



Conference Call Minutes

Aquatic Settlement Work Group

To: Aquatic SWG Parties

Date: September 5, 2018

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

Re: Revised Minutes of the August 8, 2018 Aquatic SWG Conference Call

The Aquatic Settlement Work Group (SWG) met by conference call on Wednesday, August 8, 2018, from 10:00 a.m. to 12:15 p.m. Attendees are listed in Attachment A of these conference call minutes.

I. Summary of Action Items

1. Paul Wagner (Colville Confederated Tribes [CCT]) will provide the CCT 2018 Pacific Lamprey Translocation Workplan to Kristi Geris for distribution to the Aquatic SWG prior to the Aquatic SWG meeting on September 12, 2018 (Item VI-4). *(Note: Wagner provided this plan to Geris on August 20, 2018, which Geris distributed to the Aquatic SWG that same day.)*
2. John Ferguson will contact Tracy Hillman (Priest Rapids Fish Forum [PRFF] and Rocky Reach Fish Forum [RRFF] Facilitator) regarding obtainment of a copy of Damon Goodman's (U.S. Fish and Wildlife Service [USFWS]; Arcata, California) presentation on "Lamprey Passage Alternatives," which Goodman shared during the joint PRFF, RRFF, and Aquatic SWG meeting on August 1, 2018 (Item VI-5). *(Note: Ferguson contacted Hillman, who indicated Goodman prefers his presentation materials are not distributed.)*
3. Ralph Lampman, in coordination with Kellie Carim (U.S. Forest Service [USFS]), will develop a proposal for environmental DNA (eDNA) sampling during the Douglas PUD 2018 Pacific Lamprey translocation effort, for discussion during the Aquatic SWG meeting on September 12, 2018 (Item VI-9). *(Note: Lampman provided a proposal to Kristi Geris on September 5, 2018, which Geris distributed to the Aquatic SWG on September 6, 2018.)*
4. Andrew Gingerich will provide the eDNA sampling locations for the Douglas PUD monthly sampling efforts in the Okanogan River and Wells reservoir to Kristi Geris for distribution to the Aquatic SWG (Item VI-9). *(Note: Chas Kyger provided these locations to Geris on September 4, 2018, which Geris distributed to the Aquatic SWG that same day.)*
5. Douglas PUD will provide updates on the specifications for the diffuser grating spacing in the Wells Dam collection gallery and whether there are plans to modify any grating spacings that are out of criteria (Item VI-10).

6. The Aquatic SWG meeting on September 12, 2018, will be held by **conference call** (Item VII-1).

II. Summary of Decisions

1. Aquatic SWG members present approved the report *Adult Lamprey Approach and Passage Study, Wells Dam, 2016-17*, as revised (Item VI-2).

III. Agreements

1. Aquatic SWG members present agreed that the 25% (or up to 250) Pacific Lamprey planned for release at the mouth of the Okanogan River during the Douglas PUD 2018 Pacific Lamprey translocation effort may be transferred to the CCT to translocate farther upstream in tributaries of the Okanogan River under the CCT 2018 Pacific Lamprey translocation effort (Item VI-4).

IV. Review Items

1. There are no items that are currently available for review.

V. Documents Finalized

1. The final report, *Adult Lamprey Approach and Passage Study, Wells Dam, 2016-17*, was distributed to the Aquatic SWG by Kristi Geris on September 12, 2018 (Item VI-2).

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 are listed in Attachment A) and reviewed the agenda. Ferguson asked for any additions or changes to the agenda. The following revisions were requested:

- Patrick Verhey requested updates on the specifications for the diffuser grating spacing in the Wells Dam collection gallery and whether there are plans to modify any grating spacings that are out of criteria.
- Jason McLellan added an overview from Paul Wagner on the CCT Pacific Lamprey translocation efforts in the Okanogan River.

The revised draft July 11, 2018 conference call minutes were reviewed. Kristi Geris said Ralph Lampman provided the Yakama Nation (YN) edits and comments to the minutes before the conference call on August 8, 2018, and these edits have not yet been incorporated into the

revised minutes for approval. The Aquatic SWG reviewed Lampman's edits. Geris noted that the edits are largely clarifying edits. Lampman agreed and said his edits were not substantive. Andrew Gingerich agreed with Lampman's correction to his statement about Grant PUD plans to trap for 3 weeks (not 2 weeks). Gingerich further clarified that Grant PUD plans to trap for 15 days. Geris said all other comments and revisions received from members of the Aquatic SWG were incorporated into the revised minutes. Aquatic SWG members present approved the July 11, 2018 conference call minutes, as revised.

Action items from the Aquatic SWG conference call on July 11, 2018, are as follows (note: the following italicized item numbers correspond to agenda items from the July 11, 2018 conference call):

- *Aquatic SWG members will review the revised draft report, Adult Lamprey Approach and Passage Study, Wells Dam, 2016-17, and be prepared for Douglas PUD to request approval of this revised report during the Aquatic SWG meeting on August 8, 2018 (Item VI-1).*

This will be discussed during today's conference call.

- *Douglas PUD will communicate to Grant PUD the Aquatic SWG request to obtain a portion of Pacific Lamprey from the earlier portion of the 2018 migration being collected by Grant PUD at Priest Rapids Dam for translocation by Douglas PUD to locations upstream of Wells Dam (Item VI-2).*

As reported by Chas Kyger via email on July 12, 2018, Douglas PUD contacted Grant PUD as discussed during the Aquatic SWG meeting on July 11, 2018, and Grant PUD agreed to allocate a portion of the fish Grant PUD collects to be translocated upstream of Wells Dam if the PRFF approves of this request and if the run size is large enough for Grant PUD to meet their translocation program needs.

- *A Wells White Sturgeon Collection Update will be discussed during the Aquatic SWG meeting on August 8, 2018 (Item VI-3).*

This will be discussed during today's conference call.

- *Ralph Lampman will provide John Ferguson and Kristi Geris with the contact information for Sang-Seon Yun (Big River Scientific, LLC) to schedule a brief presentation on bioassay sampling to monitor Pacific Lamprey pheromone levels during the Aquatic SWG meeting on September 12, 2018 (Item VI-5).*

Lampman provided contact information for Yun, who is scheduled to present during the Aquatic SWG meeting on September 12, 2018.

- *The Aquatic SWG will continue discussing bioassay sampling, to monitor Pacific Lamprey pheromone levels over time as translocation efforts are implemented, during the Aquatic SWG meeting on August 8, 2018 (Item VI-5).*

This will be discussed during today's conference call.

- *Ralph Lampman will contact Kellie Carim (USFS) to request a brief presentation and discussion of eDNA sampling to monitor Pacific Lamprey presence during the Aquatic SWG meeting on August 8, 2018 (Item VI-5).*

This will be discussed during today's conference call.

2. DECISION: *Adult Lamprey Approach and Passage Study, Wells Dam, 2016-17* (Andrew Gingerich):

Andrew Gingerich said this report has been available for review for a while (the first draft report was distributed on April 9, 2018). Gingerich said comments have been received from Washington Department of Fish and Wildlife (WDFW), the CCT, USFWS, and the YN. He said the comments have been addressed and edits incorporated into the revised draft report, *Adult Lamprey Approach and Passage Study, Wells Dam, 2016-17*, that was distributed to the Aquatic SWG by Kristi Geris on June 14, 2018. Gingerich said at this time, Douglas PUD would like to request approval of the report.

Aquatic SWG members present approved the report, *Adult Lamprey Approach and Passage Study, Wells Dam, 2016-17*, as revised. The final report was distributed to the Aquatic SWG by Kristi Geris on September 12, 2018.

3. Pacific Lamprey Translocation Logistics Update (Andrew Gingerich):

Andrew Gingerich said Grant PUD began trapping on July 30, 2018, and transported fish upstream of Rock Island Dam at Kirby Billingsley Hydro Park. Gingerich said Douglas PUD elected to not translocate these fish farther upstream above Wells Dam; rather, Douglas PUD will begin translocating the earlier part of the run this week. He said numbers are just starting to increase; beginning on August 1, 2018, a total of 118 Pacific Lamprey were counted at Priest Rapids Dam and over the last 2 days the counts were 312 and 321 fish. He said Grant PUD captured about 50 fish on August 6, 2018, and he expects the same for August 7, 2018; however, he has not yet reviewed that report, which he expects to receive today. He said Douglas PUD plans to meet with Grant PUD staff this week to determine if Douglas PUD will conduct translocation this week.

Gingerich recalled that if Douglas PUD transports this week, fish would be collected from Grant PUD at Kirby Billingsley Hydro Park, taken to Wells Fish Hatchery for tagging, and released upstream of Wells Dam. He said Grant PUD is conducting 3 weeks, or 15 days, of trapping. He said following this will be when Douglas PUD-funded trapping will occur at Priest Rapids Dam. He said this is Grant PUD's second week of trapping; therefore, the evening of August 16, 2018, and day of August 17, 2018, will be Grant PUD's last trapping day. He said August 20 to 24, 2018, and August 27 to 31, 2018, is tentatively when Douglas PUD will conduct trapping. He said trapping may go into the first week of

September 2018. He recalled Douglas PUD is targeting up to 1,000 fish and this early effort of translocating Grant PUD mitigation fish is per an Aquatic SWG request to translocate a composition of fish that includes the early part of the run. He said Ralph Lampman may have a plan for Priest Rapids Dam trapping next week.

Lampman asked for clarification about the 321 Pacific Lamprey Gingerich mentioned. Gingerich clarified that 321 fish was the total fishway count at Priest Rapids Dam on August 7, 2018. He said Grant PUD is not trapping every single fish moving through the fish ladders. He said on August 1, 2018, the total count was 118 fish; therefore, the migration is on the ascending limb at Priest Rapids Dam.

Lampman said the YN are proposing a joint effort, depending on availability of fish, where they would tag about 200 Grant PUD fish and release them at a site above Rock Island Dam and a site above Rocky Reach Dam. He said this will provide data on the behavior of fish in these reaches, and the effort complements what Douglas PUD is doing upstream of Wells Dam. Lampman asked whether Douglas PUD plans to pick up fish next week. Gingerich suggested monitoring counts this week and early next week and then deciding on when to initiate translocation efforts. He added that he does not believe the YN taking 200 fish next week will hinder anyone's translocation efforts.

Lampman asked whether the 75% upstream of Wells Dam and 25% below the Okanogan River confluence split will be targeted for each release, or whether the first part of the run will be released at the lower location and the second part of the run in the upper location. Gingerich said ultimately, the goal is to have a mix among all of the releases that results in the 75:25 distribution at the end of the season. He said he cannot say for certain what the proportional split of each release is, because those details are guided by logistics and timing. He said he is also not suggesting all fish from one batch will go to the Methow River and the second batch will go to the Okanogan River. Gingerich said Douglas PUD's intention is to tag and assign release location to each fish, so that in the end it can be discerned where each fish was released for use in analysis later.

4. CCT Pacific Lamprey Translocation in the Okanogan River (Paul Wagner):

Paul Wagner said Pacific Lamprey abundance has been declining in the Okanogan River. He said the last time a Pacific Lamprey was sampled in the Okanogan River was in April 2010, and it was a single juvenile captured in a screw trap. Therefore, Pacific Lamprey may be extirpated from the subbasin. Wagner said in 2017, the YN contacted the CCT and asked if the CCT would join the YN in translocating the adults collected at Priest Rapids Dam (through Grant PUD trapping efforts) into the Upper Columbia River upstream of Wells Dam (including the Okanogan River Subbasin). He said a total of 49 passive integrated transponder (PIT)-

tagged Pacific Lamprey were released in the Similkameen River and 120 Pacific Lamprey were released in the mainstem Columbia River between the Methow River and the mouth of the Okanogan River. Wagner said the CCT would like to continue this effort of reestablishing Pacific Lamprey in the Okanogan River. He said subsequent to this release, the CCT drafted a translocation plan for implementation in 2018, where the CCT would like to PIT-tag and release a maximum of 400 Pacific Lamprey each year. He said the biggest limiting factor is the extremely warm mainstem temperatures in the Okanogan River; therefore, the translocation plan calls for releasing fish in tributaries of the Okanogan River to increase survival and initiate olfactory cues in the system. He said these are steelhead-bearing streams and the release locations include the Similkameen River and Omak, Loup Loup, Salmon, and Antwan creeks. He said the CCT have been conducting a long-term monitoring program called the "OBMEP" (Okanogan Basin Monitoring and Evaluation Program), so data are available to understand what is going on in the basin. He said there are PIT arrays in the smaller tributaries, so the CCT can track movement of adults leaving the system. He said the CCT hope to obtain fish, as available, from mainstem hydropower projects. He said the CCT are currently coordinating with WDFW to obtain a transport permit.

Wagner further clarified that ammocoetes need to remain in freshwater for 7 to 9 years and survival in the Okanogan River is not good due to the temperatures, which is why the proposal is to release in the tributaries—for better juvenile survival.

John Ferguson asked whether in 2017, with the releases in the Similkameen River and mainstem Columbia River, the fish moved upstream. Wagner said there were also 136 Pacific Lamprey released at the Starr Boat Launch upstream of Wells Dam and downstream from the mouth of the Okanogan River. He said no fish were detected upstream at Gebbers Landing in the Okanogan River. He said almost all detected fish turned around and were detected up the Methow River. He said additionally on June 3, 2018, one Pacific Lamprey from the Starr Boat Launch release was detected on a PIT array at river mile 15.5 in the Okanogan River. He said the YN have been translocating Pacific Lamprey upstream of Wells Dam since 2015, and the single detection in June 2018 is the only detection of Pacific Lamprey in the Okanogan River. He said the CCT are hoping to further increase pheromones upstream.

Ferguson asked whether the CCT have contacted Douglas PUD, Grant PUD, and Chelan PUD. Wagner said he contacted Douglas PUD as of today. He said the translocation plan was just finished today, and was sent to WDFW, the YN, and USFWS. He said Lampman suggested he present this information to the Aquatic SWG.

Andrew Gingerich recalled that Douglas PUD reported on the fish released at Starr Boat Launch and the Okanogan River confluence, as reflected in the meeting minutes

(Aquatic SWG meeting on September 13, 2017). Gingerich recalled that Douglas PUD and the Aquatic SWG had not yet had a Statement of Agreement in place, but Douglas PUD, the YN, and the CCT participated in tagging and translocating fish for the Starr Boat Launch release, and the CCT translocated fish farther upstream. He said he did not know a fish was detected in the Okanogan River, which he found interesting. He said those fish being detected in the Methow and Chewuch rivers is consistent with what has been observed in the past. He said the Chewuch River seems to be a point of interest for Pacific Lamprey.

Lampman said there was also one fish from a Methow River release that was detected moving up the Okanogan River. Wagner asked what year, and Lampman said he would need to review the report but he believes it was from the release in 2017. Lampman said it may also have been a Wenatchee River release. Wagner said he does not have a record of this, and Lampman said some PIT-tag data were submitted late, which could explain why this did not appear earlier. *(Note: following the conference call on August 8, 2018, Lampman provided the YN report, Translocation of Adult Pacific Lamprey within the Methow Subbasin, 2015-2016 Broodstock, which describes the one adult Pacific Lamprey from the Methow River release that was subsequently detected in the Okanogan River; PIT ID 3D9.1C2C98B3A2.)*

Lampman said the YN are supportive of this translocation plan. He said that during initial years of translocation a lot of adults will turn around, but if translocation efforts continue for a few years pheromones will become established and fish will start moving upstream. He said this is the required process. He said before 2010, there were 20 to 50 fish in the screw trap and then it dropped to 1 and 0. He said Pacific Lamprey are using steelhead strongholds in the Yakima River Subbasin, as well. He suggested translocating Pacific Lamprey to spawning areas and tributaries. He said where these fish come from is a joint decision. He said he advocates the fish come from Douglas PUD and Grant PUD, and that it be a mixture to meet the needs for both streams.

Gingerich said if the Aquatic SWG is already proposing translocating up to 250 Douglas PUD fish to the mouth of the Okanogan River this could be an opportunity for the CCT to take these fish to the tributaries to meet the CCT's goal. Ferguson said this sounds like an excellent idea considering the environmental conditions in the mainstem Okanogan River. Wagner agreed this is an excellent idea. Gingerich said Douglas PUD has a similar agreement with Grant PUD where Grant PUD moves fish to Kirby Billingsley Hydro Park and Douglas PUD takes fish from there. Ferguson noted that the fish would already be PIT-tagged. Patrick Verhey asked who would be PIT-tagging these fish. Gingerich said Douglas PUD is already planning to PIT-tag up to 1,000 fish. Verhey said WDFW is supportive.

Wagner said the CCT are still waiting for a transport permit to be in place, and he asked whether this effort might be covered under the Douglas PUD permit. Gingerich said he would need to review the permit, which may include the entire basin. He added that WDFW is typically supportive of these activities and Verhey may be able to help with the transport permit. Verhey agreed that he or Chad Jackson can help shepherd this through.

Ferguson asked whether anything is needed from the Aquatic SWG to approve this handing off of fish. Gingerich said as long as Douglas PUD is not moving fish beyond the mouth of the Okanogan River, and aside from logistical items to work out, Douglas PUD is supportive of handing off fish to the CCT to release in the tributaries of the Okanogan River. Gingerich said ideally, the CCT can pick up the fish at Wells Fish Hatchery after Douglas PUD tags them.

Aquatic SWG members present agreed that the 25% (or up to 250) of the Pacific Lamprey planned for release at the mouth of the Okanogan River during the Douglas PUD 2018 Pacific Lamprey translocation effort may be transferred to the CCT to translocate farther upstream in tributaries of the Okanogan River under the CCT 2018 Pacific Lamprey translocation effort.

Lampman said if there are issues with collecting fish during the earlier part of the run, it seems it would be okay to release fish in the Okanogan River later since it takes fish longer to reach the upper Okanogan River anyway and this will be in tune with their natural behavior. Ferguson summarized what Lampman is suggesting is that because of late coordination and logistical issues, if the 25% portion of Pacific Lamprey that Douglas PUD plans to release in the Okanogan River per Aquatic SWG discussions occurs at the end of the Pacific Lamprey migration, this would be okay from a biological context. Lampman said this is correct.

Wagner said he will provide the CCT 2018 Pacific Lamprey Translocation Workplan to Kristi Geris for distribution to the Aquatic SWG prior to the Aquatic SWG meeting on September 12, 2018. *(Note: Wagner provided this plan to Geris on August 20, 2018, which Geris distributed to the Aquatic SWG that same day.)*

5. Joint Priest Rapids Fish Forum, Rocky Reach Fish Forum, and Aquatic SWG meeting on August 1, 2018 – Debrief (John Ferguson):

John Ferguson requested a high-level debrief on the joint PRFF, RFFF, and Aquatic SWG meeting that was held on August 1, 2018. Patrick Verhey said RD Nelle (USFWS) would be a good person to explain Damon Goodman's presentation (on "Lamprey Passage Alternatives"). Verhey said his takeaway from the presentation is that using flexible plastic tubing is an efficient way to move adult Pacific Lamprey over structures. He said Goodman has had high success and with low cost. Verhey said Goodman looked at the fishways at

Wells Dam with Andrew Gingerich and Chas Kyger and extended an invitation to anyone interested in touring the projects where Goodman has implemented this technique of moving adults using tubing. Verhey said Goodman discussed the ideal diameter for the tubing, which is fed through a counting box equipped with a motion sensor. Verhey said the box structure eliminates false counts triggered by other things such as birds.

Ralph Lampman said Goodman has typically used 4-inch tubing but has experimented with 2-inch, which also works but delays Pacific Lamprey travel time through the tubing compared to the larger diameter tubing. Lampman said Goodman is still developing the final conclusions of the study, but a general conclusion is that while Pacific Lamprey can pass through 2-inch tubing, 4-inch tubing works better. Lampman also said Goodman is testing 8-inch tubing. Lampman said the key to the effectiveness of this method is setting up the tubing in a location where Pacific Lamprey congregate. He said 99% of test fish were able to pass through the tubing and thus virtually no fish fell back through the tube. He also said that passage times were very short.

Ferguson asked whether the tubing is partially full of water. Lampman said there are 13 liters of water per minute flowing through the 4-inch tubing, which results in approximately 0.5 to 1 inch of water depth in the tube. He said the goal is to not create a syphon with too much water; rather, just create a trickle of water to allow Pacific Lamprey to migrate up the tubing. He said that water temperature within the tubing was around 60 to 70°F, which seems to work. He added that ideally the tubing will not have dips in the line because Pacific Lamprey may hold here; rather, the tubing should have a continuous, positive slope.

Gingerich asked whether Tracy Hillman obtained a copy of the presentation for distribution. Ferguson said he will contact Hillman regarding obtaining a copy of Goodman's presentation on "Lamprey Passage Alternatives." (*Note: Ferguson contacted Hillman, who indicated Goodman prefers that his presentation materials not be distributed.*)

Lampman recalled that he distributed a document in June 2018, which includes a lot of the information Goodman shared during his presentation (titled, *Van Arsdale Dam Pacific Lamprey Passage Structure [Smooth Tube]*, distributed on June 2, 2018).

6. Wells White Sturgeon Monitoring and Evaluation Update (Andrew Gingerich):

Andrew Gingerich said last week, the Douglas PUD White Sturgeon monitoring and evaluation (M&E) effort began targeting wild origin White Sturgeon adults in the Wells Project. He said the M&E crew is using the same gear as in past years, which include 14- (14/0), 16- (16/0), 18- (18/0), and 20-aught (20/0) hooks, 40 hooks per line, and 12 lines per night. He said crews set the lines in the afternoon and retrieve them early the next day.

He said crews have pulled lines for 6 of the 20 scheduled "pull" days. He said the first day of each week is a "set" day (set the lines). He said to date 130 White Sturgeon have been captured, which is a large number. He said unfortunately, over 95% of these fish are hatchery fish, predominately 5-year olds (i.e., brood year 2013, stocked in 2014), between 27 to 32 inches in length, and easily weighed over 10 pounds each. He said 14- to 15-pound fish is a regional success story in terms of stocking fish in this area. He said this M&E plan includes a natural reproductive assessment, which requires capturing enough adults to acoustically track and locate spawning areas within the reservoir to evaluate spawning success. He said this effort is limited because there may not be many adults in the Wells Project. He said only about 12 adults have been captured in the last 2 years of M&E sampling. He said this year in the first 6 days of M&E sampling, no adults have been captured. He guessed some hatchery fish have not reached adequate size to recruit to adult gear. He said although the hooks are not catching fish, the hooks are clean (no bait) upon retrieval, which suggests smaller fish are eating the bait but are not getting hooked in the mouth. He said on average, crews are catching 21 (almost 22) fish per day. He said about 4.5% of the hooks deployed caught fish (i.e., a catch per unit effort of 0.045), which is on pace to handle 423 fish this year. He said for Douglas PUD, this is a strong number. He said if this effort continues to struggle at capturing adults, at the very least, these data can be used to refine the estimated confidence around the survival estimate for 5-year-old fish. He said in Lake Roosevelt, there have been observations that as fish age, fish get better at recruiting to the gear. He said that overall, he believes there is still value in collecting these data.

Jason McLellan suggested using all 18/0 and 20/0 hooks, if Douglas PUD is targeting adults specifically for tagging and not for any other stock assessment index. He said there may still be a few hatchery fish captured but not nearly as many. Gingerich said he thought of this, but crews are still retrieving clean hooks. McLellan said this will happen regardless, probably due to crayfish over smaller White Sturgeon, especially if hooks are barbed. Gingerich said hypothetically, if there are 20 adults and 5,000 fish capable of recruiting to the gear, it is inevitable crews will have to handle some hatchery fish to capture an adult. McLellan said in his experience, as hatchery adults increase on a line, wild adults decrease. He said as the lines load up with hatchery adults, other adults are less likely to recruit. He said once fish get to a certain size (e.g., 160-centimeter fork length), the catch rate starts to decline, especially with larger wild adults. He said research on Halibut longline fisheries in the ocean and the effect of hook size, line spacing, and bait found most commonly the way to capture larger Halibut is to space the hooks wider apart. He said if Douglas PUD is using the same methods the CCT uses in Lake Roosevelt, which sounds like it is the case, the hooks are only spaced 15 feet apart. He said if there are 3- to 5-foot long hatchery fish on the line, the distance between the fish on the hooks is smaller than the size of the fish. He suggested, rather, setting hooks

30 feet apart and using larger hooks. He said this comes back to the question of what Douglas PUD's objectives are. He said if Douglas PUD cannot catch enough fish to conduct an early life history assessment, then something needs to be modified. He said the CCT have a fairly good idea of where adults are located in the Wells Project. He said the CCT, Douglas PUD, or a contractor could start fishing early life history gear at times of the year and at locations where this life stage is expected to be. He said from a cost-effective approach, this option may be better. Gingerich said this is something worth discussing within the Aquatic SWG. He said Douglas PUD does have requirements to conduct reproductive assessments and its complicated because there does not seem to be a lot of adults in the Wells Project and those adults are not spawning every year. He said this is challenging for Douglas PUD, at least in the short-term.

Patrick Verhey asked if McLellan could speak more on hook spacing to catch larger fish. Verhey said he has experience with this for Halibut fishing but not for White Sturgeon. McLellan clarified that the CCT have done a lot of experimentation with hook spacing and they theorize that responses to hook spacing for White Sturgeon and Halibut would be similar. Verhey said he understands commercial fisheries space hooks much closer together compared to conventional gear when targeting smaller fish. He said, however, it is possible it may not make a difference.

John Ferguson summarized the discussion by saying that Douglas PUD has about 20 days left of this M&E effort. He said a field sampling regime is underway this year and he is guessing Douglas PUD does not have plans to change the regime this year. He said the next step is to finish out M&E this year, present the results to the Aquatic SWG, and frame up these topics for further discussion. He said the Aquatic SWG will revisit the Douglas PUD White Sturgeon M&E objectives and sampling methodologies for 2019 in the fall or winter 2018. Gingerich said this makes sense. He said Douglas PUD would be hesitant to change regimes mid-season. He said one idea for 2019, when juvenile indexing returns as part of M&E and objectives in the *White Sturgeon Management Plan*, is to consider fishing 14/0 to 20/0 hooks less during juvenile indexing and stock assessment, and to try what McLellan is suggesting when conducting more directed adult activities.

Gingerich said Douglas PUD plans to provide a complete summary of the 2018 M&E effort upon completion of the sampling, and the Aquatic SWG can discuss options for 2019 at that time.

7. Wells White Sturgeon Rearing and Larvae Capture Brood Year 2018 (Jason McLellan and Andrew Gingerich):

Jason McLellan said this year, the CCT collected larvae for Douglas PUD similar to the previous 5 years using plankton net gear in the upper Columbia River. McLellan said crews

captured about 28,000 larvae, out of which a little more than 2,000 were provided to Douglas PUD and the Wells Fish Hatchery. He said approximately 2,500 larvae were also provided to Sherman Creek Fish Hatchery (WDFW) and are destined to go back into Lake Roosevelt as yearlings. He said the remaining larvae were marked with calcein and transferred downstream to monitor natural recruitment.

Andrew Gingerich said this year, it seemed the fish were a little more developed upon receipt compared to other years and were ready to be presented with feed almost immediately. He said during this early rearing phase, hatchery staff have been experimenting with a diet consisting of different ratios of mash relative to Otohime larval feed, and quite a bit of loss was observed (i.e., as much as 80 fish per day). He said since then, there has been a decrease in mortality. He said 1 week ago, hatchery staff increased the concentration of Otohime in the mash. He said staff started with 5% Otohime mixed with bulk mash and are now up to 50% Otohime. He said the decrease in mortality can be attributed to a combination of diet and weeding out those individuals that have difficulty transitioning to feed. He said it is natural to observe this type of loss. He said this week, there have been about 10 mortalities per day. He recalled in past years it has been observed that these numbers will continue to fall. He said currently, there are about 1,100 fish on station. He said there will be no hand count until staff are more comfortable with mortality rates.

8. Water Quality and River Forecast Update (Andrew Gingerich):

Andrew Gingerich said it has been fairly quiet over the last month at Wells Dam in terms of river flow and total dissolved gas production. He said the average river flow passing Wells Dam has been around 90,000 to 95,000 cubic feet per second (cfs) and is expected to decline. He said there has been more shape to the daily flow pattern this year, as mid-afternoon river flow increases due to releases of water from the Federal Columbia River Power System to meet power production needs. He said there have been only a few forced spill events, and typically these have been at night and short-lived. He said the Wells Project has remained in total dissolved gas compliance in the forebay and tailrace. He said current conditions are typical for this time of year.

9. PRESENTATION: Environmental DNA Sampling to Monitor Pacific Lamprey Presence (Kellie Carim, U.S. Forest Service):

Kellie Carim said she provided her presentation titled, "Environmental DNA for Monitoring Pacific Lamprey Reintroductions" (Attachment B), to Kristi Geris prior to the conference call on August 8, 2018 (*note: Geris distributed the presentation to the Aquatic SWG technical representatives at this same time*). Carim said Ralph Lampman asked her to share how eDNA can help monitor Pacific Lamprey reintroduction in the Wells Project.

Slide 1 of Attachment B

Carim said eDNA sampling is emerging as a more commonly used tool to understand species ranges and loosely, abundance. She said eDNA signals can be obtained from a wide range of indicators from soft skins cells to gametes during spawning.

Slide 2 of Attachment B

Carim said a sample can be captured by sampling water for analysis. She said, for example, water from the Columbia River can be filtered to determine if Pacific Lamprey eDNA is present.

Slide 3 of Attachment B

Carim said USFS conducted a project titled, "Reintroduction of Pacific Lamprey in the Upper Wenatchee River," in coordination with USFWS, the YN, and the National Genomics Center for Wildlife and Fish Conservation.

Slide 4 of Attachment B

Carim said in 2009, USFWS conducted electrofishing surveys to determine distribution, and in 2016, the YN began translocating Pacific Lamprey.

Slide 5 of Attachment B

Carim described the translocation locations for two events in 2016. She clarified that everything upstream of Tumwater Dam is referred to as "upper" and everything downstream of Tumwater Dam is referred to as "lower."

Slide 6 of Attachment B

Carim described the eDNA sampling locations post-translocation. She said samples were collected at both left and right bank locations. She said when sampling occurred, samples were collected in areas where staff believed Pacific Lamprey may be present. She said, for example, samples were not collected in the (fast-moving) thalweg; rather, samples were collected in well-mixed areas with lower velocity. She said a sample was also collected in the White River.

Slide 7 of Attachment B

Carim described the locations of eDNA Pacific Lamprey detections. She said the red dots shown on slide 7 of Attachment B are scaled relative to the concentration of Pacific Lamprey DNA that was detected. She said samples typically consist of 5 liters of water. She said no fish were detected in the higher elevations of the upper Wenatchee River, the White River, the Chiwawa River, or downstream of Lake Wenatchee. She said this suggested that fish had not yet moved from the location of translocation. She said for Pacific Lamprey moving forward, in a system the size of the Wenatchee River, she believes collecting one sample should be

sufficient for this size system. She said again, no DNA was detected; however, a single fish was detected in the White River.

Slide 8 of Attachment B

Carim reviewed the conclusions and sampling recommendations. She said most eDNA work has been conducted in smaller streams. She said possibly in a river this size (Wenatchee River), collecting only one sample in just one bank would be sufficient to obtain an estimate of fish presence based on the concentration of DNA in the sample. She said if there is a decrease in DNA, this suggests fish have left the area. She said if there is DNA near a dam and more DNA farther upstream, this suggests how fish are moving.

Slide 9 of Attachment B

Carim reviewed considerations for sampling at Wells Dam. She recommended sampling both banks as a pilot. She also recommended sampling year-to-year and within the year.

Slide 10 of Attachment B

Carim reviewed other considerations, including cost per sample (\$85), equipment needs, and other uses for the samples collected. Carim said USFS has pumps to loan, if needed, for a certain sampling event. She said pumps are provided on a first-come, first-served basis. She said July and August are the busiest times of year. She said, however, if sampling will be conducted on a regular basis she recommends purchasing a pump, which cost about \$1,000. She said USFS recommends a specific pump that is efficient for pumping 5 liters per sample. She said eDNA sampling is beneficial for other uses, for example, to detect the presence of an invasive species or if study objectives change.

Discussion

Andrew Gingerich asked, regarding the negative detection of eDNA and single detection of a Pacific Lamprey in the White River, what the timespan between these detections was. Carim said she thinks it was weeks apart. She said it could be possible the fish was not in the area during the time of eDNA sampling.

Gingerich said he has seen a few presentations on eDNA; however, he does not have a good sense of the resolution resulting from this type of sampling. He asked what volume of what is needed, and how many fish are needed to obtain a positive reading. Carim said this is a lot harder to determine in larger river systems. She said the scope of the project in the Wenatchee River took a good look at this because it was known how many fish were translocated and there were detections. She said unfortunately, there is no good answer for this question because there is so much flow in a system of this size. She said USFS and the YN are researching this question in Idaho and in basins within Washington. She said the two

agencies are collecting samples at core locations in certain intervals. She said currently, the work conducted in the Wenatchee River is the only data available that ties detection with specific numbers of adults.

Lampman said he believes that it is beneficial to implement eDNA sampling. He noted the relative concentrations shown in the Wenatchee River study. He suggested using the release locations as monitoring locations and conducting eDNA sampling in the Methow River every 30 kilometers and at tributary junctions that have a high likelihood of Pacific Lamprey use. He also suggested collecting samples in August and developing a strategy to conduct this sampling in 2018.

Gingerich asked what the research question pertaining to Wells Dam is. Lampman said the goal is increasing the pheromone signal to attract adults and eDNA is the surrogate for pheromone signal in the river. He said if there is more eDNA signal over time, this suggests the biomass is larger. He said more adults will be translocated each year and the larvae abundance should increase as well. He said this would be good to detect over the years.

Gingerich said there are still questions regarding concentration. He said Douglas PUD is currently conducting eDNA sampling for Northern Pike, which involves sampling monthly in the Okanogan River and below Chief Joseph Dam. He said this contract is with the Rocky Mountain Research Station. He said he thinks the CCT might also be sampling in the Okanogan River. Gingerich recalled Carim noting the efficiency of eDNA sampling and the ability to also analyze the data for other species. Carim said the USFS manages these samples, as well. She said the CCT may not be sampling the Okanogan River because Douglas PUD is; however, the CCT are sampling for Northern Pike downstream of Grand Coulee Dam and these samples could be repurposed and analyzed for Pacific Lamprey presence. Carim said there are also other agencies conducting eDNA sampling and the USFS can query a database for those results. She said there were also several samples submitted for the Columbia River last week, and if these sites coincide with Pacific Lamprey presence these samples can be analyzed as well.

Gingerich said Douglas PUD is sampling two sites in the Okanogan River. He asked whether, if there is spawning in the Foster Creek delta, there should be eDNA in the Chief Joseph Dam tailrace. He also asked what the expectation regarding Pacific Lamprey presence should be if something is detected. Carim said there are multiple considerations in answering these questions. *(Note: Carim provided a brief response to Gingerich's question during the Aquatic SWG conference call on August 8, 2018 and provided a more detailed response via email following the meeting, as follows.)*

It is known that both the presence of DNA in a sample (i.e., detection of an animal) and the amount of eDNA in that sample are related to how close the sample was collected to the fish and how many fish are present. The more animals present, the more DNA and higher the detection probabilities are. If there are only a few fish present, then the detection efficiency goes down, especially the farther away the sample is collected from those few individuals. There has been a good amount of research on detection probabilities in headwater stream systems (i.e., 3 to 5 cfs or smaller), especially as it pertains to probability of detecting a single fish. However, there are much less known detection probabilities in very large river systems, particularly when fish are present in low abundance. In this respect, a bit more ground truthing is needed with the comparison of eDNA samples to known fish abundance in larger river systems. USFS is working to inform this question in large river systems with the Pacific Lamprey work being performed across Idaho and the middle Columbia River this summer.

With regards to the question, "what can be expected of live fish with a positive eDNA detection," if a positive detection is found, this means there is Pacific Lamprey DNA in the system. When live individuals are occupying a given area, repeated positive detections should be observed. eDNA is capable of detecting a single copy of DNA in a sample; therefore, it is easier to detect a species with eDNA than it is with traditional sampling methods. That said, contamination can occur, and DNA can be moved around without the presence of a live fish. Therefore, surprising results should be interpreted in context to fully understand the implications of the results.

Lampman said the cost of eDNA sampling is attractive and the data will be available for other species. He said he does not want to regret down the line not starting the sampling earlier.

John Ferguson asked whether Lampman is asking the Aquatic SWG to consider eDNA sampling in 2018 to establish a baseline to monitor Pacific Lamprey translocation efforts under the *Pacific Lamprey Management Plan*. Lampman said this is correct. Ferguson asked if Lampman is suggesting conducting sampling in August 2018. Lampman said September 2018 is okay, too. Ferguson asked how the current Methow River sampling the YN are conducting in 2018 does not suffice for a baseline dataset. He asked why is there a need to do more than what is already being done. Lampman said the question is ultimately about adults passing Wells Dam. He said even if there is a big plume of signature in the Methow River, it may not be present at Wells Dam. He said the Aquatic SWG is evaluating effects on adults at Wells Dam and sampling in the mainstem Columbia River will help answer these questions. Carim added that the Methow River is much smaller than the Columbia River, so calibrating samples in the Columbia River would be useful and the Methow River data would help inform the baseline. She said there tends to be a site- or context-specific interpretation

of results with eDNA sampling. She said, for example, knowing what concentration of fish expressed a signal in the Methow River is much different than in the Columbia River because one would expect a much more diluted signal in a larger system.

Lampman said he believes it would be useful for Carim to see the sites. Gingerich said some of this seems outside of the scope the Aquatic SWG and Douglas PUD are working on for the translocation program. He said he still has questions about the effectiveness of samples and about the objectives. He said Douglas PUD does own a pump and he cannot envision a scenario where Douglas PUD could not share or loan the pump. He said Douglas PUD is already collecting eDNA samples and there may be an opportunity for a cost share to analyze these samples. He said Douglas PUD staff are already at Wells Dam, and again, there may be opportunity for a cost share to send Douglas PUD staff out to collect additional samples. He said in summary, there may be opportunities to arrange cost shares; however, funding this unknown program in totality, at this time, does not seem likely.

Lampman said he, in coordination with Carim, will develop a proposal for eDNA sampling during the Douglas PUD 2018 Pacific Lamprey translocation effort, for discussion during the Aquatic SWG meeting on September 12, 2018. *(Note: Lampman provided a proposal to Geris on September 5, 2018, which Geris distributed to the Aquatic SWG on September 6, 2018.)*

Gingerich said he will provide the eDNA sampling locations for the Douglas PUD monthly sampling efforts in the Okanogan River and Wells reservoir to Geris for distribution to the Aquatic SWG. *(Note: Kyger provided these locations to Geris on September 4, 2018, which Geris distributed to the Aquatic SWG that same day.)*

Jason McLellan said he can coordinate with Holly McLellan regarding the CCT eDNA sampling in the Okanogan River. Carim said she just received Holly McLellan's schedule, which includes two locations: Mosquito Park and Mallot Bridge. *(Note: following the conference call on August 8, 2018, Carim clarified the two locations include Mosquito Park (east and west bank at 48.10306 -119.70863 and 48.10287 -119.71017, respectively), as well as at Mallot Bridge (east and west bank at 48.28014 -119.70447 and 48.28082 -119.70486, respectively); these sites were sampled in mid-June 2018 and will be sampled again in September 2018, and Holly McLellan provided permission for samples from these sites to be reanalyzed for Pacific Lamprey.)*

Ferguson said Lampman should include in the proposal a clarification for the need for eDNA sampling. Gingerich said he understands the cost is reasonable; however, Douglas PUD will need to review a more thought out plan including how these data will be useful, instead of a

vague sampling plan with hopes that the data will be useful in the future. Carim said she can provide input on the sampling strategy, including how to sample for given objectives.

10. Diffuser Grating Spacing in the Wells Dam Collection Gallery (Patrick Verhey and Andrew Gingerich):

Andrew Gingerich recalled that Patrick Verhey requested this agenda item; however, Verhey had to leave the meeting early. Gingerich said he does not have an update on this at this time and he is unsure if Chas Kyger has discussed this with Wells Dam technicians. Gingerich said if modifications were needed the time to do this is during the annual winter maintenance period, so a plan would be needed sooner than later.

Douglas PUD will provide an update on the specifications for the diffuser grating spacing in the Wells Dam collection gallery and if there are plans to modify any grating spacings that are out of criteria.

VII. Administration

1. Upcoming meetings (John Ferguson):

The Aquatic SWG meeting on September 12, 2018, will be held by conference call.

Other upcoming meetings include: October 10, 2018 (TBD) and November 14, 2018 (TBD).

List of Attachments

Attachment A List of Attendees

Attachment B "Environmental DNA for Monitoring Pacific Lamprey Reintroductions" presentation by Kellie Carim (USFS)

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
Patrick Verhey	Aquatic SWG Technical Representative	Washington Department of Fish and Wildlife
Ralph Lampman	Aquatic SWG Technical Representative	Yakama Nation
Jason McLellan	Aquatic SWG Technical Representative	Colville Confederated Tribes
Paul Wagner	Technical Support	Colville Confederated Tribes
Kellie Carim	Guest Speaker	U.S. Forest Service