



SUSITNA-WATANA HYDRO

Meeting Notes Water Resources Technical Workgroup Meeting February 15, 2013

LOCATION: Z.J. Loussac Library – Public Conference Room
3600 Denali Street
Anchorage, AK

TIME: 8:30 a.m. – 5:00 p.m.

SUBJECT: Habitat Mapping, Draft Fish Distribution and Abundance and River Productivity Implementation Plans, 2012 Salmon Radio Telemetry Study

GoTo MEETING: <https://www3.gotomeeting.com/register/782824310>
1-800-315-6338 Code 3957#

Goal Review Information filed with FERC on January 31, 2013 and Other Updates

ATTENDEES Alice Shelly R2, Joetta Zabloutney R2, Bill Fullerton Tetra Tech, Klaus Wuttig ADEC, Betsy McCracken USFWS, Dudley Reiser R2, Tim Nightengale R2, Leslie Jensen ARRI, Jeff Davis ARRI, Gay Davis ARRI, Wayne Dyok AEA, Phil Hilgert R2, Ken Hogan FERC, Stormy Haught ADF&G, Fred Winchell Louise Berger Group, Catherine Berg USFWS, Rebecca Long Coalition for Susitna Dam Alternatives, Marie Steele OPMP, Michael Buntjer USFWS, Robert Burgess ABR, Krissy Plett DNR, Matther LaCroix EPA, James Brady HDR, Michael Barclay HDR, Jan Konigsberg Alaska Hydro Project, Matt Cutlip FERC, Betsy McGregor AEA, Kathryn Toews McMillen, Scott Crowther Ratepayers

ON PHONE Dave Cartalia FERC, Ethen Bell Stillwater Sciences, Paul Makowski FERC, Bob Henszey USFWS, [Leanne Jansen Science Center], Steve Padula McMillen, Laura Arendall R2, [David Braun Southside EPA], Chiska Derr USFWS

Per FERC's 1/17/2013 letter, AEA was requested to follow a unique study plan determination schedule of 14 on the 58 proposed 2013 studies, mainly those related to water resources. This schedule was in response to pending AEA deliverables including the fish distribution and abundance implementation plan, river productivity implementation plan, open flow routing model results, Focus Area and study site locations, and habitat mapping results. Drafts of these documents were filed with FERC on 1/31/2013 and finals will be filed on 3/1/2013. Matt Love explained that today's meeting was scheduled to discuss the information provided in these documents and to receive any comments or concerns from licensing participants. The agenda, documents, and supporting presentations can be found on the meetings page at <http://www.susitna-watanahydro.org/>. These meeting notes are intended to supply information and significant consultation not included in the provided materials.

Habitat Mapping results as they pertain to Upper River (Michael Barclay HDR)

Michael Barclay presented the 2012 habitat mapping results (PowerPoint available at http://www.susitna-watanahydro.org/wp-content/uploads/2013/02/UR_Aerial-Video-Hab-Mapping.pdf). The tributaries upstream of Devils Canyon were videotaped while team members were traveling by helicopter, providing the ability to view areas otherwise inaccessible. The video was reviewed and habitats were identified by three individuals. The identification process began by creating a catalogue for each habitat for consistency in naming the habitats. Multiple individuals collaborated throughout the process and cross-checked each other's work to ensure consistency. Michael Barclay explained that this approach has been used in previous projects and has proven a useful tool in mapping habitat. Results and photographs are included in the presentation. Because the habitat is a reflection of the underlying structure, which does not generally change with changes in flow, mapping will not be conducted at other flows. The results give an understanding of the frequency and abundance of habitat types in the area surveyed.

Michael Barclay said that a portion of the river was ground-truthed and those results were very similar to the video mapping.

Jeff Davis requested that the data be illustrated to compare the habitats proposed to be inundated vs. those not inundated. He also requested that known salmon spawning habitat being inundated vs. current spawning habitat be provided. Michael Barclay said that these comparisons can be calculated with the results and ground mapping in 2013 will further refine the data. It was agreed that this information will be included as an attachment to the study plan and filed on March 1, 2013.

Michael Barclay said that an attempt was made to take video of the Lower River for mapping purposes. Due to the wide floodplain and complex braiding structure, multiple passes or a higher-than-preferred elevation was required to encompass the entire floodplain. This effort concluded in low resolution or difficulty in identifying the location of the videography. Jan Konigsberg mentioned the capabilities of drone technology and high resolution possible at high elevation.

Michael Barclay said that the Middle River will be mapped using orthophotos, video, and ground mapping. Five replicates of each mesohabitat in the mainstem and off-channel habitat will be ground-mapped. In addition, all habitats within Focus Areas will be ground-mapped. He clarified that ground mapping may be limited in accessibility. The parameters being collected are presented in the RSP.

Draft Fish and Abundance Implementation Plan (MaryLouise Keefe R2)

MaryLouise Keefe reviewed the key points of the Fish Distribution and Abundance Implementation Plan. This draft document is available at <http://www.susitna-watanahydro.org/type/documents/> under the "documents" tab as part of the January 31, 2013 filing. The final plan, including all appendices, will be filed on March 1, 2013. This document will be used to guide field crews in their sampling efforts.

MaryLouise Keefe described the data sources and the success level associated with specific gear. Jeff Davis said that certain gear, such as minnow traps and electrofishing, can't be compared.

Jeff Davis clarified to the attendees that "tributary spawners", as presented in the results, refers to any salmon not spawning in the mainstem of the Susitna River. It does not specify whether the fish spawned in a large tributary, such as the Talkeetna, Chulitna, or Yentna, or in a small clear water tributary.

MaryLouise Keefe explained that the fish identified as spawning in the mainstem of the Susitna River were not visually confirmed as spawning due to the turbid waters. They were considered spawning as a result of tag activity

associated with spawning. Further efforts such as LiDAR will be implemented in 2013 to confirm spawning in turbid waters.

MaryLouise Keefe noted that there was movement of fish from the lower portion of Devils Canyon downstream for spawning, and that this was consistent with documentation from the 1980s.

Jeff Davis feels that it may not be possible to extrapolate the data to other parts of the river because the total population is not currently known. MaryLouise Keefe explained that the value of the 2012 radio telemetry efforts was to use the information in planning the fish distribution and abundance studies, not to determine fish distribution. Previous incubation and emergence studies will also guide the fish distribution and abundance studies. Michael Buntjer said that the RSP did not have consistent emergence timings between studies. MaryLouise Keefe said that the fish distribution and abundance studies will be relying on the emergence information provided in the Fish Distribution and Abundance Implementation Plan. MaryLouise Keefe explain that emergence predictions will change as more data are available.

Rebecca Long believes that the winter studies may not collect enough data to fully understand the potential Project effects on incubation and emergence. She asked if the variability of emergence can be understood with the years available for the study program. Matt Cutlip said that if there isn't enough information available when applying for a license to understand Project effects, then FERC will address that at the time.

Jeff Davis requested that fork length be documented on all fish handled throughout the studies. MaryLouise Keefe clarified that all fish receiving PIT tags and radio tags, and 100 individuals sampled in distribution and abundance surveys will be measured. In addition, fish receiving tags will be weighed prior to tagging.

MaryLouise Keefe presented Table 5.5-1 of the Fish Distribution and Abundance Implementation Plan, which addresses the location to be sampled for early life history data. Michael Buntjer asked if emergence will be sampled. MaryLouise Keefe explained that the objective of this study is to study the movement of fish to and from locations. Dudley Reiser added that the timing of emergence will be estimated from data collected in the instream flow winter studies, such as intergravel temperatures and video observations. Phil Hilgert explained the wide variability associated with emergence as being due to the large number of influential factors associated with emergence timing.

Michael Bunther asked how fish less than 50-mm long are being studied. Dudley Reiser explained that underwater video will capture these fish.

MaryLouise Keefe presented Figure 5.6-1 of the implementation plan, which illustrates the proposed locations for PIT tag interrogation systems, outmigrant traps, and stationary radio telemetry receivers. Klaus Wuttig suggested moving some PIT tag interrogation systems downriver where the majority of fish are located. MaryLouise Keefe explained that there will be opportunistic scanning as well. Because of the lack of information regarding movement of juveniles out of tributaries upstream of Devils Canyon, the stations upriver are crucial to inform the fish passage study.

Stormy Haught said that he would expect pike to be located in the brown water sloughs. Jeff Davis suggested double-checking the data that suggest pike in Montana Creek (Section 5.6.5), because he does not know of pike being in this creek.

Fish Distribution and Abundance Sampling (MaryLouise Keefe R2 and Alice Shelly R2)

MaryLouise Keefe began explaining that the habitat mapping data of the Upper River were not available at the time of planning the Fish Distribution and Abundance of the Upper River study. A transect approach was selected for this study and after reviewing the habitat mapping data, the transect approach is confirmed to be adequate to achieve the objectives of the study.

Alice Shelly explained that each mesohabitat captured within each transect will be sampled in 40-meter sample lengths. Jeff Davis asked if stream lengths and areas will be calculated for each sample technique. MaryLouise Keefe confirmed this. Matt Cutlip asked that the area be provided at each sample location.

Klaus Wuttig recommended being flexible on the transect locations. The transect location could be shifted opportunistically to capture critical sites upstream or downstream from the original transect location. MaryLouise Keefe explained that the transect locations were fixed for statistical reasons. Ken Hogan added that collecting fish absence data is not considered unsuccessful sampling. One must be consistent on site selection to address where fish are and are not. Klaus Wuttig said that it would not be possible to calculate variance with the current approach. Alice Shelly explained the objective to be distribution rather than variance.

Klaus Wuttig explained that commonly, electrofishing sample lengths equal the main channel width times three. He is concerned that 40 meters is not long enough to apply electrofishing effectively. Stormy Haught agreed that 40 meters seemed short for electrofishing in the main channel. MaryLouise explained that the sampling approach was to apply consistent lengths for all sampling. Klaus Wuttig suggested reducing the transect numbers and extending the sample lengths. Matt Cutlip recommended the sample length be provided as a range. MaryLouise Keefe asked if electrofishing should have a unique sample length. The transect widths (currently 40 meters) could widen to 1,000 meters. Electrofishing would sample the entire 1,000 meters while all other gear types could sample within the transect at random starts but for 40-meter lengths. The total number of transects would then decrease. MaryLouise Keefe expressed the importance of statistics and the comparability of data. Alice Shelly noted that subsampling certain habitats is a less precise sampling strategy. Consultation will continue regarding this topic.

Alice Shelly continued the presentation by explaining the options on slide 4. The GRTS sampling approach allows for reliable analysis of data if sampling of certain locations is not possible. This is ideal for the Susitna River system because access may be limited. Depending on the drainage area of the tributary, a size unit (presented on slide 6) will be chosen for sampling.

Matt LaCroix asked when the sampling will occur and if the timing would capture different species at multiple life stages. MaryLouise Keefe explained that sampling will occur every other month from May through October (the open water season).

Michael Buntjer asked what methods will be applied to the main channel. MaryLouise Keefe said that a method will be chosen from an array. Access to the middle of the channel may be limited by flow conditions. Stormy Haught suggested floating down the river and fishing opportunistically. Ken Hogan explained that the ILP accounts for situations where data cannot be obtained. If changes are made by AEA or comments are provided by licensing participants, an explanation and scientific backing need to be provided. He added that rationale for cost increase vs. the value of additional information in respect to evaluating Project effects should be included. Matt Cutlip added that if rationale for requested changes is not provided, FERC must provide it. This may result in rationale inconsistent with the participant's actual rationale.

Jan Konigsberg asked if daily variability of presence/absence will be sampled. MaryLouise Keefe answered that it will not. Michael Barclay added that diurnal variations are not possible due to the inability to fly at night.

MaryLouise Keefe explained the approach to collecting fish distribution and abundance data in the Lower River. The current habitat mapping in this area is based on geomorphology to PRM 62.5. Beginning with a random start, five transects were equally spaced throughout the upper portion of the Lower River. Due to the flow routing model results, additional transects will be located downstream of the current downstream limit. At each transect location sampling will be conducted at one site for each present habitat type. Matt LaCroix asked how a site will be chosen if two instances of a habitat type are present. MaryLouise Keefe said that a random selection will be made. Matt LaCroix stated that variability needs to be captured. Mike Buntjer said that the representativeness of the Lower River will not be possible to calculate because the Lower River will not be mapped.

Betsy McCracken asked where microhabitat parameters will be collected. Dudley Reiser said that this will occur in the Lower River and Middle River. MaryLouise Keefe mentioned that the TWG meeting in the second quarter of 2013 will further discuss microhabitats. Betsy McCracken said that this information is needed to evaluate the sufficiency of the study and Project effects. Dudley Reiser said to reference the RSP for further detail. Matt Cutlip added that the current habitat suitability criteria (HSC) data collection is relatively robust because it is not using HSC curves from other studies.

MaryLouise Keefe presented the Fish Distribution and Abundance Sampling – Middle River presentation and explained the approach for 2013. The distribution will be sampled by documenting presence or absence. Abundance will be calculated by catch per unit effort (CPUE) and will be sampled at three replicates of each habitat within the Focus Areas. Jeff Davis was concerned that if there are less than three replicates of a specific habitat within a Focus Area, the multiple sampling within one specific habitat would create unreliable results. Alice Shelly explained that the habitats are being spatially evaluated.

Draft River Productivity Implementation Plan (Time Nightengale R2)

Tim Nightengale explained the River Productivity Implementation Plan available at <http://www.susitna-watanahydro.org/wp-content/uploads/2013/02/Att-D-River-Productivity-Implementation-Plan.pdf>. A draft was filed with FERC on 1/31/2013, and the final plan with all attachments will be filed on 3/1/2013. Time explained the sampling strategy, methods, and data analysis metrics proposed for 2013. The River Productivity Study is intended to provide the basis for a long-term quality program.

The first objective of this study is to synthesize existing literature on the impacts of hydropower development and operations on benthic macroinvertebrate and algal communities. Jeff Davis asked if literature on benthic organic matter will be considered. Tim Nightengale said that it would be included if available.

In regard to objective 8, characterize organic matter resources in the Middle and Upper Susitna River, Tim Nightengale specified that the detritus will be sampled if present.

Ken Hogan asked how the River Productivity Study chose which Focus Areas to study. Tim Nightengale said that he considered longitudinally, with some preference toward areas with known fish use. Jeff Davis requested that macroinvertebrates be sampled at all Focus Areas. Time explained the extensive time and effort required post-field work. With the extensive lab work and protocol, it is not practical or necessary to sample everywhere.

Tim Nightengale explained the concept of a “reference site” in the Talkeetna River because the Talkeetna River is affected by processes similar to those affecting the Susitna River. This provides the opportunity to create a long-term monitoring program to compare the reference site, treated as a control, to the Susitna River post-Project. Jeff Davis asked if the reference site would be chosen due to similarities to a specific Focus Area, and if so has a Focus Area been chosen? Tim Nightengale explained that reconnaissance is required in 2013 to locate the most suitable site before any commitments are made. Dudley Reiser explained the need to collect data at the reference site before concluding which Focus Area it is most similar to.

Tim Nightengale explained the methods being used in the River Productivity Study. He explained that the exact date of sampling will be dependent on the hydrology at the time. The hydrograph and live video cameras will be monitored to ensure that ideal conditions will be sampled.

Stormy Haught asked if the colonization timeframe will be informed by observations made in 2012. Tim Nightengale confirmed that this is the case.

Tim Nightengale explained that rudimentary transects will be placed perpendicular to the shoreline and will allow the river bottom to be mapped (with much area interpolated from). A modified Hess sampler will be used to collect benthic macroinvertebrate data. Stormy Haught questioned the modifications required for a Hess sampler to withstand extensive water level fluctuations. He said that the sampler would need modifications specific to multiple stages. Jeff Davis claims that using Hess samplers, which require velocity and a particular depth, neglects habitats with slack water, without linear flow, such as backwater pools, and those without sampler-appropriate water depths. Tim Nightengale explained that the objective is to repeatedly sample areas with likely catch for monitoring purposes. The Hess targets these habitats. Jeff Davis claimed that the objective is to understand food availability. By limiting the habitats being sampled, the data may be missing food sources. Tim Nightengale noted that all gear has depth limitations. Deeper waters are anticipated to have less extreme Project effects. Due to the limited light penetration, deeper waters generally have less algae to support productivity. Matt LaCroix felt that the potential impacts on macroinvertebrates are not primarily in the varial zone. Ken Hogan said that the data reflecting the river’s productivity may be skewed if the study concentrates on highly productive areas. Tim Nightengale explained that productivity is defined as a healthy river providing food for fish in this study. A trophic analysis is being conducted rather than studying the productivity of carbon.

Tim Nightengale added that drift and emergent traps will also be deployed. Jeff Davis proposed that dredge sampling be conducted in slack water habitats.

Tim Nightengale discussed snag sampling, as explained in the River Productivity Implementation Plan, Section 2.2.1.2. Portions of snags will be collected and examined for species. Appendix 1 of the plan explains the processing protocol used at the lab.

Jeff Davis disagrees with subsampling organic matter and suggests sampling all organic matter. He gave an example of collecting five rocks from each Hess. Jeff Davis also requested that a plankton tow be performed at each location, collecting drift samples.

Tim Nightengale presented a photograph of emergence traps (Figure 2.2-1). Stormy Haught warned that these traps may be a bear attraction. Jeff Davis asked how the collection of emergence will be analyzed. Will a low count be associated with a lack of production? Tim Nightengale explained that production is inferred by the final numbers.

Tim Nightengale explained that the advantage of using a Hester-Dendy multiplate sampler is that the surface area is precise and constant. Multiple samplers will be connected to a chain and anchored by a rebar post. Jeff Davis asked how the results will be evaluated in relation to colonization and how winter information is being collected. Michael Buntjer felt that winter seems a more crucial time to study than during storm events to fully understand Project effects. Phil Hilgert said that storms are being targeted because the extreme fluctuation may simulate post-Project conditions.

Matt LaCroix asked how terrestrial inputs are being targeted. Tim Nightengale explained that the drifting detritus will be evaluated. MaryLouise Keefe said that the objective for this study is to address the flushing out of nutrients rather than added input.

2012 Salmon Radio Telemetry Study Results (Brian Nass HDR)

Brian Nass presented the information contained in the draft 2012 Adult Salmon Distribution and Habitat Utilization Study available under the 2/15/13 meeting on at <http://www.susitna-watanahydro.org/meetings/>. The PowerPoint presented by Brian Nass is available at the same location.

Brian Nass explained that the label “other mainstem” is explained in detail in Table 17 of the report. Michael Buntjer asked if the reason for some salmon perishing before known spawning times is due to tag effects. Brian Nass said that this could not be concluded. It is not known whether these salmon perished at the time that no movement was detected. It could have been a regurgitated tag.

Jeff Davis asked how better estimates of fish numbers above Devils Canyon could be obtained. Brian Nass said that an additional fish wheel will be located immediately downstream of Devils Canyon to target individuals traveling upstream. Jeff Davis asked how many tags would need to be installed to know the tagged/untagged ratio. Brian Nass said that it would be difficult to achieve with such a small population. Brian Nass added that this is not the objective of the study. Jack Erickson said that ADF&G is trying to get Chinook basin-wide estimates for the Yentna and mainstem.

Jeff Davis asked if it was possible to determine a population number with standard error. Jack Erickson and Klaus Wuttig said that this is not likely when considering the number needed to be tagged for confidence in the results.

Brian Nass said that it is anticipated that all five species of salmon will be tagged. The Curry wheel will be extended to September to collect coho, if present.

Jeff Davis asked if an additional method could be implemented to better confirm spawning in turbid waters. Brian Nass said that LiDAR will be used in waters deep enough to execute.

Klaus Wuttig asked for details pertaining to resident species being tagged and sample sizes. Further consultation is requested to discuss these details.

Brian Nass explained that the 1980s studies had reported vaguely on spawning observations. They did not typically provide specific locations, only habitat types, when spawning was documented.

2013 Winter IFS Studies Update (Michael Lilly GW Scientific)

Michael Lilly provided a brief update on the recent field work. He mentioned that velocity open water leads are common in the Susitna River and are extremely unsafe. The location may be unpredictable and shifting. At times the

water may cause a thinning of the ice, never creating an open water lead, increasing the risk of falling through the ice. Another safety concern of winter studies is the sheer ice pieces that are covered with soft snowfall. Michael Lilly witnessed some trails, created by snowmachines, eventually becoming open water leads. He explained that warmer temperatures in the winter are considered icing conditions for helicopter travel.

Michael Lilly described the depth of frazzle ice in some areas as being the entire water column. This can make it difficult to impossible to take flow measurements.

Michael Lilly explained that the cameras used in the winter pilot study were excellent and withstood the conditions, resulting in desired resolution.

General Discussion

The updated QAPP will be filed on March 1, 2013.

Rebecca Long asked how FERC is applying 2012 data in the study plan determination. Matt Cutlip explained that for the aspects of the RSP dependent on the 2012 data, FERC will consider that data when forming the determination.

Leanne Jansen asked if the GPS approach includes real-time kinematic (RTK). This survey approach will ensure precise and consistent coordinates for sampling. MaryLouise Keefe confirmed that the GPS technology will be using controlled points such as those in the RTK surveys to provide consistency.

Betsy McCracken asked if dissolved copper will be included in the metals sampling. Wayne Dyok said that copper will be included.

Matt Cutlip explained that comments on the 14 study plans pending FERC's determination as well as the implementation plans and Focus Areas report can be submitted to FERC by March 18, 2013. If someone has comments on the flow routing model results and habitat mapping, then they may submit comments as well.

Jay Stallman asked when the first quarter deliverables explained in the geomorphology RSP will be provided. Bill Fullerton said that these items will be provided by March 1, 2013.

Stormy mentioned that Devil Creek is not currently included in the The Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes. He suggested that James Brady should nominate this creek because data have been collected showing it as utilized by anadromous fish.