

Susitna-Watana Hydroelectric Project Document

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1.1. Caribou Distribution, Abundance, Movements, and Productivity

1.2. Requester of Proposed Study

AEA ~~anticipates a resource agency will request the proposed study on behalf of Alaska Department of Fish and Game (ADF&G), Division of Wildlife Conservation~~

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

The following sections provide the necessary context and justification for the proposed study.

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

The goal of the study is to obtain sufficient population information on caribou, one of the most important wildlife resources in the region, to use in evaluating Project-related effects and identifying any necessary measures to avoid, minimize, or mitigation for those effects.

The study area will encompass the Project impoundment zone and potential access and transmission-line routes from the west and the north, referred to herein as the greater Project area, most of which is located within Game Management Unit (GMU) subunit 13E.

Four primary objectives have been identified for this study:

- 1) Document seasonal use of, and movement through, the greater Project area by both females and males of the Nelchina caribou herd (NCH) and the Delta caribou herd (DCH);
- 2) Assess the relative importance of the greater Project area to both the NCH and DCH;
- 3) Document productivity and calf survival of caribou using the greater Project area; and
- 4) Analyze data from historical caribou studies and synthesize with recent data for the NCH and DCH as a continuation of the caribou task of 2012 study W-S1 (AEA 2012).

Data collected through standard (Very High Frequency – VHF) radio-telemetry, satellite-linked Global Positioning System (GPS) telemetry, photocensuses, and aerial surveys of population composition and calf production will document currently used areas, as well as providing data on the timing and duration of seasonal use and the and proportion of the caribou populations using the Project area. This information may be used to develop seasonal or access restrictions to protect sensitive habitats. The information collected will be used to inform development of appropriate avoidance, minimization, and mitigation measures in support of ADF&G management objectives for the NCH and DCH.

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.]

ADF&G is responsible for the management, protection, maintenance, and improvement of Alaska's fish and game resources in the interest of the economy and general well-being of the state (AS 16.05.020). ADF&G monitors caribou populations and manages subsistence and sport hunting for caribou (5 AAC 85.025) through regulations set by the Board of Game (AS 16.05.255). The Federal Subsistence Board, which comprises representatives from the U.S.

Fish and Wildlife Service, the National Park Service, the Bureau of Land Management, the Bureau of Indian Affairs, and the U.S. Forest Service, oversees the Federal Subsistence Management Program (57 FR 22940; 36 CFR Parts 242.1–28; 50 CFR Parts 100.1–28) with responsibility for managing subsistence resources on Federal public lands, including caribou, for rural residents of Alaska.

The current population objective for the NCH was established to ensure consistently high sustainable harvest levels for Alaskan hunters (Tobey and Schwanke 2009). ADF&G's management objectives for the NCH in GMU 13 and GMU subunit 14B are to maintain a fall population of 35,000–40,000 caribou, with a minimum of 40 bulls:100 cows and 40 calves:100 cows; and to provide for an annual harvest of 3,000–6,000 caribou (Tobey and Schwanke 2009). ADF&G's management objectives for the DCH in GMU 20A are to maintain a bull:cow ratio of $\geq 30:100$ and a large bull:cow ratio of $\geq 6:100$; reverse the decline of the herd and increase the midsummer population to 5,000–7,000 caribou; and sustain an annual harvest of 300–700 caribou (Seaton 2009).

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.

Caribou range use and movement studies during the early 1980s for the proposed Susitna Hydroelectric Project are insufficient to accurately characterize the current caribou use of this area. The NCH is a moderately large herd with 40,233 caribou in 2011 (ADF&G, unpublished data); whereas the DCH is much smaller with 2,985 caribou in 2007 (Seaton 2009). In addition to the much larger NCH, the DCH now also uses portions of the greater Project area extensively. Since 1985, the number of NCH caribou has increased significantly. A related change has been increased use of summer and winter range in the northwestern portion of the NCH range in subunit 13E, northwest of the Project location. Because the NCH continues to calve in the eastern Talkeetna Mountains in GMU 13A, south of the Project location, changes in summer and winter range could mean more caribou would cross through the greater Project area during seasonal migrations to and from the calving grounds.

Current annual monitoring efforts for the NCH and DCH by ADF&G identify general herd distribution, productivity, and annual survival for the purpose of assessing annual herd trends and related harvest strategies. These data are insufficient, however, to assess the potential Project-related impacts or to identify potential mitigation measures for caribou in the greater Project area. Mixing of the two caribou herds since the mid-1990s in the northern portion of the greater Project area between the Susitna River and Butte Lake has been a more recent development that adds a level of complexity to range use and importance for the two herds (Seaton 2009). In addition, established vegetation exclosures in the NCH range can be used to monitor abundance of lichens in an ungrazed area for assessment of range conditions.

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.

The Project will result in wildlife habitat loss and alteration, blockage of movements of mammals, disturbance, and changes in human activity due to construction and operation of the Project. The Project may result in habitat loss, reduced access, or displacement from seasonally used sensitive habitats in the middle and upper Susitna River basin such as caribou calving and wintering areas caused by increased human activity.

The caribou study addresses the following direct, indirect, and cumulative effects (AEA 2011):

- W1: Potential direct loss and alteration of wildlife habitats, including key habitat features such as mineral licks, from Project construction and operation;
- W2: Potential direct physical and behavioral blockage and alteration of movements due to reservoir water and ice conditions; access and transmission corridors; and new patterns of human activities;
- W3: Potential changes in wildlife mortality rates due to Project-related fluctuations in water and ice conditions in the reservoir and downstream river reaches;
- W4: Potential cumulative impact of changes in predator and prey abundance and distribution related to increased human activities and habitat changes resulting from Project development; and
- W5: Potential indirect impacts to wildlife from changes in hunting, vehicular use, noise, and other disturbance due to increased human presence resulting from Project development.

Documentation of currently used areas, along with information on timing, duration, and proportion of the regional population that uses those areas, can be used to develop seasonal or access restrictions to protect sensitive habitats. The information developed will be used to inform development of appropriate avoidance, minimization, and mitigation measures in support of ADF&G management objectives for the NCH and DCH. This information will also be useful to prevent inadvertent disturbance from unrelated field studies for the Project.

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.

The methods employed in this study will be standard capture, handling and telemetry monitoring techniques for caribou (Adams et al. 1987). These techniques have been widely used for monitoring big game populations in Alaska. Small piston helicopters (Robinson R44®, Robinson Helicopter Company, Torrance, California) and chemical immobilization techniques will be used to capture caribou and small fixed-wing aircraft (Piper® PA-18 Super Cub, Piper Aircraft, Inc., Vero Beach, Florida) will be used for radio-tracking flights. All methods will be fully evaluated and compliant with Alaska Interagency Animal Care and Use Committee certification. Standard permits required by the State of Alaska for animal capture and monitoring are in-hand.

To accomplish the study objectives, a fairly large sample of both females and males from each of the caribou herds using the greater Project area will be captured and monitored. Limitations of radio- and GPS/satellite telemetry will be compensated for by incorporating both techniques.

GPS/satellite and VHF locations will be used to evaluate spatial distribution and movements of cows and bulls from each herd, with the GPS collars providing a greater volume of high-resolution data. Location, date, reproduction, survival status, and group size will be documented for each caribou located during scheduled radiotelemetry flights. Critical movement timing and corridors can most reliably be captured with the use of GPS/satellite collars that record regular locations of caribou at a predetermined frequency throughout the year. Data from satellite-collared caribou has successfully been used to analyze daily movements for calving caribou (Kelleyhouse 2001) and would provide a high-quality dataset for evaluating use of the greater Project area. Data analysis and visual representation of data will be accomplished using ArcGIS® (Geographic Information System) software (ESRI, Redlands, California).

Study Activity	Schedule	Objectives
Telemetry – movements, productivity, survival	Deploy 15 radio and 30 satellite collars: late April 2012; early October 2012	1, 2, 3, 4
Survey – telemetry relocations, movements, productivity, survival	Monthly monitoring: 2012–2015 Weekly monitoring: spring and fall migration, calving	1, 2, 3, 4
Telemetry – movements, productivity, survival	Remove, refurbish, redeploy 30 satellite collars: April 2014 – October 2014; October 2014 – April 2015	1, 2, 3, 4
Telemetry – movements, productivity, survival	Remove all satellite collars: October 2016	1, 2, 3, 4

Large-scale NCH and DCH range use has been documented in past studies, but this study will use a more focused research approach to provide Project-specific data. Distribution, movement, reproduction, and calf survival monitoring efforts will be focused within the greater Project area, which has been identified as critical to caribou (Seaton 2009; Tobey and Schwanke 2009).

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.

Existing annual monitoring efforts for caribou are insufficient for accurate evaluation of potential Project-related impacts or to identify potential mitigation measures for caribou in the greater Project area. By supplementing existing herd monitoring projects with additional collars, a large sample (170 radio and satellite) of collars will be available for tracking caribou movements in the greater Project area, beginning in summer 2012.

Using telemetry data to monitor caribou movements, distribution, and demography is the principal tool used for caribou management of Alaska herds and has proven to be a cost-effective method to study this highly mobile species in remote locations. In addition, GPS/satellite telemetry provides animal-specific movement information not available from aerial surveys or ground-based surveys. Maintaining a large sample of caribou over multiple years is necessary to capture the large variation in resource use among years, herds, sexes, and individuals.

The study schedule is outlined in the following table:

Period	Item	Estimated Effort
Fiscal Year 2012 (1 March 2012 – 30 June 2012)	Biologist	3 @ 2 months
	Spring capture (45 caribou)	7 days
	Monitoring flights	~10 flights
Fiscal Year 2013 (1 July 2012 – 30 June 2013)	Biologist	3 @ 2.5 months
	Fall capture (45 caribou)	7 days
	Monitoring flights	~25 flights
Fiscal Year 2014 (1 July 2013 – 30 June 2014)	Biologist	3 @ 1.5 months
	Spring capture (28-30 caribou)	5 days
	Monitoring flights	~25 flights
Fiscal Year 2015 (1 July 2014 – 30 June 2015)	Biologist	3 @ 1.5 months
	Fall and spring capture (60 caribou)	9 days
	Monitoring flights	~25 flights
Fiscal Year 2016 (1 July 2015 – 30 June 2016)	Biologist	3 @ 1.5 months
	Monitoring flights	~25 flights
Fiscal Year 2017 (1 July 2016 – 30 June 2017)	Biologist	3 @ 2 months
	Fall capture (60 caribou)	8 days
	Monitoring flights	~25 flights

1.3.8. Literature Cited

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