

# Rocky Reach Fish Forum

Wednesday, 1 March 2017

1:00 – 4:00 p.m.

Chelan PUD First Floor Conference Room

Wenatchee, WA



CHELAN COUNTY

Meeting called by Steve Hemstrom

Chairperson, Tracy Hillman

Notes taken by Meaghan Connell and Katja Gottbrecht

## ***Attending Representatives:***

Hemstrom, Steve	Chelan PUD	(509) 661-4281	steven.hemstrom@chelanpud.org
Lewis, Steve	USFWS	(509) 665-3508 x14	stephen_lewis@fws.gov
Rose, Bob*	YN	(509) 865-5121	rosb@yakamafish-nsn.gov
Verhey, Patrick	WDFW	(509) 754-4324	patrick.verhey@dfw.wa.gov
Zimmerman, Breean*	WDOE	(509) 575-2808	Breean.zimmerman@ecy.gov

## ***Attending Participants:***

Clement, Marcie	Chelan PUD	(509) 661-4186	marcie.clement@chelanpud.org
Connell, Meaghan	Chelan PUD	(509) 661-4757	meaghan.connell@chelanpud.org
Gottbrecht, Katja	Chelan PUD	(509) 661-4757	katja.gottbrecht@chelanpud.org
Hillman, Tracy	BioAnalysts	(208) 321-0363	tracy.hillman@bioanalysts.net
Keller, Lance	Chelan PUD	(509) 661-4299	lance.keller@chelanpud.org
Lampman, Ralph*	YN	(509)388-3871	lamr@yakamafish-nsn.gov
McClellan, Jason*	CCT	(509)263-1082	Jason.McLellan@colvilletribes.com
Nelle, RD	USFWS	(509)548-7573	RD_Nelle@fws.gov

\* Joined via phone.

# Meeting Minutes

## I. Welcome and Introductions

Tracy Hillman welcomed everyone to the Rocky Reach Fish Forum (RRFF or Forum) meeting. Participants introduced themselves.

## II. Agenda Review

The agenda was reviewed and approved.

## III. Approval of Meeting Minutes

The February meeting minutes were reviewed and approved with one edit.

## IV. Review Action Items

- Alene Underwood will provide the RRFF with a revised copy of the Tumwater Dam Lamprey Passage Feasibility Study. **Completed**
- Ralph Lampman will provide an update on the detection of the adult lamprey released in 2016 downstream from and within Tumwater Dam. **Ongoing; report will be available soon.**
- RD Nelle will provide Steve Hemstrom with adult lamprey telemetry information from the Methow and Entiat rivers. **Completed**
- Steve Hemstrom will contact the Army Corps of Engineers to see if they have examples of loss in distribution vs loss from mortality for adult lamprey or a similar fish. Steve has emailed the Army Corps of Engineers and is waiting for a response. **Ongoing**
- Steve Lewis will talk to RD Nelle about available data on natural mortality rates for adult lamprey. **Completed; there are no data.**
- Steve Hemstrom will find out the number of adult lamprey recovered during fishway dewatering in previous years. **Completed**
- Steve Hemstrom will check with Alene Underwood on the timeline for the Tumwater Dam feasibility analysis and reporting. Report delayed due to contractor. **Ongoing; report should be available in early April.**
- Steve Hemstrom will talk to Alene Underwood and Michelle Smith about the annual policy meeting and if an update on sturgeon monitoring could be presented at that meeting. **Completed**
- Steve Hemstrom will talk to Thad Mosey to see if sturgeon have been observed in the fishway at Rock Island and Rocky Reach dams. **Completed**
- Steve Hemstrom will check about the possibility of a RRFF tour of the Rocky Reach fishway. **Completed**

- Steve Hemstrom will provide pictures (if available) to Steve Lewis of the new, ¾-inch grating recently placed in the Rocky Reach fishway. **Completed**
- Steve Hemstrom will talk to Blue Leaf on sequential in-fishway PIT-tag detections at Rocky Reach to see if drop-back is occurring within the fishway. **Completed**
- Tracy Hillman will discuss with John Ferguson and Mike Clement the possibility of a joint RRFF, PRFF, and ASWG Pacific lamprey coordination meeting. **Completed**

## V. Aquatic Invasive Species and Water Quality

### Aquatic Invasive Species Report

Marcie Clement reported that the annual Aquatic Invasive Species (AIS) Report details sampling required by the Aquatic Invasive Species Plan. Marcie asked the RRFF to review the report and ask questions or give comments by 21 March 2017. A key point in the report is that no Zebra or Quagga mussels were found in the project area in 2016. Marcie made a few updates to the wording in the Response and Coordination section. She stated Chelan PUD shall implement the Dreissenid Mussel Rapid Response Plan, 2014, as applicable. Marcie also added new language to address WDFW's request for additional visual sampling at the boat launches (i.e., looking at the chains and the docks). Environmental Assessment Services (EAS) did a survey of the reservoir's shoreline on both sides, mapping the macrophyte beds. It was not a full-blown study but rather a visual survey. The EAS survey found nothing alarming. Two years ago, Chelan PUD identified flowering rush, which was taken care of by the Department of Natural Resources and Ecology. They missed a couple of plants and did a retreatment by mechanical pulling and then covering with burlap. Marcie will coordinate with the Weed Board and Ecology to look at this again next year.

Tracy Hillman asked what happens if Chelan PUD finds invasive mussels growing in the reservoir. Marcie responded that there is an incident command structure that is led by WDFW. Chelan PUD will participate with them by following their action plan and their incident response, similar to what happened during the Wanapum drawdown. The technical teams that Marcie participates on outside of the PUD are already exploring what we would do if invasive mussels are found; some options include application of chemical treatments such as Zequanox.

RD Nelle asked if the PUD samples with tow nets and if Marcie had thoughts on conducting eDNA sampling in the future. Marcie responded that eDNA is not the best tool for looking for the presence of adult mussels because it often produces false positives. She said, however, that eDNA is always on the table as a sampling tool, but that current sampling efforts and physical tows are best. Patrick Verhey asked about the methodology changes at the docks and piers and if that was part of the shoreline survey. Marcie indicated that it was part of the survey and it did not create a large change in the current sampling effort.

## Total Dissolved Gas Report

Marcie Clement reported that the Annual Total Dissolved Gas (TDG) report for the fish-spill season is complete and was submitted to Ecology. The next report coming up is the Water Quality Report for the non-fish-spill season, which covers temperature and TDG. This report will be out on 10 March. Because Chelan PUD was not 100% compliant with the Numeric Water Quality criteria for TDG at Rocky Reach Dam at the Year Five check-in, the next step, according to the 401, is to: *“prepare a report that evaluates what measures, operational and structural, may be reasonable and feasible to implement to further reduce TDG production at the Project.”* HDR prepared the Total Dissolved Gas Abatement Alternatives Analysis Report for Chelan PUD and the report is out for comment until 1 April 2017. Chelan PUD received a letter from Ecology stating that dam operations are not harming aquatic life based on Gas Bubble Trauma (GBT) studies at Rock Island Dam. The PUD has a requirement to do GBT monitoring at Rocky Reach Dam that has been on hold as Ecology reevaluates TDG and its effects. Chelan PUD and Ecology have several meetings scheduled to talk about 401 Certification requirements. They will also discuss Ecology requirements for GBT testing.

The report from HDR includes:

- Alternatives analysis (Rocky Reach already has intrinsic TDG reduction capabilities due to its design); little new technology exists since alternatives were discussed at relicensing.
- Spill gate testing and refinement of flat spill configuration; the flattened spill configuration, where the PUD evenly distributes spill to keep a flat spill rather than an arc or shooting out one side, seemed to be more effective in reducing TDG than other configurations. Chelan PUD will test this during the non-fish-spill season over a longer time period.
- Examining PUD operations (there aren't any recommendations to change structural operations).

Marcie asked the Forum to please review the report and provide her with comments by 1 April 2017.

Patrick asked Breean to elaborate on what Ecology is looking at regarding sampling for GBT. Breean said she is still looking into it and will provide additional information during a future meeting. Marcie added that Chelan PUD does sampling at Rock Island and Rocky Reach dams. Lance Keller remarked that Chelan PUD collects annual data at Rock Island dam per the S&P program. Tracy Hillman asked if the monitoring data are stored on DART (Data Access in Real Time). Lance responded that GBT data are on the Fish Passage Center site. Marcie added that data can also be found on the Army Corps of Engineers' website.

### Action Items:

- **The RRF will review and send comments on the Total Dissolved Gas Abatement Alternatives Analysis Report to Marcie Clement by 1 April 2017.**
- **The RRF will review and send comments on the 2016 AIS Monitoring Report to Marcie Clement by 21 March 2017.**

## VI. White Sturgeon

### Juvenile Rearing

Lance Keller reported that as of Monday, 27 February, Chelan Hatchery has 2,308 juvenile white sturgeon on station at the Chelan Hatchery. Since last month, a total of 53 juvenile sturgeon have died. The latest fish health report states that there is a minor case of fungus, which is possibly due to the stress of moving them from Wells Hatchery to Chelan Hatchery. The fish are being treated with a salt bath. Given the size of the fish, Lance assumed the fungus was the cause of mortality; although, the exact cause is unknown. Even with the loss of 53 fish, Chelan PUD is well above the 2,250 fish needed for release in 2017. These fish will be marked in March.

A week or two before release, Chelan PUD will do QA/QC to assess tag loss. The PUD will also collect data on length and weight of the fish. The fish will be released in late April/early May. Tracy Hillman asked Lance to clarify marking efforts. Lance said they will PIT tag and scute mark all juvenile sturgeon before release. Patrick Verhey remarked that it's a strange time of year for fish fungal infections. Lance concurred and stated that the Fish Health Report noted the fungus must have been minimally present at best, and maybe the transfer and extra handling increased the incidence of infection. Lance added that the fish will have time to recover before they are released in 2017.

### Workshop for Policy Members

Steve Hemstrom reported that Chelan PUD staff is still discussing the possibility of a face-to-face Workshop to discuss monitoring results. He added that the presentation on sturgeon may be too detailed for the annual policy meeting. Steve Hemstrom inquired if the USFWS has a policy representative. Steve Lewis replied that he is acting as the policy representative while the Service works on allocation of duties. Tracy Hillman noted that the Rocky Reach Settlement Agreement states that the technical representative cannot be the same person as the policy representative. Tracy explained that the policy representative must have authority from the agency they represent to make policy-level decisions (see Rocky Reach Hydroelectric Project (FERC #2145) Annual Policy Committee License Update). Steve Lewis will check with Jim Craig to see who the USFWS will designate as their policy representative.

Lance Keller reiterated that the purpose of the Workshop is not to sound an alarm but rather to keep the policy group engaged with the most up-to-date data. Tracy suggested that if a workshop cannot be organized, maybe the PUD could provide the policy representative with a monitoring summary report. Steve Hemstrom and Lance are working on updating the PowerPoint now for the annual policy meeting; the PowerPoint helps summarize what goes on each year for each of the management plans and will be made available to the policy members in the event they cannot attend the presentation.

Lance reported that he and Blue Leaf conducted the last round of diet sampling last week. They caught two sturgeon; one had nothing in its stomach, while the other contained a few annelids (segmented worms). Lance said the draft annual report will be available in March. Lance proposed doing another full year of diet study and re-evaluating sampling next year. If they continue to catch few sturgeon during

the winter period, the Forum may consider spreading the winter sampling effort across the spring, summer, and fall sampling periods. Lance noted that traces of mammals and birds have been found in diet samples, which he found surprising. Steve Lewis asked if the Columbia River Inter-Tribal Fish Commission (CRITFC) fish were sampled as well. Lance clarified that there are no CRITFC fish in the Rocky Reach reservoir. CRITFC fish were released in Rock Island reservoir and those fish occur within Rock Island reservoir downstream to the estuary.

Jason McLellan asked if the PUD is doing any studies to test the efficiency of their diet sampling, such as dissecting the stomachs of a few sturgeon they have sampled with gastric lavage. Lance replied that the PUD is interested in doing those studies, but they have not sacrificed any fish in their surveys to this point. Tracy suggested that maybe Chelan PUD can work with Grant PUD on using Chelan's gastric lavage technique on CRITFC fish collected in the Priest Rapids Project area. CRITFC fish captured during monitoring efforts by Grant PUD are being sacrificed and their stomachs are dissected for evaluation of diets. This assumes the efficiency of the lavage technique does not vary between CRITFC sturgeon and sturgeon sampled within Rocky Reach reservoir. Lance said CRITFC fish sampled in the Priest Rapids Project area are larger than the fish sampled in Rocky Reach reservoir. The differences in size may bias results. Patrick Verhey clarified that the evaluation would be on sampling efficiency, not on diet composition because habitat differs between Rocky Reach reservoir and the Priest Rapids Project area. Ralph Lampman recommended that the same crews that lavage fish in Rocky Reach reservoir would need to lavage CRITFC fish collected in the Priest Rapids Project area.

#### **Action Items:**

- **Steve Lewis will check into who will represent the USFWS on the Rocky Reach Policy Committee.**
- **Lance Keller will provide the sturgeon diet analysis survey report to the RRFF in April or May.**

## **VII. PACIFIC LAMPREY**

### **Pacific Lamprey NNI Estimation**

Tracy Hillman reported that the NNI Subgroup meeting was cancelled because Grant PUD could not attend. Tracy said the PRFF reasoned that a separate meeting outside the regularly scheduled Fish Forum meetings would be very difficult to schedule. Therefore, they (PRFF) recommended that the PRFF and RRFF hold a joint meeting in May during the day of their regularly scheduled PRFF/RRFF meetings to discuss Pacific lamprey NNI. Because the focus of the joint meeting would be Pacific lamprey NNI, there would be little discussion on sturgeon. Sturgeon updates such as fish marking and release date could be shared quickly during the meeting or distributed via email.

Tracy asked the RRFF if they supported the schedule proposed by the PRFF. The response was positive; although, Steve Hemstrom said he will have to check with Alene Underwood on the possibility of a joint meeting. Tracy indicated that Grant PUD may give a presentation on their passage results from monitoring adult lamprey over the past several years. Tracy asked if Chelan PUD would want to give a presentation as well, suggesting the presentations on fish passage results would lead into the NNI

discussions. Steve Hemstrom agreed to present passage results if a joint meeting is feasible. Patrick Verhey stated that the PRFF also talked about inviting Douglas PUD to the joint meeting. Douglas PUD could share their hypotheses for evaluating Wells Dam effects on lamprey passage with the Forums.

**Action Item:**

- **Steve Hemstrom will check with Alene Underwood to see if the RRF can meet jointly with the PRFF to discuss adult lamprey NNI.**

### Natural Mortality Rates

RD Nelle reported that he did not find any information on natural mortality rates for adult lamprey in undammed systems.

### Adult Lamprey Dam Passage and Escapement Monitoring Report

Steve Hemstrom sent out the draft report authored by Blue Leaf titled, *“A Monitoring Study to Quantify Dam Passage and Tributary Escapement of Adult Pacific Lamprey in the Rocky Reach Project Area and the Mid-Columbia River.”* The report includes passage statistics and escapement rates. Steve Hemstrom reported that he and Blue Leaf reviewed the data to see if drop-back was occurring in the fishway, but because of the location of the PIT-tag arrays in the fishway (primarily in the upper fishway), the data were not very conclusive. However, drop-back did not occur in the upper fishway based on tag detections. Steve Hemstrom also added that with the lamprey travel times being short from release to top of the Rocky Reach fishway exit, it does not appear there is much drop-back occurring.

Steve Hemstrom shared the following from the Blue Leaf Report:

Of the 211 lampreys released, 169 (80.1%) have been detected in either the adult fishway at Rocky Reach or Wells dams, or in a mid-Columbia River tributary; 19 of the 169 (90.5%) were released along the left-bank upstream from Rock Island Dam and 150 of the 169 (78.9%) were released along the right-bank. As of 31 December 2016, preliminary Rocky Reach fishway passage rate was 98.8%. One hundred sixty-two of the 164 fish detected in the Rocky Reach fishway were last detected at the fishway exit and two were last detected at the lower weir antennas in the upper fishway. One fish that passed Rocky Reach Dam was last detected in the Chewuch River upstream from Winthrop, WA. Five fish were last detected in the Wenatchee River. No lampreys from the 2016 study have been detected at Rock Island Dam. Currently, 96.2% of the tagged-and-released lamprey are potentially overwintering in the mainstem of the Columbia River, either within the Rock Island or Rocky Reach reservoirs, or in the lower Wenatchee River or Entiat River downstream of the FDX detection point, as indicated by their last detection site or lack of detection so far. A better estimate of the final locations of all tagged lamprey will be available in spring 2017, and an estimate of the number of fish that overwintered in the mainstem Columbia River and resume migration in spring 2017.

RD Nelle asked about detection efficiencies at the arrays in tributaries. Steve Hemstrom did not yet have data for lamprey detections, but noted there are detection efficiencies for salmonids. RD Nelle

suggested Ralph Lampman may be able to speak to detection efficiencies based his data. Steve Hemstrom would like to talk further on how deeply to delve into tributary systems as a requirement of dam passage. Bob Rose asked for a clarification of the location of PIT detection antennas at Rocky Reach Dam. Steve Hemstrom replied there is no PIT detection at the entrance, only in the upper fishway and at the exit. Steve Hemstrom referred everyone to pages 13-14 in the Blue Leaf report for an illustration of the location of the arrays.

Steve Hemstrom indicated that detections so far can be found in the Adult Lamprey Full duplex PIT Detection 2015-2016 RIS RR Ent spreadsheet. He also noted that the arrays will likely pick up more detections during spring and early summer, and the Blue Leaf report will be updated based on those detections. He asked for comments on the current draft to get a sense of any issues or necessary additions. Comments on this version of the draft are due by 22 March 2017.

Bob Rose asked Steve Hemstrom to summarize in the report the objectives of the study and to discuss whether the objectives were met. Based on his quick review of the report, Bob said this was not immediately clear. Steve Hemstrom agreed to do this.

Bob Rose asked Steve Hemstrom if adult lamprey had been observed at Wells Dam but not at Rocky Reach Dam. In other words, did adult lamprey pass Rocky Reach Dam undetected? Steve Hemstrom said there may have been one fish that passed undetected, but he will have to look at the data. It's possible that the lamprey could be in a tributary upstream from Rocky Reach Dam but residing below a detection array. Steve Lewis asked how many lamprey may have passed undetected at Wells Dam. Steve Hemstrom noted the low count at Wells Dam (around five fish) indicated that there were likely very few. Lance Keller added that there would need to be an upstream detection in order to confirm this. Steve Lewis asked if the 42 lamprey that remain undetected reflect the fact that there is no array at the entrance of the fishway. Steve Hemstrom replied that during fishway dewatering for maintenance, Chelan PUD did not detect any PIT-tagged fish at Rocky Reach Dam and only one at Rock Island Dam (released by Grant PUD), indicating that the 42 fish are somewhere else. He hopes to get detections on these fish in the spring as they move to spawn areas. Lance stated that Chelan PUD thought they would see more detections in the fish rescues but that was not the case.

#### **Action Items:**

- **The RRF will send comments on the draft Monitoring Study to Quantify Dam Passage and Tributary Escapement to Steve Hemstrom by 22 March 2017.**
- **Steve Hemstrom will describe how the study met the objective under each section of the draft report.**

#### **Adult Lamprey PIT-Tag Detections**

Steve Hemstrom observed that the 2015 PIT-tag detections show that lamprey overwinter and then move. He noted that this overwinter waiting period will need to be an element in any future PIT-tagging or telemetry study. The PIT-tag data allows one to track where fish are and their passage and rate of passage. Steve Hemstrom noted the lamprey seem to be able to move quickly when motivated.

## Detections of Tagged Lamprey Released by the Yakama Nation in the Wenatchee River

Ralph Lampman shared some results from the release of tagged adult lamprey into the Wenatchee River during spring and fall 2016. On both occasions, lamprey were released at Tumwater Dam downstream of the fish ladder and also within the ladder at several points. Ralph reported higher passage rates for those fish released within the ladder and reported about a 4.2% overall passage rate (up to weir #18), but noted the small sample size. Ralph will provide a report on results by 15 March 2017. Patrick Verhey asked for a take-home message from the study. Ralph cited several lessons learned including observations about how the method of releasing lamprey may contribute to passage success, and observed that the lamprey seemed to fare better during the fall release because of lower stream flows at that time. Patrick asked if Ralph planned to do this study again and if he could make suggestions for improvement of passage at Tumwater Dam. Ralph replied that he will have a meeting on 2 March to discuss planning for the spring field season and what has been learned thus far. Patrick commented that there is still a question if there is a natural run of lamprey that would pass Tumwater Dam, and, if that's the case, will Chelan PUD look to improve fish passage there. Steve Hemstrom confirmed the PUD is discussing the feasibility of improving lamprey passage at Tumwater Dam. Patrick noted that Ralph's work could be helpful to Chelan PUD for that purpose. Ralph commented that if Chelan PUD were to place an array at the entrance, there would be a better opportunity to get more information on passage rates there.

### Action Item:

- **Ralph Lampman will provide the RRF with a report describing results from the 2016 release of adult lamprey in the Wenatchee River by 15 March 2017.**

## Regional Lamprey Workshop

Tracy Hillman reported that he and John Ferguson, chair of the Aquatic Settlement Work Group (ASWG), have been discussing the desire of the groups to hold a joint ASWG, RRF, and PRFF monitoring coordination workshop this spring. To that end, Tracy asked the RRF for possible agenda items for the joint workshop. Including those items identified by the PRFF, the RRF identified the following agenda items:

1. Describe what studies the PUDs propose to do in 2017. This includes when, where, and how they intend to conduct their studies. Members can then discuss how to coordinate the studies.
2. Identify proposed or possible studies to be conducted post-2017 (long-term planning).
3. Discuss the linking of monitoring results and studies across the three groups.
4. Identify lamprey studies conducted downstream (e.g., Corps studies) that may contribute to or benefit upstream studies.
5. Update on tagging technology by Daniel Deng (PNNL).
6. Identify and discuss hypotheses that may fill data gaps (starting with a discussion on the five hypotheses identified by the ASWG).
7. Identify and discuss hypotheses (or mechanisms) that link the apparent loss of adult lamprey in reservoirs to dam operations.

Tracy clarified that this workshop would focus on coordinating lamprey monitoring activities among the groups, not on lamprey NNI, which will be discussed during the joint May meeting (depending on Chelan PUD concurrence). Tracy also noted that the date and location of the workshop is yet to be determined.

Tracy stated that during the PRFF meeting, Grant PUD indicated that Chelan and Douglas PUDs would need to hire a contractor if they wanted to collect adult lamprey at Priest Rapids Dam this year. Steve Hemstrom said he has not connected with Grant PUD on this yet because he is unsure if Chelan PUD will do another year of study. The Forum discussed why a second and possibly third year of study would be beneficial (e.g., to calculate an average, to account for variables such as different river flows, to have enough data to make decisions on NNI, etc.). Steve Hemstrom said he is not opposed to a second year of study, but wants to have parameters that state when the data are good enough and when the study is finished. Steve Hemstrom remarked that he does not want to engage in a discussion about NNI while continuing to study passage. Tracy asked each member present if they believe a second year of study at Rocky Reach Dam would be beneficial. All members present agreed to a second year of study. Steve Hemstrom will take this to his managers for discussion, noting that if they have another 99% passage rate result, would Chelan PUD be obligated to conduct a third year of study? Patrick Verhey noted that NNI is also about juveniles, and that at some point, a reasonable estimate of juvenile effects will need to be determined. Patrick added that we have to exhaust all avenues and use adaptive management before we can say we don't have any tools left to improve adult passage.

Steve Hemstrom asked the group for their thoughts about why there are no or few adult lamprey approaching Wells Dam. He said a 99% natural mortality rate from Rocky Reach to Wells is doubtful unless there is a reservoir effect suddenly stopping lamprey when they move up in the mid-Columbia River. Steve Hemstrom asked for help in determining what that project effect is, because a high level of natural mortality is very unlikely. Steve Lewis reported that the ASWG thought there may be a lack of a pheromone signal upstream from Wells Dam. Patrick noted that there were some changes to Wells Dam including modifications at the counting window, differing flows through the doors, and a device that allows lamprey to pass through the lower orifice. Other hypotheses proposed included effects of the 2008 Tripod fire, sturgeon stocking (although Tracy noted that declines at Wells Dam began with passage in 2008 and sturgeon were not stocked in Rocky Reach reservoir until 2011), and water from sturgeon rearing at the Wells Hatchery being disseminated into the river downstream from Wells Dam.

#### **Action Items:**

- **The RRFF will send additional agenda items to Tracy Hillman for the proposed regional lamprey coordination workshop.**
- **Tracy Hillman and John Ferguson will prepare a final agenda for the workshop.**

#### **Tumwater Dam Feasibility Study**

Steve Hemstrom reported that Alene Underwood is managing the Tumwater Feasibility Study and that they hope to have the report to the RRFF very soon. Steve Lewis inquired if CH2M Hill would be available to explain the study to the RRFF. Steve Hemstrom said it would be better, based on availability, to have a Chelan PUD engineer provide a presentation to the Forum. Members present agreed.

Steve Hemstrom reported on his biological memo dated 31 January 2017 on the subject of "*Pacific Lamprey biological knowledge and assumptions supporting the TWD Lamprey Passage Feasibility Study.*" The memo indicated that most lamprey do not pass Rocky Reach and Rock Island dams until late in the season (July/August) and so could not arrive at Tumwater before the first of July through late August. Data on the lamprey spawning period is largely inferred from what has been observed in the Entiat River by USFWS, but very little data are available. Information in the memo helped to inform the Tumwater Feasibility Study recommendations. Steve Hemstrom requested the RRF provide him with feedback on the memo.

Steve Hemstrom stated that he will attend a Fish Passage Workshop in Corvallis, Oregon, in June. Tracy will email information on this workshop to RRF members.

**Action Items:**

- **Steve Hemstrom will provide information on the 21 June 2017 fish passage workshop in Oregon to Tracy, who will disseminate it to the RRF.**
- **The RRF will send comments on the 31 January 2017 biological memo to Steve Hemstrom.**
- **Steve Hemstrom will share PIT-tag array detection efficiencies for salmon to Ralph Lampman.**
- **The RRF will reply to Steve Hemstrom regarding hypotheses on Rocky Reach Project effects on adult lamprey.**

## **VIII. Meeting**

The next regular meeting of the RRF is scheduled for Wednesday, 5 April 2017 from 1:00 to 4:00 p.m. in the Chelan PUD Second Floor Conference Room.