SUSITNA-WATANA HYDRO

Meeting Notes
Initial Study Report (ISR) Meeting
Wildlife and Botanical Programs (Studies 10.5–10.20; 11.5, 11.7–11.9)
March 29, 2016

Location	Alaska Energy Authority – Board Room 813 West Northern Lights Blvd. Anchorage, AK 99503
Time	8:30 A.M. – 3:30 P.M. AKDT
Subject	ISR Meeting
Goal	Review study objectives, methods, variances, results, decision points, proposed modifications, steps to complete studies, and discuss licensing participants' comments.
Attendees	**Betsy McGregor** AEA, **Doug Ott** AEA, **Dan Smith** AEA, **Wayne Dyok** H_2O EcoPower, **Julie Anderson** Denali Management Solutions, **Kirby Gilbert** MWH, **Chuck Sensiba** Van Ness Feldman, **Kathryn Peltier** McMillen Jacobs Associates, **Sydney Hamilton** Accu-Type Depositions (ATD), **Sunny Morrisen** ATD, **Brian Lawhead** ABR, **Terry Schick** ABR, **Susan Ives** ABR, **Alan Mitchnick** FERC, **Tyler Rychener** Louis Berger, **Joe Klein** ADF&G, **Rick Merizon** ADF&G, **Mark Burch** ADF&G, **Kevin Colson** ADF&G, **Earl Becker** ADF&G, **Betsy McCracken** USFWS, **Douglass Cooper** USFWS, **Erin Knoll** USFWS, **Jesse Hankins** BLM, **Mike Wood** SRC (in afternoon)
On Phone	**Tim Obritschkewitsch** ABR, **Brian Cooper** ABR, **John Shook** ABR, **Alex Prichard** ABR, **Janet Kidd** ABR, **Todd Mabee** ABR, **Karen Sughrue** FERC, **Quinn Emmering** FERC, **Nicole Jurjavcic** Stillwater Sciences, **Emily Teraoka** Stillwater, **Laura McClure** Stillwater, **Dirk Pedersen** Stillwater, **Alynda Foreman** Louis Berger, **Jennifer Curtis** EPA, **Cassie Thomas** National Park Service, **Heide Lingenfelter** Ahtna, **Gloria Stickwan Ahtna, Whitney Wolff** Talkeetna Community Council, **Becky Long** Susitna River Coalition (SRC), **Mike Wood** SRC (in morning), **Ruth McHenry** Copper Country Alliance (CCA), **Jan Konigsberg** Hydropower Reform Coalition,

Introduction

As part of the Federal Energy Regulatory Commission's (FERC) Integrated Licensing Process (ILP), Alaska Energy Authority (AEA) is required to hold meetings with licensing participants and FERC to discuss the study results and AEA's plans to modify the Study Plan as outlined in the Initial Study Report (ISR). The ISR Parts A, B, and C for each study were filed with the FERC on June 3, 2014. For many studies, additional information was filed in technical memoranda September through December 2014. In the fall of 2015, Study Implementation Reports (SIR) and Study

Completion Reports (SCR) were filed with FERC to report on the status or in some cases completion of studies since the previous ISR filings. ISR Part D, filed on November 6, 2015, provided a "roadmap" of the various components of each study, updates to the study progress, variances, modifications, and steps to complete the study. The ISR Meetings were held in Anchorage over five days, March 22, 23, 25, 29 and 30, 2016, covering the 58 FERC-approved Study Plans for the Susitna-Watana Project.

The following meeting notes are for the March 29, 2016 meeting and intended to capture any significant discussion/information in addition to the materials provided on the Project website (http://www.susitna-watanahydro.org/). The meeting agenda and presentations are available under the "previous meetings" tab (link provided under the meetings tab) on the Project website.

After introductions, Kirby Gilbert, MWH, presented a brief overview of the history of major filings and milestones of the Project and an updated FERC schedule. AEA will file the ISR Meeting Summary April 24, 2016. Licensing participants file requests for modifications to the existing Study Plan or requests for new studies June 23, 2016. Kirby reviewed the regulatory requirements for requesting a study plan modification to an existing study or a new study, and made reference to the poster boards in the room. AEA and other licensing participants file responses to the requests August 22, 2016. FERC will make its study plan determination on the meeting summaries and any disagreements or recommendations for modified or new studies by October 21, 2016. These details are in the "Introduction to ISR Meetings" presentation.

10.15 - Waterbird Migration, Breeding, and Habitat Use

Tim Obritschkewitsch, ABR, and Brian Lawhead, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results. The spring and fall migration surveys have been completed and the breeding-season surveys have been completed. The Study Plan (RSP Section 10.15.6) included a decision point to evaluate the results of the ground-based radar and visual migration surveys in the first year of study to determine if a second year of those surveys was necessary. The comprehensive migration surveys completed in 2013 met the study objective to "document the occurrence, distribution, abundance, habitat use, and seasonal timing of waterbirds migrating through the Project area in spring and fall". Thus, no ground-based radar or visual migration surveys were conducted in 2014. A cumulative Study Completion Report was filed November 2015. AEA proposed to consolidate the objective and methods related to mercury analysis of wildlife species under the Mercury Bioaccumulation Study (Study 5.7). AEA has met the remaining study objectives and this study is considered complete; accordingly, AEA plans no further modifications to the Study Plan (Slide 17).

Becky Long, SRC, asked if the data collected during the 2013 migration surveys were representative because spring 2013 was anomalous, having one of the latest break-ups on record. Brian Lawhead, ABR, replied that, while the timing of the migration undoubtedly was affected by the late break-up, there was no indication that occurrence and abundance of species were affected. That conclusion was supported by the data from the 2014 aerial migration surveys, which found the same species and groups as in 2013, albeit with somewhat different seasonal timing. In 2013, the timing of breeding was compressed for some waterbird species, but the same species and relative numbers were present in both years. Tim Obritschkewitsch, ABR, noted that the timing of the spring migration and use of waterbodies by birds shifted by about a week between years, but the same species and relative numbers were present. He added that the timing of the fall migration was similar in both years, as was the species composition and total number of birds. Brian Lawhead clarified that the primary objective of the study was to identify the species and the magnitude of migration through the area, and that the timing was less important. The objective was to identify

the species groups and numbers to use in developing PME measures to avoid collision and potential attraction to light from Project infrastructure. That objective was achieved. He added that the results of the 2013 ground-based radar and visual migration surveys were compared to data from other similar studies in interior and southcentral Alaska to provide context on the nature of bird migration through the study area.

Mike Wood, SRC, asked if surveys of overwintering waterfowl (specifically mallards and mergansers) were part of the study design and inquired if swans were surveyed. Brian Lawhead, ABR, said that no winter surveys were conducted for waterfowl in the Upper or Middle River. He noted that waterfowl leave the Upper River area during the winter but that small numbers of waterfowl could be present in the Middle River as occurs elsewhere in a few locations in interior Alaska near springs and areas of groundwater upwelling. Tim Obritschkewitsch, ABR, noted that swans had been surveyed throughout the migration and breeding seasons, as was summarized in the ISR and SCR.

10.14 - Surveys of Eagles and Other Raptors

John Shook, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results; as explained in the June 2014 ISR. In addition to the June 2014 ISR Parts A, B, and C, a 2014 Study Implementation Report was filed with FERC in November 2015, along with ISR Part D. No decision points were included in the RSP.

AEA proposes four modifications to the Study Plan (Slides 15 and 16): 1) In 2014, AEA eliminated the Chulitna Corridor from further consideration (ISR Part D Overview, Section 1.3) and added the Denali East Option road and transmission corridor (ISR Part C, Section 7.1.2) to the study area; 2) the woodland raptor survey intensity will be increased; 3) no further eagle foraging and communal roosting surveys will be conducted (SIR Section 7); and 4) the mercury analysis objectives and methods have been consolidated under Study 5.7 (Mercury Assessment and Potential for Bioaccumulation) (ISR Part C, Section 7.1.2).

Betsy McCracken, USFWS, stated that the USFWS has limited staffing resources and their review of wildlife studies will be limited to written comments on Studies 10.14, 10.15, and 10.16. She also reiterated USFWS's concern, expressed in the meeting last week, that no avian blood or feather samples had been obtained for characterization of mercury levels under Study 5.7.

Jesse Hankins, BLM, asked if the raptor nest data is available for use by other agencies. Betsy McGregor, AEA, said that data requests can be submitted directly to AEA, recognizing the sensitive nature of the raptor nest data. Sensitive data such as nest locations are not generally filed with FERC or provided to the public.

Becky Long, SRC, asked why low nesting success may have occurred in 2013 and 2014. John Shook, ABR, said that this is addressed in the Discussion sections of the reports. The nesting success observed in this study was comparable to studies in nearby areas, and may be linked to the low phase of the snowshoe hare population cycle that occurred during the study. Becky Long commented that, in the October 2014 meeting, the anomalous breakup in 2013 may have caused migration to be delayed until after the raptor migration surveys ended, so that it was not possible to distinguish whether migratory movements were delayed or whether some birds simply did not show up. Brian Lawhead, ABR, pointed out that the ground-based radar and visual surveys covered a longer period, so some data were obtained. He noted that the majority of raptors in the study area are eagles, which migrate early.

Erin Knoll, USFWS, asked if the 10-mile buffer around the proposed reservoir zone for the golden eagle nesting survey was 5 miles or 10 miles from each side of the reservoir zone. Brian Lawhead, ABR, clarified that it was 10

miles on each side. Betsy McGregor, AEA, added that the 10-mile buffer study area was developed through consultation with the USFWS, specifically with Golden Eagles territorial take in mind. She suggested referring to the consultation record for the wildlife resources section of the Proposed Study Plan (PSP) filed with FERC in June or July of 2012, which is on AEA's website as well.

Erin Knoll, USFWS, asked if small species of raptors (Merlin, Kestrel, Sharp-shinned Hawk, Hawk Owl, Boreal Owl) are being accounted for in the avian surveys. John Shook, ABR, replied that the point-counts used for the landbird/shorebird study would have detected some small raptors and noted that some of those species (such as Merlin) were observed in aerial surveys. No large owls (Great Horned or Great Gray) were observed, and it is assumed that few are present in the study area. Terry Schick, ABR, clarified that the landbird point-counts were conducted a bit late for some early-nesting species (e.g., owls), but that the habitat evaluation will consider these species. Brian Lawhead, ABR, added that surveys for small raptors are difficult, so these species will be assumed to be present in the study area and will be addressed in the wildlife habitat evaluation, as agreed to with USFWS during the study planning process.

Alan Mitchnick, FERC, asked for more details on the regulatory impetus for eagle territory take. Brian Lawhead, ABR, stated that it is a concern of USFWS primarily in the area of the proposed reservoir zone. The territory is much larger than the specific areas used for nesting and includes foraging areas, which is why the larger buffer around the reservoir was added. The size of the buffer is related to the average distance between adjacent occupied nests, according to USFWS staff responsible for eagle permitting.

Mike Wood, SRC, stated that he has noticed an increase in Snowy Owls in the last couple winters (January-April), especially high in the tundra of the Gold Creek transmission corridor. He has also seen Red-tailed Hawks in the area and an increase in red-backed voles. Brian Lawhead, ABR, replied that Snowy Owls nest in the tundra are known to be very transient and only occur in the Project vicinity during winter based on prey availability. Brian noted the surprisingly few Red-tailed Hawks that were recorded during surveys; one nest in 2013. John Shook, ABR, added that it is possible there were more birds closer to Talkeetna at lower elevations.

10.16 - Landbird and Shorebird Migration, Breeding, and Habitat Use

Terry Schick, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results of the two years of surveys. The results for Study 10.16 are explained in the June 2014 ISR and in the 2014 Study Implementation Report, which was filed with FERC in November 2015. A summary of the work completed on this study can be found in ISR Part D. A decision point for this study is that AEA has determined that the current data set (1–2 years of field data depending on the survey) is sufficient to meet the study objectives and that an additional year of sampling is not needed. See Slides 18 and 19 for further rationale on this decision point.

AEA proposes three modifications to the Study Plan (Slide 17): 1) for the lacustrine-focused surveys, the original bird abundance metric (birds per unit time) will be replaced with the total number of birds recorded on lacustrine water bodies and in adjacent habitats; this change will be implemented during preparation of the SCR (ISR Part C, Section 7.1.2); 2) comparisons of current (2013 and 2014 data combined) and historical (1980s APA Project) data on the occurrence and abundance of breeding landbirds and shorebirds will be made and the results presented in the SCR (ISR Part C, Section 7.1.2); and 3) the possible collection of feathers from Belted Kingfishers for mercury analysis in support of Study 5.7 (Mercury Assessment and Potential for Bioaccumulation) has been consolidated under that study (ISR Part C, Section 7.1.2).

Erin Knoll, USFWS, asked if restricting the survey for colonial nesting swallows to 2 miles downstream of the proposed dam site was based on an assumption that the effects of the dam will stop at the dam itself. Terry Schick, ABR, responded that the downstream effects of the Project was a hydrology-related question appropriate for another study, and explained that the colonial nesting swallow surveys were focused on estimating the number of colonies that could be inundated by filling the reservoir. Erin also asked if shorebirds were surveyed downstream of the dam site. Terry Schick answered that shorebirds were surveyed throughout the full study area, which included 2-mile buffers around the reservoir area and dam and camp site (same as for swallows); shorebirds were also surveyed in each of the proposed corridors.

Mike Wood, SRC, asked if studies were conducted in the Middle River. Terry Schick, ABR, answered no, that the study was focused on potential impacts of filling the reservoir and on construction of the dam, access roads, and transmission lines rather than on downstream effects. Mike Wood followed up with his personal observation that Belted Kingfishers and mergansers, species that depend on juvenile fish rather than insects, are abundant in the Middle River. He had not made observations in the Upper River due to lack of accessibility. Terry Schick responded that the study was focused on the Upper River, where Belted Kingfishers were found to not be abundant during project surveys. Terry added that the Middle River has more salmon resources and presumably more juvenile salmon and trout, and that, for those reasons, Belted Kingfishers could be more abundant there. Brian Lawhead, ABR, added that the Belted Kingfisher was dropped as a target species for tissue sampling for mercury levels because the concern for mercury was accumulation in the reservoir inundation zone, and there were not enough kingfishers there to warrant using it as a target species. Other species were identified as better candidates for mercury sampling.

10.5 - Moose Distribution, Abundance, Movements, Productivity, and Survival

Mark Burch, ADF&G, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. In addition to the June 2014 ISR and associated Part D, a 2014 Study Implementation Report was filed with FERC in November 2015. As a result of the comments received during the October 2014 ISR Meeting, AEA implemented a few variances: 20 additional collars were deployed in the Middle River; a late winter population survey along the Middle River was conducted in March 2015; and a third late winter inundation zone survey was conducted in March 2015.

AEA proposes two modifications to the Study Plan (Slide 15): 1) continuation of telemetry and GPS collar monitoring through March 2016 and 2) conducting a second late-winter survey in Middle Susitna River in March 2016.

Becky Long, SRC, expressed concerns regarding five significant impacts that the Project and access/transmission corridors may have on moose and other large carnivores. These include potential changes in habitats, behavioral reactions causing moose to search further for habitat, population fragmentation, an increase in human access and moose harvest, and mortality from vehicle collisions. Becky said the 1980s studies identified 11 different subpopulations with different migratory behaviors and habitat use that would be impacted in different ways by the proposed reservoir. Becky asked if it the moose browse survey would be conducted on CIRWG lands, which were not sampled in 2013. Mark Burch, ADF&G, said that they had permission to go on CIRWG lands for the fine-scale browse assessment conducted in March 2016.

Heide Lingenfelter, Ahtna, commented on the importance of river corridors to moose in winter, especially in deep snow years, and asked if GPS collar data could enumerate how many moose were using the river corridor in winter, since VHF flights were suspended at that time of year. Mark Burch, ADF&G, replied that aerial surveys of VHF collars

were conducted throughout the study area, but less regularly in the winter and that ADF&G also did several counts of moose in late winter in the inundation zone and downstream riparian area. GPS collars provide movement data consistently throughout the year. Brian Lawhead, ABR, said that GPS collars provide fine-scale movement data year-round on a small number of animals and the late-winter inundation zone surveys were done specifically to look at how many moose were using that area.

Becky Long, SRC, asked if not surveying the VHF collars in the winter would bias the estimates of moose use of riparian areas in that important season. Mark Burch, ADF&G, said that riparian areas are recognized as being important winter habitat for moose and the population counts and browse survey data would provide good information on use of the area.

Ruth McHenry, CCA, asked if the study observed moose reactions to Air Force jet training overflights. Mark Burch, ADF&G, said that the methods used for this study would not capture such reactions.

Mike Wood, SRC, asked when the collars will be removed from the moose in the Middle River. Mark Burch, ADF&G, said that ADF&G did not have plans to remove those collars yet and will continue to use them for research purposes, such as twinning assessments.

10.6 - Caribou Distribution, Abundance, Movements, Productivity, and Survival

Mark Burch, ADF&G, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR and associated ISR Part D in November 2015. No Study Implementation Report was filed for this study in 2015.

AEA proposes the following four modifications to the Study Plan (Slides 11 and 12): 1) continue differentiation between the Eastern Migratory Group and the Western Group (ISR Part A, Section 4.1.1; ISR Part C, Section 7.1.2); 2) continue increased frequency of telemetry flights to twice weekly during peak calving (ISR Part B; ISR Part C, Section 7.1.2); 3) retrieve GPS collars in 2014, refurbish and redeploy spring 2015; and 4) continue radio-tracking flights through October 2015.

Becky Long, SRC, commented that the study divides the caribou herd into two migratory groups (east and west), but she stated that the study also should consider the small Chulitna Hills group and the small Cantwell group. Becky stated that the study should consider cumulative human impacts from other activities besides the dam. These include mineral exploration drilling south of the Susitna River, including northern part of the calving area, and the expansion of Air Force training areas (Military Operations Areas, or MOAs) with associated noise and emissions. Local knowledge says an increase in ATV access and hunting pressure are causing caribou herds to be more fractured. She referenced the 2011 ADF&G caribou survey and inventory report which showed large numbers of Nelchina caribou have spent late summer and winter in the Watana Creek area in recent years, raising concerns that females might have difficulty crossing the reservoir area during spring migration to calving grounds. Caribou make wide-ranging migrations that can shift due to changing range conditions, so caribou herds need large areas in which to survive.

Betsy McCracken, USFWS, asked whether this study will consider information about climate change and ice processes in relation to the proposed reservoir. Mark Burch said that climate change and ice is not specifically part of the study scope. Betsy McGregor, AEA, said that the EFDC model in the water-quality study modeled ice processes in the reservoir and will be taken into account in the impact assessment related to caribou.

Heide Lingenfelter, Ahtna, asked when the study implementation report would be completed. Mark Burch said it would be completed by July 1.

10.7 - Dall's Sheep Distribution and Abundance

Brian Lawhead, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. In addition to the June 2014 ISR, ISR Part D and a 2014 Study Completion Report were filed with FERC in November 2015. AEA has met the study objectives and this study is considered complete; accordingly, AEA plans no modifications to the Study Plan.

Tyler Rychener, Louis Berger, asked if the time-lapse camera photographs of the Jay Creek lick in 2013 were usable after the camera was disturbed by a bear. Brian Lawhead, ABR, said the photos were still usable even though the camera had been tipped sideways.

Becky Long, SRC, noted that the SCR generally reported low numbers of Dall's sheep, which were attributed to the effects of severe winters, and that low numbers are a general concern for Dall's sheep in southcentral Alaska. She asked why numbers seem low. Mark Burch, ADF&G, said that sheep die from many causes and low numbers can also be accounted to low rates of lamb production. This is an issue that a specific study would need to be designed to address. Brian Lawhead, ABR, said that the ISR presented historic surveys that indicated the population had declined in the study area.

10.9 - Wolverine Distribution, Abundance, and Habitat Occupancy

Kevin Colson, ADF&G, provided an overview of the objectives, components, variances, modifications, and a summary of the results; as explained in the June ISR. In addition to the June ISR and associated Part D, a 2014 Study Completion Report was filed with FERC in November 2015. AEA has met the study objectives and this study is considered complete; accordingly, AEA plans no modifications to the Study Plan.

Becky Long, SRC, asked if 2014 was the only year in which the necessary snow conditions did not occur to perform the population survey. Kevin Colson, ADF&G, said that in both 2013 and 2014 snow conditions were not adequate for a SUPE survey. Brian Lawhead, ABR, explained that the SUPE surveys require specific snow and tracking conditions which is why it may take multiple years to complete. Deep snow and then fresh snowfall and flyable weather are required to so the field crew can identify new tracks. Kevin Colson said that 2015 provided the necessary snowfall and survey conditions. Becky asked if findings were similar to results from the 1980s studies. Kevin replied that the results were similar in terms of elevational occurrence of wolverines and in which habitats tracks occurred.

Mike Wood, SRC, stated that he has seen more wolverine tracks over the last few years. Kevin Colson, ADF&G, said there are no previous density estimates for that area, but that the area supports a very large number of wolverines.

10.17 - Population Ecology of Willow Ptarmigan in Game Management Unit 13

Rick Merizon, ADF&G, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR and associated ISR Part D in November 2015. No Study Implementation Report was filed for this study in 2015.

AEA proposes the following three modifications to the Study Plan (Slides 10-12): 1) aerial transect flights were canceled, but more telemetry flights added to improve the precision of space-use inferences and allow better

predictions about distribution of ptarmigan across the study area; 2) Butte Creek site was added in 2014 as an alternative capture site (ISR Part A, Figure 4.1-1, and ISR Part C, Section 7.1.2); and 3) Deadman Lake site was added in 2014 as another alternative capture site because the upper Jay Creek site was not accessible.

Mike Wood, SRC, commented that the Deadman Creek area supports a lot of ptarmigan.

10.10 - Terrestrial Furbearer Abundance and Habitat Use

Brian Lawhead, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. In addition to the June 2014 ISR, a Study Completion Report and ISR Part D were filed with FERC in November 2015. AEA has met the study objectives and this study is considered complete; accordingly, AEA plans no modifications to the Study Plan.

Ruth McHenry, CCA, asked if the study looked at whether trapping occurred in the study area. Brian Lawhead, ABR, explained that trapping harvest would be addressed in another study (Study 10.20) but it is important to note that not all trapped species are required by ADF&G to be reported (i.e., have the pelts sealed); this study did not monitor the occurrence of traplines in the study area. Betsy McGregor, AEA, said that the subsistence and recreation studies also are documenting at trapping that occurs in the area.

Mike Wood, SRC, asked if the area between Devils Canyon and the Oshetna River was studied, area was trapped historically, but difficult to access and does not know of anyone trapping in that area now. Brian Lawhead, ABR, replied that this study was not able to conduct ground-based sampling in the area south of the Susitna River in that stretch, but the area referred to by Mr. Wood was covered by aerial track transect surveys.

10.11 - Aquatic Furbearer Abundance and Habitat Use

Alex Prichard, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results; as explained in the June ISR. In addition to the June ISR and associated Part D, a 2014 Study Implementation Report was filed with FERC in November 2015.

AEA proposes the following four modifications to the Study Plan (Slides 14 and 15): 1) the Chulitna Corridor has been removed from the study area (ISR Part D Overview, Section 1.3) and the Denali East Option (access road and transmission corridor) has been added to the study area (ISR Part C, Section 7.1.2); 2) substitute the two seasons of incidental observations of muskrats obtained in 2013 and 2014 in place of the first year of muskrat pushup surveys and the muskrat pushup surveys planned for spring 2016(ISR Part D, Section 7.2) thus will constitute the second year of those surveys, fulfilling the study plan objective (RSP Section 10.11.4.1); and 3) the objectives and methods in this study related to mercury analysis, including the literature review of food habits and diets of river otters and mink and the collection of hair samples, have been consolidated under Study 5.7 (Mercury Assessment and Potential for Bioaccumulation) (ISR Part C, Section 7.1.2).

Mike Wood, SRC, asked if observations were made in the Middle River reach regarding river otters and beaver. Brian Lawhead, ABR, replied yes.

Ruth McHenry, CCA, asked if any annual differences were noted regarding the numbers of overland movements of river otters or muskrats. Alex Prichard, ABR, replied it was difficult to determine that because the surveys are snapshots in time. Brian Lawhead, ABR, agreed that the information to address this question was limited but noted that some otter tracks did pass through upland areas between drainages.

10.13 - Bat Distribution and Habitat Use

Brian Lawhead, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results. The decision point in the RSP to continue surveys in 2014 was predicated on locating roost sites in 2013. No roost sites were found that year, but bats were widespread in the study area and peaks of seasonal activity were found during the maternity colony and prehibernation/migration periods, so the survey effort continued in 2014. A cumulative Study Completion Report and ISR Part D were filed in November 2015. AEA has met the study objectives and this study is considered complete; accordingly, AEA plans no modifications to the Study Plan.

Becky Long, SRC, asked if the cliff where the radio-tagged bat was observed roosting was in the inundation zone. Brian Lawhead, ABR, stated that he thought one area was, but that should be confirmed by looking at the SCR. Becky also asked if white-nose syndrome, a problem with bats in the Lower 48 states, was seen in Alaska. Brian Lawhead explained that this disease is a concern but has not been found in Alaska. Nevertheless, decontamination protocols were practiced in the capture effort for this study to ensure that all equipment was clean.

Tyler Rychener, Louis Berger, asked why the activity levels in September were so different between years. Brian Lawhead, ABR, said it was unknown because little is known about bats in this area.

10.18 - Wood Frog Occupancy and Habitat Use

Todd Mabee, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. In addition to the June 2014 ISR, ISR Part D and a 2014 Study Completion Report were filed with FERC in November 2015. AEA has met the study objectives and this study is considered complete; accordingly, AEA plans no modifications to the Study Plan.

Becky Long, SRC, asked for clarification regarding the higher occupancy rate of breeding frogs in deeper waterbodies. Todd Mabee, ABR, replied that the analysis suggested that shallow-water environments are used less because of their greater susceptibility to dewatering and drying up.

Whitney Wolff, Talkeetna Community Council, asked whether the inability to sample on CIRWG land in 2013 affected the results. Brian Lawhead, ABR, replied that the CIRWG lands were surveyed in 2014 and that data were collected throughout the entire study area over the two years of sampling, which was sufficient to meet the objectives.

10.8 - Distribution, Abundance, and Habitat Use by Large Carnivores

Alex Prichard, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. In addition to the June 2014 ISR, ISR Part D and a 2014 Study Implementation Report were filed with FERC in November 2015. AEA proposes no modifications to the Study Plan to complete the study and meet the Study Plan objectives. The field work for this study is complete, with final analyses and the Study Completion Report remaining to be done.

Whitney Wolff, Talkeetna Community Council, asked why the bear density analysis excluded data from GMU subunits 13A and 13B. Brian Lawhead, ABR, said that the data for those portions of the eastern end of the study area were not collected at the same time as in the rest of the study area. Earl Becker, ADF&G, stated that the time and money required for the GIS programming and spatial density analysis were not worth the information that would have been obtained, given the observed distribution of brown bears in those areas.

Cassie Thomas, NPS, noted that the bear hair-snagging effort avoided populated and high-traffic areas for safety and asked if incidental information could be used to provide information on the use of those areas by bears. Brian Lawhead, ABR, replied that no such incidental reporting was done and noted that the study avoided Focus Areas, cabins, and dwellings, because of the risk of snagging dogs or people. The level of human activity in 2015 was much lower, so more sampling could be conducted that year.

Mike Wood, SRC, asked when the last instance of wolf predator control was implemented by ADF&G in GMU 13. He stated that he has noticed a rise in moose and coyote populations, with less wolf presence noticed, and was curious if that could be an effect of predator control. Mark Burch, ADF&G, said that the last time wolf control was conducted was in winter 2013–2014. Mike Wood asked how that was considered in the study. Betsy McGregor, AEA, responded that the study captures baseline conditions, which would include such activities. Mike asked a more general question about why some studies did not include the area downstream of the dam. Mark Burch replied that the study areas were determined through the study planning phase. Betsy McGregor, AEA, remarked that the impacts are different in different areas (Upper River, Middle River, Lower River) and noted that many of the wildlife study areas are huge, well beyond the Project area. Brian Lawhead, ABR, noted that the impact assessment will be based on the wildlife habitat evaluation (Study 10.19), which will also consider a large area in the Upper basin as well as the whole riparian area downstream past Talkeetna.

10.12 - Small Mammal Species Composition and Habitat Use

Brian Lawhead, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR and ISR Part D in November 2015. This desktop study has not yet been initiated.

No modifications to the Study Plan methods are proposed to complete this study and meet the Study Plan objectives. However, the study area has changed from that described in the Study Plan (RSP Section 10.12.3), with the elimination of the Chulitna Corridor and the addition of the Denali East Option (access road and transmission-line corridor alternative).

10.20 - Wildlife Harvest Analysis

Alex Prichard, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR and ISR Part D in November 2015. No modifications to the Study Plan are proposed to complete this study and meet the Study Plan objectives. This desktop study has not yet been initiated.

Whitney Wolff, Talkeetna Community Council, asked which GMUs were included in the 2012 Technical Memorandum and will be included in this study. Betsy McGregor, AEA, said that 13A, 13B, 13E, 14B, 16A and portions of 20A will be studied, as presented in the RSP.

Mike Wood, SRC, requested that moose mortalities along the Alaska Railroad tracks be included in the data set.

10.19 - Evaluation of Wildlife Habitat Use

Terry Schick, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June ISR and ISR Part D in November 2015. This desktop study has not yet been initiated, it will be completed when the wildlife habitat maps from Studies 11.5 and 11.6 are completed.

AEA proposes the following three modifications to Study Plan Section 10.19 (Slide 7): 1) the 4-mile study area buffer surrounding the proposed Project areas and access road/transmission alignments has been reduced to a 2-mile buffer, which corresponds directly to the reduction of the study area buffer for Study 11.5 (Vegetation and Wildlife Habitat Mapping Study in the Upper and Middle Susitna Basin) because the habitat data for the Project area used in this study will come from the habitat map prepared for Study 11.5; 2) . AEA removed the Chulitna Corridor and added the alternative Denali East Option (access road and transmission line corridor) to the study area; for this study, the new corridor includes a 2-mile buffer surrounding the road and transmission line alignments for the Denali East Option; and 3) in contrast to a selected set of bird Species of Concern for analysis, as described in the RSP, each bird species recorded in the study area will be ranked for habitat values for each mapped wildlife habitat type.

Whitney Wolff, Talkeetna Community Council, asked about the selection process for the mammal species from Studies 10.5–10.18 that will be included in the evaluation. Brian Lawhead, ABR, replied that the species with adequate field data or information from the literature on habitat use will be included, including all of the large mammal species and keystone species such as beaver. He said it may be difficult to acquire enough information for some small mammal species. The species likely to be excluded would be those small mammals that are less abundant or less well-studied, and hence less ecologically important from a numerical or biomass standpoint as prey species. Previous studies in the 1980s did a good job of cataloguing the mammal species that occur in the Project area, so the study team will have good information to work from.

Mike Wood, SRC, asked whether marine mammals, including seals and belugas swimming upstream as far as the Yentna River to follow eulachon, would be considered in the study. Terry Schick, ABR, indicated that the occurrence of marine mammals in the Lower River would be taken into account, as much as possible, in the habitat evaluation process.

11.5 - Vegetation and Wildlife Habitat Mapping Study in the Upper and Middle Susitna Basin

Terry Schick, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR Parts A, B, and C, and updated in November 2015 in ISR Part D. Field surveys were completed as described in the RSP. The steps to complete the study, currently underway, include senior review of map polygon boundaries, performing a spatial join in GIS to merge polygon boundaries with those from the downstream study area in the adjacent riparian vegetation study (11.6), and development of a project-wide habitat map for use in the evaluation of wildlife habitat use (Study 10.19). There were no decision points in the RSP for this study.

AEA proposes two modifications to Study Plan Section 11.5 (Slide 11): 1) the Chulitna Corridor was eliminated from the study area (ISR Part D Overview, Section 1.3) and the Denali East Corridor Option was added to the study area as an additional, alternative north-south corridor alignment for transmission line and road access from the dam site to the Denali Highway (ISR Part C, Section 7.1.2); and 2) the original study area buffer of 4 miles was reduced to a 2-mile buffer to match the study areas for two closely related studies (Study 11.7, wetlands mapping, and Study 10.16, landbirds and shorebirds) (ISR Part C, Section 7.1.2).

Whitney Wolff, Talkeetna Community Council, asked which document discussed the variance reducing the original study area buffer from 4 miles to 2 miles. Betsy McGregor, AEA, identified the document as ISR Part C, Section 7.1.2. Whitney asked for more background on the decision and wondered if it had resulted in elimination or shift of any habitats. Terry Schick, ABR, responded that the original 4-mile habitat buffer was larger than necessary and that the

wetland and wildlife researchers concurred that 2 miles was sufficient to assess Project effects on wetlands and wildlife habitats. Terry added that a new set of wildlife habitats has been prepared (re-aggregated) from the mapping data for presentation in the Study Completion Report, and that the habitats identified in the June 2014 ISR were based on a partial data set (when only about 30% of the study area had been mapped). Hence, in the Study Completion Report, there will be a different set of habitats described, some of which will be very similar to those presented in the ISR while others will be different.

11.7 - Wetland Mapping Study in the Upper and Middle Susitna Basin

Sue Ives, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. As described for Study 11.5 (the work for that study and Study 11.7 is being conducted concurrently), all field work and digitizing of wetland map polygons has been completed, and senior-level QA/QC of the mapping is well underway. No decision points were included in the RSP for this study.

AEA proposes one modification to Study Plan Section 11.7 (Slide 10). The Chulitna Corridor was eliminated from the study area (ISR Part D Overview, Section 1.3) and the Denali East Corridor Option was added to the study area as an additional, alternative north-south corridor alignment for transmission line and road access from the dam site to the Denali Highway (ISR Part C, Section 7.1.2).

Betsy McGregor, AEA, commented that since the study area is very large and spans multiple ecoregions, a single functional assessment method does not exist that is suitable for the entire area. The wetland mapping team, through a collaborative process with the U.S. Army Corps of Engineers, EPA, USFWS, and the Mat-Su Borough, determined that using a composite approach for the wetland functional assessment would be most appropriate for the Project. This collaborative planning effort for the functional assessment was pursued during the study planning phase in 2012, and is documented in Section 11 of the Proposed Study Plan.

11.8 - Rare Plant Study

Janet Kidd, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. Field surveys were completed as described in the RSP in 2013. No field work for this study has been conducted since 2013. Field work on CIRWG lands was not conducted in 2013; the final field surveys (which will include work on CIRWG lands) will be completed in the next study year. No variances or decision points were identified for this study.

AEA proposes one modification to Study Plan Section 11.8 (Slide 8). The Chulitna Corridor was eliminated from the study area (ISR Part D Overview, Section 1.3) and the Denali East Corridor Option was added to the study area as an additional, alternative north-south corridor alignment for transmission line and road access from the dam site to the Denali Highway (ISR Part C, Section 7.1.2).

No questions were asked.

11.9 - Invasive Plant Study

Janet Kidd, ABR, provided an overview of the objectives, components, variances, modifications, and a summary of the results, as explained in the June 2014 ISR. Field surveys were completed as described in the RSP in 2013. No additional field work for this study has been conducted since 2013. The final field surveys will be completed in the next study year. There were no variances or decision points for this study.

AEA proposes one modification to Study Plan Section 11.9 (Slide 10). The Chulitna Corridor was eliminated from the study area (ISR Part D Overview, Section 1.3) and the Denali East Corridor Option was added to the study area as an additional, alternative north-south corridor alignment for transmission line and road access from the dam site to the Denali Highway (ISR Part C, Section 7.1.2).

Becky Long, SRC, complimented the study team on the preparation of this study ("… a really good job"). She said that she would like to ensure the herbicides and pesticides are not used if invasive plants are discovered as a result of the Project. Becky asked if the second year of data collection is planned to sample at the dam site where licensing study activity and land disturbance has occurred. Janet Kidd, ABR, said that the project will consider adding the dam site in addition to the camps and airstrip. Janet said that the sites to be sampled in the second year have not been finalized and features such as substrate necessary for the colonization of invasive species and activity in the area will be considered.

Whitney Wolff, Talkeetna Community Council, asked whether helicopter landing zones, drill-rig sites, and similar disturbed areas will be included in subsequent years, because such disturbances and the traffic in and out of those areas are known risk-factors for the spread of invasive species. Janet Kidd, ABR, responded that ABR would work with AEA to identify the extent of these sites with respect to any future field work and that Best Management Practices would be identified and used to prevent the spread of invasive species. Betsy McGregor, AEA, added that the aquatic studies teams use disinfecting protocols of field equipment to minimize the risk of spreading invasive aquatic species.

Mike Wood, SRC, stated that orange hawkweed is abundant at the Talkeetna airport and may be spread by helicopters. Also, the invasive aquatic plant *Elodea* is problematic for providing pike (another invasive species in southcentral Alaska) with habitat. He voiced concerns that boats, floatplanes, and equipment can spread this invasive aquatic plant. Becky Long, SRC, stated that orange hawkweed likes well-drained sunny soils, such as those found at the Talkeetna airport, and if it lands in disturbed areas that is where it would get a start. Terry Schick, ABR, noted that was a good point and that Best Management Practices will be very important to implement during the construction phase of the Project.