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CopperFox Metals Inc.

Schaft Creek Project

British Columbia, Canada

Schaft Creek Project 2006 Moose Baseline Report

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March 2007

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EXECUTIVE SUMMARY

Executive Summary

CopperFox Metals Inc. (CopperFox) has begun an initiative to develop a copper-gold-molybdenum-silver project within the Schaft Creek watershed approximately 140 km southwest of Dease Lake in north-western British Columbia. Moose (*Alces alces*) are an important economic and social resource within the region associated with the Schaft Creek and Mess Creek watersheds. In order to assess potential effects of the proposed Schaft Creek Project (Project) on this species, winter aerial surveys were conducted during January/February 2006 within the study area. This study aimed to establish baseline information on moose population and distribution, and to identify moose wintering habitats within the study area.

Aerial surveys were conducted between January 28 and February 2, 2006 and systematically covered 14 survey units (SUs) within the study area. Number, sex, age class, and location of all observed moose were recorded. Vegetation cover was also recorded to facilitate sightability corrections required for analysis with the program AERIAL SURVEY and the British Columbia moose model. To assess moose habitat capability within the study area, topographic features including slope, elevation, and aspect, in addition to biogeoclimatic ecosystem classification (BEC), were compared with randomly generated locations. Frequency distributions and rank percentile analysis were used to determine winter moose selection for topographic conditions.

A total of 137 groups representing 219 individual moose were observed throughout the study area. With sightability adjustments, the number of moose within the study area was determined to be 314 (± 35 at 90% confidence interval [C.I.]). Demographics adjusted for sightability included a sex ratio of 93 bulls (± 16 at 90% C.I.) per 100 cows and productivity of 31 calves (± 8 at 90% C.I.) per 100 cows. Moose densities throughout the 14 SUs ranged between 0 and 1.61 individuals/km^2 (0.50 ± 0.49, average ± standard deviation [SD]) based on capable habitat, and 0.47 individuals/km^2 of capable habitat based on the entire area surveyed.

Analysis of topographic characteristics of moose observations revealed no significant difference in aspect or elevation when compared to randomly distributed points. However, moose observations occurred on significantly flatter topography. A clustered pattern of moose distribution was observed between elevations of 763 m to 961 m which was not consistent with that observed from the random locations. Moose were found to select specific BEC habitat types within the study area, with the majority of moose observed in only 3 of 10 available BEC subzones: BWBSdk1 (60.8%), ESSFmc (25.6%), and SWBun (13.9%).

Based on the moose observations from this study, capable habitat was defined for the study area as regions below 1,050 m with slopes less than 60%. Some moose selection for drier to mesic trembling aspen dominated sites indicative of the BWBSdk1 was also observed and should be considered during the ecosystem mapping evaluation in 2007.

ACKNOWLEDGEMENTS

Acknowledgements

This report was prepared for CopperFox Metals Inc. by Rescan Environmental Services Ltd. The project was managed by Shane Uren (M.A.Sc., R.P.Bio.) of Rescan. The report was written by Shaun Freeman (B.Sc., R.P.Bio), Sarah Vascotto (M.Sc.) and Brandie Harding (B.Sc.). Fieldwork was conducted by Shaun Freeman, with assistance from Odelia Dennis and Mitchell Engdahl. Accommodation was provided by CopperFox Metals Ltd. at the Schaft Creek Camp and helicopter support was provided by Pacific Western Helicopters. Report production was coordinated by Amanda Broda.

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1. INTRODUCTION

1. Introduction

Moose (*Alces alces*) are an important economic and social resource within the region associated with the Schaft Creek and Mess Creek watersheds. This species is vital for both traditional harvest by the Tahltan First Nation (Tahltan) and recreational harvest for resident and non-resident hunters (BC MSRM, 2000).

CopperFox Metals Inc. (CopperFox) has begun an initiative to develop a copper-gold-molybdenum-silver project within the Schaft Creek watershed approximately 140 km southwest of Dease Lake in north-western British Columbia. There is currently no access to the proposed development. The proposed access route follows Mess Creek from the transportation corridor associated with the Galore Creek project to the south.

This report presents the results of an investigation of moose winter habitat use and demographics conducted during 2006 in the Schaft Creek area. The survey goals were to establish baseline information regarding the local population size and distribution within the development area. These data will be used to assess potential effects of the Schaft Creek Project (Project) development.

1.1 Objectives

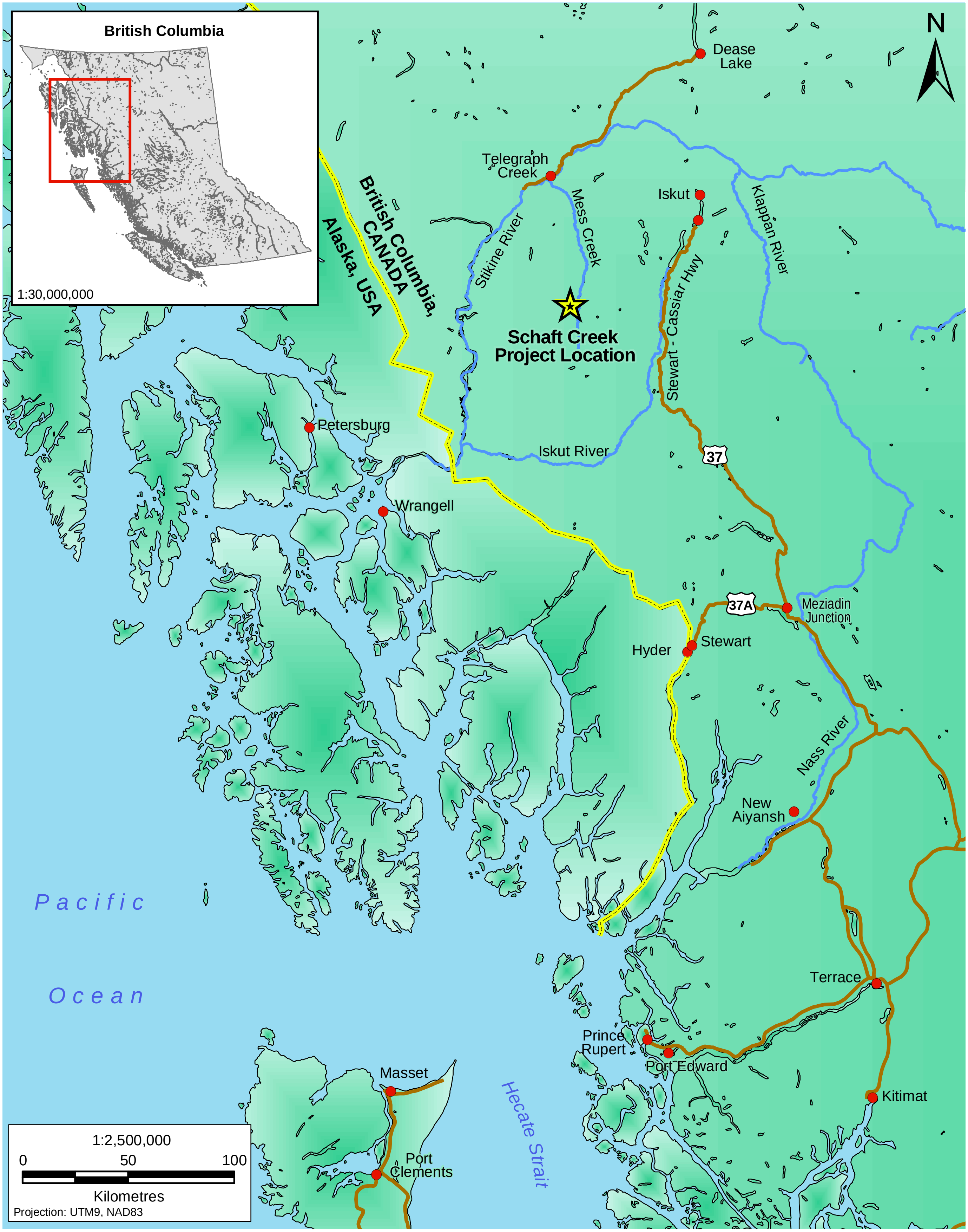
The overall objective of this study was to collect baseline information with respect to the population of moose within the Schaft Creek study area. The Resource Inventory Committee (RIC, 1998) define a wildlife population as a group of organisms of the same species occupying a particular space at a particular time. This definition was refined for the current study as the number of wintering moose within the study area as represented by relative abundance estimates.

The specific objectives of this study were to:

- establish baseline estimates of the population demographics of local wintering moose in the study area;
- establish baseline information on the winter distribution of the local moose population in the study area;
- identify occupied moose wintering habitat characteristics; and
- assess capable habitat within the study area.

1.2 Study Area

The Project is located in the mountainous terrain of north-western British Columbia (Latitude: 130º 58’ 48.9”, Longitude: 57º 22’ 4.2”) approximately 1,000 km northwest of Vancouver (Figure 1.2-1). The area is located 80 kilometers southwest of Telegraph Creek and approximately 76 kilometers west of the Stewart-Cassiar paved highway (Highway 37). The mineral claims of interest are situated near the headwaters of Schaft Creek - a tributary of Mess Creek which flows into the Stikine River downstream of the community of Telegraph Creek.



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Location of the Schaft Creek Project

FIGURE 1.2-1

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The Project is within the coastal climate zone of British Columbia and is characterized by cool summers and cold humid winters. Elevations on the property range from 500 m to greater than 2,000 m above sea level. Average annual precipitation is estimated to be 640 mm which is approximately 84% greater than that recorded at Telegraph Creek (*i.e.,* the nearest community). Temperatures are strongly influenced by the Coast Mountains and may range from above 20ºC in the summer to well below -20ºC in winter.

While the area is predominately pristine, past exploration has occurred within the upper basin of the Schaft Creek drainage. The mineral claims are within the Telegraph Creek Community Watershed identified in the Cassiar Iskut-Stikine Land and Resource Management Plan (CIS LRMP) area (BC MSRM, 2000). Much of the study area falls within the trap line of an active fur harvester who currently resides on Mess Lake. In addition, a local outfitter regularly takes clients to harvest moose, sheep (*Ovis dalli*), goat (*Oreamus americanus*) and grizzly bear (*Ursus arctos*) within the study area.

The wildlife study area encompassed both the Schaft Creek and Mess Creek drainage basins to their headwaters and beyond the height of land to More Creek (Figure 1.2-2). This area is represented by the Northern Boreal Mountain ecoprovince, and the Yukon-Stikine Highlands and Northern Mountains and Plateaus ecoregions (Luttermerding *et al.,* 1990). Ecosections within the study area include the Tahltan Highlands and Southern Boreal Plateau. The biogeoclimatic ecosystem classification (BEC) system categorizes the study area into the Englemann Spruce-Subalpine Fir (ESSF), Spruce Willow Birch (SWB), Boreal White and Black Spruce (BWBS), and Interior Cedar Hemlock (ICH). Boreal Altai Fescue Alpine (BAFA), formerly Alpine Tundra (AT), is present at higher elevations. The transition between the ecology of the site is quite pronounced with Mess Creek forming an effective border. Geomorphology to the west of Mess Creek is representative of rugged coastal mountains while the east supports expansive high elevation plateaus.

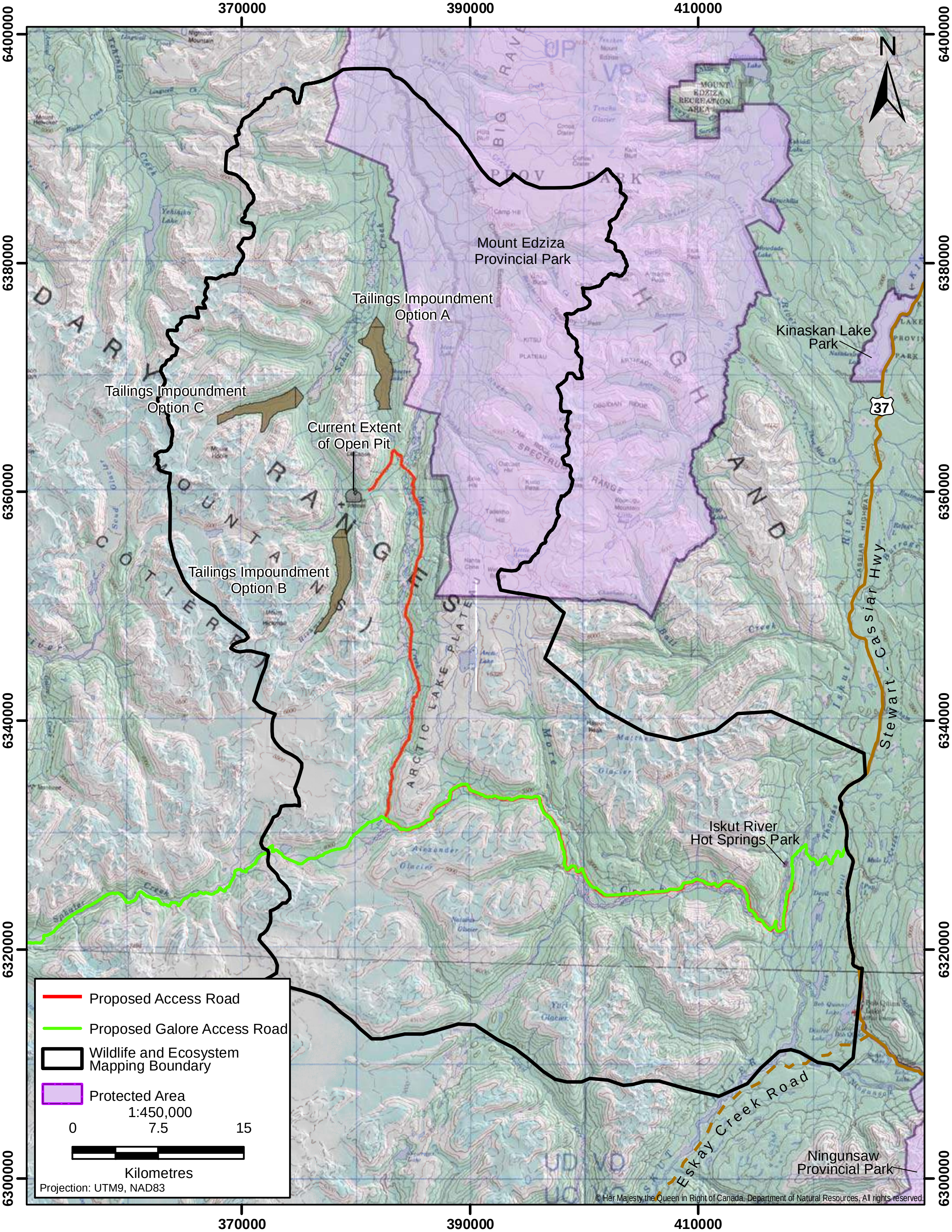

FIGURE 1.2-2

Schaft Creek Wildlife Study Area

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2. METHODS

2. Methods

Aerial surveys for moose were conducted in January/February 2006. Winter surveys were selected as moose are typically concentrated along valley bottoms at this time, and moose visibility is enhanced against snow. Winter habitat availability is also considered to be a limiting factor in the carrying capacity of the land base for moose. Therefore, surveys during late winter permit the identification of important winter habitats for moose. This section summarizes the winter aerial survey data collection and analysis methodology.

2.1 Field Data Collection

The focus for the moose inventory was defined prior to conducting aerial surveys in the winter of 2006. The study area was sub-divided into fourteen ecologically distinct survey units (SUs) (Figure 2.1-1). These SUs considered area potentially affected by mine development, as well potential control areas for future monitoring efforts. The area surveyed included some regions beyond the boundary of the delineated study area to better facilitate development of a future monitoring plan.

Aerial surveys for moose were conducted between late January and early February, 2006. Each of the 14 delineated SUs had topographic boundaries that could be recognized in the field. The majority of units surveyed, particularly those most likely affected by the development, were bound by topographic features that would restrict moose use and accommodated the use of total count surveys. However, the northern edge of the study area represented gentle topography (*i.e.*, the Southern Boreal Plateau ecosection) that lacked features that could restrict moose movement. Area beyond these SUs took on a different ecology and was more suited to random stratified block surveys than total count surveys.

SUs within the study area associated with the development footprint and access corridor were surveyed. The field methods used to inventory moose adhered to the aerial survey protocol identified by BC MSRM (2002). This included the use of a Bell 206 helicopter with two observers, a pilot, and navigator. The helicopter averaged approximately 100 km/hour, however, this rate changed with conditions: faster over open areas where sightability was great and slower over closed forest. Surveys were conducted when daytime high temperatures were below freezing and snow cover was complete. All flight paths within each SU were recorded using a hand-held Garmin 76 GPS with an external antenna adapted for use within a vehicle (Appendix I). Potential late-winter habitat within the SUs, including area likely to be considered unsuitable for moose, was inventoried for moose. Analysis of these data was used to assess local habitat use and direct habitat suitability model development.

All moose observations were recorded and identified as calves or adults (including yearlings), and adults were classified by sex (cows or bulls). Cows were identified from bulls based on the presence of a vulva patch (white patch of hair seen on the rump). For each moose group (1 or more individuals) observers estimated oblique cover as percent vegetative cover (or screening cover) around the first animal seen in the group. Vegetative cover was measured obliquely

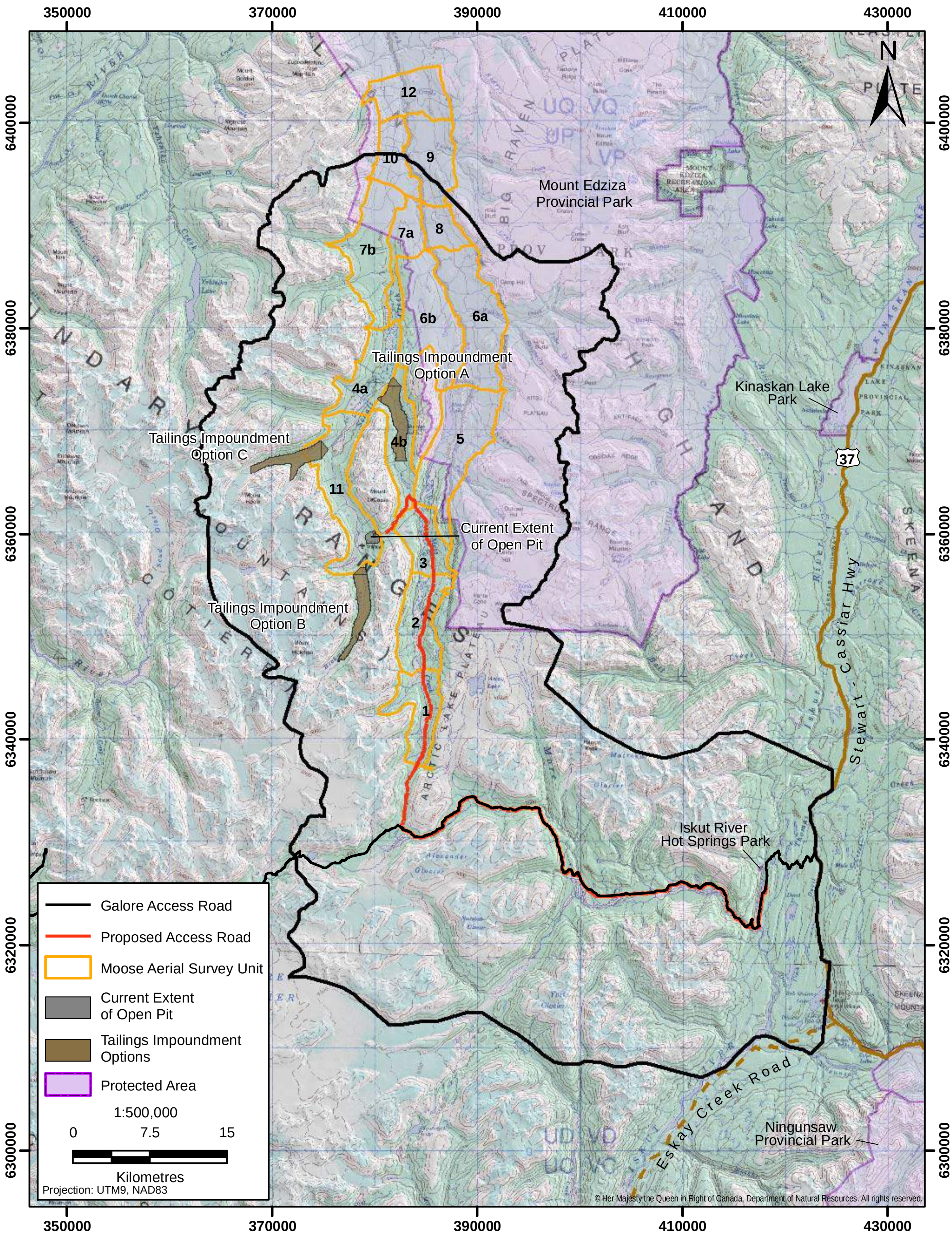

FIGURE 2.1-1

Moose Aerial Survey Units within the Schaft Creek Wildlife Study Area

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within a 9 to 10 m radius around each moose group as required for inclusion of sightability estimates (Anderson and Lindzey, 1996; Unsworth *et al.*, 1998; Quayle *et al.*, 2001). Moose observations were geo-referenced using a hand-held Garmin 76 GPS with an external antenna adapted for use within a vehicle.

2.2 Data Analyses

2.2.1 Winter Population Characteristics

Extrapolation of the data to obtain a baseline population estimate for the study area was not required as the total area considered capable of supporting wintering moose within the study area were surveyed. Therefore, there was no stratification of habitat within the SUs or calculation of associated sample statistics.

Moose observations (waypoints) and helicopter flight lines (tracks) were downloaded from the GPS and analysed with ArcView© GIS Program, Version 9.1 (Environmental Systems Research Institute). Sightability correction was applied to each observation using the program AERIAL SURVEY (Unsworth *et al.,* 1998) to achieve estimates of population and demographics. Detection probabilities were determined using sightability data from a British Columbia model (Quayle *et al.,* 2001).

2.2.2 Winter Spatial Distribution

Moose locations were classified by topographical features (*i.e.,* elevation, slope, and aspect) derived from the digital elevation model (DEM) with 1:20,000 Terrain Resource Inventory Mapping (TRIM) data. Within each SU, the total area alongside the amount of capable habitat (as determined by methods described below and results from Section 3.3.2) was tabulated. Survey effort was determined by calculating the amount of survey time per square kilometre of total area and capable habitat within each SU.

Spatial survey data were analysed to identify if moose were selecting particular topographic features within the study area and to assess the availability of the topographic features associated with capable moose winter habitat within the study area. Given concerns expressed by other researchers regarding the independence of samples when using individual animals during ungulate habitat modelling work (*e.g.*, Gross *et al.*, 2002), waypoints identifying groups of moose provided the basis for analysis. The analysis included a comparison of observations of elevation, slope, and adjusted aspect to four similar sets (n = 137) of randomly generated points within the study area to determine if moose were exhibiting habitat selection. Points were generated in GIS using HAWTH's analysis tools version 3.07 for ARCVIEW 9.x. Random points were selected within the study area below 1,100 m - the contour above which no moose were observed during the 2006 winter survey.

Observations made during aerial surveys indicated that there may be two alternate habitat use strategies undertaken by moose: (1) a more classic use of low elevation riparian habitat, and (2) an exploitation of steep, southerly facing aspen stands at higher elevations below the Big Raven Plateau. The later strategy was suspected of being driven by the availability of extensive willow cover on the plateau which moose would occupy during shoulder periods or as snow pack conditions allowed. Frequency distributions for particular topographic features (*i.e.,* slope, elevation and aspect) were then developed for the data and randomly generated points were compared to the observational data. The results were then scrutinized for the presence of a distribution pattern of moose observation features that was not evident in that of the randomly generated points.

3. RESULTS

3. Results

3.1 Survey Effort

Moose aerial surveys were conducted between January 28 and February 2, 2006. During this period, SUs were surveyed for a minimum of 11 and a maximum of 122 minutes (62.5 min ± 34.3, average [ave] ± standard deviation [SD]) totalling 14.6 survey hours throughout the four days: 3.7 hours on January 28, 4.0 hours on January 29, 2.0 hours on January 31, and 4.9 hours on February 2.

Survey effort was determined by calculating the amount of time spent in each SU per square kilometre of total area and capable habitat available within each SU (Appendix II). The survey effort throughout the 14 SUs ranged between 0.37 and 4.01 mins/km^2 (1.78 ± 1.03 mins/km^2, ave ± SD) for total area and between 0.57 and 4.45 mins/km^2 (2.09 ± 1.10 mins/km^2, ave ± SD) for capable habitat.

Unpredicted and isolated snow squalls and inclement weather resulted in abandoning survey efforts on two days during the survey (January 30 and February 1). When the surveys were resumed, track evidence within the remaining SUs suggested that moose had not moved in or out of the SUs. Moose had likely remained quite stationary during the duration of the effort as an adaptation to reduce energy demand during deep snow conditions.

3.2 Winter Population Characteristics

3.2.1 Population Size

A total of 137 groups representing 219 individual moose were observed throughout the study area between January 28 and February 2, 2006 (Table 3.2-1; Appendix III). Moose were observed in 12 of the 14 SUs included in the study area with the majority observed in SU 5 (22.8%), 6A/B (15.5%), 9 (12.8%), and 12 (11.4%), while no moose were observed in SUs 1 or 4B (Appendix IV). Of these observations, bulls accounted for 38.8%, cows accounted for 42.9%, and calves accounted for 11.8% while the remainder (6.4%) were unidentified moose.

Adjustments were made for sightability based on B.C. moose models (Quayle *et al.,* 2001) using AERIAL SURVEY software (Unsworth *et al.,* 1998). With these adjustments, the number of moose within the study area was determined to be 314 (± 35 at 90% confidence interval [C.I.]) individuals (Table 3.2-1). Similarly, the number of bulls, cows, calves, and unidentified individuals accounted for 35.7%, 38.9%, 11.8%, and 13.7%, respectively, of the moose within the study area.

3.2.2 Group Size

A total of 137 groups of moose were observed in the study area (Appendix III). The average group size was 2.00 ± 0.86 (ave ± SD) and ranged between 1 and 5 individuals. However, the largest proportion of groups consisted of lone individuals (58.4%).

Table 3.2-1
Summary of Moose Observations in the Schaft Creek Study Area, 2006

Parameter	Schaft Creek Study Area Observed Data	Schaft Creek Study Area Adjusted Data*	Variance (SE^2)	90% Confidence Interval*
Bulls	85	112	90	16
Cow	94	122	50	12
Calves	26	37	26	8
Unknown	14	43	182	22
Totals	219	314	453	35

***Adjustments for sightability and estimates of variance were derived using the program Aerial Survey (Unsworth *et al.*, 1998) with the B.C. moose model (Quayle *et al.*, 2001). 90% confidence intervals can be calculated by 1.65*√(variance).**

3.2.3 Sex Ratio and Productivity

Sex ratio for the observed and adjusted moose data were determined by calculating the number of males per 100 females (Appendix IV). From the moose observed within the study area, the ratio of males to females was almost equal (90.4 males per 100 females). Similarly, the ratio was 93 males (± 16 at 90% C.I.) per 100 females following sightability adjustments.

Productivity, also defined as recruitment at level 2 classification by MSRM (2002), was determined by calculating the number of calves per 100 cows. Productivity from the observed data was 27.7 calves per 100 cows and 31 calves (± 8 at 90% C.I.) per 100 cows once adjusted for sightability. Natality was determined by calculating the number of calves per 100 adults. Natality from the observed data was 14.5 calves per 100 adults and 11.9 calves (± 2.3 at 90% C.I.) per 100 adults once sightability adjustments were calculated.

3.2.4 Density

Moose densities were determined for each SU by calculating the number of moose observed within each SU by the amount of total area and capable habitat available within each SU (Appendix IV). Moose densities throughout the 14 SUs (including 4 subunits) ranged between 0 and 1.45 individuals/km^2 (0.43 ± 0.42, ave ± SD) based on total area and between 0 and 1.61 individuals/km^2 (0.50 ± 0.49, ave ± SD) based on capable habitat. Based on total area, the highest density was observed in SU 8 (1.45 individuals/km^2). Based on capable habitat, the highest density was also observed in SU 8 (1.61 individuals/km^2). Moose density based on the entire area surveyed was 0.47 moose/km^2 of capable habitat.

3.3 Winter Spatial Distribution

3.3.1 Moose Locations

Moose group locations were analysed alongside GIS data to determine topographical features at each observation (Appendix III). This included determining elevation, slope, aspect, and habitat classification following the biogeoclimatic ecosystem classification (BEC) system.

Elevation

The elevations of the moose observations ranged between 489 m and 1,049 m and averaged 798 m ± 108 m (ave ± SD, n = 137). Within the study area, the average of the observed elevations was not significantly different than the four sets of random locations generated below 1,100 m (ANOVA $F_{4,680} = 0.40$, P = 0.81). A rank percentile analysis of the observations suggested that 95% of the moose observed were below 988 m in elevation and 50% were between 798 and 489 m (*i.e.,* the lowest observed elevation). A comparison of histograms developed for the random and observed elevations identified a clustered distribution pattern of moose observations between elevations of 763 m and 961 m (Figure 3.3-1). This elevation band may be associated with the drier trembling aspen dominated sites below the plateau. Efforts to more accurately identify this association will be carried out concurrently with the ecosystem mapping program in 2007.

Slope

The slopes of the topography associated with moose observations ranged between 0 and 76% with an average of 20 ± 15% (ave ± SD, n = 137). There appeared to be selection for more gentle topography within the study area as the moose observations were on significantly flatter slopes than randomly available locations (ANOVA $F_{4,680} = 4.45$, P = 0.001). A rank and percentile analysis of the observations indicated that 95% of the moose observations were below 47% slope, while half of the observations were on slopes of less than 18.5%. As suggested by the ANOVA, a comparison of histograms developed for random and observed locations revealed a substantial divergence of properties with moose observations being recorded on lower slopes more often than those available within the study area (Figure 3.3-2).

Aspect

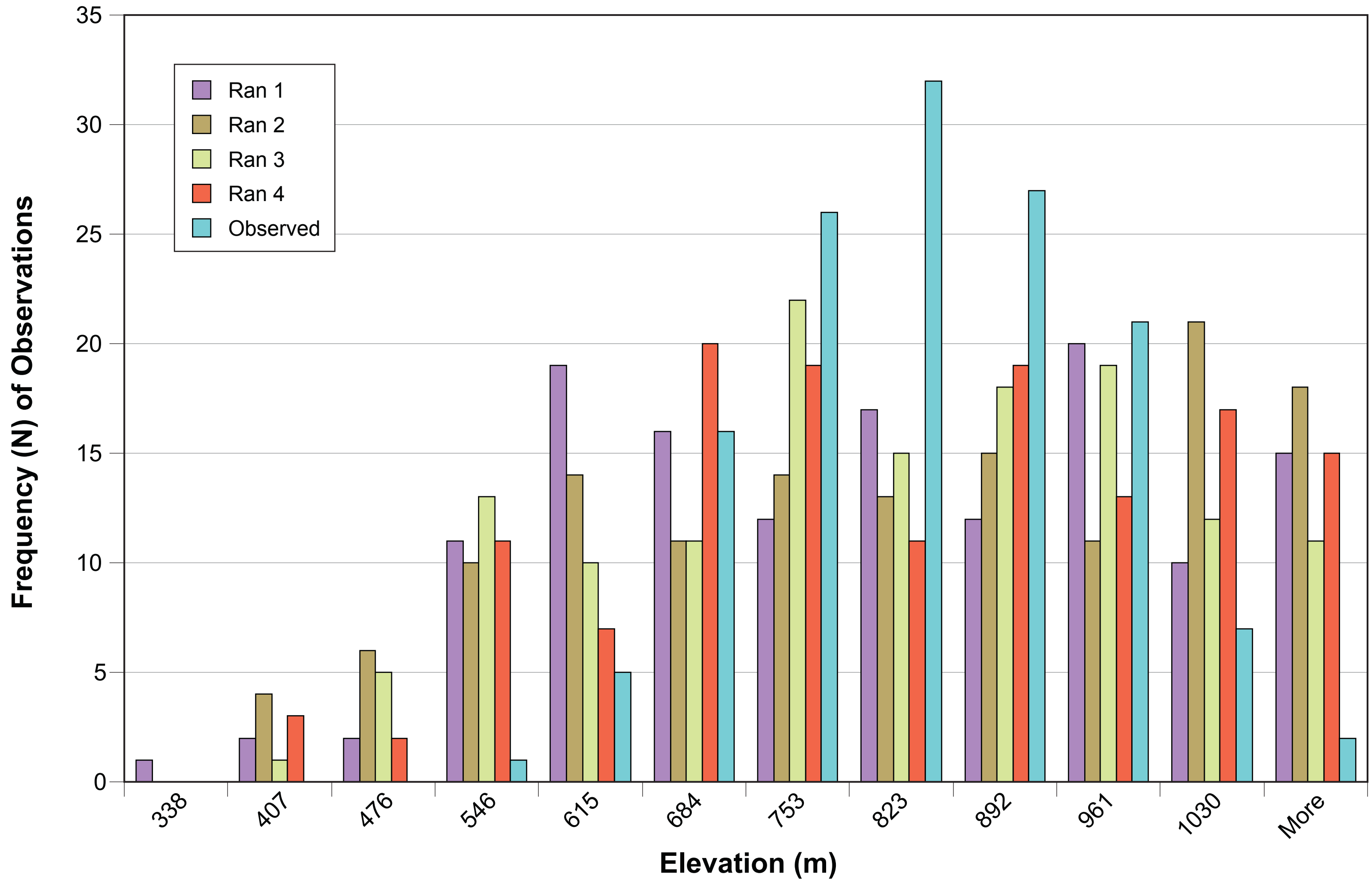
To assess whether moose were selecting for warmer aspects, random points were compared to the adjusted value ($|180 - \Theta^{o}|$) of observed aspect. No significant difference was observed between the moose locations and four sets of random points (ANOVA $F_{4,680} = 0.60$, P=0.66).

Habitat Classification

Moose were observed within three BEC subzones including BWBSdk (60.8% of observations), SWBun (13.9%), and ESSFmc (25.6%) while random points were distributed amongst eight BEC classifications. The proportional distribution was significantly different ($\chi^2 = 80.89$, df=7, P<0.001) between observed and random points suggesting a selection for specific ecosystems in the drainage (Table 3.3-1). The distribution of random points was nearly identical to the area represented by each BEC in the study area below 1,100 m ($\chi^2 = 0.012$, df=10, P~1.0), although traces of two additional BEC subzones (BAFAun, and ESSFvvp) were also included. This suggests that random points were indicative of conditions within the study area, and analysis conducted using randomly generated points was appropriate to assess habitat type.

3.3.2 Capable Habitat

Of all moose observations and corresponding topographical locations, 95% were detected at elevations below 988 m with the highest observation at 1,048 m. In addition, 95% were detected at slopes below 47% with the steepest slope recorded at 76%, however, all but one observation



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Elevation Histogram of Random (Ran) and Observed Moose Locations

FIGURE 3.3-1

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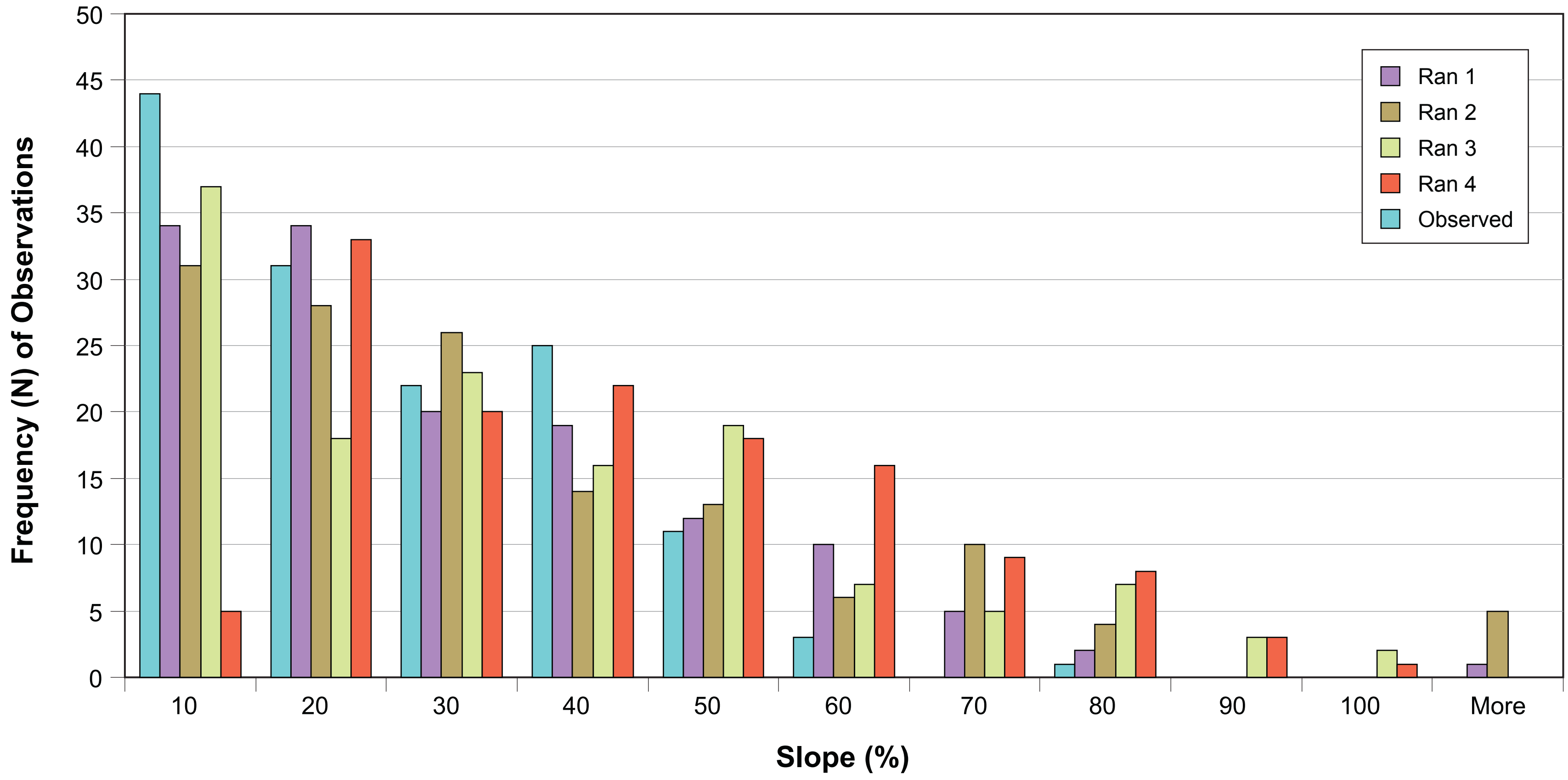

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FIGURE 3.3-2

Slope Histogram of Random (Ran) and Observed Moose Locations

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was less than 60%. Moose did not appear to exhibit habitat selection with regards to aspect. As a result, highly capable habitat for wintering moose was identified as areas below 988 m where slopes were less than 47%.

Table 3.3-1
Percent of Moose Observations, Random Points, and Study Area Located within each BEC Habitat Type

BEC Subzone	Name	Moose Observations (%)	Random points (%)	Area of study area <1,100 m (%)
BAFAun	Boreal Alti Fescue Alpine undetermined	0.00	0.00	0.01
BWBSdk 1	Boreal White and Black Spruce dry, cool	60.58	17.88	17.10
ESSFmc	Engelmann Spruce- Subalpine Fir moist cold	25.55	19.53	22.60
ESSFmcp	Engelmann Spruce- Subalpine Fir moist cold parkland	0.00	0.55	0.24
ESSFvv	Engelmann Spruce- Subalpine Fir very wet very cold	0.00	5.66	6.21
ESSFvvp	Engelmann Spruce- Subalpine Fir very wet very cold parkland	0.00	0.00	0.30
ESSFwv	Engelmann Spruce- Subalpine Fir wet very cold	0.00	18.25	16.96
ESSFwvp	Engelmann Spruce- Subalpine Fir wet very cold parkland	0.00	1.82	1.85
ICHwc	Interior Cedar Hemlock wet cold	0.00	28.83	27.37
SWBun	Spruce Willow Birch undetermined	13.87	7.48	7.05

Capable habitat for determining density estimates observed included all area below 1,050 m and on slopes of less than 60%. Although BEC zone appeared to influence selection, more refined ecosystem classifications are anticipated to be developed in association with ecosystem mapping in 2007. This vegetation information will be combined with the topographic data to develop moose winter habitat suitability models to inventory important habitat for this species.

Based on the above criteria, the amount of capable habitat within each SU was identified (Appendix IV). Capable habitat within each SU accounted for between 66.2% and 97.8% (83.0 ± 9.0%, ave ± SD) of the total area within each SU, while capable habitat within the overall study area accounted for 82.7%.

4. DISCUSSION

4. Discussion

4.1 Winter Population Characteristics

The productivity (31 calves/100 cows) observed was lower than other areas surveyed in 2006 and 2005 (*i.e.,* coastal Stikine 74 calves, interior Iskut 47 calves, and Klappan River 33 calves per 100 cows). As the area has received limited disturbance, this observation was possibly equated to high rates of predation. Wolves (*Canis lupus*) were observed during the survey and in spring, grizzly bear (*Ursus arctos*) were observed along the edge of the Big Raven Plateau presumably stalking mountain goats (*Oreamnos americanus*). It was suggested from past research that grizzly bear sampled within the Edziza and Spatsizi plateaus acquired about half of their diet from terrestrial prey, most likely ungulates (Rescan Environmental Services Ltd., 2006).

4.2 Winter Spatial Distribution

From local observations and anecdotal evidence, it is suspected that a proportion of the wintering moose population identified in the mid-Mess Creek likely summers in upper Mess and into the More Valley. Moose observed along the edge of Big Raven Plateau likely exploit the extensive willow and forage production of this area during the growing season. Some moose that use the potential development area may winter beyond the moose survey area into the more topographically gentle, forested area associated with the extensive Boreal White and Black Spruce (BWBS) BEC zone within the Southern Boreal Plateau ecosection along the Stikine valley. The inclusion of a larger area north of the ecosystem mapping boundary (*e.g.,* block 12) should ensure that this number is quite small. Due to the relative homogeneity and expanse of this area, a method of stratified random block sampling would be required to estimate the population beyond SU 12; however, it was believed to be sufficiently removed from the development to be beyond the scope of this inventory effort.

While no observations of moose were made on level ground along the Big Raven Plateau, many moose shed antlers were detected above 1,300 m during field work in summer 2006. This observation suggests early winter use or use during periods when snow is not limiting movement. Deep snow (as was experienced during 2006) likely encourages some moose to move over the edge of the plateau to steeper, south and west facing topography with shallower snow pack. These areas appeared to support abundant moose browse in the form of trembling aspen with an understorey of rose and willow, indicative of drier to mesic sites of the BWBSdk1 BEC subzone (*e.g.,* 03 site series which supports abundant aspen through to climax seral stage). Proximity to thick browse producing habitats associated with the SWB BEC zone on the Big Raven Plateau likely allows moose to opportunistically exploit both the steep and flat areas as winter snow pack conditions permit. Habitat mapping should include consideration for both early winter (shallower snow pack) and late winter (severe snow pack conditions) to accommodate for this apparent pattern of habitat use. Some of these areas used during winter shoulder periods may be extremely important to sustain moose populations during more critical winter periods.

The capable habitat defined during this study (slope <60% at elevations below 1,050 m) reflects conditions selected by moose during high snow pack conditions throughout a relatively normal year. Areas of critical habitat use, expected to be exploited by moose during more severe winter conditions, are anticipated to be within the parameters of capable topography defined within this report. Therefore, these areas should be included within the suitability mapping component considered for development in 2007.

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APPENDIX I
MOOSE AERIAL SURVEY FLIGHT PATHS, WINTER 2006

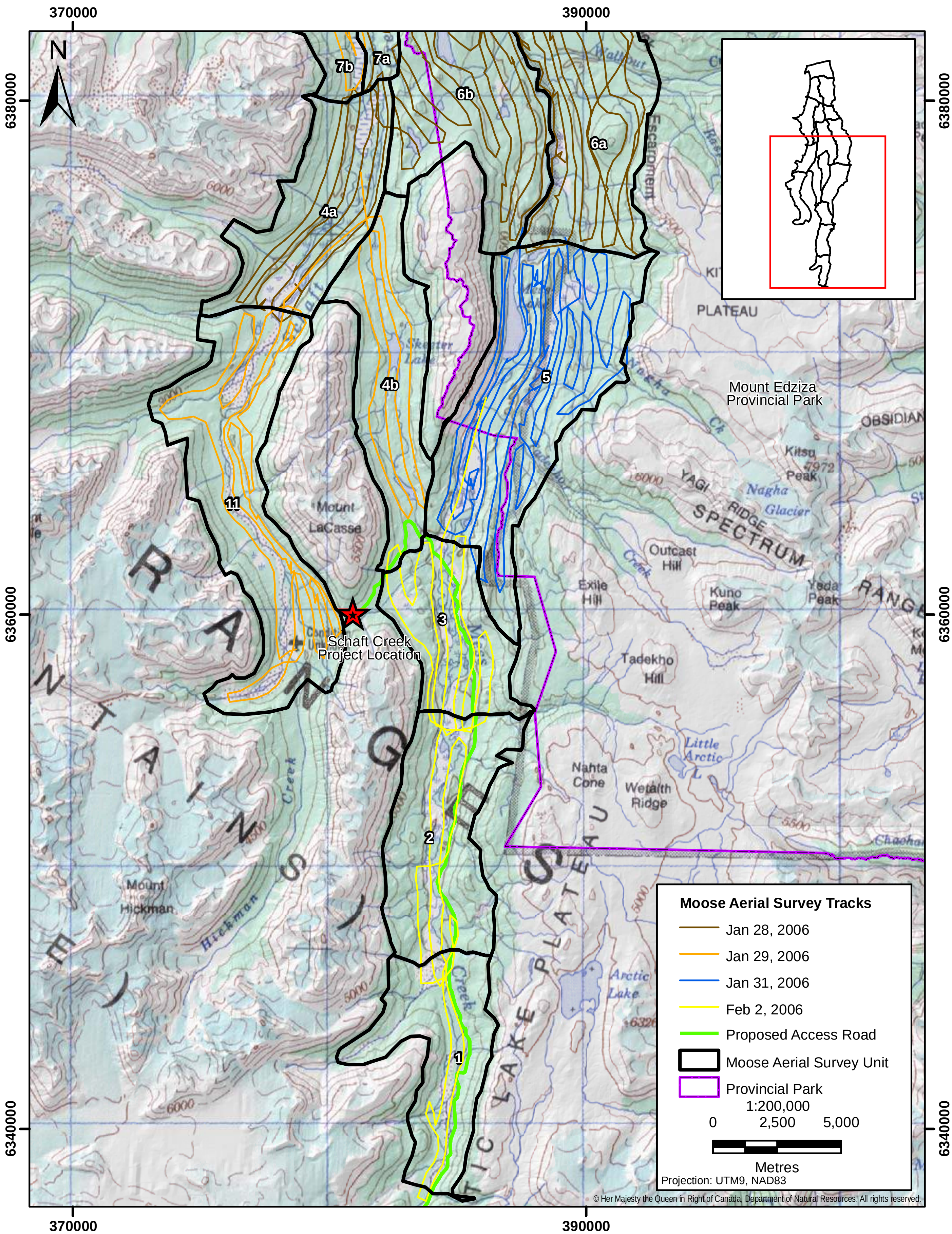

FIGURE I-1

Moose Aerial Survey Flight Path for Survey Units from 1 to 7b, 2006

copper FOX metals inc.

Rescan

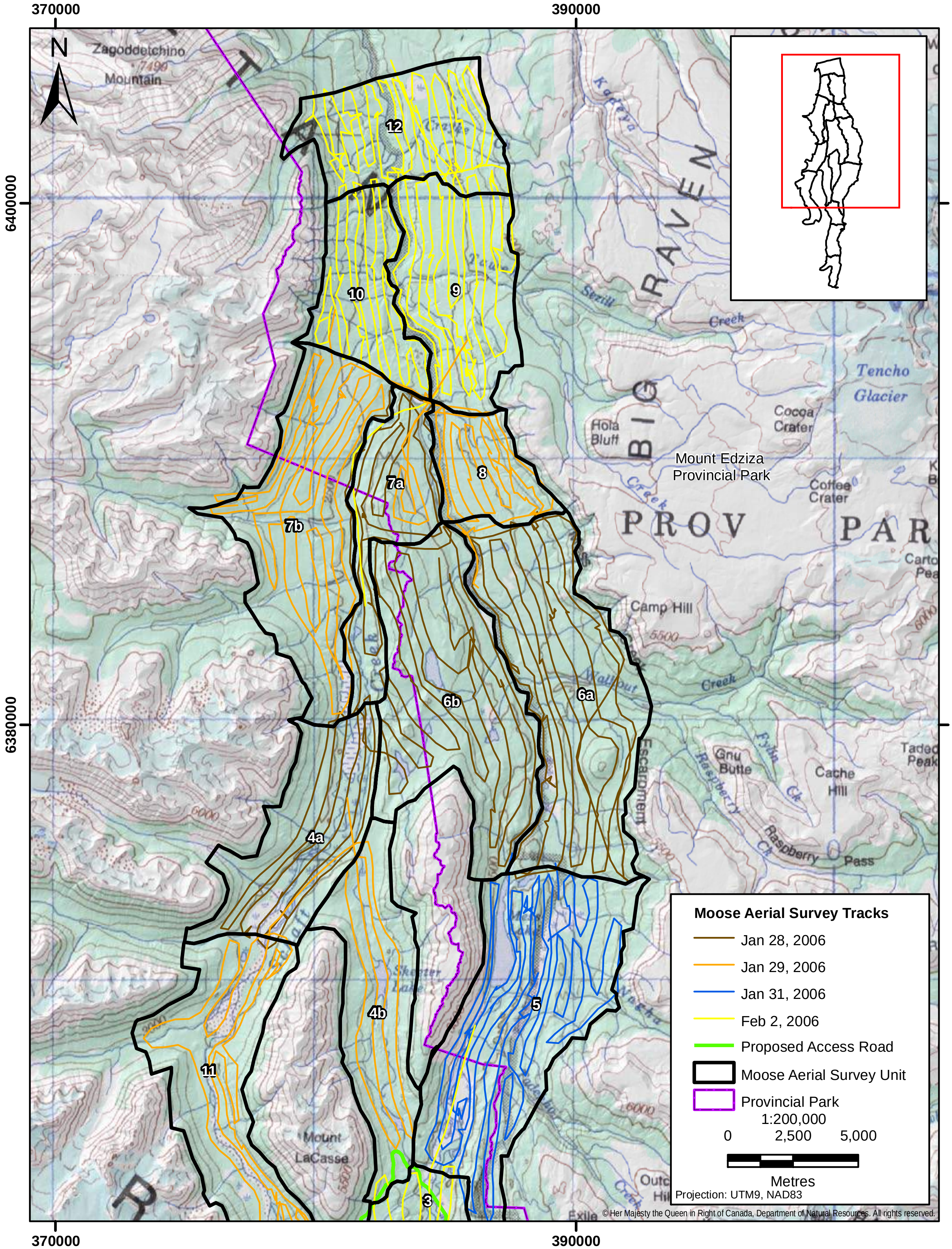

FIGURE I-2

Moose Aerial Survey Flight Path for Survey Units from 3 to 12, 2006

copper FOX metals inc.

Rescan

APPENDIX II
SUMMARY OF MOOSE WINTER SURVEY EFFORT AND FLIGHTS AT SCHAFT CREEK, WINTER 2006

Appendix II
Summary of Moose Winter Survey Effort and Flights at Schaft Creek, Winter 2006

Date	Survey Unit	Time (min)	Total Area (km^2)	Effort (min/km^2)	Capable Habitat area* (km^2)	Effort (min/km^2)	Cloud Cover (%)	Snow age	Snow cover (%)	Temperature (°C)	Wind	Location
2-Feb-06	1	11	29.3	0.38	19.4	0.57	100	Old	100	-4	5 mph - S	Headwaters of Mess Cr
2-Feb-06	2	20	36.5	0.55	26.2	0.76	50	Old	100	-6	5 mph - S	Mess Cr. W of Little Arctic Lk
2-Feb-06	3	31	24.9	1.24	18.8	1.65	60	Old	100	-6	5 mph - S	Mess Cr. W of Exile Hill
28-Jan-06	4A	45	32.6	1.38	28.8	1.56	100	Fresh	100	-14	5 mph - S	Headwaters of Shaft Cr
29-Jan-06	4B	27	32.1	0.84	25.9	1.04	15	Fresh	100	-8	10 mph - S	Shaft Cr. Including Skeeter Lk
31-Jan-06	5	122	62.2	1.96	47.5	2.57	100	Old	100	-8	5 mph - SE	Mess Lk
28-Jan-06	6 (A and B)	116	113.5	1.02	99.9	1.16	100	Fresh	100	-13		Mess Cr. W of Raspberry Pass
28-Jan-06	7A	59	22.8	2.59	22.3	2.65	100	Fresh	100	-12	5 mph - S	Between Shaft Cr and Mess Cr
29-Jan-06	7B	90	48.3	1.86	42.7	2.11	60	Old	100	-18		West of Shaft Cr
29-Jan-06	8	61	15.2	4.01	13.7	4.45	30	Fresh	100	-12	5 mph - SE	Mess Cr. W of Hola Bluff
2-Feb-06	9	93	34.6	2.69	29.9	3.11	40	Old	100	-5	5 mph - S	Mess Cr. W of Taweh Cr
2-Feb-06	10	62	22	2.82	20	3.10	60	Old	100	-6	5 mph - S	W of Mess Cr. Downstream of Shaft Cr
29-Jan-06	11	64	54.1	1.18	42.4	1.51	5	Fresh	100	-8	5 mph - SE	Headwaters of Shaft Cr
2-Feb-06	12	74	31.4	2.36	24.9	2.97	30	Fresh	100	-5	calm	Mess Cr. Including Crayke Cr.
Total		**875**	**559.5**	**1.56**	**462.4**	**1.89**						

***Capable habitat is defined as <1,050 m elevation and <60% slope**

APPENDIX III
DETAILS OF MOOSE OBSERVATIONS AT SCHAFT CREEK, WINTER 2006

Appendix III
Details of Moose Observations at Schaft Creek, Winter 2006

Waypoint	Date	Time	Survey Unit	Total	Cows	Calves	Bulls	Unidentified	Snow Cover (%)	NAD	Northing	Easting	Elevation (m)	Slope (%)	Aspect	Habitat Type (BEC)
1	28-Jan-06	10:44	6	5	1	1	3	0	100	83	6377916	388990	665.9	1.1	289	SBS un
2	28-Jan-06	10:45	6	1	1	0	0	0	100	83	6377624	389134	665.9	1.1	162	SBS un
3	28-Jan-06	11:03	6	1	0	0	1	0	100	83	6376303	388791	675.3	8.8	27	ESSFwv
4	28-Jan-06	11:18	6	3	1	1	0	1	100	83	6382535	388645	774.0	4.9	116	SBS un
5	28-Jan-06	11:34	6	2	2	0	0	0	100	83	6384343	389251	797.5	20.3	284	SBS un
6	28-Jan-06	11:36	6	2	1	0	0	1	100	83	6384066	389020	774.3	9.3	271	SBS un
7	28-Jan-06	11:43	6	1	0	0	0	1	100	83	6376581	390809	904.4	18.5	274	ESSFwv
9	28-Jan-06	11:52	6	1	1	0	0	0	100	83	6382864	390542	881.0	15.0	224	ESSFwv
10	28-Jan-06	11:55	6	2	1	1	0	0	100	83	6384213	389592	845.5	5.9	307	SBS un
11	28-Jan-06	11:56	6	3	1	1	1	0	100	83	6385390	389016	861.2	46.0	256	SBS un
12	28-Jan-06	11:59	6	2	1	1	0	0	100	83	6387569	388402	871.3	20.7	252	SBS un
13	28-Jan-06	12:01	6	1	0	0	1	0	100	83	6388000	388394	871.8	13.3	226	ESSFwv
14	28-Jan-06	12:06	6	2	1	0	1	0	100	83	6383780	390798	987.8	16.9	197	ESSFwv
15	28-Jan-06	12:34	6	1	1	0	0	0	100	83	6378538	388028	774.4	37.0	152	SBS un
16	28-Jan-06	13:38	6	3	2	1	0	0	100	83	6383533	385913	791.4	44.4	83	SBS un
17	28-Jan-06	13:46	6	1	0	0	1	0	100	83	6376671	386740	831.7	33.7	76	ESSFwv
18	28-Jan-06	13:51	6	1	0	0	0	1	100	83	6381041	386082	810.3	20.0	318	SBS un
19	28-Jan-06	14:13	6	1	0	0	0	1	100	83	6385096	382482	877.2	13.5	232	SBS un
20	28-Jan-06	14:17	6	1	1	0	0	0	100	83	6381768	383634	1032.5	17.8	151	ESSFwv
21	28-Jan-06	14:42	4A	1	0	0	1	0	100	83	6371975	377697	735.0	0.6	71	ESSFwv
22	28-Jan-06	14:44	4A	1	1	0	0	0	100	83	6373439	378496	732.8	5.8	120	ESSFwv
23	28-Jan-06	14:56	4A	3	1	0	2	0	100	83	6371890	377292	739.0	3.7	73	ESSFwv
24	28-Jan-06	15:24	7A	1	1	0	0	0	100	83	6388070	381304	690.7	5.0	90	SBS un
25	28-Jan-06	15:27	7A	2	0	0	2	0	100	83	6390493	381753	655.0	10.6	329	SBS un
26	28-Jan-06	15:29	7A	2	0	0	2	0	100	83	6391997	382907	648.8	25.1	71	SBS un
27	28-Jan-06	15:40	7A	2	1	1	0	0	100	83	6384762	382053	763.9	36.7	270	SBS un
28	28-Jan-06	15:46	7A	2	0	0	2	0	100	83	6388359	381639	750.3	50.2	248	SBS un
29	28-Jan-06	15:49	7A	1	0	0	0	1	100	83	6391398	382477	703.8	19.0	296	SBS un
30	28-Jan-06	15:53	7A	3	0	0	3	0	100	83	6391095	383736	674.7	35.2	91	SBS un
31	28-Jan-06	15:59	7A	1	0	0	0	1	100	83	6387934	381874	805.8	42.9	251	SBS un
32	28-Jan-06	16:03	7A	1	0	0	1	0	100	83	6391597	383329	709.5	11.6	352	SBS un
1	29-Jan-06	10:42	8	2	1	1	0	0	100	83	6387589	385981	679.7	11.8	275	SBS un
2	29-Jan-06	10:58	8	1	1	0	0	0	100	83	6389488	385969	732.5	3.7	254	SBS un
3	29-Jan-06	11:05	8	1	1	0	0	0	100	83	6389132	386927	769.1	13.7	282	SBS un
4	29-Jan-06	11:08	8	2	1	1	0	0	100	83	6388694	387464	809.1	1.9	84	SBS un
5	29-Jan-06	11:10	8	1	0	0	1	0	100	83	6389741	386998	834.4	30.2	234	SBS un
6	29-Jan-06	11:13	8	3	2	0	1	0	100	83	6390407	386715	848.4	12.4	277	SBS un
7	29-Jan-06	11:18	8	1	0	0	1	0	100	83	6390097	386937	868.2	19.2	256	SBS un
8	29-Jan-06	11:19	8	2	1	0	1	0	100	83	6389721	387402	917.3	42.3	194	ESSFwv
9	29-Jan-06	11:20	8	1	0	0	1	0	100	83	6388886	387696	859.0	5.6	216	SBS un
10	29-Jan-06	11:22	8	2	2	0	0	0	100	83	6388688	388129	895.2	29.5	246	ESSFwv
11	29-Jan-06	11:26	8	2	2	0	0	0	100	83	6388130	388454	894.2	14.8	207	ESSFwv
12	29-Jan-06	11:29	8	1	1	0	0	0	100	83	6389031	388292	989.5	30.7	219	ESSFwv
13	29-Jan-06	11:31	8	3	2	0	1	0	100	83	6389474	387491	905.6	35.3	233	SBS un
14	29-Jan-06	11:48	7B	1	1	0	0	0	100	83	6391758	379735	897.7	18.5	88	ESSFwv
15	29-Jan-06	12:27	7B	1	0	0	1	0	100	83	6387971	379065	801.5	12.2	349	SBS un
16	29-Jan-06	12:45	7B	1	0	0	0	1	100	83	6392536	380901	784.3	6.9	245	SBS un
17	29-Jan-06	13:34	7B	2	1	0	1	0	100	83	6392572	379829	917.2	11.7	111	ESSFwv
18	29-Jan-06	13:36	7B	2	1	1	0	0	100	83	6392116	379856	892.1	17.4	101	ESSFwv
19	29-Jan-06	13:49	7B	1	1	0	0	0	100	83	6391461	379367	967.4	25.0	115	ESSFwv
20	29-Jan-06	13:51	7B	1	1	0	0	0	100	83	6392382	379834	903.6	10.6	167	ESSFwv
21	29-Jan-06	13:54	7B	1	1	0	0	0	100	83	6393745	380067	921.0	18.0	119	ESSFwv
22	29-Jan-06	14:41	11	2	1	0	1	0	100	83	6362717	377797	848.8	36.4	254	ESSFwv
23	29-Jan-06	14:42	11	4	2	0	2	0	100	83	6362325	378273	886.7	47.7	223	ESSFwv
24	29-Jan-06	14:44	11	1	1	0	0	0	100	83	6361823	378563	865.9	34.4	219	ESSFwv
25	29-Jan-06	14:57	11	1	0	0	1	0	100	83	6360621	379532	944.6	18.4	279	ESSFwv
26	29-Jan-06	14:58	11	2	1	0	1	0	100	83	6361113	379326	975.1	35.5	205	ESSFwv
27	29-Jan-06	15:04	11	3	0	0	3	0	100	83	6363775	377270	912.1	36.4	238	ESSFwv
28	29-Jan-06	15:05	11	1	0	0	1	0	100	83	6364497	376849	937.4	59.7	248	ESSFwv
29	29-Jan-06	15:15	11	1	0	1	0	0	100	83	6371399	378489	785.9	32.8	310	ESSFwv
30	29-Jan-06	15:17	11	2	2	0	0	0	100	83	6370707	378509	908.8	46.2	290	ESSFwv
31	29-Jan-06	15:23	11	1	1	0	0	0	100	83	6369090	376634	754.0	3.0	136	ESSFwv
1	31-Jan-06	10:35	5	2	1	1	0	0	100	83	6369889	386963	709.0	1.2	272	ESSFwv
2	31-Jan-06	10:39	5	1	1	0	0	0	100	83	6365042	385304	720.0	0.5	199	ESSFwv
3	31-Jan-06	10:41	5	1	1	0	0	0	100	83	6365269	385500	722.8	1.0	263	ESSFwv
4	31-Jan-06	10:41	5	3	2	0	1	0	100	83	6365145	385626	721.0	1.2	147	ESSFwv
5	31-Jan-06	10:42	5	2	0	0	2	0	100	83	6365318	385651	720.9	1.9	45	ESSFwv
6	31-Jan-06	10:42	5	4	0	0	4	0	100	83	6365495	385725	719.0	3.4	99	ESSFwv
7	31-Jan-06	10:47	5	2	1	1	0	0	100	83	6368337	385862	736.4	47.0	112	ESSFwv
8	31-Jan-06	10:47	5	5	1	0	4	0	100	83	6368105	385827	717.4	8.5	122	ESSFwv
9	31-Jan-06	11:01	5	1	0	0	1	0	100	83	6364107	385597	720.8	10.6	278	ESSFwv
10	31-Jan-06	11:01	5	2	0	0	2	0	100	83	6364415	385661	719.2	5.4	289	ESSFwv
11	31-Jan-06	11:05	5	1	0	0	1	0	100	83	6369164	386792	712.9	0.8	32	ESSFwv
12	31-Jan-06	11:07	5	1	0	0	0	1	100	83	6371264	387847	794.3	32.3	286	ESSFwv
13	31-Jan-06	11:09	5	1	0	0	0	1	100	83	6371789	387713	775.9	30.6	199	ESSFwv
14	31-Jan-06	11:30	5	2	1	1	0	0	100	83	6373752	388410	886.7	75.5	315	ESSFwv
15	31-Jan-06	11:33	5	1	1	0	0	0	100	83	6373092	388078	835.1	28.8	253	ESSFwv
16	31-Jan-06	11:34	5	2	1	1	0	0	100	83	6372938	388113	842.8	50.3	278	ESSFwv
17	31-Jan-06	11:35	5	1	0	0	1	0	100	83	6372765	388370	1003.6	24.8	271	ESSFwv
18	31-Jan-06	11:38	5	1	1	0	0	0	100	83	6370239	388527	787.1	1.6	39	ESSFwv
19	31-Jan-06	11:39	5	1	1	0	0	0	100	83	6369485	388361	798.6	2.5	345	ESSFwv
20	31-Jan-06	11:40	5	1	0	0	1	0	100	83	6369373	388357	799.8	8.9	5	ESSFwv
21	31-Jan-06	11:41	5	1	1	0	0	0	100	83	6369020	388194	798.5	5.8	265	ESSFwv
22	31-Jan-06	11:42	5	1	1	0	0	0	100	83	6368715	388110	790.8	8.7	228	ESSFwv
23	31-Jan-06	11:56	5	2	1	0	1	0	100	83	6369226	388488	815.4	20.6	319	ESSFwv
24	31-Jan-06	11:57	5	1	1	0	0	0	100	83	6370232	388687	788.7	4.3	312	ESSFwv

Note: No moose observations for survey units: 1 and 4B.

(continued)

Appendix III
Details of Moose Observations at Schaft Creek, Winter 2006 (completed)

Waypoint	Date	Time	Survey Unit	Total	Cows	Calves	Bulls	Unidentified	Snow Cover (%)	NAD	Northing	Easting	Elevation (m)	Slope (%)	Aspect	Habitat Type (BEC)
25	31-Jan-06	12:09	5	3	0	0	3	0	100	83	6371759	389478	809.5	2.0	298	ESSFwv
26	31-Jan-06	12:15	5	2	1	1	0	0	100	83	6368745	389849	1022.2	19.0	283	ESSFwv
27	31-Jan-06	12:26	5	1	1	0	0	0	100	83	6373838	390252	811.7	10.2	262	ESSFwv
28	31-Jan-06	12:31	5	4	1	0	3	0	100	83	6373031	389705	795.3	1.9	54	ESSFwv
1	2-Feb-06	10:33	3	1	0	0	1	0	100	83	6361024	384672	725.0	0.0	-1	ESSFwv
2	2-Feb-06	11:02	2	1	0	0	1	0	100	83	6346792	384486	762.7	3.8	113	ESSFwv
3	2-Feb-06	11:02	2	2	1	0	1	0	100	83	6346859	384303	759.5	1.6	85	ESSFwv
4	2-Feb-06	11:46	9	1	0	0	1	0	100	83	6396786	383220	557.5	9.9	221	BWBSdk 1
5	2-Feb-06	11:53	9	1	1	0	0	0	100	83	6397306	383725	615.0	28.6	226	BWBSdk 1
6	2-Feb-06	11:53	9	1	0	0	1	0	100	83	6397445	383626	614.9	4.3	232	BWBSdk 1
7	2-Feb-06	12:05	9	1	1	0	0	0	100	83	6398138	384471	715.1	19.8	258	BWBSdk 1
8	2-Feb-06	12:08	9	1	0	0	1	0	100	83	6396301	384377	654.9	37.4	255	BWBSdk 1
9	2-Feb-06	12:10	9	1	1	0	0	0	100	83	6394409	385530	823.2	27.0	257	ESSFwv
10	2-Feb-06	12:14	9	1	0	0	1	0	100	83	6393394	385826	828.4	15.9	252	ESSFwv
11	2-Feb-06	12:16	9	1	0	0	1	0	100	83	6394875	385475	841.0	39.4	264	SWB un
12	2-Feb-06	12:18	9	2	0	0	2	0	100	83	6395673	385148	762.5	32.4	254	BWBSdk 1
13	2-Feb-06	12:21	9	2	1	1	0	0	100	83	6397971	384808	748.9	3.6	301	BWBSdk 1
14	2-Feb-06	12:23	9	1	0	0	1	0	100	83	6400106	384945	728.1	2.7	233	BWBSdk 1
15	2-Feb-06	12:26	9	1	0	0	0	1	100	83	6398599	384995	759.9	0.3	39	BWBSdk 1
16	2-Feb-06	13:15	9	1	1	0	0	0	100	83	6394360	385785	906.1	20.8	255	ESSFwv
17	2-Feb-06	13:17	9	3	1	2	0	0	100	83	6393810	386040	913.4	38.8	260	ESSFwv
18	2-Feb-06	13:17	9	1	0	0	1	0	100	83	6394023	386114	943.6	25.9	257	ESSFwv
19	2-Feb-06	13:19	9	2	1	0	1	0	100	83	6393619	386040	900.4	28.8	254	ESSFwv
20	2-Feb-06	13:23	9	2	0	0	1	1	100	83	6393500	386069	911.8	45.2	271	ESSFwv
21	2-Feb-06	13:29	9	1	0	0	1	0	100	83	6396875	386109	804.7	24.2	287	BWBSdk 1
22	2-Feb-06	13:44	9	1	0	0	0	1	100	83	6400824	386773	1015.0	30.8	256	SWB un
23	2-Feb-06	13:48	9	3	2	0	1	0	100	83	6398204	387027	1048.2	39.9	225	SWB un
24	2-Feb-06	14:14	10	2	1	1	0	0	100	83	6397479	382169	673.9	28.6	68	SBS un
25	2-Feb-06	14:27	10	1	0	0	1	0	100	83	6400228	381457	846.9	11.2	312	SBS un
26	2-Feb-06	14:36	10	1	0	0	1	0	100	83	6395280	381586	729.1	3.7	124	SBS un
27	2-Feb-06	14:40	10	1	1	0	0	0	100	83	6398613	381133	907.2	22.6	118	SBS un
28	2-Feb-06	14:46	10	1	1	0	0	0	100	83	6397105	380975	880.9	15.0	73	SBS un
29	2-Feb-06	14:46	10	2	1	1	0	0	100	83	6396435	380816	882.1	40.7	140	SBS un
30	2-Feb-06	15:01	12	1	0	0	0	1	100	83	6404667	382743	605.0	29.8	216	SBS un
31	2-Feb-06	15:06	12	1	1	0	0	0	100	83	6401162	383344	569.5	23.2	243	SBS un
33	2-Feb-06	15:12	12	2	1	1	0	0	100	83	6401135	384326	638.0	49.5	178	BWBSdk 1
34	2-Feb-06	15:14	12	1	1	0	0	0	100	83	6403651	383896	678.0	7.4	227	BWBSdk 1
35	2-Feb-06	15:17	12	2	1	1	0	0	100	83	6403853	383661	681.9	7.8	95	BWBSdk 1
36	2-Feb-06	15:20	12	1	1	0	0	0	100	83	6402145	384561	690.1	13.3	262	BWBSdk 1
37	2-Feb-06	15:28	12	1	0	0	1	0	100	83	6403162	385449	798.9	15.1	270	BWBSdk 1
38	2-Feb-06	15:31	12	2	1	1	0	0	100	83	6404349	385235	849.9	45.8	234	BWBSdk 1
39	2-Feb-06	15:33	12	1	1	0	0	0	100	83	6403574	385793	878.5	31.9	234	BWBSdk 1
40	2-Feb-06	15:35	12	1	1	0	0	0	100	83	6401334	386101	903.8	33.2	245	BWBSdk 1
41	2-Feb-06	15:45	12	2	1	1	0	0	100	83	6403431	382145	546.1	18.5	129	SBS un
42	2-Feb-06	15:47	12	1	0	0	1	0	100	83	6404040	382455	489.3	27.3	360	SBS un
43	2-Feb-06	15:51	12	1	0	0	1	0	100	83	6402214	381884	681.9	37.3	126	SBS un
44	2-Feb-06	15:55	12	2	1	1	0	0	100	83	6403421	381232	678.8	36.0	58	SBS un
45	2-Feb-06	15:56	12	1	0	0	1	0	100	83	6403329	381584	615.8	30.7	51	SBS un
46	2-Feb-06	15:59	12	3	3	0	0	0	100	83	6402830	381081	726.9	6.0	92	SBS un
47	2-Feb-06	16:05	12	1	0	0	1	0	100	83	6401778	380785	856.9	29.7	70	SBS un
48	2-Feb-06	16:06	12	1	1	0	0	0	100	83	6401281	381044	842.7	27.9	70	SBS un

Note: No moose observations for survey units: 1 and 4B.

APPENDIX IV
SUMMARY OF OBSERVATIONAL DATA FROM SCHAFT CREEK MOOSE WINTER SURVEY, 2006

Appendix IV
Summary of Observational Data from Schaft Creek Moose Winter Survey, 2006

Moose Survey Observations and Results

	Survey Unit #														
Composition	**1**	**2**	**3**	**4A**	**4B**	**5**	**6**	**7A**	**7B**	**8**	**9**	**10**	**11**	**12**	**Total**
Bulls	0	2	1	3	0	24	8	10	2	6	13	2	9	5	**85**
Cows	0	1	0	2	0	19	15	2	6	14	9	4	8	14	**94**
Calves	0	0	0	0	0	5	6	1	1	2	3	2	1	5	**26**
Unidentified	0	0	0	0	0	2	5	2	1	0	3	0	0	1	**14**
Total	**0**	**3**	**1**	**5**	**0**	**50**	**34**	**15**	**10**	**22**	**28**	**8**	**18**	**25**	**219**

Moose Population Charateristics

Population	Age/Sex	Ratio		
Productivity	Juvenile/Female	0.277	27.7	juveniles per 100 females
Sex ratio	Male/Female	0.904	90.4	males per 100 females
Natality	Juvenile/Adult	0.145	14.5	births per 100 adults

Moose Population Densities

Survey Unit	Moose Observations	Total Area (km^2)	Density ($moose/km^2$)	Capable Habitat area* (km^2)	Density ($moose/km^2$)	Proportion of Capable Habitat
1	0	29.3	0.00	19.4	0.00	66.21
2	3	36.5	0.08	26.2	0.11	71.78
3	1	24.9	0.04	18.8	0.05	75.50
4A	5	32.6	0.15	28.8	0.17	88.34
4B	0	32.1	0.00	25.9	0.00	80.69
5	50	62.2	0.80	47.5	1.05	76.37
6	34	113.5	0.30	99.9	0.34	88.02
7A	15	22.8	0.66	22.3	0.67	97.81
7B	10	48.3	0.21	42.7	0.23	88.41
8	22	15.2	1.45	13.7	1.61	90.13
9	28	34.6	0.81	29.9	0.94	86.42
10	8	22	0.36	20	0.40	90.91
11	18	54.1	0.33	42.4	0.42	78.37
12	25	31.4	0.80	24.9	1.00	79.30
Total	**219**	**559.50**	**0.39**	**462.40**	**0.47**	**82.65**

***Capable habitat is defined as <1,050 m elevation and <60% slope**