Priest Rapids Fish Forum

Conference Call

Wednesday, 7 January 2026
9:00 a.m. – 11:30 a.m.

FINAL MINUTES

PRFF Members

Michael Lucid, USFWS
Ralph Lampman, Keely Murdoch, YN
Nathan and Clayton Buck, Wanapum
Jason McLellan, Bret Nine, CTCR
Mike Clement, Chris Mott, Grant PUD
Tracy Hillman, Chair
Patrick Verhey, Laura Heironimus, WDFW
Melissa Peterson, Chad Brown, Ecology
Aaron Jackson, Carl Merkle, CTUIR
Steve Lewis, BIA
Pete McHugh, CRITFC

Meeting Attendees

Mike Clement, Grant PUD
Melissa Peterson, Ecology
Joseph LeMoine, Grant PUD
Chris Mott, Grant PUD
Tygh Schuster, YN
Michael Lucid, USFWS
Pete McHugh, CRITFC
Nathan Buck, Wanapum
Tracy Hillman, Chair
Ralph Lampman, YN
Nate Patterson, YN
Shannon Adams, YN
Jason, McLellan, CTCR
Patrick Verhey, WDFW
Todd Miller, WDFW
Tim Taylor, Grant PUD
Steve Lewis, BIA

Action Items:

- Laura Heironimus will update the White Sturgeon Spontaneous Autopolyploidy Guidance document based on recently published literature.
- Melissa Peterson will share some slides with the PRFF that describe the WQAP evaluation criteria.

- Mike Clement will check with Gabriella Brill (ODFW) to see whether she is able to present her White Sturgeon telemetry results to the PRFF in March.
- Ralph Lampman will contact Ryan Harnish (PNNL) and see if Ryan can provide more information on his power analysis for estimating sample sizes for a juvenile Pacific Lamprey study at the dam (assuming a ViRDCt model and different standard errors).
- Tracy Hillman will coordinate with the RRFF to see if the RRFF can meet with the PRFF in February to discuss juvenile lamprey survival studies.

I. Welcome and Introductions

Tracy Hillman welcomed everyone to the meeting and identified all attendees.

II. Agenda Review

The PRFF reviewed and approved the January agenda with one addition: Interest in a presentation from Gabriella Brill (ODFW) on her White Sturgeon telemetry work downstream from McNary Dam.

III. Approve December Meeting Notes

The PRFF reviewed and approved the 3 December 2025 meeting minutes with edits.

IV. Review Action Items

The PRFF reviewed the following action items from the December meeting:

- Laura Heironimus will update the White Sturgeon Spontaneous Autopolyploidy Guidance document based on recently published literature. **Ongoing.**
- Grant PUD will consider the request to collect genetic samples (e.g., fin clips) from a subsample of adult lamprey collected at Priest Rapids Dam for analysis by CRITFC. **Complete. Because Grant PUD does not anesthetize lamprey collected at Priest Rapids Dam and they do not have a crew trained to anesthetize fish, they will not collect tissue samples for genetic analysis from a sample of lamprey collected at the dam. They will reconsider this after the current SOA expires.**
- Jason McLellan will share the user-manual for the White Sturgeon life-cycle model with the PRFF. **Complete.**
- Laura Heironimus will update her Bonneville Reservoir White Sturgeon spreadsheet to include adult sturgeon per km. **Complete.**
- Tracy Hillman will request permission from Douglas PUD to share their "Juvenile Pacific Lamprey Passage Study Plan Outline" with the PRFF. **Complete.**
- PRFF members will discuss the spatial scale of a juvenile Pacific Lamprey survival study and the appropriate model to use within their respective agencies. They will share those results with the group during the January meeting. **Complete. Addressed during today's meeting.**
- PRFF members will consider the size of the survival standard error for a valid juvenile Pacific Lamprey survival study and identify appropriate sample sizes. **Ongoing. This was discussed during today's meeting.**

V. Water Quality

Columbia River Water Temperature TMDL – Tim Taylor reported that they (Grant PUD) are on track to meet the schedule for completing the Water Quality Attainment Plan (WQAP). Tim noted that they have assembled their project team, identified project concepts, and developed evaluation criteria. On 30 December, they sent a draft memo that identifies their evaluation criteria to Ecology. Ecology is currently reviewing the draft memo. Melissa Peterson added that she can share some slides with the PRFF that describe the evaluation criteria and how they are used in the process.

Other Water Quality Items – No additional water quality items were discussed.

VI. White Sturgeon

White Sturgeon Hatching and Rearing – Tygh Schuster provided an update on the status of juvenile White Sturgeon at the Yakama Nation Sturgeon Facility. He said the fish are looking good and they continue to grow. Based on sampling fish on 29 December, the current tank counts and average fish weights are as follows:

- Tank 1: 452 fish at 22.92 grams/fish
- Tank 2: 548 fish at 23.08 grams/fish
- Tank 3: 36 fish at 24.71 grams/fish
- Tank 4: 1,058 fish at 18.27 grams/fish
- Tank 5: 252 fish at 16.27 grams/fish
- Tank 6: 298 fish at 14.15 grams/fish

Presentation by Gabriella Brill – Mike Clement asked whether the PRFF would be interested in hearing a presentation by Gabriella Brill (ODFW) on her research on movement of adult White Sturgeon downstream from McNary Dam. Mike reminded members that during broodstock collection efforts, Grant PUD helped Gabriella with tagging White Sturgeon with acoustic tags. Now that Gabriella has finished her thesis, she is willing to present her work to the PRFF.

Members indicated that they would like to hear about her work and recommended that she present her results to the PRFF during the March meeting. Mike will check with Gabriella to see whether she is able to present to the PRFF in March. Steve Lewis asked whether her thesis was available for review before the March meeting. Here is a link to her thesis: Gabriella Brill Thesis

Other White Sturgeon Items – No additional White Sturgeon items were discussed.

VII. Pacific Lamprey

Juvenile Pacific Lamprey Survival Studies – Tracy Hillman reminded members that they had a couple action items from last month: (1) members will discuss the spatial scale of a juvenile Pacific Lamprey survival study and the appropriate model to use within their respective agencies and (2) members will consider the size of the survival standard error for a valid juvenile Pacific Lamprey survival study and identify appropriate sample sizes. Regarding the first action item, Tracy said there are two different spatial scales at which to conduct a survival study: project scale and at the dam. There are also two different models: Virtual/Paired Release (ViPRe) and Virtual Release/Dead-Fish Correction (ViRDCt) model. Last month, members were leaning toward conducting the study at the dam and using the ViRDCt model but wanted to discuss these within their respective agencies. Tracy asked each member

present whether they support conducting the study at the dam and using the ViRDCt model. Responses were as follows:

- Ralph Lampman: YN supports the study at the dam and using the ViRDCt model and would like all PUD studies occurring in the same year and coordinated.
- Michael Lucid: USFWS supports the study at the dam and using the ViRDCt model.
- Patrick Verhey: WDFW supports the study at the dam and using the ViRDCt model; however, Patrick would like to discuss this with Laura.
- Steve Lewis: BIA supports the study at the dam and using the ViRDCt model and would like to see the PUDs conduct the studies at the same time.
- Pete McHugh: CRITFC supports the study at the dam and using the ViRDCt model.
- Jason McLellan: At this time, CTCR supports the study at the dam and using the ViRDCt model; however, Jason still needs to discuss this with Kirk Truscott.
- Mike Clement: Grant PUD supports the study at the dam and using the ViRDCt model.
- Melissa Peterson: Ecology supports the study at the dam and using the ViRDCt model.

Tracy said given the general agreement to conduct the study at the dam and use the ViRDCt model, the next step is to consider the size of the survival standard error for a valid juvenile Pacific Lamprey survival study and identify appropriate sample sizes. This was the second action item for members. Referring to the Upper Columbia Juvenile Lamprey Source Datasheet that Ralph Lampman prepared for the PRFF, Tracy showed the following table:

SE	Half of 95% C.I.	Full 95% C.I.	Min for 50% Mean Survival Rate	Max for 50% Mean Survival Rate	Min for 90% Mean Survival Rate	Max for 90% Mean Survival Rate
0.100	0.196	0.392	30.4%	69.6%	70.4%	109.6%
0.050	0.098	0.196	40.2%	59.8%	80.2%	99.8%
0.030	0.059	0.118	44.1%	55.9%	84.1%	95.9%
0.025	0.049	0.098	45.1%	54.9%	85.1%	94.9%
0.015	0.029	0.059	47.1%	52.9%	87.1%	92.9%

This table, prepared by Ralph, shows the 95% confidence intervals (CI) associated with different survival standard errors (SE). For example, for a 90% survival estimate with a SE of 5%, the 95% CI would be 80.2-99.8%. In contrast, for a 90% survival estimate with a SE of 2.5%, the 95% CI would be 85.1-94.9%. Recalling a question by Jason and Laura during the last meeting, Tracy asked how these results will be used to identify mitigation. For example, if a study estimates that 90% of the juvenile lamprey survive passing the dam, with a SE of 5%, the "true" survival estimate is likely between about 80% and 100%. How will mitigation be determined for a point estimate with such a large CI?

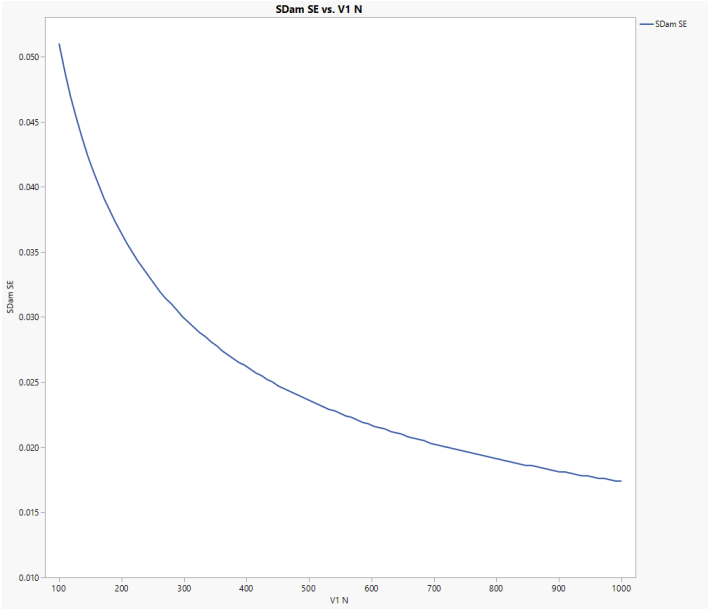
Ralph Lampman responded that he is more concerned with trying to understand in general what the juvenile survival rate is in the project area. For example, is survival relatively high (~90%) or low (<50%)? He does not want to postpone a survival study another 10 years to make sure we have everything perfect to meet, say, a 2.5% SE. Ralph did acknowledge that there are benefits to having a large sample size and trying to achieve a 2.5% SE, but that may not be doable in the short term, and he does not believe it is worth postponing the study another 10 years. Ralph noted that a "buffer" could be added to

the estimate if there is a concern about the large CIs. Ralph reminded everyone that it is also important to identify the pathways used by juvenile lamprey passing through dams. Different routes may have differential effects on fish passage success, which would be important to know. This information would be useful when discussing possible mitigation.

Mike Clement indicated that because they have a NNI (no net impact) requirement, they believe the SE should be 2.5%. This is consistent with their juvenile salmonid survival study requirements. This SE was decided by all parties for salmonid studies before the studies were conducted. Because the studies should generate a survival estimate with relatively high precision, mitigation is based on the point estimate. Pete McHugh agreed and said the point estimate is the value used for mitigation and they try to achieve a SE of 2.5% in salmonid studies; however, based on his understanding, if, after conducting the survival study, the point estimate has a SE greater than 2.5%, the Priest Rapids Coordinating Committee can accept the estimate with a higher SE or request a redo of the study. He added that although the frameworks for a juvenile salmonid study and a juvenile lamprey study are different, the core concepts appear to be similar.

Ralph said he understands the concern about having a precise survival estimate but there are more uncertainties associated with a juvenile lamprey study and therefore accepting a higher SE would be appropriate. He reiterated that a buffer could be added to the point estimate if members are concerned about a large CI. He added that based on his calculations, there is only about a 5-percentage point difference on the tails of the 95% CI between a 2.5% and 5.0% SE.

Michael Lucid asked whether it is possible to run a power analysis to show the relationship between different SEs and sample sizes. If there is not a large difference in the number of fish needed to conduct a survival study with a SE of 2.5% versus 5.0%, then we may be able to agree to a SE of 2.5%. At the least, this would help us determine whether a study with a SE of 2.5% is feasible and fundable. Ralph indicated that Ryan Harnish generated a graph that shows the relationship between sample size and SE. Ralph posted the following figure in the Chat:



The figure shows that for a SE of 2.5%, one would need between 400-500 tagged juvenile lamprey at V1 (virtual array). For a SE of 5%, one would need about 100 tagged juvenile lamprey at V1. Ralph was not certain what assumptions attended Ryan's analysis.

Mike Clement indicated that he asked LGL to run a power analysis to determine the minimum sample size for a juvenile lamprey study using the ViRDCt model and a SE of 2.5%. LGL estimated that 2,300 juveniles would be needed. This estimate would be for studies at both Wanapum and Priest Rapids dams; therefore, the sample size per dam would be 1,150 juvenile lamprey. He said, based on Ralph's spreadsheet, it is unlikely we can capture enough juveniles to conduct the study with a SE of 2.5%. Ralph noted that according to Ryan's analysis, which is also based on the ViRDCt model, about 500 juveniles would be needed per dam for a study with a SE of 2.5%. Ralph said we need more information on how LGL and Ryan conducted the power analyses. Pete indicated that it appears Ryan's estimates include estimating passage-specific survival rates. Thus, his estimates of sample sizes may be higher than needed if we are only interested in overall passage survival at a dam. Mike responded that the Pacific Lamprey Management Plan calls for route-specific survival rates. Therefore, a larger sample size would be needed. Pete noted that the juvenile salmonid studies in the project area are not designed to evaluate route-specific survival rates. Therefore, the dams will not be wired to address the requirements for a juvenile lamprey survival study. Pete added that we also need some estimate of difference or effect size. He agreed with Ralph that more information is needed on how the power analyses were conducted.

Ralph said he would reach out to Ryan for more information on his power analysis. Mike said he could also reach out to Dave Robichaud for more information on his analyses. Tracy also reminded members to consider how we intend to address predation effects on survival. This was an issue Jason identified during the last few meetings. Mike added that because Grant PUD and Chelan PUD have similar juvenile lamprey requirements, it may be useful to have a joint PRFF and RRFF meeting next month on this one item. This would avoid having to discuss the same thing separately within each group. It is probably not necessary to invite the ASWG because Douglas PUD's requirements are generally different than Chelan and Grant PUDs.

The group agreed that we should first seek information from Ryan before contacting LGL. Ryan likely has all the information, including R code, needed to evaluate the power analyses. Ralph said he will reach out to Ryan. Tracy will coordinate with the RRFF and see whether they are open to meeting with the PRFF on the topic of juvenile lamprey survival studies.

Ralph said he still prefers to have the survival studies coordinated among the PUDs. Studies conducted in the same year will provide more information on fish passage through the hydrosystem. Although this will require more fish, if 500 are needed per dam, the total number for a system-wide study would be about 2,000 juveniles. This may be doable and if we agree to not estimate route-specific survival rates, the number of fish needed to conduct a system-wide study could be less than 2,000 juveniles. Ralph also pointed out that regional coordination is called out in the Pacific Lamprey Management Plan (see Section 4.3.3).

Based on the language in Section 4.3.3 of the Pacific Lamprey Management Plan, Ralph asked Mike what Grant PUD would do to coordinate with Douglas PUD if Douglas PUD decides to conduct a survival study in 2027. Mike said that because Wanapum and Priest Rapids dams would be wired to detect acoustic tags in 2027, their interrogation system would also monitor tagged fish released by Douglas PUD provided the tags were still active by the time the fish reach the Priest Rapids Project area. Ralph asked whether Grant PUD would monitor for juvenile fish if the Douglas PUD study was conducted in 2028. Mike said yes, provided their dams are still wired. If they are not wired to detect acoustic tags, Grant PUD would not participate.

PLCI Lamprey Information Exchange Recap – Ralph Lampman reported that the 2025 Lamprey Information Exchange was held on 9-11 December in Portland, OR. Ralph provided a recap of the Information Exchange by walking through the agenda (see Attachment 1). Ralph noted that about 150 people attended the Information Exchange and an additional 80 people attended virtually. There was a Lamprey 101 Workshop, a field trip to Willamette Falls, and an executive session on the first day (9 December). The second day (10 December) began with a Tribal invocation and keynote address. Following that was a raffle and rockstar award voting, and a review of the Tribal Pacific Lamprey Restoration Plan (Tribal Restoration Plan). Session 1 included three presentations on lamprey passage. There was also a poster session, which included five poster presentations. Session 2 on the second day included three presentations from the Alaska Regional Management Unit.

The third day of the symposium (11 December) included several sessions. Session 3 included five presentations on restoration and reintroduction. Between Sessions 3 and 4, there was a discussion on outreach, which included two presentations. Following that discussion, they announced the Rockstar awards. Session 4 included three presentations on status and distribution, and the final session included three presentations on genetics and contaminants.

Ralph concluded by stating that the 9th Annual Information Exchange was a success and affordable. He recommended that more people attend in the future.

Other Pacific Lamprey Items – Ralph Lampman indicated that the Anadromous Fish Evaluation Program meeting will be held on 22 January 2026 from 9:00 am to 5:30 pm. The Upper Columbia Science Summit will be held in Leavenworth, WA on 21-22 January 2026.

VIII. Administration

Mike Clement reported that Grant PUD will be sending out draft annual reports for a 30-day review by the PRFF. He said the Bull Trout report, which was sent to the PRFF for review was finalized and sent to Ecology. The draft Pacific Lamprey report will be sent to the PRFF very soon and then the draft White Sturgeon report will be sent to the PRFF.

IX. Adjourn

With no additional business to discuss, Tracy Hillman adjourned the meeting at 11:30 am.

X. Next Meeting

The next meeting of the PRFF will be on Wednesday, 4 February 2026.

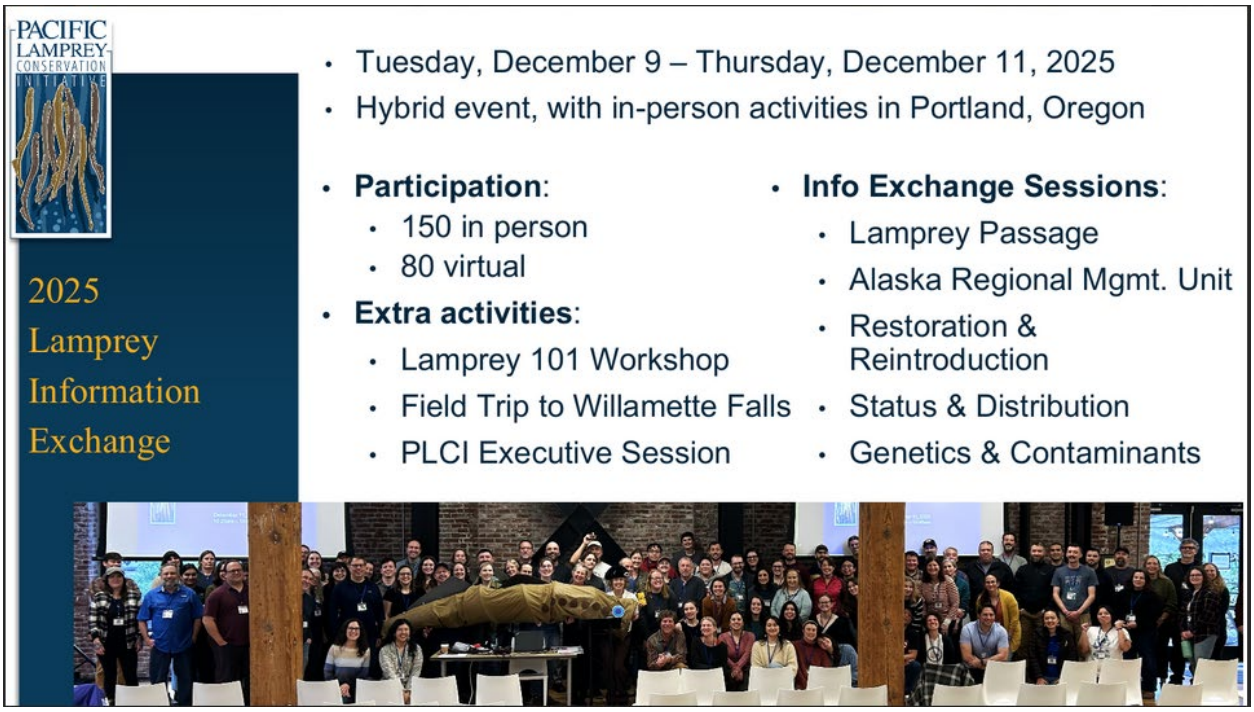
Attachment 1

Lamprey Information Exchange Agenda

9TH ANNUAL

L AMPREY INFORMATION EXCHANGE

AGENDA



TUESDAY 9 DECEMBER 2025

LAMPREY 101 WORKSHOP (~50 people)

FIELD TRIP TO WILLAMETTE FALLS (25 participants)

PLCI EXECUTIVE SESSION (Lamprey Implementation Tracking System – LITS) (~25 people)

WEDNESDAY 10 DECEMBER 2025

LAMPREY SYMPOSIUM, DAY 1

WELCOME & TRIBAL INVOCATION

TRIBAL KEYNOTE

RAFFLE & ROCKSTAR AWARD VOTING

TRIBAL PACIFIC LAMPREY RESTORATION PLAN

SESSION 1: LAMPREY PASSAGE

- JUVENILE PACIFIC LAMPREY PASSAGE BEHAVIOR AND SURVIVAL IN THE LOWER COLUMBIA AND LOWER SNAKE RIVERS – Kate Deters, Pacific Northwest National Laboratory
- ADULT PACIFIC LAMPREY PASSAGE AND MIGRATION BEHAVIOR AT LOWER COLUMBIA R IVER DAMS – Daniel Deng, Pacific Northwest National Laboratory
- DEVELOPMENT OF THE F LOATING ADULT LAMPREY COLLECTOR (OPERATION NOCTURNAL) PHASE II – Ralph Lampman, Yakama Nation Fisheries

POSTER SESSION

- STATO- WHAT? A CLOSER LOOK AT ARCTIC LAMPREY STATOLITHS – Niamh Balaji, Western Washington University
- MONITORING TRANSLOCATED PACIFIC LAMPREY USING R ADIO TELEMETRY AND IDENTIFYING AMMOCOETE DISTRIBUTIONS AND DENSITY ON THE WARM SPRINGS RESERVATION – Aldwin Keo, Confederated Tribes of Warm Springs Natural Resources, University of Idaho
- 2025 ANADROMOUS WATERS CATALOG AND SURVEY SITES FOR ARCTIC AND PACIFIC LAMPREYS IN ALASKA – Nate Cathcart, Alaska Department of Fish and Game
- DETECTION OF PACIFIC AND BROOK LAMPREY IN NORTHERN CALIFORNIA COASTS AND ESTUARIES THROUGHOUT THE YEAR USING EDNA METHODS – Michelle Schuiteman, Cal Poly Humboldt
- LAMPREY IMPLEMENTATION TRACKING SYSTEM – Tod Sween, Nez Perce Fisheries

SESSION 2: ALASKA REGIONAL MANAGEMENT UNIT

- THE 2025 REPORT ON LAMPREY RESEARCH IN ALASKA – Nate Cathcart, Alaska Department of Fish & Game
- TRACKING PACIFIC LAMPREY: INTEGRATING TRADITIONAL KNOWLEDGE AND FIELD SURVEYS IN ALASKA – Meghan Montagne, Knik Tribe
- REPRODUCTIVE BIOLOGY OF LETHENTERON SPP. IN ALASKAN RIVER DRAINAGE – Amber Perk, University of Alaska Fairbanks

THURSDAY 11 DECEMBER 2025

LAMPREY SYMPOSIUM, DAY 2

SESSION 3: RESTORATION & REINTRODUCTION

- REINTRODUCTION OF PACIFIC LAMPREY TO UPPER WILLAMETTE TRIBUTARIES FOLLOWING DECADES OF HABITAT INACCESSIBILITY - Jon Hess, Columbia River Inter-Tribal Fish Commission
- REINTRODUCING THE MILLER LAKE LAMPREY TO MILLER LAKE FOLLOWING EXTIRPATION – Ben Clemens, Oregon Department of Fish & Wildlife
- ALA KA ZAM – BRINGING PACIFIC LAMPREY BACK TO THE TUCANNON RIVER WITH ARTIFICIALLY PROPAGATED LARVAE – Zach Seilo, Confederated Tribes of the Umatilla Indian Reservation
- DEVELOPING METHODS TO OUTPLANT LARVAL PACIFIC LAMPREY IN THE TUCANNON RIVER – Mary Moser, Moserworks LLC
- ROAD LAMPREY: GUIDELINES FOR TRAP AND HAUL OF PACIFIC LAMPREY – Ann Gray, U.S. Fish & Wildlife Service

DISCUSSION: OUTREACH

- PLCI OUTREACH INITIATIVES AND FUTURE DIRECTIONS – Sophia Troeh, U.S. Fish & Wildlife Service
- CHALLENGES TO IMPROVING THE SIGNAL WHILE REDUCING THE NOISE IN COMMUNICATING RECOMMENDATIONS IN LAMPREY – Ben Clemens, Oregon Department of Fish & Wildlife

ROCKSTAR AWARD ANNOUCEMENTS
(*inducted into the **Lamprey Hall of Fame**, given a commemorative rock)

Lamprey Hub - Individual Award = Monica Blanchard (WDFW)

Lamprey Hub – Team Award = Nez Perce Tribe

Lamprey Spoke Award = Sophia Troeh (USFWS)

Lamprey Lifetime Award = Christina Wang (Benthos Consulting)

SESSION 4: STATUS & DISTRIBUTION

- DISTRIBUTION OF LAMPREY SPECIES WITHIN THE SALMON RIVER WATERSHED, CALIFORNIA – Sam Stroich & Kim Deniz, Salmon River Restoration Council
- E-BLIMP MAKES ITS LANDING! UPDATED DISTRIBUTION MAPS AND OCCUPANCY MODELS FOR PACIFIC LAMPREY IN THE 21ST CENTURY – Kellie Carim, U.S. Forest Service
- MODELING LAMPREY DISTRIBUTION USING FLOW, GEOMORPHOLOGY, AND ELEVATION IN A TERMINAL LAKE SYSTEM – Jacob Dickey, Oregon State University

SESSION 5: GENETICS & CONTAMINANTS

- ENVIRONMENTAL RNA (E-RNA) DISTINGUISHES SEX AND MATURITY IN PACIFIC LAMPREY – Dan Bingham, Cramer Fish Sciences
- AN INVESTIGATIVE STUDY INTO MICROPLASTIC ACCUMULATION AND ITS CORRELATION WITH MERCURY LEVELS IN A CULTURALLY RELEVANT SPECIES OF THE COLUMBIA RIVER BASIN – Venecia Rollins, Oregon State University
- PER- AND POLYFLUOROALKYL SUBSTANCES IN PACIFIC LAMPREY AND OTHER FISH SPECIES IN THE PACIFIC NORTHWEST – Elena Nilsen, U.S. Geological Survey