Technical Working Group – Instream Flow TWG

Pebble Project

November 19, 2008

Atwood Building Room 1270

Draft Minutes Recorded by Charlotte MacCay/Pebble Partnership (PLP)

I.   PRESENT:

Tom Crafford (DNR)
Andrea Meyer (ADNR)
Jason Mouw (ADF&G)
Cecil Rich (ADF&G)
Craig Schwanke (ADF&G)
Jeff Estensen (ADF&G)
Scott Maclean (ADF&G)
Mike Daigneault (ADF&G)
Phil Brna (USFWS)
Doug McBride (USFWS)
Francis Mann (USFWS)
Doug Limpinsel (NOAA)
Jean Zodrow (EPA – via phone)
Phil North (EPA)
Leslie Tose (USACE)
Dan Young (NPS)
Charlotte MacCay (PLP)
Ken Taylor (PLP)
Dudley Reiser (R2)
MaryLouise Keefe (R2)
Randy Bailey (Bailey Env.)
Jim Buell (Buell & Assoc.)

Public
Doug Wachob (The Nature Conservancy)
Tim Troll (The Nature Conservancy)
Carol Ann Woody (FRC)

ADMINISTRATIVE

- Jason Mouw was nominated lead for the Instream flow TWG.

(Agency Lead) The first Instream Flow TWG meetings were a much smaller group. There was an email to R2 that listed issues that needed to be covered. It has been copied to most people here at the table.

(Agency) There were no minutes from the second Instream Flow meeting.

(PLP) The notes cannot be located.

DATA REQUESTS

ADF&G sent out an email that lists a collection of habitat suitability criteria and curve analyses issues.

(R2) R2 has sent PLP hydraulic data, channel cross section data and substrate codes. PLP is expected to forward these data to the TWG soon.

(Agency) Future issues for discussion include:

- Habitat mapping

- Redd surveys

- Fish distributions by species, life stage, and periodicity

- Major fish congregations

- Information leading to transect locations

- Habitat Suitability Criteria

- Recurring interest in groundwater - surface water exchange

- Development of weighted useable area curves – habitat:flow relationships

- Hydrology and habitat time series

(R2) We rely on Knight Piesold (Jaime Cathcart) for the hydrologic time series. Because there are no long term flow records available for streams in the project area, K-P is using a number of techniques to develop a period of record that can be used as the basis for a habitat-time series. (Agency) We need PLP/R2 to share what they know.

(PLP) The hydrology data have been released to the public and are posted on our web page.

(Agency) Is that raw gaging data?

(Agency) Yes, it is existing USGS data and additional PLP data gage data. It is recommended that PLP be careful to keep the actual gage data separate from any synthesized data.

(Agency) How many years of data are needed for the instream flow model and time series analysis?

(R2) The PHABSIM models are developed based on hydrology data collected during the field surveys. For time series analysis, the more years of record the better; generally 15-20 years or more should provide a good representation of year types.   We presently have 4 plus years of flow data.

(Agency) There may be nearby gages on lake outlets.

(R2) They don't have an extensive record.

(Agency) We have some Lower Talarik Creek flow data – it's basically a flat-line that is useful for baseflow, but is otherwise of limited use.

(Agency In response to another agency member asking for an opinion of the process so far) There's not a lot of information for 2004-2007 and we haven't seen habitat maps yet. We do know more about the transect placement from a field trip and we have had input on proposed transects. Haven't seen the study design in full context of all the data. We have been giving speculative input, when we see some more data we can move forward from being so speculative.

(R2) In 2004-2007 HDR collected a substantial amount of information, but calibrated hydraulic models were never developed. R2 has done that now and has completed hydraulic models on 73 out of 92 transect. PLP will forward these to the group soon. The other 19 transects have various QA/QC issues that are still being reviewed. We hope to still use them, but we held on to them for now in lieu of additional analysis. Measurements were collected on another 46 transects in 2008 and are in the review and analysis process; these data sets will be passed on when completed.

INSTREAM FLOW MODEL

(Agency) When the model is up and running what is the result going to look like? Is it similar to what was done at Cooper Lake?

(R2) We will have transects that can be rolled up within strata to get a composite weighted useable area (WUA)/flow for each species and target lifestage for a given strata, as well as a composite of similar habitat transects between strata. Eventually we will have composite flow relationships that are weighted by habitat types for the whole river. With these, we can proceed with a time series analysis for each of the different species and target life stages that illustrate how habitat varies over time as influenced by differing hydrologies and water year types; e.g. wet year, dry year, average year. This will allow us to look at potential flow related impacts when we know the mine plan and water management scenarios. There are multiple steps in getting to this point, and we want to work closely with the agencies as this process continues. For example, We may need to pull in species experts for input on the HSC curves.

(Agency) We may have information for one species, but it may not cover other species.

(Agency) Cooper Lake was based on many assumptions.

(R2) This project has more HSC site specific data than what was available for for the Cooper Lake project.   We also will be considering and evaluating other reference HSC curve sets for comparative purposes. Also, in the final analysis, some best professional judgment will be used in developing these curves.

TARGET SPECIES

(Agency) How do we orchestrate expert review of curve sets if there are not experts in the room for that species?

(R2) Hopefully, we can collectively identify at least one (and in some cases several) species expert(s)s to assist in the derivation of HSC curves for any of the species for which site specific data may be difficult/impossible to collect.

(Agency) Is that the intent for all species?

(R2) We have a list of target species, mostly anadromous fish, and rainbow trout. We are staying away from sculpin.

(Agency) If you use salmonids as an indicator species it will act as an umbrella for other species

(Agency) Grayling spawn during spring high flows and therefore collecting field data at that would likely be difficult.
(Agency) The data of June 1st for adult anadromous fish entry into the system is often used, but there is some disagreement about that date

(R2) We will have HSC curves for all the target species (and lifestages) including grayling and Dolly Varden. For many of the key species, the HSC curves will be based primarily on site specific data. For others for which HSC data are difficult to collect, we will be relying on a combination of existing HSC curves and data (from other areas) coupled with opinions from species experts. (Agency) I assume you are using the model to look at how to mitigate flow effects from the mine. (R2) Yes, in many respects it is a similar type of analysis we have used on hydro projects to evaluate the effects of different flow release proposals on target fish species habitats.

(Agency) You can use the model to figure out ways to store and release water to mitigate effects of the project?

(R2) These tools will help us to determine the best ways to do that; how much water, where, when. Not only can we use the model as a means to evaluate project impacts, but also to evaluate various mitigation and possibly enhancement options. This is a common process used on hydro-projects.

(Agency) Off channel habitat (OCH) studies have been an integral component since the beginning of the studies. It would be interesting to see what's been done over the past year. R2 has apparently added some pressure transducers as a means to track stage changes in OCH with changes in flow in the mainstem rivers. These data could be interesting and drive some recommendations.

(R2) Correct, these data should be able to be used to evaluate the connectivity of side channels with the mainstem. . HDR studied sites in the Upper Talarik and South Fork Koktuli and did a ground survey of separation and connection points. R2 has those data. .

(Agency) Keep in mind that there is little understanding of the winter ecology of fish. There could be impacts if winter flow is affected. You may need to add in winter surveys. HSC curves may not mean much in the winter, as winter behavior can be very different than during other periods. The assumption is that winter presents pretty harsh conditions for fish survival at site, with the exception of open water areas and deeper pools.

(R2) Winter sampling has not shown large numbers of fish. Winter nighttime sampling had higher numbers, but it is unsafe to continue that program.

(Agency) What about Beaver ponds?

(R2) We don't have much fish use data on that habitat type. We tried remote cameras but it didn't work out.

(Agency) You need to know where to put the cameras.

(Agency) Infrared is one way of getting temperature signals of areas that may be more stable and better places to survey.

(Agency) There is some information being gathered at other places today that fish don't hunker down in winter, that they are moving about in the streams.

(Agency) This is a common problem for fish biologists; i.e. for about half of the year we don't know what the fish are doing.

(Agency) You could consider pit tag stream arrays once you found the fish to determine if they were moving around. Could use thermo-electric generators or solar rays, maybe wind. Possibly use propane or wind.

(Agency) In the early-mid 90's people were looking at stream morphology by the color of water on video – calibrated to depth. It was also done with satellite reflection characteristic of depths.

(Agency) It's not been seen at the level of resolution to capture the tributaries.

(Agency) We can send around literature on that.

(R2) The amount of data needed to verify fish use costs a lot. You can now just use LIDAR to get the elevation data of the stream boundaries and adjacent topography.

(Agency) Bailey Env is looking into light reflection techniques (Green Lidar) to determine water depth and stream profile. We can review this at the next meeting.

(R2) We feel pretty comfortable with the PHABSIM transects that have been surveyed to date. Mainstem channels have fairly homogenous habitat types over long stream sections; these streams are not complex and are not heavily influenced by wood. Most are relatively low gradient and there are not a lot of pools or cascades.

(Agency) If there is a pool, fish don't just occupy the pool, but places within the pool. If the next transect is in a run, it is not reflecting the transitions at the edge of pools or catching the transition areas between habitat types.

(R2) Life all models, there are some assumptions implicit in the application of the PHABSIM models. However, in general, the goal is to install and survey enough transects within the different habitat types present that when appropriately weighted and composited, you get some idea of how habitat changes with changes in flow.

(Agency) It may be better to have the study continue to follow a feature such as a pool than to keep studying a static transect.

(R2) We have to have stability in the stream bed during the period in which measurements are taken to develop well calibrate hydraulic models. After the models are developed it is ok if the sampling site moves. We are developing habitat:flow relationships for a given habitat type, not for a specific fixed location. (Agency) Are you going to model the floods too?

(R2) Yes, we will be looking at the effects of the project on the channel forming flows. This analysis will be based in part on the prior work of Interfluv, as well as additional data collected this year. (Agency) There is probably enough output from the transects, but it would still be good to discuss this issue (i.e. selection of habitats for measurement) relative to habitat mapping.

(R2) We were scheduled to fly the area for habitat mapping, but never got the required 3000' ceiling with no glare to fly during a good low flow period. It was a later low-flow year and when the low flows did occur it was bad weather. We did manage to get some of the Upper Talarik. We'll try again next year. We had been banking on the aerial survey but there are still a number of pieces to overlap and try to map i.e. past videography, some Upper Talarik aerial surveys, early transects, some ground cover. Generally have good data for the Upper Talarik, some data for the South Fork Koktuli, and the least amount of data for the North Fork Koktuli. We will pull something together but it will take a couple of months to do so.

(Agency) Move ahead – we'll take what we have and know that it needs to be supplemented later.

(R2) Intergravel temperature data is another interesting piece of information we are gathering on the project. We'll also be developing Thermal Infrared (TIR) imaging for each stream that will be validated/compared with temperature data from thermistors in the streams. There are 54 thermistors some are at USGS gage sites, some are at HDR gage sites, some are in the tributaries. Some will cover spawning habitat, and in the South Fork Koktuli and the Upper Talarik some will focus on the groundwater upwelling areas. There is a full range of recorders tied in with meteorological stations.

(Agency) Did siting bias the selection of the temperature recorder locations?

(R2) Some thermistors were purposely put in tributaries to provide data for important temperature nodes for the model.

ACTION ITEMS

Bailey Environmental is looking into light reflection to determine water depth and stream profile. We can review this at the next meeting.

Submit hydraulic data decks noted above to TWG for review   R2/PLP Dec 2008

Send out Habitat Suitability Criteria for review by the TWG   R2 2009

NEXT MEETING AGENDA ITEMS

Review recently released data (hydraulic data decks)

Review what's been done in the past season for off channel habitat

Summarization of HSC data and next steps in developing and selecting HSC curves for application on project streams.