SUSITNA-WATANA HYDRO

Draft Meeting Summary
Instream Flow Study-Fish, IFS-Riparian
Groundwater, Ice, Geomorphology, Water Quality
Technical Work Group Meeting
14 September 2012

LOCATION: AEA Project offices – 1st Floor Conference Room
411 W 4th Avenue; Suite 1
Anchorage, Alaska 99501

TIME: 8:00 am – noon; 1:00 pm – 3:45 pm (AKDT)

SUBJECT: **Preliminary Instream Flow Study Site Selection**

Attendees: Bob Henszey USFWS, Jeff Davis ARRI, Gay Davis ARRI, Leslie Jensen ARRI, Dudley Reiser R2, Joe Klein ADF&G, Phil Hilgert R2, Betsy McCracken USFWS, Kevin Fetherston R2, Stormy Haught ADF&G, Michael Buntjer USFWS, Betsy McGregor AEA, Michael Lilly GWS, Ron Benkert ADF&G, Dani Evenson R2, Kathryn Toews LVA, Marielle Remillard GWS, Paul Dworian URS, Wayne Dyok AEA, Joetta Zablotney R2, Mark Lamareaux Village of Eklutna, Bill Fullerton TetraTech , Robin Beebee HDR

On the phone: Rob Plotnikoff TetraTech, MaryLouise Keefe R2, Kim Sager ADNR, Matt Cutlip FERC, Fred Winchell Louis Berger, Matt Love Van Ness Feldman, Steve Padula LVA, Becky Long Coalition for Susitna Alternatives, Tim Ruga Louis Berger, Ethan Bell Stillwater, Krissy Plett ADNR

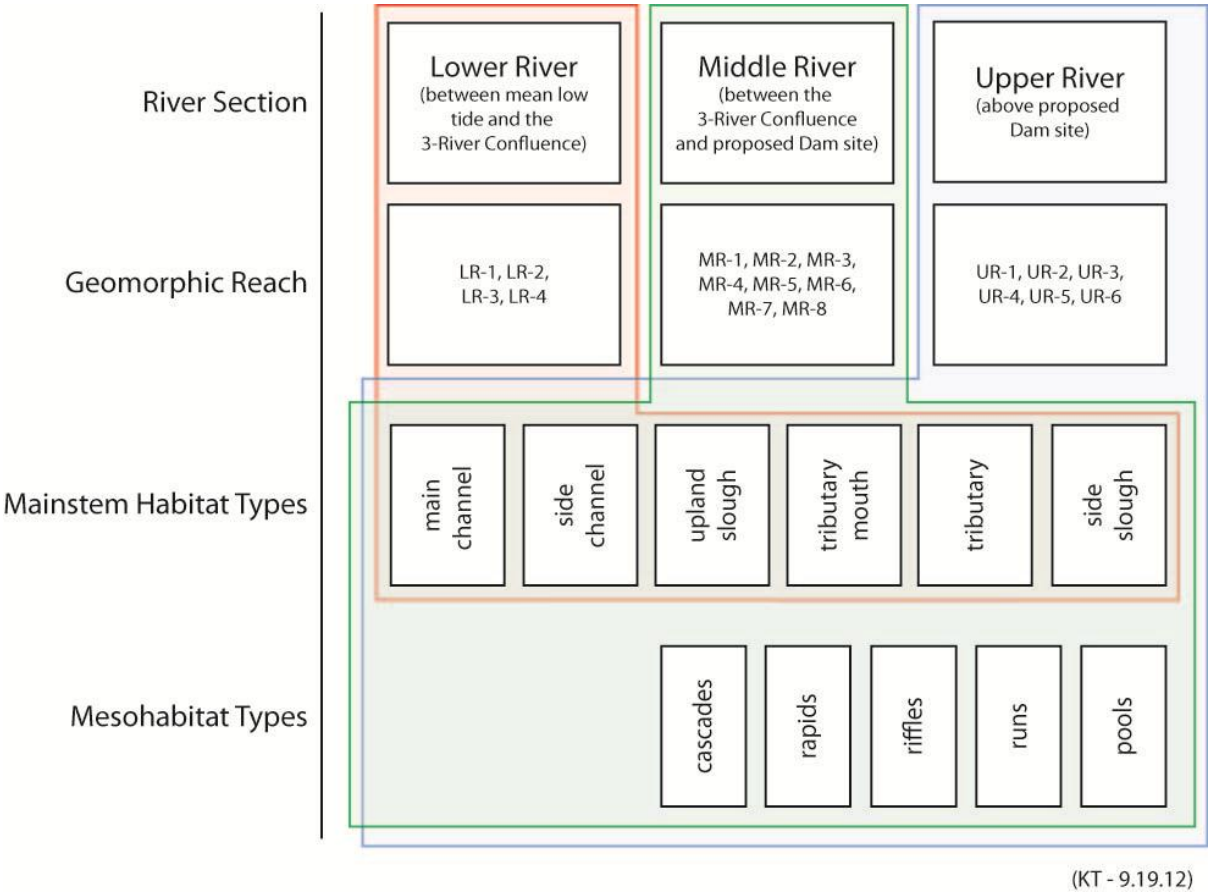
This meeting was focused on the Study Site Selection process. Dudley Reiser noted that since there had been many different issues and questions raised regarding the instream flow study, the plan moving forward was to have TWG meetings that would focus on and advance the state of understanding issues central to moving the study forward. This meeting was focused on Study Site Selection, but there will be other meetings scheduled that will focus on Methods selection, Habitat Suitability Curve development, Periodicity, and more topics. More information regarding specific TWG meeting topics and schedules would be provided in subsequent TWG meetings.

Following introductions, there were a series of four PowerPoint presentations prepared by Dudley Reiser and Phil Hilgert (Instream Flow Study – Fish), Kevin Fetherston (Instream Flow Study -Riparian), Bill Fullerton (Geomorphology), and Robin Beebee (Ice Processes). The presentations are available on the Susitna-Watana Hydroelectric Project website (http://www.susitna-watanahydro.org/meetings/).

It was explained by AEA and study leads that the process being discussed during this meeting related to site selection is a first cut and that refinements would be made based on further information (e.g. results of habitat mapping) and further discussions with the TWG.

<u>Status of Reach Stratification and Habitat Mapping</u>

Habitat classification was explained by Dudley Reiser in the following hierarchical arrangement (NOTE - this figure was not presented at the meeting but is included here to summarize the classification system).



(KT - 9.19.12)

The current study sites were selected based on interpretation of the high resolution aerial imagery gathered with the LiDAR data by the Mat-Su Borough in 2010 and 2011. The study areas will be further refined as additional data (e.g. 2012 ADCP transect data, habitat mapping videography) become available.

River Mile Designation

Joetta Zablotney presented the work underway to create a current GIS hydrography data layer for the Susitna River as well as the naming convention for tributaries and features in the mainstem Susitna River, such as side channels, side sloughs and upland sloughs. The hydrography and thalwag location is being determined by the current aerial imagery and the ADCP transect data. The new river mile system being created will be utilized project-wide. A crosswalk will be created to compare the historical and current river miles.

Joe Klein asked if river mile (RM) 0 will be located at mean low tide. Dudley Reiser indicated that is under discussion. Mean low tide may be designated as zero or as a negative number (i.e. distance) from

the existing/historic river mile zero. The location of mean low tide needs to be determined. Betsy McGregor added that the updated mapping will be made available (once finalized), through the ADNR's website for the Susitna Watana Project.

Jeff Davis questioned which study is sampling to the level of meso and/or microhabitat. Habitat mapping will be done as part of the Aquatic Habitat Characterization study (see Section 7.9 of the PSP). Currently, all proposed intensive study sites are based on mainstem habitat types, as that is the most specific information presently available. Jeff Davis pointed out that species are affected on a microhabitat level. Videography of the middle river has been gathered for mesohabitat mapping purposes and is currently being processed; habitat types may be refined based on that data as well as additional data gathered in the field. Betsy McGregor mentioned that the videography, when finalized, would also be available on ADNR's website; Courtney Smith at ADNR is the contact person for the Susitna-Watana geodatabase.

Study Site Selection/Extrapolation Criteria

Intensive study sites[1] (i.e. Focus Areas) were chosen to represent many aspects of the respective river reach including fish habitat, geomorphology, water quality, groundwater and riparian resources. The objective of this approach is to evaluate and determine relationships between main channel flow in the Susitna River and the quality and quantity of habitats within off-channel habitats (e.g. side channel, side slough, upland slough, tributary mouths). It is anticipated that the study results within these areas will be extrapolated and applied to a larger scale of the river.

Bill Fullerton stated that the lower river stations were sampled at a single flow in 2012. Sampling at additional flows is an option in the future if additional data are deemed necessary.

With respect to the selection of the Focus Areas, raptor nest locations will need to be factored in, as there are buffer requirements during the nesting season to avoid disturbance to the birds. Other Focus Area selection considerations include accessibility and land ownership. Phil Hilgert noted that data from the 1980s had been reviewed and factored into the identification of the candidate Focus Areas as listed in the PowerPoint presentation. Site selection completed in 1981 and 1982 was extensive and incorporated a random selection approach. Sites became more focused in 1983 and 1984 as information became available indicating where the highest fish use occurred. Dudley Reiser noted that there was an extensive amount of data collected in the 1980s and that it is important to use and apply these data in planning future studies. Other sources of information that will be used in determining Focus Areas include results of the 2012 studies and the LiDAR data. Wayne Dyok added that the dramatically changing water conditions this year may help to understand conditions associated with Project operations.

Preliminary Study Site/Focus Area Selection

[1] During the course of the meeting, this terminology "intensive study sites" was modified to "Focus Areas".

Jeff Davis voiced concerns of sampling in turbid water and the difficulty of differentiating whether there are no individuals present (if not collected) or if the methods simply limit the collection of the individuals. He feels that sampling methods need to be suitable to have confidence in the results. Phil Hilgert indicated that sample sites will be in both turbid and clearwater areas. Focus Areas: Phil Hilgert noted that Focus Areas will be used to sample across resource disciplines (fish, habitat, riparian, geomorphology, water quality, ice, groundwater). The areas will not necessarily be the only locations of data collection for each resource area, but will serve to provide a more comprehensive understanding of how specific areas are influenced by and respond to main channel flows. Study Leads (Phil Hilgert, Kevin Fetherston, Bill Fullerton, Robin Beebee) presented proposed river reaches and Focus Area descriptions (refer to presentations available on AEA's website for the 9/14/2012 Instream Flow Study-Fish, IFS Riparian meeting). These Focus Areas were selected as representative of the respective geomorphic river reach in which they are located and include all mainstem habitat types. Joseph Klein asked if the entirety of each Focus Area will be evaluated by, for example the riparian study. Phil Hilgert indicated that this would be the case. He further explained that the reason no Focus Areas were identified between MR3 and MR4 was for safety concerns related to their proximity to Devils Canyon. It was emphasized that safety will take precedent in conducting all studies so that locations with dangerous or hazardous sampling conditions would not be selected

Some added details regarding specific Focus Areas that were discussed are as follows:

- The MR1 Focus Area includes a portion of a side slough. It was noted that the upstream portion of the slough was not included in the area and a concern was raised regarding the absence of a hydraulic control for that slough in the area. New boundaries were considered and Phil Hilgert mentioned that there will likely be some adjustment in final boundaries of the Focus Areas. He mentioned that a location downstream of current proposed Focus Area was discussed during an internal meeting but was deemed less representative of side channel habitat types.
- The Focus Area in MR2 (upstream site) will likely include a gross mesh (i.e. larger spacing) in the main channel and a finer mesh (more dense spacing) sampling strategy in the side channel areas when applying 2D modeling. This Focus Area is representative of rearing habitat and of features found between Devils Canyon and the proposed Project site. This area was not studied in the 1980s because the 1980s design concept included 2 dams and this area coincided with the lower reservoir that is not part of the current Project. This area includes groundwater and surface water as well as multiple geomorphic characteristics.
- MR5's Focus Area includes Portage Creek and is representative of the MR5 reach.
- With respect to the Focus Areas in MR6, Joe Klein mentioned that he knows of coho presence above the boundary shown in Slough 8A. He asked for fisheries work to cover that area. Michael Lilly clarified that other studies would include sampling outside of Focus Area boundaries as appropriate to each particular resource. Dudley Reiser indicated he observed chum and sockeye spawning in Slough 8A during 2012 field reconnaissance. He also noted there were no beaver dams present at this site on September 13, 2012. Robin Beebee noted that in some cases, the absence of beaver dams may reflect areas where ice jams are not present and

the river narrows. She thought Slough 8A would be a good location for evaluating effects of the Project in the winter because the added winter flow would likely flush this area.

- Betsy McCracken requested that Focus Areas include both areas where fish occur and areas where no fish occur. Phil Hilgert noted that few/no fish were observed in Slough 17 which is part of the Indian River Focus Area (MR6). The Focus Area at Indian River (in MR6) was actually selected because it had this side slough (Slough 17) which looks similar to Slough 6A which did support substantial fish use in the 1980s. Adding the river delta at Indian was another factor in choosing this site. He also reiterated that no fish sampling was conducted in the 1980s at the Focus Area sites above Devils Canyon. Kevin Fetherston pointed out there were sharp lines between areas with meadows and trees and hypothesized this may be due to ice shear. Beaver dams can also form meadows. This site includes such meadows and will ensure that such habitats are studied.
- Robin Beebee discussed Slough 21 (in MR6) as having characteristics considered interesting for the ice processes study. According to the 1980s data, a channel in this area seems to have been created by river ice. Based on the 1980s simulation, this area will incorporate the edge of ice formation on the river after the Project effects are established. Jeff Davis also mentioned that Slough 21 is a sockeye spawning location. Spawning was seen in the 1980s but not in 2012. This slough currently includes a beaver dam complex; beaver dams were likewise mentioned in the 1980s at this location.
- Whiskers Slough is a Focus Area in MR8 that supports chum salmon spawning. Jeff Davis asked why chum would prefer this area since it is not distinguishable from other areas in the river. He asks that studies be developed to address this question.
- Slough 11 (also in MR6) is downstream of Gold Creek and the railroad bridge. Studies of this area were done in the 1980s. However, access to railroad property may constraint sampling intensity at this focus area. Dudley Reiser stated that spawning was seen on September 13, 2012 just down from the beaver dam.
- Dudley Reiser noted that while no specific proposed Focus Areas had been identified yet for the lower river, plans were to select one or more sites. The 2012 salmon radiotelemetry data would be used to identify specific study locations in the lower river section.

Critical Sites: Critical sites will be added to emphasize particular life stages. Jeff Davis asked what classification scale the critical sites would be based on (mainstem habitat type, mesohabitat or microhabitat). Dudley Reiser explained that the life stages may be associated with either a mainstem habitat type or mesohabitat type.

Betsy McCracken and Jeff Davis asked if non-physical habitat characteristics at the micro level (such as temperature, DO and food source) will be used in selecting the site locations. MaryLouise Keefe explained that those factors are based on the physical habitat (meso level) so the mesohabitat level will allow us to map all habitat types. Jeff Davis is interested in biotic information being a factor in choosing critical sites as attributes. Dudley Reiser mentioned that other studies will tie into this. The AEA team is

aware that factors other than those currently available are important to fish. Joe Klein indicated he supported moving forward with the critical site concept. As important sites are recognized (a location of spawning burbot for example) then a critical site could be created.

Instream flow sites will include the tributary delta upstream to the upper extent of potential hydrologic influence from the Project, but not further upstream within the tributary itself.

Phil Hilgert expressed the need for Focus Areas and critical sites to be chosen by March 2013 in order for data collection to begin.

Winter studies: A participant (not identified) inquired when winter studies were scheduled to occur. Phil Hilgert said that they would begin this winter and that the dates would depend on the weather and ice conditions.

Ice damming and shearing effects were explained by Kevin Fetherston and Robin Beebee. The scarring on trees of the riparian zone will be used to map out the ice floodplain – tree interactions and to define ice process domains for site selections. Also, bringing data in from the botanical riparian study will provide a greater understanding. Michael Lilly brought in a portion of a tree with an ice scar. Kevin Fetherston explained how these scars can tell the height of the ice as well as the years in which the scarring occurred, providing historic data (see photo). A core sample can be taken and growth rings can date the time of the ice scar. He noted that the upper and lower end of the scar could be measured for scar elevation.

The effects of the Project on ice will be predicted by looking at current effects of ice dams. The proposed dam will be "collecting" any upstream ice. This needs to be considered when predicting post-Project ice damming. Natural climate change is also a consideration as it may be a factor changing ice and its effects. Robin indicated that there is currently insufficient data to determine if ice cover has naturally changed since the 1980s. Wayne Dyok elaborated by saying that NOAA/NMFS is working on collecting data, and AEA is planning on combining NMFS's and AEA's data to see if natural climate changes have occurred. The distance of an ice free zone caused by the Project was discussed. The ADCP transects and possible controls (for GIS accuracy) will be used in ice process zone mapping.

Betsy McCracken asked that side slope be considered in the floodplain to choose sites. It was explained that would be possible with the use of the surveyed transects and the LiDAR data.

<u>Other Topics Discussed</u>

Terminology

The importance of consistent language throughout the studies was discussed and will be provided in the RSP, in the form of a glossary. It is important to note that different terminology exists for different fields (e.g. geomorphology and riparian). These terms will be defined in the RSP.

References

Michael Buntjer mentioned that references were not provided/correct in the PAD with regard to chum emergence dates. References, emergence dates and how to handle variability of multiple references going forward will be explored by the team.

Corrections to the presentation material

In the Geomorphology PowerPoint Presentation on the slide titled "Mainstem Aquatic Habitats Determination of 1980s and 2012 Areas", the final sentence should read:–1980s habitat types only available *downstream* of RM 149 (Portage Creek) since 1980s effort did not extend upstream from Devils Canyon.

Protocol and future meetings

The protocols for TWG meetings were discussed regarding the distribution of presentation materials. Betsy McGregor said that any materials such as PowerPoint presentations will be available online prior to each TWG meeting and the attendees are responsible for printing materials if they would like hardcopies. Hardcopies of agendas will be provided at the meeting by AEA.

Jeff Davis requested an outline for the habitat classifications and the integration of studies. Dudley Reiser indicated he would try to present something at the next TWG meeting but that final details of the classification are still being refined. These would be more fully described in the RSP. Jeff Davis has requested a visual representation showing the integration of studies for him, and others, to comment on.

The next TWG meeting will focus on Methods and will include a Site Reconnaissance. Several participants commented that the protocol for providing feedback on meetings needs to be clear. It was noted that when providing comments to AEA one may also file it with FERC by CCing them in the email or distributing it directly to FERC.

Action Items

- The designation of mean low tide as river mile (RM) 0 will be determined.
- Videography, when finalized, will be made available through the ADNR's website for the Susitna-Watana Project.
- The RSP(s) will include:
    - glossary of terms;
    - outline/schematic of the habitat classification system; and
    - schematic/description of the integration of the studies.