

Baker River Project License Implementation

Aquatic Resources Group

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PRESENT

Arnie Aspelund, Doug Bruland, Nathanael Overman, Jory Oppenheimer, Jacob Venard, Caitlin Faulkner, Nick Verretto, and Tom Flynn (PSE); Ken Bates (Kozmo Inc.), Bob Helton (Citizen); Stan Walsh (SRSC); Phil Hilgert by phone and Eric Jeanes (R2); Craig Olson (NWIFC); Steve Fransen and Ed Meyer (NMFS); Jeremy Gilman (USFS); Ashley Rawhouser (NPS); Brock Applegate and Brett Barkdull (WDFW); Lyn Wiltse and Jamie Riche (facilitators, PDSA).

DECISIONS – none today

2013 ARG DATES: Continue to earmark second Tuesdays for possible conference calls. Meet in-person quarterly: January 8, March 12, June 11, and September 10.

ACTION ITEMS

- Jeremy Check on the in-water schedule fish and avian limitations for the Spawning Beach Decommissioning. Is there room to move re: the avian timelines?
- Nathanael Schedule an appointment with Ed and R2 early in the New Year re trap studies.
- Doug, Kevin, Co-managers – Determine drop location for spawning beach morts.
- Nick Forward the PIT tagging proposal to the co-managers and agencies.
- Co-Mgrs and agencies – Respond to Nick's marking proposal by December 3, consider the subsampling modification.
- Doug – provide fish samples from the LB FSC (when it's deballasted Nov 28) to Craig for IHN analysis.
- All Contact Nick if you need a copy of the 2011 study report that was issued last February.

PREVIOUS - STILL RELEVANT - ACTION ITEMS

- Stan Coordinate co-managers to update the adult trap protocol for sea-run cutthroat.
- Co-Mgrs Send a draft Fish Production Plan to Arnie ASAP, as per FPPF. Co-mgrs report still making progress; discussions taking place, report in the works.
- All Review / update the ARG representation list for your organization (ongoing).

UPDATE ON PREVIOUS ACTION ITEMS

Fish Production Plan: Stan reported that the co-managers are scheduled to meet after Thanksgiving to make progress on the plan.

IHN Outbreak Report: [Insert provided by Craig Olson] "Craig provided a report of the IHN status for 2011 and 2012 as indicated by several sampling points. IHN is a highly infectious viral disease that has host-preference for Sockeye. 2011 was a "hot IHN year" with pervasive IHN found among brood stock in both the hatchery AI program and all four sections of beach 4. Because a large number of sockeye adults were also put into Baker Lake, an attempt was made to assess whether IHN was active in spawners using Little Park and Channel Creeks. At Channel Creek all the samples contained IHN; at Little Park Creek just a little

virus was found except for one “hot” male. The results were imprecise because the samples were only taken on one day, and multiple fish were combined into some of the samples.

Two attempts were made to determine whether IHN infections transferred from the wild spawning adults to juveniles in Baker Lake. Upper Skagit unsuccessfully battled difficult conditions trying to catch juveniles in a tow net to test in mid-winter. The second attempt was to sample out-migrating smolts from the Baker FSC. For eight weeks, from April 16 - June 4, 2012, PSE crews submitted 20 fish per week for testing, focusing on suspicious-looking fish. No IHN was found among those outmigrants. This is in contrast to the 1990's, when it was fairly easy to find IHN among spring outmigrants after infected fry were planted into the lake. Not finding infected smolts is a welcome hint that stocking Baker Lake with the amount of infected sockeye adults stocked in 2011 is less risky to the lake rearing juveniles than is planting of infected fry. Current hatchery containment procedures, which prevented the stocking of infected fry on three occasions this past spring, seem to be working well.

Testing of brood fish this fall indicates that IHN is similar to last year in the 2012 adults. The virus has been found in fish from all four beach sections and all the AI brood ponds. Specific disease containment protocols are being followed and they make a difference. The Channel Creek spawners have been checked again this year over the last three weeks and IHN is prevalent there again.

Like financial reports that state “past results are not necessarily indicative of future performance,” Craig notes a couple changes in the current situation that may cause our future experience to vary from our successful containment of IHN in the past decade. For one, the version of the virus that showed up here in 2011 is different (a mutation) from the strain that had been prevalent along our coast for the last twenty years. It is not isolated to us; it caused outbreaks in several places throughout the Salish Sea this past year. We do not yet know whether this mutation will prove to be more or less virulent, transmissible, or persistent than the previous one, though the number of outbreaks this year suggest it's pretty successful. The other difference Craig points out is the incredible success of the Baker project increasing the sockeye population ... which means that many more potential IHN hosts. Craig and the co-managers are treating 2012 as another opportunity to assess the impacts of abundant infected adults, and where containment efforts are working or where they may need to be increased. The co-managers are including what we're learning into risk assessments for our containment options.”

HOT TOPICS, BRCC, & LICENSE PROCESS UPDATES

The fourth Wednesdays will continue to be reserved for BRCC conference calls as needed. In-person meetings are scheduled semi-annually (spring and fall).

No hot topics today. Tom noted that folks at PSE are feeling excited about the work ahead and the major projects coming online in the next year.

BAKER FISH HATCHERY OPERATIONS

Doug gave the report in Kevin's place since the hatchery folks are spawning Sockeye today. This will be the fourth spawning day of the season. The first one gave us the largest number of eggs we've ever collected... over one million collected that day! Counting today's collection, we will be close to three million eggs in hand. He pointed out that the hatchery is following a very strong disease prevention policy to avoid an IHN outbreak.

Assuming the fish are ripe, the first Coho spawning day will start Monday or Tuesday of Thanksgiving week so they can submit samples (liver, spleen, ovarian) for virology analysis before the holiday weekend.

The sockeye program is set up for 6 million fry and we're well on our way. The spawning beaches were fully loaded with 3,400 fish and we expect a great production. The post-spawn die off is going strong now; staff are collecting the morts and transporting them for nutrient enhancement. Doug double-checked at break and confirmed that the fish are being transported and deposited into upstream tributaries. The co-managers

expressed concern about disease transmission, especially during hot years, and want the fish delivered to a non-water drop site. Stan stated he believed there was a pre-season agreement to drop hot fish into a pit ... or at least not in a tributary. The co-managers will work with Doug and Kevin to address this.

Brett asked about pre-spawn mortalities. Doug didn't have those numbers on hand, but Craig confirmed that any pre-spawn morts are tested for IHN. They characterized the numbers as slightly higher than normal, but not alarming.

HATCHERY FISH INVENTORY

Doug reported that the motorized fish pump that is used to collect the fall release juvenile, ad-clipped Sockeye from raceways 1 & 2 for transport isn't working. They tried to repair it yesterday and will try again today. After today's spawning, they will pump those fish for transport and release to Baker Lake.

65,000 ad-clipped coho are being held in raceway 4 for 2013 spring release and bio studies. 20,000 Rainbow trout are being held in the circulars for spring/summer releases to Depression Lake, a derby, and charity event.

The artificial incubation and spawning beaches A-D have sockeye that are being spawned now.

In general operation updates, Doug noted that the extra screens that were installed to catch leaves worked as intended and hatchery staff is paying attention to processes to ensure the facilities are safe for people as well as fish.

FSC / SPAWNING BEACHES UPDATE

Caitlin shared a project update for the Floating Surface Collector (FSC) commissioning and Channel Creek spawning beach decommissioning projects.

The **FSC** was ballasted for the first time on October 31st. It was a little light, so they will add some permanent ballast to ensure it floats at the right level. The NTS commissioning was delayed due to a tear in the lining during transit (since repaired and commissioning is now underway). Seven systems were tested last week and all were signed off. FSC and NTS were joined together in the water November 5. The guide net deployment started October 1 and is scheduled to be in place later this week. The materials for the debris boom have been delivered on site and fabrication will begin this week. She expects commissioning to be completed this month, balance the screens in December – January and reach substantial completion in January or February in order to be operational by March 1st, per the license. She showed some photos of the work progress.

She then reported on the **Spawning Beaches** decommissioning project. There hasn't been much new work since the last ARG meeting. She reminded folks that Anchor QEA is handling the design work in accordance with the preferred "Alternative 5" design approach. A limited amount of lead paint, asbestos piping and insulation, and diesel contamination were all found on site. PSE is working to get plans from consultants for the safe removal of those materials and the contaminated soil. They have scheduled final design for construction to begin after the first of the year. Construction is scheduled to start no sooner than September 15 to accommodate an avian protection window in the area, with in water work done at the front end. The decommissioning process is scheduled to be complete no later than November 1 and PSE expects this project to be complete by the end of 2013.

The group shared some concerns about the in-water work schedule, noting that Sockeye are moving into the channel by late September. There are competing interests at play with avian timelines impacting the schedule. Jeremy will ask internally if there is room to move on the avian timelines.

FSC UPDATE

Nick reported that five FSC-related plans were submitted to ARG in August and the FERC in October: The Downstream Fish Passage Implementation Plan, the Operations and Maintenance Plan, the Preliminary Emergency Response Plan, the Quality Assurance/Quality Control Plan, and the Post-Construction Evaluation Plan. If you only have time to review one plan, Nick suggests the Post-Construction Evaluation Plan, which includes detailed hydraulic and biological evaluation data, the screens balancing plan, and other operational details that he thinks are of most interest to ARG members.

UPSTREAM TRAP POST-CONSTRUCTION

Nick reminded the group that the upstream trap was completed in June 2010. NMFS requires that a post-construction evaluation be conducted to confirm that the trap operates according to design and to confirm whether the attraction flow is adequate for the increased powerhouse discharge flow. Preliminary work was conducted and a plan is under development, which will be finalized with the Services and submitted to the FERC, then conducted following initiation of powerhouse operations. Phil described the four-step process, which included reviewing operations and daily fish counts under a number of different flow conditions and compared with historic conditions. Preliminary results indicated no evidence of delay associated with the volume of flow through the trap. Fish entered the trap in greatest numbers when attraction flows were 5% or less of Baker River flows.

Three consecutive years of record salmon returns suggest that the Upstream Fish Trap is operating as designed. Brett noted that the timing and distribution of the fish return window has changed; the last two years have seen a distribution curve with a marked peak and a big shoulder on the tail end of the run. There is a question about whether this change is about the new machinery or if it is the natural distribution curve for big return years. The post-Unit 4 portion of this plan calls for a repeated analysis of the sockeye and coho runs with the new flow regime in place, still focused on attraction flow and whether the trap operates according to design. Ed noted his concern that juvenile coho of ~70 mm length were entering the trap, and that tolerances don't allow for their safe handling and transport. Ed suggested adding this issue to the post-construction evaluation, but it was decided that the issue would be addressed separately. Nick and Tom will initiate internal conversations to consider operational changes that could resolve the small fish issue. We'll stay tuned.

DOWNSTREAM PASSAGE

Nick reported that the 2011 downstream fish passage annual report (Sept. 1, 2011 – Aug 31, 2012) will be submitted for ARG review shortly. It reviews the year's operations, fish numbers, and any issues that occurred throughout the previous year. He encouraged ARG members to review the report in detail for a better understanding of ongoing operational issues with the facilities. Nick noted that the 2011 study report was issued last February and distributed to the group, but that anyone needing a copy should contact him.

BAKER UPSTREAM FISH TRAP RETURNS

Doug reported that a record terminal run of 48k sockeye occurred in 2013. This includes tribal trap haul, sport fishing, treaty commercial haul, and fish at the trap. Brett noted that this represents a smolt-to-adult survival rate of about 12%, which is a little on the high side of the normal range, but not extraordinary.

ARTICLE 104 CONNECTIVITY ANNUAL REPORT

Nathanael reported that this has been a good year. The 2012 field season numbers included 24 char at the upstream fish trap, 59 char at the UB FSC, 47 caught by angling near the UB FSC, and 35 at Lake Shannon.

Snorkel surveys are underway in the Upper Baker River and Sulphur Creek; 216 bull trout have been observed in the Upper Baker and 20 bull trout in Sulphur Creek. For comparison, last year was a big year in the Baker River when 143 bull trout were observed. In Sulphur Creek, 14 bull trout were observed on this year's October 17 survey and roughly half were in the 10-12 pound range. This suggests this is a good year for bull trout spawners in Sulphur Creek. Native char surveys will continue for a few more weeks, so total numbers will increase. Ashley said that higher numbers of bull trout is consistent with regional observations, perhaps related to lower stream temperatures.

2012 UPPER BAKER SUBSAMPLING REPORT, 2013 PLANNING

Nick discussed aspects of the 2012 subsampling program, including the direct transport method, showing photos of operations. These showed stability and safety issues with the hopper and docking station and highlighted modifications necessary to improve functionality, efficiency and safety.

Eric (R2) noted that 2011 was a practice year to test some procedures. 2012 was the first year for subsampling on the largest return days. Having a subsampling option was very helpful during the two largest return days, May 6 & 8 (about 85k one day, over 40k another). He shared information about R2's study of the subsampling accuracy, which found that mechanical separation of fish into multiple raceways, combined with the tendency for fish to come in big groups, significantly reduces subsampling accuracy. The group was disappointed that mechanical sampling wasn't more accurate. Nick then showed data reflecting the fish techs' estimation accuracy and the group was impressed (a few folks suggested the techs could be card counters in Las Vegas!). With a few outlying exceptions, the fish techs were generally within 5-10% in their estimates.

Nick suggested a modification of the subsampling program to include 100% sampling of raceway #1 at all times, and sampling of all raceways when the daily fish number is estimated by the on-site biologists to be 6,000 fish or less. Subsampling at the 25% level would be initiated at all times when the daily migration is estimated to exceed 6,000 fish (this represents a reduction from the 2012 trigger of 18,000 fish, and is only possible if freeze brand studies are replaced by PIT tag releases). Risk of being overwhelmed will be minimized by distributing fish into all four raceways from April 24 – May 31. The subsampling would occur within this window.

Eric noted that this decision will also impact the operational approach to marking fish. PIT tagging, if that is to be done, is scheduled for mid-December. This conversation was tabled until the end of the meeting in order to allow for further background information to be presented. Upon resuming the discussion, it was agreed that Nick would send a proposal and place it on the agenda for further discussion at the January 8th ARG meeting.

2013 LB FSC STUDY PLAN REVIEW / APPROVAL

Eric walked the group through the plan for the 2013 LB FSC study plan, which he described as very similar to the 2010 UB study.

Study objectives:

- determine the flow preference of naturally migrating sockeye and coho salmon smolts by operating the FSC at 500 and 1000 cfs inflow;
- determine survival and physical condition of smolts through collection, holding and transport facilities;
- determine survival and physical condition of fry when operating the FSC at 1000 cfs inflow;
- compare the recapture rate of PIT-tagged and freeze-brand downstream migrating sockeye and coho against the 2012 baseline gulper recapture rate;
- use the physiological differences (gill ATPase) displayed between the overall population of PIT fish and the PIT fish that are captured in the trap in order to discern the differences between migrants and non-migrants; and
- identify the level of predation on study fish and the impact to performance of the FSC.

There are several parts to this study. They will use naturally migrating coho and sockeye smolts from April 22 through June 14, switching flows back and forth between 500 and 1000 cfs each day at 8:00 a.m. They will switch raceways at the same time to differentiate between fish captured at each cfs level and will record the number of juveniles captured under each scenario. They will also run individually marked juveniles through the facility to evaluate the effects of the machinery on the fish themselves. Another element of the study will evaluate the effects of holding and transport; this part of the study will run May 6 – June 10,

noting fish condition three times at different holding times. There will also be a mark-recapture study to verify 100% detection, determine initial FSC effectiveness, and compare recapture rates with the old gulper and freeze-branded coho.

2012 LB FSC STUDY REPORT

Eric described the study done at Lower Baker this year. There were releases of PIT tagged coho and sockeye (1,000 of each) at three sites (upstream, a mid-lake site called “neck-down” and one near the boat launch) on Lower Baker. The goal was to identify the effects of release location on recapture rates, compare the recapture rate of individually marked and batch marked downstream migrating coho and sockeye released into Lower Baker, and project the findings as they relate to future studies to be conducted on the LB FSC.

The sockeye recapture rates were: 10.6% at the upstream site, 12.1% at the “neck-down” site, and 10.8% at the boat launch site. Periodicity makes a big difference in recapture rates; fish released in the peak of migration give the best rate of recapture. The coho recapture rates were: 23.3% at the upstream site, 23.6% at the “neck-down” site, and 26.6% at the boat launch site. All of the return data were compared with water temperature data, solar radiation (sunny vs. cloudy day) data, water elevation, and spill; the fish followed predictable patterns. There was a big difference between PIT tagged and freeze-branded coho (which saw the highest recapture rate in 21 years – 57.7%), which was not particularly surprising to Eric, given the other variables in terms of collection accuracy between PIT tagged and freeze-brands as a methodology, variation in handling protocols, and the limited number of samples. The results of this study were used to inform the 2013 study discussed earlier.

2013 OPERATIONS PLANNING

Circling back to the earlier conversation about PIT tagging vs. freeze branding, Nick walked the group through a recommendation for transitioning to PIT tagging for upcoming studies at Upper and Lower Baker:

Upper Baker:

- initiate annual PIT tag sockeye and coho releases for continued biological performance monitoring in 2013 (increased data reliability, detail and integration as well as reduced sampling requirements)
- discontinue freeze branding
- conduct sub-sampling at 25% level (sample only pond #1) and include entire migration period where daily numbers exceed single transport load (6,000 fish); enabled by discontinuation of freeze branding and other special mark studies

Lower Baker:

- 2013: 1st-year flow preference study by daily pump switching between 500 and 1000 cfs flow
- 2014: 2nd-year, performance study using PIT tagged sockeye and coho smolts
- 2015: 3rd-year, performance study using PIT tagged sockeye and coho smolts
- Discontinue freeze branding
- Initiate annual PIT tag sockeye and coho releases for continued biological performance monitoring in 2016
- 25% subsampling to be initiated 2014, after 2013 flow preference study

Steve commented on the group’s original intention to move toward PIT tagging, as evidenced by the choice of equipment on the machinery. His concern is centered around the disparity of results for Lower Baker; he noted that changing to PIT tags could cause the FSC to be out of performance compliance just because of the difference inherent in the methodology. Nick noted that all PIT-tag releases would be conducted at the same sites of previous PIT-tag releases for comparability, so the risk of reduction in number might apply only at Lower Baker if the 2012 results are real. The group also talked about the value of having a 20+ year body of data in the freeze-brand fish; after some discussion, they agreed that interrupting this data set is not a large risk because there have been so many changes to the system that the past and future data sets will not have much in common anyway.

Stan suggested Nick send the proposal to the co-managers and services to ask for their direction. They will respond by December 3rd. Steve added a suggestion for PSE to move forward with PIT tagging for now.

Nick will also provide information about subsampling in the email to co-managers so they can think about this between now and the next ARG meeting. Subsampling will need to be a significant part of the January 8 ARG agenda.

PARKING LOT

- Sampling rate for Baker Hatchery Coho needs to be addressed.
- PSE will propose a sub-sampling protocol.