A List of Attendees
Attachment B *Summary of Douglas PUD Adult Lamprey Passage Studies 2007–2020*

Attachment A – Attendees

Name	Role	Organization
John Ferguson	Aquatic SWG Chairman	Anchor QEA, LLC
Kristi Geris	Administration/Technical Support	Anchor QEA, LLC
Andrew Gingerich	Aquatic SWG Technical Representative	Douglas PUD
Chas Kyger	Aquatic SWG Technical Alternate	Douglas PUD
Steve Lewis	Aquatic SWG Technical Representative	U.S. Fish and Wildlife Service
RD Nelle	Aquatic SWG Technical Support	U.S. Fish and Wildlife Service
Breean Zimmerman	Aquatic SWG Technical Representative	Washington State Department of Ecology
Patrick Verhey	Aquatic SWG Technical Representative	Washington Department of Fish and Wildlife
Laura Heironimus	Aquatic SWG Technical Alternate	Washington Department of Fish and Wildlife
Monica Blanchard*	Aquatic SWG Technical Support	Washington Department of Fish and Wildlife
Ralph Lampman	Aquatic SWG Technical Representative	Yakama Nation
Jason McLellan	Aquatic SWG Technical Representative	Colville Confederated Tribes

Notes:
* Joined conference call at the end of the *Pacific Lamprey – Past Studies, Translocation, and Study Plan Development* discussion.