

From: [Hays, Steve](#)
To: "[Breean Zimmerman \(bzim461@ecy.wa.gov\)](#)"; "[Peterschmidt, Mark F. \(ECY\) \(mape461@ecy.wa.gov\)](#)"; "[david.bowen@ecy.wa.gov](#)"; "[Jim Pacheco](#)"; "[Korth, Jeffrey](#)"; "[Graham Simon](#)"; "[travis.maitland@dfw.wa.gov](#)"; "[Kari Grover Wier](#)"; "[pwillard@fs.fed.us](#)"; "[Emily Johnson \(ekjohnson@fs.fed.us\)](#)"; "[Alex Martinez \(ramartinez@fs.fed.us\)](#)"; "[Ashley Rawhouser@nps.gov](#)"; "[Hugh Anthony@nps.gov](#)"; "[Steve Lewis \(Stephen.Lewis@fws.gov\)](#)"; "[Rich Domingue \(richard.domingue@noaa.gov\)](#)"; "[Bonnie.Hossack@noaa.gov](#)"; "[Justin Yeager \(Justin.Yeager@noaa.gov\)](#)"; "[Bill Towey](#)"; "[Bob Rose \(rosb@yakamafish-nsn.gov\)](#)"; "[Carl Merkle \(carlmerkle@ctuir.com\)](#)"; "[mcooney@cityofchelan.us](#)"; "[Phil Archibald \(ndmarkey@gmail.com\)](#)"; "[Nick Elwell](#)"; "[tom.ernsberger@parks.wa.gov](#)"; "[nona.snell@rco.wa.gov](#)"; "[Richard Uhlhorn \(richard@richarduhhorn.com\)](#)"; "[Thomas O'Keefe \(okeefe@amwhitewater.org\)](#)"
Cc: [Osborn, Jeff](#); [Smith, Michelle](#); [Sokolowski, Rosana](#); [Clement, Marcie](#); [Bitterman, Deborah](#); [Buehn, Scott](#); [Campbell, Rob](#); [Willard, Catherine](#); [Underwood, Alene](#)
Subject: Reduced Flow Operations To Implement Chelan River Steelhead Trout Egg to Emergence Survival Study
Date: Tuesday, March 21, 2017 4:42:14 PM
Attachments: [Chelan River steelhead egg to emergence survival study.docx](#)

PUBLIC UTILITY DISTRICT NO. 1 of CHELAN COUNTY

P.O. Box 1231, Wenatchee, WA 98807-1231 • 327 N. Wenatchee Ave., Wenatchee, WA 98801

(509) 663-8121 • Toll free 1-888-663-8121 • www.chelanpud.org

To: Chelan River Fishery Forum

Washington Department of Ecology

Washington Department of Fish and Wildlife

United States Forest Service

National Park Service

United States Fish and Wildlife Service

National Marine Fisheries Service

CCT (Colville)

YN (Yakama)

CTUIR (Umatilla tribe)

City of Chelan

Lake Chelan Sportsman Association

United States Geological Survey

Washington State Parks and Recreation Commission

Washington State Recreation and Conservation Office

Lake Chelan Recreation Association

American Whitewater

From: Steven Hays, Fish & Wildlife Senior Advisor
Public Utility District No. 1 of Chelan County (Chelan PUD)
steve.hays@chelanpud.org
(509)661-4181

Re: Lake Chelan Hydroelectric Project No. 637 (Project)
Reduced Flow in Chelan River Habitat Channel To Implement
Chelan River Steelhead Egg to Emergence Survival Study

Dear Chelan River Fishery Forum and Other Parties:

As decided at the March 2, 2016 meeting of the Chelan River Fishery Forum (CRFF), Chelan PUD will conduct a study in 2017 to determine egg to emergence survival for Steelhead Trout in the Chelan River Habitat Channel. The portion of the meeting summary that relates to this study is as follow:

Steelhead egg-to-fry Survival Measurement

Jeff reported the high spawning success of cylindrical egg tubes (CETs) data for Chinook salmon to the CRFF and inquired whether this data would be a sufficient surrogate for steelhead spawning. One complication of measuring steelhead-spawning success is gathering test eggs. Coordination with Eastbank Hatchery staff to establish specific steelhead spawning timing and egg incubation would be necessary. Steelhead broodstock and eggs are collected and incubated significantly earlier than steelhead spawning in the wild. Using test eggs with similar temperature units to naturally spawned eggs would be required to perform a valid test.

Jeff proposed the following options to the CRFF for consideration:

- Option 1: Use Chinook salmon CET data as surrogate for predicting steelhead egg-to-fry survival in the Habitat Channel;

OR

- Option 2: Coordinate steelhead egg take and incubation with Eastbank Hatchery staff to “match up” hatchery egg temperature units with wild fish estimated temperature units, and perform a CET investigation in the Habitat Channel using the same methodology by WDFW for spring Chinook salmon. Conduct the investigation in 2016, if possible. If not schedule the investigation for 2017, and, possibly, 2018.

The CRFF supported Option 2. It was noted that due to lack of time, WDFW may not be able to schedule this study in 2016, which is the preferred starting time. It might be necessary that Chelan PUD contact other consultants to see if they may be able perform this study in 2016.

Phil suggested that Chelan PUD investigate as to whether any others (i.e. BioAnalysts) have done survival egg-to-fry studies.

Chelan PUD recognized that it will be necessary to contact the HCP committee to obtain permission to handle ESA eggs.

After discussing other options, the CRFF recommend to explore the use of a Vibert box methodology used by WDFW for spring Chinook salmon egg-to-fry survival evaluation for conducting the steelhead egg-fry survival study.

Action Items:

- Jeff and Steve will contact Catherine Willard, Chelan PUD, who is Chelan PUD’s Hatchery Committee representative. They will request that this study be discussed in the HCP Hatchery Committee so that the 2016-2017 Broodstock Collection planning include steelhead eggs for this study. Chelan PUD will request permission and their input using the WDFW Vibert Box methodology for the steelhead egg-to-fry survival study.

Chelan PUD has been working through the logistics of conducting this study and has proceeded with preparation, including the reservation of five pairs of surplus steelhead adults of hatchery origin that were obtained from the Wells Hatchery. A study protocol and methodology is attached for your information and review. This protocol has been evolving as procurement of the egg boxes, construction of artificial redds and procurement of the adult steelhead for the gametes has come together in the past three weeks. Until today, the anticipated timing of the adult steelhead was expected to be around the second week of April. However, today personnel at the Eastbank Hatchery where the fish are being held determined that three of the adult females have reached maturity and they have scheduled this coming Thursday, March 23, for collection of gametes. Gamete collection and placement of egg baskets in the artificial redds constructed in the Habitat Channel will also take place on March 23.

Please Note That It Will Be Necessary To Reduce Flow In The Habitat Channel For Part Of The Day In Order To Install The Egg Boxes

The artificial redds were constructed at a flow of 85 cfs and in some locations the flow velocity and depths presented some challenges. Since March 15, the flow was increased to approximately 285 cfs, which is the flow from four pumps operating in the canal and approximately 85 cfs coming from Reaches 1-3 of the Chelan River. This flow will be in effect until May 15, as called for by previous decision of the CRFF. However, it is not feasible to install the egg boxes at this high flow. Therefore, the protocol for this study calls for flow reduction as follows:

Placement of the egg boxes with fertilized gametes will require that pumped flows be reduced because water depths and velocities at many of the artificial redd locations will be unmanageable at the higher flows. The procedure for reducing flows on the day or days when egg boxes will be installed will be to turn off pumps at the rate of one pump per hour, which past experience has been successful in preventing the stranding of Chinook Salmon fry in the shallow water rearing habitat in the HC. Thus, beginning three hours prior to the initiation of egg box placement, pumped flow will be reduced by turning off one pump. A second pump will be turned off two hours prior to egg box

placement and the third pump at one hour prior. Preparation for initiation of gamete fertilization and egg box placement will proceed during this time. The fourth pump will be turned off and egg box placement will begin. At the conclusion of egg box placement, the 285 cfs flow with four pumps will be resumed. A survey to determine if any steelhead are actively constructing redds will be conducted at the initiation of the flow reduction. If any redd construction activity was observed, then a follow-up survey will be conducted to determine if the steelhead resume redd construction after the flow is returned to four pumps, with subsequent surveys to determine if the redd was completed. Monitoring and rescue operations to determine if any Chinook Salmon fry were stranded will also proceed during the reduction in pumped flows.

Therefore, please be advised that reduction in flows to the Habitat Channel will begin on March 23, 2017, at approximately 0800, with flow reduced by one pump at that time. Flow will be reduced by additional pumps at 0900, 1000 and 1100, with the flow in the Habitat Channel reaching about 85 cfs by 1130. Meanwhile, steelhead spawning and gamete collection will be concluding around 1030 and the gametes will arrive at the Habitat Channel at around 1130. Egg baskets will be seeded with fertilized gametes and placed in the artificial redds until all redds have received an egg basket according to the protocol. If a fourth female has not matured by March 23, then one female will be used for ten of the redd locations, with the other two females used for five redds each. When all the redds have received an egg box with fertilized gametes, the pumps will be returned to operation and the flow will return to 285 cfs.

Today I conducted a steelhead spawning survey of the Habitat Channel with Scott Hopkins and we did not observe any new steelhead redds under construction. A steelhead redd that was initiated on March 8 was observed to be complete during a survey the following week and today there were no adult steelhead observed guarding that redd or staging elsewhere in the Habitat Channel. Also, no Chinook Salmon fry were observed rearing in the shallows and inundated willow areas, which was expected since water temperatures remain cold (6.5 degrees C) and emergence of Chinook is just beginning. Based on the observations during the survey and information from last year's snorkel surveys, we do not expect any adverse effects from a short-term reduction in flow in the Habitat Channel to either adult steelhead spawning activity or to rearing Chinook Salmon fry.

If you have any questions, please do not hesitate to contact me at (509-661-4181) or by email.

Steven Hays

Fish and Wildlife Senior Advisor

steve.hays@chelanpud.org

(509) 661-4181

<< File: Macroinvertebrate Investigation Chealn River 2016 Draft Annual Report.docx >>