Susitna-Watana Hydroelectric Project (FERC No. 14241)

Terrestrial Furbearer Abundance and Habitat Use Study Plan Section 10.10

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 Terrestrial Furbearer Abundance and Habitat Use (Study Plan 10.10) 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 completed Study 10.10 since the filing of the ISR in June 2014. As detailed below, AEA's recent activities for Study 10.10 have consisted of the following activities:

- The study team completed field work (winter and summer) in 2014.
- The study team completed aerial track surveys in winter 2014.
- On October 21, 2014, AEA held an ISR meeting for the Wildlife and Botanical studies.
- The study team completed laboratory analyses of DNA from hair and scat samples.
- The study team generated population estimates of coyotes and red foxes through fecal genotyping and genetic capture–recapture modeling.
- The study team assessed snowshoe hare and vole density using data from counts of fecal pellets and live captures, respectively.
- The study team compiled furbearer habitat data using aerial and ground surveys.
- The study team calculated occupancy probabilities for all target furbearers using ground-based snow survey data.
- The study team released the Study Completion Report in October 2015.

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 Study Completion Report and this ISR Part D. In light of this additional implementation, AEA has now completed Study 10.10 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 provide current information on the abundance and habitat use of four species of terrestrial furbearers (coyote, red fox, lynx, and marten) for use in evaluating potential Project-related impacts and identifying appropriate mitigation.

The study objectives are established in RSP Section 10.10.1:

- Develop population estimates of coyotes and red foxes through fecal genotyping and genetic capture–recapture analyses using scats collected along trails and rivers throughout the study area during winter months (January–March) in 2013 and 2014.
- Develop a population estimate of marten through DNA-based capture–recapture analysis, using hair samples collected in the reservoir inundation zone with hair-snag tubes.
- Develop a population estimate of lynx through DNA-based capture–recapture analysis using hair samples collected throughout the study area with hair-snag plates.
- Assess prey abundance in the study area by conducting snowshoe hare pellet counts and estimating vole density using a mark–recapture framework from live-trapping sessions.
- Compile habitat-use data for the furbearer species being studied, using aerial track surveys.

2.2. Study Components

This study consists of the following components:

- Sample collection.
- Genetic analysis.
- Habitat use and evaluation.
- Statistical analysis and data interpretation.

3. STATUS, HIGHLIGHTED RESULTS, AND ACHIEVEMENTS

The following tasks were completed in 2013 and reported in Part A of the ISR for Study 10.10:

- The study team collected fox and coyote scats to be used in genetic capture–recapture models. A small number of lynx hairs were collected from rub pads.
- Deployment of marten hair tubes was hampered by lack of access to Cook Inlet Regional Working Group (CIRWG) lands; hence, a small trial number of hair tubes were tested during 2013.
- Furbearer habitat use data were collected during three helicopter surveys during winter 2013.
- In addition, ground-based occupancy surveys were conducted to increase habitat use data and provide additional furbearer population assessments.

- Prey surveys were conducted for snowshoe hares and voles during the summer field season.
- Analysis of scat and hair samples began at the University of Alaska in spring 2013.

The study team has completed the following activities for Study 10.10 since the June 2014 filing of the ISR:

- The study team completed all field work in 2014, including winter furbearer surveys, two more aerial surveys, and summer surveys of prey abundance.
- Scats and hair samples were collected during winter 2014, along with habitat-use data from ground-based and aerial track surveys.
- Genetic analyses of hair and scat samples were completed during 2014.
- Coyote and red fox population density and population growth rates were estimated for 2013 and 2014 using spatially explicit capture–recapture (SECR) and Pradel open mark–recapture models.
- Snowshoe hare and vole density estimates were generated for 2013 and 2014.
- Furbearer habitat-use data was compiled from aerial track surveys and ground-based track surveys in 2013 and 2014, and ground-based track surveys were used to estimate furbearer occupancy probabilities by major habitat types. Occupancy modeling was used to analyze habitat-use patterns of lynx, marten, coyotes, and red foxes during 2013 and 2014.

4. SUMMARY OF STUDY 10.10 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
10.10 Terrestrial Furbearer Abundance and Habitat Use (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 terrestrial furbearers.	RSP for Study 10.10

Title	Date	Description	Link
FERC Study Plan Determination for Study 10.10	2/1/2013	This document presents FERC approval of Study 10.10, which approved AEA's Revised Study Plan with no recommended changes.	FERC SPD for Study 10.10
Draft Initial Study Report for Study 10.10	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 10.10. This draft ISR was later republished as Part A of the final ISR.	Draft ISR for Study 10.10
Initial Study Report for Study 10.10	6/3/2014	This document is the Initial Study Report (Parts A, B and C) for Study 10.10. Part A republishes the Draft ISR. Part B identifies supplemental information and errata in Part A. Part C presents study modifications and plans for completing the study.	ISR Part A for Study 10.10 ISR Part B for Study 10.10 ISR Part C for Study 10.10
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
Terrestrial Furbearer Abundance and Habitat Use Study, Study Plan Section 10.10 (Study Completion Report)	11/4/2015	AEA's Study Completion Report: a summary of field survey results for 2013–2014.	2013-2014 SCR for Study 10.10

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 Study 10.10, 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 updated and supplemented by the Study Completion Report for Study 10.10 (Section 4), describing 2013 and 2014 study plan implementation.
Part A, Section 5	This Section is updated and supplemented by the Study Completion Report for Study 10.10 (Section 5), describing the results of the 2013 and 2014 study plan implementation.

6. VARIANCES

6.1. 2013 Study Season

The following variances are reported in the June 2014 ISR:

- Sampling was conducted in as much of the original study area as possible, but no surveys were conducted in the Chulitna and Gold Creek corridors due to the combination of a non-centrally located base camp, physical barriers for safe travel by snowmachine, and lack of access to CIRWG lands.

- To maximize sampling effort in areas accessible by snowmachine from the winter base of operations on the Denali Highway, the study team expanded the survey area to include areas to the northeast of the study area depicted in the Study Plan.

- The study team modified the deployment and use of the lynx hair snags (RSP Section 10.10.4.1) to increase sampling efficiency in the field and to create a survey layout that allowed better comparison of the lynx survey data with those from the canid scat collection effort.

- Marten surveys were not conducted as planned in RSP Section 10.10.4.1 because of the lack of access to CIRWG lands and the difficulty of snowmachine access in the reservoir inundation zone, which included a large proportion of suitable marten habitat (spruce forest).

- Snowshoe hare surveys were conducted in summer primarily as described in RSP Section 10.10.4.1, although the study team changed the way that the sample grid locations were allocated to better account for variability of habitats throughout the survey area.

- The vole live-trapping survey also involved slight variances from the Study Plan, in that trapping nights were reduced from the one to five nights originally proposed to a single night per grid. By reducing effort at each site to one night of trapping, each grid size could be increased from the proposed 50 traps per grid to 100 traps per grid and the total number of grids was increased from 8–10 to a total of 15, thereby increasing sample sizes and provided better coverage of the survey area.

- Additional data on habitat use and species occupancy (beyond the aerial surveys described in the Study Plan) were collected during the ground-based track surveys in winter 2013, including the use of motion-sensing cameras. These data were intended to generate additional habitat-use information and to assess furbearer population status.

- The Study Plan did not propose to include occupancy modeling in the study design; rather, the study team included this additional analytical element during final project planning. Detections from track data to assess furbearer habitat associations using occupancy models in software programs *MARK* and *RMARK* allow estimation of the proportion of survey cells occupied by each furbearer species, probability of detections for each species and for each survey method, and occupancy as a function of prey availability and habitat type.

6.2. 2014 Study Season

The following variances occurred following the 2013 field effort reported in the June 2014 ISR:

- The study team established a more centrally located field camp in winter 2014 and sampling was conducted in as much of the original study area as possible, but no surveys were conducted in the Chulitna and Gold Creek corridors for the same reasons stated above in Section 6.1.

- The study team continued the 2013 variance related to deployment and use of lynx hair snags described above in Section 6.1 to increase sampling efficiency in the field and allow better comparison of the lynx survey data with those from the canid scat collection effort.

- The study team continued the 2013 variances described above in Section 6.1 for snowshoe hare surveys and vole live-trapping surveys.

- The study team continued to collect additional data on habitat use and species occupancy (beyond the aerial surveys described in the Study Plan) during the ground-based track surveys in winter 2014, as described above in Section 6.1.

- The study team discontinued the use of motion-sensing cameras to collect data on habitat use and species occupancy because that survey method did not produce useful information during the 2013 field season. This variance was proposed as a modification in ISR, Part C, Section 7.1.2.

- Marten surveys were implemented in 2014 as originally described in RSP Section 10.10.4.1. Because marten home ranges are small and a comprehensive survey of the entire study area was impractical, the marten survey was restricted to heavily forested areas near the inundation zone that were on accessible lands. This variance was proposed as a modification in ISR, Part C, Section 7.1.2.

- Rather than deploying marten hair-sampling tubes using a grid-based system as described in the Study Plan (RSP Section 10.10.4.1), hair tubes were deployed at approximately 1-km (0.62 mi) intervals along the major sampling transect routes that were established for scat collection, thereby allowing better comparisons with canid and lynx data as well as more efficient sampling. Tubes were deployed in areas closest to the proposed reservoir inundation zone where dense spruce forest, similar to habitats found in the inundation zone, existed.

- Because very few lynx hair samples were obtained from lynx hair snags in 2013, the study team attempted to increase the number of samples collected in 2014 by backtracking fresh lynx tracks while checking lynx hair snags. Winter backtracking has been shown to be an effective way to locate hair samples that have been rubbed off on tree bark or left in bedding areas.

7. STUDY PLAN MODIFICATIONS

7.1. Modifications Identified in ISR

Section 7 of the ISR (Part C) details modifications for this study following the 2013 study season. These modifications are generally summarized as follows:

- As explained in Section 1.3 of the ISR Part D Overview, AEA added the Denali East Option (road and transmission corridor) to the study area. Winter field surveys in 2014 were completed before the addition of this corridor, but those field surveys were conducted in the area of the new corridor option because of the survey area expansion in 2013, described above in Section 6.1.
- The winter 2014 survey season included collection of genetic samples and completion of track surveys as described in RSP Section 10.10.4.1. Variances described in ISR, Part A, Section 4.1.1 were continued during the 2014 season.
- Marten surveys were implemented as originally described in RSP Section 10.10.4.1 during the 2014 season.
- The study team changed base-camp locations in 2014, improving access to areas nearer the proposed Watana Dam site. However, the northern side of the Susitna River remained the principal zone for survey work.

7.2. Modifications Identified since the June 2014 ISR

As detailed in the Study Completion Report for this study, the following modification, added after the June 2014 ISR and prior to the 2014 field season, was implemented during the 2014 field season:

- As explained in Section 1.3 of the ISR Part D Overview, AEA removed the Chulitna Corridor from the survey area.

As detailed in the Study Completion Report for this study, AEA plans no further modifications of the methods for this study, as this study is now complete.

8. STEPS TO COMPLETE THE STUDY

The field work, data collection, data analysis, and reporting for this study successfully met three of the five study objectives in the FERC-approved Study Plan. Although the two objectives pertaining to population estimates of marten and lynx could not be fulfilled due to laboratory analytical problems (described in Section 6.3 of the Study Completion Report), sufficient data on habitat use, occupancy, and abundance of these two species were obtained to assess potential Project impacts and develop protection, mitigation and enhancement measures. In light of the results, variances, and modifications described above, AEA has completed this study.