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SUSITNA-WATANA HYDRO

20141217-5190

ALASKA ENERGY AUTHORITY

December 17, 2014

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Susitna-Watana Hydroelectric Project, Project No. 14241-000

Filing of Additional Information in Response to October 2014 Initial Study Plan Meetings

Dear Secretary Bose:

By letters dated January 28, 2014 and October 3, 2014, the Federal Energy Regulatory Commission (Commission or FERC) modified the procedural schedule for the preparation and review of the Initial Study Report (ISR) for the proposed Susitna-Watana Hydroelectric Project, FERC Project No. 14241 (Project).[1] As required by the Commission's January 28 letter, the Alaska Energy Authority (AEA) filed the ISR with the Commission on June 3, 2014 and conducted ISR meetings on October 15, 16, 17, 21, 22, and 23, 2014. As required by the Commission's October 3 letter, AEA will be conducting additional ISR meetings on January 7 and 8, 2015.

In response to the October ISR meetings, AEA and licensing participants identified two technical memoranda that AEA would file with the Commission in December 2014, ahead of the January ISR meetings. In accordance, AEA is filing and distributing the following technical memoranda:

- Attachment A: *Study of Fish Distribution and Abundance in the Upper Susitna River (Study 9.5) - Evaluation of 2014 Study Modifications in the Black River Technical Memorandum.* This technical memorandum describes how the modifications to the Study of Fish Distribution and Abundance in the Upper Susitna River (Study 9.5) outlined in the ISR were applied to the Black River during the 2014 study year.

- Attachment B: *River Productivity Study (Study 9.8) - Fish Diet Sample Size Sufficiency Analysis Technical Memorandum.* This technical memorandum describes an analysis of stomach contents samples conducted after field

[1] Letter from Jeff Wright, FERC Office of Energy Projects, to Wayne Dyok, Alaska Energy Authority, Project No. 14241-000 (issued Jan. 28, 2014); Letter from Jeff Wright, FERC Office of Energy Projects, to Wayne Dyok, Alaska Energy Authority, Project No. 14241-000 (issued Oct. 3, 2014).

sampling was completed to determine whether the sample size targets and the actual sample sizes were sufficient to meet the Study Plan objectives.

Additionally, AEA notes that data collected during the Study Plan implementation, to the extent they have been verified through AEA's quality assurance and quality control (QAQC) procedures and are publicly available, can be accessed at http://gis.suhydro.org/isr_mtg. On December 17, 2014, AEA posted the following data to this website:

- *Baseline Water Quality Data (Study 5.5),* 2014 QAQC water quality data and DVRs per the Quality Assurance Project Plan.

Finally, AEA notes that it has posted the agenda and PowerPoint presentations for the upcoming January ISR meetings to the Project website (http://www.susitna-watanahydro.org/meetings/).

AEA appreciates the opportunity to provide this additional information to the Commission and licensing participants, which it believes will be helpful in determining the appropriate development of the 2015 study plan as set forth in the ISR. If you have questions concerning this submission please contact me at wdyok@aidea.org or (907) 771-3955.

Sincerely,

Wayne M Dyok

Wayne Dyok
Project Manager
Alaska Energy Authority

Attachments

cc: Distribution List (w/o Attachments)

Attachment A

Study of Fish Distribution and Abundance in the Upper Susitna River (Study 9.5) – Evaluation of 2014 Study Modifications in the Black River Technical Memorandum

Susitna-Watana Hydroelectric Project (FERC No. 14241)

Study of Fish Distribution and Abundance in the Upper Susitna River (Study 9.5)

Evaluation of 2014 Study Modifications in the Black River Technical Memorandum

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

R2 Resource Consultants, Inc.

December 2014

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Abbreviation	Definition
ADF&G	Alaska Department of Fish and Game
AEA	Alaska Energy Authority
CPUE	Catch per unit effort
CW	Channel width
FDA UP	Study of Fish Distribution and Abundance in the Upper Susitna River
FERC	Federal Eneregy Regulatory Commission
GRTS	Generalized random tessellation stratified sampling
IP	Implementation Plan
ISR	Initial Study Report
km	Kilometer
km^2	Square kilometers
m	Meter
MC	Main Channel
Mi	Mile
mi^2	Square miles
OC	Off-Channel
OCH	Off-Channel Habitat
PRM	Project river mile
RSP	Revised Study Plan
SE	Standard Error
SPD	Study Plan Determination
SR	Species richness
TSR	True species richness

1. INTRODUCTION

In 2013, AEA's study teams conducted the first year of data collection for the Fish Distribution and Abundance in the Upper Susitna River Study (Study 9.5). Objective 1 of the Study of Fish Distribution and Abundance in the Upper Susitna River was to describe the seasonal distribution, relative abundance (as determined by catch per unit effort [CPUE], fish density, and counts), and fish-habitat associations of resident fishes, juvenile anadromous salmonids, and the freshwater life stages of non-salmon anadromous species (RSP Section 9.5.1; AEA 2012). Sampling in 2013 was effective at documenting fish distribution (Task A). Relative abundance estimates were effectively generated for all sampled habitats (Task B). However, analysis of habitat associations (Task C) was limited by the low number of off-channel habitats in the mainstem Susitna River and the low number of rare habitat types in Upper River tributaries.

Modifications to the Study Plan were presented in Part C, Section 7 of the Initial Study Report (ISR) filed with FERC June 3, 2014 (AEA 2014a). AEA implemented the following proposed modifications in 2014 to gather additional information; to meet study plan objectives; and better inform the second study year. This technical memorandum describes how the modifications to the Study of Fish Distribution and Abundance in the Upper Susitna River (Study 9.5) outlined in the ISR were applied to the Black River during the 2014 study year.

In response to the October 2014 ISR meetings, AEA informed the licensing participants that AEA would be filing this TM with the Commission ahead of the January 2015 ISR meetings.

2. SAMPLING DECISION: INCREASED SAMPLING EFFORT IN SELECT UPPER RIVER TRIBUTARIES

2.1. Sampling in 2013

The April 2013 FERC Study Plan Determination (SPD) recommended scaling sampling in proportion to stream size (FERC 2013, p. B-124). To achieve a spatially-balanced and random sample of fish habitats within Upper River tributaries, the length of the tributaries were divided into sampling panels that were 200, 400, or 800 m long, depending on the tributary drainage area, and the required percentage of stream length was sampled using a generalized random tessellation stratified (GRTS) sampling methodology. The original sampling plan (ISR 9.5 Section 4.1.2.1) was to survey the GRTS panel for mesohabitat types, and to select one unit of each mesohabitat type and sample 40 m (131 ft) of each selected unit. The FERC SPD recommended all the classified mesohabitat units be sampled. However, logistical constraints in 2013 required sub-sampling 100 m (328 ft)-long units within GRTS panels. Specifically, within a selected GRTS panel, fish sampling occurred in either a complete mesohabitat unit or up to 00 m (656328 ft) per mesohabitat for each mesohabitat type present (ISR 9.5 Section 7.1.2.4).

2.2. Measures of Sampling Sufficiency

Post-season analysis indicated that the 2013 tributary sampling program was effective at documenting the fish species present within Upper River tributaries. The analysis consisted of

comparing the total number of species found in a tributary, referred as observed species richness (SR), and an estimate of true species richness (TSR) in a tributary (Cochran 1977).

However, as indicated in Section 7.1.2.4 of Study 9.5 Initial Study Report (AEA 2014b), the 2013 sub-sampling may have been inconsistent with the intent of the April 2013 FERC SPD, with smaller basins receiving proportionally more effort, and larger basins receiving proportionally less. In addition, a post-2013 field season review of the remote video within each GRTS panel indicated that there were some habitat types that were under-represented in 2013 fish sampling and the fish-habitat association analysis likely would benefit from additional replicates.

Sampling sufficiency for characterizing fish distribution is often evaluated in relation to channel width (Paller 1995, Patton et al. 2000, Hughes et al. 2002, Maret and Ott 2003, Reynolds et al. 2003, Kirsch et al. 2014). Fish sampling and habitat surveys completed in 2013 provided channel width information that was not available to incorporate into the Implementation Plan (AEA 2013). The AEA study team reviewed the 2013 sampling effort in the context of field measurements of channel width to prioritize additional sampling. Kirsch et al. (2014) recommended sampling lengths of 40 wetted channel widths for wadeable streams, 120 channel widths for nonwadeable streams in basins with a watershed area of 100-300 km^2 (38.6 – 115.8 mi^2), and more than 140 channel widths in nonwadeable streams in larger drainage basins.

2.3. Increased Sampling Effort

AEA proposed to apply the recommendation from Kirsch et al. 2014 for determining the length of Upper River tributaries to sample during the next year of sampling as described in Upper River technical memorandum filed September 17, 2014 (R2 Resource Consultants 2014). The stream-specific sample length changes for all Upper River tributary waters were presented in the September 2014 technical memorandum and are included in Table 2.3-1 for ease of access.

AEA proposed to maintain the spatial configuration of the original GRTS panel sampling and apportioned the additional sampling length within the existing panels by selecting the number of fully-sampled panels necessary to achieve the sampling length target as described in ISR Section 9.5.7.1.2.4. However, in the Black River the total length of main channel habitat within GRTS panels selected for sampling in 2013 was short target sampling lengths, so two more panels were added to the 2014 fish surveys.

2.4. Implementation of Increased Tributary Sampling Effort in 2014

As described in ISR Section 9.5.7.1.2.4, AEA implemented the recommended increase in sampling in the Black River in 2014. The proposed increase in sampling length for the Black River was more than triple the effort expended in 2013 (Table 2.4-1). In 2013, the 100 m (328 ft) sub-sampling approach occurred in six GRTS panels (Panels 1, 2, 4, 6, 7, 9) and resulted in sampling of 11 mesohabitat units within 1,050 m (0.65 mi) of sample unit length (Table 2.4-2). In 2014, sampling the full length of all available main channel mesohabitats and 20x wetted-widths of off-channel habitats present within in the same six panels resulted in 19 mesohabitat units for a total length of 2,724 m (1.69 mi) sampled (Table 2.4-2). In order to achieve the target length of 3,178 m (1.97 mi) of recommended sampling (Table 2.3-1), two additional 400 m

panels were added using the GRTS methodology (Panels 3 and 5). These eight panels also included 402 m of off-channel habitats so the total effort in 2014 completed surveys in 28 mesohabitat units for a total of 3,619 m (2.25 mi).

3. RESULTS OF COMPARISON OF SAMPLING PROTOCOLS IN THE BLACK RIVER

The 2014 sampling was conducted so as to first replicate the 2013 survey length and then extend the sampling to the full targeted sample length. Breaking the data in this way facilitated comparison between the subsample and full sample approaches and avoided concerns about interannual variability of data that could result from comparing 2013 and 2014 data sets. For the remainder of the memorandum, the replicated data set is referred to as the 2014 subsample while the data collected from the fully expanded effort is referred to as the 'full sample'. The purpose of such a comparison was to determine if completing the full sampling approach improved AEA's ability to meet study objectives. The evaluation that follows is based on various species metrics including fish distribution, species richness, relative abundance, and fish-habitat associations.

3.1. Fish Distribution

Five fish species were identified in the Black River system during the full 2014 sampling effort: Arctic grayling (Thymallus arcticus), burbot (*Lota lota*), longnose sucker (*Catostomus catostomus*), sculpin (Cottid sp.), and round whitefish (*Prosopium cylindraceum*) (Table 3.1-1). These species represent resident salmonid or non-salmonid functional groups and all were observed previously in the Black River. Notably absent in 2014, were anadromous juvenile Chinook salmon (*Oncorhynchus tshawytscha*), observed in Black River during subsampling in 2013.

In replicating the 2013 survey effort, the 2014 subsample resulted in the collection of three of the five species documented: Arctic grayling, burbot, and sculpin. Longnose sucker and round whitefish were found in the extended survey length in low numbers; only1 longnose sucker and 5 whitefish were observed out of 3,193 total fish observations (Table 3.1-1). Due to their relative rarity in the Black River habitats, the subsampling approach was insufficient to reliably detect these species.

3.1.1. Species Richness

The observed species richness (SR), or the total number of species found in the Black River in 2014, and an estimate of true species richness (TSR) following the concepts of Cochran (1977) were used as measures of sampling sufficiency, indicative of the success of the full and subsampling approaches in detecting species' presence. The SR and TSR values, and when these metrics were first achieved within the GRTS panel matrix, are shown in Table 3.1-2 and depicted in Figure 3.1-1. As discussed above, the observed SR from the full sample was five species collected from eight GRTS panels. The five species were detected within the first two GRTS panels. The estimated TSR for the Black River was 5.6 species. The subsample returned only three species from six GRTS panels and all three were detected in the first site. The SR and TSR

were both calculated at 3.0 fish for the subsampling effort. These calculations highlight the limitations of this analysis when all species are either very common (observed at all six sites) or very rare (never observed).

3.2. Relative Fish Abundance

Fish counts across all sites, mesohabitats, sampling methods, and seasons are shown in Table 3.1-1 for the full and subsamples. Sculpin dominated the catches followed by Arctic grayling, and burbot using both the full and sub-sampling methods. Since the full sample effort totaled 3.4 times the stream distance of the subsampling (3,619/1,050m = 3.4x), it was expected that the numeric factor between fish counts of fish from the two approaches should be in the range of 3.4x (or conversely, the subsample ran slightly less than 30 percent of the full sample). As expected, the count expansion factors for Arctic grayling, burbot, and sculpin ranged between 2.7 and 3.9x (Table 3.1-1). This finding suggests the subsampling approach provided consistent information compared to the full sampling regarding the most abundant species.

3.2.1. CPUE

Fish abundance information can be somewhat biased as a function of sampling gear type and the level of effort expended during the surveys. For this reason fish counts are often reported in terms of relative fish abundance and the counts are normalized with respect to effort. For comparative purposes, catch per unit of effort (CPUE) was calculated for the most frequently used sampling technique performed during the 2014 surveys, backpack electrofishing.

Analyses were conducted for the three species most often observed, with several lifestage groupings:

- Arctic grayling juveniles, subadult/adults, and total of all lifestages,
- Burbot juveniles, subadults/adults, and total of all lifestages, and
- Sculpin total of all lifestages.

CPUE was estimated as catch per hour of shocking time for each species/lifestage combination within each mesohabitat unit sampled using backpack electrofishing. Mesohabitats were the primary mesohabitat sampling units and were sampled as clusters defined by GRTS panels. Average CPUE and the associated standard error (SE) for each mesohabitat type was estimated using a combined ratio estimate (Cocharn 1977). Calculations were performed with package *survey* (Lumley 2004, Lumley 2014) in the statistical software *R* (version 3.1.1; R Core Team 2014).

CPUE for backpack electrofishing results by mesohabitat type and sampling events (seasons) are shown in Tables 3.2-1 through 3.2-7. The mean, standard error, and number of replicate mesohabitat units sampled for the full and subsampling approaches are shown in each of the tables. Boxplots comparing the subsample and the full sample CPUE results for the three species and three sampling events, early summer, late summer, and fall are presented by habitat type and life history stage in Figures 3.2-1 to 3.2-7.

3.2.1.1. Arctic Grayling

The CPUE for juvenile Arctic grayling ranged between 0 and 10 fish/hr during the full sample survey depending on habitat type. The same metric for the subsample ranged from 0 to 11 fish/hr. The CPUE results were nearly identical for all habitat types and all seasons during the full and subsample surveys (Table 3.2-1, Figure 3.2-1). The standard errors were generally lower for the full sample, as expected due to increased sampling. This finding suggests that the main benefit for an expanded sampling effort for juvenile Arctic grayling in terms of relative abundance was an increase in precision.

Given the lower abundances of subadult and adult life stages, it appears the grayling capture rate was slightly greater in the full sample compared to the subsample for boulder riffle, rapid, and upland slough habitats (Table 3.2-2, Figure 3.2-2). A small improvement in accuracy of relative abundance for the full sample was apparent for subadult/adult Arctic grayling.

The total CPUE for all Arctic grayling, regardless of life history stage, indicated similar findings as for the juvenile grayling. Since juveniles comprise at least 63 percent of this total, and since the added benefit ascribed to the subadult/adult class was small, the full sampling effort did not provide considerable improvement in CPUE accuracy for this species compared to what could be determined from the subsample (Table 3.2-3, Figure 3.2-3). However, there were improvements in precision of the estimates, which can be helpful in comparing abundance among habitats.

3.2.1.2. Burbot

The CPUE for juvenile burbot ranged between 0 and 4 fish/hr during the full sample survey and from 0 to 8 fish/hr for the subsample. The mean CPUE results differed between the full and subsampling surveys (Table 3.2-4, Figure 3.2-4). This finding suggests there may have been added benefit in accuracy as well as precision (reduced SE estimates) for the full sample effort for juvenile burbot.

There were no adult and very few subadult burbot captured during 2014 by any of the sampling approaches. Given the rare occurrences of this life history stage, it appears the burbot capture rate was slightly greater during the full sample compared to the subsample for boulder riffle, and rapid habitats (Table 3.2-5; Figure 3.2-5). A small added benefit for the full sample effort was apparent for subadult burbot.

The total CPUE for all burbot, regardless of life history stage, indicated similar findings as the juvenile burbot. Small gains in accuracy and precision during the full sample were observed, particularly in riffle habitats and in the rapid habitat that was not sampled in the subsample approach (Table 3.2-6, Figure 3.2-6).

3.2.1.3. Sculpin

Sculpin were the most abundant species observed during the surveys. Given the small overall size of the sculpin, the total of all life histories was evaluated for this species.

The mean CPUE for sculpin ranged between 23 and 82 fish/hr during the full sample survey and from 37 to 91 fish/hr for the subsample. In some habitats, the CPUE data show large differences

in mean estimates between the full and subsample methods, but the mean estimates using the full sample methodology were not always higher or lower (Table 3.2-7, Figure 3.2-7). Thus, the subsample did not result in consistently biased estimates of average CPUE. Precision, however, was substantially better (lower SE) with the full compared to the subsampling approach, with a few exceptions. In these few cases when the subsampling method offered lower standard errors than the full survey, the sample size was very small and likely resulted in an underestimate in the overall variability in CPUE. The full sample resulted in more realistic variability measurements and better precision in estimating CPUE for sculping. This finding suggests that the only added benefit for an expanded sampling effort for sculpin is in small increases in estimating error.

3.3. Fish-Habitat Associations

For consistency with the ISR (AEA 2014), this section documents the total observations (counts) of fish species and life history types among mesohabitats during the 2014 sub- and full sampling. The total observations of fish species in the Black River system by season and macrohabitat type are presented in Table 3.3-1. When these count data are reviewed simultaneously with the increased sampling of mesohabitats depicted in Tables 3.2-1 and 3.2-2 (taken from R2 Resource Consulants 2014), it is clear that the 2014 sampling effort resulted in increased replicates of fish counts across habitats, including rarer habitats. This increased replication will better support a full evaluation of fish-habitat association for the USR once the study modification is implemented in Upper River tributaries during the next year of study.

In addition, some general observations based on fish counts by habitat, including seasonal shifts in habitat associations as fish grew and matured and as water temperature declined are presented below.

- Highest counts of Arctic grayling, sculpin, and burbot were in boulder riffle habitat, followed closely by counts in run/glide habitat
- Arctic grayling counts lowest in upland slough habitat
- Overall trend for Arctic grayling, sculpin, and burbot was for reduced counts from summer to fall
- Patterns in habitat associations were similar across life stages for Arctic grayling
- Sculpin found in all habitat types sampled
- Round whitefish and longnose sucker were rare in all Black River mesohabitats

4. DISCUSSION

This technical memorandum was prepared to assess whether additional sampling effort improved AEA's ability to meet study objectives including fish distribution, relative abundance, or habitat associations in the Black River. The subsampling approach performed adequately where species and habitats were abundant. The expanded, full sampling approach provided the greatest return with respect to rare habitats and rare species and, thus, confirms the adequacy of the ISR proposed modification. Thus, AEA recommends continuing future surveys using the full sampling approach. After successfully implementing the full sampling approach in the Black River, AEA recommends adopting the tributary sampling modifications and targets from the Initial Study Report 7.1.2.4, as summarized in Section 2.3 above.

In applying this modified approach, the sampling length in all but one tributary would be maintained or increased beyond that accomplished in 2013 (R2 Resource Consultants 2014). The sample length for each tributary will be developed for the length of main-channel to be sampled and will be accomplished by sampling the fewest number of GRTS panels possible to accommodate the target length. The use of the GRTS panel process for selection will ensure that survey sites are spatially balanced throughout the mainstem. In addition, because the target lengths are based on main channel panels, the length of off-channel habitat surveyed will be in addition to the length of sample targets, as was evident for the Black River in 2014. As the application of this modification in the Black River has shown, this modified approach will allow for inclusion of additional mesohabitat replicates and will improve AEA's ability to discuss fish use of habitats for rare species and habitats in Upper River tributaries.

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6. TABLES

Table 2.3-1. 2013-2014 tributary sampling summary and proposed future Upper River tributary sampling length targets.

GRTS Sampled Tributaries	Drainage Basin Area (km^2)	Chinook salmon presence	GRTS Sampling Unit Size (m)	Number of GRTS Population Sample Units	Number of 2013 Sample Sites	Number of mesohabitats sampled 2013	Meters Sampled 2013	% Sampled 2013	Number of mesohabitats sampled 2014	Meters sampled 2014	Average Wetted width (m)	Channel Widths Sampled 2013	Kirsch et al. 2014 target (CW)	Kirsch et al. 2014 target (m)	Kirsch et al. 2014 target (%)	Proposed Change (m)
Oshetna River (PRM 235.1)	1424.5	yes	800	52	13	28	2,604	6%	--	--	36	73	140	5,026	12%	2,422
Black River	NA	no	400	24	6	11	1,050	11%	28	3619	23	46	140	3,178	33%	2,128
Goose Creek (PRM 232.8)	269.1	no	200	81	20	38	3,107	19%	--	--	14	219	120	1,704	11%	-1,403
Kosina Creek (PRM 209.1)	1036.5	yes	800	24	6	10	1,000	5%	--	--	32	31	120	4,522	24%	3,522
Tsisi Creek	NA	no	400	23	6	10	980	11%	--	--	14	69	140	1,988	22%	1,008
Watana Creek (PRM 196.9)	452.7	yes	400	60	15	30	2,561	11%	--	--	11	231	140	1,554	6%	--
Watana Creek Tributary	NA	no	200	67	13	18	1,459	11%	--	--	10	154	140	1,330	10%	--
Unnamed Tributary (PRM 194.8)	321.2	no	400	32	2	4	300	2%	--	--	3	88	140	476	4%	176
GRTS Total	--	--	--	454	81	149	13,061	8%	--	--	--	--		19,778	12%	7,853
Direct sample Tributaries																
Jay Creek (PRM 211)	160.1	no	NA	--	NA	8	324	--			14	--	--	--	--	--
Unnamed Tributary (PRM 206.3)	<80.3	no	NA	--	NA	--	--	--	3	263	6.9	--	--	--	--	Direct
Unnamed Tributary (PRM 204.5)	<80.3	no	NA	--	NA	--	--	--	2	330	4.5	--	--	--	--	Direct
Unnamed Tributary (PRM 197.7)	<80.3	no	NA	--	NA	--	--	--	5	358	7.1	--	--	--	--	Direct
Deadman Creek (PRM 189.4)	453.5	no	NA	--	NA	--	--	--	5	357	28.4	--	--	--	--	--
Direct Sample Total	--	--	--	--	--	8	324	--	15	1,308	--	--	--	--	--	--

Table 2.4-1. Black River sample unit length (meters) by tributary channel /macrohabitat and mesohabitat type for GRTS sampling approach 2013 and 2014.

	Trib Hab Type	Single Channel				Split Channel					Complex Channel					Off-Channel Habitat					
	Trib MC/OC HabType	Main Channel				Primary			Secondary		Primary		Secondary	Tertiary		Tributary		Upland Slough			
Year	Mesohabitat	Boulder riffle	Rapid	Run/Glide	Single Total	Boulder riffle	Riffle	Run/Glide	Run/Glide	Split Total	Boulder riffle	Run/Glide	Riffle		Complex Total	Run/Glide	Boulder Riffle	Pool	Run/Glide	OCH Total	Grand Total
2013	Black River: Panel 01			100	100													100		100	200
	Black River: Panel 02											100	100		200				100	100	300
	Black River: Panel 04	100			100																100
	Black River: Panel 06					100		100	50	250											250
	Black River: Panel 07	100			100																100
	Black River: Panel 09	100			100																100
2013 Total		300	-	100	400	100	-	100	50	250	-	100	100	-	200	-	-	100	100	200	1,050
2014	Black River: Panel 01	104		296	400													127		127	527
	Black River: Panel 02						100	245		345			55		55				140	140	540
	Black River: Panel 03	43	282	75	400											51	44			95	495
	Black River: Panel 04		90		90			310		310									40	40	440
	Black River: Panel 05										400				400						400
	Black River: Panel 06	150		100	250	100				100		50			50						400
	Black River: Panel 07	210	190		400				17	17											417
	Black River: Panel 09	280			280						120				120						400
2014 Total		787	562	471	1,820	100	100	555	17	772	520	50	55	-	625	51	44	127	180	402	3,619

Table 2.4-2. Black River mesohabitat unit count (number of replicate mesohabitat units) by tributary macrohabitat and mesohabitat type for GRTS sampling approach 2013 and 2014.

	Tributary Habitat Type	Single Channel				Split Channel					Complex Channel					Off-Channel Habitat					
	Trib MC/OC HabType	Main Channel				Primary			Secondary		Primary		Secondary	Tertiary		Tributary		Upland Slough			
Year	Mesohabitat	Boulder riffle	Rapid	Run/Glide	Single Total	Boulder riffle	Riffle	Run/Glide	Run/Glide	Split Total	Boulder riffle	Run/Glide	Riffle		Complex Total	Run/Glide	Boulder Riffle	Pool	Run/Glide	OCH Total	Grand Total
2013	Black River: Panel 01			1	1													1		1	2
	Black River: Panel 02											1	1		2				1	1	3
	Black River: Panel 04	1			1																1
	Black River: Panel 06					1		1	1	3											3
	Black River: Panel 07	1			1																1
	Black River: Panel 09	1			1																1
	2013 Total	3	-	1	4	1	-	1	1	3	-	1	1	-	2	-	-	1	1	2	11
2014	Black River: Panel 01	1		1	2													1		1	3
	Black River: Panel 02						1	1		2			1		1				1	1	4
	Black River: Panel 03	1	2	2	5											2	1			3	8
	Black River: Panel 04		1		1			1		1									1	1	3
	Black River: Panel 05										1				1						1
	Black River: Panel 06	1		1	2	1				1		1			1						4
	Black River: Panel 07	1	1		2				1	1											3
	Black River: Panel 09	1			1						1				1						2
	2014 Total	5	4	4	13	1	1	2	1	5	2	1	1	-	4	2	1	1	2	6	28

Table 3.1-1. Total observations of fish species in the Black River by habitat category using full and subsampling approaches during 2014.

Habitat Category	2014 Full Sample[a]					2014 Subsample[a]				
	Burbot	Arctic Grayling	Longnose Sucker	Sculpin Sp.	Round Whitefish[b]	Burbot	Arctic Grayling	Longnose Sucker	Sculpin Sp.	Round Whitefish[b]
Black River Mainstem	101	422	0	2,147	5	37	122	0	736	0
Unnamed Tributary	3	52	0	206	0	NS	NS	NS	NS	NS
Upland Slough	9	10	1	237	0	5	2	0	207	0
Total Observations	113	484	1	2,590	5	42	124	0	943	0
Factor (Full/ subsample)	2.7	3.9	-	2.7	-	0.37	0.26	-	0.36	-

[a] Counts from all sampling methods
[b] Whitefish total includes unidentified species
NS = Not surveyed during 2014 under the subsampling approach
0 = Surveyed in 2014 without any recorded fish observations by any of the collection methods

Table 3.1-2. Summary of sampling sufficiency measures for the Black River in 2013 and 2014.

Upper River Tributary	Number of Sample Sites	SR[a]	Site when SR first observed	TSR_{H-T}[b]	Site when TSR_{H-T} -1 first observed	TSR_{H-T} minus SR	Percent of TSR observed
Black River Subsample 2013	6	6	3	6.6	3	0.6	91%
Black River Subsample 2014	6	3	1	3.0	1	0.0	100%
Black River Full Sample 2014	8	5	2	5.6	2	0.6	89%

[a] Observed species richness - the total number of species found in a tributary
[b] Horvitz-Thompson estimate (Cochran 1977) of the true species richness in a tributary

Table 3.2-1. Summary of juvenile Arctic grayling CPUE for backpack electrofishing in fish/hour by habitat type in the Black River for three sampling periods in 2014.

		Arctic Grayling Juveniles					
		2014 Full Sample			2014 Subsample		
		Number of Units[1]	Mean	SE	Number of Units[1]	Mean	SE
Boulder Riffle	Early Summer	12	5.9	1.3	4	5.0	2.9
	Late Summer	11	9.9	1.9	4	11.0	0.4
	Fall	14	5.2	1.2	4	3.8	1.2
Run/Glide	Early Summer	9	9.1	3.0	4	7.6	3.2
	Late Summer	11	4.9	1.1	6	5.9	2.9
	Fall	9	3.4	1.1	4	5.1	1.7
Rapids	Early Summer	4	6.6	2.9	0	n/a	n/a
	Late Summer	4	1.4	1.7	0	n/a	n/a
	Fall	2	7.8	1.1	0	n/a	n/a
Riffles	Early Summer	2	2.3	n/a	1	4.6	n/a
	Late Summer	1	0.0	n/a	0	n/a	n/a
	Fall	2	9.3	n/a	1	7.0	n/a
Upland Sloughs (Pools + Run/Glide)	Early Summer	5	0.7	0.5	2	0.0	n/a
	Late Summer	4	0.0	0.0	2	0.0	n/a
	Fall	4	1.4	0.9	2	2.9	2.5

[1]Replicate mesohabitat units

Table 3.2-2. Summary of subadult/adult Arctic grayling CPUE for backpack electrofishing in fish/hour by habitat type in the Black River for three sampling periods in 2014.

		Arctic Grayling Subadults/Adults					
		2014 Full Sample			2014 Subsample		
		Number of Units[1]	Mean	SE	Number of Units[1]	Mean	SE
Boulder Riffle	Early Summer	12	1.6	0.84	4	0.4	0.36
	Late Summer	11	1.0	0.38	4	0.0	n/a
	Fall	14	0.6	0.23	4	0.6	0.50
Run/Glide	Early Summer	9	1.1	0.51	4	1.8	0.63
	Late Summer	11	0.0	n/a	6	0.0	n/a
	Fall	9	0.4	0.30	4	0.0	n/a
Rapids	Early Summer	4	5.2	2.00	0	n/a	n/a
	Late Summer	4	0.0	n/a	0	n/a	n/a
	Fall	2	0.0	n/a	0	n/a	n/a
Riffles	Early Summer	2	0.7	n/a	1	0.0	n/a
	Late Summer	1	0.0	n/a	0	n/a	n/a
	Fall	2	0.0	n/a	1	0.0	n/a
Upland Sloughs (Pools + Run/Glide)	Early Summer	5	0.7	0.54	2	0.0	n/a
	Late Summer	4	0.0	n/a	2	0.0	n/a
	Fall	4	0.0	n/a	2	0.0	n/a

[1]Replicate mesohabitat units

Table 3.2-3. Summary of total Arctic grayling CPUE for backpack electrofishing in fish/hour by habitat type in the Black River for three sampling periods in 2014.

		Arctic Grayling Total					
		2014 Full Sample			2014 Subsample		
		Number of Units[1]	Mean	SE	Number of Units[1]	Mean	SE
Boulder Riffle	Early Summer	12	7.5	1.7	4	5.4	3.0
	Late Summer	11	11.0	1.8	4	11.0	0.4
	Fall	14	5.8	1.3	4	4.4	1.4
Run/Glide	Early Summer	9	10.0	2.9	4	9.4	3.1
	Late Summer	11	4.9	1.1	6	5.9	2.9
	Fall	9	3.8	1.3	4	5.1	1.7
Rapids	Early Summer	4	12.0	3.7	0	n/a	n/a
	Late Summer	4	1.4	1.7	0	n/a	n/a
	Fall	2	7.8	1.1	0	n/a	n/a
Riffles	Early Summer	2	3.0	n/a	1	4.6	n/a
	Late Summer	1	0.0	n/a	0	n/a	n/a
	Fall	2	9.3	n/a	1	7.0	n/a
Upland Sloughs (Pools + Run/Glide)	Early Summer	5	1.5	1.1	2	0.0	n/a
	Late Summer	4	0.0	n/a	2	0.0	n/a
	Fall	4	1.4	0.9	2	2.9	2.5

[1]Replicate mesohabitat units

Table 3.2-4. Summary of juvenile burbot CPUE for backpack electrofishing in fish/hour by habitat type in the Black River for three sampling periods in 2014.

		Burbot Juveniles					
		2014 Full Sample			2014 Subsample		
		Number of Units[1]	Mean	SE	Number of Units[1]	Mean	SE
Boulder Riffle	Early Summer	12	2.1	0.52	4	2.9	1.0
	Late Summer	11	4.3	1.20	4	8.3	2.7
	Fall	14	1.2	0.29	4	2.4	0.7
Run/Glide	Early Summer	9	2.4	0.92	4	3.0	2.0
	Late Summer	11	0.7	0.35	6	0.4	0.2
	Fall	9	0.0	n/a	4	0.0	n/a
Rapids	Early Summer	4	4.4	3.30	0	n/a	n/a
	Late Summer	4	1.4	1.70	0	n/a	n/a
	Fall	2	0.0	n/a	0	n/a	n/a
Riffles	Early Summer	2	0.7	n/a	1	0.0	n/a
	Late Summer	1	3.3	n/a	0	n/a	n/a
	Fall	2	0.0	n/a	1	0.0	n/a
Upland Sloughs (Pools + Run/Glide)	Early Summer	5	0.9	0.69	2	2.3	2.0
	Late Summer	4	0.0	n/a	2	0.0	n/a
	Fall	4	1.1	0.99	2	2.1	1.9

[1]Replicate mesohabitat units

Table 3.2-5. Summary of subadult/adult burbot CPUE for backpack electrofishing in fish/hour by habitat type in the Black River for three sampling periods in 2014.

		Burbot Subadults/adults[1]					
		2014 Full Sample			2014 Subsample		
		Number of Units[1]	Mean	SE	Number of Units[2]	Mean	SE
Boulder Riffle	Early Summer	12	0.4	0.32	4	0.0	n/a
	Late Summer	11	0.1	0.08	4	0.0	n/a
	Fall	14	0.0	n/a	4	0.0	n/a
Run/Glide	Early Summer	9	0.0	n/a	4	0.0	n/a
	Late Summer	11	0.0	n/a	6	0.0	n/a
	Fall	9	0.0	n/a	4	0.0	n/a
Rapids	Early Summer	4	1.1	0.66	0	n/a	n/a
	Late Summer	4	0.0	n/a	0	n/a	n/a
	Fall	2	0.0	n/a	0	n/a	n/a
Riffles	Early Summer	2	0.0	n/a	1	0.0	n/a
	Late Summer	1	0.0	n/a	0	n/a	n/a
	Fall	2	0.0	n/a	1	0.0	n/a
Upland Sloughs (Pools + Run/Glide)	Early Summer	5	0.0	n/a	2	0.0	n/a
	Late Summer	4	0.0	n/a	2	0.0	n/a
	Fall	4	0.0	n/a	2	0.0	n/a

[1] No adult burbot were collected. [2]Replicate mesohabitat units

Table 3.2-6. Summary of total burbot CPUE for backpack electrofishing in fish/hour by habitat type in the Black River for three sampling periods in 2014.

		Burbot Total					
		2014 Full Sample			2014 Subsample		
		Number of Units[1]	Mean	SE	Number of Units[1]	Mean	SE
Boulder Riffle	Early Summer	12	3.0	0.96	4	2.9	1.0
	Late Summer	11	4.5	1.10	4	8.3	2.7
	Fall	14	1.2	0.29	4	2.4	0.8
Run/Glide	Early Summer	9	2.4	0.92	4	3.0	2.0
	Late Summer	11	0.7	0.35	6	0.4	0.2
	Fall	9	0.0	n/a	4	0,0	n/a
Rapids	Early Summer	4	6.6	2.70	0	n/a	n/a
	Late Summer	4	1.4	1.70	0	n/a	n/a
	Fall	2	0.0	n/a	0	n/a	n/a
Riffles	Early Summer	2	0.7	n/a	1	0.0	n/a
	Late Summer	1	3.3	n/a	0	n/a	n/a
	Fall	2	0.0	n/a	1	0.0	n/a
Upland Sloughs (Pools + Run/Glide)	Early Summer	5	0.9	0.69	2	2.3	2.0
	Late Summer	4	0.0	n/a	2	0.0	0.0
	Fall	4	1.1	0.99	2	2.1	1.9

[1]Replicate mesohabitat units

Table 3.2-7. Summary of total sculpin CPUE for backpack electrofishing in fish/hour by habitat type in the Black River for three sampling periods in 2014.

		Sculpin Total					
		2014 Full Sample			2014 Subsample		
		Number of Units[1]	Mean	SE	Number of Units[1]	Mean	SE
Boulder Riffle	Early Summer	12	68	11	4	39	5.3
	Late Summer	11	53	9.9	4	77	12
	Fall	14	30	5.3	4	37	6.8
Run/Glide	Early Summer	9	69	9.1	4	91	11
	Late Summer	11	82	15	6	75	15
	Fall	9	51	9.0	4	68	20
Rapids	Early Summer	4	46	12	0	n/a	n/a
	Late Summer	4	77	1.9	0	n/a	n/a
	Fall	2	43	15	0	n/a	n/a
Riffles	Early Summer	2	52	n/a	1	54	n/a
	Late Summer	1	23	n/a	0	n/a	n/a
	Fall	2	47	n/a	1	52	n/a
Upland Sloughs (Pools + Run/Glide)	Early Summer	5	35	11	2	63	26
	Late Summer	4	35	19	2	70	24
	Fall	4	45	15	2	91	5.5

[1]Replicate mesohabitat units

Table 3.3-1. Total observations of fish species in the Black River by season and mesohabitat type using full and subsampling approaches during 2014.

		Full 2014 Sampling Approach[a]							2014 Subsampling Approach[a]						
		Burbot		Arctic Grayling		Longnose Sucker	Sculpin Sp.	Round Whitefish[b]	Burbot		Arctic Grayling		Longnose Sucker	Sculpin Sp.	Round Whitefish[b]
Mesohabitat Type	StudyPeriod	Juvenile	All Life Stages	Juvenile	All Life Stages	All Life Stages	All Life Stages	All Life Stages	Juvenile	All Life Stages	Juvenile	All Life Stages	All Life Stages	All Life Stages	All Life Stages
Black River Mainstem															
Boulder Riffle	Early Summer	15	27	66	112	0	504	4	6	11	16	21	0	116	0
	Late Summer	19	22	62	92	0	331	0	9	9	17	22	0	120	0
	Fall	11	14	40	58	0	273	0	4	5	7	11	0	67	0
Rapid	Early Summer	5	9	10	26	0	65	0	NS	NS	NS	NS	NS	NS	NS
	Late Summer	4	4	3	6	0	101	0	NS	NS	NS	NS	NS	NS	NS
	Fall	0	0	6	7	0	35	0	NS	NS	NS	NS	NS	NS	NS
Riffle	Early Summer	2	3	3	5	0	96	1	1	2	3	3	0	48	0
	Late Summer	2	2	0	0	0	11	0	NS	NS	NS	NS	NS	NS	NS
	Fall	0	0	4	8	0	29	0	0	0	2	6	0	20	0
Run/Glide	Early Summer	12	13	26	39	0	239	0	6	7	18	23	0	141	0
	Late Summer	6	6	40	50	0	305	0	3	3	19	28	0	142	0
	Fall	1	1	14	19	0	158	0	0	0	8	8	0	82	0
Unnamed Tributary															
Boulder Riffle	Early Summer	2	2	4	5	0	7	0	NS	NS	NS	NS	NS	NS	NS
	Fall	0	0	3	5	0	2	0	NS	NS	NS	NS	NS	NS	NS
Riffle	Late Summer	0	0	3	3	0	8	0	NS	NS	NS	NS	NS	NS	NS
	Fall	0	0	0	0	0	4	0	NS	NS	NS	NS	NS	NS	NS
Run/Glide	Early Summer	1	1	11	32	0	2	0	NS	NS	NS	NS	NS	NS	NS
	Late Summer	0	0	0	0	0	24	0	NS	NS	NS	NS	NS	NS	NS
	Fall	0	0	6	7	0	159	0	NS	NS	NS	NS	NS	NS	NS
Upland Slough															
Pool	Early Summer	3	4	1	3	1	62	0	2	2	0	0	0	44	0
	Late Summer	0	0	3	4	0	3	0	NS	NS	NS	NS	NS	NS	NS
	Fall	1	2	0	1	0	1	0	NS	NS	NS	NS	NS	NS	NS
Run/Glide	Early Summer	1	1	0	1	0	45	0	1	1	0	1	0	39	0
	Late Summer	1	1	0	0	0	68	0	1	1	0	0	0	68	0
	Fall	1	1	1	1	0	58	0	1	1	1	1	0	56	0

[a] Counts from all sampling methods
[b] Whitefish total includes unidentified species
NS = Not surveyed during 2014 under the subsampling approach
0 = Surveyed in 2014 without any recorded fish observations by any of the collection methods

7. FIGURES

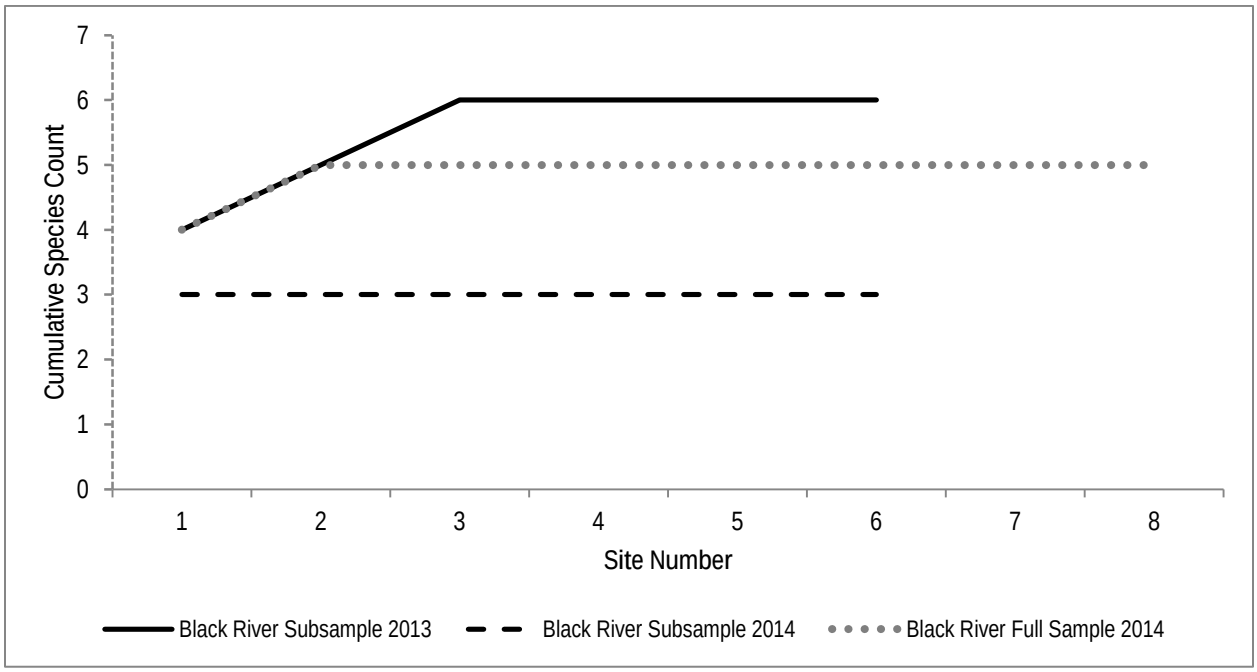

Figure 3.1-1. Species accumulation curves from the Black River GRTS sampling sites during full and subsampling in 2014. Note: The species accumulation curve generated during subsampling in 2013 is provided for reference.

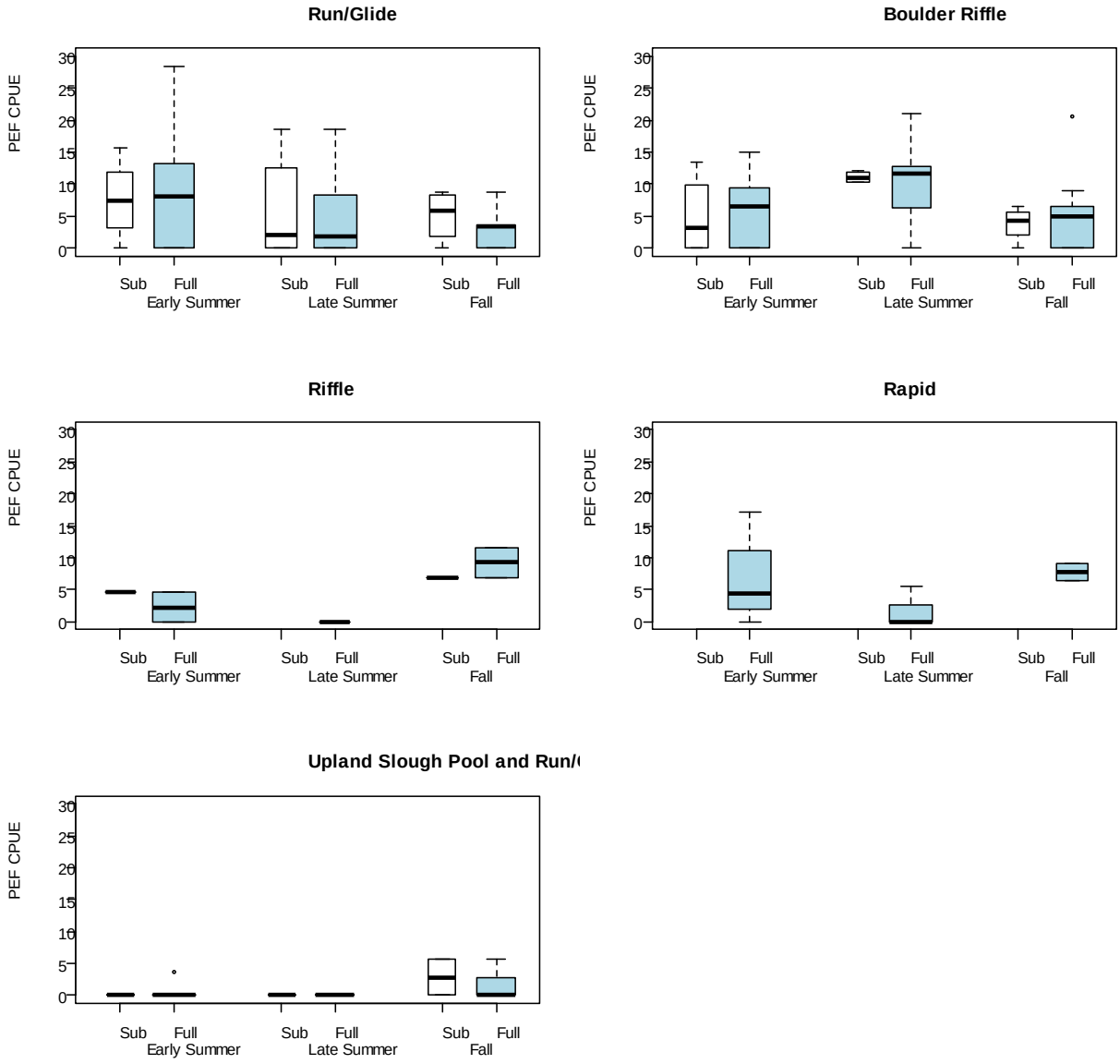

Figure 3.2-1. Boxplots comparing 2014 subsampling to 2014 full sample in the Black River based on CPUE for backpack electrofishing in fish/hour for juvenile Arctic grayling during three sampling events. The boxes represent the interquartile range (i.e., 1st to 3rd quartile of data), the black line in the box is the median. The whiskers extend to the full range of the data unless one or more data points are extreme, in which case these points are plotted separately as small circles. Box width is proportional to sample size.

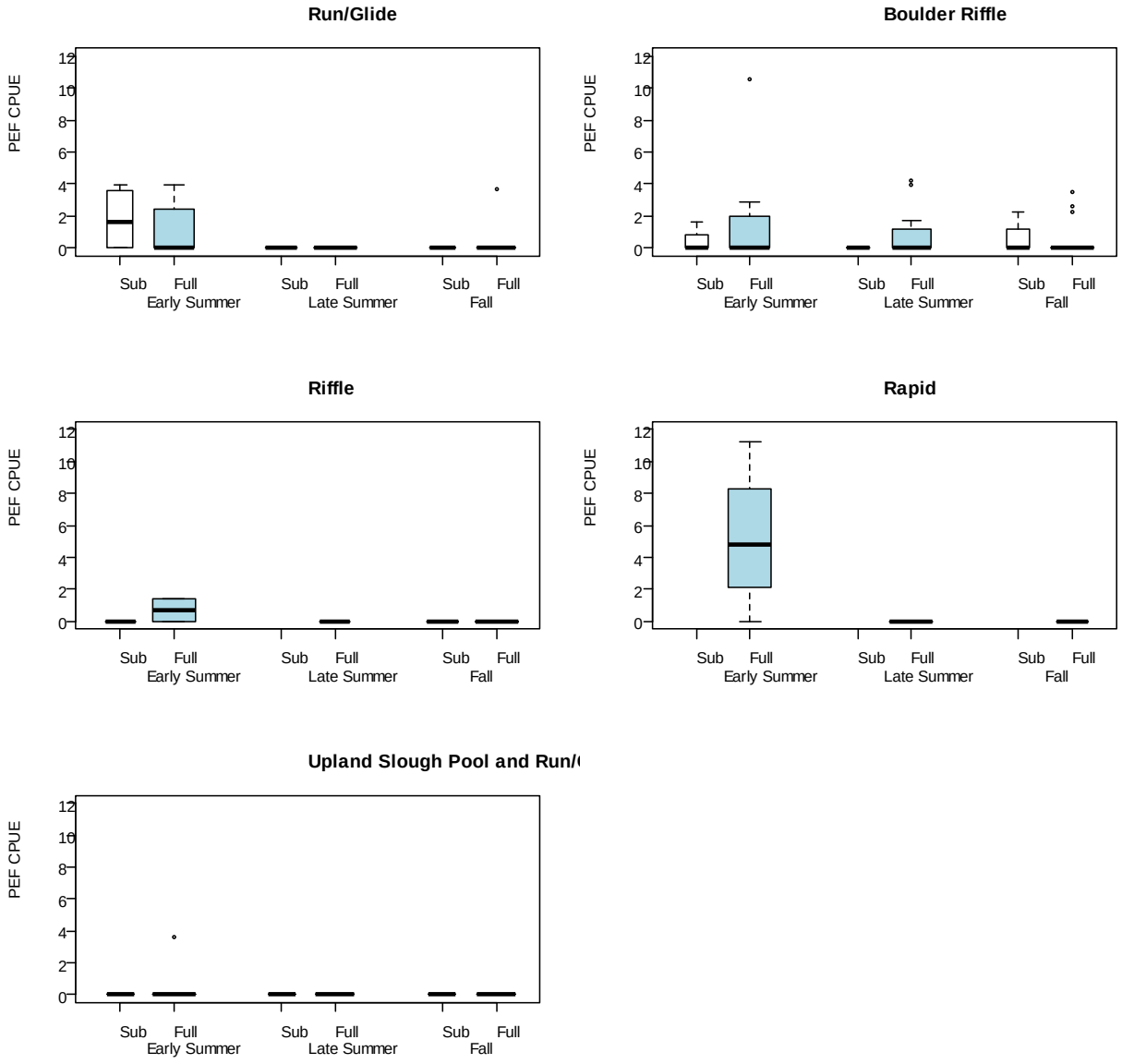

Figure 3.2-2. Boxplots comparing 2014 subsampling to 2014 full sample in the Black River based on CPUE for backpack electrofishing in fish/hour for subadult/adult Arctic grayling during three sampling events. The boxes represent the interquartile range (i.e., 1st to 3rd quartile of data), the black line in the box is the median. The whiskers extend to the full range of the data unless one or more data points are extreme, in which case these points are plotted separately as small circles. Box width is proportional to sample size.

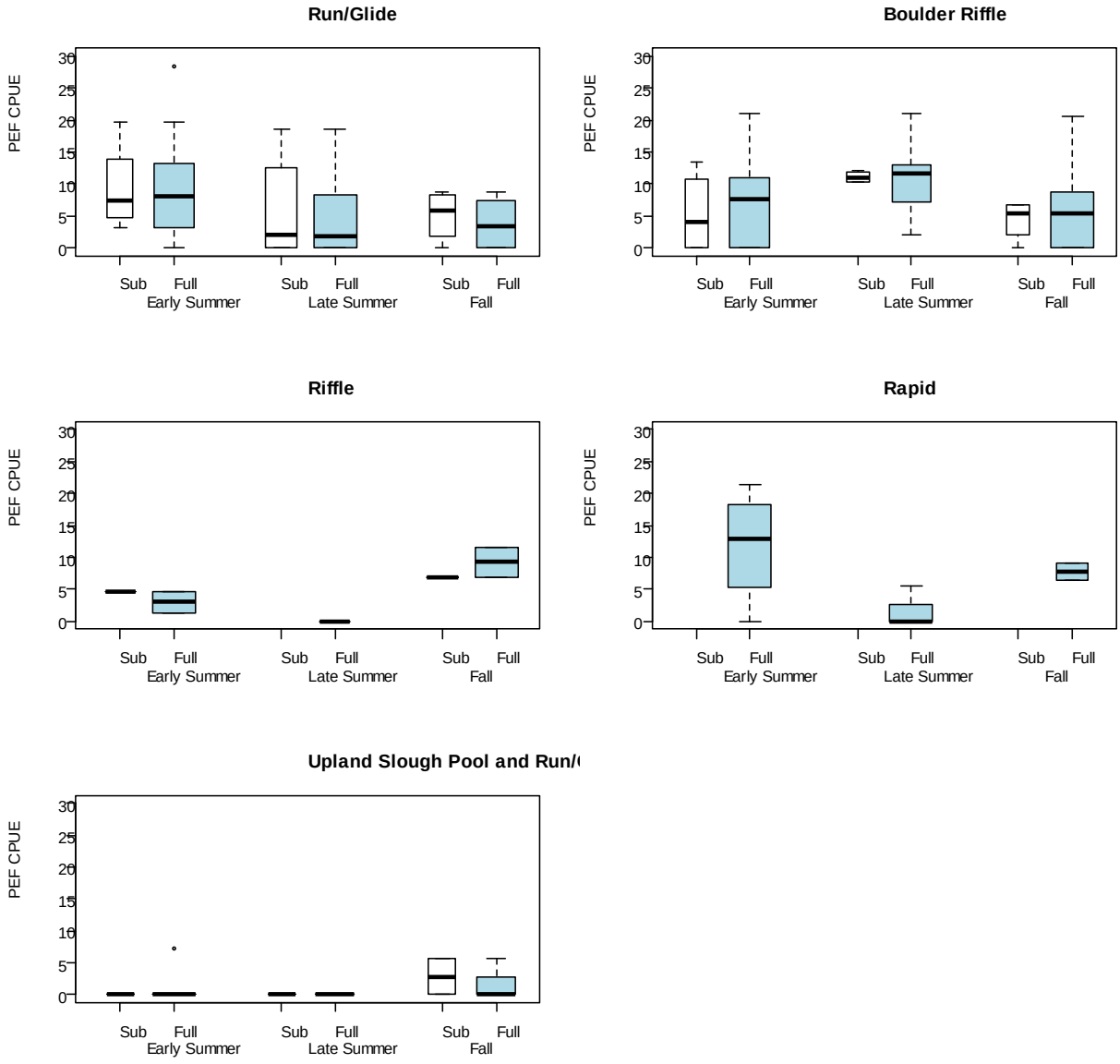

Figure 3.2-3. Boxplots comparing 2014 subsampling to 2014 full sample in the Black River based on CPUE for backpack electrofishing in fish/hour for total Arctic grayling during three sampling events. The boxes represent the interquartile range (i.e., 1st to 3rd quartile of data), the black line in the box is the median. The whiskers extend to the full range of the data unless one or more data points are extreme, in which case these points are plotted separately as small circles. Box width is proportional to sample size.

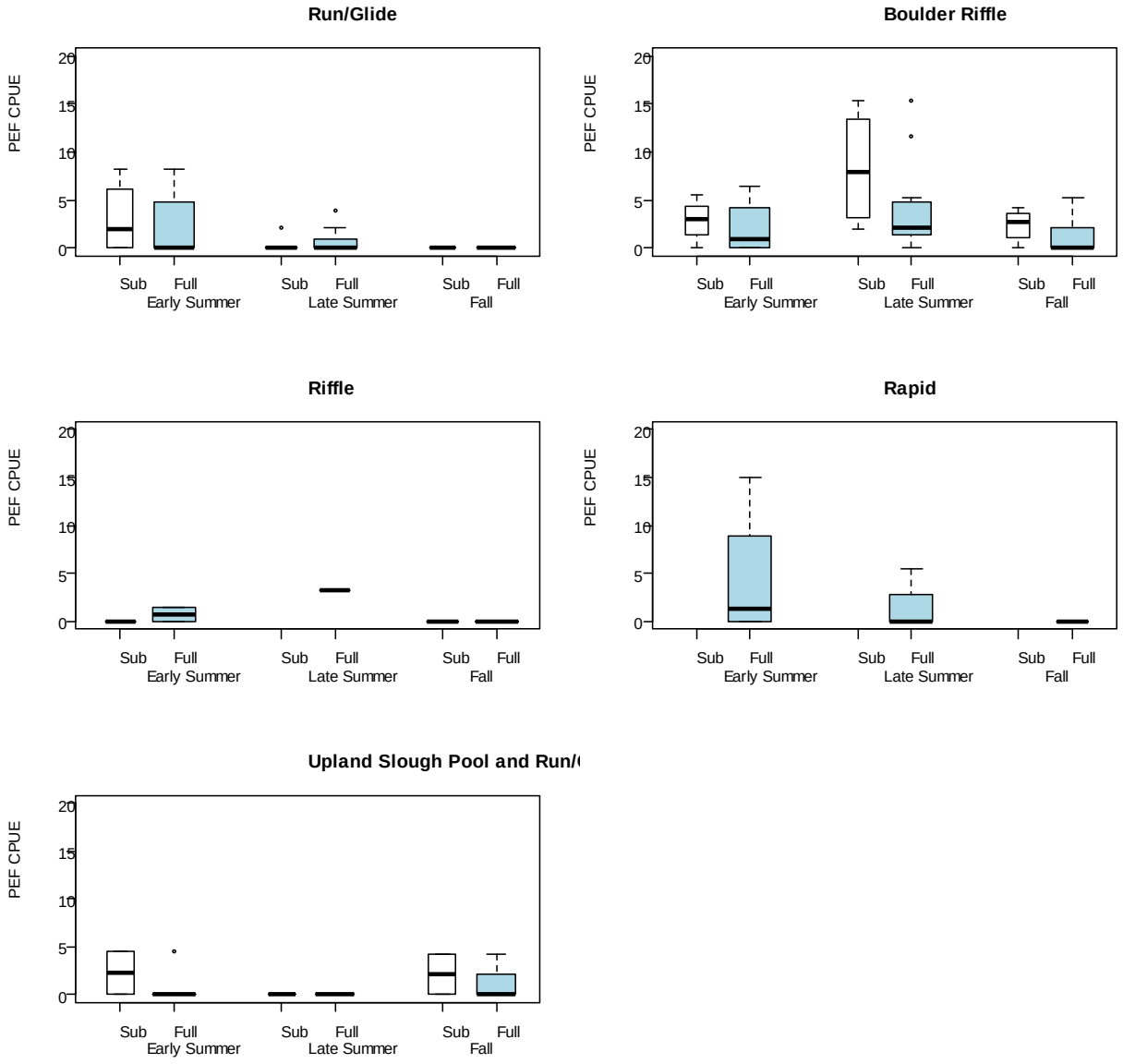

Figure 3.2-4. Boxplots comparing 2014 subsampling to 2014 full sample in the Black River based on CPUE for backpack electrofishing in fish/hour for juvenile burbot during three sampling events. The boxes represent the interquartile range (i.e., 1st to 3rd quartile of data), the black line in the box is the median. The whiskers extend to the full range of the data unless one or more data points are extreme, in which case these points are plotted separately as small circles. Box width is proportional to sample size.

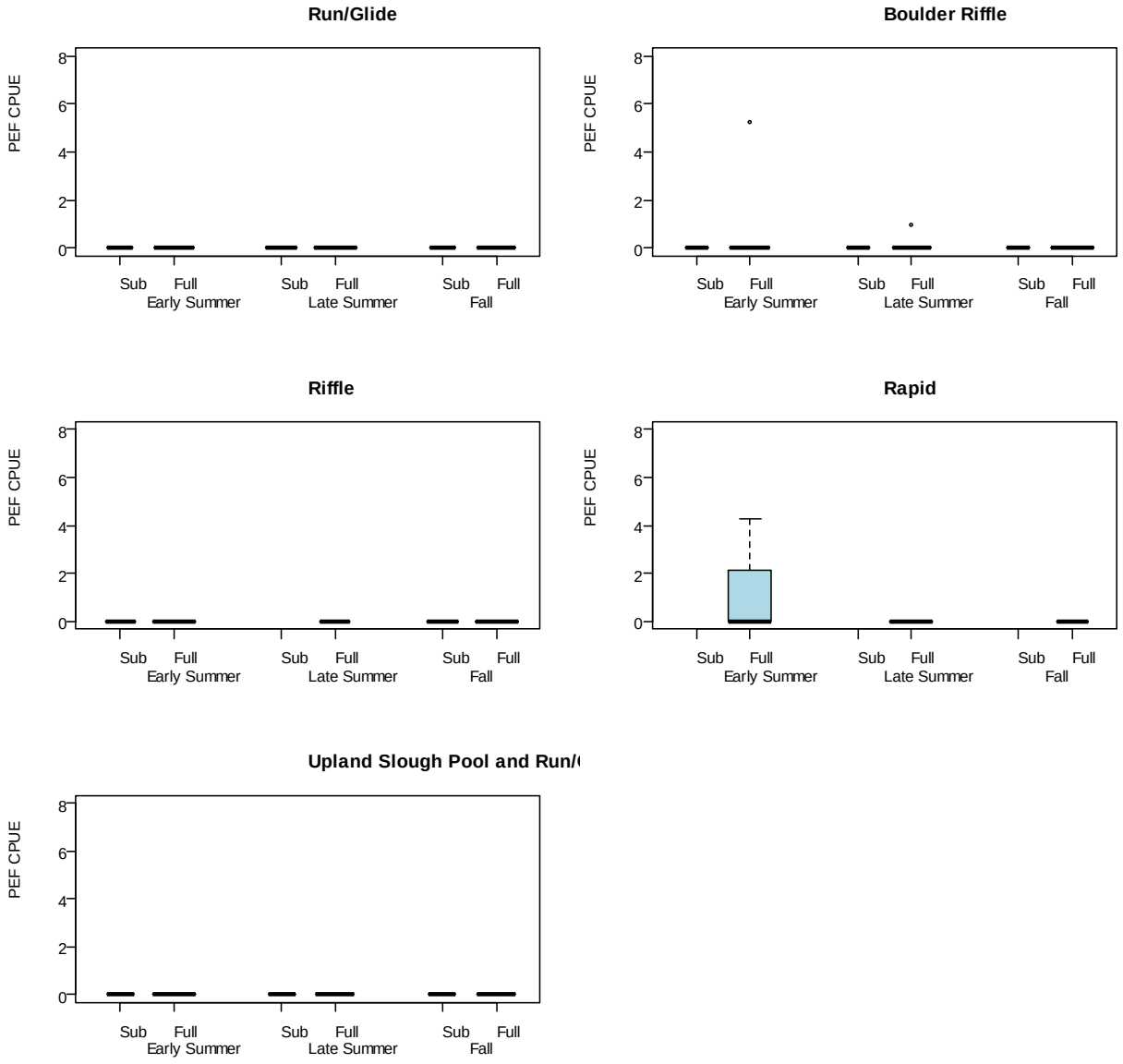

Figure 3.2-5. Boxplots comparing 2014 subsampling to 2014 full sample in the Black River based on CPUE for backpack electrofishing in fish/hour for subadult/adult burbot during three sampling events. The boxes represent the interquartile range (i.e., 1st to 3rd quartile of data), the black line in the box is the median. The whiskers extend to the full range of the data unless one or more data points are extreme, in which case these points are plotted separately as small circles. Box width is proportional to sample size.

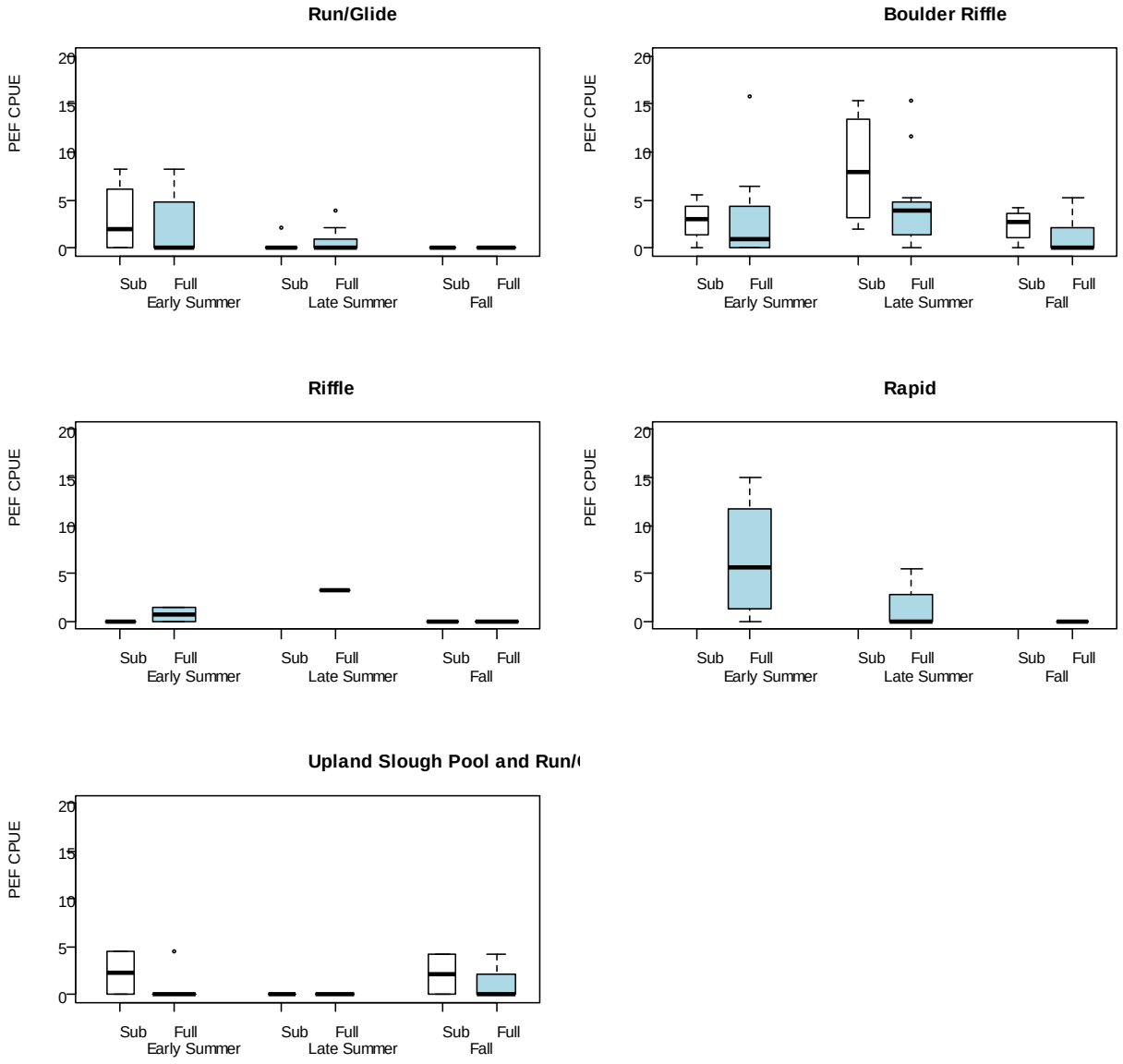

Figure 3.2-6. Boxplots comparing 2014 subsampling to 2014 full sample in the Black River based on CPUE for backpack electrofishing in fish/hour for total burbot during three sampling events. The boxes represent the interquartile range (i.e., 1st to 3rd quartile of data), the black line in the box is the median. The whiskers extend to the full range of the data unless one or more data points are extreme, in which case these points are plotted separately as small circles. Box width is proportional to sample size.

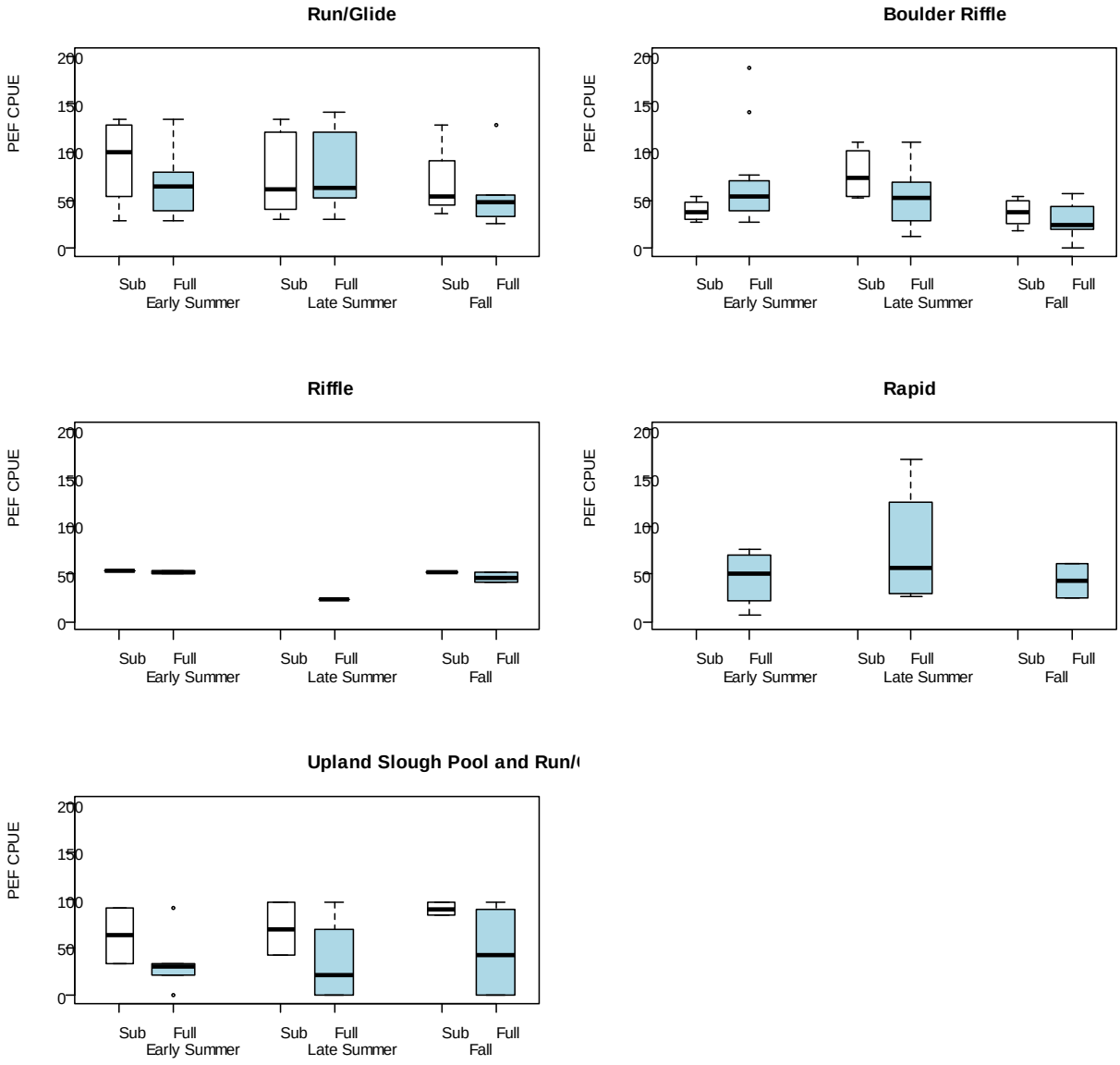

Figure 3.2-7. Boxplots comparing 2014 subsampling to 2014 full sample in the Black River based on CPUE for backpack electrofishing in fish/hour for total sculpin during three sampling events. The boxes represent the interquartile range (i.e., 1st to 3rd quartile of data), the black line in the box is the median. The whiskers extend to the full range of the data unless one or more data points are extreme, in which case these points are plotted separately as small circles. Box width is proportional to sample size.

Attachment B

River Productivity Study (Study 9.8) –
Fish Diet Sample Size Sufficiency Analysis Technical Memorandum

Susitna-Watana Hydroelectric Project (FERC No. 14241)

River Productivity Study (Study 9.8)

Fish Diet Sample Size Sufficiency Analysis Technical Memorandum

Prepared for

Alaska Energy Authority

SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

University of Alaska Fairbanks and R2 Resource Consultants, Inc.

December 2014

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF ACRONYMS AND SCIENTIFIC LABELS

Abbreviation	Definition
AEA	Alaska Energy Authority
FA	Focus Area
ISR	Initial Study Report
RSP	Revised Study Plan
TM	Technical Memorandum

1. BACKGROUND

The River Productivity Study Revised Study Plan (RSP) (AEA 2012) proposed to conduct a trophic analysis to describe the food web relationships within the current riverine community within the Susitna River. To achieve this objective, the RSP proposed to sample the stomach contents of juvenile Chinook salmon, juvenile coho salmon, and two size classes of rainbow trout. The RSP established a target sample size (*n*) of eight fish per species and size class, within each sampling site, during each season. This sample size target was selected because estimates of the diet composition of salmonids often stabilize between n = 7-12 stomach content samples (Beauchamp et al. 2007, Vinson and Budy 2011). We selected n = 8, at the low end of this range, because the study objectives were focused on quantifying the broad dietary patterns (e.g., distinguishing among aquatic invertebrates, terrestrial invertebrates, and marine derived food such as salmon eggs) across a large number of sampling sites, rather than comprehensively identifying all prey taxa within any given site. Further, the study also included a stable isotope analysis to provide a complementary estimate of diet composition. One advantage of stable isotope analysis is the ability to quantify diet composition with relatively few samples, because each sample integrates the food assimilated into the consumer's tissue over a period of weeks to months (Fry 2006, Hanisch et al. 2010). The River Productivity Study collected stomach contents and stable isotope samples from the same individual fish, which is an especially effective approach to quantify dietary patterns (McIntyre et al. 2006, Vinson and Budy 2011).

This technical memorandum (TM) describes an analysis conducted after field sampling was completed to determine whether the sample size targets and the actual sample sizes were sufficient to meet the objectives. Field sampling during 2013 did not collect the full eight samples for each species during many sampling events, as described in the Initial Study Report (ISR) (AEA 2014). This was due both to logistical difficulties that prevented all sites from being sampled and also to the apparent absence or very low densities of the study species at some sites that were sampled, especially in the main channel. To determine whether this dataset was sufficient to quantify fish diet composition, we analyzed the 2013 stomach content data using cumulative prey curves. Field sampling during 2014 achieved the sample size target at many more sites with a total of 449 additional fish collected. However, the stomach content data were in the early quality control stage during the preparation of this TM, so they are not included here.

In response to the October 2014 ISR meetings, AEA informed the licensing participants that AEA would be filing this TM with the Federal Energy Regulatory Commission ahead of the January 2015 ISR meetings.

2. ANALYSIS METHODS

Cumulative prey curves were used to determine whether sample sizes were sufficient. This approach plots the cumulative number of randomly pooled stomach content samples on the *x*-axis, with the cumulative number of prey types on the *y*-axis. The point at which the curve stabilizes indicates the minimum number of stomach content samples necessary to characterize diet composition (Cortes 1997, Chipps and Garvey 2007). Cumulative prey curves were generated for each study species, at each sampling site, in each season. The order of stomach

content samples was randomized. Prey types were categorized following the methods of the overall diet composition analysis. Prey types were identified to the family level for invertebrates and to species level for fish when possible. Fish eggs were counted as a separate prey item. Due to the large number of curves representing every combination of sites and seasons, all curves were combined into a single figure for each species, and each curve was adjusted slightly up or down to show overlapping data points. To aid in interpreting the multiple curves per species, the mean increase in prey types per additional sample was also calculated.

3. RESULTS AND INTERPRETATION

The cumulative prey curve analysis indicated the sample size target of $n = 8$ was likely sufficient to adequately quantify diet composition in this study (Figure 1). Overall, the number of prey types stabilized as sample sizes approached eight for all three species. Some individual curves stabilized at lower sample sizes, suggesting that smaller samples sizes ($n = 4$-7) may have been adequate at certain sites during certain seasons. Individual curves stabilized at different numbers of prey types, ranging from 2-16, suggesting that diet breadth differed between sites and seasons. The mean increase in cumulative prey types (indicated by the red lines in Figure 1) fluctuated due to random variability but approached zero as the number of samples approached $n = 8$, providing further support for the adequacy of this sample size to achieve the study objectives.

These cumulative prey curves were interpreted with caution because the target sample sizes were not met during several sampling events in 2013. Repeating this analysis with the more complete 2014 dataset will be important to confirm these findings. However, based on the data currently available, the study design was likely adequate to achieve the objectives of the River Productivity Study, especially considering the additional information provided by the stable isotope analysis.

4. PLANS FOR FURTHER ANALYSIS

A similar cumulative prey curve analysis will be conducted using the 2014 stomach content data and included in the Updated Study Report. The USR will also include a comprehensive evaluation of the adequacy of the combined stomach contents and stable isotope datasets to meet the study objectives.

5. LITERATURE CITED

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6. FIGURES

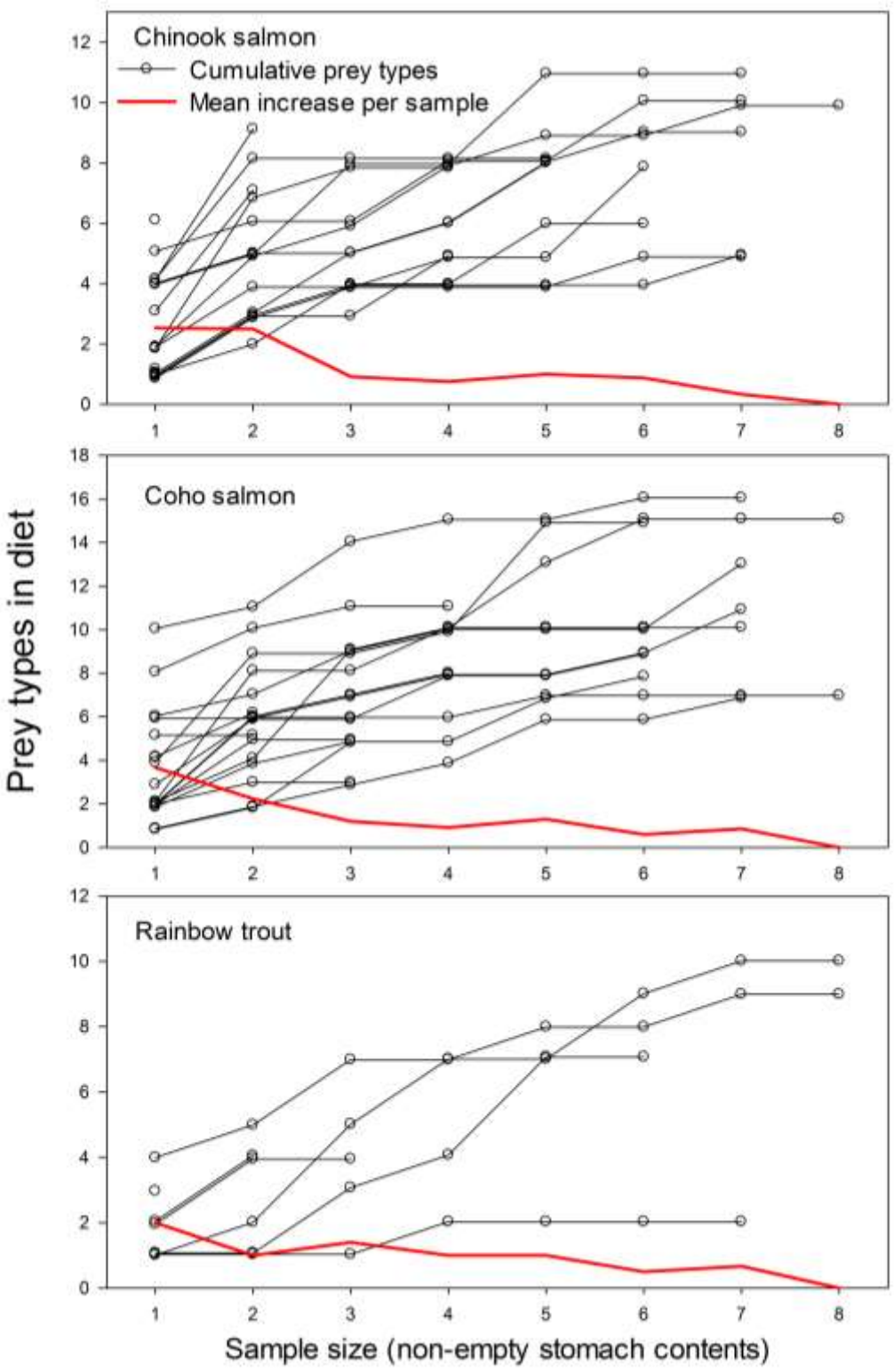

Figure 1. Cumulative prey curves for Chinook salmon, coho salmon, and rainbow trout sampled during 2013.

20141231-5212

ALASKA ENERGY AUTHORITY

December 31, 2014

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Susitna-Watana Hydroelectric Project, Project No. 14241-000
Request to Suspend Procedural Schedule and Notice of Postponement of ISR Meetings

On December 26, 2014, the Governor of the State of Alaska issued an Administrative Order to suspend discretionary spending on a number of capital projects including the Susitna-Watana Hydroelectric Project (Project), due to the large state budget deficit, http://gov.alaska.gov/Walker_media/documents/20141226-administrative-order-271.pdf. Accordingly, the Alaska Energy Authority (AEA), applicant for the Project, requests the Federal Energy Regulatory Commission to suspend the schedule in this proceeding for 60 days pending further notice from AEA regarding future plans for the Project. In addition, AEA provides notice that the Initial Study Report meetings currently scheduled for January 7-8, 2015 in Anchorage, are postponed until further notice.

If you have questions concerning this submission please contact me at wdyok@aidea.org or (907) 771-3955.

Sincerely,

/s/Wayne Dyok
Wayne Dyok
Project Manager
Alaska Energy Authority

cc: Distribution List

20150105-5012

Cathy Teich, Talkeetna, AK.
Cathy Teich
P. O.Box155
Talkeetna,AK 99676
1-3-15

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission 888 First St., N.E.
Washington, DC 20426

Honorable Secretary Bose:

RE: Proposed Susitna-Watana Hydroelectric Project P-14241-000 Near Talkeetna, Alaska General Wildlife Comments on AEA's Initial Study Report (June 2014)

AEA's Initial Study Report (ISR) has some problems:

1. The data on the ISR is severely limited by land access issues.

2. The ISR fails to consider the effects of access corridors (transportation and transmission lines) on moose, caribou, bears, wolves, wolverines, and Dall sheep.

3. The ISR fails to consider the 1980's data on wolverine and wolves, and fails to utilize new technologies (SPS collars, which did not exist in the 1980's) to gather data on bears.

4. Lower river studies are necessary but currently lacking.

5. Discussion of potential mitigation measures is lacking in all reports.

6. Post-development monitoring is not considered or described.

7. Wildlife reports fail to include author's names, thus compromising credibility.

8. Extensive and successful wolf harvest efforts have substantially affected wolf populations.Much more information specific to the study area is needed to meet project objectives.

9. Two of the four caribou herds that would be impacted by dam development do not receive adequate attention in the ISR. These would be the permanent Chulitna group and the migratory Cantwell group.

10. Sub-herd identification is important, but is not currently being conducted as part of the caribou studies.

I ask that you consider these shortcomings in the ISR and not allow AEA to proceed. Many of these studies have been sloppy, perhaps due to lack

of access, poor weather (the climate is changing and affecting everything), and the haste of AEA. This is not the way to proceed concerning such an important issue. The Susitna River ecosystem is incredibly fragile. Any small change can affect the entire system forever. I ask that you require AEA to consider all of the above if they are allowed to continue in this process. It would be a wise move to consider requiring AEA to do climate change studies, as well.

Besides the general wildlife comments, something that has not been addressed is the affect of a possible dam failure that would take out the Parks Highway, a major transportation corridor in the state. If this were to happen, the shipping of food and other goods throughout the state would be dramatically affected. Since we have so few roads, and few alternative routes, this would be a real issue.

Please consider these comments.

Sincerely,

Cathy Teich
907-733-2155
cathyt@mtaonline.net

20150108-3000

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
January 8, 2015

OFFICE OF ENERGY PROJECTS

Project No. 14241-000 –Alaska
Susitna-Watana Hydroelectric Project
Alaska Energy Authority

Wayne Dyok
Susitna-Watana Project Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK 99503

Subject: Request to hold the Integrated Licensing Process in abeyance

Dear Mr. Dyok:

On December 31, 2014, you requested that we hold the Integrated Licensing Process (ILP) for the proposed Susitna-Watana Hydroelectric Project in abeyance for 60 days. You also stated that you are postponing the Initial Study Report meetings scheduled for January 7 and 8, 2015, until further notice. Your reason for the request to hold the ILP in abeyance is that the Governor of the State of Alaska has issued an Administrative Order suspending discretionary spending on the proposed project due to a state budget deficit.

Due to the uncertainty of the project proposal at this time, we agree that the ILP should be held in abeyance until further notice. Doing so would conserve stakeholder resources until the state's commitment to the project can be clarified. Therefore, your request is granted. Please file an update of the status of the proposed project within 60 days of the date of this letter.

If you have any questions, please contact Nick Jayjack at (202) 502-6073 or Nicholas.Jayjack@ferc.gov.

Sincerely,

Jeff Wright
Director
Office of Energy Projects

cc: Mailing List
Public Files

20150112-0059

ALASKA ENERGY AUTHORITY

December 31, 2014

ORIGINAL

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Re: Susitna-Watana Hydroelectric Project, Project No. 14241-000
Request to Suspend Procedural Schedule and Notice of Postponement of ISR Meetings

On December 26, 2014, the Governor of the State of Alaska issued an Administrative Order to suspend discretionary spending on a number of capital projects including the Susitna-Watana Hydroelectric Project (Project), due to the large state budget deficit, http://gov.alaska.gov/Walker_media/documents/20141226-administrative-order-271.pdf. Accordingly, the Alaska Energy Authority (AEA), applicant for the Project, requests the Federal Energy Regulatory Commission to suspend the schedule in this proceeding for 60 days pending further notice from AEA regarding future plans for the Project. In addition, AEA provides notice that the Initial Study Report meetings currently scheduled for January 7-8, 2015 in Anchorage, are postponed until further notice.

If you have questions concerning this submission please contact me at wdyok@aidea.org or (907) 771-3955.

Sincerely,

/s/Wayne Dyok
Wayne Dyok
Project Manager
Alaska Energy Authority

cc: Distribution List

813 West Northern Lights Boulevard Anchorage, Alaska 99503 T 907.771.3000 Toll Free (Alaska Only) 888.300.8534 F 907.771.3044

20150226-5073

20150226-5073

ALASKA ENERGY AUTHORITY

February 26, 2015

FERC Project # 14241-001
Susitna-Watana Hydroelectric Project
Alaska Energy Authority

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

Dear Secretary Bose,

On March 7, 2012, the Alaska Energy Authority was granted a Preliminary Permit by the Federal Energy Regulatory Commission (FERC), Project No. 14241, for a period of three years to study and investigate the feasibility of the proposed project to be located on the Susitna River, near Cantwell, in Matanuska-Susitna Borough, Alaska. Article 4 of the Preliminary Permit requires a progress report to be filed with the FERC at the end of each 6-month period. Enclosed is our sixth 6-month progress report for the period of September 2014 through February 2015.

If you have questions or need additional information, please contact the undersigned at (907) 771-3955. Thank you.

Sincerely,

Wayne M Dyok

Wayne Dyok
Project Manager
Alaska Energy Authority

Attachment

cc: Attached Distribution List

813 West Northern Lights Boulevard Anchorage, Alaska 99503 T 907.771.3000 Toll Free (Alaska Only) 888.300.8534 F 907.771.3044

-- Alaska Energy Authority --

Sixth 6-Month Progress Report for the Preliminary Permit

on the

Susitna-Watana Hydroelectric Project FERC No. 14241

submitted to the

Federal Energy Regulatory Commission

February 26, 2015

BEFORE THE UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Project No. 14241-001

Sixth 6-month Progress Report
Under Article 4 of the Preliminary Permit

(1) The Alaska Energy Authority (AEA or Permittee) submits the following progress report as required under Article 4 of the Director's order of March 07, 2012, issuing the preliminary permit. This report is made in order that the Permittee may secure and maintain priority for a license for the project under Part I of the Federal Power Act while obtaining the data and performing the activities required to determine the project feasibility and support a license application. As a condition of the Preliminary Permit, the Federal Energy Regulatory Commission (Commission or FERC) requires AEA to submit a progress report every six months that describes, for that report period, "the nature and timing of what the permittee has done under the prefiling requirements of 18 CFR §§ 4.38 and 5 other applicable regulations; and, where studies require access to and use of land not owned by the permittee, the status of the permittee's efforts to obtain permission therefore."

(2) The location of the proposed project is:

State:	Alaska
County:	Matanuska-Susitna Borough
Township or nearby town:	Cantwell, Alaska
Stream:	Susitna River

(3) Permittee Contact:

Mr. Wayne Dyok, Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK 99503
Phone (907) 771-3955

Mike Swiger, Van Ness Feldman
1050 Jefferson Street, NW
Washington, D.C. 20007-3877
Phone (202) 298-1800

(4) Progress Report:

During the past 6 months, AEA continued engagement of licensing participants in the Integrated Licensing Process (ILP) study plan implementation. AEA also continued engineering feasibility and economic studies for the project including completion of a comprehensive Engineering Feasibility Report issued in January 2015. AEA implemented the first year of study for the 58 approved ILP studies based on FERC's study plan determinations of February 1 and April 1, 2013. A final Initial Study Report

(ISR) reporting on study progress in 2013 was prepared and filed on June 3, 2014. In October, ISR meetings were held over 6 days to discuss the results and proposed modifications for the remainder of studies. On September 17, 29, and 30, 2014, AEA filed 30 technical memorandums outlining study result updates from work accomplished in 2014. A second series of ISR meetings were planned for early January to discuss those updated results, but were postponed pursuant to the Governor's Administrative Order 271.

During the next six-month period AEA expects to complete end of 2014 technical reports. AEA is currently evaluating funding limitations for the Susitna-Watana Project.

Please contact our Project Manager, Mr. Wayne Dyok, at (907) 771-3955, and visit our Project Website at http://www.susitna-watanahydro.org

20150304-5174

ALASKA ENERGY AUTHORITY

March 4, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000; Status Update on Request to Hold the Integrated Licensing Process in Abeyance

Dear Secretary Bose:

By letter dated December 31, 2014, the Alaska Energy Authority (AEA) requested the Federal Energy Regulatory Commission (Commission or FERC) to suspend the Integrated Licensing Process schedule with regard to the proposed Susitna-Watana Hydroelectric Project, FERC Project No. 14241 (Project).[1] This request was granted by the Commission on January 8, 2015, with the condition that AEA file an update of the status of the proposed Project.[2] This letter constitutes AEA's 60-day status report.

AEA requests the Commission to maintain the abeyance at this time. AEA continues to evaluate funding limitations and AEA expects to be in a better position to propose plans for the next steps forward within 60 days of the date of this letter. At that time, AEA will submit another status report with the Commission, which will include a proposed plan and schedule for the ongoing licensing of the Project.

If you have any questions related to this matter or need additional information, please do not hesitate to contact the undersigned at (907) 771-3955. Thank you.

Sincerely,

Wayne M Dyok

Wayne Dyok
Project Manager
Alaska Energy Authority

cc: Distribution List

[1] Request to Suspend Procedural Schedule and Notice of Postponement of ISR Meetings, Project No. 14241-000 (filed Dec. 31, 2014).

[2] Letter from Jeff Wright, FERC, to Wayne Dyok, AEA, Project No. 14241-000 (issued Jan. 8, 2015).

20150312-5055

American Fisheries Society
Western Division

President Hilda Sexauer, President-elect Jim Bowker, Vice-president Cleve Steward, Secretary-Treasurer Travis Neebling, Past-president Pam Sponholtz

March 12, 2015

Kimberly D. Rose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

RE: Western Division of the American Fisheries Society Statement on the Proposed Susitna-Watana Hydropower Project, FERC Project P-14241

The American Fisheries Society (Society) is the world's oldest and largest "scientific and professional" organization whose mission is to advance sound science, promote professional development, and disseminate science-based fisheries information for the global protection, conservation, and sustainability of fishery resources and aquatic ecosystems.

The Western Division (Division) is the largest of four geographic subdivisions of the Society within North America, representing a tremendous array of 3,500 fisheries professionals involved in all aspects of fisheries. The collective diversity and expertise of our members is the basis of an intimate and unparalleled familiarity with fisheries resources and issues within our geographic region, which includes the State of Alaska.

The Division and Society have a long history with hydropower projects, dams, and their environmental consequences. Members of both groups had formal discussions in the 1950s opposing the construction of proposed dams in the Columbia River Basin.[1,2] More than 60 years later and post-construction of those same dams, the Division adopted a resolution based on the best scientific information available, indicating that the four lower Snake River dams and reservoirs are a significant threat to the continued existence of remaining Snake River salmon, Steelhead, Pacific Lamprey, and White Sturgeon. For over a half-century, the Division and Society have developed multiple policies predicting that hydropower projects and dams will adversely affect native, wild fisheries and their associated habitats. [3-5] The cumulative knowledge of these policies confirms the difficulty of designing an environmentally-benign hydropower dam.

The State of Alaska submitted an application to the Federal Energy Regulatory Commission (FERC) in the early 1980s seeking a federal license to construct a hydroelectric dam on the Susitna River. Because Alaska's budget is dependent on oil, the project proposed in the 1980s ultimately was not economical. It is the Division's understanding that the Alaska Energy Authority (AEA) has proposed to revive the Susitna-Watana Hydropower project. The Division has substantial biological and economical concerns regarding this project, and plans to provide more formal, technical comments in response to the pre-project assessment studies (i.e., AEA Initial Study Report). At this time, we respectfully request the FERC and Alaska Legislature consider the comprehensive and cumulative impacts this project will create for the fishery resources and aquatic ecosystems of the Susitna River Basin. Impacts to these important resources cannot be mitigated for a project of this scale. Additional concerns include possible threats to the social and economic well-being of the local communities that rely heavily on such resources and ecosystems.

Provided below are just a few of the many considerations the Division requests that the FERC and Alaska Legislature contemplate prior to project approval and expenditure of additional state funds.

- The project proposed by the Alaska Energy Authority would involve constructing the largest dam in Alaska at 735 feet tall, and the second tallest dam in the United States.[6] Currently, the Susitna River flows

unobstructed for 300 miles, is the 6th largest drainage in Alaska, and the 15th largest drainage by volume in the United States.[7,8] The proposed project is expected to "create a reservoir that is 42 miles long with an average width of 1 mile,"[9], an 8,000 feet long airstrip, construction camps, a railroad spur, and extensive gravel mining in the area, all resulting in large-scale transformation of the biological, chemical, and physical conditions to which fishes and other aquatic organisms resident in the Susitna River Basin have adapted over millennia.

- The Susitna River Basin is home to all five species of Pacific salmon (Chinook, Chum, Coho, Pink, and Sockeye), Rainbow Trout, Dolly Varden, Arctic Grayling, Burbot, Arctic Char, and Lake Trout.[10] Other resident species are also present, including the Eulachon (Smelt), a member of the Southern Distinct Population Segment which was listed by the National Marine Fisheries Service in 2010 as Threatened under the Endangered Species Act.[11]

    - Chinook Salmon - The Susitna River is Alaska's 4th largest Chinook Salmon population and 2nd largest recreational Chinook Salmon fishery.[12] This population has been documented to migrate more than 100 miles upstream of the proposed dam site.[13] Former Alaska Governor Parnell's Chinook Salmon Research Initiative was prompted by the global decline of Chinook Salmon, even in waters relatively unaffected by anthropogenic changes, and includes the Susitna River Chinook Salmon as an "indicator stock."[14]

    - Sockeye Salmon - The most commercially important salmon population of the Susitna River is the Sockeye.[15] One of the top 10 remaining Sockeye Salmon populations in the world can be found in the Matanuska-Susitna Basin.[16] Sockeye Salmon populations in the Matanuska-Susitna Basin support commercial, sport, personal use, and subsistence fisheries throughout the area

- The Susitna River Basin is vital to the economics of the State of Alaska. A reduction in the salmon populations of this watershed as a result of a large-scale hydropower project would reduce tourism and jobs, “illustrating the importance of keeping ecosystems healthy in order to provide services which are economically important.”[17] A 2009 study completed for the Matanuska-Susitna Borough determined that sport fishing related expenditures for both residents and visitors generated 900 to 1,900 local jobs, and contributed $31 million to $64 million of personal income to people of the region.[18] Residents and nonresident anglers fish nearly 300,000 days in the Matanuska-Susitna Borough and spend $63 million to $163 million in sport fishing gear and services. This equates to spending $126 to $602 per angler day.[18]

- The environmental consequences of hydropower projects on aquatic systems are numerous and varied, and documented throughout the scientific literature. Some of the direct and indirect influences to the biological, chemical, and physical properties of rivers and riparian area are included below.

    - Inadequate passage upstream and downstream for fish migration despite numerous modern passage technologies, such as costly and sometimes ineffective fish ladders and, barge and truck transportation for salmon around dams;[19]
    - Direct fish mortality;[19]
    - Elimination of essential life history processes for aquatic organisms;[19-27]
    - Disruption and modification of the natural hydrograph[26] with changes in water depth and velocity, as well as channel width;[27]
    - Rapid changes in available in-channel and riparian habitats,[26,27] and fragmentation of spawning and rearing habitat for fishes;[19,28,29]
    - Extreme fluctuations in water temperature, dissolved gases, dissolved and suspended solids, and nutrient concentrations among other water quality parameters;[27]
    - Undesirable changes in algal and aquatic vegetation production;[27,30]
    - Degraded aquatic insect diversity, abundance, and biomass;[19,30,31]
    - Simplified river channel morphology and riverbed substrate composition;[19,27]

- Markedly poorer physical habitat structure in reservoirs than in natural lakes or the pre-existing natural river channel;[32]
- Substantial declines in fish assemblage richness and abundance as a result of altered flow regimes, degraded water quality and physical habitat structure, migration barriers, depleted food webs, and disrupted biotic interactions;[33,34]
- Capture of sediments and organic matter upstream of dams reducing transport downstream to maintain existing physical habitats as well as benefits for aquatic communities;[35-37]
- Alteration of flow regimes and reservoir habitat upstream of dams, proving more beneficial to non-native and invasive piscivorous fishes such as Northern Pike.[30,34,38]

- Efforts to mitigate the detrimental effects of hydropower projects on aquatic ecosystems in the Lower 48 have been largely unsuccessful. For example, from 1998-2011, eleven federal agencies (excluding states, tribes, and local governments) spent more than $3 billion attempting to recover Pacific salmon in the Columbia River Basin,[39] which was previously the world's largest king salmon producer.[40] These endeavors have yet to result in the recovery of a single salmon stock in this basin or elsewhere.[39]

The Division's review of the scientific literature and the breadth of the Society's policies confirm the organization's standing in the broad field of dam construction and the associated impacts. The Susitna-Watana Hydropower project will have detrimental effects to the fisheries and aquatic ecosystems of the Susitna River Basin, and subsequently damaging influences to the area's economy and quality of life. Further, the scientific literature confirms the enormous difficulty of mitigating for impacts that convert a free-flowing river into a system with significant, hydrological modifications. In addition, the Division is concerned about the further adverse consequences that this project could have on the global status of salmon, given the degraded status of these unique fish outside of Alaska.

With the recent decline in the price of fossil fuels, and the increased value of fish and other ecosystem services provided by the Susitna River, the proposed Susitna-Watana Hydropower project is both economically and environmentally untenable. The Division hopes that the FERC and Alaska Legislature consider the consequences that this project will create for the fishery resources and aquatic ecosystems of the Susitna River Basin. Additionally, the Division recommends that carefully designed, robust, and statistically defensible sampling be conducted and critically reviewed by subject matter experts, should further studies be completed prior to project approval. Following this protocol will ensure the validity of data collected, allowing for precise analysis and modeling of the environmental consequences. The Division intends to provide more formal, technical comments in response to the AEA Initial Study Report. For now, the Division appreciates the opportunity to provide sound scientific information regarding our environmental concerns.

Sincerely,

Hilda Sexauer, President
Western Division American Fisheries Society

Cc: Governor Bill Walker
Lieutenant Governor Byron Mallott
Senator Lisa Murkowski
Senator Dan Sullivan
Congressman Don Young
Larry Hartig, Commissioner, Alaska Department of Environmental Conservation
Mark Myers, Commissioner, Alaska Department of Natural Resources
Marty Rutherford, Deputy Commissioner, Alaska Department of Natural Resources
Sam Cotten, Commissioner, Alaska Department of Fish and Game
Tony DeGange, Director of Habitat, Alaska Department of Fish and Game
Representative Wes Keller, District 10 Representative

Senator Pete Kelly, Senate Finance Committee Co-Chairman
Senator Anna MacKinnon, Senate Finance Committee Co-Chairwoman
Senator Peter Micciche, Senate Finance Committee Member
Senator Click Bishop, Senate Finance Committee Member
Senator Mike Dunleavey, Senate Finance Committee Member
Senator Lyman Hoffman, Senate Finance Committee Member
Senator Donny Olson, Senate Finance Committee Member
Representative Benjamin Nageak, House Resources Committee Co-chairman
Representative Dave Talerico, House Resources Committee Co-chairman
Representative Mike Hawker, House Resources Committee Member
Representative Bob Herron, House Resources Committee Member
Representative Craig Johnson, House Resources Committee Member
Representative Kurt Olson, House Resources Committee Member
Representative Paul Seaton, House Resources Committee Member
Representative Andy Josephson, House Resources Committee Member
Representative Geran Tarr, House Resources Committee Member

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Economic Development Department, Institute of Social and Economic Research, University of Alaska Anchorage
www.iser.uaa.alaska.edu

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20150317-3056

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
March 17, 2015

OFFICE OF ENERGY PROJECTS

Project No. 14241-000 –Alaska
Susitna-Watana Hydroelectric Project
Alaska Energy Authority

Wayne Dyok
Susitna-Watana Project Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK 99503

Subject: Letter granting request for continued Integrated Licensing Process abeyance

Dear Mr. Dyok:

On March 4, 2015, you filed a status report on your project proposal and requested that we continue to hold the Integrated Licensing Process (ILP) for the proposed Susitna-Watana Hydroelectric Project in abeyance for an additional 60 days. You stated that Alaska Energy Authority (AEA) continues to evaluate funding limitations, and AEA expects to be in a better position to propose plans for the next steps forward within 60 days of the March 4, 2015 date of your letter. You also stated that at that time, AEA will file another status report with the Commission, which will include a proposed plan and schedule for the project's ILP.

Due to the uncertainty of the project proposal at this time, we agree that the ILP should continue to be held in abeyance until further notice. Doing so would conserve stakeholder resources until the state's commitment to the project can be clarified. Therefore, your request is granted. Please file an update of the status of the proposed project by May 4, 2015.

If you have any questions, please contact Nick Jayjack at (202) 502-6073 or Nicholas.Jayjack@ferc.gov.

Sincerely,

Ann F. Miles
Director
Office of Energy Projects

cc: Mailing List
Public Files

20150504-5231

ALASKA ENERGY AUTHORITY

VIA ELECTRONIC FILING

May 4, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000; Status Update on Request to Hold the Integrated Licensing Process in Abeyance

Dear Secretary Bose:

By letter dated March 4, 2015, the Alaska Energy Authority (AEA) requested the Federal Energy Regulatory Commission (Commission or FERC) to continue to suspend the Integrated Licensing Process (ILP) schedule with regard to the proposed Susitna-Watana Hydroelectric Project, FERC Project No. 14241 (Project).[1] This request was granted by the Commission on March 17, 2015, with the condition that AEA file an update of the status of the proposed Project by May 4.[2] This letter constitutes AEA's 60-day status report.

AEA requests the Commission to maintain the abeyance for an additional 60 days. The Alaska legislature did not conclude its 2015 session by the end of April as expected. The legislature has been called into special session to address outstanding issues including the state budget. Once the Project's funding status is more certain, AEA will be in a position to propose a plan and schedule for the ongoing licensing.

[1] Status Update on Request to Hold the Integrated Licensing Process in Abeyance, Project No. 14241-000 (filed Mar. 4, 2015).

[2] Letter from Ann Miles, FERC, to Wayne Dyok, AEA, Project No. 14241-000 (issued Mar. 17, 2015).

813 West Northern Lights Boulevard Anchorage, Alaska 99503 T 907.771.3000 Toll Free (Alaska Only) 888.300.8534 F 907.771.3044

If you have any questions related to this matter or need additional information, please do not hesitate to contact the undersigned at (907) 771-3955. Thank you.

Sincerely,

Wayne Dyok
Project Manager
Alaska Energy Authority

cc: Distribution List

20150513-3018

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, DC 20426
May 13, 2015

OFFICE OF ENERGY PROJECTS

Project No. 14241-000 –Alaska
Susitna-Watana Hydroelectric Project
Alaska Energy Authority

Wayne Dyok
Susitna-Watana Project Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, AK 99503

Subject: Letter granting request for continued Integrated Licensing Process abeyance

Dear Mr. Dyok:

On May 4, 2015, you filed a status report on your project proposal and requested that we continue to hold the Integrated Licensing Process (ILP) for the proposed Susitna-Watana Hydroelectric Project in abeyance for an additional 60 days because the state legislature did not conclude its session at the end of April as expected. You expect to be in a better position to propose plans for the next steps forward once the funding status of the project is more certain.

As stated in our March 17, 2015 letter, due to the uncertainty of the project proposal, the ILP is being held in abeyance until further notice. Therefore, you do not need to again request that the Commission hold the process in abeyance. Until the state's commitment to the project can be clarified, please file an update on the status of the proposed project every 60 days.

If you have any questions, please contact Nick Jayjack at (202) 502-6073 or Nicholas.Jayjack@ferc.gov.

Sincerely,

Ann F. Miles
Director
Office of Energy Projects

cc: Mailing List
Public Files

20150826-5223

ALASKA ENERGY AUTHORITY

August 26, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000; Request to Lift Integrated Licensing Process Abeyance

Dear Secretary Bose:

The Alaska Energy Authority (AEA) requests that the Federal Energy Regulatory Commission (Commission) lift the Integrated Licensing Process (ILP) abeyance for the Susitna-Watana Project (Project) and adopt the attached proposed schedule (Attachment 1) for amending the Director's Study Plan Determination (SPD).

On July 2, 2015, AEA filed a status update on the ILP abeyance noting that AEA was awaiting further direction on the Project from the Governor's office and that AEA would provide a specific plan to the Commission within the next 60-day reporting period. On July 6, 2015 the Governor's office clarified Administrative Order 271 (Attachment 2) and authorized AEA to proceed with the SPD.

To ensure that the SPD is based upon a complete and up-to-date record, AEA is proposing to update the June 3, 2014 Initial Study Report (ISR) with the 2014 data collection and analysis effort. AEA is in the process of preparing study reports and additional technical memoranda. AEA will file these documents between mid-September and November 6, 2015. Attachment 3 identifies the documents to be filed during this period. Additionally, in order to assist FERC staff and licensing participants in the review of the ISR, on or before November 6, 2015, AEA will file a supplement to the ISR. The supplement will identify the sections of the June 2014 ISR which are being updated by this new information and the remaining steps to complete the study plan.

Regarding the schedule, AEA proposes a 3-month period for licensing participants to review the material before holding the ISR meetings beginning on February 16, 2016. AEA proposes to file the ISR meeting summary by March 17, 2016. Proposed study plan modifications and comments on the meeting summary would be due on May 1, 2016 with reply comments due on June 30, 2016. If the Commission accepts the schedule, the Director's updated SPD would be completed by August 29, 2016.

The proposed schedule was presented to FERC staff, Alaska Native entities, federal and state resource agencies, and other licensing participants. (The consultation record is included as Attachment 4). All consulted parties who commented agreed data collected

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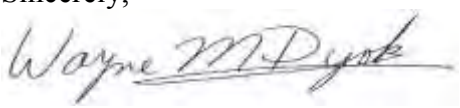
in 2014 should be considered in the updated SPD. All parties, with the exception of National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS), supported or did not object to AEA's proposed schedule for amending the SPD. NMFS and USFWS commented that they could not commit to the schedule without having a better understanding of the information that is to be provided in the fall. AEA appreciates NMFS and USFWS concerns, but has provided 2 ½ months more time than the Commission's regulations require between filing the ISR and holding the ISR meetings. Furthermore, parties would have until May 1, 2016 to file their proposed study plan modifications, in essence 6 months from when information is provided to file proposed study plan modifications.

AEA requests that the Commission issue a revised schedule at its earliest convenience, after which AEA will begin to file the technical memoranda and reports listed in Attachment 3

If you have any questions related to this matter or need additional information, please do not hesitate to contact the undersigned at (907) 771-3955. Thank you.

Sincerely,



Wayne Dyok
Project Manager
Alaska Energy Authority

cc: Distribution List

Attachment 1
Susitna-Watana Hydroelectric Project No. 14241
Proposed ILP Schedule

Responsible Party	Pre-Filing Milestone	FERC Regulation	Date
AEA	File reports which summarize data that has become available since the June 2014 ISR.	NA	On or Before to November 6, 2015 (as reports become available)
AEA	File ISR Part D.	NA	November 6, 2015
AEA	Hold Initial Study Report Meeting for all studies (6 days).	5.15(c)(2) waived	February 16, 2016
AEA	File Initial Study Report Meeting Summary.	5.15(c)(3) modify	March 17, 2016
All Stakeholders	File Disagreements with Meeting Summary and Recommendations for Modified or New Studies.	5.15(c)(4) modify	May 1, 2016
AEA and All Stakeholders	File Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies.	5.15(c)(5) modify	June 30, 2016
FERC	Issue Director Determination on Meeting Summary Disagreements and Recommendations for Modified or New Studies.	5.15(c)(6) modify	August 29, 2016

State of Alaska

Bill Walker, Governor

Office of Management and Budget
PO Box 110020
Juneau AK 99811-0020
(907) 465-4660, fax 465-3008

MEMORANDUM

Date: July 6, 2015

To: Sara Fisher-Goad, Executive Director
Alaska Energy Authority

From: Pat Pitney, Director
Office of Management and Budget

Subject: Susitna Watana Hydroelectric Project – Administrative Order 271

On December 26, 2014, the Governor issued Administrative Order 271. With regards to the Susitna-Watana Hydroelectric Project (Project), the Governor directed the Alaska Energy Authority (Authority) to cease all discretionary spending, and not to incur new or additional expenses or obligations or entering into or amending existing contracts. The administrative order also directed the Authority not to spend unobligated or unencumbered funds, and to submit a status report of the project to the Office of Management and Budget.

Based upon our review of this project, we concur that non-discretionary expenditures would include those necessary to advance the Project to complete and preserve the value of Federal Energy Regulatory Commission (FERC) required studies, including those that are in process provided they are within existing appropriations. Incrementally advancing the project toward the FERC study plan determination is deemed non-discretionary activity. The Authority may utilize the remaining $6.6 million of the original $192 million appropriation to continue to move the project through 2017, at which time the project will be revisited in the context of the fiscal environment and other competing major capital projects.

I appreciate the time that you and your staff have devoted to this project. Please feel free to call me to discuss further.

Cc: Fred Parady, Deputy Commissioner, Department of Commerce Community and Economic Development

Arnold Liebelt, OMB Policy Analyst, Office of Management and Budget

Attachment 3
Susitna-Watana Hydroelectric Project (FERC No. 14241)
Reports Anticipated to be filed with FERC between September and November 6, 2015

Study / Section	Study Name	Report Anticipated to be Filed
4 Geology and Soils		
04.5_GS	Geology and Soils Characterization Study	2014 Study Implementation Report
5 Water Quality		
05.5_WQ	Baseline Water Quality Study	Study Completion Report
05.6_WQMod	Water Quality Modeling Study	2014 Study Implementation Report
05.7_Merc	Mercury Assessment and Potential for Bioaccumulation Study	2014 Study Implementation Report
6 Geomorphology		
06.5_Geo	Geomorphology Study	2014 Study Implementation Report
06.6_GeoMod	Fluvial Geomorphology Modeling below Watana Dam Study	2014 Study Implementation Report
7 Hydrology-Related Resources		
07.5_GW	Groundwater Study	2014 Study Implementation Report
07.6_Ice	Ice Processes in the Susitna River Study	2014 Study Implementation Report
07.7_Glac	Glacial and Runoff Changes Study	No additional information since June 2014 ISR
8 Instream Flow		
08.5_IFS	Fish and Aquatics Instream Flow Study	2014 Study Implementation Report
08.6_RIFS	Riparian Instream Flow Study	2014 Study Implementation Report
9 Fish and Aquatics		
09.5_FDAUP	Study of Fish Distribution and Abundance in the Upper Susitna River	2014 Study Implementation Report
09.6_FDAML	Study of Fish Distribution and Abundance in the Middle and Lower Susitna River	2014 Study Implementation Report
09.7_Escape	Salmon Escapement Study	Study Completion Report
09.8_RivPro	River Productivity Study	2014 Study Implementation Report
09.9_AqHab	Characterization and Mapping of Aquatic Habitats Study	Study Completion Report
09.10_ResFsh	The Future Watana Reservoir Fish Community and Risk of Entrainment Study	No additional information since June 2014 ISR
09.11_Passage	Study of Fish Passage at Watana Dam	2014 Study Implementation Report
09.12_Barrier	Study of Fish Passage Barriers in the Middle and Upper Susitna River and Susitna Tributaries	2014 Study Implementation Report
09.13_AqTrans	Aquatic Resources within the Access Alignment, Transmission Alignment, and Construction Area Study	2014 Study Implementation Report
09.14_Gene	Genetic Baseline Study for Selected Fish Species	2014 Study Implementation Report

Study / Section	Study Name	Report Anticipated to be Filed
09.15_FshHarv	Analysis of Fish Harvest in and Downstream of the Susitna-Watana Hydroelectric Project Area	No additional information since June 2014 ISR
09.16_Eul	Eulachon Run Timing, Distribution, and Spawning in the Susitna River Study	No additional information since June 2014 ISR and fall 2014 technical memoranda
09.17_CIBW	Cook Inlet Beluga Whale Study	No additional information since June 2014 ISR and fall 2014 technical memoranda
10 Wildlife		
10.5_Moose	Moose Distribution, Abundance, Movements, Productivity, and Survival Study	2014 Study Implementation Report
10.6_Cbou	Caribou Distribution, Abundance, Movements, Productivity, and Survival Study	No additional information since June 2014 ISR
10.7_Dall	Dall's Sheep Distribution and Abundance Study	Study Completion Report
10.8_LgCar	Distribution, Abundance, and Habitat Use by Large Carnivores Study	2014 Study Implementation Report
10.9_Wolverine	Wolverine Distribution and Abundance Study	Study Completion Report
10.10_TerFur	Study of Terrestrial Furbearer Abundance and Habitat Use	Study Completion Report
10.11_AqFur	Aquatic Furbearer Abundance and Habitat Use Study	2014 Study Implementation Report
10.12_SmMam	Small Mammal Species Composition and Habitat Use Study	No additional information since June 2014 ISR
10.13_Bat	Bat Distribution and Habitat Use Study	Study Completion Report
10.14_Raptor	Surveys of Eagles and Other Raptors Study	2014 Study Implementation Report
10.15_WtrBird	Waterbird Migration, Breeding, and Habitat Study	Study Completion Report
10.16_Breed	Breeding Survey Study of Landbirds and Shorebirds	2014 Study Implementation Report
10.17_Ptar	Population Ecology of Willow Ptarmigan in Game Management Unit 13 Study	No additional information since June 2014 ISR
10.18_Frog	Study of Distribution and Habitat Use of Wood Frogs	Study Completion Report
10.19_WldHab	Evaluation of Wildlife Habitat Use Study	No additional information since June 2014 ISR
10.20_WldHarv	Wildlife Harvest Analysis Study	No additional information since June 2014 ISR
11 Botanical		
11.5_VegHab	Vegetation and Wildlife Habitat Mapping Study	No additional information since June 2014 ISR
11.6_Rip	Riparian Vegetation Study Downstream of the Proposed Susitna-Watana Dam	2014 Study Implementation Report
11.7_Wetland	Wetland Mapping Study	No additional information since June 2014 ISR
11.8_Rare	Rare Plant Study	No additional information since June 2014 ISR
11.9_Invasive	Invasive Plant Study	No additional information since June 2014 ISR
12 Recreation and Aesthetics		

Study / Section	Study Name	Report Anticipated to be Filed
12.5_Rec	Recreation Resources Study	2014 Study Implementation Report
12.6_Aes	Aesthetics Resources Study	2014 Study Implementation Report
12.7_RecFlow	Recreation River Flow Study	2014 Study Implementation Report
13 Cultural and Paleontology		
13.5_Cultural	Cultural Resources Study	2014 Study Implementation Report
13.6_Paleo	Paleontological Resources Study	No additional information since June 2014 ISR
14 Subsistence		
14.5_Sub	Subsistence Baseline Documentation Study	2014 Study Implementation Report
15 Socioeconomics and Transportation		
15.5_Econ	Regional Economic Evaluation Study	No additional information since June 2014 ISR
15.6_Soc	Social Conditions and Public Goods and Services Study	No additional information since June 2014 ISR
15.7_Tran	Transportation Resources Study	2014 Study Implementation Report
15.8_Health	Health Impact Assessment Study	2014 Study Implementation Report
15.9_Air	Air Quality Study	2014 Study Implementation Report
16 Project Safety		
16.5_PMF	Probable Maximum Flood Study	No additional information since June 2014 ISR
16.6_Seis	Site Specific Seismic Hazard Study	Study Completion Report

Attachment 4
Summary of AEA Consultation Record Regarding ILP Restart and Proposed Licensing Schedule

Affiliation	Staff	AEA Staff	Date	Time
Cook Inlet Region Working Group (CIRWG) - Chickaloon Moose Creek Native Association	Eydie Baller	Julie Anderson	various July- mid August 2015	various
CIRWG - Cook Inlet Region, Inc.	Jason Brune	Julie Anderson	various July- mid August 2015	various
CIRWG - Seldovia Native Association, Inc	Tony Cange	Julie Anderson	various July- mid August 2015	various
CIRWG - Ninilchik Native Association, Inc.	Greg Encelewski	Julie Anderson	various July- mid August 2015	various
CIRWG - Knikatnu, Inc.	Tom Harris	Julie Anderson	various July- mid August 2015	various
CIRWG - Tyonek Native Corporation	Jim Hoffman, Connie Downing	Julie Anderson	various July- mid August 2015	various
CIRWG - Salamatof Native Association, Inc.	Chris Monfor	Julie Anderson	various July- mid August 2015	various
Knik Tribe	Debra Call	Julie Anderson	8/13/15	11:30 am
ADFG	Joe Klein, Mark Burch, Carol Petraborg	Betsy McGregor	7/21/15	3-4 pm
DEC/AIR, DEC/Water, DHSS, DNR/DGGS, DNR/Lands, DNR/OHA, DNR/OPMP, DNR/PAADS, DNR/Parks, DNR/Water	Thomas Turner (DEC/AIR); William Ashton (DEC/Water); Sarah Yoder (DHSS); Deanne Stevens (DNR/DGGS); Clark Cox, Clifford Larson, Eric Moore, Candice Snow (DNR/Lands); Shina Duvall, Richard Vanderhoek (DNR/OHA); Marie Steele (DNR/OPMP); Wendy Steinberger (DNR/PAADS); Ryan Thomas (DNR/Parks); Carl Reese, David Schade, Michael Walton (DNR/Water)	Betsy McGregor, Wayne Dyok, Julie Anderson	7/28/15	10-11 am
EPA	Matt LaCroix, Jennifer Curtis	Betsy McGregor, Wayne Dyok	7/28/15	2-3 pm
ACOE	Roberta Budnik	Betsy McGregor, Wayne Dyok	8/5/15	10-11 am

Affiliation	Staff	AEA Staff	Date	Time
USFWS, NMFS, ADNR OPMP	Socheata Lor, Betsy McCracken, Ellen Lance, Catherine Yeargan, Melissa Burns (USFWS); Jeanne Hanson, Sue Walker, Sean Egan, Ed Meyer, Tom Meyer (NMFS); Guy Phillips, Jim Munter (NMFS contractors); Marie Steele (DNR)	Betsy McGregor, Wayne Dyok, Julie Anderson	8/5/15	1-2 pm
USFWS, NMFS	Socheata Lor, Betsy McCracken, Ellen Lance (USFWS); Jeanne Hanson, Sue Walker, Sean Egan, Ed Meyer, Tom Meyer (NMFS)	Betsy McGregor, Wayne Dyok, Julie Anderson	8/13/15	10:30-11:30 am
BLM	Brenda Becker, Dan Teitzel, Kirsten Heins	Betsy McGregor, Wayne Dyok	8/13/15	9-10 am
Susitna River Coalition	Mike Wood	Julie Anderson	various 8/5/15 through 8/18/15	various

AEA Team Member		Other Party	
Name:	*Julie Anderson*	**Name:**	*See below*
Organization:	*AEA*	**Organization:**	*Cook Inlet Region Working Group*
Study Area:	*NA*	**Phone Number:**	*NA*
Date:	*Various*	**Time:**	
Meeting held by: [X] AEA Team [ ] Other Party			

Meeting participants and dates:
Tom Harris, CEO – Knikatnu, Inc.7/10/15 (teleconference)
Chris Monfor, CEO – Salamatof Native Association, Inc. 7/10/15 (teleconference)
Jason Brune, Sr. Director, Lands and Resources - Cook Inlet Region, Inc. 7/10/15 (teleconference)
Eydie Baller, CEO – Chickaloon Moose Creek Native Association, Inc 7/13/15 (teleconference)
Greg Encelewski, CEO – Ninilchik Native Association, Inc. 7/13/15 (teleconference)
Tony Cange, CEO - Seldovia Native Association, Inc. 7/13/15 (teleconference)
Jim Hoffman, CEO and Connie Downing, Sr. Lands Manager - Tyonek Native Corporation (TNC) meeting in TNC office 8/6/15

Email correspondence to all participants and discussions on various dates early July through mid-August 2015.

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination.

Material Provided:
- Pat Pitney 7/6/15 memo regarding Administrative Order 271 and the Susitna-Watana Project
- Proposed ILP schedule through FERC Director's Determination of ISR material

Discussion:

Julie Anderson (AEA) provided an overview of Pat Pitney's 7/6/15 memo regarding Administrative Order 271 and there was some discussion regarding the near term activities planned for the Susitna-Watana Hydroelectric Project in accordance with the new direction from the Administration.

AEA clarified what was considered non-discretionary activities and provided examples:
- Permit fees and compliance.
- demobilization of installed field equipment;
- preservation of the state's investment thus far, completion of analysis of data already collected, completion of studies near completion;
- continuation of licensing effort through FERC Director's Determination on all data collected, analyzed and reported;
- Cumulative complete datasets and reports available for the public, resource managers, researchers, and developers in the most usable format;

<u>Study Implementation</u>
In light of the memo, the following activities would occur during 2015 regarding study implementation:

- Decommissioning of data collection sites where data is adequate or has met the FERC-approve Study Plan (seismic stations, some meteorological stations, radiotelemetry stations for salmon escapement study, some hydrology stations);
- Continuation of AEA support for ADFG to complete surveying of collared moose, caribou and ptarmigan;
- Completion of Large Carnivore Study;
- Completion of vegetation and wetland surveying and mapping;
- Completion of 3-yr seedling survival study;
- Continued hydrologic data collection based on needs identified by riverine modelers;
- Continued data analysis and reporting to preserve the value of the State's investment thus far.

Licensing Activities

AEA plans to file tech memos during September through early November 2015 summarizing data collection and analysis that has occurred since the June 2014 ISR (Parts A, B and C). The tech memos would be in a similar format to the ISR and would include the study objectives, methods, variances to the methods and results and discussion. Depending on the study, the results and/or discussion sections may be cumulative for all years of data collection. For ongoing multi-year studies, data analysis will not be conducted on incomplete datasets. But work performed since the June 2014 ISR will be summarized. Supporting data will also be provided in the same manner as it has in the past, via GINA's Susitna-Watana website.

AEA will also file an ISR Part D for each study November 6, 2015. The ISR Part D will primarily be in a tabular format. The purpose is to provide a status of the study implementation – indicate all tech memos that have been filed during study implementation, provide a brief description of each report, provide context of reports to one another as well as the June 2014 ISR (e.g., indicate what is supplemental information versus where new information supersedes previously filed information). The ISR Part D would also summarize proposed modifications as well as the remaining steps to complete the study.

A complete set of ISR meetings would then be held beginning the week of February 15, 2016.

The remainder of the schedule was discussed:

- AEA files Meeting Summary – March 15, 2016
- Licensing Participants file Disagreements with the Meeting Summary and Recommendations for Modified or New Studies –April 30, 2016
- All Parties file Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies –June 30, 2016
- FERC issues Director's Determination – August 30, 2016

AEA requested feedback on inclusion of all of the information gathered thus far to be considered for review, comments and FERC's Determination; the value of taking the Project up to the ISR Determination phase of the Integrated Licensing Process; and the proposed schedule.

The members of the Cook Inlet Region Working Group (CIRWG) identified above were pleased that the state was moving forward to the FERC Study Plan determination and agreed that using the most current data to make study plan determinations was important. Additionally, they did not express any concerns

with the proposed schedule. AEA will continue to provide monthly updates to the group on any activity that occurs on or near their lands.

Action Item:

Provide meeting notes for review by attendees.

AEA Team Member		Other Party	
Name:	*Julie Anderson*	**Name:**	*Deb Call, Vice-Chair*
Organization:	*AEA*	**Organization:**	*Knik Tribe*
Study Area:	*NA*	**Phone Number:**	*907-306-3689*
Date:	*8/13/2015*	**Time:**	*11:30 am – in Anchorage*
Meeting held by: [X] AEA Team [ ] Other Party			

Others at meeting: N/A

Subject: Integrated Licensing Process restart

Discussion:

- Pat Pitney 7/6/15 memo regarding Administrative Order 271 and the Susitna-Watana Project
- Proposed ILP schedule through FERC Director's Determination of ISR material and use of the most current study data.

Deb Call agreed that it was important to provide the most current study data available to FERC for the Final Study Plan Determination and the proposed schedule provided adequate time for participants' review and comments.

Action Item:

Provide a copy of the meeting record.

AEA Team Member		Other Party	
Name:	*Betsy McGregor*	**Name:**	*Mark Burch, Joe Klein, Carol Petraborg*
Organization:	*AEA*	**Organization:**	*ADFG*
Study Area:	*NA*	**Phone Number:**	*NA*
Date:	*7/21/15*	**Time:**	*3-4 pm*
Meeting held by: [X] AEA Team [ ] Other Party			

Others at meeting: none

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination.

Discussion:

Betsy McGregor (AEA) provided an overview of Pat Pitney's 7/6/15 memo regarding Administrative Order 271 and the near term activities planned for the Susitna Project in accordance with the new direction from the Administration.

Study Implementation

In light of the memo, the following activities would occur during 2015 regarding study implementation:

- Decommissioning of data collection sites where data is adequate or has met the FERC-approve Study Plan (seismic stations, some meteorological stations, radiotelemetry stations for salmon escapement study, some hydrology stations);
- Continuation of AEA support for ADFG to complete surveying of collared moose, caribou and ptarmigan;
- Completion of Large Carnivore Study;
- Completion of vegetation and wetland surveying and mapping;
- Completion of 3-yr seedling survival study;
- Continued hydrologic data collection based on needs identified by riverine modelers;
- Continued data analysis and reporting to preserve the value of the State's investment thus far.

Licensing Activities

AEA plans to file tech memos during September through early November 2015 summarizing data collection and analysis that has occurred since the June 2014 ISR (Parts A, B and C). The tech memos would be in a similar format to the ISR and would include the study objectives, methods, variances to the methods and results and discussion. Depending on the study, the results and/or discussion sections may be cumulative for all years of data collection. For ongoing multi-year studies, data analysis will not be conducted on incomplete datasets. But work performed since the June 2014 ISR will be summarized. Supporting data will also be provided in the same manner as it has in the past, via GINA's Susitna-Watana website.

AEA will also file an ISR Part D for each study in early November. The ISR Part D will primarily be in a tabular format. The purpose is to provide a status of the study implementation – indicate all tech memos that have been filed during study implementation, provide a brief description of each report, provide context of reports to one another as well as the June 2014 ISR (e.g., indicate what is supplemental information versus where new information supersedes previously filed information). The

ISR Part D would also summarize proposed modifications as well as the remaining steps to complete the study.

A complete set of ISR meetings would then be held in mid-February 2016.

The remainder of the schedule was discussed:

- AEA files Meeting Summary – Mid-March 2016
- Licensing Participants file Disagreements with the Meeting Summary and Recommendations for Modified or New Studies – End of April 2016
- All Parties file Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies – End of June 2016
- FERC issues Director's Determination – End of August 2016

AEA requested feedback on inclusion of all of the information gathered thus far to be considered for review, comments and FERC's Determination; the value of taking the Project up to the ISR Determination phase of the Integrated Licensing Process; and the proposed schedule.

ADFG expressed support for providing the most current information to participants for review and bringing the Project forward to the ISR Determination. Joe Klein appreciated that there were adequate funds to bring the licensing process up to that point. Based on feedback he had received from other ADFG staff, the amount of review time and the modified ILP schedule seemed to work out well. Review would occur during the winter and early spring, outside of the typical field season. Filing of the Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies would occur at the end of the State's FY16 fiscal year.

The vast amount of data was also discussed and its value to the State beyond the Susitna-Watana project for state and federal resource managers, research and future development. AEA will continue to support GINA for housing the data. All of the datasets that do not contain sensitive information (e.g. cultural resources) will be made available to the public in a usable format.

Action Item:

Provide meeting notes for review by attendees.

AEA Team Member		Other Party	
Name:	*Betsy McGregor, Wayne Dyok*	**Name:**	*See below*
Organization:	*AEA*	**Organization:**	*DEC, DHSS, DGGS, DNR Parks, DNR Water, DNR Lands, DNR PAADS, SHPO, DNR OPMP*
Study Area:	*NA*	**Phone Number:**	*NA*
Date:	*7/28/15*	**Time:**	*10-11 am*
Meeting held by: [X] AEA Team [ ] Other Party			

Others at meeting:

DEC/AIR	Thomas Turner
DEC/Water	William Ashton
DHSS	Sarah Yoder
DNR/DGGS	Deanne Stevens
DNR/Lands	Clark Cox, Clifford Larson, Eric Moore, Candice Snow
DNR/OHA	Shina Duvall, Richard Vanderhoek
DNR/OPMP	Marie Steele
DNR/PAADS	Wendy Steinberger
DNR/Parks	Ryan Thomas
DNR/Water	Carl Reese, David Schade, Michael Walton

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination.

Discussion:

Wayne Dyok (AEA) provided an overview of Pat Pitney's 7/6/15 memo regarding Administrative Order 271 and the near term activities planned for the Susitna Project in accordance with the new direction from the Administration.

AEA clarified what was considered non-discretionary activities and provided examples:

- Permit fees and compliance, GINA hosting Susitna data, ARLIS hosting library of historical and current documents;
- Demobilization of installed field equipment;
- Preservation of the state's investment thus far, completion of analysis of data already collected, completion of studies near completion;
- Continuation of licensing effort through FERC Director's Determination on all data collected, analyzed and reported;
- Cumulative complete datasets and reports available for the public, resource managers, researchers, and developers in the most usable format;

<u>Study Implementation</u>

In light of the memo, the following activities would occur during 2015 regarding study implementation:

- Decommissioning of data collection sites where data is adequate or has met the FERC-approve Study Plan (seismic stations, some meteorological stations, radiotelemetry stations for salmon escapement study, some hydrology stations);
- Continuation of AEA support for ADFG to complete surveying of collared moose, caribou and ptarmigan;

- Completion of Large Carnivore Study;
- Completion of vegetation and wetland surveying and mapping;
- Completion of 3-yr seedling survival study;
- Continued hydrologic data collection based on needs identified by riverine modelers, including consideration of USGS gages;
- Continued data analysis and reporting to preserve the value of the State's investment thus far.

Current funds are inadequate to complete all of the riverine models. AEA's contractors will systematically bring all models up to a comparable level. The first priority is on completion of longitudinal/1D models, followed by 2D modeling in each Focus Area, beginning with FA-128.

The vast amount of data was also discussed and its value to the State beyond the Susitna-Watana project for state and federal resource managers, research and future development. AEA will continue to support GINA for housing the data. All of the datasets that do not contain sensitive information (e.g. cultural resources) will be made available to the public in a usable format. David Shade commented on the value of the hydrology data and wanted to be sure it would be available for regional groundwater and surface water modeling.

Licensing Activities

AEA plans to file tech memos/reports during September through early November 2015 summarizing data collection and analysis that has occurred since the June 2014 ISR (Parts A, B and C). The tech memos would be in a similar format to the ISR and would include the study objectives, methods, variances to the methods and results and discussion. Depending on the study, the results and/or discussion sections may be cumulative for all years of data collection. For ongoing multi-year studies, data analysis will not be conducted on incomplete datasets. But work performed since the June 2014 ISR will be summarized. Supporting data will also be provided in the same manner as it has in the past, via GINA's Susitna-Watana website.

AEA will also file an ISR Part D for each study in early November. The ISR Part D will primarily be in a tabular format. The purpose is to provide a status of the study implementation – indicate all tech memos that have been filed during study implementation, provide a brief description of each report, provide context of reports to one another as well as the June 2014 ISR (e.g., indicate what is supplemental information versus where new information supersedes previously filed information). The ISR Part D would also summarize proposed modifications as well as the remaining steps to complete the study.

A complete set of ISR meetings would then be held in mid-February 2016.

The remainder of the schedule was discussed:

- AEA files Meeting Summary – Mid-March 2016
- Licensing Participants file Disagreements with the Meeting Summary and Recommendations for Modified or New Studies – End of April 2016
- All Parties file Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies – End of June 2016
- FERC issues Director's Determination – End of August 2016

After November 6, 2015 any collection or analysis of data will not be included in the ISR review; data analysis and reporting after November will continue as appropriate in order to preserve the information for the state.

AEA requested feedback on inclusion of all of the information gathered thus far to be considered for review, comments and FERC's Determination; the value of taking the Project up to the ISR Determination phase of the Integrated Licensing Process; and the proposed schedule.

State representatives commented that the proposed timeline is very reasonable; the state agencies do not object to the proposed schedule. The state agencies would prefer the most up-to-date analysis and data relevant to the review; it is "nonsensical" to review incomplete data sets.

Discussion ensued regarding state permits for access, data collection and/or equipment installation and demobilization.

Action Items:

- Provide meeting notes for review by attendees.
- AEA Schedule meeting with DEC on 2013 & 2014 water quality data
- AEA may contact Parks to go out in field when closing out sites
- OPMP/HSS Schedule meeting with AEA to provide HIA status

AEA Team Member		Other Party	
Name:	*Betsy McGregor, Wayne Dyok*	**Name:**	*Matt LaCroix, Jennifer Curtis*
Organization:	*AEA*	**Organization:**	*EPA*
Study Area:	*NA*	**Phone Number:**	*NA*
Date:	*7/28/15*	**Time:**	*2-3 pm*
Meeting held by: [X] AEA Team [ ] Other Party			

Others at meeting: none

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination.

Handouts:

- Agenda
- Pat Pitney 7/6/15 memo regarding Administrative Order 271 and the Susitna-Watana Project
- Proposed ILP schedule through FERC Director's Determination of ISR material

Discussion:

Wayne Dyok (AEA) provided an overview of Pat Pitney's 7/6/15 memo regarding Administrative Order 271 and the near term activities planned for the Susitna-Watana Hydroelectric Project in accordance with the new direction from the Administration.

AEA clarified what was considered non-discretionary activities and provided examples:

- Permit fees and compliance, GINA hosting Susitna data, ARLIS hosting library of historical and current documents;
- Demobilization of installed field equipment;
- Preservation of the state's investment thus far, completion of analysis of data already collected, completion of studies near completion;
- Continuation of licensing effort through FERC Director's Determination on all data collected, analyzed and reported;
- Cumulative complete datasets and reports available for the public, resource managers, researchers, and developers in the most usable format;
- Completion of vegetation and wetland mapping as match obligation for USDA grant awarded to Ahtna [Copper River-Ahtna Tribal Resource Conservation District].

<u>Study Implementation</u>

In light of the memo, the following activities would occur during 2015 regarding study implementation:

- Decommissioning of data collection sites where data is adequate or has met the FERC-approved Study Plan (seismic stations, some meteorological stations, radiotelemetry stations for salmon escapement study, some hydrology stations);
- Continuation of AEA support for ADFG to complete surveying of collared moose, caribou and ptarmigan;
- Completion of Large Carnivore Study;
- Completion of vegetation and wetland surveying and mapping;
- Completion of 3-yr seedling survival study;
- Continued hydrologic data collection based on needs identified by riverine modelers;

- Continued data analysis and reporting to preserve the value of the State's investment thus far.

Licensing Activities

AEA plans to file tech memos during September through early November 2015 summarizing data collection and analysis that has occurred since the June 2014 ISR (Parts A, B and C). The tech memos would be in a similar format to the ISR and would include the study objectives, methods, variances to the methods and results and discussion. Depending on the study, the results and/or discussion sections may be cumulative for all years of data collection. For ongoing multi-year studies, data analysis will not be conducted on incomplete datasets, but work performed since the June 2014 ISR will be summarized. Supporting data will also be provided in the same manner as it has in the past, via GINA's Susitna-Watana website.

AEA will also file an ISR Part D for each study November 6, 2015. The ISR Part D will primarily be in a tabular format. The purpose is to provide a status of the study implementation – indicate all tech memos that have been filed during study implementation, provide a brief description of each report, provide context of reports to one another as well as the June 2014 ISR (e.g., indicate what is supplemental information versus where new information supersedes previously filed information). The ISR Part D would also summarize proposed modifications as well as the remaining steps to complete the study.

A complete set of ISR meetings would then be held starting on February 16, 2016.

The remainder of the schedule was discussed:

- AEA files Meeting Summary – March 15, 2016
- Licensing Participants file Disagreements with the Meeting Summary and Recommendations for Modified or New Studies –April 30, 2016
- All Parties file Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies –June 30, 2016
- FERC issues Director's Determination – August 30, 2016

AEA requested feedback on inclusion of all of the information gathered thus far to be considered for review, comments and FERC's Determination; the value of taking the Project up to the ISR Determination phase of the Integrated Licensing Process; and the proposed schedule.

EPA staff expressed no concern with the proposed schedule. Staff load can be challenging around the holidays so the extra lead time with the schedule is helpful. It was noted that the additional time in the schedule between providing materials/ISR Part D for review, holding the ISR meetings, and filing of Meeting Summary Disagreements and Recommendations for Modified or New Studies is a benefit. EPA staff did not see a downside of considering all of the available information/data on the record within the FERC process. The ISR Part D, providing a status of each study implementation as described, would be helpful for reviewers.

The vast amount of data was also discussed and its value to the State beyond the Susitna-Watana project for state and federal resource managers, research and future development. AEA will continue to support GINA for housing the data. All of the datasets that do not contain sensitive information (e.g. cultural resources) will be made available to the public in a usable format.

Action Item:
Provide meeting notes for review by attendees.

AEA Team Member		Other Party	
Name:	*Betsy McGregor, Wayne Dyok*	**Name:**	*Roberta Budnik*
Organization:	*AEA*	**Organization:**	*ACOE*
Study Area:	*NA*	**Phone Number:**	*NA*
Date:	*8/5/15*	**Time:**	*10-11 am*
Meeting held by: [X] AEA Team [ ] Other Party			

Others at meeting: none

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination.

Discussion:

Betsy McGregor (AEA) provided an overview of the Project history beginning with AEA filing its PAD in December 2011. Betsy discussed the consultation that occurred with the ACOE, EPA and MSB during the study planning phase in 2012 to develop the methodologies to be used in wetland delineation and functional assessment. AEA has been implementing the FERC-approved Study Plan with variances and proposed modifications noted in the June 2014 ISR.

Roberta asked when the ACOE Section 404 permit would be filed. AEA responded that the permit would be filed simultaneously with the License Application.

Wayne Dyok (AEA) provided an overview of Pat Pitney's 7/6/15 memo regarding Administrative Order 271 and the near term activities planned for the Susitna Project in accordance with the new direction from the Administration.

Study Implementation

In light of the memo, the following activities would occur during 2015 regarding study implementation:

- Decommissioning of data collection sites where data is adequate or has met the FERC-approve Study Plan (seismic stations, some meteorological stations, radiotelemetry stations for salmon escapement study, some hydrology stations);
- Continuation of AEA support for ADFG to complete surveying of collared moose, caribou and ptarmigan;
- Completion of Large Carnivore Study;
- Completion of vegetation and wetland surveying and mapping;
- Completion of 3-yr seedling survival study;
- Continued hydrologic data collection based on needs identified by riverine modelers;
- Continued data analysis and reporting to preserve the value of the State's investment thus far.

Licensing Activities

AEA plans to file tech memos during September through early November 2015 summarizing data collection and analysis that has occurred since the June 2014 ISR (Parts A, B and C). The tech memos would be in a similar format to the ISR and would include the study objectives, methods, variances to the methods and results and discussion. Depending on the study, the results and/or discussion sections may be cumulative for all years of data collection. For ongoing multi-year studies, data analysis will not be conducted on incomplete datasets. But work performed since the June 2014 ISR will be summarized.

Supporting data will also be provided in the same manner as it has in the past, via GINA's Susitna-Watana website.

AEA will also file an ISR Part D for each study in early November. The ISR Part D will primarily be in a tabular format. The purpose is to provide a status of the study implementation – indicate all tech memos that have been filed during study implementation, provide a brief description of each report, provide context of reports to one another as well as the June 2014 ISR (e.g., indicate what is supplemental information versus where new information supersedes previously filed information). The ISR Part D would also summarize proposed modifications as well as the remaining steps to complete the study.

A complete set of ISR meetings would then be held in mid-February 2016, for six days over two weeks.

The remainder of the schedule was discussed:

- AEA files Meeting Summary – Mid-March 2016
- Licensing Participants file Disagreements with the Meeting Summary and Recommendations for Modified or New Studies – End of April 2016
- All Parties file Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies – End of June 2016
- FERC issues Director's Determination – End of August 2016

AEA requested feedback on inclusion of all of the information gathered thus far to be considered for review, comments and FERC's Determination; the value of taking the Project up to the ISR Determination phase of the Integrated Licensing Process; and the proposed schedule.

Roberta responded that more information would allow for a more informed decision and would be transparent. She approved of AEA's proposed schedule extending FERC's ILP milestone deliverables for all parties, indicating that would prevent licensing participants from requesting additional time. She noted that the filing dates were not around major holidays. She could not provide a definitive answer on the adequacy of time for review. However, she noted that providing the schedule and materials ahead of time would allow for the agency to staff up and shift resources around to accommodate the proposed schedule.

Action Item:

Provide meeting notes for review by attendees.

AEA Team Member		Other Party	
Name:	*Betsy McGregor, Wayne Dyok*	**Name:**	*Brenda Becker, Dennis Teitzel, Kirsten Heins*
Organization:	*AEA*	**Organization:**	*BLM*
Study Area:	*NA*	**Phone Number:**	*NA*
Date:	*8/13/15*	**Time:**	*9-10 am*
Meeting held by: [X] AEA Team [ ] Other Party			

Others at meeting: none

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination.

Handouts:

- Agenda
- Pat Pitney 7/6/15 memo regarding Administrative Order 271 and the Susitna-Watana Project
- Proposed ILP schedule through FERC Director's Determination of ISR material

Discussion:

Wayne Dyok (AEA) provided an overview of Pat Pitney's 7/6/15 memo regarding Administrative Order 271 and the near term activities planned for the Susitna-Watana Hydroelectric Project in accordance with the new direction from the Administration.

AEA clarified what was considered non-discretionary activities and provided examples:

- Permit fees and compliance, GINA hosting Susitna data, ARLIS hosting library of historical and current documents;
- Demobilization of installed field equipment;
- Preservation of the state's investment thus far, completion of analysis of data already collected, completion of studies near completion;
- Continuation of licensing effort through FERC Director's Determination on all data collected, analyzed and reported;
- Cumulative complete datasets and reports available for the public, resource managers, researchers, and developers in the most usable format;

<u>Study Implementation</u>

In light of the memo, the following activities would occur during 2015 regarding study implementation:

- Decommissioning of data collection sites where data is adequate or has met the FERC-approved Study Plan (seismic stations, some meteorological stations, radiotelemetry stations for salmon escapement study, some hydrology stations);
- Continued hydrologic data collection based on needs identified by riverine modelers;
- Completion of moose browse survey in March 2016 to complete the Moose Study;
- Collection of ice thickness and water stage elevation data during January – March 2016.
- Continuation of AEA support for ADFG to complete surveying of collared moose, caribou and ptarmigan through the year;
- Completion of Large Carnivore Study;
- Completion of vegetation and wetland surveying and mapping;

- Completion of 3-yr seedling survival study;
- Continued data analysis and reporting to preserve the value of the State's investment thus far.

Licensing Activities

AEA plans to file tech memos during September through early November 2015 summarizing data collection and analysis that has occurred since the June 2014 ISR (Parts A, B and C) and the fall 2014 filed materials. The tech memos would be in a similar format to the ISR and would include the study objectives, methods, variances to the methods and results and discussion. Depending on the study, the results and/or discussion sections may be cumulative for all years of data collection. For ongoing multi-year studies, data analysis will not be conducted on incomplete datasets, but work performed since the June 2014 ISR will be summarized. Supporting data will also be provided in the same manner as it has in the past, via GINA's Susitna-Watana website.

AEA will also file an ISR Part D for each study November 6, 2015. The ISR Part D will primarily be in a tabular format. The purpose is to provide a status of the study implementation – indicate all tech memos that have been filed during study implementation, provide a brief description of each report, provide context of reports to one another as well as the June 2014 ISR (e.g., indicate what is supplemental information versus where new information supersedes previously filed information). The ISR Part D would also summarize proposed modifications as well as the remaining steps to complete the study.

A complete set of ISR meetings would then be held starting on February 16, 2016.

The remainder of the schedule was discussed:

- AEA files Meeting Summary – March 15, 2016
- Licensing Participants file Disagreements with the Meeting Summary and Recommendations for Modified or New Studies –April 30, 2016
- All Parties file Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies –June 30, 2016
- FERC issues Director's Determination – August 30, 2016

AEA requested feedback on inclusion of all of the information gathered thus far to be considered for review, comments and FERC's Determination; the value of taking the Project up to the ISR Determination phase of the Integrated Licensing Process; and the proposed schedule.

BLM staff expressed no concern with the proposed schedule or considering the complete set of data for review for FERC's Study Plan Determination. Dennis indicated that it made sense to review the full dataset since it would need to be reviewed anyway.

Discussion ensued regarding land access permit compliance and removal of seismic stations from BLM land.

Action Item:
Provide meeting notes for review by attendees.

AEA Team Member		Other Party	
Name:	*Wayne Dyok, Betsy McGregor, Julie Anderson*	**Name:**	*See Below*
Organization:	*AEA*	**Organization:**	*NMFS, USFWS and DNR*
Study Area:	*NA*	**Phone Number:**	*NA*
Date:	*8/5/15 and 8/13/2015*	**Time:**	*1-2 pm; 10:30-11:30am, respectively*
Meeting held by: [X] AEA Team [ ] Other Party			

August 5, 2015 1-2 pm

Others at meeting: Socheata Lor (USFWS), Betsy McCracken (USFWS), Ellen Lance (USFWS), Catherine Yeargan (USFWS), Melissa Burns (USFWS); Jeanne Hanson (NMFS), Sue Walker (NMFS), Sean Egan (NMFS), Ed Meyer (NMFS), Tom Meyer (NMFS); Guy Phillips (NMFS contractor), Jim Munter (NMFS contractor); Marie Steele (DNR) [Wayne Dyok joined the meeting at 1:25 pm.]

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination.

Discussion:

Betsy McGregor (AEA) provided an overview of Pat Pitney's 7/6/15 memo regarding Administrative Order 271 and the near term activities planned for the Susitna Project in accordance with the new direction from the Administration and AEA's proposed ISR Determination Schedule.

AEA intends to move toward the "next logical stopping point" for the project. They plan to move forward in compliance with the AO using the remaining appropriated funds through fiscal years 2016 and 2017 as necessary to incrementally move towards a license application. Betsy McGregor explained that activities were prioritized based on the limited funds, necessary tasks (e.g., permit compliance, demobilization of equipment), tasks to preserve the value of data already collected, and the next FERC licensing steps. While some studies are considered important or of high priority, they cannot be implemented at this time because of the cost; for example, many studies require more than a million dollars each to complete.

Study Implementation

In light of the memo, the following activities would occur during 2015 regarding study implementation:

- Decommissioning of data collection sites where data is adequate or has met the FERC-approved Study Plan (seismic stations, some meteorological stations, radiotelemetry stations for salmon escapement study, some hydrology stations);
- Continuation of AEA support for ADFG to complete surveying of collared moose, caribou and ptarmigan;
- Completion of Large Carnivore Study;
- Completion of vegetation and wetland surveying and mapping;
- Completion of 3-yr seedling survival study;
- Continued hydrologic data collection based on needs identified by riverine modelers;
- Continued data analysis and reporting to preserve the value of the State's investment thus far.

Licensing Activities

AEA plans to file tech memos/reports during September through early November 2015 summarizing data collection and analysis that has occurred since the June 2014 ISR (Parts A, B and C) and the material filed during the fall of 2014. The tech memos would be in a similar format to the ISR and would include the study objectives, methods, variances to the methods and results and discussion. Depending on the study, the results and/or discussion sections may be cumulative for all years of data collection. AEA offered that the reports would be more substantive for the ten or eleven studies for which the FERC-approved Study Plan has been completed. For ongoing multi-year studies, data analysis will not be conducted on incomplete datasets, and these reports would be much shorter. Rather the work performed since the June 2014 ISR will be summarized but not analyzed. Supporting data will also be provided in the same manner as it has in the past, via GINA's Susitna-Watana website. *The Services prefer that AEA compile all information into a final, stand-alone ISR.*

AEA will also file an ISR Part D for each study in early November. The ISR Part D will primarily be in a tabular format. The purpose is to provide a status of the study implementation – indicate all tech memos that have been filed during study implementation, provide a brief description of each report, provide context of reports to one another as well as the June 2014 ISR (e.g., indicate what is supplemental information versus where new information supersedes previously filed information). The ISR Part D would also summarize proposed modifications as well as the remaining steps AEA believes are necessary to complete the FERC-approved Study Plan.

USFWS expressed concern that the Services have not had an opportunity to file comments regarding the first year of studies with FERC. The Services noted that they did not consider the FERC-approved Study Plan to be complete for any study given that the step in the Integrated Licensing Process which allows license participants to review study results to date and recommend modifications or new studies has not occurred. The Services believe that to be a fundamentally important step inherent in the ILP. AEA assumed the risk of continuing and completing some studies absent licensing participants' comments on those studies, recommendations for study modifications and proposed new studies, and FERC's study plan determination. The Services disagree with AEA that "10 or 11" studies are completed.

AEA responded that extensive consultation and collaboration with licensing participants occurred during the nearly yearlong study plan development phase; FERC issued its Study Plan Determination with recommendations, some of which included ongoing consultation which has occurred; and AEA implemented the FERC-approved Study Plan with variances noted in the June 2014 ISR.
AEA acknowledged their concerns and agreed that AEA is assuming risk by continuing implementation of the FERC-approved Study Plans without FERC's Study Plan Determination on the ISR or "first" year of study.

NMFS agreed and stated that they would like to "stay much closer to the process"; and expressed further interest in providing June 2014 ISR comments, study modifications, and new study recommendations now. AEA asked if their comments were only on the June 2014 ISR or if they also capture all of the reports filed in the fall of 2014. NMFS indicated that the Services' comments are not 100% complete on all of the material that has already been filed with FERC for review. AEA stated that they are not asking for comments now as some of the comments may be outdated and no longer valid based on additional information gathered.

AEA agreed to take some time to consider if AEA would respond to comments provided on the June 2014 ISR or would just respond at one time to up-to-date comments on all of the material cumulatively filed with FERC through the fall of 2015 as indicated in AEA's proposed schedule.

AEA requested feedback on inclusion of all of the information gathered thus far to be considered for review, comments and FERC's Determination; the value of taking the Project up to the ISR Determination phase of the Integrated Licensing Process; and the proposed schedule.

NMFS expressed support for providing the most current study data to participants for review prior to FERC issuing the Final Study Plan Determination.

The Services expressed significant concern regarding the ability to review the additional data with current resources under the proposed schedule (v7/21/15). AEA agreed to provide a draft table of the materials to be filed with FERC in addition to the ISR Part D to the meeting participants and schedule a follow up meeting for the next week to allow time to review the information and proposed schedule.

Betsy McGregor continued with the proposed schedule overview. A complete set of ISR meetings for all studies would be held in mid-February 2016, whether or not additional information would be filed in fall 2015. All cumulative information reported through the fall 2015 filings would be open for discussion; discussion would not be limited to new material filed since the June 2014 ISR.

The remainder of the schedule was discussed:

- AEA files Meeting Summary for the February 2016 meetings – Mid-March 2016
- Licensing Participants file Disagreements with the Meeting Summary and Recommendations for Modified or New Studies – End of April 2016
- All Parties file Responses to Meeting Summary Disagreements and Recommendations for Modified or New Studies – End of June 2016
- FERC issues Director's Determination – End of August 2016

Action Item:

AEA will provide a table of material to be filed with FERC in addition to the ISR Part D in fall 2015 by Monday, August 10.
Schedule a follow up meeting.
Provide meeting notes for review by attendees.
AEA will provide Pat Pitney's 7/6/15 memo.

August 13, 2015 10:30 – 11:30 am

Others at meeting: Socheata Lor (USFWS), Betsy McCracken (USFWS), , Ellen Lance (USFWS); Jeanne Hanson (NMFS), Sue Walker (NMFS), Ed Meyer (NMFS), Sean Egan (NMFS), Tom Meyer (NMFS).

Subject: Proposed licensing schedule from updated ISR submittal through Director's Determination – follow up meeting from August 05, 2015.

Discussion:

Julie Anderson reviewed the purpose of the meeting which was to get comments on the proposed licensing schedule, following the USFWS and NMFS review of the material discussed on 8/5/15 and the table provided to the Services late in the afternoon on 8/11/15.

AEA indicated that based on staffing and consultants' resources, schedule and budget, AEA intended to respond to licensing participants' comments on all of the material that has been filed at one time, as indicated in the proposed schedule, at the end of June 2016.

Betsy McGregor (AEA) provided an overview of the table which consists of a general list of the material anticipated to be filed in the fall 2015 by study in addition to the ISR Part D. This was provided for internal planning purposes only. The table indicates the studies for which data collection is considered complete and the reports would include a cumulative analysis for all years of data collection, as well as those studies for which there is no additional information to file since the June 2014 ISR and fall 2014 materials. The Services requested additional descriptions of the materials which would be provided for their review – i.e., number of pages and one or two-sentence descriptions of "update on data gathered in 2014" and/or "update on analysis conducted in 2014," where additional description was not provided in the table. In response, AEA indicated that the volume of material to be reviewed was much less than the June 2014 ISR, provided the table of studies and planned activities filed with FERC on March 24, 2014 and directed the Services to ISR Part C Section 7 *Completing the Study.* As the material has not been delivered to AEA or is in draft format, AEA is not able to provide page numbers and does not have the resources to provide additional detail for all studies at this time. AEA indicated that if the Services provided a request for information regarding a specific study after reviewing the information provided, AEA would follow up.

A discussion of the proposed schedule and impact on workload, staffing and contracting for USFWS, NMFS and AEA occurred. Concern was voiced by the agencies regarding their inability to meet the proposed schedule. AEA stated the material would be filed with FERC as the reports were finalized in the period between September and November 6, 2015. This will avoid a large amount of material being filed at the same time, allowing for a phased review by participants and two-and-a-half months review time for many tech memos/reports and six months to prepare and file comments. The ISR meetings are scheduled to start February 16, 2016. USFWS and NMFS requested additional time to determine if the proposed schedule would be reasonable. They would like more information on the scope of the review materials that will be provided in order to make that decision. They expressed concern about not being able to estimate the potential workload imposed upon them by this latest modification of the ILP licensing process. AEA agreed to provide proposed time frames for filing reports on the studies of interest to the agencies.

Agencies also expressed concern that this review period (November 6 – February 16) was interrupted by many major holidays for the fourth year in a row (Thanksgiving, Chanukah/Christmas, New Year's) and that it was difficult to bring consultants on board again to work over this time-frame and that it was difficult for staff to face once again, a daunting workload over the holiday season when in the past such work has required a great deal of overtime and affected staff ability to take leave during this time.

Agencies also expressed concern that they had nearly completed review comments when the project was placed on hold by AO 271, that these comments would have been filed with FERC and made available to AEA and other licensing participants in February of 2015, and most importantly, that these

comments would have been useful to AEA in planning for implementation of studies and for analysis of study results. The Agencies noted that AEA conducted additional study and analysis absent this input by Agencies or any other licensing participants. Agencies believe this information, several hundred pages of analysis, is valuable to the process and that it should be provided to AEA sooner rather than later, at least in summary form. AEA reiterated that while some additional analysis has occurred, very little if any data collection has occurred since AEA would have received the Services' comments under the licensing schedule in place prior to the issuance of AO 271.

NMFS Fish Passage Engineer Ed Meyer noted that he was not able to access the Fish Passage Technical Team ftp site. AEA indicated that there had been a change in the management and hosting of the ftp site and would send out the new information.

In response to the Services' concern over having adequate time for review, AEA provided brief details on the timing of releasing reports/ tech memos:

- Geomorphology Studies – September
- Groundwater Study - end of October
- Ice Processes Study - end of October
- Instream Flow and Riparian Instream Flow Studies – end of October/early November
- Salmon Escapement Study - mid/end of September
- Fish Distribution and Abundance Studies – late October/early November - waiting to hear from ADFG genetics lab on delivery of species ID
- Glacial and Runoff Changes – No additional information will be filed; AEA completed the FERC-approved Study Plan and provided the results in the June 2014 ISR. [Services asked about DGGS report on additional work being performed. DGGS recently provided a draft of the report to AEA. It is undergoing final review and is anticipated to be distributed in September.]
- Aquatic Habitat and Mapping Study – September
- Fish Passage Feasibility Study – early September
- Eulachon and Cook Inlet Beluga Whale Studies – Nothing will be filed as no additional work has been performed since that reported in the June 2014 ISR and the September 2014 Tech Memos.

NMFS believes the Beluga whale study is incomplete. NMFS stated that the study as modified was not approved by NMFS and AEA has not received any formal written comments from NMFS. AEA concurred and indicated that no work had been performed on that study since the filing of the September 2014 Beluga Whale Study tech memos (consistent with the information AEA provided in the table of tech memos/reports anticipated to be filed in fall 2015).

AEA stated that the substantive material to be reviewed is within the tech memos/reports and not the ISR Part D. The ISR Part D is intended to facilitate review and provide a status of the study implementation.

NMFS requested that the meeting between Services' biometricians and R2's biometrician Alice Shelly that was cancelled by AEA in response to AO 271 be rescheduled at the earliest opportunity. The Services have concerns with data analysis. AEA agreed to re-schedule this meeting after the materials to be filed prior to November 6, 2015 are reviewed by the Services' biometricians.

AEA agreed to provide draft meeting notes to the NMFS and USFWS by email the next week. During this time period, the Agencies would have time to further review the schedule and provide feedback to AEA.

Action Item:

Provide meeting notes for review by attendees.
AEA will provide 7/6/15 memo from Pat Pitney to AEA to the Agencies.

AEA Team Member		Other Party	
Name:	*Julie Anderson*	**Name:**	*Mike Wood*
Organization:	*AEA*	**Organization:**	*Susitna River Coalition*
Study Area:	*N/A*	**Phone Number:**	*907-354-5815*
Date:	*Various 8/5/15 and 8/18/15*	**Time:**	
Call Placed by:	X AEA Team	☐ Other Party	

Others on Call: N/A

Subject: Integrated Licensing Process Restart

Discussion:

- Pat Pitney 7/6/15 memo regarding Administrative Order 271 and the Susitna-Watana Project
- Proposed ILP schedule through FERC Director's Determination of ISR material

The material above was sent to Mike Wood on 8/5/2015 and again on 8/17/2015. Mike confirmed receipt of the material 8/18/2015. We discussed the budget and the proposed schedule on 8/14/15. Mike will not be able to meet or provide comment until the latter part of September due to his schedule.

Action Items:

Contact Mike at the end of September and schedule a time to meet.

20150908-5044

20150908-5044

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 2, 2015

Wayne Dyok
Project Manager
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503

Re: Continuation of Parts of the Susitna Monitoring Network Stations

Dear Mr. Dyok:

In order to better understand the hydrology and meteorology of the Susitna River and its watershed, the Alaska Energy Authority (AEA) contracted for a network of gaging and metrological stations to be installed and maintained. The National Marine Fisheries Service (NMFS) appreciates AEA sharing the data that has been collected from these gages with us. It has come to our attention that AEA now plans to decommission these stations this month. This data is useful to several agencies in Alaska and NMFS requests that AEA continue maintaining some stations and collecting data through the end of the State of Alaska's current fiscal year (June 30, 2016).

The catalyst for data collection in this region was the proposed Susitna-Watana hydroelectric project. This is a remote region that we know very little about and we appreciate the large workload that went into establishing and maintaining the network and the value of continuing these datasets. Understanding the melt rate and ice dynamics of the Maclaren Glacier and the temperature and precipitation regimes driving these changes will help the state and federal government with long-term planning. Currently, NOAA's National Weather Service and NMFS are exploring opportunities to support a subset of these stations on a long-term basis. One option is to retrofit the stations with modems which could communicate directly with GOES or other satellites. The number of solar panels and batteries would be increased to make it possible to visit less frequently. Once a satellite connection is established the seven repeater stations could be dismantled. However, NOAA cannot assume maintenance of the gages immediately. Therefore, NMFS requests AEA continue to maintain these monitoring stations to allow NOAA to resolve fiscal and logistical details and concerns.

NMFS's four highest priorities are:

- ESG2 High Elevation Meteorological Station
- ESS80 discharge station (Susitna near Cantwell)
- ESS55 discharge station (Portage Creek)
- ESM2 Meteorological station (Cantwell)

We appreciate AEA's willingness to reconsider their decision removing the monitoring equipment this September, as long-term datasets are extremely valuable for detecting trends and facilitating consultation and decision making processes.

Should you have any questions regarding this issue, please contact staff hydrologist Sean Eagan at (907)586-7345 or sean.eagan@noaa.gov.

Sincerely,

James W. Balsiger, Ph.D.
FOR Administrator, Alaska Region

cc: Scott Lindsey, NWS

AEA Request Continue Stream and Met monitoring (2) se/jlh 9-1-15

20150909-3014

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Alaska Energy Authority Project No. 14241-000

NOTICE SOLICITING COMMENTS ON REQUEST TO LIFT THE ILP ABEYANCE AND APPROVE PROPOSED MODIFICATIONS TO THE ILP PLAN AND SCHEDULE

(September 9, 2015)

On August 26, 2015, Alaska Energy Authority (AEA), prospective license applicant for the proposed Susitna-Watana Hydroelectric Project No. 14241, requested that Commission staff: (1) lift the Integrated Licensing Process (ILP) abeyance granted to AEA for its proposed project on January 8, 2015; and (2) approve AEA's proposed modifications to the ILP plan and schedule. These requests, including the proposed process plan and schedule modifications, can be viewed at http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13969092.

The Commission is soliciting comments on these requests. Any comments should be filed within 30 days from the date of this notice. Comments may be filed electronically via the Internet. See 18 C.F.R. § 385.2001(a)(1)(iii) and the instructions on the Commission's website http://www.ferc.gov/docs-filing/efiling.asp. Commenters can submit brief comments up to 6,000 characters, without prior registration, using the eComment system at http://www.ferc.gov/docs-filing/ecomment.asp. You must include your name and contact information at the end of your comments. For assistance, please contact FERC Online Support. In lieu of electronic filing, please send a paper copy to: Secretary, Federal Energy Regulatory Commission, 888 First Street, NE, Washington, D.C. 20426. The first page of any filing should include docket number P-14241-000.

For further information, contact Nick Jayjack at (202) 502-6073.

Kimberly D. Bose,
Secretary.

20150916-5124

20150916-5124

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 14, 2015

Wayne Dyok
Project Manager
Alaska Energy Authority
813 West Northern Lights Blvd.
Anchorage, AK 99503

Re: Cooperative effort to maintain pieces of the Susitna Monitoring Network

Dear Mr. Dyok:

On September 4, 2015, the National Marine Fisheries Service (NMFS) filed a letter with the Federal Energy Regulatory Commission (FERC) requesting that the Alaska Energy Authority (AEA) not dismantle four monitoring sites and one network of repeaters which were established in 2012 to support the Susitna-Watana dam licensing effort. This current letter acknowledges that this cooperative maintenance effort is outside of the FERC licensing process.

NMFS appreciates AEA's willingness to do the fall maintenance on several discharge stations, to leave the repeater network upstream of Talkeetna in place, and to pay Geo-Watersheds Scientific to process the data through October 31, 2015.

The National Weather Service's Alaska-Pacific River Forecasting Center (APRFC), Alaska Division of Geological & Geophysical Survey (DGGS), NMFS, and AEA all have reasons to maintain pieces of the Susitna Monitoring Network. While the telemetry network currently benefits all four parties, the individual monitoring stations have different levels of value to each of the above mentioned parties.

Long-term maintenance of any single monitoring site is expensive and a careful triage of cost versus benefit will need to be conducted. If any of the above mentioned agencies are to benefit a Memorandum of Understanding (MOU) will need to be developed outlining individual agency's responsibilities as to which agency maintains the stations; receives, stores and serves the data; owns the physical equipment; and is the permittee on the land use permits for these sites. Also, there may be additional agencies who would want to be a party to a MOU.

NMFS understands that AEA is not committing to any additional maintenance of monitoring stations once fall 2015 activities are complete. NMFS also understands that if APRFC and NMFS do not get an MOU signed by the fall of 2016, AEA will remove the remaining monitoring stations. AEA's decision to maintain, rather than dismantle, a subset of the monitoring sites this September allows time for all parties to evaluate their long-term needs. NMFS looks forward to a multi-agency cooperative effort to continue parts of this valuable monitoring network which AEA established in 2012.

Should you have any questions regarding this issue, please contact staff hydrologist Sean Eagan at (907)586-7345 or sean.eagan@noaa.gov.

Sincerely,

for James W. Balsiger, Ph.D
Administrator, Alaska Region

cc: Scott Lindsey, NWS

G:AEA Request Continue Stream and Met monitoring (2) se/jlh 9-1-15

20150928-5171

ALASKA ENERGY AUTHORITY

September 28, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000; Request for Minor Amendment of Proposed ILP Schedule

Dear Secretary Bose:

The Alaska Energy Authority (AEA) requests that the Federal Energy Regulatory Commission (Commission) make a minor modification to the schedule proposed in AEA's August 26, 2015 filing with the Commission. AEA's proposed ILP schedule has the Initial Study Report (ISR) meetings commencing on February 16, 2016. It has been brought to AEA's attention that the Northwest Hydro Association is having its annual conference the week of February 15, 2016. Several Susitna-Watana participants had planned to attend the conference and would no longer be able to attend if ISR meetings are held that week. Further, February 15 is a federal holiday and meeting participants travelling from Juneau or outside Alaska would need to travel on the holiday to attend the meetings. To avoid those conflicts, AEA proposes to initiate the meetings on February 9, 2016. Meetings would be held February 9, 10, and 11, and February 23, 24, and 25. The remainder of AEA's proposed schedule would remain unchanged.

Should you have any questions or need additional information, please do not hesitate to contact the undersigned at (907) 771-3955. Thank you.

Sincerely,

Wayne M Dyok

Wayne Dyok
Project Manager
Alaska Energy Authority

cc: Distribution List

813 West Northern Lights Boulevard Anchorage, Alaska 99503 T 907.771.3000 Toll Free (Alaska Only) 888.300.8534 F 907.771.3044

20151005-0047

Joseph R. Henri

ATTORNEY AT LAW

PO Box 210556 (9921 Near Point Drive) Anchorage, Alaska 99521-0556

Tel: (907) 338-0880 Fax: (907) 279-4785 Email: sctd@alaska.com

24 September 2015

ORIGINAL

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000;
Request to Lift Integrated Licensing Process Abeyance

I have reviewed the letter of Wayne Dyok, Project Manager, this subject, addressed to you on 26 August 2015. My letter to you is to add my own voice as an interested Alaska citizen in confirming the request of the project manager, Alaska Energy Authority. Particularly important is the inclusion of the latest studies available, viz., the 2014 studies which were continuations of prior studies or the second year of study on projects begun in 2013.

As you may know, Alaska state income has fallen by approximately 60% since 2013 due to the extreme market price reduction in a barrel of oil. This has hit the State of Alaska right between the eyes because about 95% of state revenues come from the one source, oil royalties and oil taxes. But the Watana project is eminently desirable for the long range well-being of Alaska; it should not be unnecessarily impeded even though it has its detractors inspired by national preservationist NGO's.

Please work with the Alaska Energy Authority to the full extent of your powers to allow AEA to proceed as quickly as possible, under its present strained circumstances, towards a successful project.

Thank you for your attention.

Sincerely yours,

Joseph R. Henri

Joseph R. Henri

Cc: Ms. Sara Fisher-Goad
Mr. Wayne Dyok

20151005-5008

Cathy Teich, Talkeetna, AK.
P.O. Box 155
Talkeetna, AK 99676
10-01-15

Kimberly D. Bose
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Honorable Kimberly Bose:

RE: Proposed Susitna-Watana Hydroelectric Project No. 14241-000
Comments on AEA's request to lift the ILP abeyance and proposed
modifications to the ILP plan and schedule

Thank you for the opportunity to comment on AEA's request to lift the abeyance on the licensing process for the proposed Susitna-Watana dam and proposed modifications to the ILP plan and schedule.

I request that you not allow AEA to restart the licensing process for the proposed Susitna-Watana dam project.

The State of Alaska and AEA have spent over $190 million on the proposed dam. Studies have been repeatedly mismanaged. Last year, AEA failed to differentiate between baby Chinook and Coho salmon, so they simply called them "chinoho". This is not scientific. It is shoddy science. This matter is too important to be treated so tritely.
AEA's spending has been wasteful, considering that the federal government has also invested public money and resources to be involved in the licensing process. Neither the State of Alaska or the Federal Government have money to spare at this time. AEA has not proven that they can meet licensing milestones or effectively implement the studies needed to understand the Susitna River and the impacts of a mega dam. It appears that they have no understanding of the delicate ecosystem involved.

I also request that FERC deny AEA's request to supplement the ISR with additional information collected after Oct. 3, 2014.

This additional information, being added outside of the FERC approved ILP schedule and regulations, would put a hardship on the licensing participants by creating a monumental amount of work. AEA does not plan to incorporate the new information into the ISR, just make reference it, which would complicate reviews and cost the governmental agencies and the public more tax-payer dollars. Once again, money is tight, at the State and Federal levels.

Again, I respectfully request that you not allow AEA to restart the licensing process or supplement the ISR with additional information.

Thank you.

Sincerely,

Cathy Teich
cathyt@mtaonline.net
(907) 733-2155

20151005-5049

Ninilchik Natives Association, Inc.

P.O. Box 39130
Ninilchik, AK 99639

Phone: (907) 567-3866
Fax: (907) 567-3867

October 2, 2015

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: Susitna-Watana Hydroelectric Project, FERC Project No. 14241-000; Support of the Alaska Energy Authority's proposed ILP schedule and request to lift the licensing abeyance.

Dear Secretary Bose,

The Ninilchik Natives Association, Inc. requests that the Federal Energy Regulatory Commission (Commission) approve the schedule proposed in the Alaska Energy Authority's (AEA) August 26, 2015 filing with the Commission and the Request for Minor Amendment of proposed ILP Schedule filed on September 28, 2015.

In discussions with AEA, we understand that AEA proposes to incorporate 2014 studies and reports into the schedule and process to ensure that the Study Plan Determination is based on the comprehensive set of data and best available information.

FERC and stakeholders will have the opportunity to consider all of the data and information collected to date, thus preserving the value of the work already done. The proposed schedule provides sufficient time for review of existing study material and new 2014 data. Most review times are doubled from FERC regulation schedule with over 100 days provided from new 2014 material being available before a full set of initial study report meetings.

Additionally, the Alaska Energy Authority will use existing funds to preserve the investment that the state has already made and advance the project. In consideration of limited existing funds devoted to the project, the proposed schedule is cost effective and provides the most up to date materials to all stakeholders

Lifting the abeyance and approving AEA's proposed schedule will allow AEA to advance to the next FERC milestone and receive a FERC Study Plan Determination that is based on the most current data available.

We, as an Alaskan Native Corporation, have invested time and energy in this project. It is our sincere belief that should this project see fruition we would benefit not only ourselves, but our future generations with a clean renewable energy. The census and caucus put together by the Alaskan Native Corporations associated with this project has been a monumental accomplishment. It heralds a new day where a region can work together to better the world. That is why we request that you approve the proposed schedule and allow this project a chance.

Should you have any questions or need additional information, please do not hesitate to contact me at greg@nnai.net; 907.398.0884 cell; 907.567.3866 office; or via post to PO Box 39130, Ninilchik, AK 99639.

Thank you.

Richard Greg Encelewski
President/ CEO
The Ninilchik Natives Association, Inc.

20151005-5050

20151005-5050

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

October 2, 2015

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: FERC Project P-14241, Proposed Susitna-Watana Hydropower Project

Dear Secretary Bose:

The Federal Energy Regulatory Program (FERC) has requested that the National Marine Fisheries Service (NMFS) comment on the Alaska Energy Authority's (AEA) August 26, 2015 request to FERC to (1) lift the Integrated Licensing Process (ILP) abeyance granted to AEA for the proposed Susitna-Watana hydropower project on January 8, 2015; and (2) approve AEA's proposed modifications to the ILP plan and schedule that would culminate in an amended FERC Director's Study Plan Determination on August 29, 2016. In support of our recommendations, we are enclosing the following items:

- a summary of the recent Project licensing history and discussion of concerns (Enclosure 1);
- our September 22, 2014 letter of preliminary concerns on the Initial Study Report (ISR) (Enclosure 2); and
- the July 6, 2015 memo from Pat Pitney, Director of the State's Office of Management and Budget, to Sara Fisher-Goad, the Executive Director of AEA, about the State of Alaska's commitment to the project (Enclosure 3).

AEA has modified most of the pre-licensing steps of the ILP and now requests another modification to move the project forward one more step before stopping again in 2017. AEA also requests that licensing participants fold a large number of new study reports and technical memoranda into their existing review of the last modified version of the ISR. Although we consider the ILP an inappropriate process for an original project, we value the structured timeframes that allow us to plan how we will fulfill NMFS's statutory responsibilities for this project.

AEA states that it has completed ten or eleven studies; however, NMFS does not consider any of the studies complete. Our rationale is that, according to the ILP, no study has advanced to where NMFS could request study modifications and new studies or assess AEA's variations to the FERC-ordered study plan. NMFS has informed AEA that we have requests for significant modifications to existing studies and for new studies. At the request of AEA or FERC, NMFS can provide reviews of the ISR as it stood immediately prior to the abeyance last January. Based on current reviews of study results provided so far in the process, NMFS finds that at least a

second year of study would be necessary for all of the 21 studies included in the FERC study determination (i.e., the Revised Study Plan as modified by FERC staff recommendations). At present AEA does not have funding to conduct any field or significant modeled studies.

Therefore, NMFS recommends that AEA's request to lift the ILP abeyance not be granted. Instead we recommend that that the ILP be restarted when a financial commitment to the project is established. This recommendation is based on the State's current commitment to the project; including the status of studies conducted so far, the need for additional studies, and available funding. Currently the State's commitment to this project is to incrementally advance the project forward to the second FERC study determination and then to reconsider the project.

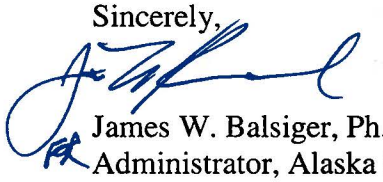
Should FERC not adopt NMFS's recommendation, NMFS requests that, alternatively, FERC require AEA to prepare a complete, stand-alone ISR that summarizes all study results, study variances, study modifications, and any new studies for stakeholder review. Currently AEA proposes to provide additional technical memoranda, study reports, errata, and a table indexing the numerous parts to each study. It is our experience that this type of organization for a document well over 10,000 pages in length is inefficient and makes the document very difficult to review thoroughly.

After the complete ISR is compiled, NMFS requests that if the ILP resumes, sufficient time of at least 60 days be scheduled to re-engage our staff and review contract budgets and scopes of work; we request that 90 days be scheduled for ISR review prior to the ISR meeting and 60 days be scheduled to file ISR meeting summary disagreements and recommendations for study modifications or new studies.

As a second year of study would not be possible until after the State reconsiders its commitment to the project in 2017, this schedule would allow us to fulfill our statutory responsibilities. Thus, a second year of study would be a full year away from FERC's study determination, and would not constrain either FERC's study determination or AEA's ability to plan for studies.

The ILP schedule for this project has been suspended. This now affords FERC an opportunity to assess the project's past and future ability to comply with the ILP or to make necessary changes to studies before resuming. If you have questions regarding this project, please contact Susan Walker at (907) 586-7646 or Susan.Walker@noaa.gov).

Sincerely,



James W. Balsiger, Ph.D.
Administrator, Alaska Region

Enclosures (3)

Cc:

e-filed under FERC Docket P-14241 as distribution to all Susitna licensing participants
Sara Fisher-Goad, AEA
Betsy McGregor, AEA
Wayne Dyok, AEA
Nicholas Jayjack, FERC
Joe Klein, ADFG
Soch Lor, USFWS
Mike Bethe, ADFG
Matt LaCroix, EPA

Enclosure 1

Background

On January 6, 2014, AEA filed a request for an extension of time to file the ISR under the ILP for the proposed project from February 3, 2014, to June 3, 2014, and to postpone most second-season studies scheduled for 2014 until 2015. Specifically, in 2014 AEA stated it would complete the following tasks:

- Only complete studies with a winter component already scheduled for early 2014 or those studies that did not require sustained logistical support,
- Continue ongoing study components such as monitoring and wildlife tracking at sites where equipment had already been installed,
- Develop and calibrate analytical models for the project; and continue an analysis of data gathered in 2012 and 2013 in comparison with data collected in the 1980s.

On January 28, 2014, FERC granted AEA's request to extend the ISR due date to June 3, 2014, to postpone most second-season studies until 2015 and set an ISR meeting date of October 16, 2014.

On June 3, 2014, AEA filed its ISR, describing AEA's progress in implementing the 58 studies required by the ILP study plan; including explanations of variances from the required study plan, and AEA's proposed modifications to the study plan. In addition, AEA also noted that they had double the budget anticipated from when they had originally requested a time extension and therefore were including in the ISR a more extensive scope of work for the summer 2014 studies.

On September 17th, 29th, and 30th, 2014, AEA filed a total of 30 technical memoranda into the project record for consideration in the upcoming FERC Director's determination on modifications to the study plan. The 30 technical memoranda include: (1) proposed study plan modifications; (2) the results of studies conducted during 2013 and 2014 that were not available at the time AEA filed the ISR in June 2014; (3) the results of second season studies that had been postponed until 2015 by FERC's January 28, 2014 letter order, but AEA decided to conduct one year ahead of schedule in 2014; and (5) the results of studies not required by the approved study plan to occur in 2014, but AEA decided to conduct in 2014 to maintain continuity of study results between 2013 and 2015.

On September 22, 2014, NMFS responded to the September 17, 2014 technical memoranda requesting that AEA adhere to the approved ILP schedule by only discussing the June 3, 2014 ISR at the October 2014 ISR meetings (Enclosure 1, NMFS September 22, 2014 letter). We noted that any studies that AEA conducted in 2014 could not be construed as "Year 2 ILP Studies," because the ISR was not yet complete and had not advanced to the point of FERC issuing a study determination at the time the studies were conducted.

On October 3, 2014, FERC issued a modification of the ILP process plan and schedule; however, due to the volume and complexity of the new information provided by AEA after the release of

the June ISR, FERC added a second set of ISR meetings to the schedule, to be held January 2015.

On November 14, 2014, AEA filed study plan meeting transcripts and additional information in response to the first half of the Initial Study Plan Meetings held in October 2014.

On December 31, 2014 AEA requested that FERC suspend the ILP schedule for 60 days and postpone the second half of the Initial Study Plan Meetings scheduled to be held in January, 2015. This request came as a result of issuance of an Administrative Order by the Governor of the State of Alaska to suspend discretionary spending on a number of large capital projects including the proposed Susitna-Watana Hydropower Project.

On January 8, 2015 FERC agreed to AEA's request to hold the ILP in abeyance until further notice to conserve stakeholder resources until Alaska's commitment to the project could be clarified. FERC requested an update on the project's status within 60 days.

On March 4, 2015 AEA requested FERC continued to suspend the ILP schedule. On March 17, 2015 FERC granted AEA's request and required an updated status report within 60 days.

On May 4, 2015 AEA's 60 day report requested another 60 day abeyance of the ILP. FERC responded on May 13, 2015, noting that due to the uncertainty of the project proposal the ILP was being held in abeyance until the state's commitment to the project could be clarified. FERC requested status updates to be filed by AEA until the state's commitment could be clarified.

On July 6, 2015, the Governor rescinded the Administrative Order and released another $6.6 million for the project in addition to $28 million in obligated but unspent funds to finish some studies and decommission field sites. These funds can be spent through the state's fiscal year 2017, ending June 30, 2017. About $600,000 of the State's fiscal year 2015/2016 funds remain available to NMFS and the U.S. Fish and Wildlife Service to contract consultants for additional study review. This amount may not be adequate. NMFS has additional independent contractors to assist with fish and aquatic studies, groundwater studies, model integration, structured decision support, and to conduct studies of winter juvenile fish habitat use.

In a letter dated August 26, 2015, AEA requested FERC lift the abeyance on the ILP and proposed a revised schedule to reinitiate the licensing process to move the Project through 2017 using the remaining $6.6 million of the original appropriations.

Discussion

The state addressed its commitment to the project in a memo from the Director of Alaska's Office of Management and Budget, Pat Pitney to the Executive Director of AEA, Sara Fisher-Goad (Enclosure 3, July 6, 2015 Alaska OMB memo). AEA is authorized "to advance the Project to complete and preserve the value of the FERC required studies; including those that are in process provided they are within existing appropriations." The memo refers to "incrementally advancing the project toward the FERC study plan determination" through 2017, provided AEA remains within the existing legislative appropriations for the project. AEA is authorized to use

the remaining $6.6 million of the original appropriation along with the already obligated funds it has remaining from its original $192 million appropriation (about $28 million). In 2017, the State will revisit the project in the context of the fiscal environment and other competing major capital projects.

AEA has stated that at least $100 million in funding would be necessary to complete the initial FERC-ordered study plan. This amount does not include any modifications to study plans, additional study requests, or additional information requests that NMFS, FERC or other licensing participants may request.

At this point AEA is able to commit to only one more partial step in the ILP process due to Alaska's budget constraints. It appears quite certain that the ILP for this project would again need to be suspended in 2017 if it is allowed to proceed at this time. Additional requests for modification to or suspension of the ILP process would therefore need to be made by AEA. AEA is again requesting that the ILP be modified by providing a large but unspecified amount of additional study results and study reports and a fourth volume of the ISR (ISR Part D) for stakeholders to review. AEA planned to begin sending these new reports to NMFS and others in mid-September, but none have been provided as of the date of this letter.

Many of NMFS concerns outlined in our September 22, 2014 letter remain unaddressed. NMFS comments on the ISR's fish studies identified issues with the integrity of data, the inability to effectively integrate modeled studies, and the progress and detail of the decision support systems. NMFS recommended that the data issues be resolved as soon as possible and that for NMFS to effectively review the project, the studies must accurately identify fish species, develop accurate habitat models, and use the best available science to understand anadromous fish distribution and habitat associations. These issues remain unresolved; largely because the ILP process has been held in abeyance and the second half of the required ISR meetings have not been held as required FERC. Thus, there is no process for licensing participants to provide FERC with recommendations for study modifications or new study requests. Additionally, AEA has conducted some second year studies. We note that this was done without the review of the first year study results and therefore were done without being appropriately modified if necessary as outlined by the ILP.

20151005-5059

20151005-5059

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

September 22, 2014

Wayne Dyok
Susitna Project Manager
Alaska Energy Authority
813 W. Northern Light Boulevard
Anchorage, AK 99503

RE: FERC Project P-14241, Proposed Susitna-Watana Hydropower Project

Dear Mr. Dyok:

The Alaska Energy Authority (AEA) has requested that the National Marine Fisheries Service (NMFS) comment on portions of the Initial Study Report for the proposed Susitna-Watana Hydropower project (June 3, 2014). We also include here comments previously submitted on the 2014 Fish Genetics Implementation Plan and on the pilot 2014 Cook Inlet beluga whale and eulachon studies (May 12 and May 14, 2014). We expect that the Alaska Energy Authority (AEA) will address these issues at the upcoming meeting on the Initial Study Report in October 2014.

Briefly, our enclosed comments on the Initial Study Report's fish studies (9.5 Upper River Fish Distribution and Abundance, 9.6 Lower and Middle River Fish Distribution and Abundance, and 9.7 Salmon Escapement) identify issues with the integrity of data, the ability to effectively integrate modeled studies, and the progress and detail of the decision support systems. Model integration is a key concern, especially for assessing baselines and project impacts on the Susitna River.

NMFS recommends that the data issues be resolved as soon as possible. For NMFS to effectively review this project, the studies must accurately identify fish species, develop accurate habitat models, and use the best available science to understand anadromous fish distribution and habitat associations. Moreover, the studies require accurate data to calibrate and validate proposed models and to integrate these models without inadvertently amplifying errors. Given the current issues with the data, it is not plausible that the data for predictive modeling be used to describe baseline conditions or to predict potential impacts. Modifications, additions, and new study requests for the second year of studies cannot be developed given the current issues with the data; these issues must be resolved prior to conducting additional field studies.

In regards to the 2014 Studies and the Final Study Plan, NMFS requests that the AEA adhere to the schedule the Federal Energy Regulatory Commission (FERC) established for the Integrated

Licensing Process (ILP) for this project in their January 28, 2014 determination. In that determination, FERC ordered the AEA to submit the final Initial Study Report on June 3, 2014 and to hold a meeting in October to present the results of the Initial Study Report and discuss any proposed changes. Although the AEA has just released reports of the studies it conducted in 2014 and intends to discuss those studies at the October meeting, NMFS is not prepared to step outside the FERC-ordered process and consider those studies at this time. The limited time allocated would be more effectively spent addressing problems with the 2013 study implementation and discussing study modifications or new studies.

Any studies that the AEA conducted in 2014 cannot be construed as "Year 2 ILP Studies," because the Initial Study Report was not yet complete at the time the studies were conducted. Conducting the studies before completing the Initial Study Report precluded participants from recommending any changes to the study or making new study requests based a review of a completed Initial Study Report. As noted by FERC in an May 6, 2014 e-mail on the Implementation Plan for the Genetic Baseline Study for Selected Fish Species in the Susitna River, Alaska:

> ...to clarify, we just reviewed our Study Determination letter and confirmed that the genetics operational plans are due by April 30 of 'each year of study implementation.' Because our January 2014 letter granted AEA's request, in part, for second season studies to be conducted in 2015 rather than 2014... it follows that the genetics operational plan for the second study season is due by April 30, 2015, and not by April 30, 2014.
>
> (Nicholas Jayjack, March 6, 2014 email to Susan Walker)

Although NMFS provided courtesy reviews and comments to the AEA on 2014 studies for fish genetics (Enclosure 2) and the Cook Inlet beluga whales/eulachon pilot study (Enclosure 3) by mid-May of 2014, NMFS does not consider any 2014 study to be the second year of study under the ILP process.

We consider these concerns significant and in need of resolution for NMFS to fulfill its statutory responsibilities. In the context of this project, we construe those responsibilities as follows:

1) to identify study data gaps;

2) to make recommendations for the second year of studies (and beyond);

3) to understand the project's ability to quantify baseline and proposed project operational impacts to fish and wildlife resources;

4) to support recommendations for the protection, mitigation, and enhancement measures associated with the project; and

5) to make informed decisions pursuant to our Section 18 Fishway Prescription authority under Federal Power Act.

The ILP schedule for this project has been altered and now affords the AEA an opportunity to make necessary changes to studies for this project prior to entering the second year of study. This will allow for development and implementation of a more accurate, effective, and cost-effective plan of study for this important project.

In our November 30, 2014, FERC filing we will provide detailed recommendations to address specific concerns related to the individual Initial Study Reports of June 3, 2014. If you have questions regarding this letter, please contact Susan Walker at (907) 586-7646 or Susan.Walker@noaa.gov).

Sincerely,

James W. Balsiger, Ph.D.
Administrator, Alaska Region

Enclosures (3)

cc:
e-filed under FERC docket P-14241 as distribution to all Susitna licensing participants
Sarah Goad, AIDEA
Betsy McGregor, AEA
Nicholas Jayjack, FERC
Joe Klein, ADFG
Soch Lor, USFWS
Mike Bethe, ADFG

Enclosure 1: Details regarding Data Integrity, Model Integration/Proof-of-Concept and Decision Support Systems.

DATA ISSUES:

Data Collection: Quality Assurance and Quality Control, and Methodologies

NMFS is concerned with the current status and implementation of aquatic studies and believes that, unless these issues are addressed, many study objectives will not be met. Our primary concerns are as follows:

1) Habitat classification has not been completed;
2) Fish passage criteria have not been developed;
3) Fish sampling study plans were not followed; sampling units were inappropriately subsampled;
4) Fish sampling locations did not incorporate FERC recommendations;
5) Because the fish sampling did not follow the sampling plan, this resulted in an inability to estimate relative fish abundance;
6) Fish seem to have been identified incorrectly;
7) Data were collected and reported at inappropriate mesohabitat scales;
8) Sampling sites among studies were not co-located;
9) Tagging goals were not met;
10) Fish targets for HSC sampling were not met;
11) The mainstem upper river migrant fish trap was not installed;
12) A fish wheel was not installed, and fish were not tagged near the entrance to Devils Canyon;
13) Additional problems associated with late installation and operation of migrant traps were likely influenced by environmental conditions associated with late breakup; and
14) Juvenile salmon distribution and abundance in 2013 were likely affected by the record fall floods in 2012.

We are providing some additional clarification on some of these concerns.

The actual implementation of the abundance sampling program did not follow the statistical models used to select sampling units. In particular, subareas (mesohabitats) within selected areas were 'randomly' selected for subsampling, and sampling was not consistent between sampling events (different gears, different effort, different order of gears, different total area sampled, etc). Sampling error in the fish distribution and relative abundance studies needs to be accounted for in order for these studies to accurately estimate fish distribution and abundance. Estimates of numbers of Chinook salmon that migrate above Devils Canyon need to include the assumptions, standard error, and resulting statistical confidence intervals associated with that estimate. Better descriptions of (and statistical accounting for) both sampling and non-sampling errors need to be provided. The data used to describe fish-habitat association

preferences and the standard errors associated with those species and life-stage habitat correlations need to be validated, as this analysis proposes to describe macrohabitat relationships for fish. These relationships will be used to evaluate project effects, to validate instream flow habitat model predictions, and to extrapolate results from focus areas to geomorphic reaches and river segments. Ultimately these data will be used to develop protection and mitigation measures and to serve as a basis for post-project monitoring.

Data collection and analysis

Data collection methods need improvement. For example, detection and recovery of PIT (Passive Integrated Transponder) tags need to be improved to yield useful data to meet study goals and objectives. Location of the detection arrays did not cover the entire channel and was biased toward fish migrating down channel. Also, because too few tags were recovered, efficiency estimates could not be made.

Misidentification of juvenile fish by species induces significant error, and application of this erroneous data would result in inaccurate conclusions. Our review of the Initial Study Report finds that a very high percentage of the juvenile salmonids were misidentified. We also question the accuracy of all juvenile fish sampling data because of the following details:

- large numbers of unidentified salmonid juveniles (some of which were PIT tagged);
- anomalous length distributions and habitat associations (e.g., juvenile Chinook 150 mm fork-length;
- the large abundance of juvenile Chinook in beaver ponds;
- the absence of pink salmon in any samples; and
- the disappearance of sockeye salmon from Indian River between the February draft Initial Study Report and the June draft Initial Study Report).

Considering the length distributions and habitat associations reported, we have reservations also about the identification of these juvenile fish and conclude that many juvenile salmonids identified as Chinook salmon were coho salmon.

There is an absence of quantitative analysis of habitat sampling, fish distribution and relative abundance, and early life history data collected to date. Deviations from the Revised Study Plan (RSP) and FERC staff recommendations make developing estimates from these data difficult or even impossible. These data are the basis of the fish and habitat sampling design and must be collected appropriately for the study to yield useful information. Without better integration of historical data into assessment of current results (e.g., the data from studies collected in 2012, which used different methodology and locations), these data should not be used to assess habitat associations for salmon by species and life stage. Much of the data on species distribution, relative abundance, and habitat associations appears anomalous in comparison to available

science on these species and their life stages as known through data previously collected and past studies conducted in the Susitna River and environs.

One of the main objectives of radio-tagging was locating spawning locations. The proposed activity of circling over a tag that remained in the same location for a period of time was not done (mainly for salmon). For non-salmon species, it was proposed to tag some species after their spawning season and monitor the tag in the following year to locate spawning locations. It remains to be seen if this actually worked. If not, the objective of locating spawning locations was not met

Scale

We do not believe that data has been collected among individual related studies at an appropriate scale to allow fish/habitat associations to be made and extrapolated. A related concern is that fish and habitat data have not been collected at a biologically relevant scale.

To assess project-caused impacts to fisheries resources (for example), the sampling effort must be at a scale relevant to Susitna River fish species and life stages and must adequately quantify baseline conditions for accurate extrapolation. In some instances, the *spatial* scale of data collection implemented varies inappropriately within and among studies, resulting in a mismatch between the data collected and the purpose of its collection. Additionally, the *temporal* scale of data collection needs improvement. The Initial Study Report indicates that winter fish sampling did not occur in all focus areas as proposed. Early spring sampling occurred only in three focus areas due to record late breakup. Initial sampling following breakup and installation of migrant traps did not occur until the middle of June (after juvenile outmigration had begun), and spring sampling for fish distribution and abundance was not conducted. Improvements need to be made to capture the full seasonality of fish life history strategies which vary considerably within a single season. (Fish move around, and the extent of that movement must be captured through sampling. A single-day of sampling is insufficient to understand the habitat associations of many different and mobile species and life-stages of fish.)

The error inherent in the inappropriate scale of data collection would be compounded by the proposal to extrapolate study results throughout the river; this would perpetuate and increase sampling errors across the entire length and width of the river and its habitats. Resource agencies are particularly concerned about this proposal to "scale up," and requested rationale for its implementation (Riverine Modeling Integration Meeting, November 2013). The ability to "scale up" is only valid when the initial sampling has been conducted accurately and at a scale relevant to resource concerns, which is not the case with studies conducted thus far.

Co-location of sampling sites

Review of the Initial Study Report reveals that sampling sites for the various study disciplines have not been consistently and thoroughly co-located, as laid out in the RSP as modified by

FERC staff recommendations, to provide an assessment of baseline conditions of habitats relative to fish use and preference. For example, invertebrate sampling locations (River Productivity 9.8) were not co-located with fish sampling locations. Rather than addressing this issue, or NMFS's previous concerns about the number of middle river sampling locations, AEA is proposing a study modification to sample in tributaries above the dam inundation zone. At some locations, sampling of variables such as depth and velocity was appropriately co-located, but other variables that should also be co-located such as groundwater exchange were not. NMFS recommends that at Focus Areas data collection for the full suite of interdependent variables should be co-located.

The cumulative effects of deficiently implemented sampling methods, failure to co-locate sampling sites, lack of integrative links, and discrepancies in data collection scales are magnified because these data are proposed for inputs to models. Model calibration, validation and decision making processes will then be used to assess potential impacts to resources.

NMFS recommends that the data issues be resolved as soon as possible. Accurate data is required to calibrate and validate proposed models; and quality data from individual studies is necessary to integrate models without amplifying errors unknowingly. Given these concerns about the data, it is not plausible to use the data for the predictive modeling that is proposed to describe baseline conditions or to predict potential project impacts.

These issues of data integrity and data collection are based in part on studies being conducted with significant differences from the FERC-modified RSP. These issues must be resolved prior to conducting additional field studies. NMFS cannot develop appropriate recommendations for study modifications or make new study requests for the second year of study given the current issues with the studies and the data.

MODEL INTEGRATION/PROOF-OF-CONCEPT:

Biological relevance

During the Riverine Modeling Integration Meeting (November 2013), 25- and 50-year scenarios for predicting project impacts to the physical river channel and habitats were proposed. While those timelines are consistent with the study plan and may present a manageable timeframe for the modeling work (B. Fullerton, POC meeting, November 2013), they may not answer questions related to assessing impacts on important biological resources in a biologically meaningful timeframe. Models need to be sensitive enough to detect changes that are biologically meaningful to the species and habitats likely to be affected by project operations. As currently planned, this is not the case.

NMFS has identified a need to develop and incorporate biological input and output parameters and evaluate these under an appropriate range of operational scenarios (e.g., base load, ecological flows, load-following, run-of-river). The temporal scales (i.e., 25- and 50-year scales)

that are needed must have biological relevance. For example, 5-, 10- and 15-year operational scenarios should be considered to demonstrate the model's ability to detect generational impacts to fish populations and habitat persistence (e.g., Susitna River Chinook salmon, 5-7 years; or 2-4 years for eulachon). NMFS is concerned that the present model cannot answer the biological questions it proposes to answer.

Some study plan data collection efforts do not provide the information needed for the integrated modeling efforts. For example, during the November 2013 Riverine Modelling Integration meeting, it was revealed that the Water Quality Modeling study would require data on the spatial distribution of groundwater discharge to surface water bodies. Analytical or numerical groundwater flow simulation would be one way to satisfy this input requirement. However, the Groundwater Study in the Initial Study Report does not explicitly state that analytical or numerical groundwater flow simulations would be undertaken in support of the other physical process models.

Model integration is at this point largely an *ad hoc* exercise. A stand-alone model integration study is required to allow stakeholders to develop confidence in the models, understand inputs and outputs, and have the conceptual linkages demonstrated via an interactive riverine working model. Many questions remain about the predictive capabilities of the models, particularly under integration and model assumptions. Sensitivity and uncertainty analyses need to be conducted to contribute to understanding of model limitations. The full extent of mismatch of purported integration of models is currently unknown, even to the project proponent, much less to stakeholders reviewing study results.

DECISION SUPPORT SYSTEMS:

Decision Support Systems (DSS) are critical for evaluating potential impacts of the project. We believe that their development should be expedited to the extent possible without excluding input from stakeholders.

The RSP (Instream Flow Study 8.5 RSP) includes the use of conceptual ecological models as the DSS to assess the project's impacts on a free flowing river and its resources. Also, the Fish Passage study includes use of a DSS to assess the feasibility and effectiveness of different fish passage options. It is our understanding that AEA intends to develop the conceptual ecological model DSS using manual matrices by early 2015 (FERC 2013) and to use a modified existing DSS for fish passage (currently past due). Considering the potential of these DSSs to support critical assessments of impacts from the project, development of the DSS should be a collaborative process with mutual development of, and agreement about fundamental objectives, assumptions, critical inputs, weighting methods, and other parts of the models. Formulation of the fundamental objectives for the DSS may reveal important, time-sensitive data gaps that require modifications to existing studies or perhaps development of new studies. An example for the fish passage DSS is reservoir ice studies: we expect to be used to design tributary collectors for outmigrating juvenile fish but don't know if the model will provide that information. An

example for the conceptual ecological model is the groundwater studies which we expect will allow estimation of project impacts to areas of upwelling, but project effects to upwelling are not one of the goals of that study. Therefore, we request that the schedule for DSS development be accelerated so potential data needs not currently covered in the existing study plans can be identified and added to the study plan.

Enclosure 2: NMFS Comments on the 2014 Fish Genetics Implementation Plan

SUMMARY:

NMFS Fisheries geneticists; Dr. Jeff Guyon, Supervisory Research Geneticist and the Fisheries Genetics Program Manager at the Ted Stevens Marine Research Laboratory of NOAA's Alaska Fisheries Science Center and Dr. Robin Waples, Senior Scientist at NOAA's Northwest Fisheries Science Center, reviewed the "Implementation Plan for the Genetic Baseline Study for Selected Fish Species in the Susitna River, Alaska." NMFS appreciates that AEA and the Alaska Department of Fish & Game (ADF&G) incorporated most of the comments and suggestions provided to AEA in our review, and included the topics discussed with ADF&G, U.S. Fish and Wildife Service and NMFS at the technical meeting in March in the final 2014 implementation plan.

COMMENTS PROVIDED TO AEA:

This report reflects a carefully thought-out approach to sampling from natural populations to provide baseline data prior to a proposed hydroelectric project. As proposed, the project would no doubt produce a great deal of very useful information. Comments below are intended to help improve certain aspects of the experimental design and/or data analysis.

Hypotheses for Chinook salmon:

Page 3: NMFS agrees that departures from HWE [Hardy-Weinberg Equilibrium] could support hypothesis 1b (fish above Devils Canyon are derived from spawners above and below), but only if the departures are in the direction of a deficit of heterozygotes, as expected under the Wahlund effect (population mixture). However, Hypothesis 2 would not necessarily produce any such departures if all the fish above the canyon were derived from a single lower population.

Page 3: "On the other hand, low genetic divergence between fish spawning above Devils Canyon and fish spawning in aggregates below the canyon would indicate that a large proportion of the fish ascending Devils Canyon are strays or colonizers, and have not established a self-sustaining population (support for Hypothesis 2)." This conclusion cannot be supported simply from failing to find a difference. It would be necessary to conduct a power analysis to determine how large a difference (e.g., Fst value) could exist and not be detected as statistically significant. Then, it would be necessary to translate the genetic data into estimates of gene flow to evaluate what levels of connectivity are consistent with the observed data.

Sampling design:

NMFS concurs that that samples from multiple years are essential to be able to make sense of the relative magnitude of spatial and temporal differences. Three years of samples may be inadequate for this purpose, especially considering that Chinook and perhaps some of the other species have generation lengths much longer than three years.

The required sample sizes depend on the particular objective, as well as the (unknown) differences among populations. In general the numbers proposed seem reasonable. However, the logic for requiring larger samples for msat [microsatellite] analyses is inadequately explained. This may be based on the idea that larger samples are required to provide precise estimates of all the low frequency alleles involved with msats. However, that is not the objective; the objective is to use all the data to draw biological conclusions about the species of interest. From this perspective, each msat locus is worth several SNP [single nucleotide polymorphism] loci in terms of information content, as a large number of empirical studies have demonstrated.

Analyses:

Page 12-13: NMFS strongly recommends that the PIs [primary investigators] not remove putative siblings as proposed. Siblings, in fact, contribute part of the signal in genetic analyses that provides insights into biological processes. Purging them from the sample universe scrubs the data of this biological signal, particularly for small populations where siblings are common. The effects that this has on subsequent analyses cannot be easily determined, but could be substantial. This purging makes the remaining individuals more similar to what would be expected from populations that are infinite in size and hence have no relatives. Purging of a particular sample might be justified, if the sample has been collected non-randomly (that is, if it is thought to represent progeny from only a few families). However, in that case the proper amount of purging could only be determined if one knows exactly how non-random the collection is. But this will seldom if ever be known in practice. Furthermore, even if this was known and relatives were removed, the result still would not be a representative collection from the population as a whole. Therefore, the solution to non-random sampling is not purging relatives but to going back into the field and collecting a representative sample.

Page 13: "We will exclude juvenile collections from the baseline if they show significant allele frequency differences from adult collections or show deviations from HWE when pooled with adult collections." We note that age structure creates mini-Wahlund effects that could cause HW departures even in mixed-age adult samples. Likewise the same thing could happen if you combine juveniles and adults produced by different cohorts. That does not mean that combining them won't produce a more robust overall estimate of population allele frequencies.

NMFS does not agree with using the Bonferroni correction for HWE tests; there are too many overall tests and thus the criterion become too conservative. Bonferroni correction controls the probability of false positives only and the correction ordinarily comes at the cost of increasing the probability of producing false negatives, consequently reducing the statistical power of the HWE tests. Instead, we suggest starting with unadjusted tests and evaluating what fraction are significant for each locus (across all pops) and for each pop (across all loci). If the resulting proportions do not deviate much from the expected proportion (dictated by the significance level

of the test), there is no reason to reject HWE. Loci or pops that are outliers can be singled out for more detailed analysis, perhaps using Bonferroni or FDR [false discovery rate].

Minor comments:

Page 1: The project "will modify the flow, thermal, and sediment regimes of the Susitna River. . . ." The project will also affect migration and fish passage, among a host of other important effects. The description of project effects should be written to comprehensively describe all major project effects.

Page 1: "If breeding isolation (lack of migration) among populations occurs over sufficient time and population sizes are small enough, genetic drift will result in variation in allele frequencies at neutral loci (loci not under natural selection) among populations." Genetic drift will *always* result in some differences unless there is complete panmixia.

Analyses of genetic distance: it is fine to use Fst as an index of genetic distance, but it must include a correction for sample size (like W&C theta). Otherwise, small samples will tend to look like outliers.

Page 6: "For mixed stock collections, sample sizes of 200 fish or 100 fish per collection are adequate to provide stock composition estimates that are within 7% or 10% of the true estimate 95% of the time, respectively (Thompson 1987)." That might have been true for the particular study cited, but how large a sample is required will depend on the number of markers and the magnitude of divergence among populations, so this general statement is not valid.

Page 8, the numbering is off under "Sample Collection Targets."

Page 9, under "Sample Collection Targets" item #9, we understand the issues regarding sample numbers, but an adequate adult Chinook salmon sample set from above the proposed dam is needed at the end of the study to make the necessary conclusions. What happens if the goal of 100 adult Chinook salmon is not realized? This should be addressed in advance.

Page 10, Section 4.2.4.1, identifies a sample target of 200 juvenile Chinook salmon from 4 systems in or above Devils Canyon, but later in the report under section 4.5 "Data Retrieval and Quality Control" it mentions that software will be used to identify siblings and exclude all but one individual in the baseline for every set of siblings identified. As such, given the likely small population sizes above the proposed dam site, 200 juveniles from each system is unlikely to be sufficient.

Page 16, Section 4.6.5, where it says "Collections will be pooled when tests indicate no difference between collections (P>0.01)." While we agree that it is difficult to prove there is no difference between collections, we recommend though using a p value greater than 0.05 as more appropriate to reject the null hypothesis.

Appendix A Section 2.2 Regarding the radio telemetry studies, the potential impacts of the tag on the migration pattern of the salmon, especially for a stock that has to migrate the farthest and through a 7-mile long Class 5+ canyon must be considered and discussed. Also please address whether the tags let you know where the fish spawned (or if they spawned) or just indicate where they were when relocated, including noting the spatial accuracy of the tag signal recoveries.

Appendix B - page 1, for the Black River: Were the Chinook that were sampled two juveniles which were collected in 2013? Please confirm and identify them as juveniles if that's true.

Table B5, Is there an overall HWE test for all markers for each population?

Enclosure 3: NMFS Initial Comments to AEA regarding the 2014 Pilot Study for Cook Inlet Beluga Whales and Eulachon

SUMMARY:
Beginning in early May 2014, NMFS staff were contacted and asked to meet with AEA and their contractors (hereinafter referred to collectively as AEA) to discuss AEA's plans to modify the [RSP as modified by FERC's determination] for the Cook Inlet Beluga Whale Study (Study 9.17). AEA informed NMFS staff of their intent to conduct a boat-based pilot study involving both a Cook Inlet beluga whale research effort and a eulachon research effort. Despite the very short notice from the intended start date of the research activities, NMFS agreed to provide some initial comments and preliminary recommendations to AEA. These initial comments were primarily provided to help reduce the high harassment and harm potential this pilot project could have on the endangered Cook Inlet beluga whales, and to help AEA avoid violating both the Marine Mammal Protection Act and the Endangered Species Act. These comments were not an endorsement of the pilot study, nor an acknowledgement that the pilot study would constitute the second year of the required FERC-approved study plans. These comments were sent to AEA by email on May 14, 2014, and are reproduced in Enclosure 3. As a result of these NMFS comments, AEA did make modifications to the pilot study in an effort to reduce the harassment potential to Cook Inlet beluga whales. NMFS has had multiple meetings with AEA to discuss the progress and status of the 2014 pilot study since early May. During several meetings, AEA has provided inconsistent information regarding their plans for 2015 Cook Inlet beluga studies. At this time, it is unclear which aspects of the FERC-approved study plans for Cook Inlet beluga whales AEA intends to implement in 2015, if any. Additionally, AEA has a pattern of providing information to NMFS immediately prior to a meeting (e.g., one hour in advance) or after the meeting, but has an expectation that NMFS will provide official comments during the meeting. This process has substantially limited the ability of NMFS to provide meaningful comments to AEA. Finally, while the focus of Study 9.17 is on Cook Inlet beluga whales, NMFS reiterates that the Marine Mammal Protection Act pertains to all marine mammals, regardless of any additional protections under the Endangered Species Act. Thus, harassment of any marine mammal resulting from AEA's activities is prohibited.

COMMENTS PROVIDED TO AEA:
These initial comments are intended to provide early guidance and preliminary recommendations regarding this pilot study. NMFS intends to submit formal comments on this study proposal to FERC.

NMFS received a draft copy of the AEA's "Pilot Study of Cook Inlet Beluga Whale and Prey Species in the Susitna River Delta" on Monday May 12, 2014. AEA and their contractors intend to implement the pilot study beginning the week after NMFS received the draft study plan for review, and continue through all of June. The pilot study is submitted in lieu of the FERC-approved beluga studies (aerial surveys, video cameras, still cameras, and water surface

elevation model) for 2014. Although NMFS agreed to try and get these preliminary comments back to AEA prior to implementation of the pilot study, NMFS advises that these are not official comments, and as such do not indicate NMFS's support for or rejection of the pilot study. Furthermore, NMFS does not consider any 2014 study to be the second year of study under the ILP process. This is because the Initial Study Report is not complete, and licensing participants have not been able to recommend any changes to the study or make new study requests based on a review of the completed Initial Study Report. Our initial comments regarding the draft pilot study after an abbreviated review period are as follows:

We understand neither AEA nor its contractors will be obtaining authorizations under the federal Marine Mammal Protection Act (MMPA) for the unintentional take by harassment of marine mammals. Thus no harassment or take of any marine mammal under NMFS' jurisdiction is authorized under either the MMPA or the Endangered Species Act (ESA) and AEA and/or its contractors would be responsible for any violation of these federal laws.

The draft pilot study references LGL Alaska Research, Inc.'s ongoing boat-based surveys for Cook Inlet belugas as good documentation of Cook Inlet belugas as a result of closer proximity and longer encounter durations with the whales than by aerial surveys. While we agree that a boat survey has the potential to get closer to and spend more time with a group of marine mammals than an airplane, we do note that the referenced LGL studies have a NMFS-issued MMPA research permit and ESA authorization to allow harassment and close approaches. The level of information collected by these two different boat-based studies will not be comparable. Furthermore, we note that the LGL researchers associated with the NMFS permitted photo-identification study are not indicated as participating in this pilot study.

The pilot study has the potential to disturb or harass marine mammals due to the presence of the boat and operation of the split-beam sonar. The pilot study does suggest the implementation of the "Marine Mammal Viewing Guidelines and Regulations" as found on our website (http://alaskafisheries.noaa.gov/protectedresources/mmv/guide.htm) as an effort to reduce the potential for harassment or take. We note that many of the steps of the viewing guidelines are stated in the "2014 Pilot Study Methods" section of the draft pilot study, but add that whales should not be encircled or trapped between boats or boats and shore, and that the study needs to ensure that when approaching the whales the boat stays fully clear of whales' path of travel (i.e., the boat doesn't approach belugas "head-on"). These guidelines are intended to reduce the likelihood that marine mammals would be affected by this study, but do not guarantee no harassment or take will occur. This is a directed research project targeting Cook Inlet beluga whales, and a research permit may be necessary if the project may result in take or harassment of this endangered species or other marine mammals.

The pilot study is designed for repeated approaches to Cook Inlet beluga whales, albeit theoretically no less than 100m away. This study design increases the potential for harassment, including behavioral modifications or displacement that may not be evident from the boat, despite one of the pilot study's goals being to not cause any disturbance to the whales themselves. Given the repeated approaches, and potential for belugas or other marine mammals to not be visible below the water, implementation of the Marine Mammal Viewing Guidelines may be insufficient for preventing harassment or take. This potential for disturbance or harassment is of concern to NMFS, not only in general, but specifically during the first two weeks of June when we will be conducting our aerial surveys to assess official population abundance and distribution. Any disturbance or behavioral modification of the beluga whales associated with the pilot study may result in a reduction of our ability to accurately conduct our aerial surveys. The Susitna delta area is an important foraging area to the Cook Inlet belugas in late spring/early summer, after limited food during the winter. Any disturbance to the whales may result in reduced foraging success, and thus have population-level adverse effects.

The draft pilot study plan indicates that "if whales move away from the area where they were initially detected, an attempt will be made to obtain a depth reading and prey information at that location", but there is no information regarding how much time must pass without a beluga sighting before the survey crew moves to that location to attempt to obtain depth and prey information. There are confirmed reports that some stressed, chased, or harassed Cook Inlet beluga whales do not swim away, but rather submerge and remain on the bottom of the seafloor, which can be very shallow in Cook Inlet. If the observers do not wait a sufficient length of time, the potential exists for a beluga exhibiting this behavior to be struck by the vessel or propellers as the boat approaches the area where belugas were observed.

Given the topography and mudflats surrounding the Susitna Delta, as well as the potential that belugas will be traveling and not staying still, it is unclear how accurately or consistently the fine-scale surveys could be implemented. Should the belugas be traveling, it is possible the boat may inadvertently chase the whales group while trying to accomplish the fine scale sampling scheme as depicted in Figure 3. This could result in increased stress or harassment to the belugas or other marine mammals (i.e., seals) in the vicinity.

The draft pilot study does not provide much detail about the acoustic component of the split-beam sonar, but we understand some split-beam sonars have the potential for operating at multiple frequencies. Frequencies below 200 kHz are within the hearing range of Cook Inlet belugas, and thus noises associated with the sonar with frequencies below 200 kHz have the potential to harass belugas and other marine mammals. Noise has been identified as one of the highest threats to Cook Inlet belugas. Based on the information in the draft pilot study plan, it appears there may only be a single frequency during operation, at 206 kHz. It is unclear whether the split-beam sonar will be operated when conducting the "fine-scale sampling" triggered by

Cook Inlet beluga sightings or if it will only be operated when no belugas are sighted, or if it will be in constant operation.

In general, the pilot study plan is unclear about the primary goal of the study; is this a beluga study that has a fish component or a fish study that will record beluga sightings? The study plan states that data on prey and belugas will be "collected simultaneously", however, fish data can only be recorded after the whales leave the area, and the split-beam sonar is unlikely to be able to collect adequate fish data from over 100 m away (the minimum distance the boat will stay from the belugas and other marine mammals). Overall, while it appears this pilot study attempts to combine information regarding the distribution of beluga whales and their prey, we do have initial concerns about the harassment potential to the belugas. Although there is information on the data collection protocol sheets and software, there is no information regarding protocols should the vessel be closer to 100m of the Cook Inlet beluga whales, or if the presence of the boat or use of the split-beam sonar results in a change of behavior, disturbance, or displacement of the whales. These are indications of harassment and take, and are currently not authorized by NMFS. NMFS requests to be provided a survey schedule in advance of the first survey.

20151005-5059

State of Alaska

Bill Walker, Governor

Office of Management and Budget
PO Box 110020
Juneau AK 99811-0020
(907) 465-4660, fax 465-3008

MEMORANDUM

Date: July 6, 2015

To: Sara Fisher-Goad, Executive Director
Alaska Energy Authority

From: Pat Pitney, Director
Office of Management and Budget

Subject: Susitna Watana Hydroelectric Project – Administrative Order 271

On December 26, 2014, the Governor issued Administrative Order 271. With regards to the Susitna-Watana Hydroelectric Project (Project), the Governor directed the Alaska Energy Authority (Authority) to cease all discretionary spending, and not to incur new or additional expenses or obligations or entering into or amending existing contracts. The administrative order also directed the Authority not to spend unobligated or unencumbered funds, and to submit a status report of the project to the Office of Management and Budget.

Based upon our review of this project, we concur that non-discretionary expenditures would include those necessary to advance the Project to complete and preserve the value of Federal Energy Regulatory Commission (FERC) required studies; including those that are in process provided they are within existing appropriations. Incrementally advancing the project toward the FERC study plan determination is deemed non-discretionary activity. The Authority may utilize the remaining $6.6 million of the original $192 million appropriation to continue to move the project through 2017, at which time the project will be revisited in the context of the fiscal environment and other competing major capital projects.

I appreciate the time that you and your staff have devoted to this project. Please feel free to call me to discuss further.

Cc: Fred Parady, Deputy Commissioner, Department of Commerce Community and Economic Development

Arnold Liebelt, OMB Policy Analyst, Office of Management and Budget

20151005-5306

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Anchorage Field Office
4700 BLM Road
Anchorage, Alaska 99507

IN REPLY REFER TO:
FWS/AFWFO

October 5, 2015

EMAILED TO:
Mr. Nicholas Jayjack
Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

Re: Susitna-Watana Hydroelectric; FERC Project No. P-14241-000

Dear Mr. Jayjack:

Thank you for the opportunity to comment on Alaska Energy Authority (AEA)'s proposed schedule to reinitiate the Federal Regulatory Energy Commission (FERC) Integrated License Process (ILP) for the Susitna-Watana hydroelectric project (Project). The AEA has filed notice of a proposed process schedule and plans to provide supplemental Project studies information. In this letter, the U. S. Fish and Wildlife Service (Service) provides our comments and recommendations to FERC, followed by our perspective on the ILP review status, and the Service's staff capacity. Additionally, in support of our recommendations and for FERC's reference, we are enclosing a summary of the recent Project licensing history (Enclosure 1) and our September 22, 2014, letter of preliminary ISR concerns (Enclosure 2).

The Service's Recommendations are:

1) Complete the second set of Initial Study Report (ISR) meetings related to first year (2013) Project studies, and file comments on the June ISR, September Technical Memorandum (TM) and ISR meetings on the record before reinitiating the licensing process.

2) Issue FERC study plan determination on first year studies.

3) File additional proposed supplemental Project information during the Updated Study Reports (USR) process step after the formal second year of study.

4) If the ILP process is to resume, provide stakeholders at least 3-months' notice before holding the second set of ISR meetings to provide sufficient time to re-engage staff

resources, review contract budgets and extend statements of work to gain capacity to participate under process timelines. Since AEA's original abeyance request, our staff resources have been reprioritized.

5) If the ILP process is to resume, allow stakeholders an additional 2-month allowance after the second set of ISR meetings to finalize and file ISR meeting summary disagreements and recommendations for modifications or new studies.

While we recognize that the ILP process is not intended for a new project, or for a project of such complexity and magnitude, we appreciate reasonably structured timeframes that allow stakeholders certainty within the licensing process.

We hope this information will be helpful as FERC considers the proposed Project licensing schedule. If you have any questions, please contact Project Biologist Betsy McCracken at (907) 271-2783 or via email at betsy_mccracken@fws.gov and include Project No. P-14241-000.

Sincerely,

Socheata Lor, Ph.D.
Anchorage Field Office Supervisor

Enclosure 1: Project history and support for recommendations
Enclosure 2: The Service's September 22, 2014, letter

Cc:
e-file under FERC Docket P-14241 as distribution
Sara Fisher-Goad, AEA
Betsy McGregor, AEA
Wayne Dyok, AEA
Joe Klein, ADFG
Jeanne Hanson, NMFS
Mike Bethe, ADFG
Jamie Stoddard, EPA
Matthew LaCroix, EPA

Enclosure 1

Project history

September 29, 2015: AEA filed an amendment to their August 26, 2015, proposed license schedule to accommodate an annual hydropower conference.

September 9, 2015: FERC issued a 30-day comment period request regarding AEA's *Proposed ILP schedule.*

August 26, 2015: AEA proposed a revised schedule to reinitiate the licensing process and move the Project through 2017 using the remaining $6.6 million of the original appropriations.

July 2, 2015: AEA filed a status update on the ILP abeyance request with the intent of providing a specific plan for the Project within 60-days.

March 4, 2015: AEA requested a second 60-day abeyance, and on May 4, 2015, a third 60-day abeyance was requested.

December 31, 2014: AEA requested a 60-day abeyance from the Project licensing. Second-set January 2014 ISR meetings canceled.

December 26, 2014: Alaska's Governor issued Administrative Order (AO) 271 required AEA to cease Project discretionary spending until state budgetary shortfalls were evaluated.

October 3, 2014: FERC issued a *Revised Susitna Project Process Plan and Schedule* (Schedule) outlining the second year of study.

ILP Review

On October 3, 2014, FERC issued a *Revised Susitna Project Process Plan and Schedule* (Schedule). According to this Schedule, the second year of study would begin after stakeholders filed their responses to Initial Study Report (ISR) meeting summary with disagreements and recommendations for modified or new studies. According to the Schedule, FERC would issue the Director Determination on ISR meeting summary disagreements and recommendations for modified or new studies after the first year of study (then scheduled for April 22, 2015). This is essentially where the license process left-off prior to AEA's original abeyance request on December 26, 2014.

Since the June ISR release up until the December Project abeyance, the Service spent significant time and staff resources drafting review comments on the June 3, 2014, ISRs and October 2014 ISR meetings. This information covers the Project's first year (2013) resource studies. We

identified resource concerns, study variances, prepared requests for both study modifications and new studies. Also within that time, during September and November 2014, an additional 1,800 pages of Project ISR information was provided for stakeholder review. This additional information was reviewed in preparation for discussion during January 2015 ISR meetings.

Due to the scope and complexity of the additional information provided after the release of the June ISR, FERC added a second set of ISR meetings into the Schedule, to be held January 2015. However, due to AO 271, those January ISR meetings were canceled. If the January 2015 ISR meetings had been held, AEA would have filed ISR meeting summaries within 15 days meeting, including any modifications to ongoing studies or proposed studies. Thirty days after that, stakeholders would have had an opportunity to file any disagreements with ISR meeting summaries and provide recommendations for modified or new studies.

The Service's review of the 2013 studies identified numerous variances and modifications that had been made to the FERC-approved study plans. We outlined those concerns in our September 22, 2014, letter (Enclosure 2). These outstanding concerns related to the 2013 studies need to be resolved prior to conducting additional years of studies. Concerns stem from biometrics and sampling designs, which provide the foundation of scientific integrity and affects our ability to assess Project impacts to fish and wildlife resources. Disagreements remain regarding the extent of potential Project effects, including upstream and downstream effects. Therefore, we recommend the Project complete the second set of ISR meetings related to first year (2013) studies and file comments on the June ISRs, September Technical TMs, and ISR meetings that are already on the record. This will also allow FERC to make a clear and transparent determination of the first year studies prior to reinitiating the sequential steps in the licensing process.

AEA's Proposed Supplemental Information

We appreciate that AEA would again like to supplement Project information including updates on data collection (2014), cumulative reports on 2012-2014 data collection, updates on analysis conducted (2014), and additional TMs and modifications from the June ISRs. Allowing the Project record to be supplemented at this point is not going to change the concerns related to the first year of studies. The Service recommends first year study plan determinations be in the record prior to requests for review of additional information.

The AEA proposes (AEA August 2015) an ISR meeting on cumulative Project efforts. We believe this suggests an oversimplification of current fish and wildlife resource concerns related to the ISR studies. The Service considers it premature to review the entire Project record at this time without having determined the adequacy of the first year of study. Additional supplementation of Project information is more appropriate for the USR process step after the formal second year of study. Because stakeholder input has not been provided to the Project record, we do not consider any of the studies to be completed.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Anchorage Field Office
605 W. 4th Avenue, Room G-61
Anchorage, Alaska 99501-2250

In Reply Refer To:
FWS/AFES/AFWFO

SEP 22 2014

Mr. Wayne Dyok
Susitna-Watana Project Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, Alaska 99503

FERC Project P-14241, Susitna-Watana Hydropower

Dear Mr. Dyok:

The U. S. Fish and Wildlife Service (Service) is providing comments on the Alaska Energy Authority's (AEA) June 3, 2014, Initial Study Report (ISR) for the proposed Susitna-Watana Hydropower project (Project). We provide AEA with our preliminary findings of concern so that they may be meaningfully considered prior to and discussed at the October, 2014 ISR meeting. The Service intends to provide full and detailed comments on these and other topics by the November 30, 2014, Federal Energy Regulatory Commission's (FERC) filing deadline.

As per the FERC Integrated Licensing Process (ILP; 18 CFR 5.15 (c)(2)), the ISR meeting scheduled in October, 2014, provides an opportunity for AEA and licensing participants to discuss the 2013 studies and identify potential modifications to study designs based on the first year's data collection. The process allows for review and recommendation of changes to sampling methodologies implemented by first year studies to ensure study objectives, as specified in the FERC-approved Revised Study Plans (RSP), are met. Our filing to FERC by November 30, 2014, will formalize our comprehensive comments and recommendations after AEA has had the opportunity to address our concerns during the October, 2014 ISR meeting.

The Service has identified three topics of significant concern: 1) data collection and reporting, 2) effective model integration, and 3) development of decision support systems (DSS). These three topics are closely tied together because precise and accurate data provide inputs to models that are used to support Project decision-making.

In these preliminary comments, the Service identifies data collection and reporting concerns (Attachment I) and recommends the data issues be resolved as soon as possible. Without robust data from individual studies, we are concerned the data do not meet study objectives, that model validation will be hindered, and model integration may lead to incorrect conclusions. Given the magnitude of our concerns related to data collection and reporting, we believe it may not be

time the Service will have, we will be unable to consider and comment on those study reports in advance of the October, 2014 ISR meeting. Furthermore, we recommend AEA dedicate the limited time at the October, 2014, ISR meeting to discuss concerns related to 2013 studies, as reported in the June 3, 2014, ISR. Additionally, an email on May 6, 2014, copied to the Service by FERC, indicated that studies carried out by AEA in 2014 were conducted outside of the ILP process and would not be considered "second year" studies. This is procedurally very important because neither the Service, nor other licensing participants (Non-Governmental Organizations (NGO) Participants 2014), will have the opportunity to fully review or comment on the design and implementation of the 2014 studies. The Service will be unable to meaningfully contribute to the discussion of the 2014 studies and urge AEA to not discuss any work conducted in 2014 at the ISR meeting. Instead, we suggest the interim results gathered between study years (i.e., 2014 data collection) be discussed at the next quarterly Technical Workgroup meeting, once we have had sufficient opportunities to review those additional data.

Summary

This letter describes some of the Service's concerns with studies reported in the June 3, 2014, ISR, and we are providing them to AEA prior to the November 30, 2014, FERC filing deadline so some issues can be discussed and resolved in a timely manner. The concerns address: 1) data collection and reporting, 2) ability to recommend further studies under the FERC ILP licensing process, 3) development of valid models to assess baseline conditions and effects from Project operations on fish and wildlife resources, 4) capacity to formulate recommendations under section 10(j) of the Federal Power Act for protection, mitigation, and enhancement measures associated with the Project, and 5) formulation of informed decisions pursuant to our Section 18 Fishway Prescription authority under the Federal Power Act. We believe the modified ILP schedule for the Project affords AEA the opportunity to make necessary changes to studies prior to entering the second year of study. The Service believes this review process accommodates the development and implementation of more accurate, effective, and cost-effective plans of study for the Project.

Thank you for the opportunity to submit these comments in advance to the October, 2014 ISR meeting. We hope they are useful to AEA and will generate valuable conversations at the meeting. If you have questions, please contact Ellen Lance (907) 271-1467.

Sincerely,

Socheata Lor, Ph.D.
Anchorage Field Supervisor

Attachment I. Data Issues

Below we discuss our preliminary concerns relating to deviations from study plans, quality assurance and control, and statistical practices and procedures for the 2013 study year.

Deviations From Study Plans – Deviations from established sampling designs occurred in some studies for various reasons, and in some cases resulted in reduced sample size or compromised reliability of data. Below we provide examples.

- As currently planned, some two-year studies cannot be completed because access to all Focus Areas (FAs) was not granted until after the first study year (e.g., ISRs 8.5, 9.6, 9.7, 9.9). For example, a fish wheel was not installed and fish were not tagged near the entrance to Devil's Canyon (e.g., ISR 9.7).

- Anomalous weather conditions prevented or delayed fieldwork on aquatic studies (e.g., ISR 8.5), resulted in late installation of migrant traps, which were likely influenced by environmental conditions associated with late breakup (e.g., ISR 9.6). Moreover, juvenile salmon distribution and abundance measured in 2013 were likely affected by the record fall floods in 2012 (e.g., ISR 9.6).

- Sampling has not been *temporally* adequate across all seasons. ISR 9.6 reports winter fish sampling did not occur across all FAs as proposed; early spring sampling occurred only in three FAs; initial sampling following breakup and installation of migrant traps did not occur until the middle of June, and therefore, spring sampling for fish distribution and abundance was not conducted (e.g., ISRs 7.5, 8.5, 8.6). The extent to which fishes move must be described through sampling; multiple sampling days across all seasons are required to capture the full seasonality of a fish's life-history strategy, which varies considerably within a single season. A single-day of sampling is insufficient to understand the habitat associations of different fish species with differing mobility and life-stages.

- Sample site selections for integrated studies were inconsistently co-located. For example, invertebrate sampling locations (ISR 9.8) were not co-located with fish sampling locations (ISR 9.6). Failure to co-locate sampling sites risks the magnification of data discrepancies, and because the data will be used as inputs for predictive models, may jeopardize the validity of the models.

- Detection arrays did not cover the entire channel and tagging efforts did not allow for detection of fish migrating upstream, therefore the data were biased and efficiency estimates cannot be calculated. Detection rate and recovery of passive integrated transponder (PIT) tags is insufficient to yield useful data to meet study goals and objectives (ISR 9.6).

- Fish targets for fish Habitat Suitability Curve (HSC) sampling were not met (e.g., ISR 8.5), therefore, power to assess fish habitat-preferences and relationships is reduced.

appropriate when the sampling is conducted accurately, in a random fashion throughout the population, and at a scale relevant to resource concerns. To assess impacts from the Project on fish resources, sampling effort must be at a scale relevant to Susitna River fish species at various life stages in order to adequately quantify baseline conditions with the accuracy required for accurate extrapolation. For example, incorrect fish identification and would lead to imprecise and inaccurate extrapolation of species-specific habitat associations.

Statistical Practices and Procedures – Based on our preliminary reviews, we note (below) failures to report standard statistical procedures and calculations required for complete analyses.

- Standard error was not reported for stated relationships between species of juvenile salmonids at various life stages and their habitat (e.g., ISRs 9.5, 9.6). A robust assessment of statistical results must include calculations for standard error.

- Assumptions for the estimating numbers of Chinook salmon migrating above Devils Canyon were not clearly specified and the standard error of that estimate was not reported (e.g., ISRs 9.6, 9.7).

- Sampling and non-sampling errors were not clearly stated (e.g., ISR 9.7). Sampling error is the error resulting from sampling only a part of the population and not the whole population. Non-sampling errors are those errors resulting from selection bias, systematic non-representativeness of samples, and transcription or recording errors. Sampling error is usually quantified and reported with confidence intervals or standard errors and related to *precision* of the estimates. Non-sampling errors are harder to recognize, yet very important, and more closely related to the *accuracy* of the estimates. Sampling errors must be clearly accounted for in statistical analyses to assess data reliability and interpret results.

- Consistent fish sampling methods were not applied (i.e., different gear types used, different effort was applied within and across sampling units, concurrent use of non-compatible gear types within a sampling unit). This resulted in inability to estimate sampling error because (e.g., ISR 9.6) inconsistent sampling methods resulted in individual datasets that are not comparable.

- No power analysis was reported (ISR 9.14), and it is unclear how sample size for both adult and juvenile Chinook salmon was determined. Based on the number of genetic markers sampled and the magnitude of genetic divergence measured in the population documented thus far, a power analysis would inform determination of the number of samples needed to provide a robust estimate of genetic diversity. Furthermore, three years of samples may not be adequate to characterize genetic diversity among a species with a life cycle of five to seven years; this limitation must be addressed in the study results.

Attachment II. Model Integration

Model integration is the manner in which all of the physical studies interact to assess baselines and Project impacts on the Susitna River. Within the ISRs, methodologies for model integration are not transparent and it is not possible to determine if model integration will identify project impacts with any degree of certainty.

As previously stated by the Service (USFWS 2013), we are concerned that time allotted to develop methods for model integration is inadequate. Prior to the release of the June 3, 2014, ISRs, a three-day Riverine Modeling Integration Meeting (RMIM) was held (November 13-15, 2013). The goal of this meeting was to provide a forum to review and discuss various riverine-related modeling and study integration efforts (AEA Instream Flow Study-Technical Team [ISF-TT] Riverine Modeling Integration Meeting Agenda, 2013). A collaborative meeting such as this one was a good effort toward developing meaningful model integration methods and the Service encourages AEA to continue this type of cooperative work.

During the RMIM, 25 and 50-year scenarios for predicting project impacts to the physical river channel and habitats were proposed. While those timelines are consistent with what is specified in RSP and may present a manageable timeframe for the modeling work (B. Fullerton, Personal Communication, November, 2013), they may not be sufficient to assess impacts to fish and wildlife resources in a biologically meaningful way.

The Service is concerned the modeling capability to answer biological questions is not sensitive enough to detect biologically meaningful changes to species and habitats likely to be affected by project operations. We recommend that modelling capabilities be developed that incorporate biological inputs and deliver outputs that are validated under an appropriate range of operational scenarios (e.g., base load, ecological flows, load-following, run-of-river). The temporal scales (e.g., 25, 50-year) must have biological relevance. For example, 5, 10 and 15 year operational scenarios should be considered to demonstrate the model's ability to detect generational impacts to fish populations and habitat persistence (e.g., Susitna River Chinook salmon; five to seven years).

Data collected for some studies do not provide the information needed for the proposed integrated modeling efforts. During the RMIM, for example, it was revealed the Water Quality Modeling study (ISR 5.6) would require data collected on the spatial distribution of groundwater discharge to surface water bodies. Analytical or numerical groundwater flow simulation would be one (of several) ways to satisfy this input requirement. However, the Groundwater Study (ISR 7.5) does not explicitly state analytical or numerical groundwater flow simulations would be undertaken in support of the other physical process models.

As a follow up to the RMIM, a Proof of Concept (POC) meeting was held April 15-17, 2014. This meeting was to: 1) confirm successful integration of models and associated metrics in a single FA (Slough 128); 2) examine the modeling process rather than focus on the actual POC results; and 3) clarify many questions related to the integration of multiple models. The discussions of modeling processes at the POC meeting was considered valuable by the Service, but not fully effective in demonstrating successful model development and integration; many

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In Reply Refer To:
FWS/AFES/AFWFO

SEP 22 2014

Mr. Wayne Dyok
Susitna-Watana Project Manager
Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, Alaska 99503

FERC Project P-14241, Susitna-Watana Hydropower

Dear Mr. Dyok:

The U. S. Fish and Wildlife Service (Service) is providing comments on the Alaska Energy Authority's (AEA) June 3, 2014, Initial Study Report (ISR) for the proposed Susitna-Watana Hydropower project (Project). We provide AEA with our preliminary findings of concern so that they may be meaningfully considered prior to and discussed at the October, 2014 ISR meeting. The Service intends to provide full and detailed comments on these and other topics by the November 30, 2014, Federal Energy Regulatory Commission's (FERC) filing deadline.

As per the FERC Integrated Licensing Process (ILP; 18 CFR 5.15 (c)(2)), the ISR meeting scheduled in October, 2014, provides an opportunity for AEA and licensing participants to discuss the 2013 studies and identify potential modifications to study designs based on the first year's data collection. The process allows for review and recommendation of changes to sampling methodologies implemented by first year studies to ensure study objectives, as specified in the FERC-approved Revised Study Plans (RSP), are met. Our filing to FERC by November 30, 2014, will formalize our comprehensive comments and recommendations after AEA has had the opportunity to address our concerns during the October, 2014 ISR meeting.

The Service has identified three topics of significant concern: 1) data collection and reporting, 2) effective model integration, and 3) development of decision support systems (DSS). These three topics are closely tied together because precise and accurate data provide inputs to models that are used to support Project decision-making.

In these preliminary comments, the Service identifies data collection and reporting concerns (Attachment I) and recommends the data issues be resolved as soon as possible. Without robust data from individual studies, we are concerned the data do not meet study objectives, that model validation will be hindered, and model integration may lead to incorrect conclusions. Given the magnitude of our concerns related to data collection and reporting, we believe it may not be

possible to yield plausible model predictions describing baseline conditions or to predict potential impacts. It is important that these issues be resolved prior to conducting additional field studies.

Much of the data collected under FERC approved study plans are proposed for use in fish habitat models, and the development of those models are based on changes to channel geomorphology and hydrology. Relationships among hydrologic models should be validated and models calibrated for the Susitna River system before their use in fish habitat models. Likewise, relationships among fish habitat models should be validated, and models calibrated for the Susitna River system prior to their use in estimating Project effects under various operational scenarios. To our knowledge there is currently no specific model integration process proposed that will ensure sound relationships among models and their accurate calibration for the Susitna River system. The Service believes that development and implementation of rigorous model integration procedures is critical to our review of this project and we discuss our preliminary concerns in detail (Attachment II).

A DSS is one of the end products of the studies, where data and models from the studies are ultimately used to help make decisions on the effects of the Project on natural resources. We understand AEA intends to develop a DSS using a manual matrix method by early 2015 (FERC 2013). As the DSS plays such an important role in the assessment of Project impacts, the Service requests its development be a collaborative process so that the fundamental objectives, assumptions, critical inputs, weighting methods, and other parts of the model are mutually agreed upon. Furthermore, we are concerned that the timeline for DSS development is lagging other efforts. The ILP process is founded under the principal of early identification of potential issues and conducting studies needed to fill information gaps (FERC 2014). Data gaps may be revealed once the fundamental objectives for the DSS are formulated. Until the DSS development process occurs, it is uncertain all the data needed to implement the DSS has been gathered. Because the DSS is not scheduled for development until 2015, it is distinctly possible that crucial new data needs may be revealed when updated study reports are filed by AEA in 2016 (as per the ILP extension approved by FERC on January 28, 2014). However, going forward, the Service believes the development of a collaboratively designed DSS is of great importance to this Project and recommends that, if practicable, the timeline for its development be accelerated.

Finally, FERC established a new schedule for the proposed Susitna-Watana hydroelectric project ILP in their January, 2014 determination. In that determination, FERC ordered AEA to submit final ISRs on June 3, 2014, for stakeholder review, to hold a meeting in October, 2014, to present results of those ISRs, and to discuss AEA proposed changes to the studies or those proposed by other licensing participants. During a meeting with the Service and National Marine Fisheries Service on September 2, 2014, AEA stated its intent to release reports from 21 new or continued studies conducted in 2014, with intent to discuss results at the October 15, 2014, ISR meeting. On September 17, 2014, AEA filed 10 of 21 reports to FERC. Because the data were gathered outside timelines specified by the FERC-ordered process, and given the limited review

time the Service will have, we will be unable to consider and comment on those study reports in advance of the October, 2014 ISR meeting. Furthermore, we recommend AEA dedicate the limited time at the October, 2014, ISR meeting to discuss concerns related to 2013 studies, as reported in the June 3, 2014, ISR. Additionally, an email on May 6, 2014, copied to the Service by FERC, indicated that studies carried out by AEA in 2014 were conducted outside of the ILP process and would not be considered "second year" studies. This is procedurally very important because neither the Service, nor other licensing participants (Non-Governmental Organizations (NGO) Participants 2014), will have the opportunity to fully review or comment on the design and implementation of the 2014 studies. The Service will be unable to meaningfully contribute to the discussion of the 2014 studies and urge AEA to not discuss any work conducted in 2014 at the ISR meeting. Instead, we suggest the interim results gathered between study years (i.e., 2014 data collection) be discussed at the next quarterly Technical Workgroup meeting, once we have had sufficient opportunities to review those additional data.

Summary

This letter describes some of the Service's concerns with studies reported in the June 3, 2014, ISR, and we are providing them to AEA prior to the November 30, 2014, FERC filing deadline so some issues can be discussed and resolved in a timely manner. The concerns address: 1) data collection and reporting, 2) ability to recommend further studies under the FERC ILP licensing process, 3) development of valid models to assess baseline conditions and effects from Project operations on fish and wildlife resources, 4) capacity to formulate recommendations under section 10(j) of the Federal Power Act for protection, mitigation, and enhancement measures associated with the Project, and 5) formulation of informed decisions pursuant to our Section 18 Fishway Prescription authority under the Federal Power Act. We believe the modified ILP schedule for the Project affords AEA the opportunity to make necessary changes to studies prior to entering the second year of study. The Service believes this review process accommodates the development and implementation of more accurate, effective, and cost-effective plans of study for the Project.

Thank you for the opportunity to submit these comments in advance to the October, 2014 ISR meeting. We hope they are useful to AEA and will generate valuable conversations at the meeting. If you have questions, please contact Ellen Lance (907) 271-1467.

Sincerely,

Socheata Lor, Ph.D.
Anchorage Field Supervisor

Cc: Sarah Goad, AIDEA
Betsy McGregor, AEA
Nicholas Jayjack, FERC
Joe Klein, ADFG, Sport Fish Division
Jeanne Hansen, NMFS
Sue Walker, NMFS
Mike Bethe, ADFG, Habitat Division
Matthew LaCroix, EPA

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[NGO Participants] Wood, M., W. Wolff, J. Konigsberg, M. Wood, R. Schryver, J. Seebach (collectively the NGO Participants). 2014. Initial Study Report Meeting, Susitna-Watana Hydroelectric Project (P-14241). Letter filed with FERC, September 16, 2014.

[USFWS] U.S. Fish and Wildlife Service. 2013. Letter to FERC Re: Alaska Energy Authority's Revised Study Plan for the Susitna-Watana Hydroelectric Project No. 14241-000. March 18, 2013.

Attachment I. Data Issues

Below we discuss our preliminary concerns relating to deviations from study plans, quality assurance and control, and statistical practices and procedures for the 2013 study year.

Deviations From Study Plans – Deviations from established sampling designs occurred in some studies for various reasons, and in some cases resulted in reduced sample size or compromised reliability of data. Below we provide examples.

- As currently planned, some two-year studies cannot be completed because access to all Focus Areas (FAs) was not granted until after the first study year (e.g., ISRs 8.5, 9.6, 9.7, 9.9). For example, a fish wheel was not installed and fish were not tagged near the entrance to Devil's Canyon (e.g., ISR 9.7).

- Anomalous weather conditions prevented or delayed fieldwork on aquatic studies (e.g., ISR 8.5), resulted in late installation of migrant traps, which were likely influenced by environmental conditions associated with late breakup (e.g., ISR 9.6). Moreover, juvenile salmon distribution and abundance measured in 2013 were likely affected by the record fall floods in 2012 (e.g., ISR 9.6).

- Sampling has not been *temporally* adequate across all seasons. ISR 9.6 reports winter fish sampling did not occur across all FAs as proposed; early spring sampling occurred only in three FAs; initial sampling following breakup and installation of migrant traps did not occur until the middle of June, and therefore, spring sampling for fish distribution and abundance was not conducted (e.g., ISRs 7.5, 8.5, 8.6). The extent to which fishes move must be described through sampling; multiple sampling days across all seasons are required to capture the full seasonality of a fish's life-history strategy, which varies considerably within a single season. A single-day of sampling is insufficient to understand the habitat associations of different fish species with differing mobility and life-stages.

- Sample site selections for integrated studies were inconsistently co-located. For example, invertebrate sampling locations (ISR 9.8) were not co-located with fish sampling locations (ISR 9.6). Failure to co-locate sampling sites risks the magnification of data discrepancies, and because the data will be used as inputs for predictive models, may jeopardize the validity of the models.

- Detection arrays did not cover the entire channel and tagging efforts did not allow for detection of fish migrating upstream, therefore the data were biased and efficiency estimates cannot be calculated. Detection rate and recovery of passive integrated transponder (PIT) tags is insufficient to yield useful data to meet study goals and objectives (ISR 9.6).

- Fish targets for fish Habitat Suitability Curve (HSC) sampling were not met (e.g., ISR 8.5), therefore, power to assess fish habitat-preferences and relationships is reduced.

- Data collected on fish habitat for the Fish Passage Barrier Study (ISR 9.12) and the HSI/HSC component of the fish and aquatic Instream Flow Study (ISR 8.5) were gathered at incompatible spatial scales to meet the study objectives.

Quality Assurance and Control Concerns - Below we preliminarily provide some discrete examples where the Service has data quality concerns. Poor data quality has a rippling effect throughout this assessment process because extrapolating inaccurate results throughout the river would amplify errors across the river and associated habitat.

- Water quality samples were qualified as either estimated or rejected by the analytical laboratory due to quality-related failures (ISR 5.5). Issues included failure to deliver samples to the laboratories within the method-specified temperature range; failure to meet procedure specified holding times; contaminated or missing field, trip, and method blanks; and Chain of Custody and bottle labeling discrepancies. AEA proposed to apply a correction factor to the 2013 data to render it useable, but provided no details on how that would be done.

- There is evidence that juvenile salmon may have been misidentified. A comparison of juvenile fish collections from the Susitna River in the 1980s (Alaska Department of Fish and Game 1983 as cited by R2 Consultants in the Fish Population Summary Document), local Alaskan rivers (Alaska Department of Fish and Game, unpublished data; Davis et al. 2013), recent studies on the Susitna River (Kirsch et al. 2014), and nearby tributaries (Miller et al. 2011), signal substantial differences in total fork length distribution and habitat associations among juvenile salmon from that which is expected. Large numbers of unidentified salmonid juveniles (some of which were PIT tagged), anomalous length distributions and questionable habitat associations decrease our confidence in the accuracy of species identification. For example, juvenile Chinook salmon measuring 150 mm fork-length were reported, juvenile Chinook salmon were reportedly most abundant in beaver ponds, there was absence of pink salmon in any samples, and a disappearance of sockeye salmon from Indian River between the February draft ISR and the June draft ISR. We have strong reservations about the identification of these juvenile fish, and suspect many juvenile salmons identified as Chinook salmon may be coho salmon.

- Information used to describe fish/habitat preferences were gathered using professional best judgment, literature, and limited field data, but were not confirmed with an adequate sample from the Susitna River system (ISR 8.5). Fish/habitat data gathered from the Susitna River is necessary to identify preferential use of the habitats. It is vital that these data are accurate as they will be used to: 1) develop Habitat Suitability Indices (HSI) and Habitat Suitability Criteria (HSC); 2) describe fish-macrohabitat relationships, which may be used to evaluate project effects; 3) validate the Instream Flow Study (8.5) habitat model predictions; and 4) extrapolate results from FAs to geomorphic reaches and river segments. Ultimately the data will be used to develop protection and mitigation measures and to provide a basis for post-project monitoring.

- The Service is concerned about AEA's proposal to "scale up", and requests rationale for its implementation (Riverine Model Integration Meeting 2013). "Scaling up" is only

appropriate when the sampling is conducted accurately, in a random fashion throughout the population, and at a scale relevant to resource concerns. To assess impacts from the Project on fish resources, sampling effort must be at a scale relevant to Susitna River fish species at various life stages in order to adequately quantify baseline conditions with the accuracy required for accurate extrapolation. For example, incorrect fish identification and would lead to imprecise and inaccurate extrapolation of species-specific habitat associations.

Statistical Practices and Procedures – Based on our preliminary reviews, we note (below) failures to report standard statistical procedures and calculations required for complete analyses.

- Standard error was not reported for stated relationships between species of juvenile salmonids at various life stages and their habitat (e.g., ISRs 9.5, 9.6). A robust assessment of statistical results must include calculations for standard error.

- Assumptions for the estimating numbers of Chinook salmon migrating above Devils Canyon were not clearly specified and the standard error of that estimate was not reported (e.g., ISRs 9.6, 9.7).

- Sampling and non-sampling errors were not clearly stated (e.g., ISR 9.7). Sampling error is the error resulting from sampling only a part of the population and not the whole population. Non-sampling errors are those errors resulting from selection bias, systematic non-representativeness of samples, and transcription or recording errors. Sampling error is usually quantified and reported with confidence intervals or standard errors and related to *precision* of the estimates. Non-sampling errors are harder to recognize, yet very important, and more closely related to the *accuracy* of the estimates. Sampling errors must be clearly accounted for in statistical analyses to assess data reliability and interpret results.

- Consistent fish sampling methods were not applied (i.e., different gear types used, different effort was applied within and across sampling units, concurrent use of non-compatible gear types within a sampling unit). This resulted in inability to estimate sampling error because (e.g., ISR 9.6) inconsistent sampling methods resulted in individual datasets that are not comparable.

- No power analysis was reported (ISR 9.14), and it is unclear how sample size for both adult and juvenile Chinook salmon was determined. Based on the number of genetic markers sampled and the magnitude of genetic divergence measured in the population documented thus far, a power analysis would inform determination of the number of samples needed to provide a robust estimate of genetic diversity. Furthermore, three years of samples may not be adequate to characterize genetic diversity among a species with a life cycle of five to seven years; this limitation must be addressed in the study results.

- Samples from presumed siblings were proposed for removal from the genetic analyses (ISR 9.14). Only if the samples have been collected in a non-random way may this method be justified. Purging related animals as proposed will bias the results. Furthermore, ISR 9.14 proposes to exclude samples from juvenile Chinook salmon if they show significant differences in allele frequency from adult Chinook salmon. Using all data will produce a more robust estimate of allelic frequencies across the entire population.

- Using a Bonferroni adjustment on the tests for Hardy-Weinberg Equilibrium (ISR 9.14) will increase the risk of a Type-2 error and reduce the statistical power of the test to detect a difference. Furthermore, estimates of genetic distance using F^{st} must include a correction for sample size otherwise small samples tend to look like outliers (ISR 9.14).

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Attachment II. Model Integration

Model integration is the manner in which all of the physical studies interact to assess baselines and Project impacts on the Susitna River. Within the ISRs, methodologies for model integration are not transparent and it is not possible to determine if model integration will identify project impacts with any degree of certainty.

As previously stated by the Service (USFWS 2013), we are concerned that time allotted to develop methods for model integration is inadequate. Prior to the release of the June 3, 2014, ISRs, a three-day Riverine Modeling Integration Meeting (RMIM) was held (November 13-15, 2013). The goal of this meeting was to provide a forum to review and discuss various riverine-related modeling and study integration efforts (AEA Instream Flow Study-Technical Team [ISF-TT] Riverine Modeling Integration Meeting Agenda, 2013). A collaborative meeting such as this one was a good effort toward developing meaningful model integration methods and the Service encourages AEA to continue this type of cooperative work.

During the RMIM, 25 and 50-year scenarios for predicting project impacts to the physical river channel and habitats were proposed. While those timelines are consistent with what is specified in RSP and may present a manageable timeframe for the modeling work (B. Fullerton, Personal Communication, November, 2013), they may not be sufficient to assess impacts to fish and wildlife resources in a biologically meaningful way.

The Service is concerned the modeling capability to answer biological questions is not sensitive enough to detect biologically meaningful changes to species and habitats likely to be affected by project operations. We recommend that modelling capabilities be developed that incorporate biological inputs and deliver outputs that are validated under an appropriate range of operational scenarios (e.g., base load, ecological flows, load-following, run-of-river). The temporal scales (e.g., 25, 50-year) must have biological relevance. For example, 5, 10 and 15 year operational scenarios should be considered to demonstrate the model's ability to detect generational impacts to fish populations and habitat persistence (e.g., Susitna River Chinook salmon; five to seven years).

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questions regarding model development and integration were unanswered. To develop greater stakeholder confidence in the models, the Service recommends conducting a formal model integration meeting to: 1) establish a model development process, 2) develop an understanding of inputs and outputs, 3) demonstrate conceptual linkages, 4) demonstrate the predictive capabilities of the models, and 4) conduct sensitivity analyses to better understand model limitations and reduce uncertainty.

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