

**FINAL - Meeting Summary Notes**  
**Lewis River License Implementation**  
**Engineering Subgroup**  
**January 30, 2007**  
**Fish Passage Meeting Notes**

**Subgroup Participants Present: (11)**

Will Shallenberger, PacifiCorp  
Frank Shrier, PacifiCorp  
Todd Olson, PacifiCorp  
Pat Klavas, WDFW  
Curt Leigh, WDFW (via phone/web conference)  
Bryan Nordlund, NOAA Fisheries (NMFS) (via phone/web conference)  
Peter Christensen, R2 Resource Consultants  
Suzanne Picard, R2 Resource Consultants  
Brian Friesz, Black & Veatch  
Lisa Larson, NHC  
Arnold Adams, PacifiCorp

**ADMINISTRATIVE**

Welcome of attendees and review agenda. Frank Shrier said that he is still working with Michelle Day (NMFS) on the Biological Opinion for the Lewis River, and after that is done it will need to go to FERC for their review. He is now anticipating that the license is unlikely before the end of May, 2007.

(Web conferencing tool is temporarily down at the start of the meeting)

**General Meeting Handouts:**

Distributed via email on 1/24/2007 by Kim McCune:

- Draft review version of 12/12/2006 meeting notes
- Meeting agenda for 01/30/2007 subgroup meeting

Distributed at meeting 01/30/2007 (paper copies):

- Draft review version of the 12/12/2006 meeting notes. 15 pages, 8 ½ x 11.
- Meeting Agenda for 01/30/2007 meeting

**NEXT MEETING**

- The next meeting is scheduled for Tuesday, 9:00 am - 4:00 pm, March 13th, at the Merwin Hydro Facility.

## **FUTURE MEETING DATES**

As a reminder, future meeting dates to be held at the Merwin Hydro Facility were set for:

- Tuesday, March 13, 2007 – 9:00 AM to 4:00 PM
- Thursday, April 26, 2007 – 9:00 AM to 4:00 PM
- Thursday, May 24, 2007 – 9:00 AM to 4:00 PM

The Tuesday, May 29<sup>th</sup>, 2007 meeting may need to be rescheduled due to schedule conflicts.

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**UPPER RELEASE CHANNEL PROJECT**

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**Upper Release Channel Handouts**

None.

**Review of Previous Meetings' Upper Release Channel Project Action Items:** See status summary table below.

No.	SUMMARY OF PENDING UPPER RELEASE CHANNEL ACTION ITEMS (remaining from previous Meetings)	STATUS
UR3	WDFW/Black & Veatch (Klavas/Nigus) Pat will work through the calculations to verify that the gravel sizes provided by Ecology for spawning will be large enough to ensure streambed stability. Black & Veatch will provide an updated plan and profile to Pat as a basis for the stability calculations.	Done. Any additional comments from WDFW will be addressed in UR5
UR4	PacifiCorp (Shrier) Present Upper Release Channel design ideas at the next ACC meeting (Jan 11 <sup>th</sup> , 2006).	Done

**Additional Comments on Last Meeting's Action Item List:**

- Curt noted that the action item UR1 was documented as 'done' during last meeting's conversations, but reappears as 'pending' in the table of on-going action items. Peter noted that this was an oversight in the preparation of the minutes and that UR1 is actually done and will be removed from the on-going action item list.

**UPPER RELEASE CHANNEL AGENDA TOPICS**

**Update and General Discussions**

- The ACC meeting on January 11, 2007 went well. The draft upper release channel design was presented to the committee. This opened a 30-day comment period which closes on February 12<sup>th</sup>, 2007. WDFW is currently reviewing the draft design.

No.	SUMMARY OF PENDING UPPER RELEASE CHANNEL ACTION ITEMS (remaining from previous Meetings)	STATUS
	None.	
	<b>NEW ACTION ITEMS (From January 30<sup>th</sup> Meeting):</b>	<b>STATUS:</b>
UR5	WDFW (Leigh) Collect and provide comments on the draft upper release channel design to PacifiCorp.	Pending

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**SWIFT DOWNSTREAM PASSAGE PROJECT**

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**Swift Downstream Passage Handouts**

- Swift Floating Surface Collector and Downstream Passage Design - Draft FSC Design Criteria and Evaluation/Response Adjustments and Modifications, dated January 29<sup>th</sup>, 2007. 7 Pages, 8 ½ x 11.
- Lewis River Downstream Fish Passage – Swift Dam Floating Surface Collector – CFD Modeling Update, printout of PowerPoint presentation dated January 30, 2007. 61 pages. 8 ½ x 11.
- CFD Model Test Plan Management Table, dated January 29<sup>th</sup>, 2007. 1 page, 8 ½ x 11.
- FSC Alternative 3 Plan and Profile Drawings, including external smolt holding and on-board smolt holding alternatives. 5 pages, 11x17.
- Fish Holding Volume Calculations Table, dated January 26, 2007. 1 page, 8 ½ x 11.

**Presentations**

- PowerPoint presentation on CFD Model (with FSC) by Lisa Larson, of NHC.

<b>SUMMARY OF PENDING SWIFT ACTION ITEMS (Remaining from Previous Meetings):</b>		<b>STATUS:</b>
S20	WDFW and NMFS (Kinne, Nordlund) Review revised Table 5.1 from the handout showing updated figures and tables on design criteria and provide comments to R2 ASAP.	Incorporated into S23
S21	WDFW/USFWS/Kozmo/R2 (Klavas, Weinheimer, Stow) Review the holding pond sizing calculations. Provide comments to R2.	Review fish holding volume table handed out today – due date February 9 <sup>th</sup> , 2007
S23	Subgroup (all) Provide feedback on FSC Design Criteria as shown in the revised handout labeled “Swift FSC Design Criteria as Compared to Other Related Facilities”. Please provide comments to Peter Christensen.	Still pending, but change text to request review of criteria document distributed at 12/12/2006 meeting - new due date February 9 <sup>th</sup> , 2007
S26	NOAA (Day) Michelle to provide feedback on fry separation goals.	Remove, this item to be reworded to reflect new goals
S27	WDFW (Kinne) Eric to forward email on catchable size fish and required grating gaps to group.	Pending
S28	Kozmo (Bates) Run fish escape model for kelts. Present findings	Item to be removed

	at next meeting.	– not enough hard data available to complete model runs
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**Additional Comments on Last Meeting’s Action Items List:** Concerning Item S28, Bryan noted that the physical condition of kelts can vary significantly, and could not suggest changes to the Swift Collector design, based on improving collection of kelts.

## SWIFT DOWNSTREAM AGENDA TOPICS

### Review 12/12/2006 Meeting Notes

- Bryan has not yet finished reviewing the notes and will provide his comments to the group by February 9<sup>th</sup>, 2007 so the notes can be finalized.

### Criteria Evaluation / Adjustment and Modification Discussion

- Will noted that Page 7 of the handout includes a flow diagram for choosing levels of responses based on the results of the initial biological evaluations. Also on this page are the definitions for the terms Adjustment and Modification as cited from the Settlement Agreement:
  - “Facility Adjustment” – A physical passage facility upgrade, improvement, or addition that was part of the original design of the passage facility, or an adjustment to the fish passage facility or its operation.
  - “Facility Modification” – A physical alteration or addition to a fish passage facility that requires a new design.
- Discussion regarding the use of the terms “Initial Adjustments” and “Secondary Adjustments” to describe possible tools to improve FSC collection efficiency after evaluation led to the decision to remove the distinction between “initial” and “secondary” in favor of combining the two categories into one category called “Potential Facility Adjustment”.
- Discussion clarifying the terms “Facility Adjustment” and “Facility Modification” led to the conclusion that facility adjustments would be developed to at least to a conceptual design level as a part of FSC final design. Facility adjustments may not need to be brought to a final design level at that time, but will be included in the final design documents as a conceptual adjustment, including analysis detail that would guarantee feasibility of design adjustment, including (but not limited to) net anchor points, installation and retrieval methods, hydraulic load analysis, operational limits and so forth. Biological studies and facility evaluation of the initial collector design will be used to further develop facility adjustments as needed to achieve passage goals specified in the Settlement Agreement. The design team will, however, make provisions to ensure the facility adjustments will be feasible additions to the FSC.
- Curt was concerned that nets were listed as a Modification. Will noted that they are actually shown as an Adjustment, and that only potentially enlarging them is shown as a Modification. There was discussion about why fully ‘enlarged’ nets would not be considered an adjustment. Bryan suggested that we really can’t be coming to a

conclusion on where to place nets until more is known about passage routes and passage efficiency based on the initial installation. Bryan further recommended that two phases of net installation be included as facility design adjustments, the first being exclusion nets (used to effectively seal off the powerhouse channel), and the second being guide nets, (used to increase passage efficiency). Bryan suggested that both of these should be considered facility adjustments, and installed if necessary, based on the initial behavioral and performance tests

- Bryan said that adjusting the screen baffles for better distribution (shown as an adjustment under the Uniform Approach Velocity criterion) should be moved to the notes with a statement that this would be done as an initial shakedown of the facility, not as a future adjustment. Will responded that this note was meant to reflect the potential ability to redistribute flow within the facility if it was found certain conditions were causing fish delay or rejection at a specific location, not to imply that the screens would not be balanced initially.

(web conferencing tool comes online at 10:30AM)

### **CFD Model Status Update**

- Lisa Larson recaps previous findings and briefs the group on the most recent CFD modeling activity. The latest CFD model runs include:
  - Scenario discharging all FSC flow from the north side of the FSC. This scenario shows that discharging all the flow from the north side of the FSC enhances the gyre in the north arm of the reservoir for both the powerhouse on and off conditions. The upstream-directed current along the south bank that was seen in previous model runs is not visible as a result of closing the south discharge gates.
  - Scenario discharging FSC flow from the north side and from the back of the FSC. This scenario also enhances the gyre in the north arm of the reservoir for both the powerhouse on and off conditions, though not to the same extent as discharging only from the north side of the FSC. The upstream-directed current along the south bank is still slightly visible with the powerhouse off, and is not evident with the powerhouse on. With flow discharged from the back gates, this scenario shows higher surface velocities in the approach channel than previous runs. For the powerhouse off condition, the flow in the approach channel re-circulates. There was general agreement that the upstream (easterly) flow along the south bank was not conducive to fish collection. There was also general agreement that the effect of the gyre on collection efficiency was unknown, but could not really be assessed in the CFD model and would be better assessed with migration behavior study.
  - Sensitivity Analysis of the effects of wind on the CFD model results. The wind sensitivity analysis was conducted to gain a better understanding of the effect of wind on the gyre and other FSC induced flow patterns. A constant 7.3-mph wind down the main arm of the reservoir was applied to the model as a surface shear force. This was chosen because wind records show 7.3 mph to be the average wind for the site. The conclusions of this analysis showed that wind has a significant impact on flow patterns at some depths. At shallow depths, the effects

of wind shear appear to overpower previously noted flow patterns. The results indicated that precaution needs to be taken when analyzing the CFD model results as there are site condition variables, such as wind that may have a substantial impact on flow patterns.

- Sensitivity Analysis of the effect of moving the upstream boundary condition 1 mile upstream. The boundary within the main arm of the reservoir was moved upstream approximately 1 mile as a sensitivity analysis to determine the impact of the boundary location on the CFD collector scenarios. This appeared to have a minimal effect on the collector location CFD modeling scenarios. As a result, the upstream boundary location was considered adequate for the collector location CFD scenarios.

### **FSC Design**

- The FSC's secondary screen design has been modified to widen the channel through the area of the highest channel velocity. Also, the fish escape model completed by Ken Bates has been incorporated into the screen channel hydraulic design spreadsheet so that identification of capture locations can be estimated, and the impact of channel modifications on capture can be assessed during design. Therefore, the drawings no longer identify the highest velocity point as a generic capture location, but rather identify estimated capture points within the channel for different length fish with the highest velocity point identified some distance downstream of that. The secondary screen channel in this alternative maintains a 3-foot width well beyond the capture point for a 10-inch steelhead smolt. Floor screens have been added downstream of the highest velocity to remove the additional flow required to maintain the wider channel width without lengthening the secondary channel.
- Bryan suggested that we may want to consider air-burst cleaning for floor screens. He also speculated that the air-burst could reduce the fish swimming ability because of reduced water density resulting in less propulsive power and could help to ensure they are captured. He cautioned that this concept could also produce a startle response, potentially causing smolts to take evasive action away from capture. He cautioned that this approach had not been tested, but could potentially be installed and tested at Swift. He noted that if the air-burst had adverse passage effects, it could be used for screen cleaning (based on programmable control of head differential detection and timing interval) at times of low passage.

### **Sorting and Transfer**

- Two alternatives have been developed for the FSC's sorting and holding area. The two alternatives are in response to the two possible moorage and access designs PacifiCorp is currently pursuing
  - External smolt holding – design includes floating holding and transport pods located outside of the FSC. The FSC is moored and held in the reservoir by anchors. Therefore, access to the FSC would need to be by boat; potentially limiting how often or easily the fish could be off-loaded to a transport truck. The

use of pods allows for long-term holding of a large number of fish because multiple pods could just be added as needed. When full of fish, a pod would be pushed by a boat to a marine railway system and then travel on a rail car to a truck loading facility on the shore. Moving the fish from the sorting facilities on the FSC automatically to the external floating pods (without excessive human or other mechanical interference) would require that the fish be pumped through a fish-friendly pump.

- On-board smolt holding – design includes smolt holding tanks located on the FSC. In this case, the FSC would be attached to vertical guides connected to a permanent pier. Trucks could drive directly up to the FSC to collect fish with no boats required. Since this approach greatly simplifies the process of getting fish from the FSC to a truck, it may be possible to have only two smolt holding tanks each sized to hold one truck-load of fish. These two tanks could fit on the FSC.
- No significant concerns were expressed with either approach, but Bryan requested a copy of the PGE report concerning their tests of a Hidrostral pump passing fish.
- The destination/handling protocol for fry has not yet been defined. Both alternatives have been developed with sufficient flexibility in mind to accommodate the final destination of fry collected on the Swift FSC.
- Resident Bull Trout captured at the FSC will be individually netted and returned to the reservoir. This could also be the case for any other adult sized fish that WDFW requests should be returned for the reservoir.

#### **PENDING ACTION ITEMS FOR SWIFT**

The following table provides a summary of all pending action items for the Swift Project.

<b>No.</b>	<b>SUMMARY OF PENDING ACTION ITEMS FOR SWIFT (remaining from previous meetings)</b>	<b>STATUS</b>
S21	WDFW/USFWS/Kozmo/R2 (Klavas, Weinheimer, Stow) Review the holding volume calculations provided at the January 30, 2007 meeting. Provide comments to R2.	Due date February 9 <sup>th</sup> , 2007
S23	Subgroup (all) Provide feedback on FSC Design Criteria as presented in the document “Biological and Hydraulic Facility Design Criteria – Draft” distributed at the December 12, 2006 meeting. Please provide comments to Peter Christensen.	Due date February 9 <sup>th</sup> , 2007
S26	PacifiCorp/NOAA (Shrier/Day) Frank to discuss with Michelle what the ultimate destination of fry caught in the FSC should be.	Pending
S27	WDFW (Kinne) Eric to forward email on catchable size fish and required grating gaps to group.	Pending
<b>No.</b>	<b>SUMMARY OF NEW ACTION ITEMS (from January 30<sup>th</sup>, 2007 meeting)</b>	<b>STATUS</b>
S29	PacifiCorp (Shallenberger) FSC Design Criteria and Evaluation Table: Combine the “Initial Adjustments” and “Secondary	Done



	Adjustments” categories into one category labeled “Potential Facility Adjustments”. Distribute updated table to the group for comments.	
S30	PacifiCorp (Shallenberger) Send a file copy of the CFD model presentation on a CD to Curt Leigh and Bryan Nordlund for their review.	Done
S31	All (Subgroup) Provide comments and feedback on CFD model result to Lisa Larson to help guide future model runs. Deadline: March 13 <sup>th</sup> , 2007 subgroup meeting.	Pending
S32	R2 (Christensen) Provide a copy of the biological evaluation of the Hidrostral pump at A-Canal to Bryan Nordlund.	Pending