

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

**Wood Frog Occupancy and Habitat Use  
Study Plan Section 10.18**

**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 Wood Frog Occupancy and Habitat Use Study (Study Plan 10.18) details the development of this study from the Revised Study Plan (RSP) in 2012, through the end of the 2014 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 (also referred to below as the Study Plan).

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 this Study 10.18 since the filing of the ISR in June 2014. As detailed below, AEA's recent activities for Study 10.18 have consisted of the following:

- In spring 2014, the study team conducted a second year of auditory surveys and acoustic monitoring of calling male wood frogs, followed by habitat occupancy modeling.
- On October 21, 2014, AEA held an ISR meeting for the Wood Frog Study and the other studies in the wildlife program.
- The study team released the Study Completion Report (SCR) 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 10.18 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 characterize the use of the Project area by breeding wood frogs to facilitate an assessment of potential impacts on wood frogs from development of the proposed Project.

The study objectives are established in RSP Section 10.18.1:

- Review existing data on habitat use and distribution of breeding wood frogs in a broad region surrounding the study area.
- Estimate the current occupancy rate for breeding wood frogs in suitable habitats in the study area through a combination of field surveys and habitat-occupancy modeling.
- Use information on current habitat occupancy and habitat use to estimate the habitat loss and alteration expected to occur from development of the Project.

- Sample frogs opportunistically for the presence of the chytrid fungus that has been linked to amphibian population declines. (At the request of state and federal management agencies, AEA agreed to sample for the chytrid fungus to opportunistically take advantage of planned fieldwork and thereby provide some baseline information on the potential occurrence of the fungus in the study area before development.)

## 2.2. Study Components

This study consists of the following components:

- Auditory field surveys.
- Occupancy modeling and habitat associations.
- Acoustic monitoring.
- Chytrid fungus bioassay.

## 3. STATUS, HIGHLIGHTED RESULTS, AND ACHIEVEMENTS

The following tasks were completed in 2013 and reported in Part A of the ISR for Study 10.18:

- A total of 90 randomly selected wetlands and water bodies were surveyed for the presence of wood frogs in 2013. Frogs were found to be widely distributed in the areas surveyed over a variety of habitat types from tundra to forested wetlands.
- Assuming 100% detectability, frog occupancy was 20.2 percent.
- Because frogs were not always detected during 5-min sampling sessions even when they were present, the study team used occupancy modeling to adjust the observed occupancy rates for non-detections. Of the 16 models compared in 2013, the best model of frog occupancy indicated that water depth was the most important habitat variable measured.
- The study team used acoustic monitoring to quantify when frogs were calling. The acoustic monitors were deployed at a subset of water bodies and wetlands on state and federal lands known to be occupied by frogs.
- The study team captured seven frogs by hand opportunistically and swabbed the skin for chytrid fungus. All seven samples tested negative.

The study team has completed the following activities for Study 10.18 since that reported in the June 2014 filing of the ISR:

- A total of 104 wetlands and waterbodies were surveyed for the presence of wood frogs in 2014. Frogs were found to be widely distributed in the areas surveyed over a variety of habitat types from tundra to forested wetlands.
- In 2014, the study team tested two types of occupancy model: one assumed that detectability was constant for all surveys (as in 2013) and the other assumed that

detectability differed between corridors (Denali and Gold Creek); the latter was added to the analysis because of the large differences observed in seasonal phenology between the Gold Creek and Denali corridors in 2014. The best of 32 models compared in 2014 included water depth and the detectability variable, corridor.

- The study team used acoustic monitoring to quantify when frogs were calling. The acoustic monitors were deployed at a subset of water bodies and wetlands on state, federal, and CIRWG lands known to be occupied by frogs.
- Sampling for the chytrid fungus was not conducted in 2014.

#### 4. SUMMARY OF STUDY 10.18 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
10.18. Wood Frog Occupancy 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 wood frogs.	<a href="#">RSP for Study 10.18</a>
FERC Study Plan Determination for Study 10.18	2/1/2013	This document presents FERC approval of Study 10.18, which approved AEA's Revised Study Plan with no recommended changes.	<a href="#">FERC SPD for Study 10.18</a>
Draft Initial Study Report for Study 10.18	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 10.18. This draft ISR was later republished as Part A of the final ISR.	<a href="#">Draft ISR for Study 10.18</a>
Initial Study Report for Study 10.18	6/3/2014	This document is the Initial Study Report (Parts A, B and C) for Study 10.18. 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.	<a href="#">ISR Part A for Study 10.18</a> <a href="#">ISR Part B for Study 10.18</a> <a href="#">ISR Part C for Study 10.18</a>
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.	<a href="#">Transcripts from ISR Meeting</a> <a href="#">Materials from ISR Meeting</a>
Wood Frog Occupancy and Habitat Use Study (10.18) – 2013-2014 Study Completion Report	11/4/2015	Study Completion Report: a summary of field survey results in 2013 and 2014.	<a href="#">2013-2014 SCR for Study 10.18</a>

## 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 10.18, during AEA's continued implementation of the Study Plan through calendar year 2014.

ISR Reference	Description
Part A, Section 4	This Section is updated and supplemented by the Study Completion Report for Study 10.18 (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 10.18 (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:

- In 2013, the methodology for selecting sample locations (RSP Section 10.18.4.1) was adjusted because mapping and fish presence data were not yet available and access to the study sites on Cook Inlet Regional Working Group (CIRWG) lands was not permitted in 2013. Therefore, the study team devised an alternative approach to selecting 120 sampling locations that still incorporated random selection of suitable sampling sites.
- Proposed field survey times from approximately 12:00 h to 22:00 h (RSP Section 10.18.4.1) were adjusted due to logistical challenges. Instead, surveys were conducted between 09:00 h and 20:00 h.

### 6.2. 2014 Study Season

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

- In 2014, the 2013 variances were carried over, except that the study team was permitted to access CIRWG lands in 2014.
- Because of the small sample size obtained in 2013, opportunistic capture and swabbing of adult frogs to sample for the presence of amphibian chytrid fungus was dropped from the field effort in 2014, as was discussed and agreed to in the technical meeting on March 6, 2014.
- As explained in Section 1.3 of the ISR Part D Overview, the Denali East Option was added to the study in May 2014, and the Chulitna Corridor was removed from the study area.

## **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.
- AEA conducted auditory field surveys for habitat occupancy modeling (RSP Section 10.18.4.1, incorporating variances described in Section 4.1.1), focusing on areas not sampled in 2013, including CIRWG lands, the new Denali East Option, and areas at higher elevations (above 2,500 ft), some of which were still frozen at the time of sampling in 2013.
- Another modification is the deletion of opportunistic swab sampling for the presence of chytrid amphibian fungus, which could not be sampled adequately without a substantially larger field sampling program.

### **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 all study objectives in the FERC-approved Study Plan. In light of the results, variances, and modifications described above, AEA has completed this study.