

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

**Project:** Baker River Project  
FERC No. 2150

**Written By:** Phil Hilgert, R2 Resource Consultants

**Meeting Date:** April 30, 2009 (Thu.), 9:00 a.m. – 10:30 a.m.

**Location:** Conference call

**Attendees:** Doug Bruland, PSE                      John Johnson, USFWS  
Jeff Chan, USFWS                      Lou Ellyn Jones, USFWS  
Phil Hilgert, R2                      Nick Verretto, PSE

**Purpose:** Review 2009 planned activities & handling protocols, and clarify license article prescriptions

Following the agenda (Attachment 1), the group reviewed the status of 2009 bull trout activities, discussed refinements to the bull trout handling protocols and discussed the intent of the terms and conditions pertaining to bull trout that were included in the October 17, 2008 FERC Order Issuing New License. A summary of decisions or action items identified during the discussion is presented under each agenda item.

**1. Review comments on draft summary of January 8, 2009 meeting**

The draft record of the January 8, 2009 meeting was approved without change. During the January meeting, Mo Small (WDFW) had agreed to revise Figure 6 and Appendix 1 of the December 23, 2008 WDFW report on bull trout genetics in the Baker Basin. The information in the figure was correct; however, reordering the sample groups by geographic capture location would make the figure easier to understand. Jeff indicated that he had not received a copy of the revisions; Phil indicated he would check with Mo on the status of the revised figures.

**2. Provide update on Baker Basin native char captures in 2009**

Doug provided a file (Table 1) listing the native char captured during 2009. Ten native char have been captured in the Upper Baker floating surface collector as of March 25th and all fish were transported and released downstream into the Skagit River. Several char were less than 100 mm and PSE staff at the Baker Project requested guidance on the minimum size of fish to be PIT tagged. The topic led to the next agenda item which was refinements to the 2009 handling protocols developed at the January 2009 meeting.

**Table 1.** 2009 Baker River Native Char Sample Information, updated March 27, 2009

Sample	Date	Capture Location	Assigned ID (PSE)	PIT Tag # Inserted	Length (mm)	Weight (g)	Tissue (x)	Scales (x)	Release Location
1	02/13/09	UB FSC	09NC01		75	4	x		Skagit R.
2	03/31/09	UB FSC	09NC02		144	29	x		Skagit R.
3	04/05/09	UB FSC	09NC03	1C2CC044B3	260	170	x		Skagit R.
4	04/09/09	UB FSC	09NC04						Skagit R.
5	04/12/09	UB FSC	09NC05		65	2			Skagit R.
6	04/16/09	UB FSC	09NC06	1C2CDF9532 1C2CDDD3A	455	1,200	x		Skagit R.
7	04/18/09	UB FSC	09NC07	A	400	499	x		Skagit R.
8	04/22/09	UB FSC	09NC08	1C2CC0E2F6	150	28	x	x	Skagit R.
9	04/24/09	UB FSC	09NC09	1C2CDF9D8E	132	21	x	x	Skagit R.
10	04/25/09	UB FSC	09NC010	1C2CDF93AB	133	20	x	x	Skagit R.

### 3. Discuss refinements to 2009 handling protocols

In response to a request for guidance on the minimum size of fish to be PIT-tagged, the group reviewed and refined native char handling protocols for the Baker River Project (see Attachment 2) (*Following the conference call, the protocol description was changed to collect a fin clip for tissue analysis rather than using a paper punch*).

### 4. Review implementation of RPM BT2

The prescription (see Attachment 1, agenda item 4) was developed to address USFWS concerns related to potential competitive interactions of spawning adult sockeye and spawning bull trout in the upper Baker River. Phil referenced a table from the upper Baker River delta scour assessment study (Table 2) and noted that the percentage of adult sockeye spawning in the upper Baker River versus the reservoir inundation zone or Channel Creek varied quite a bit and did not appear to be strongly related to the number of sockeye redds observed in the Baker Basin outside of the spawning beaches. It was noted that in recent years the number of adult sockeye released to Baker Lake ranged from none to 11,087 (Table 3). Since the USFWS concern was related to the number of adult sockeye released to Baker Lake rather than the phased completion of the fish propagation facility, all parties agreed to use a survey trigger based on the number of live adult sockeye released into Baker Lake. Surveys of the Upper Baker River will be conducted when more than 3,000 live adult sockeye are released into Baker Lake. Levels of potential interaction between spawning adult sockeye and spawning bull trout will be discussed with the USFWS and other members of the Aquatic Resources Group based on the results of the surveys.

**Table 2.** Historical distribution of sockeye spawning in the Baker River system compared to data collected in 2001 (Data for 1994-1998 provided by Skagit System Cooperative) (excerpt from R2 2005)

	<b>2003</b>		<b>2001</b>		<b>1998<sup>1</sup></b>		<b>1997<sup>2</sup></b>		<b>1996<sup>1</sup></b>		<b>1994<sup>3</sup></b>	
Start of Draw Down	8/18		10/1		7/19		11/5		10/7		9/23	
Survey Area	# of redds	% of redds	# of redds	% of redds	# of redds	% of redds	# of redds	% of redds	# of redds	% of redds	# of redds	% of redds
Drawdown Zone <sup>4</sup>	339	37.2	288	40.5	661	47	375	26.6	939	76	652	26.1
Channel Creek	283	31.1	362	49.2	510	36	537	38.0	222	18	1,002	40.1
Upper Baker River and Tributaries	289	31.7	76	10.3	237	17	500	35.4	74	6	843	33.8
<b>Total</b>	911	100	726	100	1,408	100	1,412	100	1,236	100	2,497	100

<sup>1</sup> Redd distribution estimated from raw data provided by Skagit System Coop. The number of redds derived for each location was based on either the cumulative total of new redds (if available) or the maximum number of visible redds within the survey season. Data from these years has not been adjusted to account for total escapement.

<sup>2</sup> From Walsh, 1998

<sup>3</sup> From Walsh et al., 1996

<sup>4</sup> Drawdown Zone includes Baker River Delta, lower Channel Creek, Lakeshore and Tributary deltas located below elevation 727.77 NAVD 88.

R2 2005. Upper Baker Delta Scour Assessment and Spawning Evaluation (Study A-15), final draft report dated January 2005, prepared by R2 Resource Consultants, Inc. Redmond, WA., prepared for Puget Sound Energy, Inc. Bellevue, WA. 86 pp.

**Table 2.** Number of adult sockeye captured at the Lower Baker adult trap and the number of live adult sockeye released into Baker Lake during 2000-2005 and 2007.

<b>Year</b>	<b>Adult Sockeye at LB Trap</b>	<b>Adult Sockeye Released to Baker Lake</b>
2000	10,404	5,183
2001	4,942	2,395
2002	4,023	0
2003	20,236	11,087
2004	9,113	2,764
2005	3,378	0
2006		
2007		0

## **5. Review implementation of RPM BT 4**

The prescription (see Attachment 1, agenda item 5) calls for a monitoring strategy that adequately assesses bull trout spawner returns to Baker Lake and Sulphur Creek. After some discussion, there was agreement that the intent was to identify population trends rather than population estimates. While bull trout are captured and enumerated at the fish passage facilities, the USFWS was concerned that a decline in non-migratory fish may not be identified by monitoring captures at the fish passage facilities.

Between 2001 and 2006, adult spawner surveys had been conducted approximately every 10 to 14 days (weather, flow and turbidity permitting) from mid-August through early December in reaches 3 and 2 of the Upper Baker River. Reach 3 extends from the Crystal Creek confluence (RM 24.8) downstream to just above the confluence of Sulphide Creek (RM 23.0); Reach 2 extends from the confluence of Sulphide Creek (RM 23.0) downstream to the Baker River footbridge (RM 21.2). Surveys from 2001 through 2006 consisted of biologists snorkeling individual, pre-selected habitat units within the two reaches. Individual habitat units consisted of pools, glides and other adult holding habitats and were resurveyed each visit in order to increase consistency and comparability between surveys.

Between 2003 and 2006, daytime snorkel surveys had also been conducted in Sulphur Creek, a tributary located at the upper end of Lake Shannon. Observations of all lifestages of bull trout and other salmonid spawners were recorded in four reaches of the lower one mile of Sulphur Creek. Observations were recorded by reach extending from a 21-foot water falls at RM 1.0 downstream to the confluence with Lake Shannon. Supplemental night-time surveys had been attempted, but the numerous log jams, swift current and steep terrain in Sulphur Creek increased the risk of injury and night-time surveys had been discontinued. USFWS staff are interested in having the Upper Baker River and Sulphur Creek snorkel surveys continue; PSE agreed to conduct Upper Baker River and Sulphur Creek snorkel surveys in 2009.

## **6. Review implementation of Appendix D. Section 18 Fishway Prescriptions. 3.2.2. (p. 200)**

The prescription (see Attachment 1, agenda item 6) calls for extending the period of operation of the downstream fish passage facilities if it appears that bull trout migrants are not being captured. Nick noted that PSE intends to operate the downstream fish passage facilities from March 1 through July 31 and wondered about extending trap operations if a single bull trout migrant were captured during the last two weeks of July. After some discussion, it was agreed that operation of the Upper Baker floating surface collector (FSC) would be extended past July 31 if five or more bull trout smolts (<125 mm) were captured in the last two weeks of July. If extended operation of the Upper Baker FSC were to occur, PSE would consult with the USFWS to assess whether operation was needed for the entire month of August.

## **7. Review implementation of Article 410 (3) (p. 53) (recreational fishing)**

The prescription (see Attachment 1, agenda item 6) calls for public information and education of bull trout at the Baker Project. Lou Ellyn and Jeff noted that they were looking for information to be displayed at the Lower Baker adult trap, downstream fish passage facilities and U.S. Forest Service campgrounds. They also wanted to see information on bull trout displayed at a PSE visitor center assuming there continue to be a PSE visitor center. They suggested that PSE staff could contact the USFWS information and education office for help with the materials.

**Attachment 1.****Baker River Basin Native Char Consultation  
Fish Passage Technical Working Group (FPTWG)**

Thursday, April 30, 2009

**AGENDA**

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Objective: Review 2009 planned activities & handling protocols, and clarify license article prescriptions.

**1. Review comments on draft summary of January 8, 2009 meeting**

*'Minutes native char mtg 010809.doc'*

**2. Provide update on Baker Basin native char captures in 2009****3. Discuss refinements to 2009 handling protocols**

*'Handling, tagging, 09 activ 042309.doc'*

**4. Review implementation of RPM BT2** (Minimize negative effects of increased sockeye propagation on bull trout).

**T&C BT 2.1 (p. 225):** Consistent with the HERC fund under license Article 602 (Required Funding) and in coordination with the Aquatic Resources Group (ARG), the Licensee shall periodically monitor sockeye use of the upper Baker River mainstem for natural spawning (e.g., after Phase 1 and then again after Phase 2 hatchery improvements have been completed) to **determine if there are increases in competitive interactions with bull trout** for spawning sites or higher rates of redd superimposition than anticipated. If the ARG or the FWS determine that significant levels of competitive interactions are present, the Licensee shall work with fisheries co-managers to adjust the number of adult sockeye released into Baker Lake, or take other measures, as determined appropriate by the ARG or FWS, to minimize these interactions.

**5. Review implementation of RPM BT 4** (Minimize any unanticipated levels of bull trout mortality from project operation)

**T&C BT 4.1(A) (Hydropower Operations) (p. 227):** The Licensee shall consult with FWS and the ARG to develop a **monitoring strategy that adequately assesses bull trout spawner returns to Baker Lake and Sulphur Creek** local populations. This is necessary to confirm that bull trout take anticipated from project operations is not underestimated and will not result in population declines. The monitoring of returns will provide an early indicator of unanticipated levels of mortality potentially attributable to hydropower operations. If such monitoring should reveal an unanticipated decline of the bull trout population, then the Licensee, in coordination with the ARG and FWS, shall determine to what extent hydropower operations are the cause of the decline and whether re-initiation is warranted.

**6. Review implementation of Appendix D. Section 18 Fishway Prescriptions. 3.2.2. (p. 200)**

The Service may require operation during August if sufficient downstream bull trout migrants are not captured during the previous 5 months or if bull trout smolts are present or being captured during the last two weeks of July.

**7. Review implementation of Article 410 (3) (p. 53) (recreational fishing)**

Include and maintain up-to-date information on angling regulations/ restrictions for bull trout, and on appropriate handling of incidentally caught bull trout, at visitor information facilities, interpretive services, and information boards, and develop informational materials on bull trout and associated conservation efforts for distribution or display at these facilities.

**8. Recap Decisions and Outstanding Action Items**

## Attachment 2.

### 2009 Baker River Basin Native Char Handling Protocol

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#### 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 ( $\geq 125$  mm):
  - If carrying char PIT tag: transport and release into Baker Lake, or into Lake Shannon if previously tagged in Lake Shannon
  - 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

#### Baker Lake FSC and Lake Shannon Gulper Trap 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 ( $\geq 125$  mm):
  - If carrying char PIT tag: transport and release into Skagit R. (priority of release sites: (1) Hamilton, (2) Faber Landing, (3) mouth of Baker R.)
  - 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): take small DNA tissue sample using several small clips (total  $> 2$  mm diameter) release downstream in the Skagit River
- 3) Fry ( $\leq 40$  mm): measure length, record capture, release back into reservoir at mouth of Welker Creek or near boat launch (Baker Lake) or NW shore adjacent to log boom (Lake Shannon)

#### Baker Lake FSC 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

Adults and sub-adults ( $\geq 125$  mm):

- If carrying char PIT tag: transport and release at mouth of Welker Creek or near boat launch
- If not carrying char PIT tag: take scales & tissue sample, PIT tag, record # and release at mouth of Welker Creek or near boat launch



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### PIT Tagging Procedure

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- 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.

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### DNA Tissue Collection Procedure

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- 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 ●



## 2009 Baker River Basin Native Char Activities

- Submit for analysis all juvenile, sub-adult and adult tissue samples collected in 2009 (submit samples in August 2009),
- Collect at least 35 tissue samples from **brook trout** captured in the Baker River basin; capture data similar to that recorded for bull trout will be recorded for the brook trout tissue samples (e.g., capture location, length, weight),
- Capture **adult char** by angling at UB FSC and LB gulper; angling will be opportunistic and is expected to be conducted during downstream fish passage monitoring studies,
- Transport and release char according to proposed handling protocols (intent is to decrease the number of out-of-basin char transported and released into Baker Lake).

