Meeting Summary
Susitna-Watana Hydroelectric Project Licensing
Aquatic and Water Resources 2012/2013-2014
Study Plan Development
April 5, 2012
AEA Project Offices, First Floor Conference Room
411 W 4th Avenue, Anchorage, AK

Attendees:

Organization	Name
ADNR	Kim Sager
ADF&G	Joe Klein
ADF&G	Jack Erickson
ADF&G	Ron Benkert
ADNR	Terry Schwartz
BLM-Glennallen	Tim Sundlov
BLM-Glennallen	Mike Sundergaard
FERC	David Turner
NMFS	Mandy Migura
NMFS	Eric Rothwell
NMFS	Sue Walker
USFWS	Mike Buntjer
USFWS	Bob Henszey (on phone)
USFWS	Betsy McCracken
USGS	Dave Meyer
Citizen	Mike Wood
Natural Heritage Institute	Jan Konigsberg
The Nature Conservancy	Corrine Smith
Ratepayers	Scott Crowther
AEA	Wayne Dyok
AEA	Betsy McGregor
AEA	Bryan Carey
Cardno ENTRIX	Craig Addley
Cardno ENTRIX	Jim Gill (on phone)
E-Terra	Lars Gleitsmann
GW Scientific	Michael Lily
HDR	James Brady
HDR	Keri Lestyk
LGL Alaska	Michael Link
Long View Associates	Steve Padula
Long View Associates	Randall Filbert
MWH	Kirby Gilbert
MWH	John Haapala
R2 Resource Consultants	Dudley Reiser

R2 Resource Consultants	MaryLou Keefe
R2 Resource Consultants	Kevin Featherston
Solstice AK	Robin Reich

Presentations

Keri Lestyk (HDR)
- Beluga Whale Prey Analysis

Dave Meyer (USGS)
- USGS Flow Data

Alan Olson (R2)
- Existing Fisheries Data Synthesis

James Brady (HDR)
- Upper Susitna River Fish Distribution and Habitat Study

Michael Link (LGL)
- Distribution and Middle River Habitat Utilizations

MaryLou Keefe (R2)
- Timing Distribution and Relative Abundance of Juvenile Salmon in the Middle River
- Habitat Characterization for Off Channel Habitats
- River Productivity—Macroinvertebrate and Periphyton
- Reservoir Operations Fish Community and Risk Entrainment Study
- Non Anadromous/Invasive Species Study
- Access/Transmission Corridor Characterization Study

Dudley Reiser (R2)
- Instream Flow Study

Kevin Featherston (R2)
- Riparian Instream Flow Study

General Questions/Discussion

Steve Padula (LVA) stated that FERC had granted a deadline extension, to May 31, 2012, for stakeholders to provide comments on the Pre-Application Document (PAD), scoping document 1 and formal study requests as part of the ILP process. Steve (LVA) noted that FERC had adjusted subsequent ILP milestones commensurate with the comment extension. AEA will post a revised Project licensing schedule on its website. The previously scheduled May 2012 workgroup meetings are canceled and will be held during the second week of June 2012.

Steve (LVA) said that during the next several months AEA intends to begin scheduling subgroup meetings, which would involve greater focus on the details of study planning and execution. Wayne Dyok (AEA) added that these meetings would be open to anyone who wished to participate but that the focus of the meetings would shift to more technically-oriented topics.

Steve (LVA) stated that 2012 study plans were nearing completion and AEA was requesting that stakeholders provide final input on the 2012 plans by the week of April 16, 2012. Steve (LVA) stated that AEA would be finalizing and distributing the 2013-2014 formal study request documents over the next several weeks and asked that stakeholders provide any input as soon as possible, so that by the time the requests are filed they are as comprehensive as possible, which would reduce the amount of work required by stakeholders.

Cook Inlet Beluga Whale Prey Study Plan

Keri Lestyk (HDR) presented the Cook Inlet Beluga Whale Prey Analysis. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

Mandy Migura (MNMFS) said that the draft Cook Inlet Beluga Whale Recovery Plan would be completed in the next year.

Wayne (AEA) asked when the synthesis of existing data would occur. Keri (HDR) said that the team is beginning now and should be completed in the next two months.

Mandy (NMFS) said that the National Marine Mammal Laboratory (NMML) has an opportunistic database based on sightings of beluga whales. Mandy (NMFS) said these data might not be as accurate as those produced by systematic studies, but the database is still a good source of data. Mandy (NMFS) said that ADF&G had an acoustic recorder near the Susitna River delta that was collecting year-round data, which is important because there may be year-round use of the delta by Cook Inlet belugas.

Mandy (NMFS) said that other marine mammals' prey and habitat should be considered. She said that harbor seals, killer whales and harbor porpoise are seen in the area, and they are managed under the Marine Mammal Protection Act (MMPA). Mandy (NMFS) said that if there is the potential for harassment or take of these species as the result of Project activities, a permit would be required.

Wayne (AEA) said that AEA had scheduled a July field visit planned for interested agencies, during which agencies could visit the mouth of the Susitna River. Mandy (NMFS) said that June is the period of peak Cook Inlet beluga presence in the delta.

Keri (HDR) said that AEA will develop a no-impact protocol for the 2012 field studies. Mandy (NMFS) said that AEA should initiate informal consultation under the Endangered Species Act

(ESA) as soon as possible. Wayne (AEA) said that FERC would do formal consultation until it specifies that AEA is the designee for ESA consultation.

Wayne (AEA) asked how NOAA Fisheries studies belugas in riverine systems. Mandy (NMFS) said that NOAA Fisheries does in-house aerial surveys, which are conducted when whales are congregated and during low tides to increase success of findings. She said that June aerial surveys are lacking in temporal scope, which is needed for the Project. There are some satellite tagging data, which may show upriver movement of whales. Mandy (NMFS) said that the Alaska Sealife Center had a camera that showed how far Cook Inlet belugas travelled up the Little Susitna River, which could help understand how far upstream Cook Inlet belugas may go in the Susitna River. Keri (HDR) said that the Sealife Center is on the HDR team for installing cameras for this study.

Mandy (NMFS) said that there are critical habitat species that are not listed in the study plan, including gadus and yellowfin sole. During ESA consultation, all the critical-habitat species and the Project's effects on these species will need to be addressed. Mandy (NMFS) said that her comments at the meeting were informal and she would likely provide additional comments later. Keri (HDR) said that the beluga team would coordinate with other Project studies. Mandy (NMFS) said that NMFS has evidence that topography and bathymetry might be equally or more important elements of beluga whale habitat than prey species. Project changes to bathymetry could impact beluga predation success.

Mandy (NMFS) said that NMFS is interested in changes in habitat and how the Cook Inlet belugas might be affected. NMFS is also interested in changes in prey density, timing of prey species runs, and which prey species beluga feed on during winter. The Susitna River delta is the first place newborn Cook Inlet belugas are seen, so it is an important area to understand.

Wayne (AEA) asked whether winter studies of belugas can be successful and whether belugas will use iced-over areas. Mandy (NMFS) said that based on satellite data, belugas can be present in areas with 100 percent ice cover. There is a NMML report that might have in-depth beluga dive data from the satellite tags; however, the data needs to be fine-tuned. Mandy (NMFS) said that NMFS does not know how far belugas can travel or how long they can remain under the ice.

Mike Wood (Chase resident) asked whether eulachon studies would be conducted. Keri (HDR) said that the Cook Inlet beluga study will be a year-round study, but would focus on eulachon only when Cook Inlet belugas would be feeding on them. Mike W. (Chase resident) said that he had previously seen eulachon as far upstream as Willow, whereas currently they appear travel no farther upstream than Yentna. MaryLou Keefe (R2) said that the eulachon study area is focused on where they are preyed upon by belugas.

USGS Susitna Basin Hydrological Study Plan

Dave Meyer (USGS) presented the USGS Susitna Basin Hydrological Study. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

Dave Meyer (USGS) said that USGS would be using pressure transducers and that sensors would be placed in the best locations to collect good temperature and sediment data. Dave (USGS) said that USGS would collect data at cross sections to relate continuous water temperatures of the whole stream channel. Michael Lily (GWS) said that AEA will need to know where data are collected. Dave (USGS) said that no temperature or turbidity data would be collected in the winter, but that the thermistors would be left in place. The thermistors would not be in the deep areas that would remain ice free, so that records from these thermistors would not reflect ambient winter water temperatures.

Eric Rothwell (NMFS) asked for a description of the winter gauging. Dave (USGS) said that two to three discharge measurements are taken along a transect by boring holes through the ice, as soon as the ice is strong enough to safely support field crews. Dave (USGS) said that USGS estimates discharge between the initiation of freeze up and the time when field crews can safely work on the ice, i.e. no measurements are made during that period. USGS tries to take early, mid, and late winter discharge measurements. In cases where the USGS has collected winter data consistently, it has been shown that linear estimations between sampling points are reliable, characterized by about ±12 percent error.

Eric (NMFS) said that understanding winter flows would be critical for characterizing fish overwintering habitat. Dave (USGS) said that assessing winter hydrology is challenging because the relative amount of groundwater-surface water interchange is greater during winter. There is a need for more frequent sampling at more locations to more accurately characterize winter flows.

Joe Klein (ADF&G) asked whether hydroacoustics could be used to estimate bedload. Dave (USGS) replied that daily access to instruments and use of a permanent platform, such as a bridge or bridge pier, would be required to apply hydroacoustics. The use of hydroacoustics for measuring bedload is still an experimental technology and might not be a reliable means of developing daily load calculations.

Wayne (AEA) asked whether bedload measurements could be taken during a flood flows. Dave (USGS) said that USGS used heavy-duty bedload samplers that weigh between 150 and 300 pounds that would be capable of withstanding high-flow conditions. During high flows, routine discharge measurements are done with acoustic measurements from a boat. During floods, collecting load materials could be dangerous because of trees moving down the river. Dave (USGS) said that in 1980s, bedload transport rates varied each day. Total load estimates tend to be inaccurate without continuously collecting bedload data over a long period of time because the natural bedload rates are very variable. USGS would likely assume that bedload accounts for about 5 to 20 percent of the total sediment load and focus its efforts on measuring suspended sediment.

Dave (USGS) said USGS performs QA/QC on winter stage data and only publishes data considered to be representative. USGS measures ice thickness and provides data to the National Weather Service. He said these data could be made available to AEA.

Bryan Carey (AEA) asked which of the upstream gaging sites would be most useful for calibrating the hydraulic routing model and whether flow records could be synthesized based on rating curves from locations farther downstream. Dave (USGS) replied that the most reliable data would come from the MacLaren River at the Denali Highway (near Paxson) and Susitna River near the Denali Highway (near Denali) sites, but a synthesized flow record would be inadequate for calibrating the model upstream of Denali Highway, and it would be better to calibrate the model based on data from the Gold Creek or Tsusena gages.

Dave Terry Schwartz (ADNR) asked whether the same methods employed in 1985 to measure bedload would be used for the current study. Dave (USGS) said that there are slight differences in gear but that techniques were basically the same.

Fish and Aquatic Resources Study Plans Questions/Discussion

Existing Fisheries Data Synthesis Study Plan

Alan Olson (R2) presented Existing Fisheries Data Synthesis Study Plan. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

ADF&G requested that the study include an assessment of historical data related to *Elodea* and lake trout distribution and abundance.

Mike Buntjer (USFWS) asked how the study would assess fish-habitat selection (i.e., use relative to abundance of a given habitat), as opposed to simply habitat use. Craig Addley (Cardno ENTRIX) said that habitat suitability criteria (HSC) developed in the 1980s might be used.

Sue Walker (NMFS) said that the Aquatic Resources Data Gap Analysis does not document all the data needs. Betsy McGregor (AEA) said that all of the reference documents are available through ARLIS, but not all are linked and available on line. Betsy (AEA) said that AEA will be checking with ARLIS to get these documents linked, but that AEA is not finding additional or previously undiscovered materials, but there are some low-quality or missed pages in some of the reference materials.

MaryLou Keefe (R2) said that historical data may need to be extracted from written reports, which could require a lot of time. MaryLou (R2) said that R2 is doing an assessment of whether such data are could be used in current analyses. Sue Walker (NMFS) asked about the schedule. Betsy (AEA) said that the analysis should be completed by mid-summer 2012. Sue (NMFS) said that in discussions earlier, NMFS had asked for null data, i.e., where sampling had revealed habitats that were not used by fish. Dudley Reiser (R2) said that R2 would check with Woody Trihey (Cardno ENTRIX) to see what data he might have. Alan Olson (R2) said that ideally the

synthesis of existing data would be done as quickly as possible to make it useful for implementing the 2012 studies and for developing 2013/14 study plans.

Mike B. (USFWS) asked about nomenclature and labeling areas as river segments versus reaches. Betsy (AEA) said that the workgroup would have one system-wide classification based on reach and subreach designations. MaryLou (R2) said that everyone on the project will use the same system. Betsy (AEA) said that a map of reaches and subreaches would likely be available at the June 2012 workgroup meeting. MaryLou (R2) stated that there would be some refinement of the nomenclature during the summer 2012 field effort. Betsy (AEA) said that the Project will have one GIS layer, by river mile, which will include a naming convention for all streams that are unnamed.

Upper Susitna River Fish Distribution and Habitat Study

James Brady (HDR) presented the Upper Susitna River Fish Distribution and Habitat Study. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

Joe Klein (ADF&G) asked if resident-fish habitat lost as the result of reservoir construction would be documented. James (HDR) said that Objective 3 of the study would evaluate the quality of the habitat in the inundation zone. Betsy (AEA) said that the study would include an assessment of all barriers to fish migration in tributaries that exist now and would cease to exist after the reservoir is in place.

Ron Benkert (ADF&G) said that there is observer bias associated with collecting habitat data which could be compounded by different groups collecting information. Integration across disciplines is needed and training could be conducted to reduce bias. MaryLou (R2) said that AEA was developing habitat survey protocol and would be coordinating with the workgroup. There would be QC field checks by experienced scientists throughout the season.

Betsy McCracken (USFWS) said that the USFWS might recommend a different classification system than that developed by AEA. Joe (ADF&G) said that protocol would need to be consistent with the Montgomery Buffington System. MaryLou (R2) said that it would be. Joe (ADF&G) said that the AEA needs to make available all references used in the development of habitat survey protocol. Sue (NMFS) said that it would be helpful if AEA could provide draft protocol for review before the next workgroup meeting. Betsy (AEA) said that AEA would provide protocol, references, and a map at the June next meetings. Sue (NMFS) said that the team should look at NOAA Shorezone (mapping) Program (http://www.fakr.noaa.gov/shorezone/default.htm) as an example product.

Ron (ADF&G) said that he was concerned that some habitat types, for example undercut banks, could be overlooked because aerial photography is being used to select sampling locations. Sue (NMFS) said that the mapping would need to be groundtruthed. MaryLou (R2) said that the team would be doing ground surveys where there is poor imagery.

Mike Sundergaard (BLM) said that a separate smaller group needs to meet to develop habitat survey protocols. Betsy (AEA) said that it would be important to remember the objectives of the study when considering methods.

Mike B. (USFWS) asked whether there was any corresponding shift in the peak Chinook runs since the 1980s based on ADF&G findings. Betsy (AEA) said that they haven't observed any changes in timing based on recent work. Ron (ADF&G) said that there needs to be more attention directed toward assessing mainstem salmon spawning. Betsy (AEA) said that the team would fly the mainstem to do aerial surveys. Joe (ADF&G) asked whether carcass surveys would be conducted. Betsy (AEA) said that AEA would do carcass and redds surveys.

Wayne (AEA) asked whether upstream work would be done above fish migration barriers. Betsy (AEA) said that work would continue upstream to the first fish barrier that would remain intact after reservoir filling or to 3,000 feet, whichever is encountered first. Mike B. (USFWS) said that it would be useful to document resident fish habitat upstream of the inundation zone in the mainstem of the Susitna River. Betsy (AEA) said that AEA needed to better understand the extent to which Chinook pass through Devils Canyon to assess the Project's effect on habitat in the inundation zone.

Sue (NMFS) asked for the biological basis for limiting surveys to 1 mile above a barrier. Sue (NMFS) said that AEA should document habitat in tributaries upstream to the point where it is no longer suitable. MaryLou (R2) said that the team could sample for fish at 3,000 feet, and if fish are present then they could keep looking until the habitat suitable for Chinook is no longer available. Sue (NMFS) confirmed that that would be a good strategy. Jack Erickson (ADF&G) said that radio-tagged Chinook would be tracked, which would help define the upstream extent of the species' distribution.

Mike B. (USFWS) asked why no genetic information would be collected for adult salmon. MaryLou (R2) said that tissue samples would be collected from radiotagged (i.e., adult) salmon and could be used for genetic analysis. Jack Erickson (ADF&G) said that any adult salmon that are handled should be sampled for genetic analysis. Genetic samples should only be collected if the fish is living and still fresh and six or more individuals per tributary would be best. Jack (ADF&G) confirmed that the collections could be made over the next few years. ADF&G would like samples of all salmon species, if possible.

Betsy McCracken (USFWS) asked how far upstream the distribution of northern pike extends. James (HDR) said that pike have not been found above Devils Canyon.

Distribution and Middle River Habitat Utilizations

Michael Link (LGL) presented the Distribution and Middle River Fish Habitat Utilizations Study. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

Mike B. (USFWS) asked why there was not plan to locate a radio telemetry receiver station at the proposed dam site. Michael (LGL) said that they would be flying every five days to figure out whether the tagged fish would be going up tributaries. Any fish that make it above Devils Canyon would be tracked to their spawning locations. Mike B. (USFWS) said that the study plan should be revised to make that clear. Michael (LGL) said that there had been changes to the study plan since it had been provided to stakeholders.

Mike B. (USFWS) asked whether genetic differences would be expected between fish migrating to different areas in the watershed, mainly between those occupying the lower river and those above Devils Canyon. Jack (ADF&G) said that there would be.

Michael (LGL) asked whether it be better to collect Chinook genetic samples at the time of radio-tagging or from individuals on their spawning grounds. Jack (ADF&G) said collecting samples from fish on the spawning grounds would provide a better characterization of the genetic baseline and differences between upper basin fish and those elsewhere in the system. Michael (LGL) said that it would be best to avoid taking tissue samples from fish during radio tagging to minimize handling and, as a result, the risk of affecting the behavior of tagged fish. If many Chinook pass Devils Canyon, additional work would be recommended for 2013-2014.Sue (NMFS) asked whether eggs could be used for genetic analysis. Jack (ADF&G) said that it would be necessary to consult appropriate experts to make that determination.

Mike B. (USFWS) asked whether AEA was planning to do secondary tagging as was proposed in the original study plan. Sue (NMFS) asked what range of tag loss was expected. Michael (LGL) said that 5 to 10 percent tag loss was typical. Sue (NMFS) asked what risk was involved in ancillary tagging. Jack (ADF&G) said that any puncturing of a fish's body would increase the risk of altering its behavior.

MaryLou R2) said that the HDR team would be sampling in the upper watershed and could take genetic samples. Jack (ADF&G) said that whatever can be done to get accurate baseline genetic samples in 2012 would be best. Mike B. (USFWS) asked whether the team was planning on taking genetic samples from other fish that are found with the tagged fish. Michael (LGL) confirmed that samples would be collected from any aggregation of fish above Devils Canyon. Mike B. (USFWS) said that samples from tagged fish should be segregated from untagged fish.

Craig (Cardno ENTRIX) said that collecting genetic fish information is a secondary goal and that the main goal of the study is to figure out whether mainstem spawning is occurring and where the fish are going above Devils Canyon.

Jack (ADF&G) said that these are multi-year studies, which will be continued next year. When genetics samples are collected, sampling on the spawning grounds is needed to get a clean baseline.

Sue (NMFS) said that she still questions whether a secondary tag isn’t useful and suggests that a teleconference is needed to discuss the subject more. Michael (NMFS) said that the results of

2012 will help understand whether there is a need for secondary tagging. Betsy (AEA) said that ADF&G will be doing another tagging study.

Eric (NMFS) said that the methods for studying groundwater were discussed at the April 4 meeting, but that there was no ILP study request directed specifically at groundwater assessment. Betsy (AEA) said that AEA would set up a meeting with agencies to discuss groundwater study in April and requested that agencies send an email to her that includes specifically what the agencies would like to discuss.

Timing Distribution and Relative Abundance of Juvenile Salmon in the Middle River

MaryLou (R2) presented the Timing Distribution and Relative Abundance of Juvenile Salmon in the Middle River Distribution. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

Mike B. (USFWS) asked how the middle river was defined. MaryLou (R2) said the middle river extended from the confluence of Chulitna River to Devils Canyon. MaryLou (R2) said that AEA was not studying at juvenile salmon in the lower river.

Joe (ADF&G) asked how the juveniles would be marked. MaryLou (R2) said PIT tags and PIT tag arrays would be used to detect fish. Joe (ADF&G) said that it would be important to sample at the right time because the juveniles could be missed.

Mike B. (USFWS) asked why Whiskers Creek was selected. MaryLou (R2) said it was selected because it is at the lower end of the run. Mike B. (USFWS) said that the team might want to meet to go through the protocols in more detail. Mike B. questions why the lower reach wasn't being studied. Eric (NMFS) said that the Project needs to get the results of modeling to determine lower river impacts. Betsy (AEA) said that the team will be looking at the lower river for beluga prey species and that there would be other lower river work occurring.

Habitat Characterization for Off Channel Habitats

Joe (ADF&G) said that if the study only focuses on the physical aspects it would miss biological aspects, like macroinvertebrates and other parameters. Joe (ADF&G) said that he would like to see the ability to classify categories of off-channel habitat types; the team could modify and expand the data collected so that he could understand the range and variables that the habitats may have. MaryLou (R2) said that the goal of the work is to have consistent standards that can be used across studies. Dudley Reiser (R2) said that the instream flow studies will be consistent with the 1980s work and that some of the additional parameters that were brought up by Joe (ADF&G) might be covered.

Eric (NMFS) said he knew the studies are linked, but the Project should be able to tie habitat types and functions. The team needs to make sure that habitat type information can link back to

the entire river system. The plans needed to clearly identify the links between the studies and various modeling efforts.

River Productivity—Macroinvertebrate and Periphyton

Betsy (AEA) said that maps including historic data and 2012 information would be sent out soon.

Mike B. (USFWS) said that work was proposed in the lower reach in the 1980s and that work in the lower reach could be warranted.

Mike S. (BLM) said that currently the top predator is lake trout. Lake trout are in Sally Lake and would definitely have an impact on the resident fish. MaryLou (R2) said that "transitional" in reference to sloughs a temporal definition, not a geographic area. MaryLou (R2) said that the review of the 1980s data would give more information on where the transitional sloughs areas are located. Jan Konigsberg (NHI) said that transitional slough areas were mapped in the 1984 studies, assuming that the baseline hasn't changed. MaryLou (R2) said that AEA wants a minimum of three transitional slough sample sites.

Craig (Cardno ENTRIX) said that they found that during turbid water, there was a lot of drift, and during clear water, the available drift was down. MaryLou (R2) said that they would have to look at this type of habitat type two times-once when the water was turbid and again when the water was clear. Joe (ADF&G) said that APA documents from 1980s studies show 13 sites. MaryLou (R2) said that the team would repeat sampling at those sites with the goal to make the information consistent with the 1980s as much as possible and still maintain quality work and new, more informative methods.

Dudley (R2) said that the invertebrate sampling issue often comes up with instream flow. This piece will help us understand how habitat could change with the project. Dudley (R2) said that smaller workgroup meetings would help determine sampling sites and a classification system.

Reservoir Operations Fish Community and Risk Entrainment Study

Joe (ADF&G) said that it was important to look at primary productivity and how it would be affected. Jack (ADF&G) said that ADF&G manages the fisheries in the area; however, he didn't know what would happen if there was no fishery. Betsy (AEA) said that the team would be looking at sport harvest potential based on access to the reservoir in the recreation studies. Joe (ADF&G) said that whether the road is public is an important question. Betsy (AEA) said that this would be determined by looking at safety and the socioeconomics results.

Non anadromous/Invasive Species Study

Alan Olson (R2) asked whether agencies thought that burbot should be included in the study plan. Alan (R2) said that burbot may be important because have a different timing than other species. Mike W. (Chase resident) said that he sees grayling, long nose sucker, Dolly Varden,

hooligan, burbot, grayling and rainbow trout year round. Mike W. (Chase resident) said that he had not seen eulachon up river, but that he once got them in Talkeetna. He once could get them at Deshka Landing, but now he sees them at Yentna. MaryLou (R2) said that they could be checking for blackfish.

Access/Transmission Corridor Characterization Study

Ron (ADF&G) said that this study is important to ADF&G because they are looking at the structures. Ron (ADF&G) requested that if fish are not collected at a certain time to return to the area at another time of year.

Jan (NHI) asked why there was no juvenile salmon study planned for the lower river and said that during the last project effort (1980s), winter flow was load following and possible stranding of fish was a possible Project impact. Jan (NHI) said that he was interested in what juveniles are in the river and when. Craig (Cardno ENTRIX) said that AEA understands that this issue needs to be addressed. Steve Padula (LVA) said that AEA will want to continue this coordination and by November 2012, there should be agreement on studies to conduct.

Instream Flow Study

Dudley (R2) presented the Instream Flow Study. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

Joe (ADF&G) said that for the reconnaissance visit, it would be good to have the1980s data and a map to understand and plan the trip to see where to go and to observe habitats. Dudley (R2) said that they should be able to develop a selection of photo plates of locations to revisit to see whether the sites have changed since the 1980s. Michael (GWS) said that the cross-section studies would look at this. Dudley (R2) said that intensively modeled areas should be reexamined. Joe (ADF&G) said that there is a lot of complexity at locations and that the Project might need a two-dimensional model. Joe (ADF&G) said that this type of depiction as well as overall reach, the proportions of upland sloughs compared to side channels, will be important to plan the trip.

Betsy (AEA) said that the team was obtaining 1980s aerial imagery to use in comparing sites over time. Joe (ADF&G) said that he might have a box of old photos available. Betsy (AEA) said that the LiDAR photography would be available before the end of May 2012 and that other imagery would be available in reservoir area. A three-dimensional model will be built in GIS. Bob Henzley (USFWS) said that the LiDAR data could be used to do a three-dimensional model of the watershed and that it is better than a longitudinal profile. He added that the team should be looking for major breaks in gradient. Betsy (AEA) said that it would be tough to get water surface because it has changed.

Michael (GWS) said that a survey control for the mainstem would be tied to the LiDAR survey control and series of points that would help to show water level. Craig (Cardno ENTRIX) said

that 100 transects would be taken down the river plus more with geomorphology and riparian data.

Eric (NMFS) asked what the mechanism was for model selection and how the model decision would be made. Dudley (R2) said that there are times when you can use multiple methods, but is it necessary to address question. There might be some situations where habitat value and complexity needs to be more detailed in the modeling approach. Dudley (R2) said that part of the rational is site selection and part is what model is most suited for the habitat type. Eric (NMFS) said that there might be a need for an extra model for defensiveness. An agreement on what is important is needed, and that depends on what information is known. Eric (NMFS) asks how the dominate variables that control the habitat quality would be determined. Dudley (R2) said that he was confident that from review of 1980s data, the team would get an idea of where groundwater influence was a factor or where other physical features are controlling the system. The ice study may provide a better understanding of upwelling.

Betsy McCracken (USFWS) asked whether Google Earth could be used to identify areas based on a geomorphology concerns. Lars Gleitsmann (E-Terra) said that Google Earth would not work, since the data is too course, only covers a portion of the project area, and has ice and snow cover.

Joe (ADF&G) said that he didn't see when 2012 results would be available. Dudley (R2) said that the draft study plan technical memorandum would be available in June 2012 at the earliest and that the final tech memos would be completed by November 2012. Joe (ADF&G) said that the information is needed to review before go out in the field. Dudley (R2) said that they could prepare a tech memo to plan the agency field trip to focus the effort. Joe (ADF&G) said that it would be nice to visit a representative sample and biological hot spots as determined in the 1980s. Betsy (AEA) said that there would be interim deliverables given out prior to workgroup meetings like map products.

Michael (GWS) asked if the trip was planned in August 2012, there would be more information from earlier summer efforts. Dudley (R2) said that they want to plan the field visit around when the water is going down, so we can see what is going on in sloughs, for example. Joe (ADF&G) said that when the water is receding depends where you are at in the river, or when. Michael (GWS) said that late August or September will be the best time to go if targeting before ice and around 10,000 to 12,000 cfs.

Sue (NMFS) said that all the models seem to assume a before-project baseline and an after-project baseline; however, project effects would happen over a long time-frame, and it is difficult to predict over time. Eric (NMFS) said that although there would be an additive effect over the long term, with the geomorphological model it can be carried forward to the long term. Dudley (R2) said that they would be looking at a 50-year time frame and that flow, sediment transport, and other features would be used to understand what would happen to other features.

Joe (ADF&G) said that he would like to see the slow succession over the 50-year license. The habitat models concept is good to see what process is driving the fish species. Joe (ADF&G) said that the project needs to add fish behavior and response, when juveniles seek out cover, and feeding behavior and shelter. Turbidity needs to be understood and modeled, and groundwater needs to be understood. Sue (NMFS) said that temperature is important. Joe (ADF&G) said that when adult salmon like to hold in deep waters need to be added to the modeling.

Mike S. (BLM) asked how confident the team would be with the temperature modeling, Craig (Cardno ENTRIX) said that it would be harder because it is a new project, but the water temperature will be pretty good. Joe (ADFF&G) said that as he understands, the project would be a multi intake system, so it could control water temperatures. Craig (Cardno ENTRIX) said that they would have feedback loop in the modeling for operations and impact categories. Betsy (AEA) said that they may have flushing flows and maintenance or load following scenarios and that there would have to be a balance of the energy demand and economics, bracketed by environmental needs.

Terry Schwartz (ADNR) asked how groundwater would be addressed in the modeling. Dudley (R2) said that in terms of instream flow, there was a lot of work in the 1980s data where groundwater and stage connections were identified that will be tested. Dudley (R2) said that there may be sites where temperature intensively studied. Craig (Cardno ENTRIX) said that the team understands that how groundwater studies would be integrated needs to be integrated. Terry (ADNR) said that the geotechnical bores might give some information, like bedrock fractioning. Joe (ADF&G) said that there might be other processes that drive groundwater and he was interested in what influences upstream development might have on those processes.

Betsy (AEA) said that small meetings would be set up for the next two to three weeks to address and get help with developing study plans for the groundwater issue, routing, and fisheries studies protocols. Sue (NMFS) requested that AEA send out protocols to the group prior to the fisheries meeting, so that they can be reviewed.

Riparian Instream Flow Study

Kevin Featherston (R2) presented the Riparian Instream Flow Study. See the corresponding PowerPoint presentation (Susitna-watanahydro.org).

Joe (ADF&G) asked for a definition of domain. Kevin (R2) said that in terms of where there are similar geomorphic river processes. Kevin (R2) said that it is where there are difference disturbance process occurring for example, areas where only alluvial process are happening.

Kevin (R2) said that their group would work with the geomorphology group and the ice processes group to figure out where to do intensive studies. Bob (USFWS) said that the area right below the dam was not shown for study. Kevin (R2) said that they were planning on studying there and immediately below the three rivers confluence.

Kevin (R2) said that it is likely every 10 years that peak flow would occur, but this information would be determined by looking at the age of the forest, the plant community age, distribution, and the hydrograph. Wayne (AEA) said that this type of work has been done in other places and this study is the key to understanding the system.

Bob (USFWS) asked whether the team would measure the valley-wall to valley-wall. Kevin (R2) said that they would just look at riparian areas with their target being to look at the entire active valley that is the region which is flooded by a 100 or 200-year event. Kevin (R2) confirmed that the study would help to understand the effects of changes to water flow on plant communities.