Table 9.4-1. Summary of consultation on Fish and Aquatic Resources study plans.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
General					
Email	09/01/2012	Betsy McCracken	USFWS	Resource valuation of non-salmon anadromous and resident fish resources. During the meeting, AEA consultants stated that a resource valuation would not be provided, as requested in the Service's study request for non-salmon anadromous, resident and invasive fish study. We request that an explanation be provided that describes the rationale for this determination and urge reconsideration of our study request.	AEA is not providing a resource valuation because FERC does not require a monetary value be placed on fish and wildlife resources potentially affected by a proposed project.
Email	09/01/2012	Betsy McCracken	USFWS	Trophic ecology- The Service requested information on trophic ecology in the non-salmon anadromous, resident and invasive species study request. The trophic ecology component needs to be clearly spelled out in a study plan identifying any aspects that will and will not be addressed explained and with appropriate rationale.	AEA has revised the River Productivity study plan (see Section 9.8.4.5.2) to incorporate sampling at multiple trophic levels including: organic matter, periphyton, macroinvertebrates and fish. In addition AEA has incorporated trophic model(s) that will allow AEA to describe the trophic ecology of the river with respect to supporting fisheries resources. The model(s) will also allow for evaluation of potential project effect at multiple trophic levels.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	In Study Request = Measure intragravel water temperature in spawning habitats and winter juvenile fish habitats at different surface elevations and different depths to determine the potential for freezing of redds, freezing of juvenile fish, and their habitats.	A hyphoreic study plan has been added to the ISF program that will address intergravel temperatures. See RSP Section 8.5.2.1.6 for Instream Flow.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	In Study Request = Evaluate the potential for stranding of juvenile fish and stranding mortality by season under proposed operational conditions.	An early life history study object has been added to the Fish Distribution and Abundance study. See Section 9.6.4.3.3. This new objective includes several subobjectives one of which is to evaluate baseline conditions for stranding of juvenile fish. This stranding study also will be incorporated into the ISF Program Varial Zone model and will be used to evaluate future potential risk for stranding under proposed project operational conditions. This stranding study will be used to assess the risk of stranding mortality to fry under varying flow conditions.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	In Study Request = Collect and provide the Instream Flow study with habitat suitability criteria (HSC) data to support analysis of potential project impacts. Comment = Mention of HSC is in Study 6.5, but the study request objective is not addressed in the upper, middle, or lower reaches for juvenile anadromous, resident fish, and non-salmonid anadromous fish studies. It is unclear how HSC information will be collected, particularly in winter for post-emergent fish up to 60 mm when fish will be most vulnerable to load-following operations. I see no empirical baseline information being collected to evaluate potential project effects or for inclusion in habitat modeling efforts.	HSC methods are described in the ISF Program HSC Study Plan. See RSP Section 8.5.2.1.5. This data is also being collected by Fish Distribution and Abundance Field Teams in locations where target species and life stages are found. Teams will follow the ISF study plan methods. In addition, AEA has revised the Fish Distribution and Abundance Study Plan for the Middle and Lower River (See Section 9.6.4.3.3) to provide more detail regarding focused sampling for fry less than 60mm. This sampling will provide empirical baseline data that will be used to inform habitat modeling efforts.
E-mail	09/07/2012	Betsy McCracken	USFWS	Instream Flow, Habitat Utilization, Geomorphology PSPs do not fully address USFWS' resource mgmt. concerns. During 3 days of ILP study meetings, sequencing and integration of proposed biological resource studies and physical processes was not described; significant outstanding info needed.	AEA has revised the study plans to describe the integration of proposed biological resource studies and physical processes. See RSP Sections 9, and 8. Interdependencies Flow Charts have been added to all study plans to show the flow and integration of data across studies. See RSP Sections 9 and 8.
E-mail	09/07/2012	Betsy McCracken	USFWS	Need to describe the integration of these inter-related studies, how integration will result in a comparison of baseline biological info, resulting effects to biological resources caused by project operations.	Interdependencies Flow Charts have been added to all study plans to show the flow and integration of data across biological resources. This baseline information will be available to support effects analysis but it is premature to identify specific analyses that will be applied before baseline data are available.

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E-mail	09/07/2012	Betsy McCracken	USFWS	Study results must be quantifiable to: assess potential losses to aquatic resources, habitats; review SuWa Project under relevant fish, wildlife resource conservation authorities; inform fishway prescription authority (Sec. 18 FPA); eventually develop recommended protection, mitigation, enhancement.	In the RSP, AEA has included additional detail that will clarify how data will be collected in support of future quantifiable assessments.
E-mail	09/07/2012	Betsy McCracken	USFWS	USFWS has repeatedly articulated concerns about lack of study sequencing, connectivity, integration between biological studies, other proposed engineering and physical processes studies. Need for collection of adequate temporal and spatial baseline biological, fish habitat data to provide direct input to some of proposed physical modeling efforts. Many USFWS concerns are related to temporal mismatch of biological data collection w/ forward momentum of physical modeling efforts.	Interdependencies Flow Charts have been added to all study plans to show the flow and integration of data across studies and resource programs. This detail includes temporal and spatial biological data on fish and aquatic habitat. The biological data collection is being coordinated closely with the physical modeling, for example the collection of data from multiple resources in Focus Areas. The biological data on fish distribution and abundance and habitat characterization will be used to inform the ISF model.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Study of Fish Distribution/Abundance in Upper Susitna River (Section 9.5) and Study of Fish Distribution/Abundance in Middle/Lower Susitna River (Section 9.6)					
TWG meeting	08/15/2012	Joe Klein	ADF&G	Request methods for shocking to include block nets.	Block nets have been added to methodology in RSP. See RSP Section 9.5.4.4.2, 9.6.4.4.2
TWG meeting	08/15/2012	Various	USFWS	Study site selection should follow a stratified random design.	A stratified random design is being proposed. AEA has included additional detail and documentation in the RSP regarding the sampling effort by strata. See RSP Section 9.5, and 9.6. In addition, strata have been modified per review of the 2012 video in the middle and lower river. This modification is presented in both Habitat Characterization and Fish Distribution and Abundance Revised Study Plans. See RSP Section 9.5.4.1, and 9.6.4.1.
E-mail	08/23/2012	Joe Klein	ADF&G	Minnow trapping under ice should be used during the winter, in all habitat types.	Winter access in the Upper River will be evaluated in a pilot study conducted this winter (2012-2013). Depending on the results of the pilot study AEA will add minnow trapping under ice in multiple locations to Middle River sampling methodology in the RSP. See RSP Section 9.6.4.3.1.
E-mail	08/23/2012	Joe Klein	ADF&G	Evaluate the feasibility of under ice videography	Winter access in the Upper River will be evaluated in a pilot study conducted this winter (2012-2013). Depending on the results of the pilot study AEA wil add vidoe under ice in multiple locations to Middle River sampling methodology in the RSP. See RSP Section 9.6.4.3.1.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
E-mail	08/23/2012	Joe Klein	ADF&G	Request use of trot lines in winter	Winter access in the Upper River will be evaluated in a pilot study conducted this winter. Depending on the results of the pilot study AEA will add the use of trot lines for winter sampling in the Middle River to the RSPin RSP for the Middle and Lower River. See RSP Section 9.6.4.3.1, 9.6.4.4.4.
Email	09/01/2012	Betsy McCracken	USFWS	A first step is to assess the seasonal distributions of target species and life stages and the physical habitat criteria that influence habitat selection and suitability. As a first step, target species have to be identified, agreed upon, and their life history and habitat use similarities to other, unstudied species (i.e., non-target species) need to be determined and described. In the study requests of the Service and other agencies, we recommended studying the baselines of all affected fish species and life stages, including all five species of anadromous salmon and all resident fish.	AEA will be studying seasonal distribution and life stages of all target species as described in detail in Objective 1 of the Fish Distribution and Abundance Study Plan. Target species lists were presented, discussed and agreed upon in TWG meetings in May. Since that time specific additions have been requested by ADF&G and USFWS and these requests have been added to that study plan. See RSP Section 9.6.4.3. In addition, AEA is proposing a habitat based sampling design for Fish Distribution and Abundance. Part of the value in this approach is that all fish species and life stages present at sampling locations will be targeted. Multiple methods will be used at each location to capture all species and life stages present, including all five species of anadromous salmon and resident fishes. See RSP Section 9.6.4.1.

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Email	09/01/2012	Betsy McCracken	USFWS	Fish distribution data are needed to describe the baseline data to support and compliment other proposed study objectives, including those related to fish habitat selection and utilization. A first step to acquiring adequate fish distribution is to assess the full lateral and longitudinal profile of seasonal fish distribution, life stage periodicity, and suitable used and unused habitats that are influential in fish habitat site selection.	Fish distribution data will be collected as part of Objective 1 of the Fish Distribution and Abundance Study Plan. Data will be collected in representative habitats and across all seasons in the middle and lower river. Data will be collected in the open water period in the upper river. See RSP Section 9.5.4.3.1, 9.6.4.3.1. AEA is proposing a habitat based sampling design for Fish Distribution and Abundance. This approach includes seasonal samplIng throughout that lateral and longitudinal habitats identified in the Susitna River. Part of the value in this approach is that AEA is not just going where AEA thinks fish will ,or will not, be based on 1980s data, instead AEA is proposing stratified random design to document fish presence. Multiple methods will be used at each location to attempt capture all species and life stages present. With this approach we would expect to document habitat that are and are not used by fish. See RSP Section 9.5.4.1, 9.6.4.1.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	PSP = Collect tissue samples to support the Genetic Baseline Study for Selected Fish Species (Section 7.14); (7.5 upper reach) Comment = No mention of analyzing samples; analysis mentioned in Genetic Baseline Study, but link/integration to analyzing samples collected in this study is not discussed. Will samples be analyzed? Explain.	Yes. AEA has included additional detail in the RSP for Fish Genetics that includes descriptions of both laboratory analysis of samples and analysis of genetic structure of Chinook salmon populations. See RSP Section 9.14.4.3.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	PSP = Document the timing of downstream movement and catch for fish species via outmigrant traps; (7.5 upper reach) Comment = Unclear if the timing of downstream movement and catch for the upper river includes or excludes addressing outmigration and winter sampling	AEA has included additional detail in the Fish Distribution and Abundance for the Upper River RSP regarding the location and timing of outmigrant trapping and winter sampling. See RSP Section 9.5.4.3.2, 9.5.4.3.2.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Initial written comments to PSP	09/07/2012	USFWS staff	USFWS	The list of habitat types to be sampled in the middle and lower reaches appears longer than habitats proposed for the upper reach	AEA has included additional detail in the RSP to clarify that the lists of habitat types for the Middle/Lower and Upper reaches are similar, but the actual habitat types will be defined by the habitats present in the mainstem and tributaries of interest. See RSP Section 9.5.4.1, 9.6.4.1, and 9.9.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Only winter sampling I see proposed in the upper reach includes using DIDSON and video cameras in 10 "selected" sloughs and side channels; how were/will sites be selected?; What other habitat types are available and why are they not being sampled? Is this sufficient to get at winter distribution and abundance for all life stages?; will not likely be able to identify juvenile species using these techniques (therefore, no distribution and abundance information and habitat use by species, particularly for early life stages (<60 mm); other winter sampling (using gill nets, minnow traps, and trot lines) is listed in the schedule section (and not in methods), but it is not described.	AEA has added additional detail in the Fish Distribution and Abundance RSP for the Middle/Lower River by including an objective for winter sampling and describing the techniques, locations and timing of proposed sampling. See RSP Section 9.6.4.3.1, 9.6.4.3.2, 9.6.4.3.3, 9.6.4.3.4. In addition, a study objective focused on Early Life history of Anadromous Salmon has been added to focus sampling on this species and life stages. See RSP Section 9.6.4.3.3.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Comment = Study Request objectives 7-9 are not addressed in 7.5 or 7.6; there is no mention of egg incubation (rates or success), hatching (rates or success), stranding (ramping rates) or emergence (dates and times) sampling anywhere; no mention of baseline intragravel temperature or water quality monitoring of spawning and pre-emergent juvenile fish habitats; no mention of characterizing baseline water quality conditions at spawning or rearing habitats. Only mention is in Study Goals (6.5.1.2, page 6-10); Objective 8. Conduct a variety of post-processing comparative analyses derived from the output metrics under aquatic habitat models. Approach appears to evaluate using only physical habitat models and without empirical sampling post-spawning through emergence and for juveniles up to PIT tagging size (i.e., 60 mm).	Study Request Objectives 7-9 are now addressed more specifically. AEA has added a study objective focused on Early Life history of Anadromous Salmon has been added to the Fish Distribution and Abundance RSP. See RSP Section 9.6.4.3.3. This study objective includes efforts to evaluate emergence, early movements, and stranding of fry/parr. In addition a hyporheic study will address water quality in spawning areas. See RSP Section 8.5.2.1.6.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
E-mail	09/07/2012	Mike Buntjer	USFWS	There does not appear to be any studies to collect baseline biological or physical spawning habitat information between the time eggs are deposited in redds and the time of fry emergence	The Inter-gravel Study will collect data on the physical characteristics of spawning habitat. See RSP Section 8.5.2.1.6, 9.6.4.3.3.
Initial written comments to PSP	09/07/2012	USFWS staff	USFWS	Unclear if Biotelemtry objective includes or excludes PIT tagging juvenile anadromous salmon.	AEA has added additional detail in the RSP to clarify that that juvenile salmon will be included in PIT tagging efforts. See RSP Section 9.5.4.3.2, 9.5.4.4.10, 9.6.4.3.2, 9.6.4.4.12.
Initial written comments to PSP	09/07/2012	USFWS staff	USFWS	The Middle/Lower River study objective 'characterize the age structure, growth, and condition of juvenile anadromous and resident fish by season' is not in the Upper River PSP. Is this study objective limited to juveniles or should it say "all" resident fish.	AEA has added the objective to characterize the age structure, growth, and condition of juvenile anadromous and all resident fish by season to the Upper River RSP. See RSP Section 9.5.1.1.
Comments on agency consultation meeting notes	09/13/2012	Michael Buntjer	USFWS	Michael's comment reads: "Seems to me this is at the margins of the ice cover season. Jan-Mar would seem to provide safer ice conditions for accessing sites? …would like more discussion."	Winter access in the Middle River will be evaluated in a pilot study conducted this winter (2012-2013). Depending on the results of the pilot study AEA will add additional sampling events and locations to the Fish Distributtion and Abuncance Study Plan. See RSP Section 9.6.4.3.1, 9.6.4.3.2, 9.6.4.3.3.
Comments on agency consultation meeting notes	09/13/2012	Michael Buntjer	USFWS	Is "population estimate" a necessary objective? Could do more frequent sampling for CPUE instead of population estimate sampling.	AEA has eliminated population estimation from the Fish Distribution and Abundance Studies. See RSP Section 9.6.4.3.1.

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Agency consultation meeting	09/13/2012	Betsy McCracken	USFWS	Unclear whether juvenile salmon would be included in Objective #2	AEA has added additional detail in the RSP to clarify that juvenile salmon are included in Objective #2. In addition, AEA has added additional early life history objectives. See RSP Section 9.5.1.1, 9.6.1.1.
Agency consultation meeting	09/13/2012	Jeff Davis	ARRI	Request that sampling be tied to species and life stage specific objectives	AEA's approach to fish sampling is habitat-based not driven by where we would expect to find individual species and life stages of fish. Sampling will be stratified by geomorphic reaches and mainstem habitat categories. Random samping within the habitat strata will ensure that sampling is representative of all habitats present in the system and therefore will be effective at capturing all species and life stage are present within these habitats.. In addition, monthly sampling in those representative sites will be implemented to determine what species and life stages are using those habitats seasonally. See RSP Section 9.5.4.3, 9.6.4.3.
Agency consultation meeting	09/13/2012	Stormy Haught, Monte Miller	ADF&G	Concerns with using PIT tags: 1) half vs full duplex tags, 2.) size of fish tagged, 3) human ingestion of tags	PIT tag systems have been evaluated. AEA is considering use of Texas Instruments half-duplex tags due to the flexibility of system and the ability to tailor it to local conditions at a reasonable cost. See RSP Section 9.5.4.4.10, 9.6.4.4.12
Agency consultation meeting	09/13/2012		ADF&G	Request grayling to be added to list of species to be radio tagged	Grayling has been added to target species list. See RSP Section 9.5.1.1, 9.6.1.1.

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Agency consultation meeting	09/13/2012	Betsy McCracken	USFWS	USFWS recommended Beechie as opposed to USFS which was developed for small SE streams and relative to forest practices	The methods for habitat characterization were discussed and approved in an agency meeting in May 2012. The USFS method is a standardized approach that is widely used in many rivers, including larger waters. In addition, to using that protocol for habitat characterization, AEA has revised the Habitat Characterization study plan to include the delineation and characterization of "edge habitat" in mainstem reaches. See RSP Section 9.9, 9.5.1.1, 9.6.1.1.
Agency consultation meeting	09/13/2012	ADF&G staff	ADF&G	Request for details of surgical methods, battery life and specifications which determine battery life.	Additional detail has been added to the study plan on tagging and tags. However, detail on tag specifications and battery life will be available post RSP in an study implementation plan. See RSP Section 9.5.4.4.10, 9.6.4.4.12
Agency consultation meeting	09/13/2012	Monte Miller	ADF&G	Request a table in RSP which includes: proposed tagged species, type of tagging, number of individuals, and any discrepancies.	A table with detail on target species and sample sizes has been added to the Fish Distribution and Abundance Study plans. See RSP Section 9.5 Table 9.5-2, 9.6 Table 9.6-2.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Agency consultation meeting	09/13/2012	Mike Buntjer	USFWS	Request data on movement (and timing) of newly emergent fish from spawning to rearing areas or movement of juvenile fish <60 mm in winter. Specifically: 1. How will the Project effect changes in temperature and survival? (There will be an Inter-gravel study in the ISF program). 2. How will flow fluctuations affect early life history? (The ISF physical habitat model will address this) 3. When are fish active- day vs. night? 4. Timing of movements with respect to flows to understand Project flow effects	An objective on early life history of anadromous salmon has been added to the Fish Distribution and Abundance study plan. This objective includes subobjective to address timing, movements, and diurnal behavior of anadromous salmonids in the Middle/Lower River. See RSP Section 9.6.4.3.3 In addition there has been an intragravel study component added to the Instream Flow Study Program to help collect baseline information that will be used to evaluate project effects on incubating embryos. See RSP Section 8.5.2.1.6.
Phone	09/19/2012	Matt Evenson	ADF&G	Burbot sampling methodologies. Suggested burbot be captured with hoop traps for radio tagging; trot lines are lethal to burbot.	AEA has added hoop traps to capture methods in the RSP. See RSP Section 9.5.4.4.8, 9.6.4.4.8.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	PSP = Collect tissue samples from juvenile salmon and opportunistically from all resident and non-salmon anadromous fish to support the Genetic Baseline Study (Section 7.14). (7.6 middle and lower reach) Because PSP is not structured similarly to our study requests, why is this study objective limited to juvenile salmon? This may be okay, because genetic sampling included in Salmon Escapement Study, though no mention in study of analyzing samples or overall links between studies. Without providing linkages between studies, there is a lot of searching required to find if, where, and how information is being collected.	Genetic sampling in the Fish distribution and Abundance Study (RSP Sections 9.5 and 9.6) is complimentary to Adult Escapement study (RSP Section 9.7). As such the Fish Distribution and Abundance study plan does not address collecting samples from adult salmon; that is included in the Genetics study plan. This is addressed by the study interdepencies flow chart described in RSP Section 9.14.7.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	PSP = Characterize the age structure, growth, and condition of juvenile anadromous and resident fish by season; (7.6 middle and lower reach) Comment = Is there a difference between Document (as requested) and Characterize (as proposed)? Explain Is this study objective limited to juveniles or should it say "all" resident fish. This objective is not included in upper reach; should at least characterize age structure for all resident and anadromous fish by season	AEA has revised the terminology in the RSP to use the term "document" instead of the term "characterize". This objective will be applied to all fish species collected and has been added to study plan for Upper River. See RSP Section 9.5.4.1, 9.6.4.1

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	PSP = Document the timing of downstream movement and catch for all fish species using outmigrant traps; (7.6 middle and lower reach) Comment = Unclear if this includes or excludes addressing outmigration	The use of outmigrant traps is intended to address downstream movements of fish species that have known out migrations. The placement of the traps will reflect locations where the likelihood of intercepting target species is high. This is described in the RSP. See RSP Section 9.5.4.3.2, 9.6.4.3.2.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	PSP = Describe seasonal movements of selected fish species such as rainbow trout, eulachon, Dolly Varden, whitefish, northern pike, Pacific lamprey, and burbot) using biotelemetry (PIT and radio-tags) with emphasis on identifying foraging, spawning and overwintering habitats within the mainstem of the Susitna River and its associated off-channel habitat; (7.6 middle and lower reach) Comment = Also, mentions installing up to 10 antenna arrays; is that sufficient to determine movement of juveniles in and out of habitats by reach? When, where, and how will sites be selected? What is rationale and assumptions for selecting habitat types and sites?	AEA has added additional detail in the RSP on radio telemetry of target species and array design. See RSP Section 9.5.4.4.10, 9.6.4.4.12

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Agency consultation meeting	09/13/2012	Jeff Davis	ARRI	Sampling frequency: suggested bi-weekly sampling during the critical periods for early life stages of salmon	Biweekly sampling has been added to the study plan for the objective related to early life history of salmon. See RSP Section 9.5.4.2, 9.6.4.2
Agency consultation meeting	09/14/2012	Jeff Davis	USFWS	Jeff Davis asked what classification scale critical sites (addressing specific life stages of fish) will be based on.	As described in the RSP fish sampling will occur at several habitat categories including the mainstem habitat, mesohabitat and edge habitat levels. These levels vary with the size and complexity of the river system. It is possible that one life stage of a species, including critical life stages will be sampled at all or some of these three different levels in different part of the river This should not be unexpected as fish move between habitats both within and across seasons and sampling will occur on a seasonal or monthly basis. See RSP Section 9.5.4.1, 9.6.4.1.
Phone	09/18/2012	Randy Brown	USFWS	Existing cisco whitefish data. Recent studies by Brown 2008-2011 (unpub) have ID'ed relative abundance, distribution, age camp, and spawning timing; suggest dropping cisco from list of species	Will consider dropping cisco from list of focal species in study
Agency consultation meeting	09/27/2012	Michael Buntjer	USFWS	Requests the periodicity data sources be referenced.	Sources for periodicity tables used in Project studies will be given proper citations. See RSP Section 9.5.4.3, 9.6.4.3.
Agency consultation meeting	09/027/2012	Michael Buntjer	USFWS	Requests clarification on the sampling approach in the lower river due to the more broad habitat classification applied.	The Habitat Characterization Plan has been revised and includes clarifying information on the habitat mapping approach for the Lower River and the limitations of delineating at a scale finer than mainstem habitats. See RSP Section 9.6.4.1.

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Salmon Escapement Study (Section 9.7)					
e-mail	08/23/2012	Joseph Klein	ADF&G	Identify locations of adult fish weir locations described on tributary streams (7.7.4.1.5, page 7-39). Consider placement of adult fish weir upstream of the proposed dam on prominent Chinook salmon streams.	AEA has added additional detail in the RSP identifying the likely weir locations. See RSP Section 9.7.4.4.2. In light of 2012 results on Chinook salmon above Devil's Canyon, AEA is concerned that an adult fish weir could delay or deter the upstream migration. The current tagging and escapement study design will adequately address the distribution and habitat use of adult Chinook salmon above the dam with less risk for alteing fish behavior.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	= Need to define "generate count" and how generated. If it is an index of abundance, then need to identify the standardized unit of effort. Also, not sure why escapement estimate is not being determined? This study references escapement estimates from the 1980s, but not here. Explain.	Counts will be visual observations of individual salmon in clear-water areas within the study area. These counts will be obtained from helicopter, ground, and/or on-water surveys of tributaries and mainstem habitats of the middle and upper river. The primary use for these counts is not an index of abundance but is instead to quantify mark rates among different areas. Mark rate is the fraction of the fish that are tagged. Mark rate derivation takes into account survey conditions and observer efficiency. Escapement estimate are not being determined because escapement levels are not critical to conducting an assessing the proposed project's impacts. Some quantification of abundance above the tagging sites and in particular habitats will be possible, but not total escapement to river sections (e.g., middle and/or upper river). The Salmon Study Plan has additional text to address counting and estimates of abundance.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	*In Study Request = Determine the availability and accessibility of spawning habitats by adult salmon to mainstem and tributary locations based upon flow regime*. Comment = Unclear if, how, or where this Study Request objective is being addressed. Not listed as an objective in this study; section 6.5.4.3.1 (page 6-19) describes assessing access to rearing and spawning habitats via output from flow routing models. Also, objective 13 (shown below) in fish passage study (section 7.12); page 7-98): 13. Evaluate the potential creation of fish passage barriers within existing habitats (tributaries, sloughs, side channels, off-channel habitats) related to future flow conditions, water surface elevations, and sediment transport.	AEA describes how this study request objective is being address in both the Fish Barriers and ISF study plans. RSP Sections 9.12 and 8.5. In addition text has been added to better describe the interdependencies of the Fish Barriers and ISF study plans with respect to access to rearing and spawning habitats, including mainstem sloughs, side channels, off-channel habitats and tributaries. RSP Sections 9.12.1.1 and 8.5.4.61.7.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	*In Study Request = Measure critical habitat characteristics (e.g., channel type, flow, substrate, and groundwater) at reaches used for spawning and compare these characteristics with those in adjacent reaches that do not contain spawning adults.* Comment = Do not see this study request objective addressed or any objective that looks at characterizing use, availability, or quality of potential spawning habitats. There appears to be no empirical baseline information being collected; only see determining distribution and potential abundance of redds. Also, see mention of evaluating potential dewatering or scouring of redds in Chapter 6, but no empirical baseline information to assess daily load-following operations.	Detail has been added to the Instream Flow study plan to address these concerns. See RSP Sections 8.5.4.6.1.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Email follow-up to TWG discussion 8/15	09/07/2012	Betsy McCracken	USFWS	Request that tissue samples be obtained from radio-tagged Chinook salmon	AEA has added additional detail to the RSP by including descriptions of how tissue samples will be taken from radio-tagged salmon in 2013/14. AEA notes that AEA's ability to do so is subject to ADF&G Fish Research Permit conditions.
Email	09/07/2012	Betsy McCracken	USFWS	Clarify what you mean by "generate counts" of adult Chinook salmon. Are escapement estimates being made?	The RSP study plan defines "generate count" (Section 9.7.4.4.2). Counts will be visual observations of individual salmon in clear-water areas within the study area. These counts will be obtained from helicopter, ground, and/or on-water surveys of tributaries and mainstem habitats of the middle and upper river. The primary use for these counts is not an index of abundance but is instead to quantify mark rates among different areas. Mark rate is the fraction of the fish that are tagged. Mark rate derivation takes into account survey conditions and observer efficiency. Escapement estimates of the middle and upper river are not proposed as explicit objective. Escapement levels are not critical to conducting an impact analysis. Some quantification of abundance above the tagging sites and in particular habitats will be possible, but not total escapement to river sections (e.g., middle and/or upper river).
Email	09/07/2012	Betsy McCracken	USFWS	No mention of analyzing non-Chinook tissue for genetics	Only Chinook analyses are proposed as part of genetics study (See RSP 9.14.4 for additional responses to this comment).

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Email	09/07/2012	Betsy McCracken	USFWS	It is unclear where issue of availability of habitat affected by altering flows is addressed.	This is address by instream flow model and using data from several studies in the RSP, including the salmon escapement (distribution and habitat use by spawning salmon). See RSP Section 8.5.4.3.1.
In-person meeting	09/25/2012	Jack Erickson and James Hasbrouck	ADF&G	Series of suggested edits/clarifications to PSP. Clarified that coho salmon escapement does not need to be "system-wide" but instead only Susitna River *above Yentna River*	AEA has added additional detail in the RSP tto clarify that coho escapement only applies to Susitna above Yentna confluence. See RSP Section 9.7.4.4.2.4.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
River Productivity Study (Section 9.8)					
TWG meeting	08/15/2012	Mike Buntjer	USFWS	Discussion regarding Objective 4 (Section 7.8.4.4), inquired about the rationale for not having surrogate sites in Alaska.	During the River Productivity Subgroup meeting it was discussed that surrogate systems likely do not exist in Alaska; there are no regulated glacial rivers with reservoirs of similar size and potential operations. Thus is was determined that adding a literature review of glacial rivers affected by water regulation to Objective 1 of the River Productivity Study was an acceptable alternative. This was agreed to by the Subgroup participants including representatives from AEA, USFWS, NMFS, and ADF&G. See RSP Section 9.8.4.1.
TWG meeting	08/15/2012	Jeff Davis	ARRI	Discussion regarding Objective 4 (Section 7.8.4.4), expressed concerns about literature-based assessment	This subject was further discussed in the 9/27/12 agency consultation meeting. Literature review of glacial rivers affected by river regulation will be included in Objective 1, synthesis of literature reviewed, in the RSP, Section 9.8.4.1..

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
TWG meeting	08/15/2012	Jeff Davis	ARRI	Suggests that study plan should be measuring primary and secondary productivity by conducting stream respiration / metabolism studies.	This subject was further discussed in the 9/27/12 agency consultation meeting. AEA has revised the River Productivity study plan to include a more rigorous approach to measuring primary and secondary productivity that includes collecting data on organic matter, periphyton and algea, emerging aquatic invertebrates as an estimate of carbon production, benthic macroinvertebrates, and drift. These data will be used to describe existing communities of primary and secondary producers as well as will feed into two independent trophic models: one to describe the bioenergetics and a second to describe origin of food sources under current conditions (RSP Section 9.8.4.5). AEA thinks this is as rigorous approach and is associated with less uncertainty as compared to a stream metabolism approach. In addition, stream respiration and stream metabolism studies are do not correlate well to the communities (macroinvertebrates, fish) that potentially would be affected by Project operations. As such this type of approach would limit our ability to predict project effects on those communities, outside of a net change in amount of GPP or ER. , through sampling drift, benthos, and fish diet) best relates changes in the ecosystem to fish.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
TWG meeting	08/15/2012	Joe Klein	ADF&G	Discussion regarding Objective 4 (Section 7.8.4.4), expressed concerns about literature-based assessment	This subject was further discussed in the 9/27/12 agency consultation meeting. Literature review of glacial rivers affected by river regulation will be included in Objective 1, synthesis of literature reviewed, in the RSP, Section 9.8.4.1.
TWG meeting	08/15/2012	Jeff Davis, Joe Klein	ARRI, ADF&G	Requested sampling in deep water	Current federal protocols (specifically Angradi et al. 2006, as well as those cited in the RSP Section 9.8.4.2) recommend shoreline littoral sampling, as they are usually considered to be where much of the macroinvertebrate productivity takes place. Furthermore, shoreline areas are the locations that will be most affected by the Project. Sampling deeper benthic habitats farther out in the channel is challenging and benthic organisms are usually lower in abundance in these habitats (Angradi et al. 2006).

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
e-mail	08/23/2012	Joseph Klein	ADF&G	7.8.4.4 **Conduct a literature/data search to identify existing river systems that could act as surrogates in evaluating future changes to productivity in the Susitna River.** We recommend supplementing or substituting this section using a reference reach in a similar Alaska river using a BACI design monitoring program in order to assess post project impacts.	During the River Productivity Subgroup meeting it was discussed that surrogate systems likely do not exist in Alaska so that adding a review of potential project effect to Objective 1 of the River Productivity Study was an acceptable alternative. This was agreed to by the Subgroup participants including representatives from AEA, USFWS, NMFS, and ADF&G. AEA has included in the RSP a feasibility study to identify the suitability of the Talkeetna River as a reference reach. RSP Section 9.8.4.4. AEA will consider the use of a BACI design when developing a monitoring plan for post-project impacts to river productivity. Prior to developin a monitoring plan it is important first to obtain results from baseline studies and have finalized Project operation procedures.. See RSP Section 9.8.4.4.
Email	09/01/2012	Betsy McCracken	USFWS	Marine derived nutrients are mentioned in Section 7.5.2 in association with the River Productivity Study, but are not mentioned elsewhere in the PSP	AEA has added additional detail to the RSP describing how marine derived nutrients will be addressed with a stable isotope analysis as part of the trophic analysis. See RSP Section 9.8.4.5.2.
Email	09/01/2012	Betsy McCracken	USFWS	"Trophic ecology needs to be clearly spelled out in a study plan identifying any aspects that will and will not be addressed explained and with appropriate rationale."	This subject was further discussed in the 9/27/12 agency consultation meeting. AEA has added additional detail to RSP by describing a more rigorous approach in defining trophic relationships. Options discussed included bioenergetics, stable isotope analysis, and adult insect emergence traps. See RSP Section 9.8.4.5.2.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Email	09/06/2012	Joseph Klein	ADF&G	Recommends identifying a reference reach in a similar Alaska river for using a BACI design monitoring program to assess post project impacts.	RSP will address reference sites in Objective 4 (Section 9.8.4.4), with a feasibility study on the Talkeetna River in 2013, conducting sampling efforts on multiple sites to assess community similarities with middle Susitna River sites.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Study Request = Develop a white paper on the impacts of hydropower development and operations (including temperature and turbidity) on benthic macroinvertebrate and algal communities in cold climates. *PSP = Synthesize existing literature on the impacts of hydropower development and operations (including temperature and turbidity) on benthic macroinvertebrate and algal communities;* Comment = Any difference in developing a white paper versus synthesizing existing literature?	"Developing a whitepaper" and "synthesizing existing literature" may be considered synonymous. However, stating "develop a white paper" may hold different meaning or expectations for different parties, and would require a definition of what a whitepaper is. Therefore, the PSP refers to the action of synthesizing existing literature, in descriptive terms, to clarify the proposed task. RSP Section 9.8.4.1.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Study Request = Characterize the pre-project benthic macroinvertebrate and algal communities with regard to species composition and abundance in the lower, middle and upper Susitna River. *PSP = Characterize the pre-Project benthic macroinvertebrate and algal communities with regard to species composition and abundance in the middle and upper Susitna River;* Comment = Omission of lower reach is an apparent typo.	AEA has considered the inclusion of sampling for macroinvertebrates and algae in the Lower Susitna River and has determined that, at this time, sampling in the Lower River is not warranted. Given the dramatic change is discharge, turbidity and temperature in the Susitna River associated with the inflows from the Talkeetna and the Chulitna River we do not anticipate Project related affects that will be translated to primary and secondary producers. Our approach for river productivity is to establish a rigorous sampling program for the locations with the greatest potential for change, the river upstream and directly downstream of the proposed Project dam site.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Study Request = 3. Estimate drift of benthic macroinvertebrates in habitats within the lower, middle and upper Susitna River to assess food availability to juvenile and resident fishes. *PSP = Estimate drift of benthic macroinvertebrates in selected habitats within the middle and upper Susitna River to assess food availability to juvenile and resident fishes;* Comment = Omission of lower reach is an apparent typo.	AEA has considered the inclusion of sampling for macroinvertebrates and algae in the Lower Susitna River and has determined that, at this time, sampling in the Lower River is not warranted. Given the dramatic change is discharge, turbidity and temperature in the Susitna River associated with the inflows from the Talkeetna and the Chulitna River we do not anticipate Project related affects that will be translated to primary and secondary producers. Our approach for river productivity is to establish a rigorous sampling program for the locations with the greatest potential for change, the river upstream and directly downstream of the proposed Project dam site.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Study Request = Conduct a trophic analysis to describe potential changes in the primary and secondary productivity of the riverine community following post-project construction and operation *PSP = Conduct a review on the feasibility of a trophic analysis to describe potential changes in the primary and secondary productivity of the riverine community following Project construction and operation;* Comment = Shouldn't this read: Conduct a trophic analysis, if feasible, to describe…? Also, why would it not be feasible? Explain.	This subject was further discussed in the 9/27/12 agency consultation meeting. AEA has added additional detail n the RSP describing a more rigorous empirical approach to define trophic relationships. See RSP Section 9.8.4.5.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Study Request = Characterize the **benthic** macroinvertebrate compositions in the diets of representative fish species in relationship to their source (benthic or drift component). *PSP = Characterize the macroinvertebrate compositions in the diets of representative fish species in relationship to their source (benthic or drift component);* Comment = I assume this should include term "benthic". If not, explain difference.	Analysis of fish diets of target species will include both benthic and terrestrial invertebrates. RSP will mention the terrestrial component in this objective, as well as the drift objective, Sections 9.8.4.3 and 9.8.4.7.

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Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Study Request = Evaluate the feasibility of reference sites on the Talkeetna and Chulitna Rivers to monitor baseline productivity, pre- and post-construction. (deleted in PSP; and not addressed) *PSP = AEA replaced this objective (with #4 below), but based on discussion at August 15, 2012, TWG meeting it was suggested to do both or keep the original Study Request objective. We recommend and support that suggestion.* Comment = Conduct a literature/data search to identify existing river systems that could act as surrogates in evaluating future changes to productivity in the Susitna River. (added in PSP)	This subject was further discussed in the 9/27/12 agency consultation meeting. Literature review of glacial rivers affected by river regulation will be included in Objective 1, synthesis of literature reviewed, in the RSP. See RSP Section 9.8.4.1. RSP will address reference sites in Objective 4 (Section 9.8.4.4), with a feasibility study on the Talkeetna River in 2013, conducting sampling efforts on multiple sites to assess community similarities with middle Susitna River sites.
Word document titled "ELH Juvenile Adult Fish D and A Riv Pro mb initial draft comments on PSP" attached to e-mail	09/07/2012	Michael Buntjer	USFWS	Study Request = 9. Estimate benthic macroinvertebrate colonization rates in the middle and lower reaches to monitor baseline conditions and evaluate future changes to productivity in the Susitna River *PSP = Estimate benthic macroinvertebrate colonization rates in the middle and lower reaches to monitor baseline conditions and evaluate future changes to productivity in the Susitna River.* Comment = Note: Page 7-12 of PSP states that marine derived nutrients are included in River Productivity Study, but there is no mention of it in Chapter 7; i.e., is not addressed.	AEA has added additional detail in the RSP including an analysis of fish food sources including freshwater and marine derived nutrients as part of the trophic analysis. See RSP Section 9.8.4.5.2.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Section 7.8.4.2.1, request for additional details of site-specific sample locations and sampling methodology	The RSP will include additional details regarding sampling methodology, which will be based on accepted federal agency standardized methods, such as the USGS NAQWA protocols, which sample in "richest-targeted habitat", typically riffle-like habitat and woody snags. See RSP Section 9.8.4.2.1. Sampling locations will follow this standardized sampling approach and availability within sampling focus areas; details will be addressed in the implementation plan.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Section 7.8.4.2.1, number of sample sites per macrohabitat classification.	PSP contains details on sampling areas and number of sites within those areas in Table 7.8-1, along with Figures 7.8-1 through 7.8-3. AEA has included in RSP clarification that sampling focus areas contain 1 mainstem site and 2 off-channel sites that are associated with that mainstem site. See RSP Section 9.8.4.2.1.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Section 7.8.4.2.1, inquired if macrophyte beds should be included as habitat to be sampled for benthic macroinvertebrates	No documentation of macrophyte beds as a major habitat area in the Susitna. No plans to further stratify for this habitat type.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Questions on methodology of sample snags for macroinvertebrates (in Section 7.8.4.2.1)	PSP refers readers to Moulton et al. 2002 for USGS protocols on snag sampling. RSP Section 9.8.4.2.1.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Objective 3, Section 7.8.4.3, invertebrate drift sampling methods and timing.	RSP will clarify that drift sampling will occur in spring, summer, and fall, and that 12 of the 18 sites to be sampled will be in a focus area in the Middle Reach, which include mainstem sites paired with1-2 associated off-channel sites. RSP Section 9.8.4.1, and 9.8.4.3..

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Objective 5, Section 7.8.4.5, trophic analysis.	AEA has revised the RSP to include a more rigorous approach in defining trophic relationships and addressing estimates of river productivity. See RSP Section 9.8.4.5.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 6, Section7.8.4.6, HSC criteria development. Concerned that level of sampling is insufficient.	AEA has added additional detail in the RSP regarding the HSC/HSI criteria development process. See RSP Section 9.8.4.6. In the RSP, the suitability information is literature-based, with validation by site-specific field observations, and finalization by expert panel.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 7, Section7.8.4.7, questioned what the objective is for fish diet analysis.	Fish diet analysis will provide information on what target fish species are consuming in relation to their overall abundance in community and their prevalence in drift. See RSP Section 9.8.4.7.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 7, Section7.8.4.7requested additional details about sampling efforts (locations and frequency).	AEA has added additional detail in the RSP regarding the implementation plan. RSP describes how the efforts will be coordinated with relevant fish study for timing and locations at focus areas. See RSP Section 9.8.4.7.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 7, Section7.8.4.7, asked if weights and cohort info should be collected.	Detail has been added to the RSP including taxa weights (See RSP sections 9.8.4.2.1, 9.8.4.3, 9.8.4.5, and 9.8.4.7.). In addition with the inclusion of the bioenergetics and isotopic analyses AEA approach will focuses on trophic relationships not production estimates and thus, does not include cohort analysis. RSP Section 9.8.4.5.

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Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 7, Section7.8.4.7, asked if terrestrial invertebrates and riparian vegetation cover information should be collected.	Terrestrial invertebrates will be analyzed in drift samples and fish diet analysis (RSP sections 9.8.4.3 and 9.8.4.7). Additional information on riparian vegetation will be available from the Botanical Riparian or Riparian Instream Flow studies. The interdependencies of the Riparian and River Productivity studies will be clarifed as baseline data is collected and we learn what proportion of the drift and fish diet is derived from terrestrial, specifically riparian, resources.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 4, Section7.8.4.4, asked how and who will determine if additional reference data collection at other sites is “feasible”.	RSP will address reference sites in Objective 4 (Section 9.8.4.4) with a feasibility study of potential sites in the Talkeetna River in 2013 which will include sampling efforts on multiple sites to assess community similarities with middle Susitna River sites.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 8, Section7.8.4.8, requested more detail on organic matter sampling methods.	AEA has added additional detail in the RSP regarding the methods of collecting and analyzing organic matter will be provided in the RSP. See RSP Section 9.8.4.8.

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Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 8, Section7.8.4.8, asked if organic matter processing, flow transport, and floodplain interactions will be investigated.	AEA is not proposing to such investigations because such investigations would be focused on river processes, and less on the trophic community analysis that is the focus of this study. Results of such investigations would not be easily related/ correlated to the organisms of interest, i.e. macroinvertebrates and fish, and, therefore, would be difficult to use those results to predict project effects on those communities. In addition, each of these would require a specialized and extensive study involving development with or by other study plans.
Initial written comments to PSP	09/27/2012	Jeff Davis	ARRI	Regarding Objective 9, Section7.8.4.9, request for additional details on the sample design, materials, and deployment.	Decisions on specific artificial substrates to be used will depend on location of the site, flows the devices will be subjected to, accessibility to the site, vandalism risks, and comparability to other studies in Alaska. This decision will be made after consideration of all focus areas and site-specific information required to select sampling stations for the study. See RSP Section 9.8.4.9.
Agency Consultation Meeting	09/27/2012	Various agencies	Various agencies	Discussion regarding Objective 4 (Section 7.8.4.4), concerning surrogate sites and a literature-based assessment.	Literature review of glacial rivers affected by river regulation will be included in Objective 1, synthesis of literature reviewed, in the RSP. See RSP Section 9.8.4.1.
Agency Consultation Meeting	09/27/2012	Various agencies	Various agencies	Discussion regarding reference sites in a similar Alaska river for using a BACI type design monitoring program to assess post project impacts.	RSP will address reference sites in Objective 4 (Section 9.8.4.4) with a feasibility study of potential sites in the Talkeetna River in 2013 which will include sampling efforts on multiple sites to assess community similarities with middle Susitna River sites.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Agency Consultation Meeting	09/27/2012	Various agencies	Various agencies	Discussion regarding the BACI design for use in monitoring program to assess post project impacts.	A BACI type design can be attempted, but there are concerns about the power of analysis due to the level of sampling efforts (study plan is only 2 years). Possible that only large differences will be detectable. Multivariate analyses could be attempted. Additional details would be included in an implementation plan.
Agency Consultation Meeting	09/27/2012	Various agencies	Various agencies	Discussion regarding Objective 5, Section 7.8.4.5, trophic analysis and formal productivity measures	RSP will include a more rigorous approach in defining trophic relationships and addressing estimates of river productivity. RSP Section 9.8.4.5.
Agency Consultation Meeting	09/27/2012	Various agencies	Various agencies	Question about recent flooding and the possible negative effect it would have upon sampling next year	Sampling requires multiple years in order to account for the annual variability; high, low, and average years all need to be sampled. Study plan has the limitation of 2 years of data.
Agency Consultation Meeting	09/27/2012	Various agencies	Various agencies	Regarding Objective 5, Section7.8.4.5, discussion about options for trophic analysis, productivity measures	Several approaches were discussed, including bioenergetics, stable isotope analysis, and adult emergence sampling. Regarding bioenergetics, target species may include all 3 salmon species fry/juveniles, and possibly stickleback. RSP Section 9.8.4.5.
Agency Consultation Meeting	09/27/2012	Various agencies	Various agencies	Discussion regarding Objective 4 (Section 7.8.4.4), surrogate sites in Alaska vs. literature-based.	There are no glacial rivers with hydropower operations of the proposed size and operation in Alaska. Literature review of glacial rivers affected by river regulation will be included in Objective 1, synthesis of literature reviewed, in the RSP, Section 9.8.4.1.

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Agency Consultation Meeting	09/27/2012	Jeff Davis	ARRI	Suggests that study plan should be measuring primary and secondary productivity by conducting stream respiration / metabolism studies.	RSP will include a more rigorous approach in defining trophic relationships between algae, benthos, and fish (RSP Section 9.8.4.5.). Surrogate for productivity would be adult insect emergence sampling, measuring carbon production emerging from river (RSP Section 9.8.4.2.1). This measure has been successful in other Alaskan systems, and ties in benthic macroinvertebrates and fish. Chlorophyll a and AFDM measures are commonly used in federal protocols as surrogates for primary productivity, as well. Stream respiration and stream metabolism studies are not easily related/ correlated to the organisms of interest, i.e. macroinvertebrates and fish, and, therefore, would be difficult to predict project effects on those communities outside of a net change in amount of GPP or ER. Measuring the fish prey base (as proposed through sampling drift, benthos, and fish diet) will effectively relate changes in the ecosystem to fish. See RSP Sections 9.8.4.2, 9.8.4.3, 9.8.4.5, and 9.8.4.7.

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
Characterization of Aquatic Habitats in the Susitna River (Section 9.9)					
TWG Meeting	08/15/2012	Eric Rothwell	NMFS	Eric asked how the sampling structure detail would be determined and where all the data would be collected for habitat typing.	The RSP will include the requested detail. See RSP Section 9.9.2, 9.9.5, 9.9.5.3 and 9.9.5.4.
TWG Meeting	08/15/2012	Jeff Davis	Alaska Ratepayers	Jeff Davis asked why Tongass National Forest method was selected. Jeff asked what level of classification would be used for the video work. Jeff asked if Tier III would be applied in the tributaries. Jeff stated that more detail on methods was needed.	The methods for habitat characterization were discussed and approved in an agency meeting in May 2011. The USFS method is a standardized approach that is widely used to characterize habitats in many rivers, including larger waters. In addition, to using that protocol for habitat characterization we will be revising the Habitat Characterization study to include the delineation and characterization of "edge habitat" in mainstem reaches. See RSP Section 9.9.2, 9.9.5.1, 9.9.5.2, and 9.9.5.3.
TWG Meeting	08/15/2012	Joe Klein	ADF&G	Stated that Tier III was satisfactory but more detail on methods was needed.	AEA has added additional detail in the RSP on remote and field surveys See RSP Section 9.9.2, 9.9.5, 9.9.5.3 and 9.9.5.4.
TWG Meeting	08/15/2012	Betsy McCracken	FWS	Stated she has concerns about Tier III and said more detail is needed in the plan. She asked if some form of hierarchical habitat mapping would be done.	The RSP will include hierarchical nesting and expansion of habitat type categories. (See RSP Section 9.9.2, 9.9.5, 9.9.5.3 and 9.9.5.4)

Comment Format	Comment Date	Licensing Participant Name	Licensing Participant Affiliation	Comment	Response
email	09/1/2012	Betsy McCracken	USFWS	The hierarchally nested aquatic habitats framework is needed to structure fish distribution surveys, the instream flow study and other physical process studies. Without it, the fish surveys will be too narrowly constrained and the instream flow studies will not represent all habitats that may be affected by the proposed project. The Service recommends the following habitat hierarchy for the Susitna River be used for habitat mapping purposes and integration of studies: see email for "Large River Floodplain Habitat Hierarchy" recommendation	AEA has considered the USFWS request and has developed a hierarchically nested aquatic habitat classification system that Is presented in the Habitat Characterization study plan. See RSP Section 9.9.1, 9.9.2, 9.9.5, 9.9.5.3 and 9.9.5.4. Fish distribution sampling and instream flow transects will be structured based on the hierarchical habitat framework. This is further described in RSP Sections 9.6.4.3.1 and 8.5.4.6.1.

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Agency consultation meeting	09/14/2012	Jeff Davis Betsy McCracken	ARRI NMFS	Asked if the non-physical habitat characteristics at the micro level (such as temperature, DO and food source) being considered in site selection.	The habitat characterization study does not incorporate data collection of temperature, dissolved oxygen and food source. The data collection at the Focus Areas covers multiple resource and will include the collection of meso-habitat data, fish presence and relative abundance, water quality, etc. These data will be integrated to describe these habitats in more detail.
Agency consultation meeting	09/14/2012	Jeff Davis	ARRI	Jeff is concerned that while sampling in turbid waters it may not be able to differentiate whether individuals are not present or simply not collected due to method limitations.	AEA approach includes non-visual capture methods, such as minnow trapping and seining, that have proven to be effective when fish sampling in turbid environments.
Agency consultation meeting	09/14/2012	Jeff Davis	ARRI	Requests an outline for habitat classification and integration of studies.	The Habitat Classification system is outlined in the RSP. In addition the interdependencies section addresses how this study support and integrates with other studies. See RSP section 9.9.7.
Agency consultation meeting	10/04/2012	Eric Rothwell	NMFS	Eric is unclear how the changes of habitat types with different flows at a particular location will be addressed when mapping habitat.	It is standard practice to map aquatic habitats at low to moderate stream flows, in part to help determine the most limiting condition for aquatic species. AEA approach to mapping is consistent with those standards to a large extent. Thus, AEA in not proposing to map habitat changes with flows. Flow-habitat relationships will be developed under the ISF Program.
Future Watana Reservoir Fish Community / Risk of Entrainment Study (Section 9.10)					
TWG Meeting	08/15/2012	Jeff Davis	ARRI	Has shelf ice and its potential impact on fish in the littoral zone been considered?	AEA reviewed this issue at the Willowstone Reservoir. Shelf ice is not anticipated to be an issue in the Susitna-Watana reservoir due to the changes in surface water elevation

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TWG Meeting	08/15/2012	Jeff Davis	ARRI	Smolt movement through still water habitats	This issue will be addressed as part of the fish passage study. See RSP Section 9.11.
TWG Meeting	08/15/2012	Jeff Davis	ARRI	Sediment deposition and settling rate downstream of dam	This issue will be addressed as part of the fluvial geomorphology modeling. See RSP Section 6.6.
Study of Fish Passage at Watana Dam (Section 9.11)					
Email	09/01/2012	Betsy McCracken	USFWS	**Fish Passage/fishway prescription-** The Service is concerned with the lack of transparent discussion about the potential for fish passage alternatives at the proposed Susitna-Watana dam. If fish passage is required, how will that be accomplished? If it is not feasible, what is your alternative proposal? Where is your project assessment of the fish passage feasibility? What are the design criteria being considered/evaluated?	AEA is conducting a Fish Passage Feasibility Study. The RSP will contain a revised study plan that describes the process to be followed. See RSP Section 9.11.4.3.

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Study of Fish Passage Barriers in Middle/Upper Susitna River and Tributaries (Section 9.12)					
TWG Meeting	08/15/2012	Jan Konigsberg	Natural Heritage Institute	Barrier studies in Lower River	AEA is not proposing a barrier study in Lower River at this time because it is anticipated that the potential Project-induced effects to hydrology and geomorphology will be sufficiently attenuated to preclude the creation of barriers at tributary mouths.
TWG Meeting	08/15/2012	Jeff Davis	ARRI	Target species and lifestages	As stated in the RSP (see Sections 9.12.4.1 and 9.6.4.3), target species and lifestages will be identified after review of the exsitng data on fish distribution in the Middle River and in consultation with Licensing Participants during the TWG process. No modification to study plan.
TWG Meeting	08/15/2012	Joe Klein	ADF&G	Species and lifestage timing	As stated in the RSP (See Section 9.12.4.10), passage analyses will include lifestage timing. No modification to study plan.
Email	08/23/2012	Joe Klein	ADF&G	What criteria will be used to identify "a representative number" of different habitat types?	Criteria will be determined as part of the IFS study site selection process. Study Plan revised to address this comment. See RSP Section 8.5.

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Aquatic Resources Study within the Access Alignment, Transmission Alignment, and Construction Area (Section 9.13)					
Letter	08/31/2012	Joe Klein	Alaska Department of Fish and Game	Fish surveys should be conducted at proposed crossing locations by electrofishing a distance equal to 40 wetted stream widths, with a minimum survey length of 50 meters. If initial surveys do not detect fish presence at specific crossing locations, at least one additional fish survey should be conducted during a different season.	Section 9.13.4.2.2 of the Study Plan identifies electrofishing as the primary sampling method and indicates that sampling will be conducted at a distance of up to 40 wetted channel widths and that a subsequent survey will occur during a different season for locations where fish are not observed during initial sampling. Section 9.13 of the Study Plan was revised to identify a minimum survey length of 50 meters.
Letter	08/31/2012	Joe Klein	Alaska Department of Fish and Game	If the Denali access route is chosen, replacing or improving existing stream crossings along the Denali Highway would be a necessary component of upgrading the highway to accommodate Project traffic. The ADF&G will require a comprehensive survey of stream crossings so that existing stream crossings inadequate for fish passage can be repaired or replaced with culverts or bridges designed for fish passage (ADF&G 2012).	Section 9.13.2 of the Study Plan has been revised to indicate that upgrades to the existing Denali Highway would be necessary to accommodate Project traffic, and that reviewing these crossing would be completed outside of the this current assessment, when required.

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Genetic Baseline Study for Selected Fish Species (Section 9.14)					
Email	09/1/2012	Betsy McCracken	USFWS	**Fish genetics-** During the August 15-17 meetings, AEA stated that genetic samples from the Chinook above the proposed dam site would not be collected. The stated rationale was due to the desire to minimize the handling of the fish after subsequent tagging of fish. Genetic samples of Chinook at locations above the proposed Susitna-Watana dam site are crucial to informing the Service's management goals specific to recommending licensing conditions under the Federal Power Act, and to conservation recommendations under the Fish and Wildlife Coordination Act, and the Anadromous Fish Act. As such, we consider our request for collection of genetic samples from Chinook salmon, and other fish species to be necessary for our resource evaluation of the Susitna-Watana hydropower project. Because of this information need, if AEA does not plan to collect the information, AEA should document how this study request is being addressed.	AEA supported ADF&G in 2012 by using its radio telemetry surveys to locate Chinook salmon for tissue sampling and samples were collected (Kosina Creek). This effort will continue in 2013 and 2014. Juvenile salmon collected by AEA contractors in areas above Devils Canyon were also sampled for tissue and these were provided to ADF&G. In addition, AEA will be taking tissue samples from its radiotagged fish in 2013-14, which will directly contribute to the genetic characterization of fish in the areas above Devils Canyon and the proposed dam site. As part of spawning ground surveys of the middle and upper river, AEA contractors will collect tissue from spawning adult Chinook salmon in 2013-14, as was done in 2012. Samples from middle river tributaries will contribute to addressing the question of genetic relatedness of those fish and fish that migrate above Devils Canyon.

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Email	09/1/2012	Betsy McCracken	USFWS	Fish genetic samples should be current and include samples of the Chinook migrating above the proposed dam location. Because gene frequencies change over time, all genetic samples should be within the most recent ten years to allow for valid comparison. Genetic analysis should analyze the existing extent of genetic differentiation within and between fish using distinctly different habitats. We request genetic analysis of Chinook above the proposed dam site relative to those at other upper, middle and lower river and tributary sample locations.	Genetic sampling is included in the RSP for Chinook above and below the proposed dam site. See RSP Section 9.14.3.
Email follow-up to TWG discussion 8/15	09/7/2012	Betsy McCracken	USFWS	Request that tissue samples be obtained from radio-tagged Chinook salmon	AEA will revise the RSP to include tissue sampling of some radio-tagged salmon in 2013/14.
Email	09/7/2012	Betsy McCracken	USFWS	When comparing uniqueness among stocks, use samples less than 10 yrs old.	AEA concurs.
Email	09/7/2012	Betsy McCracken	USFWS	Will tissue samples from species other than Chinook salmon be analyzed as part of the study? Explain.	No, there is not a plan to analyze these other tissue samples. These samples will be used as a repository for other researchers and for subsequent research needs identified for the Project based on the outcome of other proposed research. Analyzing all these samples without explicit questions/needs/impacts identified is beyond AEA's scope and mandate.

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Analysis of Fish Harvest in and Downstream of the Susitna-Watana Project Area (Section 9.15)					
TWG meeting	08/15/2012	Joe Klein	ADF&G	Commercial fisheries data	Analysis will incorporate caveats of data including fishery closures. See RSP Section 9.5.1.1.
TWG meeting	08/15/2012	Jeff Davis	ARRI	Additional fish harvest surveys.	No new fish harvest surveys will be completed. Such surveys are not necessary to analyze proposed Project effects.
Eulachon Distribution/Abundance in the Susitna River Study (Section 9.16)					
TWG meeting	06/12/2012	Betsy McKracken	USFWS	A comment was received to quantify marine-derived nutrients input into the system by estimating biomass of anadromous lamprey, eulachon, and Bering cisco	The eulachon study will estimate biomass of eulachon in the lower river during 2014 and if possible 2013 (Section 9.16.4.3 Objective 3: Evaluate the feasibility of estimating density of eulachon at spawning sites). In addition, marine-derived nutrients will be addressed by the River Productivity Study. See RSP Section [9.8]
Cook Inlet Beluga Whale Study (Section 9.17)					
Other meeting	09/19/2012	Mandy Migura	NMFS	The study area should only include the Susitna River delta and not all of Type 1 critical habitat	Study area was limited to Susitna River Delta. See RSP Section 9.17.3
Other meeting	09/19/2012	Mandy Migura	NMFS	Aerial surveys should be conducted more regularly and should include times when not only prey resources are available (May and June) but also during times when calves are present (July and August)	The aerial survey schedule was revised to include more surveys which will document times when prey are abundant and when calves may be present. In addition, surveys will be scheduled to include different tidal cycles. See RSP Section 9.17.4.1
Other meeting	09/19/2012	Mandy Migura	NMFS	Clarification needed for Impact Analysis	Impact Analysis will be completed following the 2013 and 2014 field seasons. Modeling efforts were increased to facilitate future impact analysis. See RSP Section 9.17.4.3.

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Other meeting	09/19/2012	Mandy Migura	NMFS	Clarification needed regarding how group size, group composition and behavior will be documented.	Revised Study Plan included clarification. Aerial surveys will be used for group counts and group behavior while the video camera portion of the study will assist with group composition (i.e. calves) and individual behavior. AEA also clarified that these surveys will be conducted to gather data on distribution and relative group sizes – there will be no attempt at producing an abundance estimate from this data. See RSP Section 9.17.4.
Other meeting	09/19/2012	Bob Small	ADF&G	Passive acoustic monitoring should be considered as a method for monitoring beluga presence, particularly for winter months when aerial and video surveys are not occurring.	AEA discussed using acoustics as a method for this study. However, given that acoustic recorders would need to be placed further away from the mudflats and in deeper water in winter due to ice scour, this data would not be relevant to the Project-related impact analysis. Therefore, modeling efforts and impact analyses will assume that belugas utilize the Susitna River delta year-round. See RSP Section 9.17.4.3.