PUGET SOUND ENERGY

Final Meeting Notes

January 13, 2015 / 9 a.m. – 3:00 p.m. / PSE Burlington, LYNC Online, Call

Baker River Project License Implementation

Aquatic Resources Group

Team Leader: Arnie Aspelund (PSE), arnie.aspelund@pse.com

PRESENT
Arnie Aspelund, Tom Flynn, Nick Verretto, Doug Bruland, Jacob Venard, Adam Elbrecht, and by phone: Caitlin Faulkner, Jory Oppenheimer and Scott Heller (PSE); Nancy Gleason (USACE); Joan Thomas, Steve Stout, and Kevin Kurras (WDFW); Erin Uloth and Jeremy Gilman (USFS); Craig Olson (NWIFC); Ashley Rawhouser (NPS); Stan Walsh (SRSC), Bob Helton (Citizen); Jeff McGowan (Skagit County); Jon-Paul Shannahan (Upper Skagit Indian Tribe); Noble Hendrix by phone (QEDA Consulting, LLC); Steve Fransen and by phone: Ed Meyer (NMFS); Lyn Wiltse and Jamie Riche (PDSA Consulting).

DECISION: None today.

2015 ARG DATES: March 10, June 9, October 6 (1st Tues)

Quote of the Day: "I will be the gladdest thing under the sun. I will touch a hundred flowers and not pick one." – Edna St. Vincent Millay

ACTION ITEMS
- All Review / update the ARG representation list for your organization.
- Joan Contact the WDFW scale lab to get the age data on the scales that PSE has been submitting and send those data to Arnie.
- Nick Send the ARG the draft signs related to the net on Depression Lake.
- Nick Send Bob Helton the passage information presented at the meeting.

PREVIOUS and/or ONGOING ACTION ITEMS
- Nick Develop a model for analyzing fry and smolt stocking influence on outmigration.
- Nick Develop and distribute a revised upstream protocol for review by Co-Managers.
- Co-Mgrs Send a draft Fish Production Plan to Arnie ASAP, as per FPFP.
- All Review / update the ARG representation list for your organization (ongoing, as needed).

SAFETY MOMENT
Feeling distracted (while traveling, for example) makes it more likely that you will experience trips (while pulling rolling luggage, for example) or spills (of things like the cash in the outside pockets of that luggage, for example). When you notice yourself getting overwhelmed and / or flustered, take a moment to center yourself and consider safety before continuing your activities.

ANNOUNCEMENTS: Lou Ellyn is retiring the end of next month. We wish her well and celebrated with the above quote (appears at the bottom of her emails) and a beautiful cake. We extended our congratulations to Kevin when Steve announced his promotion. Steve will no longer regularly attend these meetings.

BRCC, LICENSE PROCESS UPDATES
Jacob reported on the October BRCC meeting in Snoqualmie, which had a light agenda primarily focused on resource group updates. He also walked through a brief review of the last BRCC email update, and reminded folks that the next BRCC meeting is scheduled for April 22 (Earth Day) in Burlington. PSE has received

verbal approval from FERC for the updated reporting schedule reviewed and approved by the BRCC and resource groups last year. Jacob anticipates formal approval to come soon and expects 2014 reports to run on the new schedule.

SKAGIT GI UPDATE

Lynn Wetzler with the USACE had to deal with an unanticipated event and was not able to join us today to provide an update on the Corps' General Investigation. Nancy explained that on the afternoon of January 21, the USACE will host an initial meeting with agencies for the phase of the project where they will determine the total mitigation package for the environmental impacts of the preferred option. They will not be considering any Baker operations at this meeting; they are planning to look at a mitigation tool that was created in 2010-11 for evaluating the impacts related to Skagit lev*ee* rehabs. That tool doesn't include impacts to the estuary because it is focused on the area from Sedro-Woolley up to the estuary. The meeting has been scheduled for the full afternoon to allow enough time to have a full discussion of this approach.

Tom added that his understanding from Lynn is that the USACE plans to have a final feasibility report, including a 30% design, a more detailed analysis of the costs/benefits, and the Environmental Impact Statement (EIS) out by the end of 2015. More information is available on the Corps' website by searching: Skagit General Investigation.

UNIT 4 UPDATE

Jory called in to report that PSE is currently on schedule to begin operations in October 2015. The major work items involve installing the blades, and will require an outage *April through* July. The next major item will be programming and testing the facility controls, and programming the alarms for Lower Baker (LB) flow excursions. PSE will work with the ARG this summer to update the contact list.

Last October, PSE began *providing Lower Baker minimum and maximum flows* in accordance with the requirements listed in Aquatics Table 1. PSE recently completed an inspection of the *Lower Baker* dam and identified some repair issues with the intake gates. These repairs may require the use of divers, and Jory asked the ARG for suggestions for the best time to schedule an outage for this work. Without knowing details, Stan suggested that peak snow melt *period in May or June* (and associated higher *Skagit River* flows) might be a good time for this. Jory will keep the ARG updated as he gets a better idea about the scope of this work.

OPERATIONS UPDATES

Headworks Water Supply: Jacob reported that he is now PSE's lead for this work. This winter has included a couple of significant episodic rain events, including one day of 3.5 inches of rain, but there has not been any additional surface erosion. The water supply has remained clear and protected. PSE is continuing to work closely with USFS to finalize plans to shore up the work completed a couple years ago (address the remaining fines to prevent future flow issues). They are working toward a spring / summer construction schedule.

Fry Release Site Technical Working Group: Jacob reported that the working group had met three times: last April, June, and September. They will meet again immediately following today's meeting to review a recently drafted draft a contingency plan and discuss next steps.

101c2 Monitoring Update: Arnie sent the ARG the 2014 data from smolt studies on December 19, 2014. He reminded all that these studies are intended to inform the plans for future fry stocking within the Baker system and walked briefly through the report.

Erin asked if there are baseline data regarding the system's carrying capacity, and Arnie responded that a two-year study was conducted in conjunction with the relicense process to fill gaps in the data available at that time. The 101c2 approach is intended to monitor adult returns and the size and number of outmigrating smolts to provide feedback on basin sockeye production limits. Craig thanked Arnie and PSE for their work

to make these data available in such a clear format. He and other ARG members noted the value of this growing body of data.

ARTIFICIAL INCUBATION AND SPAWNING BEACH 4

Kevin showed photos of the measures they used to tighten up dewatering equipment that was allowing fry to slip into the hopper. They believe they have made the system fry-tight. If the system shows signs of letting fry through this season, they'll use dye to identify the problem and go from there. He also showed photos of the hose that was installed at an undisclosed location and expertly camouflaged to facilitate safe and fry-friendly plantings.

He then walked the group through the spreadsheet of carcass disposal. They used the morts for nutrient enhancement until they found IHN. He also briefly showed the 2014 mortality report; results were typical. He also noted that they also ran a pilot program rinsing the eggs with a 1% iodophore solution, and found that survival was slightly better with this practice, so they intend to apply this step to future. This rinse helps prevent IHN and is beneficial for other contagions. He reported that they will spawn Coho again tomorrow. There are 38 females remaining and when they're done, they should put the total take over 200k, so that will probably be their last take. Arnie noted that they are anticipating roughly 5 million fry out of the AI program and another 2 million or so from the beach program. 2.5 million will be held for about a month before they go into Lake Shannon and the remainder will go to Baker Lake.

Kevin asked the Co-Managers to meet with hatchery staff to create a plan for the wild Steelhead they're holding.

Jon-Paul noted that Co-Managers have a meeting January 14 with WDFW to discuss the best way to study fish passage through the reservoir and FSC. They think PIT-tagging would be most effective, both for reduced handling and the potential to get additional data about survival and returns. He said he wanted to be sure this is also on the radar of the Fish Passage Technical Working Group.

Doug walked through a few additional highlights from the fish inventory sheet. Rainbow Trout in the circulars are being held in the circulars for release in various lakes and derbies. Almost 10k Sockeye are being held in the Raceway 1 and 63k Coho are held in Raceway 4 for 2015 biological studies.

PSE will be completing the ROV (Remote Operated Vehicle) inspection of the Upper and Lower Baker nets to verify their condition. If any holes are found, PSE will take appropriate steps to repair them.

SPAWNING BEACH DECOMMISSIONING COMPLETE

Arnie reviewed a brief chronology of the spawning beaches' history and decommissioning process. The spawning beaches at Channel Creek were first tested and put into operation in the 1950's. An attendant lived on-site from 1960 to 1994. Two risk assessment studies showed the beaches were vulnerable to Baker River channel shifting, so PSE created a new spawning beach (#4) at Sulphur Creek, replacing the beaches at Channel Creek. In 2004, the Settlement Agreement included a measure for the decommissioning the old spawning beaches. The SA 101 article plan was approved in 2010, and PSE began working with USFS, with input from appropriate resource groups, to decommission the beaches, returning them to their natural state. Concepts were developed based on the scope of work in 2012 and a preferred plan was approved in July 2012; the final design was approved in April 2013. Construction began that year and the work was completed December 2014. (WhoHoo!)

All told, 31,488,934 counted sockeye fry went through the beaches (plus 9 years when fry weren't counted). ARG celebrated the successes those sites helped support, and celebrated the return of these old sites to a natural state. Arnie showed photos of the design, construction work, and completed sites. There is a lot of beaver activity in the area, so the area will likely look very different once our furry friends "sink their teeth" into their own engineering and construction work.

Jeremy expressed the Forest Service's satisfaction with the project. Caitlyn thanked the ARG for the strong collaboration and patience with the process. Stan noted that we have a cake and will celebrate accordingly.

FISH PASSAGE

FSC Screen Analysis and Planned Modifications

Nick reminded the group that start-up of the LB Floating Surface Collector (FSC) exposed screen channel hydraulics issues. These problems were a result design and fabrication weaknesses related to materials used in construction of the perforated-plate flow control baffles. He reviewed the design, issues and efforts taken to moderate impacts to small fish while plans for long-term modifications are being developed. Nick also showed model output which illustrated the approach velocity conditions during each of these activities and the anticipated condition when all modifications have been completed. Consultation with staff from NMFS hydraulics group has been continuous, through design, construction and remedial efforts. Removing and re-installing the plates would be extremely challenging and expensive, so present plans are to modify the baffles' porosity by attaching 1,288 small plates directly to the downstream surface of the perforated stainless plates, which will cover the same number of individual perforations and bring the system's hydraulic control capability close to that of the design, and within the established criterion.

2014 LB Performance Studies Results

Nick provided an overview of the 2014 outmigration season's LB FSC performance evaluation. The two primary evaluation components were to determine the collection rate at 1,000 cfs entrance flow of PIT-tagged sockeye and coho smolts and to determine the percentage of non-migrants within the sockeye study group (coho analysis was completed in 2013) using the ATPase methodology from the 2013 analysis in order to determine its influence on evaluation of FSC performance against the NMFS collection standard. The evaluation involved a mark-release-recapture study at 1,000 cfs flow of 2,400 PIT-tagged sockeye and 2,400 PIT-tagged coho, held 24 hours in transport tanks prior to their release below the surface and upstream of the boat launch. Recaptures were recorded within the FSC using the channel PIT tag system. Controls were released and recaptured weekly to verify 100% detection.

Determination of the proportion of non-migrants in the sockeye release group was through daily sampling of gill filament tissue May-June of both recaptured sockeye and controls (held in pens), a bioassay by the USFWS lab at Abernathy to produce enzyme activity data, and statistical analysis of the data for determination of migrant vs non-migrant study group composition and operational vs environmental influences on migration timing and rate. Noble Hendrix (formerly with R2, now an independent consultant with QEDA Consultants, LLC) explained the study process. They found that coho are affected by pump rate, time, solar radiation, and water temperature. Sockeye are most affected by a mix of pumping rate and solar radiation. Inflow, outflow, spill, and a factor representing the interaction between the pump and solar radiation were also considered and determined to have much smaller effects on the daily rate of fish collection.

They analyzed sockeye from net pens and recaptures at 3-day intervals in the LB trap with ATPase values less than or equal to 10 to create a statistical analysis of migrant proportions. The weighted estimate of migrants indicates that 4% of sockeye are non-migrants. Nick observed that this is consistent with their findings of coho.

Nick noted that this is the second year of operations at the LB FSC and the first year of a concentrated performance evaluation due to the entrance flow preference study conducted in 2013, in which sockeye showed a marked preference for 1,000 cfs, and a statistical review of tissue bioassay enzyme activity indicated about 4% of the coho were non-migrants.

Performance Overview:

Coho mean recapture performance was 96.1% in 2013 and 92.8% in 2014. Sockeye mean recapture performance was 91.8% in 2014 (an IHN outbreak in 2013 forced the cancellation of the sockeye ATPase and recapture studies.

Predation:
Nick shared a brief review of last year's predation studies, which include hook-and-line surveys. As was the case in 2013, no quantifiable predation was observed.

Smolt Mortality at LB:
Coho: 43,331 were collected and transported; 36 morts (0.08% mortality rate).
Sockeye: 375,447 were collected and transported; 347 morts, about 40 were taken for virology (0.08% mortality). The requirement to provide notice within 24 hours to the co-managers of downstream mortalities of GTE 20 smolt or 100 fry was generally complied with.

Smolt Mortality at UB:
Coho: 52,691 were collected and transported; 35 morts (0.07% mortality rate).
Sockeye: 564,432 were collected and transported; 495 morts, 43 in holding tank (0.09% mortality).

Smolt survival and condition through collection, holding, and transport: Fish were rated 1-4 (1 = undamaged, 2 = one side minor descaling, 3 = two sides descaling, 4 = condition that would likely cause delayed mortality) before and after traveling through the system. Coho smolt were too deciduous to use in the study (they were all 3's and 4's to begin with). Sockeye were released and tested at 1,000 cfs on 05/28 and 06/04 at both UB and LB. There was no quantifiable impact to smolts collected at LB; there were possible minor impacts to smolts collected at UB. They did an additional study of smolt condition after being held for 72 hours; there were no quantifiable impacts to smolts.

Fry mortality: Fry mortality was evaluated throughout the season at both surface collectors and extended throughout the season. It appears that the benefits of delayed release are marginal. Nick explained that the mortality is primarily of 26-30 mm sockeye fry, which are incredibly fragile and are not migrants, but newly emerged fry that are incidentally collected during downstream passage operations. Nick stated that the screen design criteria do not accommodate such small and fragile fish, and that any effort to address the mortality will be in vain.

LB fry releases: 156,390 coho; 1,968,131 sockeye. Coho fry collected: 1,279 collected; 1,257 transported; 22 mortalities. Sockeye fry collected: 15,648 collected; 7,687 transported; 7,961 mortalities.
Mortality of incidentally collected newly emerged sockeye fry at the LB FSC at 1,000 cfs flow was therefore 50.9%, the remainder being returned to the lake.

UB FSC was UB fry releases: 0 coho; 3,219,787 sockeye. Coho fry collected: 76 collected; 75 transported; 1 mortality. Sockeye fry collected: 9,596 collected; 4,025 transported; 5,571 mortalities. Mortality of incidentally collected newly emerged sockeye fry at the UB FSC at 1,000 cfs flow was therefore 58.1%, the remainder being returned to lake.

2015 Performance Study Plans
Nick anticipates 2015 looking a lot like 2014 in terms of the performance evaluations at Lower Baker. He reviewed the plan:

- Determine FSC collection performance with 1,000 cfs entrance flow using PIT-tagged sockeye and coho smolts;
- Determine survival and physical condition of sockeye and coho smolts through collection, holding, and transport facilities;
- Continue observations of injury / mortality of fry through the screens channel (modify baffles and adjust channel at the end of the season); and
- Identify level of predation of study fish and impact to FSC performance.

UB Results, LB Captures

- 102,407 UB sockeye ad-clips were released; 9,847 recovered LB (9.62%).

- 1,500 UB sockeye PIT tags were released; 55 recovered at LB (0 normal, 5 max).
- No UB Coho ad-clips were released.
- UB coho PIT tags released 1,500; 50 recovered LB.
- 30 coho spawners were observed Sulphur Creek.

As no spill or operational means of bypassing the net occurred, Nick believes that something must be wrong with the net that accounts for the high recovery of UB ad-clipped sockeye at the LB FSC. This makes him very interested to learn what will be found when the twice-annual UB/LB net survey is completed January 20-23.

Passage Management Information
Nick walked the group quickly through a collection of reports that were distributed in the meeting, including: 2014 summaries of Upper and Lower Baker fish passage, plans for the 2015 evaluations, the (unchanged) downstream passage protocol, a proposal for the upstream passage protocol, a summary spreadsheet of juvenile data, FSC data collection sheets, the 2015 subsampling protocol, and an evaluation sheet of biologists' estimates. If you have questions about any of these reports, please contact Nick. All of this information will also be included in the 2014 annual report, which will be distributed next month.

He spent a few minutes providing an overview of the subsampling distribution protocols at UB and LB (2015 will mark the first year that subsampling will be performed at the LB FSC). PSE will follow the current protocol until they hear differently from the Co-Managers. The spreadsheets outline the schedule for switching to 1,000 cfs flow and describe the distribution plan for fish as they come in.

DEPRESSION LAKE / WEST PASS DIKE
Rainbow trout have been planted in Baker and Depression Lakes since initiation of the recreational stocking program in 1971. Concerns of non-native trout interactions with native species caused the Baker plants to be shifted entirely to Depression Lake during the earlier stages of Project relicensing. Last summer, the ARG asked PSE to prevent rainbow trout stocked in Depression Lake from being entrained in the pump-back station and ending up in Baker Lake. Nick studied the issue and gathered cost estimates for a number of possible solutions. He showed photos of the West Pass Dike and Depression Lake and described PSE's proposal to address this issue. Screening the pump intake would be cost-prohibitive, so they are suggesting a net across the deep end of Depression Lake with safety signs to keep folks away from the pumping station.

ARTICLE 505 UPDATE
Scott called in to give the ARG an update on the projects approved and underway. Details about acquisition work are not included in public notes. If you have questions, please contact Scott.

Scott reminded ARG members that full proposals are due January 15. He will send out an agenda for the upcoming full-proposal meeting, which is scheduled January 27, 9 – 2 in Burlington. Each proponent will be allotted 20 minutes to walk attendees through their proposals and 10 minutes for Q&A. The next meeting after that will be a funding approval conference call; that call is scheduled for February 12.

STAFFING FOR FISH CREWS
Stan heard that there have been changes in how the fish crews are organized between Upper and Lower Baker and asked for clarification. Doug noted that this change was implemented about a year ago. For efficiency reasons, the maintenance crew split into two separate crews, one each at Upper and Lower Baker. The fish crew followed suit and is now also split into two crews so that they could align their start times with the maintenance crew and better support Kevin's early morning needs at the hatchery.

PLANS AND REPORTS
Arnie reviewed the schedule of reports coming out this year. The 2013 comprehensive aquatics report will come out the end of January. PSE may need to repeat some portions of the 2014 report as they move over to a calendar year reporting schedule. They will make this transition year as clear as possible.

MEETING EVALUATION

- Good attendance; thanks!
- PSE will continue to be mindful of number of copies used for these meetings; they already make double-sided copies and bring a limited number; they will continue to seek the sweet spot
- Be mindful of small fonts
- Chowder was WAY salty, please give the caterer feedback

March 10, 2015 Draft Agenda Topics:

- Usual ARG welcome and standard updates / reports
- Connectivity Article 104 Review of February Consultation Meeting
- Update from USACE re: Skagit GI (?)
- Standard updates on fish ops
- Other license implementation updates
- Update on SA 505
- Meeting protocols annual review