Rocky Reach Fish Forum

Wednesday, 7 June 2017
1:00 p.m. – 4:00 p.m.
Chelan PUD, 327 N. Wenatchee Ave.
Wenatchee, WA

Meeting called by Steve Hemstrom
Notes taken by Katja Gottbrecht

Chairperson, Tracy Hillman

Attending Representatives:

Hemstrom, Steve	Chelan PUD	(509) 661-4281	steven.hemstrom@chelanpud.org
Lewis, Steve	USFWS	(509) 663-3508	stephen_lewis@fws.org
Padgett, Michael*	Alcoa	(412) 553-4545	michael.padgett@alcoa.com
Rose, Bob	YN	(509) 865-5121	rosb@yakamafish-nsn.gov
Truscott, Kirk	CCT	(509) 978-8031	kirk.truscott@colvilletribes.com
Verhey, Patrick	WDFW	(509) 754-4624	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
Gottbrecht, Katja	Chelan PUD	(509) 661-4601	katja.gottbrecht@chelanpud.org
Goudy, Sean	YN	(509) 480-5196	gous@yakamafish.nsn.gov
Hays, Steve	Chelan PUD	(509) 661-4181	steve.hays@chelanpud.org
Hillman, Tracy	BioAnalysts	(208) 321-0363	tracy.hillman@bioanalysts.net
Jackson, Chad*	WDFW	(509)754-4624 x250	Chad.jackson@dfw.wa.gov
Jennings, Jon	DOE	(360) 407-6283	joje461@ecy.wa.gov
Keller, Lance	Chelan PUD	(509) 663-4299	lance.keller@chelanpud.org
Mackey, Mike	Weed Board	(509) 667-6576	mike.mackey@co.chelan.wa.us
Nelle, RD	USFWS	(509)548-7573	RD_Nelle@fws.gov
Sanderson, Julie	Weed Board	(509) 667-6576	julie.sanderson@co.chelan.wa.us

* 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 with the addition of a discussion on the Tumwater Dam Feasibility Study.

III. Approval of Meeting Minutes

The May RRFF meeting minutes were reviewed and approved (pending a review from Bob Rose). [*Bob approved the meeting minutes on 7 June.*]

Review Action Items

- Alene Underwood will provide the RRFF with a revised copy of the Tumwater Dam Lamprey Passage Feasibility Study. **Ongoing**
- Ralph Lampman will provide an update on the detection of the adult lamprey released in 2016 downstream from and within Tumwater Dam. **Ongoing**
- 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. **Complete**
- Steve Lewis will check into who will represent the USFWS on the Rocky Reach Policy Committee. **Complete**
- Lance Keller will provide the sturgeon diet analysis survey report to the RRFF in April or May. **Complete – included in the 2016 M&E report.**
- Ralph Lampman will provide the RRFF with a report describing results from the 2016 release of adult lamprey in the Wenatchee River by 15 March 2017. **Ongoing - Sean Goudy will follow up with Ralph to have him send the Wenatchee 2016 release report to the Forum.**
- Steve Hemstrom will share PIT-tag array detection efficiencies for salmon to Ralph Lampman. **Complete**
- The RRFF will send questions for Julie Sanderson to Tracy Hillman, who will send the questions to Julie to help her prepare for the discussion in June. **Complete**
- The RRFF will send their comments on the 2017 full-duplex study to Steve Hemstrom before the release of the 2017 study plan. **Complete - no comments were received.**

- The RRFF will send comments to Steve Hemstrom on anything they see in the 2016 study that should be included in the 2017 study. **Ongoing - Bob Rose will send Steve Hemstrom comments on the study plan on 8 June, 2017.**
- Steve Hemstrom will look at lamprey counts at The Dalles Dam and compare those to counts at Rocky Reach Dam. **Ongoing**
- Steve Hemstrom will provide the RRFF with data on the weekly fishway count passage numbers compared to weekly flows. **Ongoing**
- Rod O'Connor will send to the Forums the publication titled, *Movements, Habitat Use, and Population Characteristics of Adult Pacific Lamprey in a Coastal River.* **Complete**
- RD Nelle will look at the movements of adult lamprey released upstream and downstream of a diversion dam on the Yakima River. **Ongoing**
- Steve Hemstrom will compile data to look at the natural downstream movement behavior of Pacific lamprey in natural rivers to use in fishway passage estimates. **One review was completed – Starkovich papers. Ongoing**
- Tracy Hillman will contact Carl English (LGL) about the movement of steelhead during the 2002 radio-tag study. **Complete - Tracy will defer to this discussion to the July RRFF/PRFF meeting.**
- Tracy Hillman will check with Bob Rose and Steve Lewis to confirm their availability for the 5 July meeting. **Complete - Bob Rose and Steve Lewis are available. Kirk Truscott is a maybe.**

IV. Aquatic Invasive Species

Chelan County Noxious Weed Control Board Presentation/Proposal

Julie Sanderson and Mike Mackey from the Chelan County Noxious Weed Board (Weed Board) presented their recommendations for a potential herbicide application in the Rocky Reach Reservoir to control Eurasian Milfoil. Julie Sanderson read the Chelan PUD Annual Monitoring and Control Report (2016) and did not see measures for control of Eurasian Milfoil and other aquatic invasive species (AIS), as required by the Aquatic Invasive Species Monitoring and Control Plan (2010). This prompted the Weed Board to recommend an herbicide treatment. Marcie Clement brought the recommendation to the RRFF for review because the use of an herbicide in the reservoir may conflict with requirements in the license.

Julie cited the success of a 2015 treatment of Eurasian Milfoil the Weed Board did in the Entiat Bay using Renovate (a triclopyr-based herbicide) and the apparent reduction in milfoil after the treatment. In 2011, Mike Mackey put together a team of people (including the USFWS, Army Corps of Engineers, etc.) to choose the chemical for said treatment. The team chose Renovate because the chemical doesn't adhere to soil particles, doesn't stay in the water body for very long, and it targets milfoil. It has been used for over 20 years and was approval by EPA and Washington Department of Ecology. The Weed Board used Ecology dollars to do the application and flow/water movement tests in a shallow area near Entiat (not in the main channel) in 2011. Mike also indicated the Weed Board conducted a literature search on the effects of the herbicide on lamprey and other fish to see if there would be any problems. The window of opportunity (timing window) was selected by WDFW, and the treatment was done in late August to target the mature plants. The Weed Board also coordinated with the managers of

irrigation systems and domestic water systems (a well) to temporarily shut off irrigation service for 18 hours after treatment; there were no apparent problems when the systems were reactivated and no observed fish mortalities. Mike posited that the density of Eurasian Milfoil makes it a good place for predator fish to hide and cited a Pear Leaf study that did dissolved oxygen tests showing levels at night that can kill smaller fish. He finished by saying Eurasian milfoil is an invasive species that causes issues for recreation and that he's anecdotally seen evidence of it causing issues for smaller smolts coming down the river. Milfoil is a statewide problem that needs to be dealt with by multiple agencies including Ecology, USFWS, WDFW, and DNR. Mike asked Jon Jennings from the Department of Ecology to attend the June RRFF meeting to answer questions regarding permitting. Julie and Mike then took questions from the RRFF.

Bob Rose asked what the mechanism is that kills milfoil and how many applica+tions per year are needed to control an area. Mike Mackey responded that the active ingredient in Renovate is 14% triclopyr designed for aquatic use. The Weed Board made one application over 26 acres in 2015 and have understood from others who have used this product that they can expect to see a three-to-five-year period without milfoil, or at least a large reduction in plant abundance. The Weed Board monitored the treatment site in 2015 and 2016 and will do their final survey in August 2017.

Steve Lewis asked how the Weed Board would account for drift of the chemical in a moving system such as a run-of-the-river reservoir. Julie Sanderson responded that in thick milfoil patches, the chemical flake contacts plant material almost immediately upon entering the water. Mike Mackey added that before doing the treatment, flow tests were done in 2013. Marcie Clement asked if flow testing was done on the day of the 2015 application. Mike Mackey confirmed no flow tests were done on that day. Marcie commented that the Columbia River flows can change very quickly. Bob Rose added that 2015 was a dry year with low-flow; low-flow application may be a best-case scenario because there would be minimal drift of the chemical out of the treatment area. Bob noted each year is very different and flows during application would be something to be cognizant of in the future.

Lance Keller asked the Weed board to confirm the trade name of the chemical used. Mike Mackey replied Renovate OTF.

Marcie asked if water quality testing was done in the water column and in the irrigation system, and if the permit requested the Weed Board do water quality testing. Mike Mackey responded that water testing was not done. Jon Jennings from Ecology added that the way the permit is set up, you can do testing to see what the concentration is of an herbicide in the water, or another option is that most herbicide labels specify periods of time after treatment during which no irrigation can occur. Once you have passed that period, irrigation can be turned on again.

Bob Rose asked if the chemical is milfoil specific or if it kills all macrophytes. Julie Sanderson responded that the chemical is dicot-specific and that a lot of other native aquatic plants are monocots, so the chemical is more specific to milfoil in an aquatic plant community. Marcie Clement added that the areas that were treated are mixed macrophyte beds where the majority of the plants are native. Marcie wanted to be clear that this treatment would not get rid of aquatic weed beds.

Marcie Clement read a portion of the Renovate OTF label that the Weed Board had provided: "*Aquatic sites: for control of immersed, submersed, and floating aquatic weeds in the following aquatic sites: ponds, lakes, reservoirs, marshes, wetlands, impounded rivers, streams and other bodies of water that are quiescent, non-irrigation canals, seasonal irrigation waters and ditches which have no continuous outflow*." Marcie remarked that following the label protects you if the treatment causes any harm. She has concerns that the proposed treatment area on the Columbia River is not "quiescent." Steve Hemstrom commented that the entire 43 miles of the Rocky Reach Reservoir turns over in ten hours. Jon Jennings suggested that the State Department of Agriculture (basically the pesticide authority) can provide a legal interpretation of the Renovate OTF label (he clarified this is not a waiver, just a legal interpretation of what the label means). Mike Mackey added that he believes the manufacturer is changing the label to include areas such as those treated by the Weed Board. Jon Jennings surmised that the Department of Agriculture would probably read the label to include that area. Marcie disagreed.

Bob Rose asked Marcie Clement if Chelan PUD has done an inventory on how many acres would need to be treated, and if she would have a sense of what it would require (in number of acres per year) to be able to treat the target areas at the reservoir scale. Marcie responded that Chelan PUD surveys the reservoir every other year to map the weed beds. She noted that the milfoil beds appear to be relatively stable and not growing. She mentioned it would vary case by case, it would depend on the cost of the chemical, and how appropriate it is to use in some areas. Several of the PUD parks have much faster water than that found at Entiat.

Bob Rose asked the Weed Board if the primary driver for the recommended treatment is recreation or to reduce habitat for fish predators. He also asked, if there is an estimate of how much would need to be treated to meet the objective. Mike Mackey responded that there are about 1,000 acres of milfoil based on the survey that was done with Ecology dollars before the 2015 Entiat treatment (the survey was done by the same contractor who did the treatment). Marcie noted that it was not 1,000 acres of solid milfoil and Mike agreed. Steve Hays recalled that the contractor who last did a survey for Chelan PUD found about 800 acres of macrophyte beds, consisting of about 30-40% milfoil. Steve Hays remarked that the estimates over the years have varied, and that years like this one with high flows for a long time definitely reduce the total size of aquatic plant beds. Steve Hays recalled when milfoil first arrived in the region in the early 1980s and how quickly it spread, despite the best efforts of Ecology and others to treat and contain it. He noted that within about five to six years, it seemed to have reached equilibrium in terms of spatial distribution.

Steve Hays asked the Weed Board how they define "control." Julie Sanderson replied that the legal definition of "control" in the RCWs is to prevent the spread of the plant by either seeds or other propagules within or from the property. She noted that any harvesting or anything that would increase the spread of propagules wouldn't really be controlling; you want to reduce the amount of the weed. If there is nothing being done, there is no control.

Steve Hays made the point that as far as predator/prey habitats are concerned, the curly leaf pond weed and other native pond weeds (before the arrival of milfoil) provided just as much habitat for fish as predator cover. In 2012, Steve did a required study of water quality in aquatic plant beds (the study did not target milfoil but there was plenty of it in the areas surveyed). He had four fixed sites with 24-hour

hourly monitoring for several weeks throughout the summer. He monitored dissolved oxygen and pH close to the river bottom and any anoxic zones that might have formed within the water column. He noted swings in oxygen levels on weekends when flows were reduced, but they did not measure (except in very few cases) conditions below ideal water-quality standards. Steve Hays clarified that as he understood it, the Weed Board's idea of "control" is to not attempt to eliminate or have a reduction in milfoil in the Rocky Reach pool, but rather to seek to use methods that control its spread. Julie Sanderson said that is a good definition.

Steve Hays asked if the Weed Board had an objective for the rest of the Columbia River Basin. Mike Mackey responded that there is a coordinated weed management plan and cooperative agreement that was put together by the Army Corps of Engineers and runs from Lincoln County to Canada. The plan does not have specific projects in it, it simply includes all invasive aquatic plants that can be controlled, and the participants in the agreement work together.

Steve Hays asked if there are other entities using Renovate or other chemical treatments on milfoil. Mike Mackey replied that Okanogan County Weed Board's first application was in Osoyoos and that they are also treating some other closed lakes and have a set of other lakes they intend to treat. Jon Jennings added that Anna Lion with the Okanogan Weed Board is working on several areas of Osoyoos, although the Canadian side does not allow use of pesticides in water. Jon Jennings also remarked that the Pend Oreille Weed Board is treating large stretches of milfoil and Brazilian Elodea in the Pend Oreille River. Mike Mackey added that each county does what it can depending on permits and funding.

Steve Hays asked if there is a long-term objective for the Rocky Reach Reservoir. Mike Mackey responded that there are places in the reservoir where we can do things and places we can't—that's why we're advocating control and not eradication. As a Class B designate, you can do control in certain areas based on the definition provided by the Weed Board. There are places where treatments can be done that would (1) enhance recreational activity, and (2) help with fish issues. Julie Sanderson explained that the designation means it is a Class B on the state weed list, and if the State lists it as a Class B designation in your county, there is a requirement to control it. Beyond that, the county may choose to "select" it for control based on how much of a problem it poses.

Steve Hays summarized that the Weed Board is trying to control the spread of milfoil and its propagules with other methods where appropriate, aiming to achieve some uncertain level of reduction of the plant in the Rocky Reach Reservoir while recognizing that curly leaf and other species will still require harvesting in order to maintain recreational value. Mike Mackey said that is correct.

Steve Hays asked for the cost per acre to treat the Entiat site. Mike Mackey responded that the Weed Board spent a lot of money to go slowly, and that you can get other chemicals with the same percent active ingredient for less money. Mike thought the expense was about $1,000 per acre. Julie added that the price included the application and surveys. Steve Hays remarked that if the goal is to treat 200 acres per year for five years, the cost would be about $150,000-$200,000 per year (including administrative costs).

Tracy Hillman explained that the RRFF must balance the control of milfoil using chemical treatments with the management of several fish species. The Forum must demonstrate that they are not going to create a problem with ESA-listed fish, HCP plan species, or species of concern such as lamprey and sturgeon by approving the use of an herbicide in the project area. Tracy added that a resident fish study was completed in 2013 in the project area that included an objective to specifically sample fish assemblages within macrophyte beds. The assessment found a relatively high species richness of fish in macrophyte beds. Most of the fish were juveniles and water quality parameters measured during the assessments revealed good quality during the summer and fall. Tracy added that just because a chemical treatment does not kill fish out right, it may have effects on fish behavior and reproductive success. Avoidance behavior could lead to higher predation rates. The Forum must weigh these risks before they can approve the chemical treatment within the project area. The Weed Board mentioned there was no effect of the herbicide on fish and that EPA, NOAA, and others have demonstrated that the chemical has no effect on the fish studied (maybe including lamprey). Tracy asked the Weed Board to please provide any studies or literature they have that demonstrates the herbicide has no effects on fish (especially lamprey). This will help the Forum make an informed decision on the use of the treatment. Mike Mackey agreed to forward any information the Weed Board has.

Jon Jennings added that Ecology has been issuing Aquatic Pesticide Permits since 2001. There are many pesticides/herbicides Ecology does not allow. Ecology goes through an EIS process that evaluates possible impacts before including any of the chemicals in a permit. While Ecology is a state agency, under the ESA, Ecology does not go through biological consultation with the services, although they consult with WDFW to identify treatment windows (periods of time when sensitive or ESA-listed species are not present). Steve Hemstrom noted the RRFF would still like to see the information that exists because even if there is no mortality, there could be a behavioral effect. Juvenile Pacific lamprey live in the mud up to seven years and move at night almost exclusively, so if there is an olfactory effect that causes the lamprey to move, they'll likely be eaten by predators. Steve would like to see further statistical testing on the olfactory effects and toxicity of the herbicide on juvenile lamprey. Steve also remarked that based on his research of Triclopyr, concentration of the chemical seems to be key in terms of effects. Steve Hays said there is a D.E.I.S. out for review that covers Triclopyr and some new chemicals being considered. The D.E.I.S. has extensive documentation on toxicology, but Steve Hays did not recall anything on olfactory effects, or effects on aquatic insects or other benthic organisms being induced to move as a result of a chemical application. Jon Jennings suggested the RRFF access Washington State University's PICOL database to look up a Washington State specific version of the label.

Julie Sanderson pointed out that there are no studies that describe how an area is affected by the initial colonization of milfoil, but it is understood that there is some effect when something new comes into an ecosystem. She reiterated that milfoil is affecting the community (including juvenile lamprey, stoneflies, etc.). Marcie Clement commented that resident fish studies demonstrate that several species of fish use the weed beds.

Steve Lewis asked what the Weed Board's plan was for milfoil in 2017. Mike Mackey replied this year will simply be follow-up monitoring. Steve Lewis asked if this will include a water quality and fish

resource inventory. Julie Sanderson replied that the Weed Board is simply looking at the residual effect of one milfoil treatment and that the Weed Board does not have the capacity for fish studies. Mike Mackey added that the Weed Board's job is to get rid of milfoil. Steve Lewis suggested cost-sharing between agencies on future studies. Mike Mackey reiterated that the Weed Board relies on EPA and Ecology to give them information on effects, which they have already done for Renovate OTF. Jon Jennings suggested that the Forum contact biologists at the University of Washington if the Forum is interested in pursuing more research on avoidance studies.

Action Item:

- **Mike Mackey from the Weed Board will send literature that evaluates effects of the herbicide on lamprey and other fish species to Marcie Clement who will share it with the RRFF.**

V. White Sturgeon

Juvenile Sturgeon Releases

Lance Keller reported that juvenile sturgeon releases were conducted 24 and 25 May. A total of 2,185 fish were released into the project area. This is 65 fish below the SOA target number of 2,250. Some mortality occurred during tagging because of small fish size. Some additional fish disappeared from the Eastbank Hatchery, which Chelan PUD staff are looking into. Between the time of QA/QC and release there were some additional mortalities.

Releases of juvenile sturgeon were distributed as evenly as possible among the three release locations: Gallagher Flats, Daroga Park, and the Entiat Boat launch. Fish continue to migrate upstream of Beebe Bridge, but Chelan PUD staff are not seeing growth rates like they have in the past. Chelan PUD staff chose to keep the release locations the same as in past years for statistical reasons.

Larvae and Broodstock Collection

Lance Keller stated that the joint Chelan PUD and Grant PUD broodstock collection effort downstream from McNary Dam started on 30 May 2017. The effort continued uninterrupted through 5 June, which resulted in the collection of four females and one male, falling short of the 6x6 matrix goal. A 14-day extension to the sampling permit was granted by the comanagers and the extended effort began on 6 June 2017. Because of guide staffing issues, broodstock fishing began on 7 June 2017. An additional male fish was added to the matrix on 7 June. Donella Miller has conducted PI analysis and determined all of the females collected are ready to spawn. She is planning to spawn the fish late next week.

Lanced noted that high river flows and weather are affecting fishing success. He asked if any RRFF members were interested in assisting with broodstock efforts. Those interested are to contact Tracy and Lance. Lance clarified that the permit allows for a 6x6 matrix for the entire broodstock effort to be shared between Grant PUD and Chelan PUD (Douglas PUD is not included in the agreement this year). Chad Jackson added that the SOA requires only 18 half-sib families for full stocking. Thus, even if the full 6x6 is not achieved, the PUDs are still compliant with the SOA.

Chad Jackson reported on the larvae collection effort. He said WDFW crews have been out since mid-May doing prospecting. Larvae were first observed on Monday, 5 June. The larvae collected so far still have a visible yolk sac and do not seem to be free-eating but are drifting. Crews are sampling for larvae downstream of the 395 Highway Bridge. Chad will provide the Forum with a map of the sampling locations. As soon as they start seeing more larvae, they'll ramp up their collection efforts to maximize catch.

2016 Monitoring Report and Updates

Lance Keller reported that he and Corey Wright from Blue Leaf received no comments on the draft report. Lance requested that Blue Leaf and LGL give a presentation to the Forum in September. The Forum agreed.

Action Item:

- **Chad Jackson will provide a map showing the locations for sturgeon larvae collections in the Columbia River.**

VI. Pacific Lamprey

Pacific Lamprey NNI Estimation

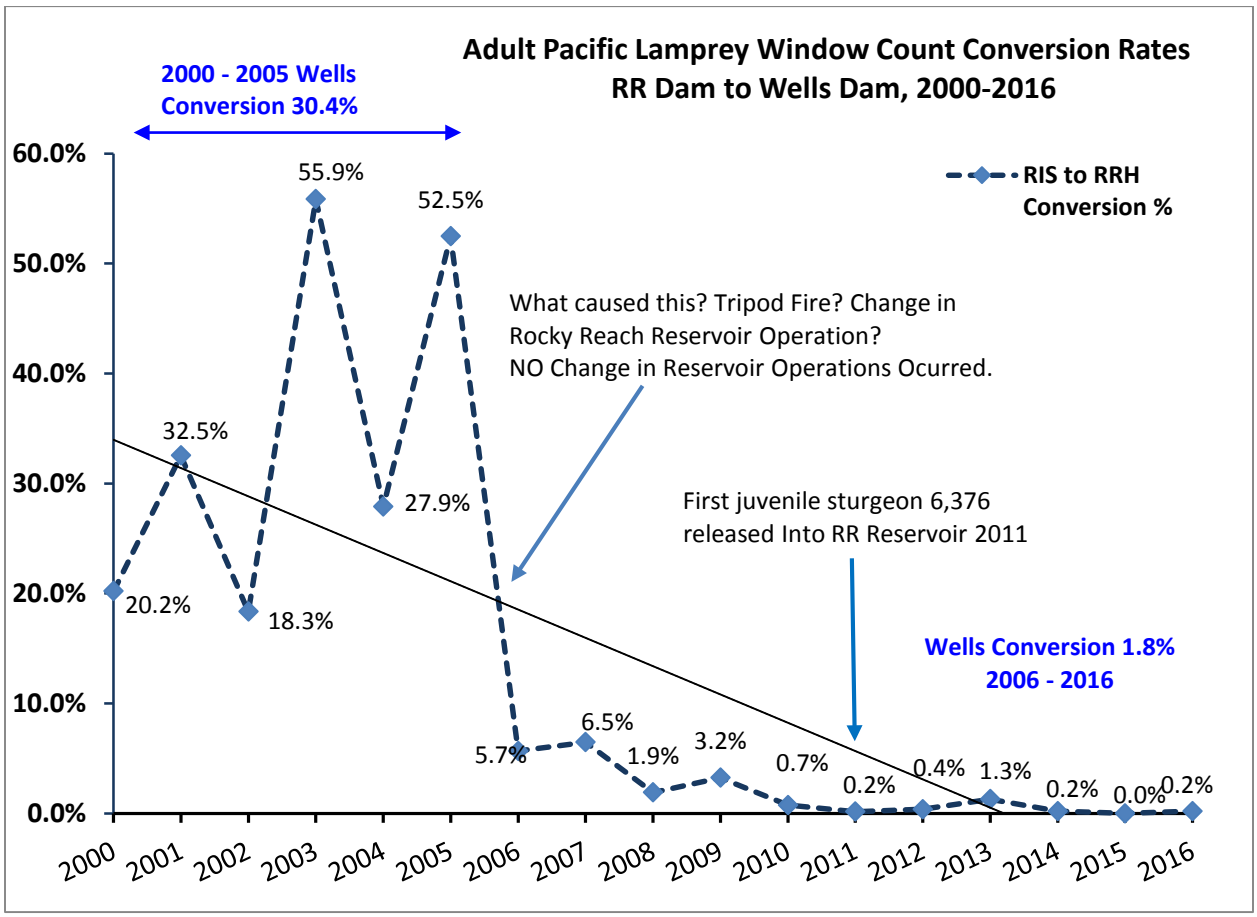
Tracy Hillman reported that the RRFF and Priest Rapids Fish Forum (PRFF) met jointly in May to discuss Pacific lamprey NNI. During the meeting, members were provided with the most recent adult Pacific lamprey passage estimates. They then discussed methods for calculating passage success and what happens when a "failed" passage ends with the fish in a downstream spawning area. They also identified additional actions that can be implemented within the fishways, noting that there aren't any, and then talked about setting an upper passage success limit for calculating NNI. Tracy said the latter issue will be discussed during the July meeting, which will be a joint meeting with the PRFF.

During the June meeting of the PRFF, the topic of adult lamprey passage through the reservoir was discussed. Members discussed studies that could be implemented to assess the fate of adult lamprey in reservoirs. Bob Rose added that the uncertainties of the results of these studies have been discussed many times and there will need to be some sort of negotiation in order to come to an agreement. Kirk Truscott added there was also a discussion on identifying what measurements need to be made on fate and what are the constraints to doing that. He said three possibilities that come to mind are: (1) was the lamprey eaten? (2) did the lamprey die (not eaten)? or (3) is it spawning somewhere in the reservoir? Kirk asked if a typical tagging study will provide the information we need and which of the possibilities are a project effect?

Bob Rose asked if Rock Island Dam fish counts are 100% accurate, and if Chelan PUD can demonstrate its accuracy. He added there is a potential discrepancy (greater than 10%) in conversion values based on dam counts (e.g., Priest Rapids to Rock Island Dam) and conversion values based on tagging studies. Kirk Truscott commented that the difference was quite a bit more than 10%. Steve Hemstrom said he will

check with Thad Mosey about the accuracy of lamprey counts at Rock Island Dam, but he doesn't think the PUD misses fish at Rock Island. Lance Keller added that lamprey could possibly go through the picket barrier, but he believes a lot of work has been done to close any gaps in the picket barrier. Lance explained that the count system is 100% video; all footage goes into a database and the footage is reviewed after it's logged. He said it takes the guessing out of what is observed because the tape can be stopped and rewound to get an accurate count. This is especially helpful if the fish move back and forth within the counting station. Lance noted that Chelan PUD is constantly refining the system, making lighting improvements so that there are no shadows, etc. Tracy Hillman wondered if the bright lights would affect lamprey passage. Lance agreed that the light is very bright but noted Chelan PUD has not seen any adverse effects. Lance noted that Chelan PUD would likely lose the resolution required to identify species if they went with a different type of light.

Tracy Hillman asked where Grant PUD's most upstream acoustic receiver is located? Steve Hemstrom commented that the Rock Island project area extends 1,000 ft downstream from the dam. Thus, Grant's receiver is more than 1,000 ft downstream from Rock Island Dam. Lance Keller commented that there have been scenarios where a lamprey tagged by Grant PUD has overwintered somewhere between Rock Island Dam and 1,000 ft downstream from the dam. Bob Rose added that the PUDs should look at the data for adults in the reservoirs and figure out how those data are to be included in the larger NNI component. Steve Hemstrom agreed that Rocky Reach Reservoir effects could be considered and could be added into the potential for NNI, but noted the larger concern for Chelan PUD and a necessary step for the RRFF is to identify and scope project reservoir effects that are likely to affect Pacific lamprey. So far, no operation effects have been identified and no one has identified or hypothesized how project operations affect adult lamprey in the reservoir. Bob Rose thinks sturgeon may be part of the equation and noted a balance must be achieved with the sturgeon and lamprey programs. Steve Hemstrom agreed that sturgeon could be affecting lamprey conversion rates, but added that one would not expect to see a drastic drop in conversion rates between Rocky Reach and Wells dams based solely on sturgeon predation or avoidance. Steve Hemstrom presented the following figure:



Tracy Hillman asked if conversion rates have dropped off this dramatically anywhere else in the Columbia River Basin. Steve Hemstrom replied not to his knowledge. RD Nelle asked if there was any difference in operations at Wells Dam. Members noted no changes in 2006. Kirk Truscott suggested looking at spill and discharge configuration, i.e., flow amounts may have stayed the same but the pattern of generation and spill may have changed. Steve Hemstrom remarked that the ups and downs of the conversion percentages (even before the dramatic decline in 2006) make him question the reasoning, because if you get one year with 27% conversion and another year with 60%, and the capabilities of the fish and the operation of the fishway are the same, you would not expect not to see this range of conversion percentages. Tracy asked Steve Hemstrom if there were any improvements in fish counting procedures at Rocky Reach Dam or Wells Dam that would perhaps explain some of the variation in conversion percentages. Steve Hemstrom replied that Chelan PUD would have to have missed (not counted) 80% of the fish at Rocky Reach to create such a percentage drop at Wells Dam.

Kirk Truscott remarked that there are acoustic tag data from last year that show last detections well downstream of what would be considered Wells Dam project effects. Some of these were last detected at Goosetail Island. Steve Hemstrom remarked that adult lamprey have to overwinter somewhere, adding that there is a fish alive in the Methow that's been there for three years. He stated whatever tag we put into these fish, we need time to see where they are going. Bob Rose suggested the group look back at the Mid-C's HCP meeting minutes from 2005 and 2006 to see what was going on at Wells and Rocky Reach dams that may help explain conversion percentages. Tracy suggested reviewing the 2005

and 2006 HCP Annual Reports instead of the meeting notes. Steve Lewis agreed to review the annual reports.

2016 PIT-Tag Study Results and Final Report

Steve Hemstrom reported that he asked Blue Leaf to re-check all interrogation sites for any new detections of the 211 PIT-tagged lamprey released in August 2016. This information will go into the 2016 passage study report, and then it will be finalized. Chelan PUD will continue to monitor 2016 tags even though the report will be final, because some of the fish tagged in 2016 may show up somewhere in two or three years. Steve Hemstrom will let the RRFF know of any new detections. Steve Hemstrom also asked Blue Leaf to include a figure in the report overlaying release dates with passage weeks to give the reader an idea of the length of time between release and detection at the top of Rocky Reach.

Update on Tumwater Dam Feasibility Study

Steve Hemstrom reported that Chelan PUD is still working on the feasibility study and no further decisions have been made. He added that he is working on the "biological expectations" white paper to help frame what might be expected for natural adult lamprey passage if such a facility were constructed. He asked the RRFF for any data they may have on historical runs of lamprey upstream from Tumwater Canyon. From what Steve has seen in the data so far, he is not convinced there were thousands of lamprey in the upper Wenatchee basin. Patrick Verhey noted that just because there are no historical data doesn't mean there were no lamprey. Biologists back then didn't care about lamprey, i.e., they didn't report the presence or abundance of lamprey.

Pacific Lamprey Passage Assumptions

Reporting and Discussion on Lamprey Passage Assumptions is deferred until the July meeting.

Rocky Reach PIT-Tag Detection Efficiencies for Salmonids

Reporting and discussion on Rocky Reach PIT-Tag detections for salmonids is deferred until the July meeting.

Adult Lamprey Diel Fishway Passage Timing, 2004-2016

Reporting and discussion on the Adult Lamprey Diel Fishway Passage Timing, 2004-2016 is deferred until the July Meeting.

Action Items:

- **Steve Hemstrom or Lance Keller will check with Thad Mosey on the accuracy of adult lamprey counts at Rock Island Dam.**
- **Steve Hemstrom will check to see if Chelan PUD did anything at Rocky Reach Dam to improve fish counts beginning in 2006.**
- **Steve Lewis will review 2005 and 2006 HCP Annual Reports to see if there were any changes in operations at Wells and Rocky Reach dams.**

VII. Bull Trout

Rocky Reach Bull Trout Study

Reporting and discussion on Bull Trout will be deferred until the next regular meeting of the RRFF.

VIII. Next Meeting

The next meeting of the RRFF will be a joint meeting with the PRFF to discuss Pacific lamprey NNI. The meeting is scheduled for Wednesday, 5 July 2017 from 9:00 a.m. to 4:00 p.m. and will be held at the Grant PUD office in Wenatchee at 11 Spokane St, Suite 205B (second floor of the GO USA building).