

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

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

**Initial Study Report
Part C: Executive Summary and Section 7**

Prepared for

Alaska Energy Authority



SUSITNA-WATANA HYDRO

Clean, reliable energy for the next 100 years.

Prepared by

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EXECUTIVE SUMMARY

Surveys of Eagles and Other Raptors 10.14	
Purpose	<p>The purpose of this study is to characterize population size, productivity, nesting phenology, and habitat use of raptor species to inform the prediction and quantification of impacts that may result from the proposed Project, and to provide information required for a possible application(s) for federal eagle take and/or eagle nest take permits.</p> <p>This study has five objectives:</p> <ol style="list-style-type: none"> 1) Enumerate and identify the locations and status of raptor nest structures and territories that could be affected by Project construction and operations; 2) Estimate Project effects on the productivity of raptors; 3) Estimate effects on nesting and foraging habitats by delineating suitable habitat features; 4) Conduct field surveys and literature reviews to map and characterize the habitat-use patterns of Bald and Golden eagles during fall and winter; and 5) Conduct a study to assess the extent to which planned overhead transmission lines may pose a collision risk to migrating or nesting raptors and to identify migratory corridors.
Status	This study is an ongoing multi-year effort. Except for the variances explained below, all 2013 field work was completed as planned.
Study Components	<p>This study includes the following components:</p> <ol style="list-style-type: none"> 1) Raptor occupancy and productivity surveys; 2) Sightability assessment of raptor nesting surveys; 3) Delineation of Bald and Golden eagle nesting habitats; 4) Fall and winter roosting and foraging surveys; and 5) Raptor migration surveys along potential transmission-line routes.
2013 Variances	<p>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.</p> <p>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 agreement with the Cook Inlet Regional Working Group.</p> <p>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</p>

	<p>season ended.</p>
<p>Steps to Complete the Study</p>	<p>To complete the study, the study team will conduct the sampling required to fulfill the objectives outlined in RSP Section 10.14.1, which consists of: (1) nest occupancy and productivity surveys; (2) sightability assessment of raptor nesting surveys; (3) delineation of Bald and Golden eagle nesting habitats; (4) fall and winter roosting and foraging surveys; and (5) migration surveys along potential power transmission routes.</p> <p>AEA will apply several modifications when implementing the FERC-approved Study Plan in 2014 and 2015:</p> <ul style="list-style-type: none"> • As described in the ISR Overview, AEA has added the Denali East Option road and transmission corridor to the study area. For this study, the corridor addition to the study area includes a 3-mi buffer surrounding the center lines of the road and transmission line alignments of the new Denali East Option. • The objectives and methods in this study related to mercury analysis, including the literature review of food habits and diets of piscivorous raptors and the collection of feather samples, have been consolidated in the Mercury Assessment and Potential for Bioaccumulation Study (Study 5.7). • AEA will modify the woodland raptor survey methods by: (1) increasing survey intensity by placing both observers on the same side of the aircraft; (2) surveying twice as many transect lines; (3) decreasing transect spacing from 400 m to 200 m; and (4) reducing the coverage to 50 percent of the 2013 study area by selecting a sample of blocks to survey. These modifications will increase the survey effectiveness because of the low density and low detectability of nests observed during the normal-intensity surveys in 2013.
<p>Highlighted Results and Achievements</p>	<p>The study team conducted occupancy and productivity aerial surveys in May and July for all raptors, focusing primarily on Bald and Golden eagles. Golden Eagles were the most numerous and widely distributed raptors in the study area, with 238 nest structures identified in 2012 and 2013, two of which were below the maximum-pool elevation of the proposed Watana reservoir. In 2013, densities of occupied and possibly occupied Golden Eagle territories (29 percent of total) ranged from 0.0073 to 0.011 territories/km². Breeding pairs were found at only five occupied territories, however, and two of those nests were successful. Productivity appeared to be low region-wide in 2013, as in 2012. The mean inter-nest distance for 37 occupied territories in 2013 was 6.6 km, whereas the mean inter-nest distance for breeding pairs was 15.4 km. Bald Eagles were the second most common raptor in the study area (41 nests). In 2013, 61 percent of all Bald Eagle nests were occupied or possibly occupied (0.007–0.008 territories/km²). These nests represented at least 24</p>

occupied territories in the raptor study area. Breeding pairs of Bald Eagles were found in 13 occupied territories in 2013 (0.004 breeding pairs/km²), of which five were successful. 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. Productivity of both falcon species was relatively high in 2013.

Nest sightability surveys to assess the effectiveness of aerial searches showed that, with the unusually persistent snow cover that occurred in 2013, several Golden Eagle 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 steep 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. Although three times more species were recorded during migration surveys in fall than in spring, the numbers of individual birds were similar during both periods. 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.

7. COMPLETING THE STUDY

7.1. Proposed Methodologies and Modifications

To complete this study, the study team will implement the methods in the Study Plan, except as described in Sections 7.1.1 and 7.1.2. These activities include the following:

- Nest occupancy and productivity surveys (RSP Section 10.14.4.1);
- Sightability assessment of raptor nesting surveys (RSP Section 10.14.4.1);
- Delineation of Bald and Golden eagle nesting habitats (RSP Section 10.14.4.1);
- Fall and winter roosting and foraging surveys (RSP Section 10.14.4.1); and
- Migration surveys along potential power transmission routes (RSP Section 10.14.4.1).

7.1.1. Decision Points from Study Plan

There were no decision points in the FERC-approved Study Plan to be evaluated for this study following the completion of 2013 work.

7.1.2. Modifications to Study Plan

As described in the ISR Overview and depicted in Figure 1, AEA has added the Denali East Option road and transmission corridor to the study area. With regard to this study, the modified study area showing the Denali East Option is depicted in Figure 7.1-1. For this study, the corridor addition to the study area includes a 3-mi buffer surrounding the center lines of the road and transmission line alignments of the new Denali East Option.

RSP Sections 10.14.1 and 10.14.4.1 provide objectives and methods for the study team to review existing literature review on the food habits and diets of piscivorous raptors as background for the Mercury Assessment and Potential for Bioaccumulation Study (Study 5.7), and to collect feather samples for characterization of mercury levels and provide information on the effects of methylmercury on piscivorous raptors. After further consideration of all mercury studies for the proposed Project, AEA has removed these objectives and methods related to mercury analysis of piscivorous raptors (RSP Section 10.15.4.3) and consolidated this work under the Mercury Assessment and Potential for Bioaccumulation Study (Study 5.7). Please see ISR Study 5.7.

With regard to the survey technique for locating nests of woodland raptors, AEA will implement several changes to increase the survey intensity, due to the low detectability and very low density of woodland raptor nests found during the normal-intensity surveys in 2013. These modifications were discussed at the wildlife technical meeting on March 6, 2014 (see http://www.susitna-watanahydro.org/wp-content/uploads/2014/03/2014-03-06TT_Wildlife_MeetingNotes_.pdf), and consist of the following:

1. The survey intensity will be increased by placing both observers on the same side of the aircraft (i.e., upslope side for better viewing when following elevation contours).
2. The study team will survey twice as many transect lines.
3. Transect spacing will be decreased from 400 m to 200 m.
4. To maintain the same field effort, the coverage will be reduced to 50 percent of the 2013 Woodland Raptor study area by selecting a sample of blocks to survey. A sample of randomly selected high-intensity resurvey blocks will be performed within the new survey blocks to evaluate the sightability of nests.

7.2. Schedule

In general, the schedule for completing the FERC-approved Study Plan is dependent upon several factors, including Project funding levels authorized by the Alaska State Legislature, availability of required data inputs from one individual study to another, unexpected weather delays, the short duration of the summer field season in Alaska, and other events outside the reasonable control of AEA. For these reasons, the Study Plan implementation schedule is subject to change, although at this time AEA expects to complete the FERC-approved Study Plan through the filing of the Updated Study Report by February 1, 2016, in accordance with the ILP schedule issued by FERC on January 28, 2014.

With regard to this specific study, AEA expects to complete data collection in both the 2014 and 2015 study seasons. In 2014, the study team will conduct two nest occupancy surveys in May and two productivity surveys in July. All remaining data collection and analysis for this study will be completed in 2015, including more nest occupancy and productivity surveys.

7.3. Conclusion

Implementation of the Surveys of Eagles and Other Raptors Study is planned for 2014 and 2015. The study team expects that the combination of study results from 2012-2013 (including the variances described in Section 4 of this ISR), the results from 2014 and 2015 (including the modifications described in Section 7.1.2 above), and integration with other studies will achieve the approved Study Plan objectives. This study is interrelated with the Mercury Assessment and Potential for Bioaccumulation Study (Study 5.7), Fish Distribution and Abundance Studies (Upper, Middle and Lower Susitna River) (Studies 9.5 and 9.6), Salmon Escapement Study (Study 9.7), Bat Distribution and Habitat Use Study (Study 10.13), Evaluation of Wildlife Habitat Use Study (Study 10.19), and Vegetation and Wildlife Habitat Mapping Study in the Upper and Middle Susitna Basin (Study 11.5). AEA expects the approved Study Plan objectives for both this study and Studies 5.7, 9.5, 9.6, 9.7, 10.13, 10.19, and 11.5 will be achieved with the modifications to this study, as these modifications will increase the survey effectiveness and expand the temporal scope of the study effort. The results of this study will be reported in the USR.

7.4. Figures

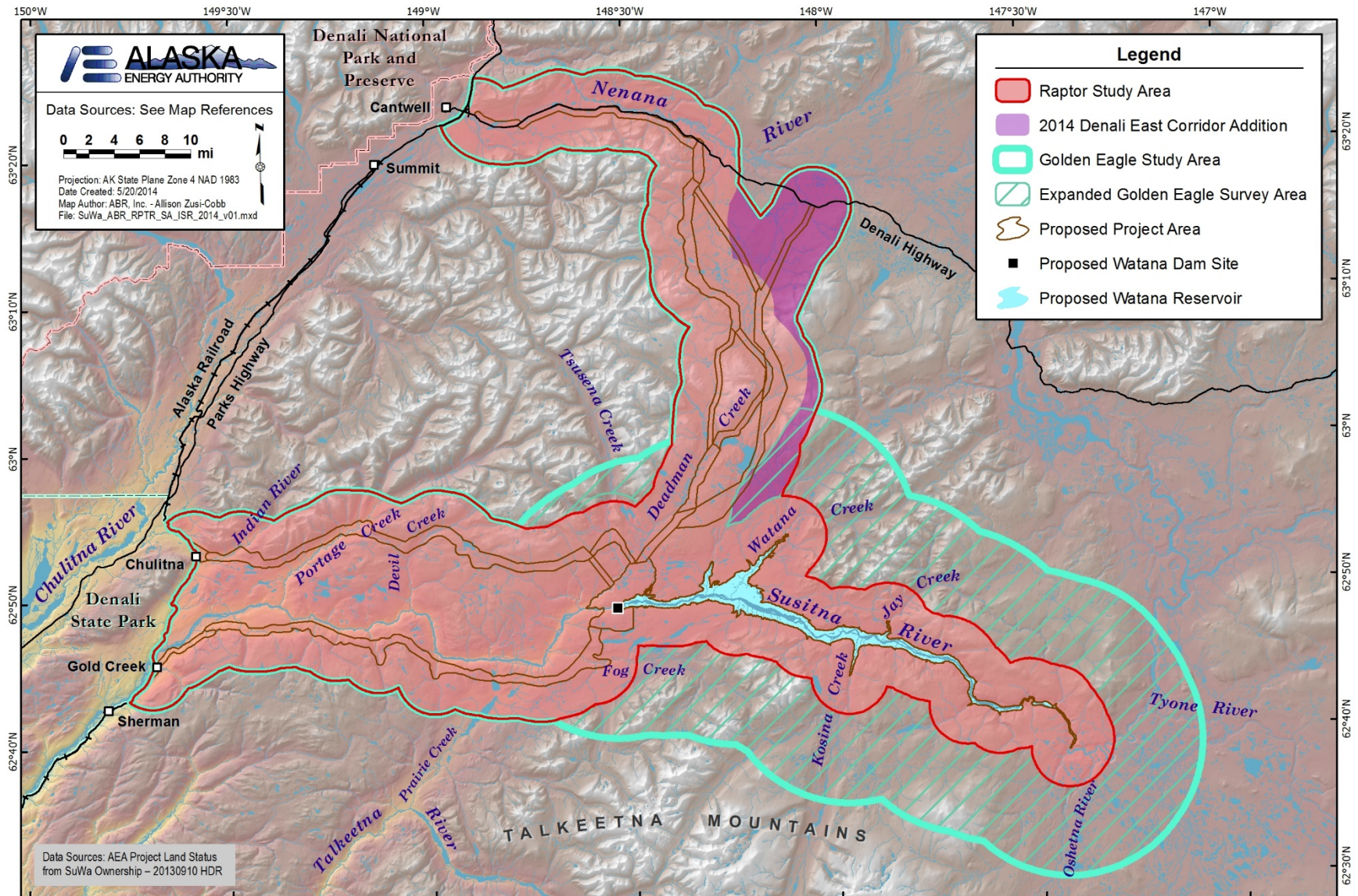


Figure 7.1-1. Revised study area for Surveys of Eagles and Other Raptors, including the Denali East Corridor Option added in 2014.