

**Meeting Notes – Baker River Basin Native Char Consultation
Fish Passage Technical Working Group (FPTWG)**

Project: Baker River Project
FERC No. 2150

Written By: Nathanael Overman, PSE

Meeting Date: February 26, 2010, 9:00 am – 11:30 am

Location: USFWS Office, Lacey, WA

Attendees: Jeff Chan, USFWS
Cary Feldmann, PSE
Phil Hilgert, R2
LouEllyn Jones, USFWS
Nathanael Overman, PSE

Purpose: Confirm 2010 Baker bull trout handling protocols and continue discussion of Lake Shannon to Baker Lake connectivity.

Generally following the agenda (attachment 1), the meeting commenced with a quick review of License Article 104 and the draft meeting notes from January 19, 2010, including a brief review of potential fishways for establishing connectivity. The bulk of the February 26, 2010 meeting was allocated to confirming bull trout handling protocols for 2010 including capture and transport of bull trout from Lake Shannon to Baker Lake. The group also discussed two potential bull trout studies being considered by other parties: the first a bull trout predation study (Jon-Paul Shannahan; Upper Skagit Indian Tribe), and the second involving bull trout use of the Baker River delta (Chuck Ebel; USACE). While reviewing the draft January 19 meeting summary, Jeff noted that Denise Hawkins (USFWS) and Mo Small (WDFW) had indicated that segregating Baker Lake, Lake Shannon, and out-of-basin bull trout populations would be beneficial; Jeff asked that a note to that effect be added before the January 19 meeting summary is finalized.

Jeff discussed the concept of a fishway between Lake Shannon and Baker Lake and mentioned that volitional fish movement, such as provided by a fish ladder, is the preferred option. However, due to site constraints, a fish ladder between Lake Shannon and Baker Lake is not feasible. Phil mentioned that a trap and haul facility could include a volitional entranceway, but once the fish enters the trap, we have to decide where to move the fish. Non-structural options have been considered and angling with genetic analysis of captured fish may provide information to help make future decisions. The new Lower Baker Floating Surface Collector and Lower Baker Adult Trap will provide greater opportunities for capturing

and tagging fish; we should learn a lot more when we tag a much higher percentage of Baker Basin bull trout. Once the Lower Baker FSC is completed, the only time we expect entrainment will be from large spill events. Perhaps every five years we will need to check to see whether there has been a significant amount of Upper Baker origin bull trout that were displaced from spill events and remain in Lake Shannon.

2010 Protocols

Phil suggested that we continue PIT tagging and conducting genetic analysis of bull trout, and noted that one of the benefits of the resulting mark and recapture data would be better insight into population sizes. The group tentatively agreed to the bull trout handling protocols as described in Attachment 2.

LouEllyn wondered if forced segregation of the different populations has long-term risks, since historically there was at least some mixing of populations? Jeff noted that we need to work with Mo and Denise to understand the implications of managing metapopulation dynamics throughout the Baker Basin. How much intermixing should we allow? Perhaps we can manage the risk by allowing X% of out-of-basin bull trout into the Baker Basin. Phil noted that some bull trout will pass downstream during spill, and some DNA analyses will be equivocal, so there will be some genetic mixing despite efforts to segregate.

Protocols for bull trout captured in the Upper Baker FSC were discussed next. The question of what to do with Sulphur Creek origin bull trout was posed. Do we assume they are outmigrating and release them in the Skagit River or should they go into Lake Shannon? Jeff suggested that they be released into Lake Shannon where they can continue downstream migration through the Lower Baker gulper or remain in Lake Shannon. LouEllyn agreed that release into Lake Shannon made sense since the fish have the option to continue downstream outmigration. However, it was decided to consult with Mo and Denise as to whether to move Sulphur Creek origin fish from the Baker Lake FSC to Lake Shannon or to the Skagit River. Handling protocols for bull trout of Sulphur Creek genetic origin captured in the downstream fish passage facilities or captured by angling during 2010 will be confirmed in a future conference call with Jeff Chan and Denise Hawkins (USFWS), Mo Small (WDFW) and Nathanael Overman (PSE). LouEllyn indicated that she would organize the conference call.

It was agreed that fish caught by angling in Lake Shannon should be PIT-tagged and a tissue sample taken. Cary suggested that angling conducted with the intent to populate the data bank of tagged fish would make sense. Jeff agreed and pointed out that it would be like doing “pre-work” for the transportation component of connectivity. Also, it wouldn’t necessarily matter where in Lake Shannon you caught the fish. Looking at the proportion by genetic origin for fish caught throughout Lake Shannon would be valuable. Jeff then posed the question, “How ‘real time’ do the genetics have to be?” Over time, we might be able to tag most of the bull trout in Baker and rely on tag data to dictate where we transport fish. In the meantime, do we hold fish while their genetics are being analyzed before

transporting? Jeff noted that he is not expecting a program of rapid genetic analysis to be implemented (i.e., holding bull trout for 1-2 days while their genetic origins are being evaluated).

LouEllyn noted that perhaps it would be best to start angling at the base of Upper Baker Dam and transport those that do have PIT tags, with fall (before bull trout have started coloring up or entering Sulphur Creek) being the best time to maximize the value of the effort expended. Jeff concurred and reiterated that he likes the approach of starting to angle in Lake Shannon with the intent to seed the population with PIT-tagged bull trout, and that from a connectivity standpoint, it makes the most sense to focus all 2010 angling efforts in Lake Shannon. If an out-of-basin origin fish is caught (as confirmed by a PIT tag corresponding to known genetic origin), then it should be released into the Skagit River. However, if it is a Baker origin fish, then if it is caught from December through May, it should be released into the Skagit River, and if it is caught from June through November, it should be transported to Baker Lake. A tissue sample from any bull trout that receives a PIT tag will be sent to WDFW for genetic analysis, most likely in November.

Bull trout studies

The meeting transitioned to discuss two potential Baker bull trout studies, the first a bull trout predation study (Jon-Paul Shannahan; Upper Skagit Indian Tribe) and the second involving bull trout use of the Baker River delta (Chuck Ebel; USACE). Nathanael had called Jon-Paul prior to the meeting to get an overview of the study. The first phase of the study involves capturing bull trout and other potential predators in Upper Baker to evaluate predation on salmon fry and smolts, especially at fry release sites. The second phase would be to calcein mark sockeye in the hatchery and monitor the consumption of hatchery vs. naturally produced sockeye. Jeff had spoken briefly with Jon-Paul prior to the January 19th meeting, but wanted to make sure there was no conflict of purpose if the USFWS issues a permit for the study. Nathanael noted that he understood that Jon-Paul's funding was uncertain and any field efforts would not begin until 2011. It was suggested that Jon-Paul be asked to present his study to the ARG, either via WebEx on March 9th, or ideally in person on June 8th. Nathanael said he would contact Jon-Paul to work out the details.

Phil addressed the Baker River delta study next. Chuck Ebel-USACE had called Phil and indicated the USACE may have some funding available in 2010 to evaluate potential bull trout spawning in the Upper Baker River delta. If a substantial amount of funding became available, Phil told Chuck that he would recommend a radiotagging study. Bull trout captured in Baker Lake could be tagged and tracked to monitor their spawning movements. Would the bull trout spawn in the Baker River delta, or hold and feed there before moving upstream to spawn? If there is limited funding, Chuck might have to resort to snorkel surveys of the Upper Baker River delta, perhaps including analyzing eggs from redds on the delta to determine species identity. Phil just wanted to mention Chuck's communication so that the USFWS

would know that any USACE efforts would be complementary and not conflict with ongoing studies in the basin. If Chuck can secure funding, Chuck will be in contact with the USFWS.

Additional comments

PSE will continue with Upper Baker River (Reach 2 and 3) and Sulphur Creek snorkel surveys in 2010.

Action items

Nathanael will finalize the January 19, 2010 meeting summary after including a note about Denise and Mo's recommendation to segregate the Baker Lake, Sulphur Creek and out-of-basin bull trout populations.

PSE will develop and submit a proposed 2010 angling effort and schedule to the USFWS. Angling will take place in Lake Shannon but not in Baker Lake. Jeff also noted that it would be good to start thinking about alternate methods of capturing bull trout if the angling catch-per-unit-effort proves excessive.

PSE will revise Baker bull trout handling protocols for 2010 (see attachment 2).

LouEllyn organize conference call with Mo and Denise.

Nathanael will coordinate with Jon-Paul for ARG presentation June 8th (or March 9th via WebEx).

Attachment 1.

BAKER RIVER BASIN NATIVE CHAR CONSULTATION

Fish Passage Technical Working Group (FPTWG)

**9:00 am – 11:00 am
Friday, February 26, 2010
Room 133, USFWS Office,
Lacey, Washington**

DRAFT AGENDA

Objective: Confirm approach to Article 104: Connectivity and 2010 activities

- 1. Review draft summary of January 19, 2010 meeting [Notes native char mtg 011910.doc]**
- 2. Review fishway options and confirm PSE's response to Article 104: Connectivity.**
 - Review License Article
 - Potential fishways: weir, waterfall trap, angling, other?
 - Tentative short-term recommendation (2010): angle for bull trout in Lake Shannon and transport and release Baker Lake origin fish back into Baker Lake
 - Tentative long-term recommendation: insert PIT tags into all bull trout handled in the Baker downstream fish passage facilities and transport based on protocols
- 3. Confirm handling protocols for 2010**
 - Continue 2009 handling protocols? [Protocol 2009 char 060809_1100]
- 4. Tribal bull trout diet analysis**
 - Jon-Paul Shannahan (Upper Skagit) bull trout diet analysis study; status? potential effects on PSE bull trout activities?
- 5. US Army Corps of Engineers response to flood control BiOp**
 - Potential interaction with PSE bull trout activities?
- 6. Confirm PSE activities for 2010**
 - Downstream fish passage facilities
 - Upstream fish passage facility
 - Sulphur Creek and Upper Baker River snorkel surveys
 - Angling efforts
 - WDFW genetic analysis - Lower Baker adult trap, angling
- 7. Recap Decisions and Outstanding Action Items**

Attachment 2.**DRAFT 2010 Baker River Basin Native Char Handling Protocol**

Lower Baker Adult Trap

Record date, capture location & method, measure and record length & weight, record sampler initials & condition (if abnormal), interrogate and record tag number if present, compare tag number against list of char PIT tags

- 1) Adults/sub-adults (≥ 125 mm):
 - If carrying char PIT tag: transport and release into Baker Lake or Lake Shannon depending on genetic origin; if out-of-basin origin, release into Skagit River. If genetic origin is unknown, collect DNA tissue sample, transport and release into Baker Lake.
 - If not carrying char PIT tag: take scales & tissue sample, PIT tag, record # and release into Skagit R. (priority of release sites: (1) Hamilton, (2) Faber Landing, (3) mouth of Baker R.)
- 2) Juveniles (< 125 mm): take scale sample, if juvenile > 40 take small tissue sample (> 2 mm diameter), release all juveniles downstream in the Skagit River.

Char Volitionally Entering and Captured in Baker Lake FSC

Record date, capture location & method, measure and record length & weight, record sampler initials & condition (if abnormal), interrogate and record tag number if present, compare tag number against list of char PIT tags

- 1) Adults and sub-adults (≥ 125 mm):
 - If carrying char PIT tag: transport and release Upper Baker and out-of-basin fish into Skagit R. (priority of release sites: (1) Hamilton, (2) Faber Landing, (3) mouth of Baker R.); release Sulphur Creek origin fish into Lake Shannon. If genetic origin is unknown, collect DNA tissue sample, transport and release into Skagit River.
 - If not carrying char PIT tag: take scales & tissue sample, PIT tag, record # and release into Skagit R. (priority of release sites: (1) Hamilton, (2) Faber Landing, (3) mouth of Baker R.)
- 2) Juveniles/ fry (41 mm to 124 mm): measure length, record capture, take small DNA tissue sample using several small clips (total > 2 mm diameter) release downstream in the Skagit River
- 3) Fry (≤ 40 mm): measure length, record capture, release back into reservoir at mouth of Welker Creek or near boat launch (Baker Lake)

Char Volitionally Entering and Captured in Lake Shannon Gulper

Record date, capture location & method, measure and record length & weight, record sampler initials & condition (if abnormal), interrogate and record tag number if present, compare tag number against list of char PIT tags

- 1) Adults and sub-adults (≥ 125 mm):
 - If carrying char PIT tag: transport and release Upper Baker, Sulphur Creek and out-of-basin origin fish into Skagit R. (priority of release sites: (1) Hamilton, (2) Faber Landing, (3) mouth of Baker

R.). If genetic origin is unknown, collect DNA tissue sample, transport and release into Skagit River.

- If not carrying char PIT tag: take scales & tissue sample, PIT tag, record # and release into Skagit R. (priority of release sites: (1) Hamilton, (2) Faber Landing, (3) mouth of Baker R.)
- 2) Juveniles/ fry (41 mm to 124 mm): measure length, record capture, take small DNA tissue sample using several small clips (total >2 mm diameter) release downstream in the Skagit River
- 3) Fry (≤ 40 mm): measure length, record capture, release back into reservoir at NW shore adjacent to log boom (Lake Shannon)

Baker Lake Angling Captures

2010 study efforts under Article 104: Connectivity do not include angling in Baker Lake for bull trout. If angling in Baker Lake is conducted as part of other studies:

Record date, capture location & method, measure and record length & weight, record sampler initials & condition (if abnormal), interrogate and record tag number if present, compare tag number against list of char PIT tags

Adults and sub-adults (≥ 125 mm):

- If carrying char PIT tag: release fish of Upper Baker genetic origin back into Baker Lake, release Sulphur Creek origin fish into Lake Shannon, release out-of-basin origin fish into Skagit River; if genetic origin is unknown, collect DNA tissue sample and release back into Baker Lake.
- If not carrying char PIT tag: take scales & tissue sample, PIT tag, record # and release back into Baker Lake

Lake Shannon Angling Captures

Record date, capture location & method, measure and record length & weight, record sampler initials & condition (if abnormal), interrogate and record tag number if present, compare tag number against list of char PIT tags

1) Adults and sub-adults (≥ 125 mm):

- If carrying char PIT tag: release Sulphur Creek origin fish back into Lake Shannon and release out-of-basin origin fish into the Skagit River. If Upper Baker origin bull trout are captured December through May, release into Skagit River; if Upper Baker origin fish are captured June through November transport and release into Baker Lake. If genetic origin is unknown, collect DNA tissue sample and release back into Lake Shannon.
- If not carrying char PIT tag: take scales & tissue sample, PIT tag, record # and release back into Lake Shannon at a location where immediate recapture is less likely.

PIT Tagging Procedure

- Collect lengths and weights,
- Collect DNA sample by clipping portion of anal fin,
- Disinfect PIT tags with 60-90% ethanol for a minimum of 15 minutes prior to tagging; disinfect needles subsequent to each injection,
- Inject PIT tag into the abdominal cavity of the fish using 20-gauge hypodermic needle; needles must be maintained free of scales and accumulated fish mucus; discard dull needles; keep smolts in water during the tagging and measurement process to the maximum extent possible,
- After inserting tag, scan fish with Biomark hand-held PIT tag reader to ensure successful implantation and record the individual tag code,
- Allow fish to recover in flow through container before release.

DNA Tissue Collection Procedure

- Fish > 85 mm - clip portion of anal fin to obtain a 5-mm-diameter tissue sample
- Fish < 85 mm - clip portion of caudal fin lobe (lower lobe) to obtain a 2mm-diameter tissue sample
- Place tissue in the sample bottle containing 95% non-denatured ethanol solution; do not dilute the ethanol; do not use methanol or reagent alcohol solutions (i.e., rubbing alcohol or denatured alcohol) because these chemicals disrupt DNA extraction; do not overload the vials with tissue because DNA will degrade; vials should contain no more than 1 part tissue to 4 parts ethanol,
- Label each bottle with geographic location, statistical area, species, date and sampler; it is important that all this information be included for the sample to be useful,
- If labels placed inside vials - **Do not use (wood) paper-based waterproof paper** (e.g., *Rite-in-the-Rain*) because chemicals interfere with DNA extraction; plastic paper (e.g., *Dura Copy*) is acceptable,
- If labels are attached to the outside of vials, cover the label with clear tape to ensure the writing does not get dissolved by preservative.

5-mm diameter ● 2-mm diameter ●



2010 Baker River Basin Native Char Activities

- Submit for analysis all juvenile, sub-adult and adult tissue samples collected in 2010 (submit samples to WDFW in November 2010).
- Capture **adult char** by angling in Lake Shannon; schedule and specific protocols to be determined.
- Transport and release char according to proposed handling protocols.
- Conduct snorkel surveys in Sulphur Creek and Upper Baker (mid-August through mid-November).

