APPENDIX 18-D
2010 AND 2011 MOUNTAIN GOAT AERIAL SURVEYS, BRUCEJACK PROJECT

1. Introduction

Mountain goat (*Oreamnos americanus*) surveys were conducted for the Brucejack Project in 2010 and 2011. The Brucejack Project and the KSM Project are located in close geographic proximity and share overlapping Regional Study Areas. The two companies have signed an agreement whereby environmental data is shared between the companies. Mountain goat surveys for the Brucejack Project were designed to overlap the KSM Project Regional Study Area, where possible, so that data from the two companies can be shared for a more fulsome dataset.

This baseline report summarizes the Brucejack mountain goat surveys in 2010 and 2011 within the shared Regional Study Area. The KSM Project 2008 and 2009 baseline survey results are presented in Appendix 18-A and mountain goat survey results are summarized in this report.

2. Methodology

Aerial surveys for mountain goats were flown during the summer of 2010 and winter of 2011 within a regional wildlife study area (RSA) for Brucejack, the majority of which overlaps with the KSM Project. Methods used to conduct the goat inventory adhered to Provincial Resource Information Standards Committee (RISC) protocols (RIC 2002) which included delineation of the study area into survey units (SUs) and helicopter-based aerial survey of these SUs during the summer and winter. The mountainous terrain within the Brucejack RSA was divided into 27 distinct SUs prior to aerial surveys, covering approximately 2,730 km^2 of the Brucejack RSA. Of these 27 SUs, 22 were also within the KSM RSA. Only results from the 22 SUs that overlap with the KSM RSA are presented in this summary report.

The aerial surveys were conducted with a bubble-windowed Bell 206 helicopter with two observers, a pilot, and navigator. Survey effort was predominately directed to areas above the treeline due to difficulty in observing mountain ungulates under closed canopy forest, although some forested areas were included in winter. The helicopter maintained an average speed of approximately 100 km/hr. Flight lines followed topographic contours or identifiable features and were spaced at intervals of approximately 500 m surface distance. Flight paths were recorded using a hand-held Garmin GPS 76 unit with an external antenna.

Aerial surveys for the KSM Project were conducted in summer 2008, and winter 2009, following the same methods, and are described in Appendix 18-A.

3. Results

3.1 Summer

Aerial surveys for mountain goats were conducted for the Brucejack Project on August 10 and August 12 to 16, 2010, within the KSM RSA. Twenty-four SUs were surveyed during the surveys for KSM in summer, 2008. Of these 24 SUs, 15 were surveyed for the Brucejack Project in 2010. For SUs that were surveyed in both 2008 and 2010, the average number of goats for that SU was calculated (Table 3.1-1). Between the two surveys, a total of 273 mountain goats were observed in the RSA (Figure 3.1-1).

During 2010, adults accounted for 79.2% of all goats observed and kids accounted for 20.8%; the summer kidding ratio was 26 kids per 100 adults. The group size of mountain goats ranged from 1 to 19 individuals. Most observations consisted of one individual (56.9%) in the RSA during 2010.

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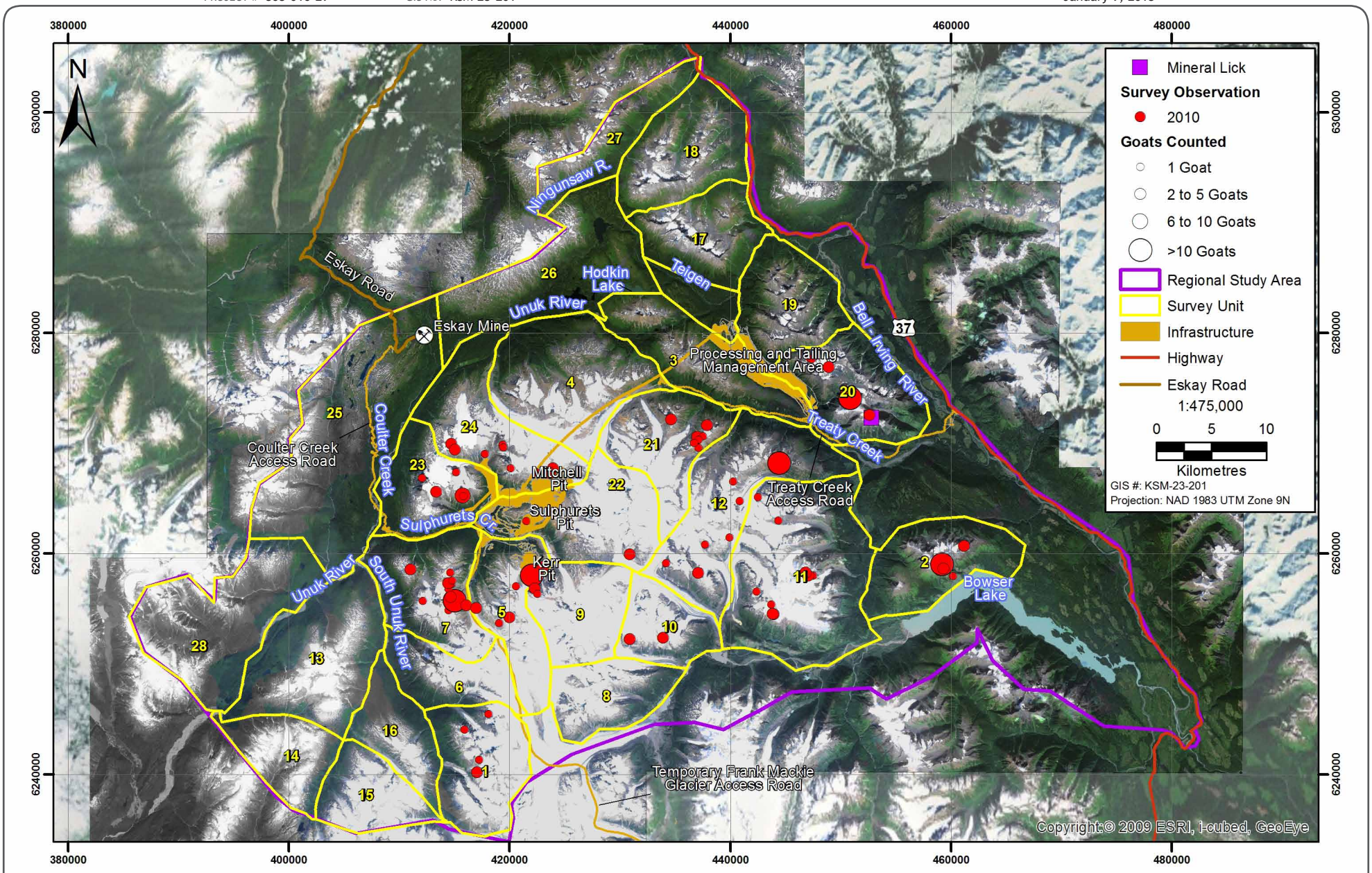

Figure 3.1-1

SEABRIDGE GOLD
KSM PROJECT

Mountain Goat Observations during Surveys for the Brucejack Project, Summer 2010

Figure 3.1-1

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Table 3.1-1. Number of Mountain Goats Observed during Summer Aerial Surveys at KSM (2008) and Brucejack (2010)

Survey Unit	Total Number of Goats Observed (adults and kids)		
	KSM 2008	Brucejack 2010	Average
1	3	6	4.5
2	17	27	22
3	23	-	23
4	10	-	10
5	4	21	12.5
6	4	0	2
7	15	31	23
8	0	0	0
9	1	4	2.5
10	0	6	3
11	11	17	14
12	8	24	16
13	4	-	4
14	2	-	2
15	11	-	11
16	0	-	0
17	33	-	33
18	5	-	5
19	26	-	26
20	14	20	17
21	7	12	9.5
22	0	5	2.5
23	31	13	22
24	1	15	8
TOTAL	230	201	272.5

-= not surveyed

One mineral lick was identified on August 14, 2010 (Figure 3.1-1). Several signs of mountain goat use (i.e., distinct paths, trails, bedding sites, digging activity) were noted throughout the study area, with the majority associated with the SUs where goats were encountered.

3.2 Winter

Aerial surveys for mountain goats were conducted for the Brucejack Project from February 20 to 22, 2011, within the KSM RSA. Sixteen SUs were surveyed during the baseline surveys conducted for the KSM Project in winter, 2009, and 18 SUs were surveyed for the Brucejack Project in winter, 2011 (Table 3.2-1). Thirteen SUs were surveyed for both projects. For SUs that were surveyed in both 2009 and 2011, the average number of goats for that SU was calculated (Table 3.2-1). Between the two surveys, a total of 214 mountain goats were observed in the RSA.

Adults accounted for 85.5% and kids accounted for 14.9% of the total number of goats. Winter juvenile demography was 19 kids per 100 adults. Forty-nine percent of the groups consisted of more than one individual and the group size ranged from 1 to 12 individuals. No goats were recorded in SU 9. The majority of goat observations were observed in SU 7 (N=44) and 20 (N=17; Figure 3.2-1).

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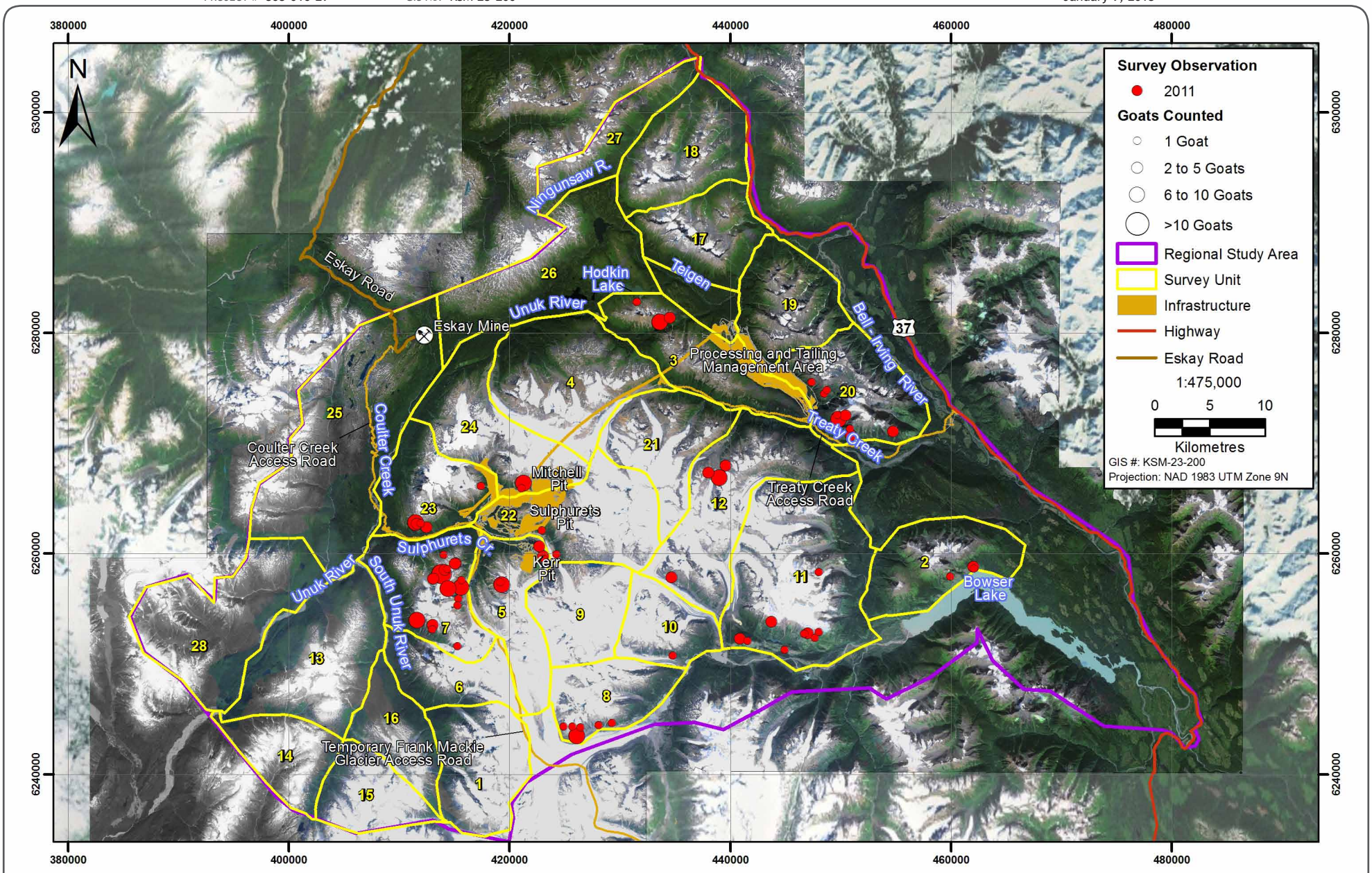

Figure 3.2-1

SEABRIDGE GOLD
KSM PROJECT

Mountain Goat Observations during Surveys for the Brucejack Project, Winter 2011

Figure 3.2-1

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Table 3.2-1. Number of Mountain Goats Observed during Winter Aerial Surveys at KSM (2009) and Brucejack (2011)

Survey Unit	Total Number of Goats Observed (adults and kids)		
	KSM 2009	Brucejack 2011	Average
1	0	-	0
2	-	12	12
3	16	10	13
4	14	-	14
5	30	13	21.5
6	0	-	0
7	37	44	40.5
8	5	11	8
9	-	0	0
10	-	1	1
11	-	14	14
12	-	16	16
17	0	-	0
19	23	-	23
20	10	17	13.5
21	9	-	9
22	10	2	6
23	18	12	15
24	3	5	4
25	3	-	3
26	0	-	0
TOTAL	178	157	213.5