

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

**Surveys of Eagles and Other Raptors
Study Plan Section 10.14**

**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 this Surveys of Eagles and Other Raptors Study (Study Plan 10.14) 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 on Study 10.14 since the filing of the ISR in June 2014. As detailed below, AEA's recent activities for Study 10.14 have consisted of the following:

- The study team conducted occupancy and productivity surveys for nesting raptors in 2014 to characterize nests and nesting success.
- The study team updated the geospatially referenced relational database for raptor nests.
- The study team further delineated eagle nesting habitat using data from field surveys and remote sensing.
- On October 21, 2014, AEA held an ISR meeting for the Surveys of Eagles and Other Raptors, along with meetings for each of the other wildlife studies.
- The study team completed the 2014 Study Implementation 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 2014 Study Implementation Report and this ISR Part D. In light of this additional implementation, this Part D also identifies AEA's plans for completing Study 10.14 in a manner that meets the objectives of the Commission-approved Study Plan.

2. BACKGROUND

2.1. Purpose of Study

The goal of this study is to characterize the population size, productivity, nesting phenology, habitat use and migratory movements of raptor species in the study area. These data will inform the prediction and quantification of impacts that may result from the proposed Project, and will provide information required for a possible application(s) for federal eagle take (lethal or disturbance take, see below) and/or eagle nest take permits.

The study objectives are established in RSP Section 10.14.2:

- Enumerate and identify the locations and status of raptor nests and territories that could be affected by Project construction and operations. Four specific tasks are associated with this objective:
 - Review and synthesize existing nest data for eagles and other raptors: Identify and assess the status of previously recorded nest locations of various species, including geographic coordinates, annual nest activity, descriptions of nest site characteristics, and general descriptions of cliff habitat in the proximity of each site.
 - Conduct field surveys to locate and characterize nests: Locate and map Bald Eagle and Golden Eagle nests in the Project study area, identifying all active and inactive nests and alternative nest sites. Locate and map active and inactive nests of other tree- and cliff-nesting raptor species (as well as Common Raven, a species whose nests often are used by raptors) in the Project study area.
 - Create a geospatial database of all nests and territories: The database will be used to calculate inter-nest distances, estimate local average territory size, and, with overlays of Project footprint and habitats, determine the number of nests and territories potentially affected by the Project.
 - Calculate local average territory size for Bald Eagles and Golden Eagles: Estimates of average territory sizes (and mean inter-nest distance) are required for the applications for federal eagle nest take permits.
- Estimate Project effects on the productivity of raptors. This objective includes four tasks:
 - Review existing productivity data.
 - Determine the average and range of productivity of nests of each species (e.g., Bald Eagle, Golden Eagle, other raptors).
 - Consider impacts on productivity at the local and larger population level using current and historical data.
 - Establish the framework for comparisons of pre- and post-construction productivity to evaluate whether realized take is consistent with the permitted take, and to ensure that the level of take is compatible with the preservation of eagle populations.
- Estimate effects on nesting and foraging habitats by delineating suitable habitat features in a geospatial database (this work will be conducted in Study 10.19, Evaluation of Wildlife Habitat Use). These characterizations will be used to determine the following:
 - The percentage of local habitat lost.
 - Numbers of breeding pairs and productivity affected by development.

- Whether or not a partial loss of a territory may functionally result in abandonment of the entire territory.
- Whether or not habitats adjacent to the Project area may be available for use by displaced nesting birds.
- Conduct field surveys and literature reviews to identify, map, and characterize the habitat-use patterns at fall and winter communal roost sites and foraging sites of Bald and Golden eagles and other raptor species. Describe seasonal habitat use, highlighting areas or conditions that may result in impacts on raptors.
- Assess the extent to which planned overhead transmission lines may pose a collision risk to migrating or nesting raptors and identify migratory corridors (including altitudes of raptor movements) in the Project transmission line corridors.
- Provide information on the distribution, abundance, food habits, and diet of piscivorous (fish-eating) raptors; feather samples for characterization of mercury levels; and information on the effects of methylmercury on piscivorous raptors, for use in Study 5.7, Mercury Assessment and Potential for Bioaccumulation.

2.2. Study Components

This study consists of the following components:

- Raptor occupancy and productivity surveys;
- Sightability assessment of raptor nesting surveys;
- Delineation of Bald and Golden eagle nesting habitats;
- Fall and winter roosting and foraging surveys; and
- Raptor migration surveys along potential transmission-line routes.

3. STATUS, HIGHLIGHTED RESULTS, AND ACHIEVEMENTS

The following tasks were completed in 2013 and were reported in Part A of the ISR for Study 10.14:

- The study team conducted occupancy and productivity aerial surveys in May and July 2013 for all raptors, focusing primarily on Bald and Golden eagles. Golden Eagles were the most numerous and widely distributed raptors in the study area. Bald Eagles were the second most common raptor in the study area. Nests of other raptor species included nine Peregrine Falcon territories on the Susitna River and lower reaches of its tributaries within the reservoir inundation zone and three Gyrfalcon sites in alpine areas above the reservoir zone.

- Nest sightability surveys to assess the effectiveness of aerial searches showed that, with the unusually persistent snow cover that occurred in 2013, some nest structures were not found on the first occupancy survey. The sightability correction factor developed in 2013 suggested that the majority of nests were found after the subsequent occupancy and productivity surveys.
- The woodland raptor survey detected no nests on normal-intensity transects over the steeply sloping forested portions of the reservoir zone, whereas three nests were found during the high-intensity transects flown for sightability assessment. This result suggests that the methodology for woodland raptor surveys should be modified in the next year of study.
- Nesting habitat for Golden Eagles (749 cliffs) and Bald Eagles (riparian zones) was mapped during the aerial surveys and, after field work ended, by applying the remote-sensing analysis developed for this study in 2012.
- The study team conducted ground-based migration surveys during spring and fall 2013. Raptor migration occurred broadly with random flight directions throughout the study area but, although numbers of raptors were higher at some sites, the rates, numbers, and directionality observed did not suggest well-defined migration corridors or peak movement periods. The most abundant raptors in both spring and fall were Golden Eagles and Bald Eagles, the most common nesters in the study area. Minimum flight altitudes and focal altitudes (probable crossing altitude of potential power lines) for eagles and other raptors were generally higher in the spring than in the fall.
- The study team conducted surveys to identify foraging and communal roosting areas (primarily for Bald Eagles) in October–December 2013. A small number of Bald Eagles remained in the study area during late fall, but left the area by December. No communal roosts or wintering foraging areas were found.

The study team has completed the following activities for Study 10.14 since the June 2014 filing of the ISR:

- The study team conducted occupancy and productivity surveys for nesting raptors in 2014 to characterize nests and nesting success.
- The study team updated the geospatially referenced relational database for raptor nests.
- The study team further delineated eagle nesting habitat using data from field surveys and remote sensing.

4. SUMMARY OF STUDY 10.14 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
10.14. Surveys of Eagles and Other Raptors (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 eagles and other raptors.	RSP for Study 10.14
FERC Study Plan Determination for Study 10.14	2/1/2013	This document presents FERC approval of Study 10.14, which approved AEA's Revised Study Plan with no recommended changes.	FERC SPD for Study 10.14
Surveys of Eagles and Other Raptors (2012 Technical Memorandum)	3/7/2013	Technical memorandum summarizing existing information on raptor nest sites and habitat use, and the results of 2012 occupancy and productivity surveys and Bald Eagle fall/early winter surveys.	Mar. 2013 TM for Study 10.14
Draft Initial Study Report for Study 10.14	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 10.14. This draft ISR was later republished as Part A of the final ISR.	Draft ISR for Study 10.14
Initial Study Report for Study 10.14	6/3/2014	This document is the Initial Study Report (Parts A, B and C) for Study 10.14. 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 10.14 ISR Part B for Study 10.14 ISR Part C for Study 10.14
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
Surveys of Eagles and Other Raptors – 2014 Study Implementation Report	11/4/2015	2014 Study Implementation Report: a summary of field survey results in 2014.	2014 SIR for Study 10.14

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 10.14, 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 Implementation Report for Study 10.14 (Section 4), describing 2014 study plan implementation.
Part A, Section 5	This section is supplemented by the Study Implementation Report for Study 10.14 (Section 5), describing the results of the 2014 study plan implementation.

6. VARIANCES

6.1. 2013 Study Season

The following variances are reported in the June 2014 ISR:

- The occupancy and productivity surveys included limited extensions outside of the study area (RSP Section 10.14.3) to mirror the study area covered in the 2012 surveys. These extensions included narrow sections of land adjacent to the study area.
- Access to some potential observation sites for the migration survey task (RSP Section 10.14.4.1) could not be achieved in 2013 due to the lack of a land access to Cook Inlet Regional Working Group (CIRWG) lands.
- Feather samples were not obtained from piscivorous raptors for mercury analysis in 2013 (RSP Section 10.14.4.1) because the necessary federal permit for salvage of Bald Eagle feathers could not be obtained in time before the season ended.

6.2. 2014 Study Season

As noted in Section 4 of the Study Implementation Report for this study, the following variances occurred following the filing of the June 2014 ISR:

- Some nests located outside of the 2014 study area (RSP Section 10.14.3), but within the 2012 study area, were surveyed. The study team opportunistically surveyed known nests from previous years only if they were located near other nests within the 2014 raptor study area. These additional areas were resurveyed in 2014 to obtain comparative data.
- As explained in Section 1.3 of the Overview of ISR Part D, the Chulitna Corridor was dropped from the nest occupancy and productivity survey effort and the Denali East Corridor Option was added (the previously designated Denali Corridor was renamed Denali West). The study area buffer zones around Project facilities and access and transmission alignments (10 mi for nesting Golden Eagles around the proposed reservoir inundation zone and 3 mi for all species in other areas) were adjusted accordingly.

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, for which corresponding 3-mi and 10-mi buffer zones were added to the study area for this study.

- All study tasks associated with mercury assessment have been transferred and consolidated under Study 5.7, Mercury Assessment and Potential for Bioaccumulation.
- Methods for performing nesting surveys for woodland raptors were modified to increase survey intensity, due to the low detectability of nests and low nest densities found in 2013.

7.2. Modifications Identified since the June 2014 ISR

As detailed in the 2014 Study Implementation Report for this study, the following modifications, added after the June 2014 ISR and prior to the 2014 field season, were 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 study area.
- As discussed in the ISR meeting on October 21, 2014, the two years of surveys conducted in 2012 and 2013 did not find any indications of fall and winter communal roosts and foraging sites used Bald Eagles or other raptors in the Study Area. For this reason, AEA will not conduct further surveys for this study task. The work needed to fulfill Study Plan Objective 4 (in Section 2 above) is therefore considered to be complete.

As detailed in the 2014 Study Implementation Report for this study, AEA plans no further 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 ISR (Part C).

- Conduct a final season of nest occupancy and productivity surveys for all survey areas.
- Conduct a second year of transect surveys for nesting woodland raptors.
- Conduct sightability surveys for the above two survey efforts.
- Complete a second year of spring and fall migration surveys in the transmission corridors, including observation points on CIRWG lands and in the Denali East Option Corridor.

Some of the objectives listed above in Section 2 cannot be accomplished until after the final year of surveys, require completion of other studies (e.g., Study 11.5, Vegetation and Wildlife Habitat Mapping; and Studies 9.5, 9.6, and 9.7, fish distribution and salmon escapement studies), or depend on final Project design.