

**Susitna-Watana Hydroelectric Project
(FERC No. 14241)**

**Distribution, Abundance, and Habitat Use by
Large Carnivores
Study Plan Section 10.8**

**Part D: Supplemental Information to
June 2014 Initial Study Report**

Prepared for

Alaska Energy Authority



SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

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1. INTRODUCTION

Section 1 (Part A) of the June 2014 ISR for Distribution, Abundance, and Habitat Use by Large Carnivores (Study Plan 10.8) details the development of this study from the Revised Study Plan (RSP) in 2012, through the end of the 2013 study season. Section 7 of the ISR (Part C), filed in June 2014, sets forth AEA's plan and schedule, at that time, for completing this study and meeting the objectives of the RSP.

As detailed in Section 2.2 of the ISR Part D overview, various circumstances have required AEA to extend the original timeframe for completing the Commission-approved Study Plan. However, AEA has made meaningful progress with this Study 10.8 since the filing of the ISR in June 2014. As detailed below, AEA's recent activities for Study 10.8 have consisted of the following:

- The study team completed the second field season of the downstream bear study (RSP Section 10.8.2.1) which consisted of deploying hair snares to collect hair samples from black and brown bears for DNA and stable isotope analysis.
- The study team conducted an aerial survey to estimate a minimum count of wolves in Game Management Unit 13E. This survey was not outlined in the Study Plan, but was conducted in addition to the literature review outlined in the Study Plan (RSP Section 10.8.2.2).
- On October 21, 2014, AEA held an ISR meeting for the Botanical and Wildlife studies.
- In October 2015, the study team completed a 2014–2015 Study Implementation Report for this study.

The primary purpose of this Part D Supplemental Information to the ISR is to report on the implementation of the Study Plan from the filing of the ISR in June 2014 through the filing of the 2014–2015 Study Implementation Report and ISR Part D. In light of this additional implementation, this Part D also identifies AEA's plans for completing Study 10.8 in a manner that meets the objectives of the Commission-approved Study Plan.

2. BACKGROUND

2.1. Purpose of Study

The goal of the study is to obtain sufficient information on three species of dominant predators and game animals in the region—brown bear, black bear, and wolf—to use in evaluating Project-related effects and identifying any appropriate protection, mitigation, or enhancement measures.

The study objectives are established in RSP Section 10.8.1

- Estimate the current populations of brown bears, black bears, and wolves in the study area, using existing data from the Alaska Department of Fish and Game (ADF&G).

- Evaluate bear use of streams supporting spawning by anadromous fishes in habitats downstream of the proposed dam that may be altered by the Project.
- Describe the seasonal distribution of, and habitat use by, wolves in the study area using existing data from ADF&G.
- Synthesize historical and current data on bear movements and seasonal habitat use in the study area, including the substantial body of data gathered by radio-tracking during the 1980s, as a continuation of the 2012 wildlife studies.

2.2. Study Components

Components of this study include the following:

- Generate population density models and population estimates for brown and black bears in the study area using existing data from distance-sampling surveys
- DNA analysis of bear hairs snagged by nonlethal, modified snares set along salmon-spawning streams to assess the minimum number of bears using those streams and to characterize the diet of bears using those areas.
- Provide background information for assessing potential Project-related impacts on the species by reviewing ongoing monitoring of and historical data on wolves.

3. STATUS, HIGHLIGHTED RESULTS, AND ACHIEVEMENTS

The following tasks were completed in 2013 and reported in Part A and Part B of the ISR for Study 10.8:

- Completed the estimates of the populations of brown bears and black bears in the study area based on existing data from the ADF&G (ISR Part A, Section 10.8.4.1.1);
- Completed one year of deploying hair snares to collect hair samples from brown and black bears in the downstream study area (ISR Part A, Section 10.8.4.1.2); and
- Described the seasonal distribution of, and habitat use by, wolves in the study area using existing data from ADF&G (ISR Part A, Section 10.8.4.2).
- Laboratory analysis of bear hair samples collected in the downstream survey area. DNA analysis was conducted to determine sex, species, and to identify unique individuals. Stable isotope analysis was conducted to estimate the proportion of major diet components based on the δ^{13} carbon signatures and δ^{15} nitrogen signatures in the hair.

The study team has completed the following activities for Study 10.8 since the June 2014 filing of the ISR:

- Bear hair snares were deployed in 2015 for a second year in the downstream study area to collect hair samples for DNA and stable isotope analysis. Snares were deployed in July 2015 and removed in September 2015. A total of 64 hair-snag snares were set at 19 different sampling locations throughout the Middle Susitna River Segment. A total of 131 hair samples were collected from 58 different snares at all 19 sampling locations.
- An aerial survey of Game Management Unit 13E was conducted by ADF&G to obtain a minimum count of wolves in the area. This survey was not described in the Study Plan but was conducted to supplement the literature review of wolf data described in the Study Plan. A total of 6 groups of wolves were identified during the January 2015 aerial survey.

4. SUMMARY OF STUDY 10.8 DOCUMENTS

Since filing of the RSP in 2012, AEA and FERC have prepared several documents pertaining to this study. To aid review by FERC staff and licensing participants, each of these documents is listed below. Each of these documents is accessible on AEA's Project licensing website (<http://www.susitna-watanahydro.org/type/documents/>) by clicking on the entry in the "Link" column in the table. In addition, these documents are available on FERC's eLibrary system (<http://www.ferc.gov/docs-filing/elibrary.asp>), in Docket No. P-14241.

Title	Date	Description	Link
10.8. Distribution, Abundance, and Habitat Use by Large Carnivores (Revised Study Plan)	12/14/2012	This document presents the plan for this study, including goals, objectives, the study area, and proposed study methods for large carnivores.	RSP for Study 10.8
FERC Study Plan Determination for Study 10.8	2/1/2013	This document presents FERC approval of Study 10.8, which approved AEA's Revised Study Plan with no recommended changes.	FERC SPD for Study 10.8
Big Game Movement and Habitat Use Study (2012 Technical Memorandum)	3/26/2013	Technical memorandum summarizing existing information on movement and habitat use of big game, including bears and wolves.	Mar. 2013 TM for Study 10.8
Draft Initial Study Report for Study 10.8	2/3/2014	This draft of the ISR summarized the study methods and variances during the 2013 study season, and presented preliminary data collected for Study 10.8. This draft ISR was later republished as Part A of the final ISR.	Draft ISR for Study 10.8
Initial Study Report for Study 10.8	6/3/2014	This document is the Initial Study Report (Parts A, B and C) for Study 10.8. Part A republishes the Draft ISR. Part B identifies	ISR Part A for Study 10.8 ISR Part B for Study 10.8 ISR Part C for Study 10.8

Title	Date	Description	Link
		supplemental information and errata in Part A. Part C presents study modifications and plans for completing the study.	
Initial Study Report Meetings, October 21, 2014	11/15/2014	Transcripts and AEA's agenda and PowerPoint presentations for the ISR meeting concerning the Project wildlife studies filed by AEA.	Transcripts from ISR Meeting Materials from ISR Meeting
Distribution, Abundance, and Habitat Use by Large Carnivores Study – 2014–2015 Study Implementation Report	11/4/2015	2014–2015 Study Implementation Report: a summary of field survey results in 2014 and 2015.	2014-2015 SIR for Study 10.8

5. NEW STUDY DOCUMENTATION SUPPLEMENTING THE ISR

The following table identifies and describes additional reports and other documents that update, refine, or otherwise supplement certain sections of the ISR pertaining to this Study 10.8, during AEA's continued implementation of the Study Plan since the ISR was filed in June 2014.

ISR Reference	Description
Part A, Section 4	This Section is supplemented by the Study Implementation Report for Study 10.8 (Section 4), describing 2014 and 2015 study plan implementation.
Part A, Section 5	This Section is supplemented by the Study Implementation Report for Study 10.8 (Section 5), describing the results of the 2014 and 2015 study plan implementation.

6. VARIANCES

6.1. 2013 Study Season

The following variances are reported in the June 2014 ISR.

The following variances were reported for the population estimation component of this study (ISR Section 4.1.1.1):

- The Study Plan (RSP Section 10.8.2.1) proposed to use line-transect survey data collected by ADF&G previously in both the Talkeetna study area (Becker and Quang 2009) in 2000, 2001, and 2003, and in a 21,528-km² area spanning GMU Subunits 13A and 13B in 2003 and 2004. The study team excluded data from GMU Subunits 13A and 13B from the analysis, however, because of the magnitude of the computational effort required to produce the modeling results and population estimates, which proved to be

much more time-intensive than anticipated. The study team concluded that the spatial model of black bears in ADF&G's Talkeetna study area effectively modeled black bears in the Susitna River drainage, so that more information was not required to make inferences about black bear population status in the study area. This change deleted four black bear groups, none of which occurred on hillsides next to the Susitna River. In 2003 and 2004, the study team flew 1,221 30-km transects in GMU Subunits 13 A and 13B and observed only 12 black bear groups, all of which were in GMU Subunit 13A. That result indicated that extending the black bear spatial model for ADF&G's Talkeetna study area into the section of GMU Subunit 13A near the reservoir impoundment zone (east of Kosina Creek and south of the Susitna River; see Figure 3-1 in the ISR Part A) would still allow precise estimation of the number of black bears in that area of marginal habitat. Of the six observations of brown bear groups in the section of GMU Subunits 13A and 13B, all were located far from the Susitna River, the closest being 10 miles away. Because little additional information would be added by analysis of the information from GMU Subunits 13A and 13B, the study team concluded that its exclusion had no appreciable effect on the ability to meet the study objectives.

The following variances were reported for the downstream surveys component of this study (ISR Section 4.1.2.1):

- Researchers were unable to access some salmon spawning streams on Cook Inlet Regional Working Group (CIRWG), Alaska Railroad Corporation (ARRC), and some private lands because land access permits were not available in 2013. Therefore, some documented salmon-spawning sites in the Middle Segment of the Susitna River were inaccessible, including all portions of the Middle Segment upstream of Project River Mile (PRM) 146.5. These limitations on spatial coverage of hair sampling limited the study team's ability to estimate the minimum population size of bears using those spawning streams, as proposed in RSP Section 10.8.4.1.2.

6.2. 2014 and 2015 Study Seasons

The following variances occurred following the filing of the June 2014 ISR:

- As explained above, the placement of hair-snags in 2013 was constrained by land access limitations that year. However, the study team was able to set hair-snag snares at most suitable locations between PRM 113.7 and 145.2 in 2013. More sampling sites were accessible in 2015 between PRM 105.1 and 152.3, including several on CIRWG lands, one on private land, and at several other sites that had experienced high levels of human activity in 2013. Hence, the study team was successful in sampling a large number of locations used by bears. Supported by this sampling effort, the study team will be able to produce a minimum estimate of the number of black bears and brown bears using the spawning streams sampled over both years and to provide information on the diet composition of both species of bears along the Middle River.

- The Study Plan proposed to use existing information on wolf distribution and population size in the area; however, ADF&G elected to conduct an aerial survey in January 2015 to estimate the minimum count of wolves in GMU 13E. That survey constituted an additional study component that provided current survey data, complementing the literature review described in the Study Plan and enhancing the ability to meet the study objectives.

7. STUDY PLAN MODIFICATIONS

7.1. Modifications Identified in ISR

As detailed in Section 7 of the ISR (Part C), AEA plans no modifications of the methods for this study.

7.2. Modifications Identified since the June 2014 ISR

As detailed in the Study Implementation Report for this study, AEA plans no modifications of the methods for this study.

8. STEPS TO COMPLETE THE STUDY

In light of the variances and modifications described above, the steps necessary for AEA to complete this study are summarized below. As necessary and appropriate, these steps have been updated from those appearing in Section 7 of the ISR (Part C).

- Laboratory analyses of hair samples collected during the 2015 field season will be conducted. DNA analysis will be conducted to determine sex and species and to identify unique individuals from as many hair samples as possible. Stable isotope analysis will be conducted to assess the proportion of major diet components based on the δ^{13} carbon signatures and δ^{15} nitrogen signatures of as many hair samples as possible.