

Meeting of the Packwood Lake Hydroelectric Project Fish, Aquatics and Instream Flow Committee

Date: January 21, 2005

Location: Lacey, Washington

Present:

Energy Northwest - Laura Schinnell, Bernice Kasko, Bill Kiel, Randy Crawford

EES Consulting - John Blum, Kent Doughty

Washington Department of Ecology - Deborah Cornett, Brad Caldwell, Paul Pickett

Washington Department of Fish and Wildlife - Lauri Vigue, Hal Beecher, Marc Hayes

United States Fish and Wildlife Service - Brian Peck, Craig Hansen

United States Forest Service - John Roland, Ruth Tracy, Ken Wieman, Charlie Crisafulli (by phone)

Yakama Nation - George Lee

NOAA Fisheries - Blane Bellerud

Meeting minutes for the June 24, 2004 and September 30, 2004 meetings were approved and will be posted to the Energy Northwest website.

The following handouts were available for the group: Packwood Lake Entrainment, Packwood Lake Tributary Fish Passage, Hall and Snyder Creek Fish Passage, and Lake Creek and Tailrace Slough Spawning draft studies and their associated PowerPoint presentations; amphibian habitat suitability criteria; preference curve information; and water quality data and associated PowerPoint presentation material.

L Schinnell opened the meeting with asking if there were any comments on the June and September 2004 draft meeting minutes. No comments were made and she indicated that the minutes would be marked as final and entered into the project record.

Entrainment Study

J Blum reviewed the purpose of the study and information obtained to date.

The study evaluated the potential for fish entrainment at the Project intake structure. Site-specific entrainment studies for the project had not been conducted previously. In 2004, EES Consulting began to study the presence of target species in the vicinity of the project intake. The target species for the entrainment study are rainbow trout and coastal cutthroat trout.

Due to the delay in obtaining the permit the surveys were only conducted for five days in October. The plant was shutdown during the surveys and no fish were seen on the last day of the study probably due to low water temperatures.

K Wieman asked if there was a published reference on the survey protocol; he also asked about the size of the intake opening behind the screens. The protocol is patterned after the Lake Chelan study. The screen areas are 9 feet; there is 15 to 20 feet before the water enters the 6' pipe and the 24" bypass. R Tracy asked about the approach to the screens. The trash rack is on the outside of the traveling screen.

L Vigue asked questions about the drawdown that occurs in September and dewatering in October in preparation for the outage. The lake is drawn down slowly to avoid damage to the bank. R Crawford explained that the first 2 feet of drawdown is done fairly quickly and then the remainder of the drawdown done slowly to prevent sloughing of the bank.

J Roland asked about fish found in the tunnel and pipeline. R Crawford said that fish had been found and theorized that they were dead before they got to the screens, and then the screens took the fish up and over. J ~~Roland~~Blum clarified that we would be inspecting the screens for fish.

K Wieman asked if we would also look for juveniles. B Peck asked if ~~screens~~ the gill net mesh were ~~small enough for~~ effective at catching juveniles and the answer was yes, depending on approach velocities. H Beecher asked about approach velocities. He asked if a gill net would be sufficient for small fish and asked about using divers to inspect the area in front of the trash racks. J Blum asked about using a smaller mesh net and H Beecher did not think that would be as effective as using a diver. J Blum asked about the use of an underwater camera, and H Beecher indicated that would be acceptable. Note: upon further inspection, the configuration of the area in front of the screens is not conducive to the use of divers; however, underwater cameras will be mounted and the screen area viewed in this manner.

July, August, and September would be the best time to conduct the studies; however we would resume studies in March if a permit can be obtained. It was clarified that there is about 10 feet between the trash racks and traveling screens. The screens operate automatically on pressure differential, and can be operated manually. The group is to provide comments on the study plans to J Blum. K Wieman asked why the studies were not done before October and J Blum informed the group that the permit was not approved before then. J Blum noted that he would seek a modification of the permit to allow the net to remain in place for several days without being staffed by a constant observer; i.e. only checked daily.

Tributaries

J Blum presented the results from the Fish Passage study. The purpose of the study is to address concerns that drawdown of Packwood Lake may modify stream connectivity, fish passage, and total habitat in tributaries upstream of Packwood Lake. The goal of the study was to establish if changes in lake elevation would interfere with upstream migration of resident rainbow trout into lake tributaries.

There is some confusion on the names of the tributaries and this will be identified and fixed before the next meeting.

L Vigue mentioned that the WDFW database shows cutthroat trout in Crawford Creek. B Peck asked if the profile was done in the thalweg of the creek. [The answer was yes.](#) J Roland asked how they defined a barrier. The barriers are determined by incline (i.e., would the fish have to jump due to the stream being too steep). B Peck asked questions on how the erodability of substratum in the tributary deltas was determined. [Only visual observations were made.](#) John B reviewed the results for each stream.

[The PAD states that](#) Drawdown to [approxiametly](#) 2856 would prevent fish passage in Crawford Creek. B Peck would like 2856 defined to the decimal point [as is done with the other tributaries.](#) L Vigue asked if we are doing any additional surveys. We are not planning to perform any additional studies. J Roland asked why Trap Creek was not surveyed; the answer was that EES Consulting was not aware that Trap Creek was a spawning creek. B Peck asked about surveying the extended bed profiles further upstream to a geomorphic nick point since historical drawdowns could have downcut headward in the channel and potentially created upstream barriers, [which would be maintained with continued annual drawdowns.](#) L Vigue stated there are wetlands identified in the National Wetland Inventory at the upper end of Packwood Lake and she is interested how drawdown could affect them. K Wieman has some aerial photos of the area done last summer that he will provide to L Schinnell. K Doughty asked for clarification that the only wetlands of interest for assessing hydraulic effects of drawdown are at the head of the lake in the Lake Creek drainage. L Vigue asked if there is an established drawdown rate in the license. R Crawford said there is not an established drawdown rate and that drawdown is conducted at a rate to minimize bank erosion.

Hall Creek and Snyder Creek Passage

J Blum stated that the goal of the study was to establish if the tailrace channel impacts fish migration and channel connectivity, and to establish whether the tailrace channel is a barrier to fish and/or has a negative impact on channel connectivity.

B Peck asked if we saw any beaver activity during the study. J Blum replied that he had not. K Wieman asked if we found a defined channel and asked what the bank full width was. Bank full width is 55' with a 36' main channel width. Conclusion was that Hall Creek was passable. B Peck commented that the picture shows [a plunge pool and riffle tailout downstream of the culvert, which indicates](#) high velocity going through the Snyder Creek culvert, indicative of an undersized culvert. K Wieman asked about fish habitat. J Blum replied that it is marginal upstream of the culvert. R Tracy had concerns that the velocity could be bad for small fish if the culvert was cleaned out. B Peck does not think Snyder Creek is passable [based on the observation of a few adult salmon upstream,](#) and would like a study done to address all species and all [life stages at all flows.](#) K Wieman would like to see calculations on [upstream](#) capacity. J Blum asked K Wieman if the Forest Service had done any work on Snyder Creek. K Wieman replied that they had and would provide the information to J Blum. K Wieman also

noted that passage of coarse sediment and large debris are considerations for the culvert passage on Snyder Creek under the tailrace. It was requested and agreed to that the passage assessment should be according to WDFW fish passage protocols, which can be used to evaluate both the existing condition and with the culvert cleaned out. There was some concern that culvert cleanout could potentially impair passage due to higher velocities.

Spawner Survey

J Blum presented that the purpose of the survey is to identify the potential for target species to use either lower Lake Creek or the tailrace slough. Electro fishing, snorkeling, and/or spawner surveys are being conducted to verify the presence and abundance of anadromous salmonids as well as rainbow trout, cutthroat trout, lamprey, and sucker.

K Wieman asked if we were looking at hatchery versus native fish and the answer was no. He also asked about water temperature in the area. J Blum replied that there is good gravel (substrate) and hydrology. B Peck asked if they ~~30 salmon observed in the tailrace plunge pool~~ were actively spawning or ~~trying to get into the tailrace~~ were holding before moving upstream, either into the tailrace or the Cowlitz River. Some fish have been observed in the stilling pond. K Wieman asked about pool depth; it is about 4 feet deep when the plant is shut down. B Peck asked if we have seen cutthroat in Lake Creek. J Blum replied that they have not seen any to date. B Peck asked how releasing 3 cfs in Lake Creek affects the Cowlitz River between Lake Creek and the tailrace. J Blum stated that the hydrology report will address that question, but that diverting the flow from Lake Creek to the tailrace does not appear to significantly affect the Cowlitz flow as the difference would not be measurable. K Wieman asked what the flows in Lake Creek were; information will be provided as part of the hydrology report. L Vigue identified an error on page 5 of the report – Riffle should be Randle.

Water Quality

K Doughty provided the results of water quality testing for temperature to date. R Tracy asked how much distance between the two tailrace thermograph locations. K Doughty showed on the map where the instrument in the stilling pond and at the lower end of the tailrace are located. K Wieman stated that the impingement study showed a drop in water temperature in October and asked if water quality data also showed a change in temperature; Kent will review the records. K Doughty showed a chart of the daily temperature record for Lake Creek near the mouth that suggests that the increased release flows for the instream flow study caused an increase in temperature since the larger volumes of warm water from the lake reduce the relative proportion of groundwater to the total flow in the channel. H Beecher would like to see how releases from the Lake affect the temperature in Lake Creek. R Tracy asked how long it took to see the water level change at the bottom of Lake Creek. When the instream flow studies were conducted it took about 3 hours to see a change from river mile 5.4 to 1.4. K Doughty presented data tables that show that, on average, water temperatures do not increase between the drop structure and the tailrace and within the tailrace; however, minor heating

does occur on some days in the tailrace. R Tracy asked if any heating of water within the stilling basin between the thermograph location in the basin and the powerplant outlet is probable; Kent replied that the travel time is on the order of seconds since the thermograph is positioned in the main velocity current. R Tracy suggested that monthly averages for the change in temperature between sites are not particularly informative; the group suggested comparisons be made on smaller time scale i.e., a 7-day average. She asked if the tailrace is sloped. R Crawford said that it was but did not know the dimensions. She also asked what the velocity would be. R Tracy asked to see the data in a 7-day maximum format with the same 7-days identified e.g. data for the time period 8/15 – 8/21, 2004. K Doughty asked if charts or tables are more informative; the group indicated that both are helpful. K Doughty asked for clarification on how the temperature criteria are applied in the tailrace; since the tailrace is not a natural waterbody what is the baseline for applying the 0.3°C incremental increase. There was some discussion on if the 0.3°C is an instantaneous number or an average. Ecology will clarify for the group. A question was asked if we are characterizing algae levels in the lake relative to other water quality parameters. K Doughty responded yes that algae data will be compared to water temperature and water chemistry once the lab completes the algae numeration, which is by species.

If anyone has questions or comments please provide them to K Doughty. L Schinnell asked if the group wanted to meet before the March 12 study request deadline. D Cornett responded that Department of Ecology may want to meet with K Doughty to have him answer some questions. K Doughty will complete data analysis in sections to speed up release of the data.

Amphibian

C Crisafulli joined the meeting by conference call. If a study is needed the target species needs to be identified. M Hayes stated that he is not aware of established habitat suitability criteria for depths and velocities for amphibians. Each species likes different temperatures, substrates, and velocities. H Beecher asked if connectivity between the channel flow and headwall seeps (the latter not dependent upon instream flow) is important for amphibians. It was stated that as headwall seep areas dry the animals may move down into the channel. They move up and down the headwalls to get into suitable habitat. Much of the year they occupy habitats on the valley wall. Rate of flow change is more important than rate of flow.

Torrent Salamander distribution gets spotty in the upper Cowlitz River basin. The Rainier and Tatoosh area have no torrent salamanders and they don't use main channels as habitat. Species of focus would be tailed frogs and giant salamanders.

It was asked if tailed frogs and rainbow trout can be in the same area. C Crisafulli speculates that they do coexist in streams.

Water temperature is an important factor in metamorphosis. In July adults enter the stream for 6-8 weeks for spawning. Eggs take several weeks to hatch. The question was asked if there are different habitat requirements for the different stages. The answer was yes. Rapid flow

fluctuations and high flows would be an issue for maintaining these species. Most of the work done on giant salamanders and tailed frogs does not focus on velocity or flow but on predators, canopy etc. Ron Altig of Mississippi State has done some research on the relationship of flow on the species. Providing for the larval stage is most important for survivability; this would be a two to three year period depending on temperatures, with the first year of most interest.

H Beecher asked if M Hayes and C Crisafulli could provide estimates on the upper and lower range limits for suitable depth and velocity for various amphibian species/life histories also could they describe good substrate? M Hayes responded that it could be done but that it would be a subjective estimate. K Doughty asked about developing a matrix that showed each species and season, maximum velocity, minimum velocity, maximum depth, minimum depth, and substrate. EES Consulting will provide a matrix table to be filled out for habitat suitability range estimates. M Hayes will work on a matrix and provide the information to K Doughty. The number one concern for the species would be a rapid change in flow rate. It was also stated that natural conditions could be worse than the controlled flows that exist as a result of plant operations.

H Beecher asked if there are area streams that you would find a high density of these species. C Crisafulli responded that he knows of some places that contain a high density and asked if USGS gages could be used as insight to the flows. H Beecher responded that he was not sure the USGS gage data would be useful.

Preference Curves

The target species list was reviewed and steelhead added to the list. B Peck asked if incubation is included. H Beecher stated that typically spawning flows are established and then an analysis of the flow necessary to keep spawning substrate wetted during the incubation period is assessed. It was stated that there was no need to apply fry suitability curves to the instream flow study since their habitat requirements are typically met across a wide range of flows. He also requested that winter rearing curves for rainbow be applied as part of the analysis, which was confirmed by the group. J Blum informed the group that he has not seen any suckers or lamprey. J Blum asked if the group were aware of any curves for suckers. H Beecher responded that there were several but not sure if there is one appropriate for our project. H Beecher would like us to use criteria that are philosophically the same and also use curves close to the Project. J Blum responded that he will use Category 3 curves.

J Blum asked the group to review the preliminary reports and provide comments to him. A meeting to discuss in detail the preference curves was scheduled for February 9, 2005 at 1:00. L Vigue will arrange the location and notify the group. It was noted that it is important to confirm that this date works for the representative(s) of the Yakama Nation.

Summary of Actions

Review draft reports and provide comments to John Blum or Kent Doughty.

Energy Northwest will clarify the names of the tributaries and provide the information to the group.

Ken Wieman has some aerial photos of the area done last summer that he will provide to Laura Schinnell.

Lauri Vigue stated there are cutthroat in Crawford Creek. She'll provide us with the information.

Ken Wieman will provide information on studies the Forest Service has done on Snyder Creek to John Blum.

There was some discussion on if the 0.3°C is an instantaneous number or an average. Ecology will clarify for the group.

John Blum asked for information on substrate preferences for giant salamanders and tailed frogs. Charlie Crisafulli to provide that to him.

Marc Hayes will work on a matrix showing each species and season, maximum velocity, minimum velocity, maximum depth, minimum depth, and substrate and provide the information to Kent Doughty.

Lauri Vigue will arrange the location of the preference curve meeting. L Schinnell will confirm the meeting date with the Yakama Nation and notify the group of the meeting time/place.