

**PUBLIC UTILITY DISTRICT NO. 1 of CHELAN COUNTY**  
P.O. Box 1231, Wenatchee, WA 98807-1231 • 327 N. Wenatchee Ave., Wenatchee, WA 98801  
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October 27, 2011

Honorable Kimberly D. Bose, Secretary, and  
Nathaniel J. Davis, Sr., Deputy Secretary  
FEDERAL ENERGY REGULATORY COMMISSION  
888 First Street, NE  
Washington, DC 20426

Re: Rocky Reach Hydroelectric Project, FERC No. 2145  
Request for Approval of "Adult Lamprey Upstream Passage Improvement" Design Drawings and Specifications, Final Phase, per License Article 401(b) and Article 5(4) of Appendix B

Dear Secretary Bose and Deputy Secretary Davis:

The Public Utility District No. 1 of Chelan County, Washington (Chelan PUD) hereby files for the Federal Energy Regulatory Commission's (Commission) approval of the final phase design drawings and specifications for construction of the "Adult Lamprey Upstream Passage Improvement" implementation measure as required in license<sup>1</sup> article 401(b) and article 5(4) of license appendix B for the Rocky Reach Hydroelectric Project No. 2145 (Project).

On January 21, 2011, the Commission issued an order<sup>2</sup> approving the Chelan PUD's first phase design drawings and specifications to modify the Project fishway to improve adult lamprey upstream passage as recommended in Section 5 of the *Pacific Lamprey Upstream Passage Modifications Literature Review and Analysis and Recommendation for Passage Improvements in the Rocky Reach Fishway (Plan)*.<sup>3</sup> The work included the fabrication and installation of aluminum ramps and plates, which was completed February 28, 2011.

Proposed Work

Under the final phase, Chelan PUD intends to install plating at all weir orifices, extending 24 inches upstream and 24 inches downstream from orifices, in the lower fish ladder section of the Rocky Reach fishway, consistent with Section 4.1.4 of the Rocky Reach Pacific Lamprey Management Plan.<sup>4</sup> These modifications were not installed during the 2010-2011 fishway maintenance period due to concerns raised by NOAA Fisheries of increasing water velocities across diffuser gratings due to plating installation, and subsequent plating design modifications to address the concern. The proposed schedule for completion is February 22, 2012 and the estimated construction cost is \$50,000.

<sup>1</sup> 126 FERC ¶ 61,138

<sup>2</sup> 134 FERC ¶ 62,062

<sup>3</sup> See [www.chelanpud.org/departments/licensingCompliance/rr\\_implementation/ResourceDocuments/34952.pdf](http://www.chelanpud.org/departments/licensingCompliance/rr_implementation/ResourceDocuments/34952.pdf)

<sup>4</sup> Chapter 5 of the Rocky Reach Comprehensive Settlement Agreement filed on March 20, 2006.

Ms. Bose and Mr. Davis, Sr.  
Federal Energy Regulatory Commission

Chelan PUD is submitting with this letter as Enclosure I, an original and one copy each of the items listed below. One of those copies will be a courtesy copy to the Director, Division of Dam Safety and Inspections. Additionally, one copy will be filed with the Commission's Portland Regional office by copy of this letter.

1. Design drawings and specifications to be used for the proposed construction.
2. Quality Control Inspection Plan (QCIP)
3. Temporary Construction Emergency Action Plan (TCEAP)

A Water Quality Protection Plan (WQPP) will not be included within Enclosure I for installation of the new plating because a minimum 300-foot flow path exists from the installation location of the new plates to the Columbia River, and the installation work will occur within the concrete fishway where sediment transport is not a concern.

We would appreciate any comments you may have as soon as practicable, as it would be helpful in our efforts to maintain the overall project schedule, which is to begin installation by the first week of January 2012.

**The material under Enclosure I meets the Critical Energy Infrastructure Information requirements under 18 CFR 388.113c. Chelan PUD requests the Commission to not release this information to the public.** The cover letter and the remaining enclosures are considered public.

Consultation

The Rocky Reach Fish Forum convened a conference call on July 6, 2011, to review and approve the proposed modifications for improving adult Pacific lamprey passage to be implemented during the 2011-2012 Rocky Reach fishway winter maintenance period. The minutes for this meeting are included to document Chelan PUD's consultation with the appropriate agencies and Tribes for implementing these modifications (see Enclosure II).

Accordingly, Chelan PUD respectfully requests your approval on the proposed design drawings and specifications for the "Adult Lamprey Upstream Passage Improvement, Final Phase" implementation measures.

Please contact me if you have any questions or require additional information.

Sincerely,



Michelle Smith  
Licensing & Compliance Manager  
(509) 661-4180  
michelle.smith@chelanpud.org

Enclosure I: Contract plans and specifications

Enclosure II: Rocky Reach Fish Forum Meeting Minutes, final, dated July 6, 2011

cc: Honorable Kimberly D. Bose, Commission (two copies of design drawings, with one copy as a courtesy copy to the Director of Division of Dam Safety & Inspections)

Doug Johnson, Commission Portland Regional Office (one copy of letter and design drawings)

**ENCLOSURE I:**  
**DESIGN DRAWINGS AND SPECIFICATIONS**

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*CEII CLASSIFIED DOCUMENT*

*CONFIDENTIAL AND PROPRIETARY INFORMATION OF CHELAN COUNTY PUD #1*

Members of the public interested in requesting CEII classified materials may contact Chelan PUD's public information officer for more information.

Public Information Officer  
327 North Wenatchee Avenue  
Wenatchee, WA 98801  
(509) 663-8121

**ENCLOSURE II:**  
**ROCKY REACH FISH FORUM**  
**MEETING MINUTES**

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# Rocky Reach Fish Forum Meeting Minutes

Date: 6 July 2011  
 Time: 9:00 – 12:00 noon  
 Conference Call

Call in number: (509) 661-4844, Password is 4000.

Meeting called by: Jeff Osborn, Chelan PUD  
 Type of meeting: RRF Meeting  
 Note taker: Debby Bitterman

## Representatives

<u>Name</u>	<u>Agency</u>	<u>Phone</u>	<u>Email</u>
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<b>Irlle, Pat</b> -phone	Ecology	(509) 454-7864	pir1461@ecy.wa.gov
<b>Jackson, Chad</b> -phone	WDFW	(509) 754-4624 x250	chad.jackson@dfw.wa.gov
<b>Lewis, Steve</b> -phone	USFWS	(509) 665-3508 x14	stephen_lewis@fws.gov
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<b>Osborn, Jeff</b>	Chelan PUD	(509) 661-4176	jeff.osborn@chelanpud.org
<b>Rose, Bob</b> -phone	YN	(509) 865-5121	rosb@yakamafish-nsn.gov
Vradenburg, Keith	City of Entiat	(509) 784-1500	kvradenburg.city@entiat.org

## Participants

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Nordlund, Bryan	NOAA	(360) 534-9338	bryan.nordlund@noaa.gov
Rosebrough, Susan	NPS	(206) 220-4121	susan_rosebrough@nps.gov
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<b>Verhey, Patrick</b> -phone	WDFW	(509) 754-4624	Patrick.Verhey@dfw.wa.gov
<b>Rainey, Steve</b> -phone	USFWS (consultant)	(503) 260-6990	wsteverainey@aol.com
Nelle, RD	USFWS	(509) 548-7573	RD_Nelle@fws.gov
<b>Miller, Donella</b> -phone	YN		

Attendees in BOLD

Meeting Purpose: Meeting of the Rocky Reach Fish Forum to continue Rocky Reach license implementation

## Minutes

Tracy Hillman welcomed everyone to the Rocky Reach Fish Forum (RRFF) conference call.

Tracy reviewed the agenda with the Forum. The Forum agreed to shuffle the agenda to accommodate the schedule of participants. The White Sturgeon discussion was moved to the front of the agenda. The notes below reflect the discussions, but not the sequence in which the topics were discussed.

Tracy reviewed the 1 June 2011 meeting minutes with the RRF. The minutes were approved with edits.

### Pacific Lamprey

#### Lamprey Passage Improvements

Chelan PUD submitted the following proposal for discussion and approval:

During the 2011-2012 winter fishway maintenance period, Chelan PUD will install plating at all weir orifices, extending 24 inches upstream and 24 inches downstream from orifices, in the lower fish ladder section of the Rocky Reach fishway to improve adult Pacific lamprey passage, pending approval from NOAA Fisheries (see Attachment 1).

Comments were received from Steve Rainey, USFWS Contractor, and Steve Lewis, USFWS (see Attachment 2).

After discussion, Tracy called for a vote on Chelan PUD's adult Pacific lamprey passage improvements proposal for installation during the 2011-2012 winter fishway maintenance period. **The Rocky Reach Fish Forum approved Chelan PUD's adult Pacific lamprey passage improvement proposal.**

#### *Action Item:*

- Once Jeff Osborn obtains data on the potential effects of the orifice plating on diffuser water velocities (velocities based on the most likely operating scenarios), he will present the adult Pacific lamprey passage improvements proposal to NOAA and the HCP Coordinating Committee for their approval.

#### Artificial Production

Tracy reported that the Artificial Production Report was received from the consultants and e-mailed to the RRF for their review. Although attendees found the report well written and comprehensive, they requested more time for a detailed review. Bob Rose noted that the document was not developed as a bookshelf ornament, but rather as a guiding document to implement propagation of Pacific lamprey in the region. To that end, the document is the beginning of a library on artificial supplementation of lamprey in the region.

#### *Action Item:*

- Bob Rose will send Tracy the Finnish Lamprey Propagation Cook Book (Nahkaisenviljelyä ja viljelykokemuksia Nejonögonodling och uppfödningserfarenheter). Tracy will forward this document to the RRF. [If "Hooked on Phonics" fails you, enjoy the pictures]
- RRF will review the Artificial Production Report and identify critical issues and next steps at the next RRF meeting.

#### Juvenile Lamprey Observations in the Rocky Reach Bypass

Lance Keller reviewed the juvenile Pacific lamprey collection data he provided to the RRF (see Attachment 3). He noted that they handled 1,002 lamprey (sizes from about 120-150 mm) during index sampling in the Rocky Reach bypass during May. Lance estimated that about 3,136 juvenile lamprey moved through the bypass in May. After reviewing flow and turbidity data, it was concluded that the large number of juvenile lamprey observed in the Rocky Reach bypass was related to high flows and increased turbidity.

#### *Action Item:*

- Jeff and Lance will follow-up with Thad Mosey and request that he check with Project Operators and notify Jeff or Lance of any observation of juvenile lamprey impingement during screen cleaning.

#### Reservoir Investigations for Ammocoetes

Ammocoete sampling, which is dictated by river flow (low flow and low load), will begin sometime in September or October. Sampling will occur in locations identified as part of the Bull Trout Stranding Investigation plan for Rocky Reach Reservoir. Sampling will occur in locations in Rocky Reach Reservoir that may be dewatered and also have appropriate juvenile lamprey rearing substrate.

*Action Item:*

- Jeff will include the information received from RD Nelle, USFWS, regarding methods and equipment for sampling juvenile lamprey in the sampling plan.

Lamprey Monitoring

Jeff reported that Chelan PUD has entered into a contract with Cramer Fish Sciences to install the Half Duplex detection antennas into Rocky Reach fishway as recommended by the RRFF. Installation will occur during the 2011-2012 winter maintenance period. Adult Pacific lamprey passage monitoring will begin in 2012.

Resident Fish

Jeff indicated that the PUD still does not have an executed payment agreement with WDFW. He also indicated that he spoke with Dave Burgess and that Dave thought that the results from the resident fish sampling efforts this year might not be representative of typical years, because macrophyte growth is far less than normal due to increased mainstem flows and decreased water temperatures within the Rocky Reach Reservoir. Given that there are only two or three future resident fish sampling events required under the current license, Dave recommended that it may be best to postpone the sampling until next year.

*Action Item:*

- Jeff will do some internal investigations and then draft an e-mail and send it to the RRFF describing proposed next steps.

White Sturgeon

Josh Murauskas provided a quick update on the juvenile white sturgeon released earlier this year, noting that they must be staying close to the release point because only a few of the acoustic-tagged fish have been detected at Beebe Bridge.

Josh also provided an update on broodstock collection. Several efforts for broodstock collection have occurred this past month resulting in the capture of 2-3 females and 9-10 males. Fish were captured at different stages of maturity and without temperature control at Marion Drain to maintain the fish it has been difficult to control maturation rate. Currently fertilized eggs from a 1x1 matrix (both from Rock Island tailrace) have been transported to Chelan Falls Hatchery and Marion Drain. Chad Jackson noted that approximately 95,000 eggs were successfully produced from the 1x1 matrix and were split between Chelan Falls Hatchery (about 38,000) and Marion Drain (remainder).

Josh reported that the 2011 broodstock collection activities are complete and there is a possibility that the 2x2 minimum spawning matrix goal (for stocking 6,500 juveniles) may not be reached this year. Therefore, Josh suggested that the RRFF think of potential next steps in case we are short of reaching our goal. He offered the following options:

- Stock a lower number of juveniles.
- Obtain juveniles from another white sturgeon program (i.e., Roosevelt/Cranbrook Fish).

Bob Rose gently reminded the Forum that the latter option is not an option and should not be considered. Donella Miller, Yakama Nation, noted that in two weeks we should have a more clear idea as to the outcome of a 2x2 mating matrix. If this is successful, then reaching the 2012 goal of releasing 6,500 fish into Rocky Reach Reservoir would be obtainable.

After further discussion, it was noted that additional conversation and information are needed before final recommendation(s) can be developed. Bob Rose recommended that the White Sturgeon Technical Workgroup meet to discuss future options and lessons learned.

*Action Item:*



- Josh will organize a Mid-Columbia White Sturgeon Technical Workgroup meeting to continue coordination and collaboration, and to discuss broodstock collection and release of white sturgeon. Josh will forward the Mid-Columbia White Sturgeon Technical Workgroup recommendation(s) to the RRF.

#### QAPP

Steve Hays noted that he will be developing the Quality Assurance Project Plan (QAPP) over the next two weeks.

#### Next Steps

Next RRF meeting has been tentatively scheduled as a conference call on Wednesday, 3 August 2011. The time is yet to be determined.

## Attachment 1

### ROCKY REACH FISH FORUM ROCKY REACH PACIFIC LAMPREY MANAGEMENT PLAN

#### Adult Pacific Lamprey Passage Improvements Proposal for Installation During the 2011-2012 Winter Fishway Maintenance Period

June 23, 2011

#### Proposal

Install plating at all weir orifices, extending 24 inches upstream and 24 inches downstream from orifices, in the lower fish ladder section of the Rocky Reach fishway to improve adult Pacific lamprey passage, pending approval from NOAA Fisheries.

#### Rationale

The Pacific Lamprey Upstream Passage Modifications Literature Review/Analysis/Recommendations for Improvements in the Rocky Reach Fishway identified and prioritized adult Pacific lamprey passage improvement measures that have been installed and tested at other dams on the Columbia and Snake rivers and would have a high likelihood of improving adult Pacific lamprey passage at Rocky Reach Dam (Section 6.0 Prioritization of Recommendations). Several proposed modifications (Items #1, #2, and #4) involved installing 18-inch wide plating on diffuser gratings in the fishway. The Rocky Reach Fish Forum (RRFF) approved installing plating on diffuser gratings in the trifurcation pool and lower fish ladder sections, and ramps at perched orifices in the upper fishway during the 2010-2011 winter fishway maintenance period. Because of a lack of time for design, fabrication, and installation, and questions regarding potential increases in water velocities across diffuser gratings and potential impacts to adult salmonid passage in the lower fishway, plating was not installed in the lower fishway during the 2010-2011 maintenance period.

Chelan PUD has since estimated potential changes in water velocities associated with installing plating of various widths (up to 18-inches wide) across the lower fishway diffuser gratings. Those calculations showed increases in water velocities across diffuser gratings from the installation of all the sizes of plating analyzed (Table 1). NOAA Fisheries reviewed these calculations and concluded that the installation of any of the analyzed widths of plating on diffuser gratings may have an adverse effect on adult salmonid passage. Therefore, at this time, Chelan PUD is not recommending the installation of plating on diffuser gratings in the lower fishway.

However, based on work conducted by Grant PUD at Priest Rapids Dam, Chelan PUD believes that the installation of plating at the weir orifices in the lower fishway will improve lamprey passage through the lower fishway. Grant PUD installed plating at orifices in the Priest Rapids fishway during the 2009-2010 winter maintenance period and monitored adult Pacific lamprey passage during 2010. Infrared video showed that all of the adult Pacific lamprey that approached orifices attached to the plating and passed successfully through the orifices. Based on the success demonstrated by Grant PUD in 2010, the similarity of Priest Rapids fishway water velocities to Rocky Reach conditions<sup>1</sup>, and completion of the prioritized list of physical measures proposed for installation in the upstream passage literature review, Chelan PUD is requesting the RRFF to approve the installation of plating at the weir orifices in the lower fish ladder section of the Rocky Reach fishway during the 2011-2012 winter fishway maintenance period.

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<sup>1</sup> Chelan PUD and Lowell Rainey recently measured water velocities within the lower fishway pools and found that the velocities were within the free-swimming capabilities of adult lamprey. Velocities ranged primarily from 2.0 to 4.0 f/s.

The RRFF has approved a monitoring plan for assessing the effectiveness of lamprey passage improvements in the Rocky Reach fish ladder. If monitoring determines that there is still a passage problem in the lower fishway, then additional passage improvement measures will be considered by the RRFF.

Table 1. Calculated velocities associated with different sized plates attached to the diffuser gratings.

Chamber A Flow Calculations (Sluice Gates A1-A8 Open)			
	Pre-Modifications	Post Modifications	Average Diffusion Velocity
Diffusion Chamber A	167 sq. ft	No Change	.53 ft/s
Diffusion Chamber A - 18" Plating		121 sq. ft	.74 ft/s
Diffusion Chamber A - 16" Plating		127 sq. ft	.7 ft/s
Diffusion Chamber A - 14" Plating		131 sq. ft	.68 ft/s
Diffusion Chamber A - 12" Plating		136 sq. ft	.66 ft/s
Diffusion Chamber A - 10" Plating		143 sq. ft	.63 ft/s
Diffusion Chamber A - 8" Plating		150 sq. ft	.6 ft/s

Fishway Attraction Water Flow (Ref. Fishway Operation Manual, pg 26)	3,875 cfs
Assumed Flow Through One "A" Chamber	89 cfs

Assumptions:

- Flow through diffusion chamber A has not been measured. Flow to each diffusion chamber is calculated based upon area proportions.
- Field verification of diffusion chamber and grating dimensions has not been performed.
- Sluice gates A1-A8 open and A9-A13 closed is a normal operating mode (based upon discussion with RR Fishway Operator).
- RR Fishway Operator has not altered fishway flows due to the installation of plating in the trifurcation pool.

## Attachment 2

Steve Rainey Fish Passage Engineering  
15313 SE Evergreen Hwy  
Vancouver, WA 98683  
Cell: 503-260-6990

July 5, 2011

To: Steve Lewis, FWS-Wenatchee

Fr: Steve Rainey

**Subject: Adult Pacific Lamprey Passage Improvements, Proposal for Installation During the 2011-2012 Winter Fishway Maintenance Period (dated June 23, 2011)**

The following is my response to the 2011-12 Lamprey Passage Improvements Proposal sent out by Chelan PUD for comment and approval. Italicized references are quotes from the proposal:

1. *Rationale, 1<sup>st</sup> Paragraph – “The Rocky Reach Fish Forum (RRFF) approved installing plating on diffuser gratings in the trifurcation pool and lower fish ladder sections, and ramps at perched orifices in the upper fishway during the 2010-2011 winter fishway maintenance period.”*

Response:

- Rocky Reach lower ladder pools have staggered orifices, which means lamprey must zig-zag from side to side as they pass each lower ladder weir at the upstream end of the transport channel. This no doubt induces increased lamprey passage delay, relative to ladders with aligned orifices on each side of each weir.
- The 2004 telemetry study median passage time for tagged lamprey through the trifurcation pool was 12-15 m/min, and through the lower ladder transportation channel was even slower at 7.2 m/min. The staggered orifices apparently contribute to slower passage through this segment of the ladder.
- RRFF approved installation of using lower ladder floor diffuser plates in the 2010-11 ladder maintenance period; however, there was not enough time to install plates because the ladder needed to be watered-up. In the 2011-12 proposal, only orifice plates at each lower ladder staggered orifice are proposed to aid lamprey passage. (NOAA has rejected installation of perimeter plates in diffuser pools due to salmon passage concerns.)
- Floor diffuser plates to aid lamprey searching for the next, opposite side orifice are not proposed for 2011-12, which FWS believes may sustain the slower lamprey passage times through this section of the Rocky Reach ladder.
- It could be argued, based on the 2004 telemetry passage time data, that the lower lamprey transport channel should have been a greater priority for passage improvements than the trifurcation pool. Floor diffuser plates were added in the trifurcation pool during the 2010-11 ladder maintenance period, to aid lamprey exhibiting fasten-burst repetitive movement along the

floor; however, there was insufficient time to allow approval and installation of transport channel, lower ladder perimeter floor diffuser plates before the ladder was watered up.

2. *Rationale, 2<sup>nd</sup> Paragraph – “Therefore, at this time, Chelan PUD is not recommending the installation of plating on diffuser gratings in the lower fishway.”*

Response:

- Prior to 2010-11 fish ladder maintenance shutdown period, the RRF believed that passage improvements were needed in the lower ladder weir pools, primarily those with add-in floor diffusers pools with staggered orifices. As the ladder has staggered orifices in each successive ladder weir, lamprey can only pass along the floor at present by entering the floor diffuser pool through the orifice on one side of the weir, then swimming long enough to find and pass the opposite side orifice in the next upstream weir.
  - Result of lamprey not being able to find and pass the next opposite side orifice is uncertain. If lamprey become exhausted, due to no floor plating on which to rest, they may be swept back downstream. (In the 2004 telemetry study, 33.6% of lamprey fell back from the lower ladder and were last seen in the tailrace.)
  - The proposed 2011-12 orifice plates will provide rest for lamprey able *that have found* the opposite side orifice before becoming exhausted. This would allow them to rest before passing upstream through the orifice to the next pool.
  - The current 2011-12 proposal does not provide any other plating for lamprey resting between opposite side orifices in lower ladder floor diffuser pools. This increases the probability that many lamprey will not readily find the opposite side orifice, become exhausted, and will either fall back, delay passing this section of the ladder, or pass through floor diffusers and into the Auxiliary Water System (AWS).
  - The proposed orifice plates occlude some surface area of floor diffusers, and incrementally increase average floor diffuser velocity. It is uncertain whether NOAA will approve orifice plate installation at Rocky Reach.
  - If they are approved, the orifice plates should aid lamprey passage for those lamprey finding the next upstream opposite side orifice in the Rocky Reach ladder. However, FWS is concerned that lamprey without endurance to find the opposite side orifice may incur excessive delay, pass through floor diffusers and become lost in the AWS, or be swept back downstream.
  - Unanswered Questions: Do lamprey have the endurance to swim indefinitely before finding the orifice plate at the opposite side orifice? If they do not readily find the orifice plate, because there is no other floor diffuser plating between the opposite side orifices, will they fall back downstream? Will their delay continue to be excessive in this ladder section? Or (worse) will they pass through floor diffusers and be lost in the Auxiliary Water System (AWS) and unable to return to the fish ladder (a problem noted in the 2004 telemetry study report)??
3. *Rationale, 3<sup>rd</sup> Paragraph – “...based on work conducted by Grant PUD at Priest Rapids Dam, Chelan PUD believes that the installation of plating at the orifices in the lower ladder weirs will improve lamprey passage through the lower fishway.”*

- Priest Rapids Dam lower ladder design is not similar to Rocky Reach. It has orifices on each side of their lower ladder floor diffuser pools, enabling lamprey to more readily find the next, directly upstream orifice.
  - Orifice plates may or may not be approved by NOAA for Rocky Reach, due to concern that salmon passage may be adversely impacted. Priest Rapids has 0.25 fps floor diffuser velocity, far below the NOAA 0.5 fps average velocity limit. Any floor diffuser increase at Rocky Reach, even the proposed orifice plates, will increase velocities above 0.5 fps limit.
4. *Rationale, 3<sup>rd</sup> Paragraph – “Infrared video showed that all of the adult Pacific lamprey that approached orifices attached to the plating and passed successfully through the orifices”.*
    - This does not say all lamprey entering the floor diffuser pool approached the next upstream orifice plates. Even though there are orifices on both sides of each weir, which suggests lamprey more readily find the next upstream orifice at Priest Rapids, the issue of whether any tired before approaching the orifice plates is not addressed? While that number may have been small at Priest Rapids, it may be more significant at Rocky Reach, where the single staggered orifices present a higher probability that some lamprey would not have endurance to swim and find the opposite side orifice without becoming exhausted.
  5. *Rationale, 3<sup>rd</sup> Paragraph – “Based on... the similarity of Priest Rapids fishway water velocities to Rocky Reach conditions<sup>2</sup>... Chelan PUD is requesting the RRFF to approve the installation of plating at the weir orifices in the lower fish ladder section of the Rocky Reach fishway during the 2011-2012 winter fishway maintenance period.” Footnote: Chelan PUD and Lowell Rainey recently measured water velocities within the lower fishway pools and found that the velocities were within the free-swimming capabilities of adult lamprey. Velocities ranged primarily from 2.0 to 4.0 f/s.*
    - Reference to velocity readings of 2.0 to 4.0 fps are not specific. Project discharges and tailwater elevations are constantly changing. FWS is interested in location of the readings, project discharge, tailwater elevations, how far downstream of the staggered orifice readings were taken, which floor diffusers were discharging and which were not, and what measured velocities occurred at other points in the transect. This gives a fuller picture of which floor diffusers were discharging and the exact conditions at the point in time the measurements were taken.
    - *Free-swimming capabilities of adult lamprey* address swimming speeds in a laboratory type stamina tunnel, but do not reference the question of lamprey stamina. If lamprey have extended stamina, their ability to find and then pass the opposite side orifice is not in question. However, it is likely that their stamina is not sufficient for all lamprey entering a floor diffuser pool to find the opposite side orifice before becoming exhausted. This is especially true if there is no plating to rest on between staggered orifices.
  6. *Rationale, 2<sup>nd</sup> Paragraph - NOAA Fisheries reviewed these calculations and concluded that the installation of any of the analyzed widths of plating on diffuser gratings may have an adverse effect on adult salmonid passage.*
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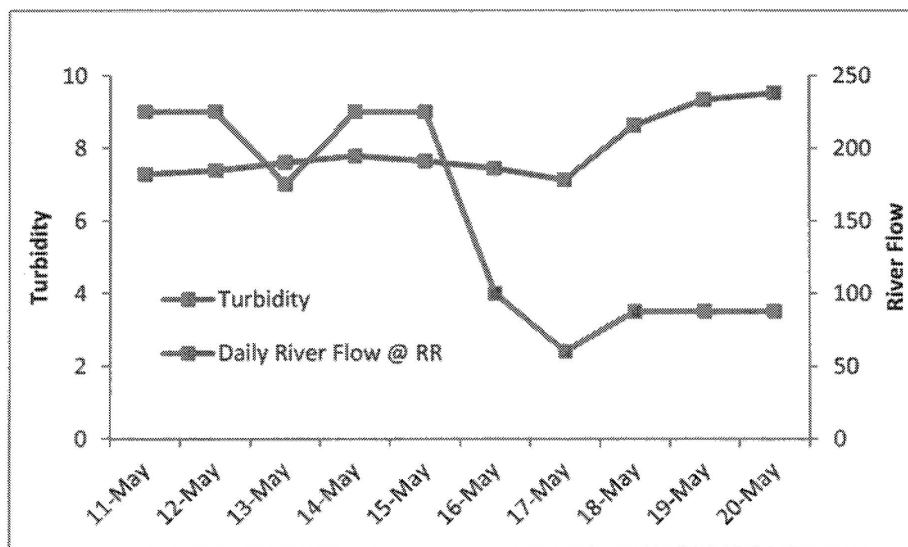
- NOAA expressed concerns that perimeter plating may adversely impact salmon passage, but did not say plates for improving lamprey passage would not be helpful, nor should not be implemented.
- In my conversation with Bryan Nordlund (NOAA), he did verbally approve a concept where (1) an approximately 8-inch wide floor plating elevated a few inches above longitudinal floor diffuser support beam and the floor diffusers themselves, extends from the downstream orifice directly upstream to the next weir. Adding an orifice (2) in the next upstream weir at the upstream end of this beam (with invert just above the floor diffuser elevation) would enable lamprey to pass directly upstream, and not have to find the opposite side orifice. This would be more similar to the Priest Rapids lower ladder layout. NOAA's idea does not result in increased floor diffuser velocities, since the added plate is nearly the same as the beam flange width, and elevated a couple inches. Confirmation that changes in ladder hydraulics would small would be needed.

If the RRF receives permission from NOAA to install orifice plates as proposed, FWS is open to PIT detection installation at successive weir staggered orifices (in upstream and downstream weirs of a floor diffuser pool) in 2012 that will answer the question of whether some lamprey are becoming exhausted and not passing the next upstream weir opposite side orifice. However, we are concerned about ignoring this issue and having no concrete plans to address it in the future. A depiction of proposed PIT detector locations, and a discussion of whether those currently planned detector locations will address this issue with the current proposal would be helpful.

### Attachment 3

#### Juvenile Lamprey Collections at Rocky Reach JSF

Sample Date	Start Time	Stop Time	Min.	Sec.	sec/60	Number of lamprey handled					Turbidity
						Lamprey Handled	Collection Time (Min)	Fish/min	20 Min Exp.	Hourly Exp.	
5/16/11	21:00:04	21:06:35	6	31	0.52	12	6.52	1.84	37	110	4
5/16/11	22:00:00	22:20:00	20	0	0.00	176	20.00	8.80	176	528	
5/16/11	23:00:00	23:20:00	20	0	0.00	126	20.00	6.30	126	378	
5/17/11	0:00:36	0:20:37	20	1	0.02	172	20.02	8.59	172	516	2.4
5/17/11	1:00:00	1:20:00	20	0	0.00	115	20.00	5.75	115	345	
5/17/11	2:00:02	2:20:02	20	0	0.00	127	20.00	6.35	127	381	
5/17/11	2:59:59	3:20:02	20	3	0.05	89	20.05	4.44	89	266	
5/17/11	4:00:02	4:20:02	20	0	0.00	42	20.00	2.10	42	126	
5/17/11	5:00:01	5:19:05	19	0	0.00	20	19.00	1.05	21	63	
5/17/11	22:00:02	22:20:20	20	18	0.30	14	20.30	0.69	14	41	
5/17/11	23:00:00	23:20:00	20	0	0.00	26	20.00	1.30	26	78	
5/18/11	0:00:00	0:20:00	20	0	0.00	25	20.00	1.25	25	75	3.5
5/18/11	1:00:01	1:20:00	19	59	0.98	27	19.98	1.35	27	81	
5/18/11	2:00:01	2:20:01	20	0	0.00	20	20.00	1.00	20	60	
5/18/11	3:00:01	3:20:02	20	1	0.02	23	20.02	1.15	23	69	
5/18/11	4:00:00	4:20:02	20	2	0.03	6	20.03	0.30	6	18	
Total						1002			1045	3136	





Chelan County PUD  
 DAILY SHIPMENT DETAIL REPORT  
 27-Oct-2011 - 2:40:33 PM

Pickup Date: 27-Oct-2011  
 Pickup Record No.: 4140 4465 20

UPS Account No.: E9E619  
 Sorted By: Order of Shipment

All charges are in USD; fuel surcharge included where applicable.

Name / Address	Shipment Detail	Options	Published Rate Charges	CCC Rate Charges
<b>Ship To:</b> Kimberly D. Bose/Nathaniel Davis FERC 888 FIRST STREET NE WASHINGTON DC 20426-0001 United States	Service Type: NEXT DAY AIR Total Packages: 1 Billable Wt.: LTR Transportation: Shipper	Shipment Service Charge:	31.86	31.86
<b>Ship From:</b> Michelle Smith/Licensing & Complian Chelan County PUD 327 N. Wenatchee Ave WENATCHEE WA 98801	Tracking No.: 1ZE9E6190155469794 Package Type: UPS Letter	Package Service Charge: <b>UPS Total Charge:</b>	31.86 <b>31.86</b>	31.86 <b>31.86</b>
<b>Ship To:</b> Douglas L. Johnson FERC SUITE 550 805 SW BROADWAY PORTLAND OR 97205 United States	Service Type: NEXT DAY AIR Total Packages: 1 Billable Wt.: LTR Transportation: Shipper	Shipment Service Charge:	19.15	19.15
<b>Ship From:</b> Michelle Johnson/Licensing & Compli Chelan County PUD 327 N. Wenatchee Ave WENATCHEE WA 98801	Tracking No.: 1ZE9E6190156062604 Package Type: UPS Letter	Package Service Charge: <b>UPS Total Charge:</b>	19.15 <b>19.15</b>	19.15 <b>19.15</b>

Summary Totals:

Shipment Option	Shpts	Pkgs	Pub Charges	CCC Charges	Billing Option	Shpts	Pkgs	Pub Charges	CCC Charges
					Prepaid	2	2	51.01	51.01
Package Option		Pkgs	Pub Charges	CCC Charges	<b>TOTAL CHARGES</b>			<b>51.01</b>	<b>51.01</b>
					2 Shipment(s)				
					2 Package(s)				

All charges are in USD; fuel surcharge included where applicable.

Your invoice may vary from the displayed rates.

\* Indicates Shipper-Paid Declared Value