10.9. Distribution and Abundance of Wolverines

10.9.1. General Description of the Proposed Study

The wolverine study is a multi-year project involving evaluation of existing information and field surveys. During 2012, previous data from wolverine monitoring efforts in the study area were assembled. In late winter 2013, a single aerial Sample-Unit Probability Estimator (SUPE) survey will be conducted. If survey conditions are inadequate in 2013, then the SUPE survey will be attempted again in 2014. Occupancy modeling also will be used to estimate detection probability for wolverines in the study area and to serve as a baseline for estimating population trend during and after construction of the proposed Project. Aerial surveys for the purpose of occupancy modeling will occur in both 2013 and 2014.

10.9.1.1. Study Goals and Objectives

The overall goal of this study is to collect preconstruction baseline population data on wolverines in the Project area (reservoir impoundment zone; facilities, laydown, and storage areas; access and transmission-line routes) to enable assessment of the potential impacts from development of the proposed Project. This information will be used to estimate the number of wolverines that may be affected by the Project and to evaluate impacts on habitats used seasonally by wolverines.

Four specific objectives have been identified for this study:

1) Estimate the current population size of wolverines;
2) Establish a population index for wolverines;
3) Describe the late-winter distribution of wolverines; and
4) Describe late-winter habitat use by wolverines.

10.9.2. Existing Information and Need for Additional Information

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 denning areas, or prey calving and wintering areas, caused by increased human activity.

The wolverine study will provide baseline data for the Project area, including a late-winter distribution assessment for development of habitat evaluation criteria. The study will provide a basis for impact assessments and for developing any appropriate protection, mitigation, and enhancement measures, which may include resource management and monitoring plans.

ADF&G conducted a mark–recapture study of radio-collared wolverines in the upper Susitna River basin for the original APA Susitna Hydroelectric Project to investigate population density and distribution, habitat selection, home-range size, and seasonal movements from 1980 to 1983 (see details in ABR 2011). A total of 22 wolverines were equipped with VHF radio-collars between April 1980 and April 1983, but sufficient data to estimate home-range size were obtained from only four males and three females. Harvest records, track data, and incidental sightings also were used to help estimate distribution, population size, and food habits of

wolverines in the Susitna basin. In addition to collared animals, the carcasses of 136 wolverines that had been harvested in or near the study area were examined. Habitat use by wolverines varied among seasons, with respect to both elevation and vegetation types. Wolverines were located at higher elevations in summer and lower elevations during winter (Whitman et al. 1986). Collared wolverines avoided tundra habitats in winter and forested habitats in summer, probably because of seasonal changes in prey availability, and used other habitats in proportion to their availability. The most notable potential impact of the original APA Susitna Hydroelectric Project on wolverine was considered to be permanent loss of winter habitat. A potential decrease in the regional moose population as a result of the project would have reduced the amount of carrion available to wolverines during winter. Whitman and Ballard (1984) estimated that 45 percent of the wolverines in their study area in the middle Susitna basin used the reservoir inundation zone to some degree. Improved access and a greater human presence in the region would have increased the potential for higher harvest rates of wolverines.

No recent estimate of the wolverine population is available for the Project area. The relative inaccessibility of much of the Project area may make it a population source area or refugium (Schwanke 2010) for the wolverine population in Game Management Unit (GMU) 13. ADF&G requested that a population estimate of wolverines be developed for the Project (ADF&G memorandum to AEA, 22 November 2011).

10.9.3. Study Area

The study area (Figure 10.9-1) is substantially larger than the Project area because of the need to consolidate sampling blocks for the SUPE technique while still encompassing the reservoir inundation zone, dam site, access and transmission-line corridors, and other project infrastructure and adjacent areas. Most of the study area is within GMU subunits 13E and 13A. Depending on whether the SUPE survey or occupancy survey is conducted in 2013(see Section 10.9.6 below), the exact boundaries may be refined further before the field survey begins in February.

10.9.4. Study Methods

An aerial survey using snow-tracking and the SUPE technique (Becker et al. 2004, Golden et al. 2007) will be used to estimate the number and density of wolverines in the Project area. With this method, the survey area is divided into sample units (e.g., 25 square kilometers; Golden et al. 2007) that are stratified (high, medium, and low density) on the basis of predicted density of wolverines. Sample units are selected at random from each stratum and are surveyed soon after a significant snowfall until all tracks within the selected sample units are located. Tracks then are followed in both directions to map the entire movement path since the last snowfall and the number of animals in the group is estimated. Data are analyzed using program SUPEPOP and formulas from Becker et al. (1998). Surveys sampling 65–70 percent of high-density sample units and 45–50 percent of medium- and low-density sample units should result in a density estimate with a coefficient of variation (CV) of <10 percent.

The SUPE methodology requires suitable conditions, including fresh snowfall followed by several days of suitable flying conditions late in the winter when adequate daylight is available. These requirements may not be met every year. Therefore, a contingency plan is necessary. Occupancy modeling is a viable approach that can be used in conjunction with the SUPE. At a minimum, the quadrats identified for sampling in the SUPE will be flown looking for tracks.

Noting presence of tracks is all that would be necessary. Because occupancy modeling does not require following tracks back to their origin and forward to the animal (as does the SUPE), windblown areas and older snow are not as much of an issue. SUPE data can also be used for occupancy modeling. Using this approach will allow ADFG to use occupancy modeling to track wolverine population trends in the study area over time, as long as the same quadrats are sampled. Sample units of 1,000-km have been used to define the coarse-scale distribution of wolverines (Gardner et al., 2010). Gardner et al. (2010) suggested using smaller sample units (100 km^2) if population contractions in a specific location were to be detected. Using 25-km^2 SUPE sampling units will allow for this kind of analysis. A meaningful result from occupancy modeling requires repeated surveys. Surveys for the purpose of occupancy modeling will be flown in both 2013 and 2014. If conditions allow, one of those will be the SUPE.

Historical reports from the original APA Susitna Hydroelectric Project study will be reviewed and synthesized, where possible, with data from other recent and current monitoring by ADF&G in GMU Subunits 13A, 13B, 13E, 14B, 16A and 20A. This portion of the work will occur as a continuation of the wildlife distribution and movements study (AEA 2012), which began in 2012. Although the findings of the wolverine study conducted for the original APA Susitna Hydroelectric Project remain relevant and can be used for current Project analyses, the original telemetry data for wolverines are no longer available (R. Strauch, ADF&G, 2012 pers. comm.), so cannot be reanalyzed using newer geospatial techniques.

10.9.4.1. Impact Assessment

Potential impact mechanisms of the proposed Project on wolverine could include the following:

- Direct and indirect loss and alteration of habitat from Project construction and operation;
- Physical and/or behavioral blockage and alteration of movements due to reservoir water and ice conditions, access and transmission corridors, and new patterns of human activities and related indirect effects, including habitat connectivity and genetic isolation;
- Direct and indirect impacts on predator and prey abundance and distribution related to increased human activities and habitat changes resulting from Project development;
- Behavioral impacts to wildlife, such as attraction or avoidance, resulting from vehicular use, noise, and increased human presence associated with Project construction or operation;
- Behavioral impacts to wildlife, such as attraction or avoidance, resulting from changes in hunting, vehicular use, noise, and increased human presence associated with increased subsistence or recreational access that may be facilitated by Project development;
- Direct mortality due to vehicle strikes, exposure to contaminants, and protection of life and property; and
- Potential changes in wildlife mortality rates due to increased harvest facilitated by Project development.

Wolverines typically occur at lower densities near human development (May et al. 2006, Gardner et al. 2010) and this may be the primary impact of the Project on wolverines. Data on the winter distribution, abundance, and habitat use by wolverines in the study area will be used to assess Project impacts of habitat loss and behavioral avoidance. Observed locations of

wolverines and, where feasible, abundance data will be plotted on the wildlife habitat map of the Project area that will be developed under the botanical resources study plan and each habitat type will be ranked by level of use. Direct loss of preferred or important habitats can be evaluated by overlaying the reservoir impoundment, related infrastructure areas, and access road and power transmission corridors onto the wildlife habitat map created for the Project (see Sections 11.5 and 10.19). Indirect loss and avoidance estimates can be made by applying various buffer distances, as determined from the available information on the anticipated effects. In this way, the GIS analysis will be combined with information from the literature to estimate the geographic extent, frequency, duration, and magnitude of Project effects on wolverines. ADF&G harvest data will provide a baseline for assessing impacts of changes in level of harvest.

10.9.5. Consistency with Generally Accepted Scientific Practice

The SUPE technique has been used by ADF&G for past wolverine studies in Alaska (Golden et al. 2007). The ADF&G Division of Wildlife Conservation supports the use of a SUPE survey for estimating the wolverine population when feasible (letter from ADNR [representing State agencies, including ADF&G] to AEA dated May 30, 2012). In recent years, ADF&G and others also have used occupancy modeling (Magoun 2006, Gardner et al., 2010) to assess wolverine populations.

10.9.6. Schedule

A single, intensive SUPE survey will be flown in late winter (February or March) 2013 after a significant snowfall. If suitable survey conditions do not develop for the SUPE survey in 2013, then a less intensive survey will be flown for occupancy modeling and the SUPE survey will be attempted again in February or March 2014. Additional wolverine data for 2012–2013, if any, will be added if it becomes available from ADF&G, following completion of data entry, verification, and QA/QC checks. An Initial Study Report and Updated Study Report will be completed within 1 and 2 years, respectively, of FERC's Study Plan Determination (i.e., February 1, 2013).

10.9.7. Level of Effort and Cost

Multiple pilot/observer teams in small, tandem-seat airplanes (Piper PA-18 or similar) would be used to cover as much of the study area as possible within as short a time period as possible, once suitable survey conditions are achieved following a fresh snowfall. It is estimated that approximately 210 hours of flight time will be required for the SUPE and 105 hours will be required for the occupancy survey. Project costs in 2013 are expected to be approximately $115,000. A second survey for occupancy modeling is planned for 2014, costing approximately $60,000. These efforts may be switched between field seasons, however, depending on survey conditions in 2013. The total cost of the wolverine study is estimated at approximately $175,000.

10.9.8. Literature Cited

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10.9.9. Figures

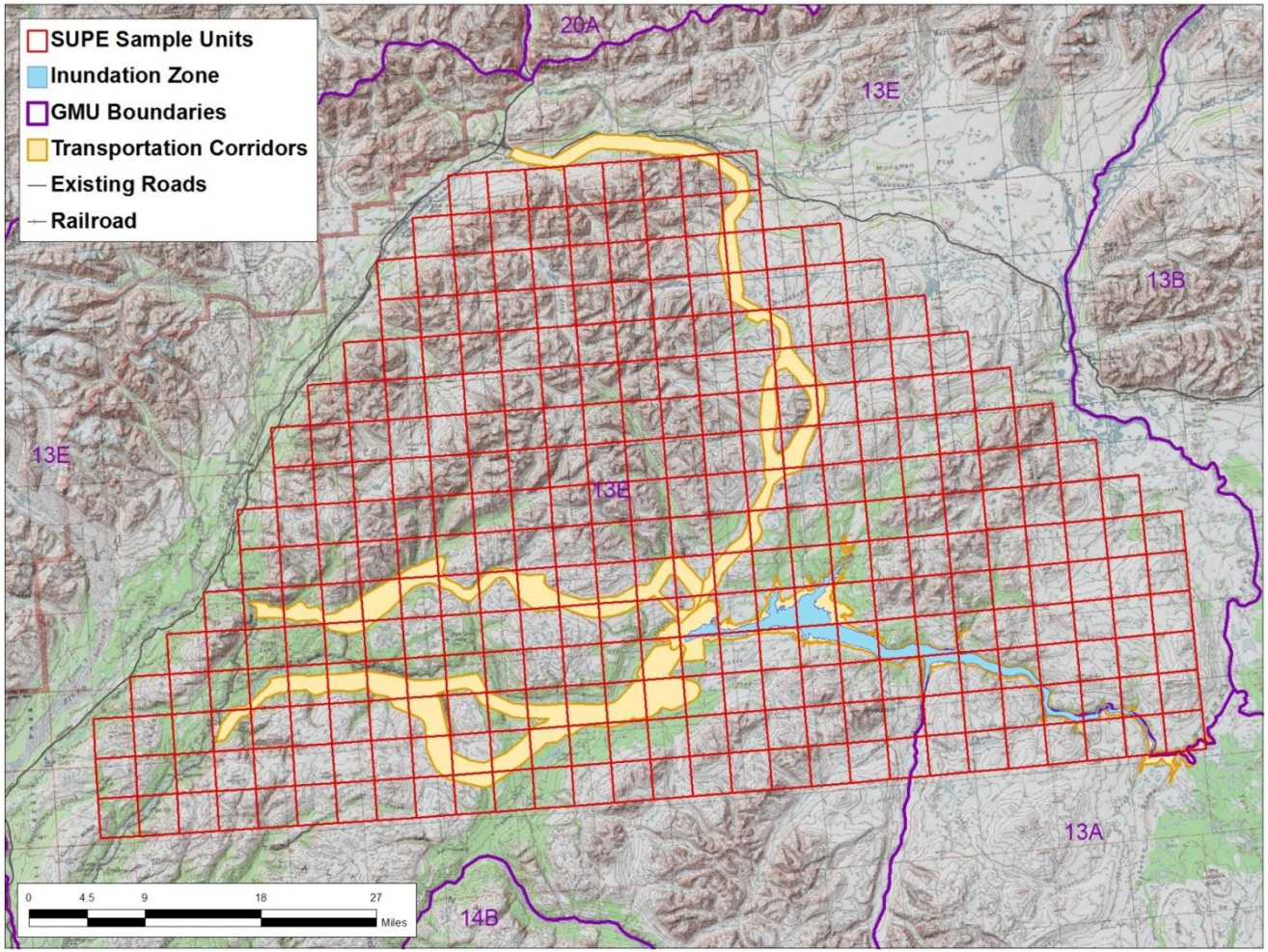

Figure 10.9-1. Wolverine study area. [DRAFT VERSION AS REVISED BY ADF&G, TO BE MODIFIED FURTHER TO INCORPORATE REVISIONS IN ALIGNMENTS AND CORRIDORS AND TO CONFORM WITH PROJECT GIS STANDARDS FOR INCLUSION IN THE RSP]