

10.7. Dall's Sheep Distribution and Abundance

10.7.1. General Description of the Proposed Study

The Dall's sheep study will be conducted over two years in 2013 and 2014. The study is designed to evaluate how many sheep use the Project area, where they are distributed, what habitats they occupy, and whether mineral licks in the Project area receive high levels of seasonal use by sheep.

10.7.1.1. Study Goals and Objectives

The goal of the study is to obtain sufficient information on the minimum population size, summer distribution, and current use of mineral licks by Dall's sheep, an important species of big game in the Project area, to use in evaluating potential Project-related effects and identifying measures to avoid, minimize, or otherwise mitigate those effects.

Four objectives have been identified for this study:

- 1) Estimate the current minimum population size of Dall's sheep in the Project area;
- 2) Delineate the summer range of Dall's sheep in the Project area;
- 3) Evaluate the current condition of mineral licks in the Project area; and
- 4) Analyze and synthesize data from historical and current studies of Dall's sheep in the greater Project area as a continuation of the 2012 study (AEA 2012).

Data collected through aerial surveys and inspection of the Jay Creek and Watana Creek mineral licks will document currently used areas for development of any necessary protection, mitigation, and enhancement measures.

10.7.2. Existing Information and Need for Additional Information

Dall's sheep were studied in the region during the early 1980s. Aerial surveys of the Watana Creek Hills counted 130–220 animals (Tankersley 1984). Later surveys of the Watana Hills counted 97 and 50 sheep (Peltier 2008). The sheep population in the larger management area has declined overall following a steep decline after the winter of 1999–2000 and additional declines during 2004–2007 (Peltier 2008). No sheep use of areas on Mount Watana (directly south of the proposed Watana impoundment) or near the Denali Highway access corridor was documented in the 1980s (Tankersley 1984).

During the 1980s research, mineral licks were identified on lower Jay Creek and upper Watana Creek (Tankersley 1984). Sheep used those licks mainly between mid-May and mid-June and at least 31 percent of the sheep population observed in the Watana Creek Hills in 1983 traveled 5 miles (8 kilometers) or more to the Jay Creek lick. The Low Watana reservoir proposed in the 1980s would not have inundated the Jay Creek lick at a normal maximum operating level of 2185 feet (135 feet higher than is planned for the current proposed Project), but may have resulted in the loss of lower areas of the Jay Creek lick and associated resting areas due to accelerated erosion, and may have inhibited sheep travel along and across Jay Creek (Tankersley 1984).

The management objectives for the Talkeetna Mountains and Chulitna–Watana Hills in Game Management Unit (GMU) Subunits 13A, 13E, 14A, and 14B are to maintain sheep populations that will sustain an annual harvest of 75 rams (Peltier 2008). This study only addresses sheep populations within portions of GMU 13E.

The proposed Project will result in wildlife habitat loss and alteration, blockage of movements of mammals, wildlife disturbance, and changes in human activity due to construction and operation.

New information is needed for a current enumeration of sheep abundance in the greater Project area, primarily in the Watana Creek Hills, and to evaluate the current extent of seasonal use of the Jay Creek and Watana Creek mineral licks by sheep. The primary concerns for Dall's sheep are alteration of movement patterns, changes in the use of nearby mineral licks, disturbance, and changes in harvest patterns due to increased human access. Current data on distribution, population size, and use of the Jay Creek and Watana Creek mineral licks will be important for assessing potential impacts on the local sheep population and developing any protection, mitigation and enhancement measures if necessary.

10.7.3. Study Area

The study area lies within GMU Subunit 13E, east of the Parks Highway and south of the Denali Highway, encompassing the Project facilities, potential access and transmission-line corridors, and most of the inundation zone for the reservoir (Figure 10.7-1). All suitable Dall's sheep habitat within the study area will be surveyed by airplane and the Jay Creek and Watana Creek mineral licks will be visited on the ground.

10.7.4. Study Methods

The proposed study would consist of three components:

- Aerial surveys for summer distribution and minimum population estimation;
- Inspection of the Jay Creek and Watana Creek mineral licks to assess their current condition and general level of use; and
- Analysis of historical (1980s) data and synthesis with current ADF&G monitoring results.

An aerial survey will be conducted each year to document sheep distribution and to develop a minimum population estimate. All suitable sheep habitat in the study area will be covered by the survey, following ADF&G protocols for summer (July) surveys after lambing and before the sheep hunting season begins in early August.

The two site visits to the Jay Creek and Watana Creek mineral licks during May and June each year will provide a qualitative assessment of lick condition and levels of use. AEA contractors will perform these site visits rather than ADF&G personnel. Results will be compared with those from ground-based surveys of mineral licks conducted in the 1980s (Tankersley 1984). Conducting site visits in both 2013 and 2014 will provide information on annual variability, and the results of the 2013 visits will be used to modify the timing of the 2014 field visits, if necessary.

10.7.4.1. *Impact Analysis*

The primary potential type of impact mechanisms resulting from of Project construction and operation on Dall's sheep may include the following:

- Direct loss and alteration of Dall's sheep habitats, including key habitat features such as mineral licks, from Project construction and operation;
- Blockage or alteration of movements and changes in distribution due to reservoir water and ice conditions, access and transmission corridors, and new patterns of human activities;
- Mortality of Dall's sheep due to Project-related fluctuating water and ice conditions in the reservoir and downstream river reaches;
- Changes in mortality that may result from altered abundance and distribution of sheep predators due to increased human activities and habitat changes resulting from Project development; and
- Mortality of Dall's sheep from increased subsistence and recreational harvest.

Data on the distribution and abundance of Dall's sheep and their use of mineral licks in the study area will be used to assess Project impacts through geospatial analysis, evaluation of the responses of the Dall's sheep to other similar projects, as documented in the scientific literature, and an examination of the current physical characteristics of the Jay Creek and Watana Creek mineral licks. Direct habitat loss caused by the Project can be evaluated by overlaying the impoundment, access and transmission corridors, and related infrastructure (including any predicted changes around the two mineral licks) and the summer sheep ranges delineated from aerial surveys onto the Project wildlife habitat map. Similarly, buffer zones can be delineated around the Project footprint, as determined from the available information on the expected effects, to estimate indirect impacts. Population data can be incorporated into the geospatial analysis to estimate the number of sheep that may be affected. The GIS analysis can be combined with information from the literature to estimate the geographic extent, frequency, duration, and magnitude of Project effects on sheep. Harvest data from ADF&G and population data from aerial surveys will provide a baseline with which to assess changes in mortality rates that may result from increased harvest, lake ice conditions, increased predation, or altered access to important habitats. Information from other studies also will be pertinent to assessment of potential Project impacts on Dall's sheep, in particular the large predator studies (Section 8.8) and harvest analysis (Section 8.20).

10.7.5. Consistency with Generally Accepted Scientific Practice

Aerial surveys will provide the best indication of the minimum population of sheep in the study area and therefore the maximum number of sheep potentially impacted by the Project. These surveys will be conducted following current ADF&G procedures for sheep in GMU 13. Aerial surveys will be conducted by ADF&G personnel and pilots experienced in conducting surveys according to ADF&G protocols. Data will be analyzed in accordance with commonly accepted statistical techniques for wildlife studies.

10.7.6. Schedule

Aerial surveys of all available Dall's sheep habitat within the study area will be conducted in July of 2013 and 2014. Data analysis and reporting will be conducted each year.

2013

- Conduct site visits to assess lick use in May and June (AEA contractor).
- Aerial surveys: one week during July (ADF&G).
- Data analysis and report preparation: August–November (joint effort).

2014

- Initial Study Report: February.
- Conduct site visits to assess lick use in May and June (AEA contractor).
- Aerial survey: one week during July (ADF&G).
- Data analysis and report preparation: August–November (joint effort).

2015

- Updated Study Report: February.

10.7.7. Level of Effort and Cost

Aerial surveys will require one observer and one pilot in a small tandem-seat fixed-wing airplane, flying daily for up to one week per summer to survey the sheep habitat in the study area. The ground visits to mineral licks will require 2–3 days per visit (twice annually), for a total of 8–10 days over both years. All suitable sheep habitat east of the Parks Highway and south of the Denali Highway within GMU 13E will be surveyed. The study cost is expected to be on the order of \$50,000 per year in 2013 and 2014, for a total of approximately \$100,000.

10.7.8. Literature Cited

- AEA. 2011. Pre-Application Document: Susitna–Watana Hydroelectric Project FERC Project No. 14241. December 2011. Prepared for the Federal Energy Regulatory Commission, Washington, DC.
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- Peltier, T. C. 2008. Units 13A, 13E, 14A (North) and 14B, Dall sheep management report. Pages 90–97 in P. Harper, editor. Dall sheep management report of survey-inventory activities. 1 July 2004–30 June 2007. Alaska Department of Fish and Game. Project 6.0. Juneau, Alaska.
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