FINAL

Conference Call Minutes

Aquatic Settlement Work Group

To: Aquatic SWG Parties Date: November 8, 2023

From: John Ferguson, Chair, Anchor QEA, LLC

Re: Final Minutes of the October 11, 2023, Aquatic SWG Conference Call

The Aquatic Settlement Work Group (SWG) met by conference call on Wednesday, October 11, 2023, from 10:00 a.m. to 12:00 p.m. Attendees are listed in Attachment A of these conference call minutes.

Summary of Action Items

1. Douglas PUD will populate the Microsoft Excel file titled "Upper Columbia Juvenile Lamprey Source Datasheet" with Pacific Lamprey count data for their respective locations identified in the "PUD table" tab (Item II-D). *(Note: Mariah Mayfield provided these data to Ralph Lampman following the Aquatic SWG conference call on October 11, 2023.)*
2. Washington State Department of Ecology (Ecology) will ask internally about possible causes for isolated exceedances of the 110% total dissolved gas (TDG) tailrace water quality standard during non-spill and low-flow conditions (Item II-F).
3. The Aquatic SWG meeting on November 8, 2023, will be held by conference call (Item III-A).

Summary of Decisions

1. There were no decision items approved during today's conference call.

Agreements

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

Review Items

1. A document titled *Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study* was distributed to the Aquatic SWG by Kristi Geris on September 16, 2023. Douglas PUD provided responses to this document, which were distributed on October 9, 2023 (Item II-D).
2. The draft *Statement of Agreement Regarding Evaluation and Implementation of White Sturgeon Adult Passage Measures (WSMP Objective 5; Section 4.4)* was distributed to the Aquatic SWG by Kristi Geris on October 9, 2023, and is available for review with edits and

comments due to Douglas PUD by November 3, 2023. Douglas PUD will request approval of the statement of agreement (SOA) during the Aquatic SWG conference call on November 8, 2023 (Item II-A).

Documents Finalized

1. The final Rocky Reach Fish Forum (RRFF) Pacific Lamprey Subgroup meeting notes and associated juvenile Pacific Lamprey survival studies documents were distributed to the Aquatic SWG by Kristi Geris on October 6, 2023 (Item II-D).

I. Welcome

A. Review Agenda (John Ferguson)

John Ferguson welcomed the Aquatic SWG members (Attachment A) and reviewed the agenda. Ferguson asked for any additions or changes to the agenda. No additions or changes were requested.

Stuart Fety introduced himself. He is new to U.S. Fish and Wildlife Service (USFWS) Division of Ecological Services in the Wenatchee, Washington office. *(Note: Fety will serve as RD Nelle's USFWS Aquatic SWG Technical Alternate. A representation designation letter is forthcoming.)*

B. Meeting Minutes Approval (John Ferguson)

The revised draft September 13, 2023, conference call minutes were reviewed. Kristi Geris said that all comments and revisions received from members of the Aquatic SWG were minor, and clarifying edits were incorporated into the revised minutes. Geris also updated distribution of action items under Summary of Action Items and corrected the meeting date under Item I-C, Review of Action Items. Lastly, there is one outstanding comment to address under Item II-C, Juvenile Pacific Lamprey Downstream Passage Study. Ralph Lampman confirmed the study in the Lower Columbia River planned for 2024 to 2025 includes McNary and John Day dams in 2024 and The Dalles and Bonneville dams in 2025. Geris noted that Ecology abstained via email prior to the conference call because a representative did not participate in the September 13, 2023, conference call. Patrick Verhey said that Washington Department of Fish and Wildlife (WDFW) will also abstain because he did not participate in the September 13, 2023, conference call. The other Aquatic SWG members present approved the September 13, 2023, conference call minutes, as revised.

C. Review of Action Items (John Ferguson)

Action items from the Aquatic SWG conference call on September 13, 2023, are as follows *(Note: The following italicized item numbers correspond to agenda items from the September 13, 2023, meeting)*:

1. *Douglas PUD will compile the past 5 to 10 years of data (whatever is available) for Pacific Lamprey collected at the rotary screw traps (RSTs) in the Methow and Okanogan rivers, including numbers collected and life stage (Item II-C).*
   Douglas PUD compiled these data, which were distributed to the Aquatic SWG by Kristi Geris on October 9, 2023. This will be further discussed during today's conference call.
2. *The Yakama Nation (YN) will distribute the document titled* Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study *that was shared on WebEx during today's conference call, and the Aquatic SWG will come prepared to discuss the questions within this document during next month's Aquatic SWG conference call on October 11, 2023 (Item II-C).*
   Ralph Lampman provided this document, which Geris distributed to the Aquatic SWG on September 16, 2023. Douglas PUD provided responses to this document, which were distributed on October 9, 2023. This will be further discussed during today's conference call.
3. *Douglas PUD will distribute a draft SOA for addressing Section 4.4 of the White Sturgeon Management Plan (WSMP), Evaluation and Implementation of Adult Passage Measures (Objective 5), including actions and a timeline for completion, for Aquatic SWG review and consideration (Item II-E).*
   This SOA was distributed to the Aquatic SWG by Geris on October 9, 2023. This will be further discussed during today's conference call.

II. Summary of Discussions

A. Draft Statement of Agreement Regarding Evaluation and Implementation of White Sturgeon Adult Passage Measures (WSMP Objective 5; Section 4.4) (Chas Kyger)

The draft *Statement of Agreement Regarding Evaluation and Implementation of White Sturgeon Adult Passage Measures (WSMP Objective 5; Section 4.4)* was distributed to the Aquatic SWG by Kristi Geris on October 9, 2023. Chas Kyger said that, as discussed in past meetings, this draft SOA sets up the framework for a long-term plan to address Objective 5 in the WSMP. The five main points discussed to date are included in the Statement, as shown in the following.

1) Perform an assessment of the biological benefits of providing upstream passage for White Sturgeon at Wells Dam.

2) Document the status of sturgeon passage measures and plans at downstream Mid-Columbia Dams.

3) Develop a draft literature review on adult White Sturgeon passage at hydro-electric and dam facilities prior to the end of 2024.

4) Review existing White Sturgeon PIT tag and interrogation data at Mid-Columbia PUD projects. Within fishway acoustic tag detections and video count data will also be included, where available. A draft technical memorandum summarizing these data will be completed by the end of 2024.

5) Collect and catalog DNA samples of White Sturgeon encountered in the Wells Project during M&E activities, with an emphasis on sampling fish released from the Wells Fish Hatchery during 2014-2023. These data will be used to determine the genetic diversity (e.g. allelic diversity) of the existing White Sturgeon population in the Wells Project. Genetic samples may be analyzed at the request and approval of the Aquatic SWG no sooner than 2025 and may include up 400 unique individuals in the Wells Project area. Results of this analysis will be used to assess the biological merit of fish passage in the context of connectivity with other White Sturgeon populations in the Columbia River. This step will be completed and approved following the review and approval of steps 1 & 2 above.

Jason McLellan said that he has a couple preliminary comments. First, it is not clear how No. 1 and No. 2 will be communicated. There is specific language for No. 4, but not for No. 1 and No. 2. Kyger said that this language was left vague so the Aquatic SWG can discuss and decide how to address these and what type of deliverables are needed. For example, he is unsure what information is available on status of passage measures, and maybe this entails contacting other PUDs or the U.S. Army Corps of Engineers (USACE). McLellan said that for No. 2, he would like to see an evaluation of sturgeon passage measures, extending beyond just White Sturgeon and Mid-Columbia River dams. He suggested including the Lower Columbia River and potentially the Snake River. He believes there may also be value in evaluating what entities are doing for other sturgeon species around the world. For example, passage at facilities in Europe may have application here. Kyger agreed that it would be relevant to consider other work and other dams, and Douglas PUD envisioned including this type of evaluation under No. 3, but perhaps this can be expanded into other areas. McLellan said that he understands how this could fit under No. 3. John Ferguson added that in the Sacramento area, passage facilities have been installed at flood control weirs, so there is more work to be mindful of.

McLellan asked, secondly, whether Douglas PUD can clarify their thinking around tissue sample collection under No. 5. While he thinks tissue sample collection is important, the way he reads No. 5 is that genetics are the primary benefit when considering biological merit, and he is not sure that this

is the case. There are other benefits in the broader Columbia River population. For example, habitat availability and quality and population productivity. Kyger said that this SOA specifically calls out genetics because this is called out in the WSMP, but the evaluation does not need to be limited to this. McLellan said that it seems the language in the SOA suggests this, so he needs to think about this more. He suggested identifying all of the biological benefits and cautioned not to focus on just one. Kyger suggested perhaps including these specifics under No. 1. McLellan agreed and reiterated that he appreciates the inclusion of genetic analysis; he thinks this is key, but it is not the only thing. There are different ways to measure genetic diversity.

Ferguson suggested that Aquatic SWG members submit edits and comments on the draft SOA to Douglas PUD by November 3, 2023, which gives Douglas PUD time to address comments, before requesting approval of the SOA during the Aquatic SWG conference call on November 8, 2023.

B. Brood Year 2023 Wells White Sturgeon Rearing Update (Chas Kyger)

A brood year (BY) 2023 White Sturgeon Rearing Update (Attachment B) was distributed to the Aquatic SWG by Kristi Geris prior to the conference call on October 11, 2023. Chas Kyger recalled reporting elevated mortality of BY 2023 White Sturgeon on station at Wells Fish Hatchery last month. This has since slowed down. Currently, there are 2,277 fish on station. The requirement for Douglas PUD's program is 325 fish. Jason McLellan reported last month that Chelan PUD's stocking target was reduced to 2,000 fish. Typically, when fish reach this size there are no more mortalities. Chas Kyger pointed out that with 2,277 fish currently on station, Chelan PUD's total program requirement may not be met this year. John Ferguson noted the large range in fish sizes. Kyger said that this has created a lot of work for hatchery staff who must continually grade fish to avoid larger fish injuring the smaller fish.

C. Adult Pacific Lamprey Trapping at Wells Dam (Mariah Mayfield)

Mariah Mayfield said that since the last meeting, there were a few more days of trapping, but no fish were collected. Therefore, total catch during the sampling was four fish. She recalled that August is the month with the most counts at Wells Dam; the trapping effort started at the tail end of the month, and counts decreased into September. As of today, total adult Pacific Lamprey passage at Wells Dam is 684 fish, which is lower than she expected considering counts at Bonneville Dam.[1]

John Ferguson recalled that last month Douglas PUD had a positive reaction overall about these traps as a workable option. Has this changed at all? Mayfield said that she still believes if Douglas PUD needs to collect adult Pacific Lamprey for a study, this can be accomplished in the Wells Dam fish ladders using the traps. She suggested installing smooth plating on the floor of the ladder

[1] According to the Columbia River Data Access in Real Time database, as of October 11, 2023, total adult Pacific Lamprey passage at Bonneville Dam was 63,923 fish.

downstream of each weir orifice to affect attachment and encourage fish to pass over the top of the weir and enter the traps. She also caveated that fish collection is dependent on high run numbers at Wells Dam. Mayfield said that the plating would be installed over the winter maintenance period and would be in place all season. John Rohrback clarified that this plating would not block or close the orifice; rather, it is installed below the orifice to deter Pacific Lamprey from attaching and passing through the orifice. Ferguson said that this is a good clarification, because he was thinking about Wells Habitat Conservation Plan Coordinating Committee concerns about blocking a passage route. Mayfield agreed with this clarification and said that this plating has been reviewed, approved, and used before.

Ralph Lampman recalled that for the 2022 Adult Pacific Lamprey Approach and Passage Study,[2] Douglas PUD planned to monitor these study fish into spring 2023, and he asked when the Aquatic SWG can expect a report. Kyger said that he just received the last of the acoustic data last week, which he sent to Dave Robichaud (LGL Limited) to process. Kyger hopes to have a final report by the end of this year. Lampman asked whether it is too late to start planning a study for implementation in 2024. Rohrback said that the latest SOA[3] stipulates translocation from 2023 to 2024, and at the Aquatic SWG's discretion, begin planning in 2024 or early 2025 for a study to begin in 2025.

D. Juvenile Pacific Lamprey Downstream Passage Study (Ralph Lampman)

John Ferguson said that the final RRFF Pacific Lamprey Subgroup meeting notes and associated juvenile Pacific Lamprey survival studies documents were distributed to the Aquatic SWG by Kristi Geris on October 6, 2023, including redistribution of the YN's document titled *Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study* (originally distributed on September 16, 2023.). Then, per an action item, Douglas PUD provided a document titled *Summary of Juvenile Pacific Lamprey Trapped in Methow and Okanogan Basins* and also provided responses to the YN's framework document, which were both distributed to the Aquatic SWG by Geris on October 9, 2023. Ferguson suggested that the YN share the survival study documents and then Douglas PUD review their documents.

[2] Study plan titled *Wells Dam 2022 Adult Lamprey Approach and Passage Study*, approved by the Aquatic SWG on March 9, 2022, and distributed that same day

[3] SOA titled *To Translocate Adult Pacific Lamprey from Priest Rapids Dam to Areas Within or Upstream of the Wells Project 2023–2024*, approved by the Aquatic SWG on June 14, 2023, and distributed on June 15, 2023

Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study

Ralph Lampman shared on WebEx the YN's document titled *Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study*. He said that this has not changed since he discussed it last month.[4]

Upper Columbia Juvenile Lamprey Source Datasheet

Lampman shared on WebEx the Microsoft Excel file titled "Upper Columbia Juvenile Lamprey Source Datasheet." He said this has not yet been shared with the Aquatic SWG and includes supporting data for the framework document. He said the "Survival" and "SE C.I." tabs show estimated survival calculations, travels times, and tag life per proposed release location. The "Key Questions" tab identifies dates to start discussing key questions within the individual forums (excerpt copied below).

#	Key Questions	Due Date
1	What is the (primary) Project Scope?	11/1/2023
2	What survival model is best to use?	11/1/2023
3	What is the acceptable precision level?	11/1/2023
4	What source of lamprey to use?	12/6/2023

Question No. 4 requires compiling data before discussion, which is why the due date is later. This leads to the "PUD table" tab, which lists potential study fish source locations by responsible party, including RSTs, dams, and monitoring and hatchery facilities. To address Question No. 4, Lampman is asking that each responsible party (i.e., Douglas PUD, Chelan PUD, Grant PUD, and the YN) populate the "PUD table" tab with Pacific Lamprey count data for their respective locations, including the mean, min, and max for all years, the last 3 years, and 2023 only, for the ratio of juveniles versus larvae, juvenile counts only, and fish lengths.

Mariah Mayfield said that Dave Grundy (WDFW) indicated that he has not yet completed quality assurance/quality control of the Methow data, but he will send this to both her and Lampman once it is available. She is unsure whether the data will be ready by the November 1 or December 6 due dates. Lampman said that any data would be helpful, and Mayfield said that Grundy has provided all other data except this year. Lampman asked whether Mayfield can populate the "PUD table" tab through 2022, and she said that she can do this. *(Note: Mayfield provided these data to Lampman following the Aquatic SWG conference call on October 11, 2023.)*

[4] Attachment C to the Aquatic SWG September 13, 2023, conference call minutes.

Final RRFF Pacific Lamprey Subgroup Meeting Notes

Lampman shared on WebEx the final RRFF Pacific Lamprey Subgroup meeting notes. RRFF members provided edits and comments on the draft notes, which were discussed and incorporated into the final notes. A key part of this review was updating the model assumptions based on discussions at the subgroup meeting. These model assumptions are summarized in a document titled *Dam Passage Survival Models and Their Assumptions*, which is Attachment 3 to the final RRFF Pacific Lamprey Subgroup meeting notes. The RRFF agreed it was best not to edit Attachment 3, because this version is what was distributed for discussion during the meeting. Rather, edits and comments were added to the source file.

2023_10_06 BioAnalysts - Survival Study Assumptions (10-04-23)

Lampman shared on WebEx the file titled, "2023_10_06 BioAnalysts - Survival Study Assumptions (10-04-23)." He said this is the *Dam Passage Survival Models and Their Assumptions* source file where edits and comments were added based on the discussions at the subgroup meeting. This is currently out for RRFF review.

Ferguson asked whether the RRFF had settled on a model. Lampman said that the YN prefers the Virtual Release/Dead-Fish Correction (ViRDCt) Model, but the RRFF has not yet voted on a preferred model.

Summary of Juvenile Pacific Lamprey Trapped in Methow and Okanogan Basins

Mayfield asked Geris to share on Webex the document titled *Summary of Juvenile Pacific Lamprey Trapped in Methow and Okanogan Basins* (Attachment C).

Mayfield said that in the Methow Basin, the Lower Methow River RST has the highest catch rate for both larval and juvenile Pacific Lamprey, but this is highly variable year-to-year (Table 1 of Attachment C). Dave Grundy indicated that most fish come through within 3 days, and it is overwhelming the crew to have to handle so many fish. His crew does the best they can to separate larvae from juveniles, keeping in mind the priority is salmonid brood collection. The Twisp River RST has never collected juvenile Pacific Lamprey (Table 2 of Attachment C). The Upper Methow and Chewuch River RSTs are primarily operated during the fall but are occasionally operated in the spring. During spring, there are issues with high river flow at both traps, but some juvenile Pacific Lamprey have been collected in the Chewuch River RST (Table 3 of Attachment C). Mayfield noted that Douglas PUD has some concerns about whether fish coming down from the Chewuch River were just washed downstream or were actually starting their downstream migration and whether these fish would be the same as fish collected farther downstream. She recalled a comment by Lampman about some juvenile Pacific Lamprey waiting before migrating downstream. Lampman said that yes, sometimes juveniles wait for about 1 year before migrating downstream.

Lampman noted the big surges of fish in Table 1. Mayfield said that because of this, Grundy is considering switching to estimating larvae counts but continuing to count individual juveniles. Lampman also said that the variability in ratios of larvae to juveniles per year is interesting.

Mayfield said that in the Okanogan Basin, the Confederated Tribes of the Colville Reservation (CTCR) operate a RST in the mainstem Okanogan River, but operating the trap is difficult due to the flow characteristics of the river. The CTCR also operate an RST in Omak Creek. No juveniles have been collected at either location (Tables 4 and 5 of Attachment C). The CTCR have observed more larval Pacific Lamprey in recent years, so there may be more downstream migrants in future years.

DCPUD Response to "Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study" (R. Lampman, YN Fisheries, 9/16/2023)
Geris shared on Webex the document titled *DCPUD Response to "Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study" (R. Lampman, YN Fisheries, 9/16/2023)* (Attachment D). Mayfield first commended Lampman for developing this framework and coordinating these discussions among the different forums. She recognized the time and effort Lampman has put into this. Mayfield then reviewed the Overall Comments and each individual comment outlined in Attachment D. Additional discussions are in the following paragraphs.

Regarding the individual comment on Page 3, Table 2, Lampman first clarified that the migration rate for the Umatilla River example is not accurate because most fish migrate immediately, but the bypass system at John Day Dam is not operational until March. Therefore, this migration rate only includes those detected. In the Yakima and Snake rivers, acoustic telemetry studies indicate that most fish migrate 40 kilometers per day. Mayfield said that this information was based on the cited memorandum. Lampman said that secondly, the dead fish releases may be complicated, but are still doable. He suggested planning for extra fish to account for this, which he did include in his framework.

Regarding the individual comment on Page 6, Figure 1, Lampman asked whether there might be potential locations in the Wells Dam bypass to install a juvenile trap. Mayfield said that at Wells Dam, fish pass via spillways. Chas Kyger further explained that bypass barriers are installed to guide fish to a spillway. Mayfield said that installing a juvenile trap in the spillway would not work due to the high water velocities. She said that a trap designed for low-flow conditions and installed upstream of Wells Dam might work. Ferguson asked where migrating juvenile Pacific Lamprey are located vertically in the water column in reservoirs. Lampman said that this depends on the time of day. Juveniles tend to migrate deeper in the water column during the day and closer to the surface during the night.

Regarding the individual comment on Page 8, Lampman suggested not basing decisions on the Haas et al. study (2023). The low tag retention was due to tagger effects. Since this study, the YN has provided tagging protocol guidance to these researchers.

Regarding sources of study fish, Lampman said that the main difference between salmon and lamprey is that lamprey are not adapted to a specific tributary. In this sense, there is no difference whether study fish come from the Upper Columbia River or somewhere else. He asked whether Douglas PUD's Pacific Lamprey Management Plan specifically says study fish must come from upstream of Wells Dam. Mayfield said that it says, "in or upstream of the project."

Lastly, Lampman said that the ViRDCt model might not be the best option for a reservoir study, but as long as there is another release location farther upstream, he thinks the ViRDCt Model will still work with a relatively low sample size and achieve the required precision levels.

Discussion

Mayfield said that Douglas PUD still feels further discussion is needed about what a statistically valid survival study entails and how to measure significant negative impact. There are still a lot of logistical issues to work out, primarily fish source. In the next 5 years, perhaps there will be more juveniles coming down from the Methow River, and the Aquatic SWG can reassess conducting a juvenile Pacific Lamprey study at that time.

Ferguson suggested that the Aquatic SWG review these documents and continue this discussion next month. The YN is interested in coordinating a joint PUD study with the upcoming USACE study as soon as 2024; however, it seems Douglas PUD is not ready for a study this soon. Ferguson asked about the path forward in the other forums. Lampman said that the RRFF mentioned that it is too late to conduct a study in 2024, and the earliest would be 2025. Ferguson asked when the Harnish et al. study results from 2023 might be available. Lampman said that Harnish plans to present preliminary results at the USACE Anadromous Fish Evaluation Program in early December 2023. The final report will be ready in spring 2024.

E. Juvenile and Adult Pacific Lamprey Literature Reviews and Document Libraries (John Rohrback)

John Rohrback said that this year Douglas PUD added four documents to the Pacific Lamprey literature review libraries, as described in the following paragraphs:

In the adult library, the publication "More Flow in a Regulated River Correlates with More and Earlier Adult Lamprey Passage, but Peak Passage Occurs at Annual Low Flows" by Clemens et al. (2023)[5] was

[5] Clemens, B.J., J.D. Romer, J.S. Ziller, and M. Jones, (2023). "More Flow in a Regulated River Correlates with More and Earlier Adult Lamprey Passage, but Peak Passage Occurs at Annual Low Flows." *Ecology of Freshwater Fish* 00:1–12.

conducted at Leaburg Dam on the McKenzie River in Oregon, where they examined flow and temperature effects.

In the juvenile library, the publication "Salvage Using Electrofishing Methods Caused Minimal Mortality of Burrowed and Emerged Larval Lampreys in Dewatered Habitats" by Harris et al. (2023)[6] looked at whether electrofishing could be used for salvage without causing harm to larval lampreys. The result was, yes, this can be done.

In the juvenile library, the publication "Survival, Healing, and Swim Performance of Juvenile Migratory Sea Lamprey (*Petromyzon marinus*) Implanted with a New Acoustic Microtransmitter Designed for Small Eel-Like Fishes" by Haas et al. (2023)[7] is a good publication while considering juvenile lamprey studies. Rohrback applauded the YN for providing guidance on how to properly tag lamprey. John Ferguson asked whether adult Sea Lamprey and adult Pacific Lamprey are similar size. Ralph Lampman said that, on average, Sea Lamprey are slightly larger. Ferguson asked about juveniles. Lampman said that he is unsure about juvenile Sea Lamprey, but juvenile Western Brook Lamprey are typically larger than juvenile Pacific Lamprey, and it is typically the inverse for adults.

In the juvenile library, the publication "Upper Temperature Limit of Larval Pacific Lamprey *Entosphenus tridentatus*: Implications for Conservation in a Warming Climate" by Whitesel and Uh (2023)[8] found that the ultimate upper lethal temperature for larval Pacific Lamprey was 29.2°C. Rohrback said that it seems larval Pacific Lamprey have a greater temperature tolerance than salmonids. Lampman said definitely, but frequently it is 4°C to 5°C cooler in the substrate habitat, so this helps. Ferguson asked about the study setting. Rohrback said that study fish were collected in Cedar Creek and moved to a laboratory setting.

Rohrback asked that Aquatic SWG members send publications to Mariah Mayfield or Kristi Geris to be uploaded to the libraries. Lampman thanked Rohrback for the update and summary, which he believes is valuable to everyone.

F. Water Quality Update (Mariah Mayfield)

The presentation, *2023 Wells Project Water Quality* (Attachment D), was distributed to the Aquatic SWG by Kristi Geris prior to the conference call on October 11, 2023.

[6] Harris, J.E., T.L. Liedtke, J. Skalicky, L.K. and Weiland. (2023), "Salvage Using Electrofishing Methods Caused Minimal Mortality of Burrowed and Emerged Larval Lampreys in Dewatered Habitats." *North American Journal of Fisheries Management* 00:1–14.

[7] Haas, T.F., T. Castro-Santos, S.M. Miehls, Z.D. Deng, Z.D., T.M. Bruning, and C.M. Wagner, (2023). "Survival, Healing, And Swim Performance of Juvenile Migratory Sea Lamprey (*Petromyzon marinus*) Implanted with a New Acoustic Microtransmitter Designed for Small Eel-Like Fishes." *Animal Biotelemetry* 11:9.

[8] Whitsel, T.A., and C.T. Uh, (2023). "Upper Temperature Limit of Larval Pacific Lamprey *Entosphenus tridentatus:* Implications for Conservation in a Warming Climate." *Environmental Biology of Fish* 106:837–852.

Mariah Mayfield said that this year was a fairly uneventful water year. The primary runoff for the Wells Project dropped quickly after the peak and never reached the 7-day, 10-year-frequency (7Q10) flood flow of 246,000 cubic feet per second (Slide 3). With these low flows, TDG is less of a concern, but water temperature becomes more of an issue. There was a period where the 7-day average daily maximum temperatures at Bridgeport, Methow, Okanogan, and Wells Dam were above 17.5°C, and there are still two locations exceeding 17.5°C (Slide 2). From April 1 to June 30, there is a TDG standard that the average of any 2 consecutive hours cannot exceed 126% TDG in the Wells Dam tailrace. There were two instances where the 2-hour mean exceeded 126%, but this still resulted in over 99% compliance for this metric (Slide 4). No signs of gas bubble trauma were observed in fish examined during this time. From April 1 to June 30, there is another TDG standard that the average of the 12 highest values within a single day cannot exceed 125% TDG in the Wells Dam tailrace, the measurements for which stayed well below this standard (Slide 5). From July 1 to August 31, the average of the two highest hourly readings within a single day cannot exceed 125% TDG in the Wells Dam tailrace. This year, with low levels of spill, this standard was easily met (Slide 6). From July 1 to August 31, the average of the 12 highest values within a single day cannot exceed 120% TDG in Wells Dam tailrace. This standard was also easily met (Slide 7). From July 1 to August 31, the average of the 12 highest values within a single day cannot exceed 115% TDG in the Rocky Reach forebay, which can be challenging with higher flows. This year, measurements stayed below this standard (Slide 8).

Mayfield said that during the non-spill season (September 1 to March 31), any hourly reading must stay below 110% TDG in the Wells Dam tailrace. This standard was met, except in mid-September, where there were three hourly measurements which exceeded the 110% threshold (Slide 9). There was no spill and low flow in the tailrace, and it is unclear what caused the exceedances. Mayfield guessed that the low flows and higher water temperatures might have caused changes in the respiration of aquatic vegetation in the tailrace resulting in off-gassing. Breean Zimmerman asked how far apart the readings were taken. Mayfield said that they were taken same day, all in a row. A calibration specialist also checked the equipment the next day and verified that it was operating correctly. John Ferguson asked what day this occurred and whether it was hot outside. Mayfield said that this occurred on the last Aquatic SWG meeting (September 13, 2023), and it was not hot outside. Her guess about off-gassing was because, while conducting eDNA sampling, she observed a lot of bubbles on the rocks, which is not typical. The next day, the exceedances occurred. Zimmerman said that she will ask internally about possible causes for isolated exceedances of the 110% TDG tailrace water quality standard during non-spill and low-flow conditions.

Mayfield said that the Wells Project consistently receives water from Chief Joseph Dam that is already above 110% TDG. To date, this has occurred 15% of the time, often times during high river flows (Slide 10). There is some leeway in the spill requirements, but even from September to October, the

Wells Dam forebay is receiving water above 107% TDG, so care needs to be taken to stay below 110% TDG in the tailrace.

Zimmerman thanked Mayfield for the presentation and asked whether Douglas PUD uses the revised TDG numbers provided to project operators during summer spill. Mayfield said yes. She added that Douglas PUD is currently drafting the 10-Year Water Quality Attainment Plan Report, which will include the last 10 years of TDG patterns in the Wells Project. Zimmerman encouraged Douglas PUD to contact her while drafting the report to chat or ask questions, which can help towards review of the report.

Jason McLellan said that the reason for the higher river flow from Lake Roosevelt during the late summer and early fall is for multiple downstream uses. Ferguson asked whether another reason is for Chum Salmon spawning near Bonneville Dam. McLellan said that he believes that comes later. He is referring to the 12-foot drawdown starting in August into September, resulting in higher river flow.

III. Administration

A. Upcoming Meetings (John Ferguson)

The Aquatic SWG meeting on November 8, 2023, will be held by conference call.

Other upcoming meetings include December 13, 2023, and January 10, 2024 (conference call).

List of Attachments

Attachment A	List of Attendees
Attachment B	BY 2023 White Sturgeon Rearing Update
Attachment C	Summary of Juvenile Pacific Lamprey Trapped in Methow and Okanogan Basins
Attachment D	DCPUD Response to "Framework and Implementation Plan for the Upper Columbia Juvenile Pacific Lamprey Passage Acoustic Telemetry Study" (R. Lampman, YN Fisheries, 9/16/2023)
Attachment E	2023 Wells Project Water Quality

Attachment A – Attendees

Name	Role	Organization
John Ferguson	Aquatic SWG Chairman	Anchor QEA, LLC
Kristi Geris	Administration/Technical Support	Anchor QEA, LLC
Chas Kyger	Aquatic SWG Technical Alternate	Douglas PUD
John Rohrback	Aquatic SWG Technical Support	Douglas PUD
Mariah Mayfield	Aquatic SWG Technical Support	Douglas PUD
RD Nelle	Aquatic SWG Technical Representative	U.S. Fish and Wildlife Service
Stuart Fety	Aquatic SWG Technical Support	U.S. Fish and Wildlife Service
Patrick Verhey	Aquatic SWG Technical Representative	Washington Department of Fish and Wildlife
Breean Zimmerman*	Aquatic SWG Technical Representative	Washington State Department of Ecology
Ralph Lampman	Aquatic SWG Technical Representative	Yakama Nation
Jason McLellan	Aquatic SWG Technical Representative	Confederated Tribes of the Colville Reservation

Notes:
* Joined the meeting before Item II-D.