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SUSITNA-WATANA HYDRO

1.1. Wood Frog Distribution and Habitat Use

1.2. Requester of Proposed Study

AEA anticipates resource agencies will request this study.

1.3. Responses to Study Request Criteria (18 CFR 5.9(b))

1.3.1. Describe the goals and objectives of each study proposal and the information to be obtained.

The goal of the wood frog study is to characterize use of the Project area by wood frogs to enable an assessment of potential impacts from development of the Project. The specific objectives of the study are to synthesize existing habitat use and distribution data and to evaluate the current distribution of wood frogs in the Project area through a combination of field surveys and habitat occupancy modeling. This information (see Criterion 1.3.5 below) will be used to estimate habitat loss and alteration for the species in the Project area.

1.3.2. If applicable, explain the relevant resource management goals of the agencies and/or Alaska Native entities with jurisdiction over the resource to be studied. [Please include any regulatory citations and references that will assist in understanding the management goals.]

Concern has been expressed about the conservation status of wood frogs in Alaska (ADF&G 2006). Resource management agencies have devoted more attention to inventorying and monitoring wood frog populations due to population declines of amphibians elsewhere in North America and to reports of deformities in wood frogs elsewhere in Alaska (Anderson 2004).

1.3.3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.

Wildlife resources are owned by the State of Alaska, and the Project could potentially affect these public interest resources.

1.3.4. Describe existing information concerning the subject of the study proposal, and the need for additional information.

Amphibians were not included in the original Susitna Hydroelectric Project environmental program studies in the 1980s; hence, data specific to the upper Susitna drainage is lacking. It is likely that wood frogs occur in the Project area because they occur in suitable habitats throughout southern Alaska and in the interior north to the southern slopes of the Brooks Range and have been documented in Denali National Park and Preserve, near Healy, and in the lower Susitna drainage (Cook and MacDonald 2003; Anderson 2004; Gotthardt 2004, 2005; Hokit and Brown 2006; MacDonald 2010). Because concern has been expressed about the conservation status of wood frogs in Alaska (ADF&G 2006) and their status in the Project area is unknown, field surveys should be conducted in areas likely to be affected by Project facilities and activities.

1.3.5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

For wood frogs, the Project will result in habitat loss and alteration, habitat fragmentation, and direct mortality due to development activities. The wood frog study will provide data to assess the following direct, indirect, and cumulative effects:

- Direct loss and alteration of wood frog habitats from Project construction and operation;
- Potential direct mortality due to Project-related fluctuating water and ice conditions in the reservoir and downstream river reaches;
- Potential direct, indirect, and cumulative impacts on predator and prey abundance and distribution related to habitat changes resulting from Project development.

The wood frog study would provide baseline data for the Project area, including habitat-use data for development of habitat evaluation criteria. The study would provide a basis for impact assessment; developing protection, mitigation, and enhancement (PME) measures; and developing resource management and monitoring plans.

1.3.6. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

Ground-based auditory surveys of randomly selected waterbodies in the Project area would be conducted in spring using standard methods (e.g., USGS 2010). These surveys involve auditory detection of frogs calling during the breeding season to detect presence or absence of wood frogs at each waterbody sampled. A repeated-measures survey design with pseudo-double-blind-observations will be used to assess the accuracy of the auditory survey.

Habitat characteristics of each sampled waterbody (e.g., size and depth, presence of emergent aquatic vegetation, presence of fish or beaver activity) would be recorded for each waterbody to enable the development of an occupancy estimation model based on the habitat characteristics of occupied waterbodies. Data from vegetation, wetland, and riparian habitat mapping, wetland functional assessments, and the literature (e.g., Stevens et al. 2006) would be assessed as potential model variables to characterize wood frog habitat. The model's predictive accuracy would be evaluated during subsequent field surveys. If the model is deemed reliable, it would be used to classify all waterbodies in the Project area with respect to their probability of supporting breeding wood frogs. Spatial analyses using model results then could be used to predict Project impacts on wood frogs.

1.3.7. Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

Auditory surveys should be conducted in spring 2013 and 2014, requiring approximately 1–2 weeks of field surveys per year. Model development would be conducted during winter 2013/2014, and ground-truthing of the model would be done in the 2014 field season.

Using a combination of field sampling and modeling would constrain costs compared with attempting to census wood frogs in all waterbodies throughout the Project area. Field data from auditory surveys are required, however, because a reliable wood frog habitat model cannot be developed solely from the literature.

1.3.8. Literature Cited

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