



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Fish and Game

DIVISION OF WILDLIFE CONSERVATION
Southeast Region

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November 14, 2017
Haines Borough Assembly
P.O. Box 1209
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Dear Assembly Members:

We would like to thank the Heli-Ski Map Committee, Haines Borough staff, and the Assembly for their efforts and allowing us the opportunity to provide comments in regards to important habitat for overwintering mountain goats and denning brown bears. The results of our habitat selection analyses include figures and tables which illustrate the amount of habitat within the approved and proposed areas for heli-skiing (Figures 1-4 and Tables 1-4). As requested, our comments are based on the 28 November, 2016 version of the heli-skiing map. We have provided comments on individual proposed areas, which include tables and maps depicting high value mountain goat and brown bear denning habitat (see pages 10-25). Expanding heli-skiing operations into any new areas can have cumulative negative effects on wildlife populations; we are especially concerned about sites S2, S3a, S3b, S4, S6b, AH2b, AH3a, AH3b, AH6, AH7a, and AH7b.

Heli-skiing activities can displace mountain goats from preferred wintering habitat during a time when goats are physically and nutritionally stressed (Côté 1996, Côté 2013, Hurley 2004). Pregnant females and kids are more susceptible to disturbances due to higher energetic demands for reproduction and growth. Consequently, disturbance and displacement from preferred winter habitat may disproportionately affect nannies and kids. The Northern Wild Sheep and Goat Council (NWSGC) is an international organization of mountain goat and sheep biologists. In 2004, NWSGC published a position statement focused on summarizing existing biological information, identifying threats and prescribing recommendations for managing helicopter supported recreation in areas where mountain goats were likely to be affected (Hurley 2004). Helicopter disturbance has been documented to disturb mountain goats from up to 2 km away, therefore the NWSGC and ADF&G recommends that helicopter activity not occur within 1.5–2 km of occupied/suspected nursery groups or important winter range (Côté 1996, Hurley 2004, Cadsand 2012, Côté et al. 2013, White et al. 2017).

A study on Admiralty and Chichagof Islands found that bear den sites ranged in elevation from sea level to 3,904 ft. (mean 1981 ft.) and aircraft traffic may lower the suitability of brown bear denning habitat (Schoen et al. 1987). Disturbance during the denning period has been shown to increase stress, cause displacement or avoidance of important habitats, and lead to early den abandonment which increases energy expenditure and reduces cub survival (Linnell 2000).

Approved areas and cumulative effects:

Ten survey areas within the Haines Borough, delineated by black polygons in Figures 1 & 3, were used to partition the region for easier interpretation. Six of these survey areas totaling 234,330 acres currently contain regions approved for helicopter skiing. When seeking to understand the potential effects of approving new areas for commercial ski tours on wildlife, it is important to evaluate proposed

areas in terms of the total effect currently approved and proposed areas may have on populations (Figures 2 & 4).

Currently, 33% (55,703 acres) of all mountain goat winter habitat available within the six survey areas (170,400 acres) is in approved heli-skiing areas. Proportions of modelled winter habitat available to each subpopulation of mountain goats affected by heli-skiing vary (Tables 1 & 3). For example, 62% of all mountain goat winter habitat available in the Takhinsha Mountains is currently within approved heli-skiing areas, whereas 11% of all mountain goat winter habitat available on Takhin Ridge is already in approved areas (Table 1). The new areas proposed for heli-skiing would increase the overall proportion of mountain goat habitat in heli-skiing areas by 3%. However, in some areas changes would be much greater. For example, if all proposed areas are approved within the Porcupine region, the proportion of mountain goat winter habitat within approved heli-skiing areas would increase from 40% to 67% (Table 1).

In total 24% of the land area currently approved for heli-skiing within the Haines Borough is mountain goat winter habitat (Table 1). However, the actual amount of heli-skiing that occurs in mountain goat winter habitat may be lower because not all of the area permitted/approved for heli-skiing is actually used by heli-ski operators. It would be possible to derive more precise calculations if the specific areas (i.e. ski runs, drop off, and pickup locations) used were delineated on maps.

From 2015 through 2017 we conducted spring aerial surveys to locate brown bear dens. We located 89 dens in the Haines area to model brown bear den site selection recording terrain features such as slope, elevation, terrain wetness, and topographic position (i.e., ridge vs. valley). The study area extended from the Davidson Glacier to the Canadian border and east to the Ferebee Glacier. Surveys were flown at approximately the 2,000 ft. elevation contour. We effectively located dens in open habitat, generally above the forest line through tracks and other sign in the snow. The optimal spring survey period is after most bears have emerged from dens and before snow cover recedes above tree line. Our findings pertain only to habitat that could be visible along the survey route and not to dens in lower elevation forested habitat. Therefore our brown bear study area represents a conservative estimate of available denning area and only includes 46% of the land approved for heli-skiing.

Using a resource selection analysis framework, we identified 79,357 acres of high-quality brown bear denning habitat in our delineated survey areas with heli-skiing. Thirty-seven percent (29,029 acres) of the den habitat available in these survey areas is located within areas currently approved for heli-skiing. The proposed amendments to create new heli-skiing areas would affect an additional 5% (3,845 acres) of denning habitat (Table 2). In some survey areas, such as the Takhinsha Range and Summit Creek vicinity, an average of 67% of the modelled denning habitat is within currently approved heli-skiing areas (Fig. 4, Table 2). Amendments in these areas would affect an additional 137 acres (1%) and 226 acres (4%) of denning habitat, respectively. In the Porcupine area 3,085 acres (11%) of denning habitat are within the 28,418 acres currently approved for heli-skiing (Table 2 & 4). The newly proposed areas in the Porcupine Mountains would affect an additional 2,567 acres (23%) of denning habitat, increasing the total proportion of brown bear denning habitat potentially affected by heli-skiing in this survey area to 53% (Table 2). We identified a large concentration of brown bear dens (n=25) along the Takhin Range. Proposed amendments in this area would affect an additional 915 acres (8%) of bear den habitat increasing the total proportion of brown bear denning habitat in this survey area to 24%. In the Chilkoot-Ferebee survey area only 31% of the designated heli-skiing area was surveyed. Therefore, a relatively small percentage of the area was identified as bear den habitat. We did not make inferences about brown bear denning habitat outside the study area (Figures 3 & 4).

Explanation of tables:

Tables 1 and 2 describe the proportion of ski areas that have been identified as important mountain goat overwintering and brown denning habitat and the proportion of the habitat that is in ski areas. For example, 22 % of the area approved for heli-skiing within the survey area called “Takhinsha” is mountain goat habitat and 62% of all available mountain goat habitat within the same survey area is designated for skiing (Table 1). Tables 3 and 4 show the size (in acres) of each survey area with the number of acres approved for heli-skiing and wildlife habitat within. For example, the Takhinsha survey area is 153,792 acres in total and 42,129 acres within Takhinsha is mountain goat habitat. The total area of approved for skiing within Takhinsha is 119,432 acres and 26,174 acres of that is mountain goat habitat. The proposed area within Takhinsha is 8,726 acres in size and 472 acres of the proposed area is mountain goat habitat.

Assessment of proposed areas:

In addition to our previously submitted comments, on subsequent pages, we provide individual assessments for each proposed new heli-ski area, in regard to effects on mountain goat winter and brown bear denning habitat. It is important to note that the figures used in the individual assessments that follow only display habitat that falls within the proposed area and a 1,500m buffer. The NWSCG recommends helicopters maintain a minimum distance of 1,500 m from winter goat habitat in order to avoid the negative effects of disturbance (Hurley 2004). Figures 2 and 4 include all identified habitat within each approved heli-ski area and proposed heli-skiing areas. Habitat assessments were based on resource selection function models derived from extensive animal location data collected in the study area. Specific analytical details of the models have been discussed with community members, industry and agency representatives. Formal description and reporting of analytical activities is pending. If an area contains mountain goat winter habitat or brown bear denning habitat within the 1,500m buffer we consider that area to have the “potential” to disturb wildlife. If we had observations of mountain goats or brown bear dens within the 1,500m buffer we considered that area “likely” to disturb wildlife. However, it is important to note that aerial surveys are conducted once per year due to weather, pilot availability, and time constraints. The absence of an observation in a given area does not guarantee the absence of animals because terrain and vegetation can conceal goats and bear dens from detection.

Ski area mapping accuracy:

Boundaries used for delineating proposed ski areas were clearly not accurate, and in some cases failed to follow logical topographies and existing boundaries (e.g. AH4A, AH6, AH7A, S1, etc.). We strongly recommend increased scrutiny on map boundary digitization and accuracy in the future. In addition, poor mapping accuracy results in inefficient use of time among parties involved in analysis and decision making. This is an easily avoidable problem and can be remedied by using professional GIS software (i.e. ArcGIS); the use of hard copy USGS topographic maps may be useful for initial delineation and communication purposes with industry. We recommend using Google Earth only for display purposes once ski area polygons have been created in ArcGIS.

Table 1. Mountain goat winter habitat in survey areas with helicopter skiing. Data are summarized by the proportion of habitat relative to the approved and proposed ski area designations.

Area	Ski Areas		Total Survey Area		
	Prop. of ski areas that are mountain goat habitat		Prop. of total mountain goat habitat that is in each survey area		
	Approved	Proposed	Approved	Proposed	Approved + Proposed
Takhinsha	0.22	0.05	0.62	0.01	0.63
Chilkoot-Ferebee	0.32	--	0.23	0.00	0.23
Porcupine	0.17	0.30	0.40	0.27	0.67
Four Winds	0.25	0.02	0.26	0.00	0.26
Summit	0.16	0.06	0.32	0.00	0.32
Takhin	0.37	0.32	0.11	0.04	0.15
Total	0.24	0.20	0.33	0.03	0.36

Table 2. Brown bear denning habitat in survey areas with helicopter skiing. Data are summarized by the proportion of habitat relative to the approved and proposed ski area designations.

Area	Ski area		Total survey area		
	Prop. of ski areas that are brown bear denning habitat		Prop. of total brown bear denning habitat that is in each survey area		
	Approved	Proposed	Approved	Proposed	Approved + Proposed
Takhinsha	0.12	0.02	0.68	0.01	0.69
Chilkoot-Ferebee	0.05	--	0.14	0.00	0.14
Porcupine	0.11	0.23	0.29	0.24	0.53
Four Winds	0.16	0.00	0.25	0.00	0.25
Summit	0.34	0.76	0.66	0.04	0.70
Takhin	0.27	0.29	0.16	0.08	0.24
Total	0.12	0.16	0.37	0.05	0.41

Table 3. Mountain goat winter habitat in survey areas with helicopter skiing. Data are summarized by the areal extent of habitat relative to the approved and proposed ski area designation.

Area	Total Area		Approved Ski Areas		Proposed	
	Area Size (acres)	Mtn Goat Habitat (acres)	Area Size (acres)	Mtn Goat Habitat (acres)	Area Size (acres)	Mtn Goat Habitat (acres)
Takhinsha	153,792	42,129	119,432	26,174	8,726	472
Chilkoot-Ferebee	171,597	70,729	50,584	16,040	0	0
Porcupine	66,630	12,141	28,418	4,839	11,254	3,335
Four Winds	105,497	15,799	17,024	4,177	242	4
Summit	22,298	6,088	11,962	1,919	299	19
Takhin	45,029	23,514	6,910	2,554	3,131	997
Total	564,843	170,400	234,330	55,703	23,651	4,827

Table 4. Brown bear denning habitat in survey areas with helicopter skiing. Data are summarized by the areal extent of habitat relative to the approved and proposed ski area designations.

Area	Total Area		Approved Ski Areas		Proposed	
	Area Size (acres)	Brown Bear Den Habitat (acres)	Area Size (acres)	Brown Bear Den Habitat (acres)	Area Size (acres)	Brown Bear Den Habitat (acres)
Takhinsha	153,792	21,550	119,432	14,755	8,726	137
Chilkoot-Ferebee	171,597	18,208	50,584	2,489	0	0
Porcupine	66,630	10,650	28,418	3,085	11,254	2,567
Four Winds	105,497	11,022	17,024	2,716	242	0
Summit	22,298	6,178	11,962	4,090	299	226
Takhin	45,029	11,750	6,910	1,895	3,131	915
Total	564,843	79,357	234,330	29,029	23,651	3,845

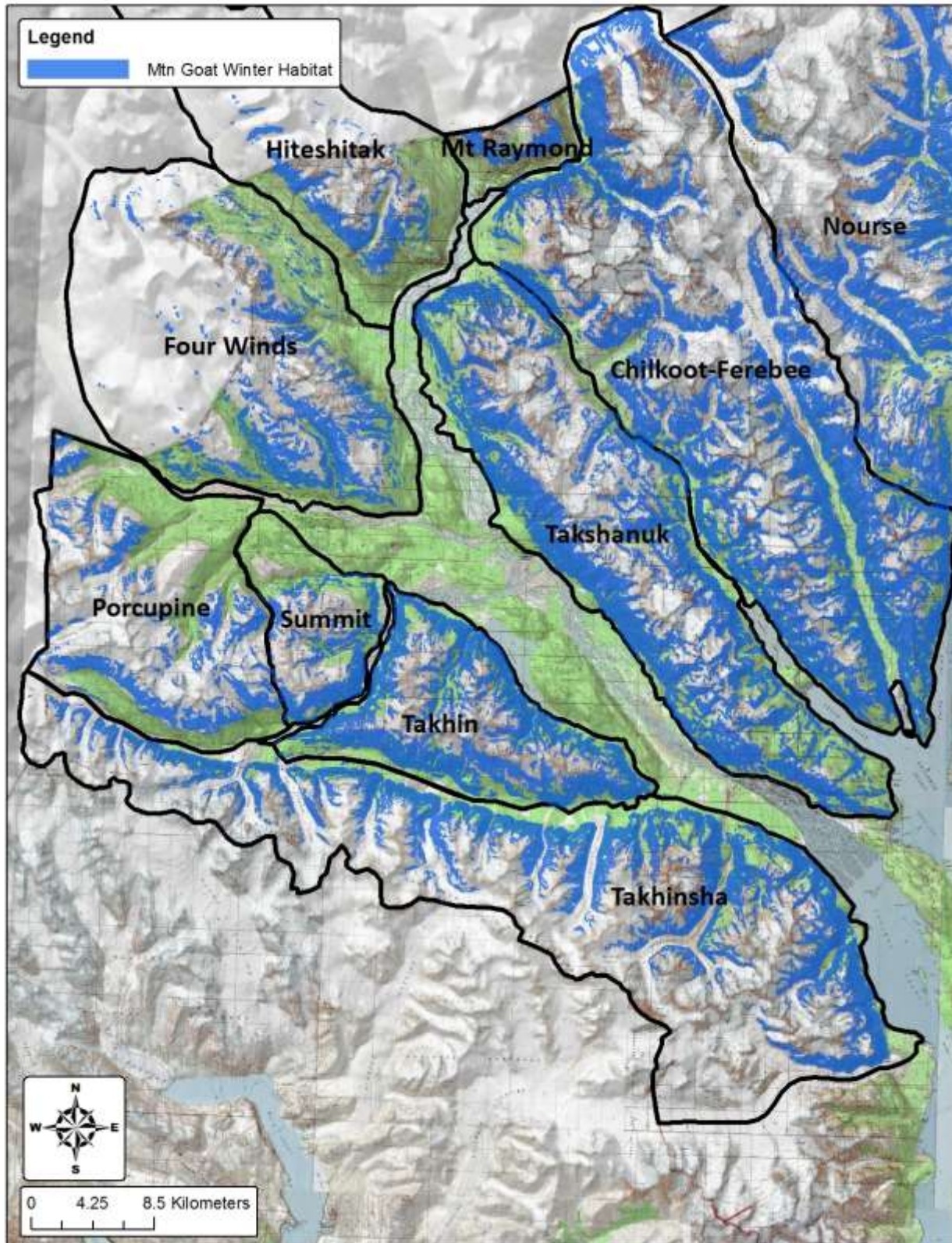


Figure 1. Modeled mountain goat winter habitat, within mountain regions, in Haines, Alaska. Survey areas are delineated by the black polygons; areas with helicopter skiing include Takhinsha, Takhin, Summit, Porcupine, Four Winds, and Chilkoot-Ferebee.

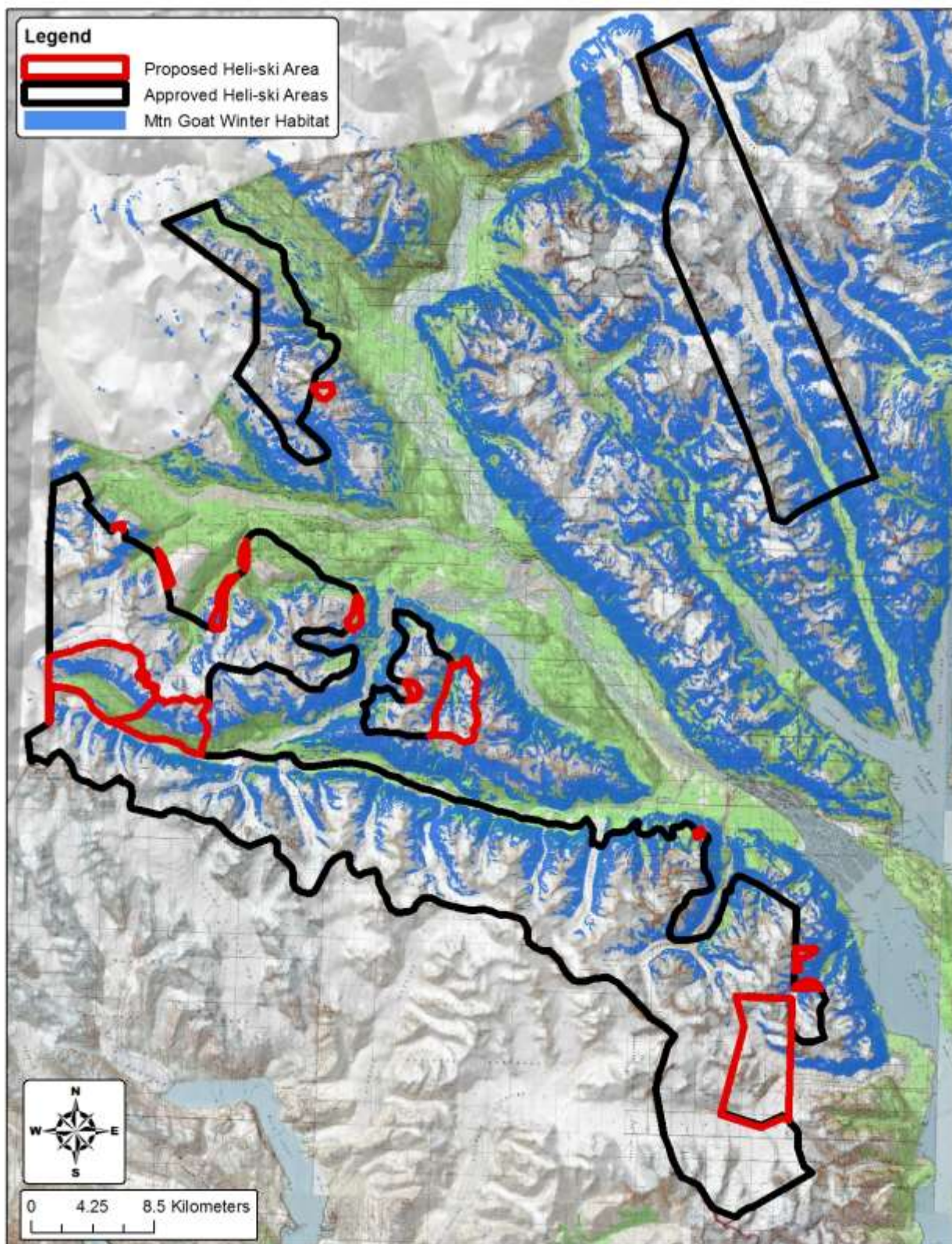


Figure 2. Modeled mountain goat winter habitat in Haines, Alaska, relative to approved and proposed heli-skiing areas.

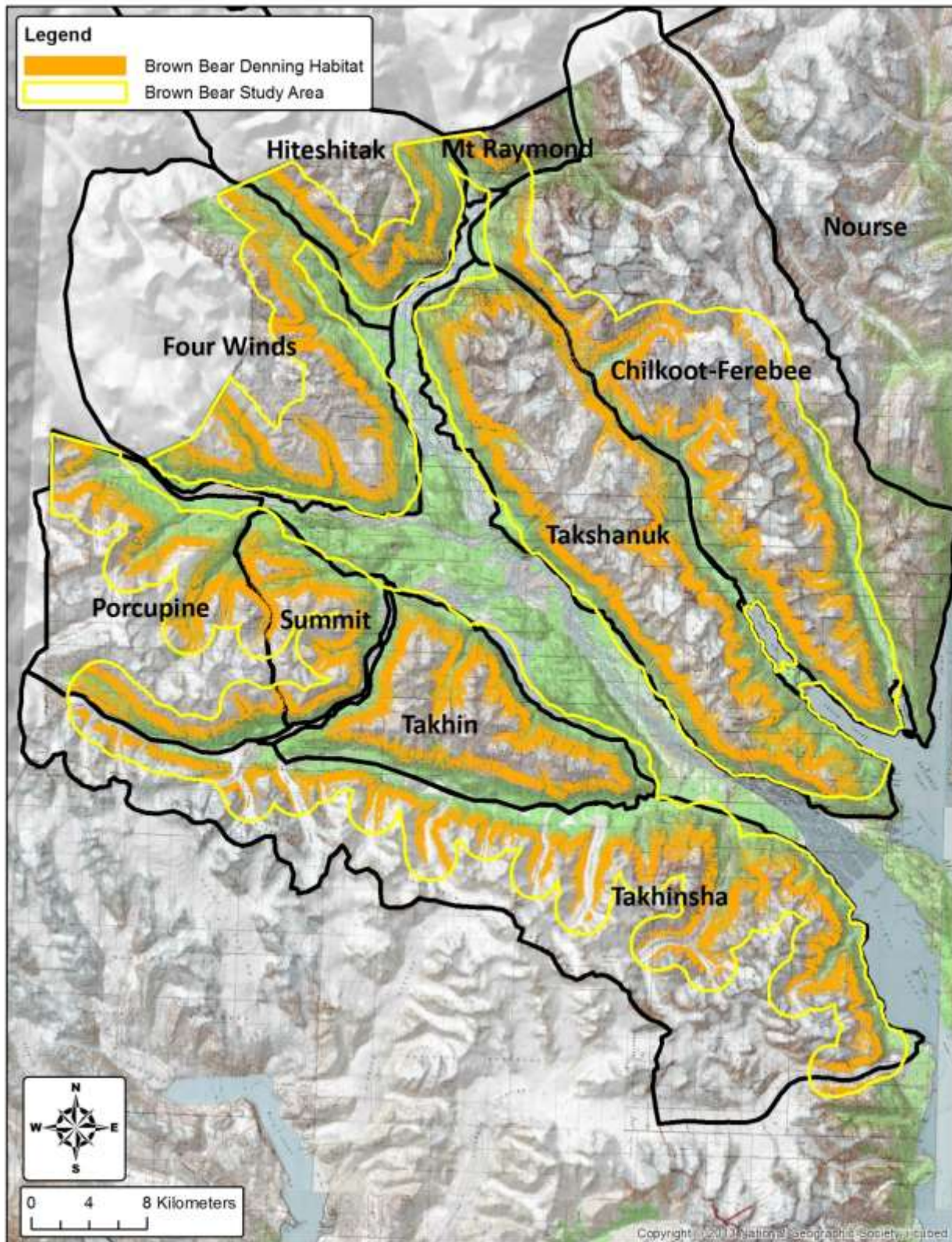


Figure 3. Modeled brown bear denning habitat, within mountain regions, in Haines, Alaska. Survey areas are delineated by the black polygons; areas with helicopter skiing include Takhinsha, Takhin, Summit, Porcupine, Four Winds, and Chilkoot-Ferebee.

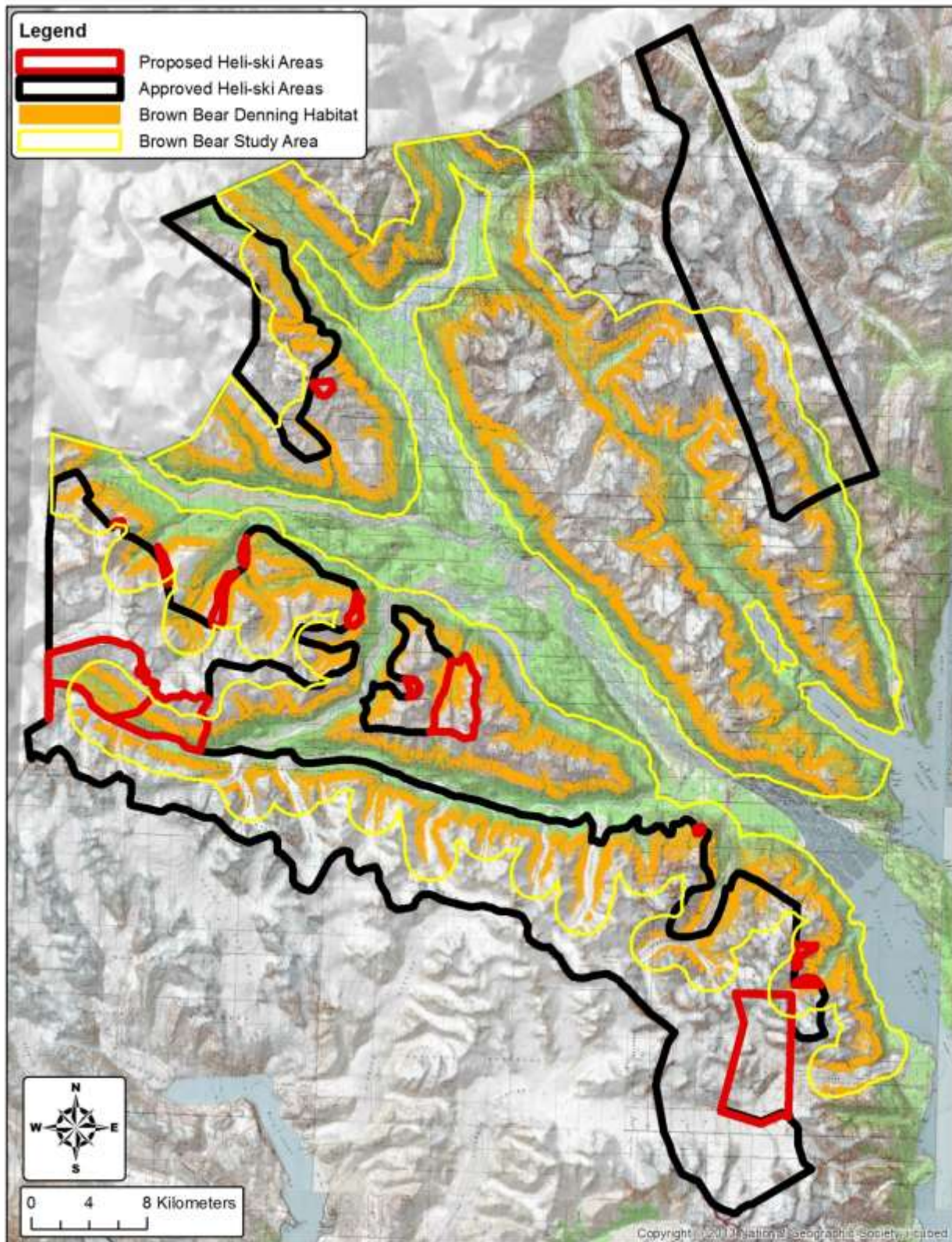
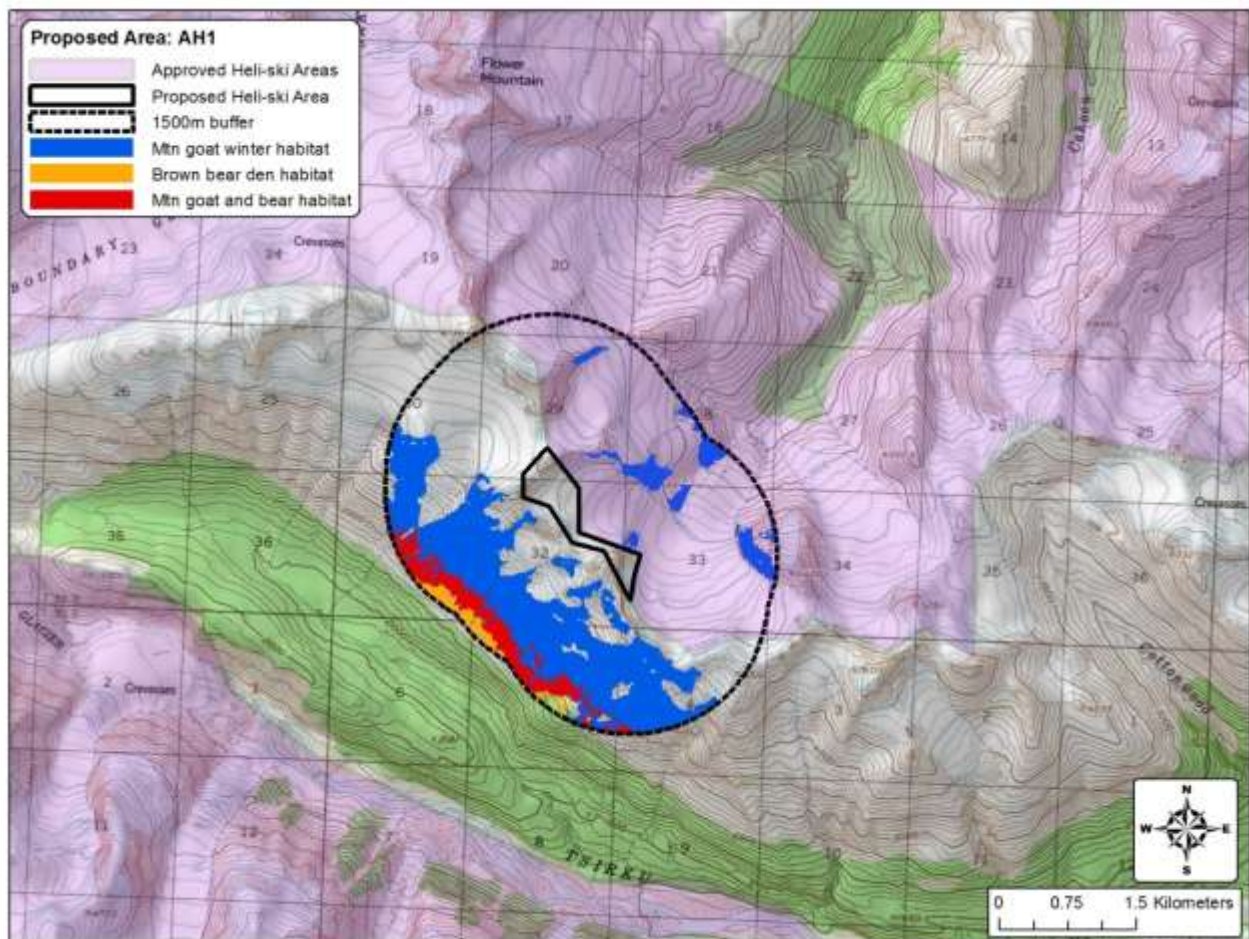


Figure 4. Modeled brown bear denning habitat in Haines, Alaska, relative to approved and proposed heli-skiing areas.

AH1, Comments:

The proposed area (126 acres) contains 1 acre of mountain goat winter habitat (0.4% of the area) and 0 acres of brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 3,553 acres) 1,038 acres of mountain goat winter habitat (29.2%), 186 acres of brown bear denning habitat (5.2%) and 1,080 acres of combined habitat (30.4%) were present. No brown bear dens were observed within the 1,500m buffer. Mountain goats have been observed within the 1,500m buffer during fall surveys. This area has the potential to disturb denning brown bears and is likely to disturb overwintering mountain goats.

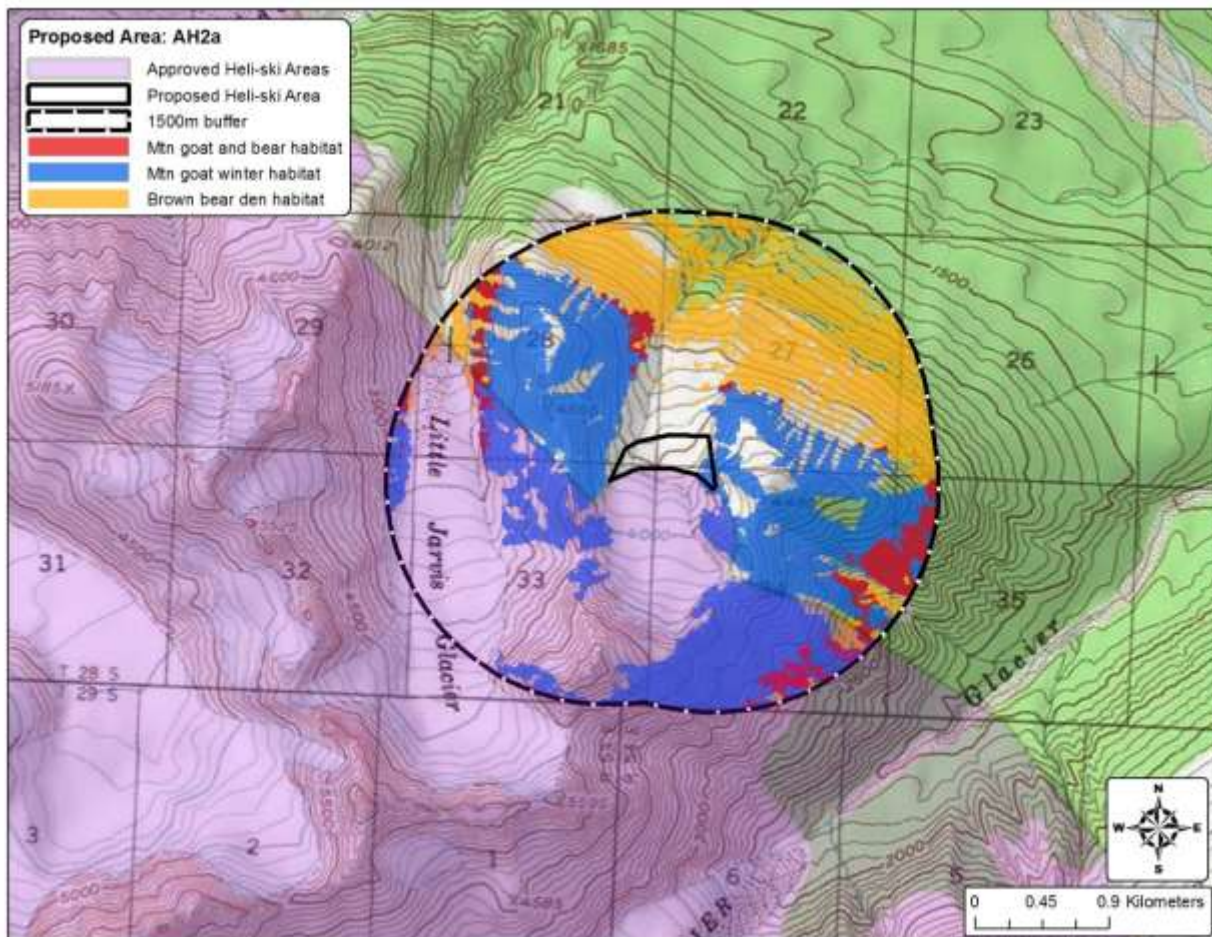
Proposed Area: AH1 (Porcupine), area size = 126 acres, 1,500m buffer size = 3,553 acres						
Area	Mountain goat		Brown bear		Combined	
	acres	% of area	acres	% of area	acres	% of area
Proposed Area	1	0.4%	0	0.0%	1	0.4%
1,500 m buffer	1,038	29.2%	186	5.2%	1,080	30.4%



AH2A, Comments:

The proposed area (35 acres) contains 3 acres of mountain goat winter habitat (9.0% of the area) and 0 acres of brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size =2478 acres) 928 acres of mountain goat winter habitat (37.3%), 585 acres of brown bear denning habitat (23.5%) and 1,406 acres of combined habitat (56.5%) were present. ADF&G did not observe any bear dens or mountain goats within the 1,500m buffer during fall surveys. This area may potentially disturb both denning brown bears and overwintering mountain goats.

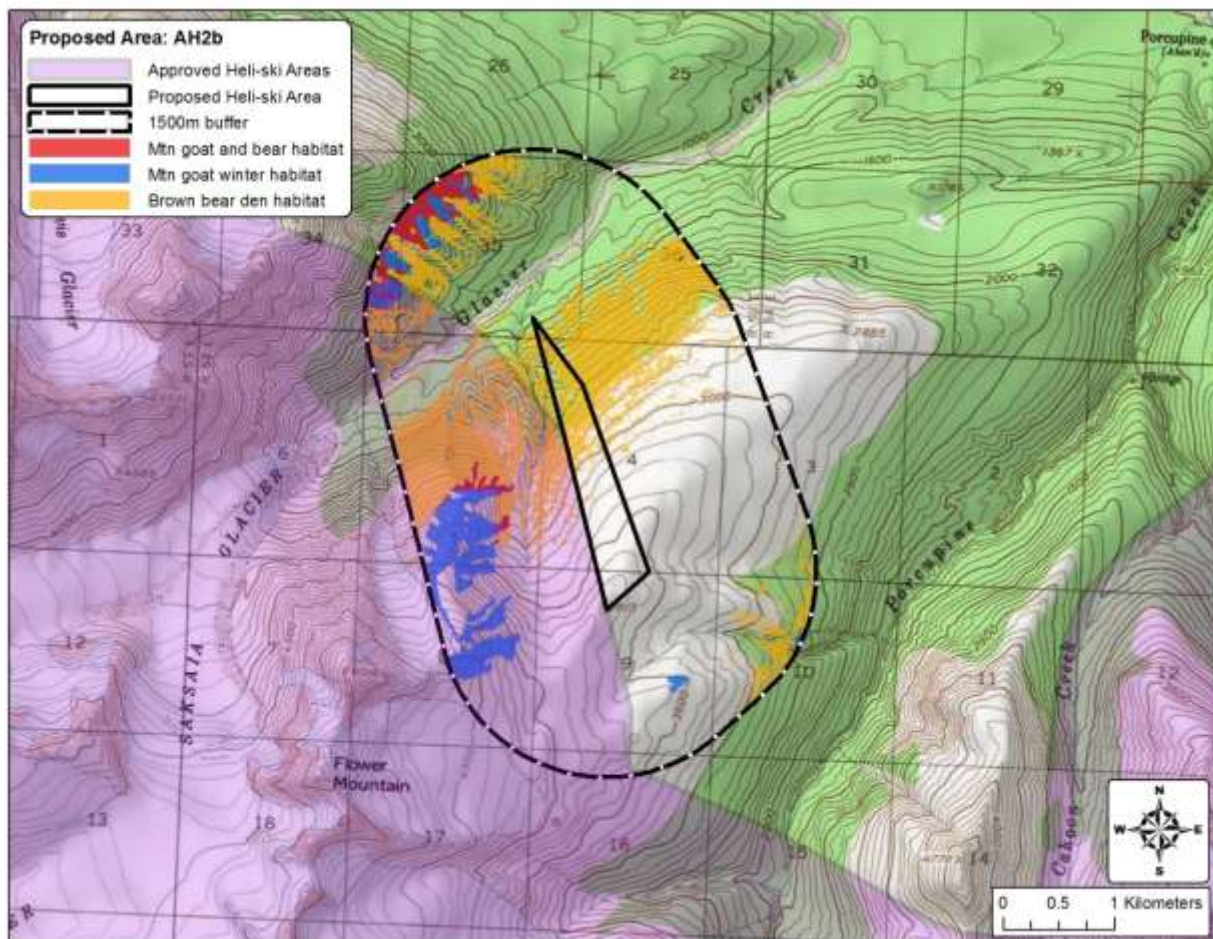
Proposed Area: AH2a (Porcupine), area size = 35 acres, 1,500m buffer size = 2,487 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	3	9.0%	0	0.0%	3	9.0%	
1,500 m buffer	928	37.3%	585	23.5%	1,406	56.5%	



AH2B, Comments:

The proposed area (193 acres) contains 0 acres of mountain goat winter habitat and 56 acres of brown bear denning habitat (28.9% of the area). Within 1,500m of the proposed area (inclusive area size = 4,062 acres) 263 acres of mountain goat winter habitat (6.5%), 992 acres of brown bear denning habitat (24.4%) and 1,184 acres of combined habitat (29.2%) were present. Brown bear denning habitat occurs within the AH2B and 3 brown bear dens were observed within the 1,500m buffer one of which is in the area currently approved for heli-skiing. The addition of this site is likely to disturb denning brown bears and has the potential to disturb overwintering mountain goats.

Proposed Area: AH2B (Porcupine), area size = 193 acres, 1,500m buffer size = 4,062 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	0	0.0%	56	28.9%	56	28.9%	
1,500 m buffer	263	6.5%	992	24.4%	1,184	29.2%	

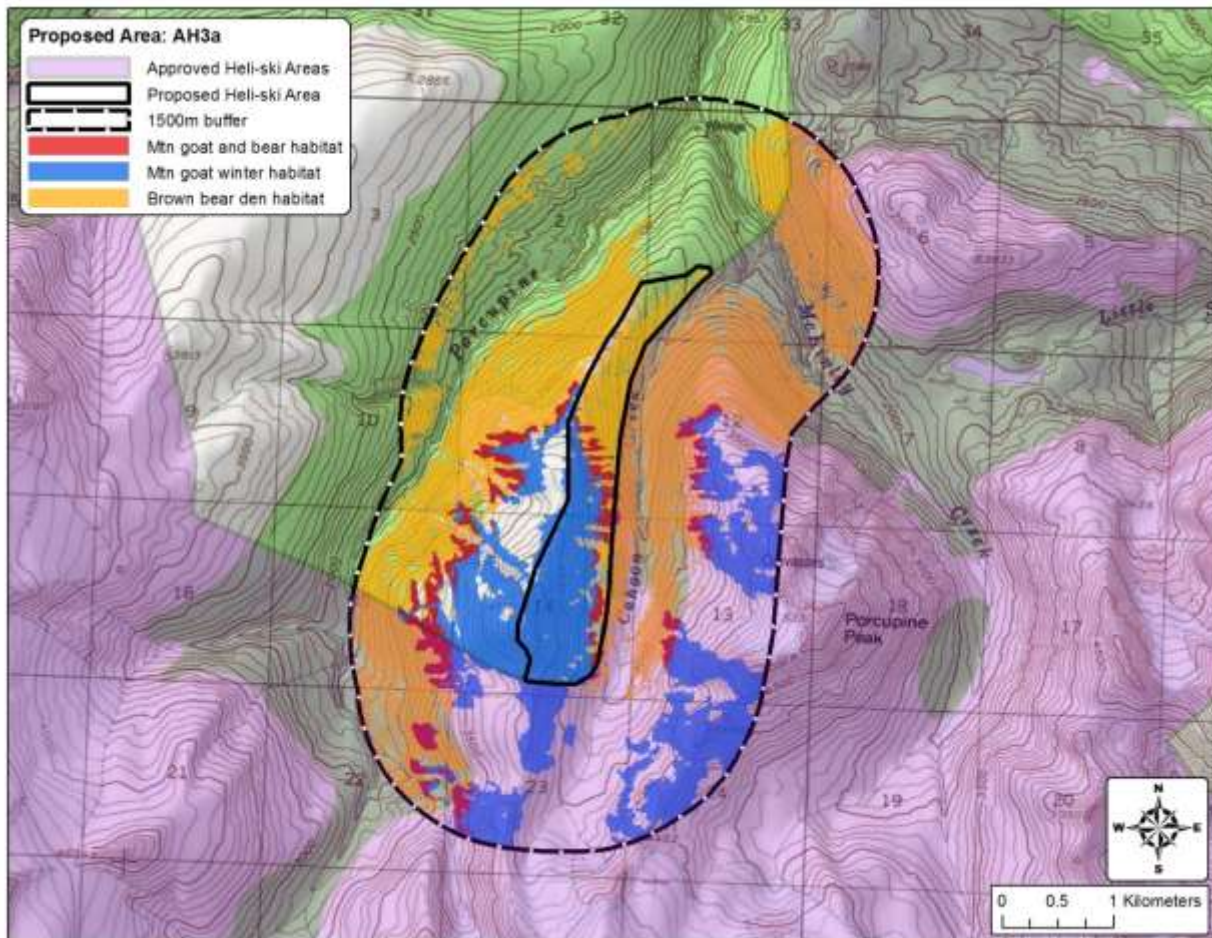


AH3a, Comments:

The proposed area (477 acres) contains 270 acres of mountain goat winter habitat (56.7% of the area) and 175 acres of brown bear denning habitat (36.7% of the area); there are 409 acres (85.7% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 5,561 acres) 1,220 acres of mountain goat winter habitat (21.9%), 2,117 acres of brown bear denning habitat (38.1%) and 3,134 acres of combined habitat (56.4%) were present. GPS data indicates that mountain goats overwinter in the proposed area and in 2017 during an aerial survey we observed a female brown bear with 3 cubs in the proposed area, and 2 brown bear dens were observed within the 1,500m buffer. This site is likely to disturb both overwintering mountain goats and denning brown bears.

Proposed Area: AH3a (Porcupine), area size = 477 acres, 1,500m buffer size = 5,561 acres

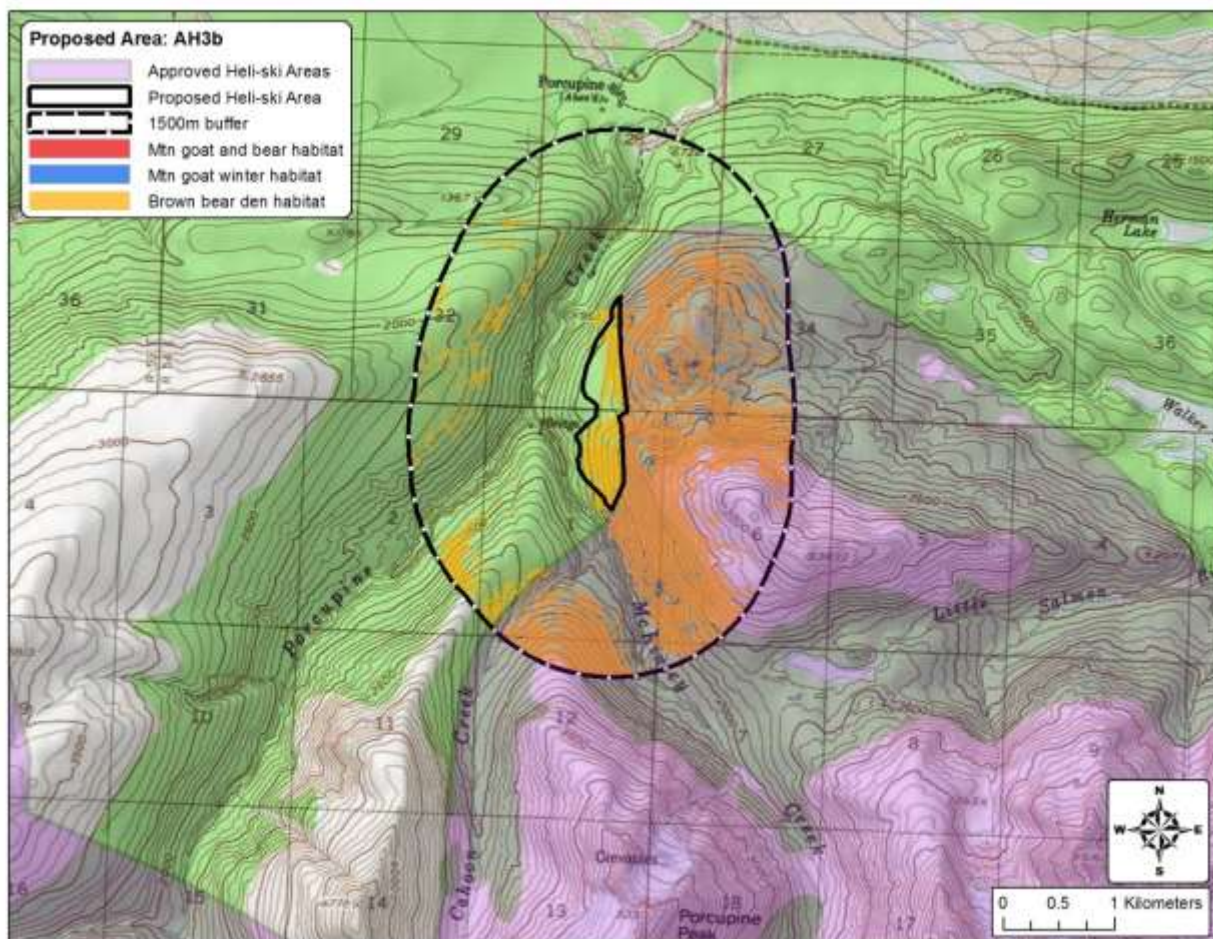
Area	Mountain goat		Brown bear		Combined	
	acres	% of area	acres	% of area	acres	% of area
Proposed Area	270	56.7%	175	36.7%	409	85.7%
1,500 m buffer	1,220	21.9%	2,117	38.1%	3,134	56.4%



AH3b, Comments:

The proposed area (124 acres) contains 0 acres of mountain goat winter habitat and 79 acres of brown bear denning habitat (63.9% of the area). Within 1,500m of the proposed area (inclusive area size = 3,380 acres) 0 acres of mountain goat winter habitat and 1,038 acres of brown bear denning habitat (30.7%). No mountain goat observations or brown bear dens were observed within the 1,500m buffer. This site has the potential to disturb denning brown bears.

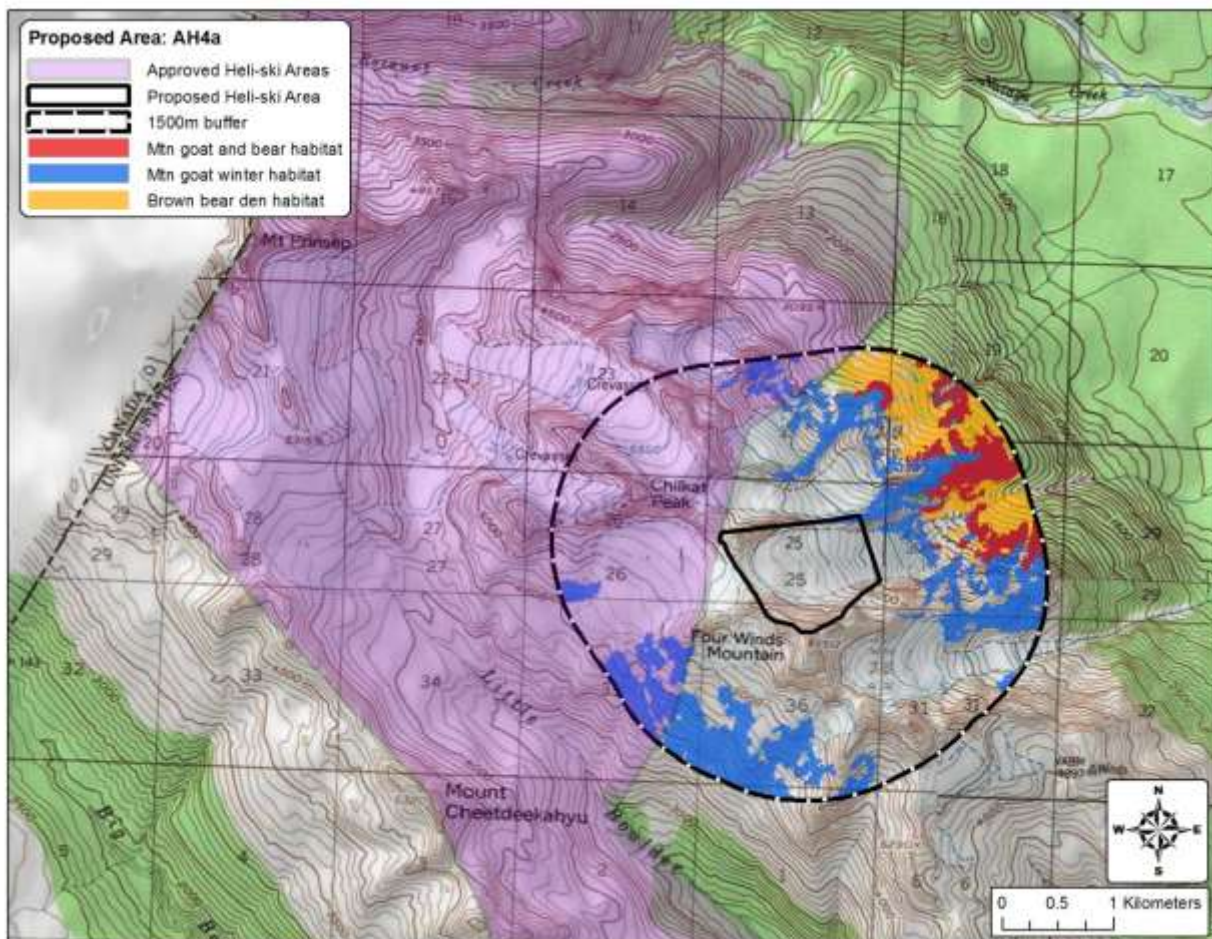
Proposed Area: AH3b (Porcupine), area size = 124 acres, 1,500m buffer size = 3,380 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	0	0.0%	79	63.9%	79	63.9%	
1,500 m buffer	0	0.0%	1,038	30.7%	1,038	30.7%	



AH4a, Comments:

The proposed area (242 acres) contains 4 acres of mountain goat winter habitat (1.6% of the area) and 0 acres of brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 3450 acres) 764 acres of mountain goat winter habitat (22.1%), 353 acres of brown bear denning habitat (10.2%) and 967 acres of combined habitat (28.0%) were present. One brown bear den was observed within the 1,500m buffer. GPS data indicates that mountain goats overwintered within the 1,500m buffer. The addition of this site is likely to disturb overwintering mountain goats and denning brown bears.

Proposed Area: AH4a (Four Winds), area size = 242 acres, 1,500m buffer size = 3,450 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	4	1.6%	0	0.0%	4	1.6%	
1,500 m buffer	764	22.1%	353	10.2%	967	28.0%	

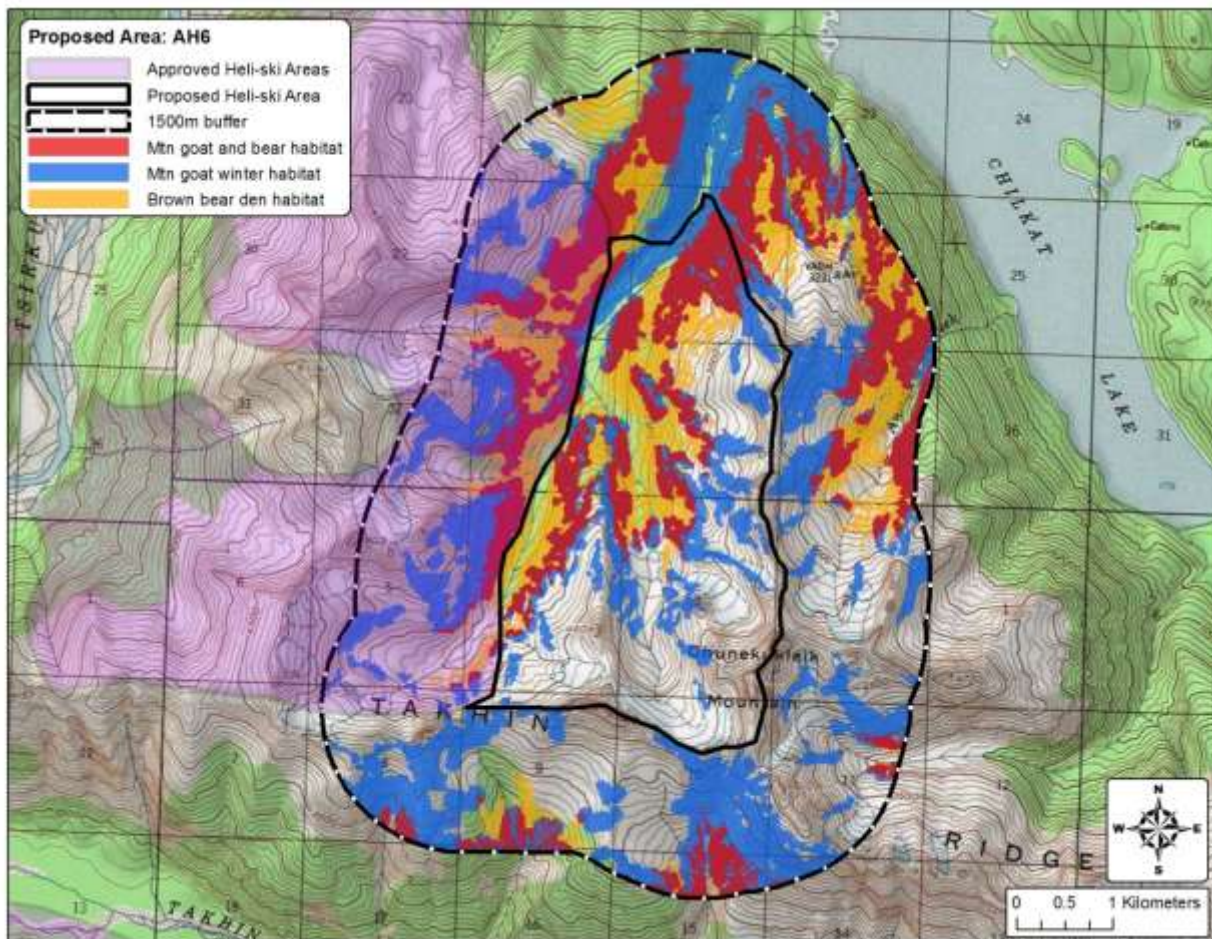


AH6, Comments:

The proposed area (2,943 acres) contains 1,045 acres of mountain goat winter habitat (35.5% of the area) and 915 acres of brown bear denning habitat (31.1% of the area); there are 1,446 acres (49.2% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 10,493 acres) 4,405 acres of mountain goat winter habitat (42.0%), 2,909 acres of brown bear denning habitat (27.7%) and 5,533 acres of combined habitat (52.7%) were present. Mountain goats were observed throughout the proposed area during fall aerial surveys and 8 brown bear dens were observed within the 1,500m buffer. This site is likely to disturb affect both overwintering mountain goats and denning brown bears.

Proposed Area: AH6 (Takhin Ridge), area size = 2,943 acres, 1,500m buffer size = 10,493 acres

Area	Mountain goat		Brown bear		Combined	
	acres	% of area	acres	% of area	acres	% of area
Proposed Area	1,045	35.5%	915	31.1%	1,446	49.2%
1,500 m buffer	4,405	42.0%	2909	27.7%	5,533	52.7%

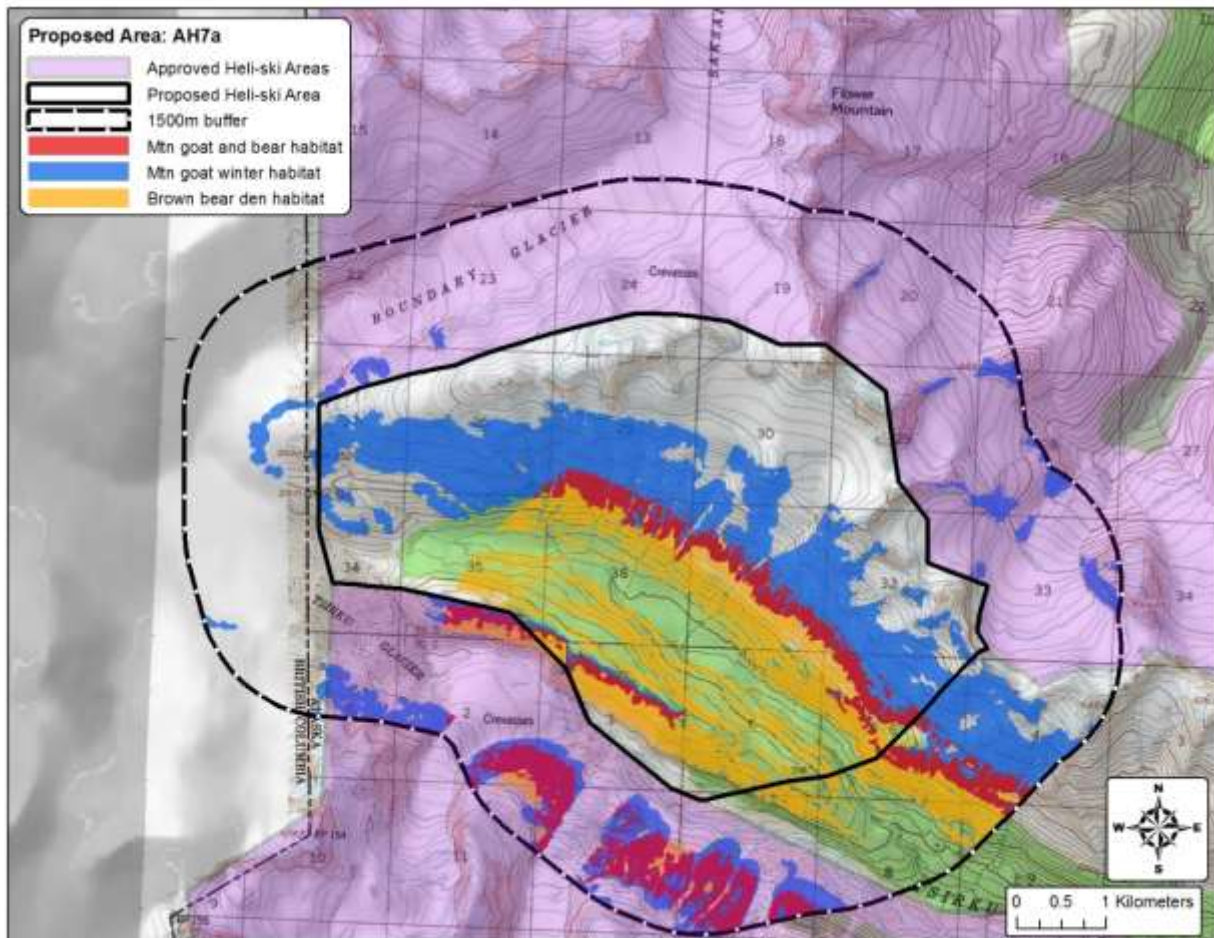


AH7a, Comments:

The proposed area (6,603 acres) contains 1,830 acres of mountain goat winter habitat (27.7% of the area) and 1,431 acres of brown bear denning habitat (21.7% of the area); there are 2,930 acres (44.4% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 16,116 acres) 3,285 acres of mountain goat winter habitat (20.4%), 2,264 acres of brown bear denning habitat (14.0%) and 4,697 acres of combined habitat (29.1%) were present. Mountain goats were observed within the proposed area and the 1500m buffer during fall aerial surveys. No brown bear dens were observed within the 1,500m buffer. This site is likely to disturb overwintering mountain goats and has the potential to disturb denning brown bears.

Proposed Area: AH7a (Porcupine), area size = 6,603 acres, 1,500m buffer size = 16,116 acres

Area	Mountain goat		Brown bear		Combined	
	acres	% of area	acres	% of area	acres	% of area
Proposed Area	1,830	27.7%	1,431	21.7%	2,930	44.4%
1,500 m buffer	3,285	20.4%	2,264	14.0%	4,697	29.1%

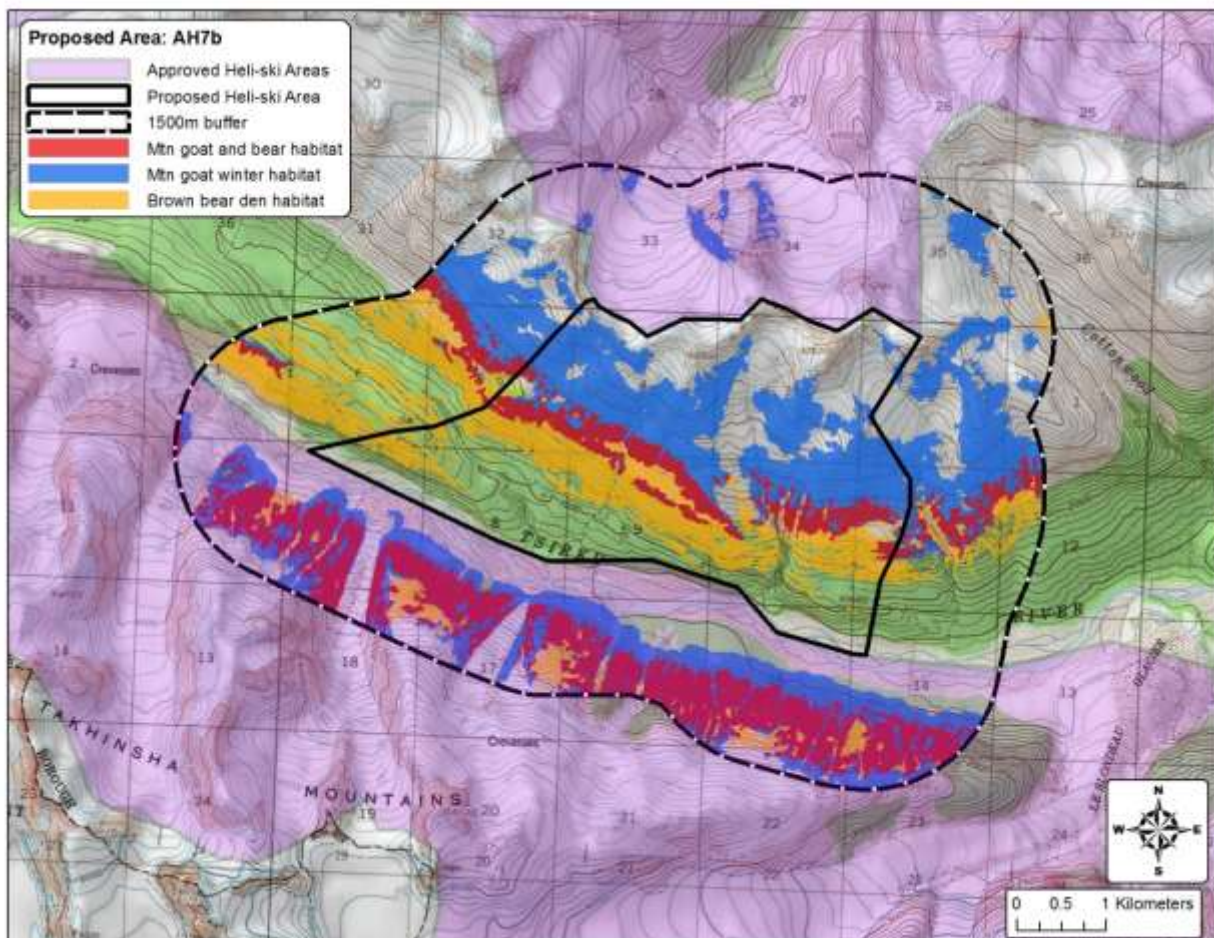


AH7b, Comments:

The proposed area (3,674 acres) contains 1,225 acres of mountain goat winter habitat (33.6% of the area) and 905 acres of brown bear denning habitat (24.8% of the area); there are 1,819 acres (49.9% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 12,206 acres) 4,064 acres of mountain goat winter habitat (33.3%), 2,911 acres of brown bear denning habitat (23.9%) and 5,410 acres of combined habitat (44.3%) were present. Mountain goats were observed within the proposed area and the 1500m buffer during fall aerial surveys. No brown bear dens were observed within the 1,500m buffer. This site is likely to disturb overwintering mountain goats and has the potential to disturb denning brown bears.

Proposed Area: AH7b (Porcupine), area size = 3,647 acres, 1,500m buffer size = 12,206 acres

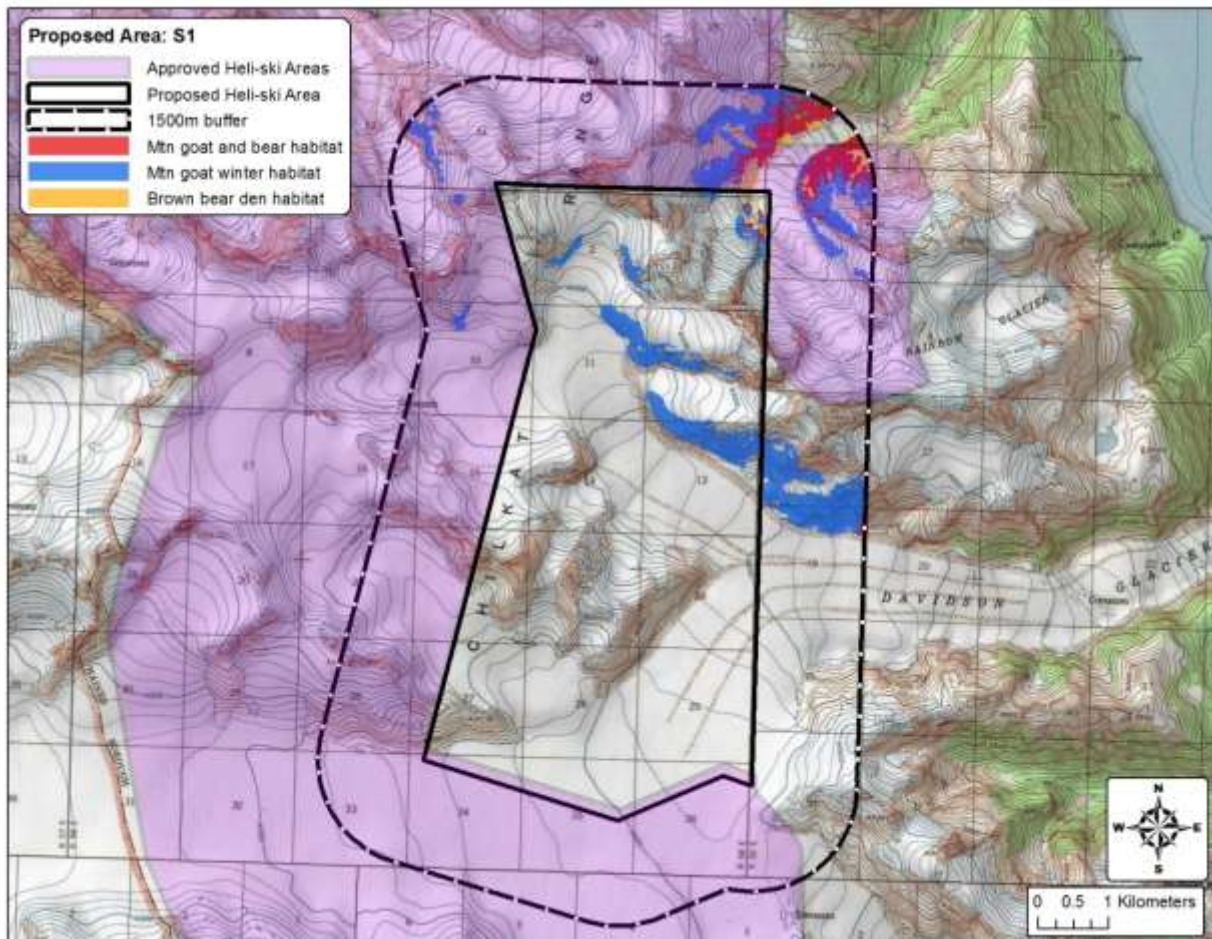
Area	Mountain goat		Brown bear		Combined	
	acres	% of area	acres	% of area	acres	% of area
Proposed Area	1,225	33.6%	905	24.8%	1,819	49.9%
1,500 m buffer	4,064	33.3%	2,911	23.9%	5,410	44.3%



S1, Comments:

The proposed area (8,322 acres) contains 336 acres of mountain goat winter habitat (4.0% of the area) and 15 acres of brown bear denning habitat (0.2% of area); there are 342 acres (4.1% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 19,620 acres) 1,254 acres of mountain goat winter habitat (6.4%), 304 acres of brown bear denning habitat (1.6%) and 1,311 acres of combined habitat (6.7%) were present. No brown bear dens were observed within the 1,500m buffer. This site has the potential to disturb overwintering mountain goats and denning brown bears.

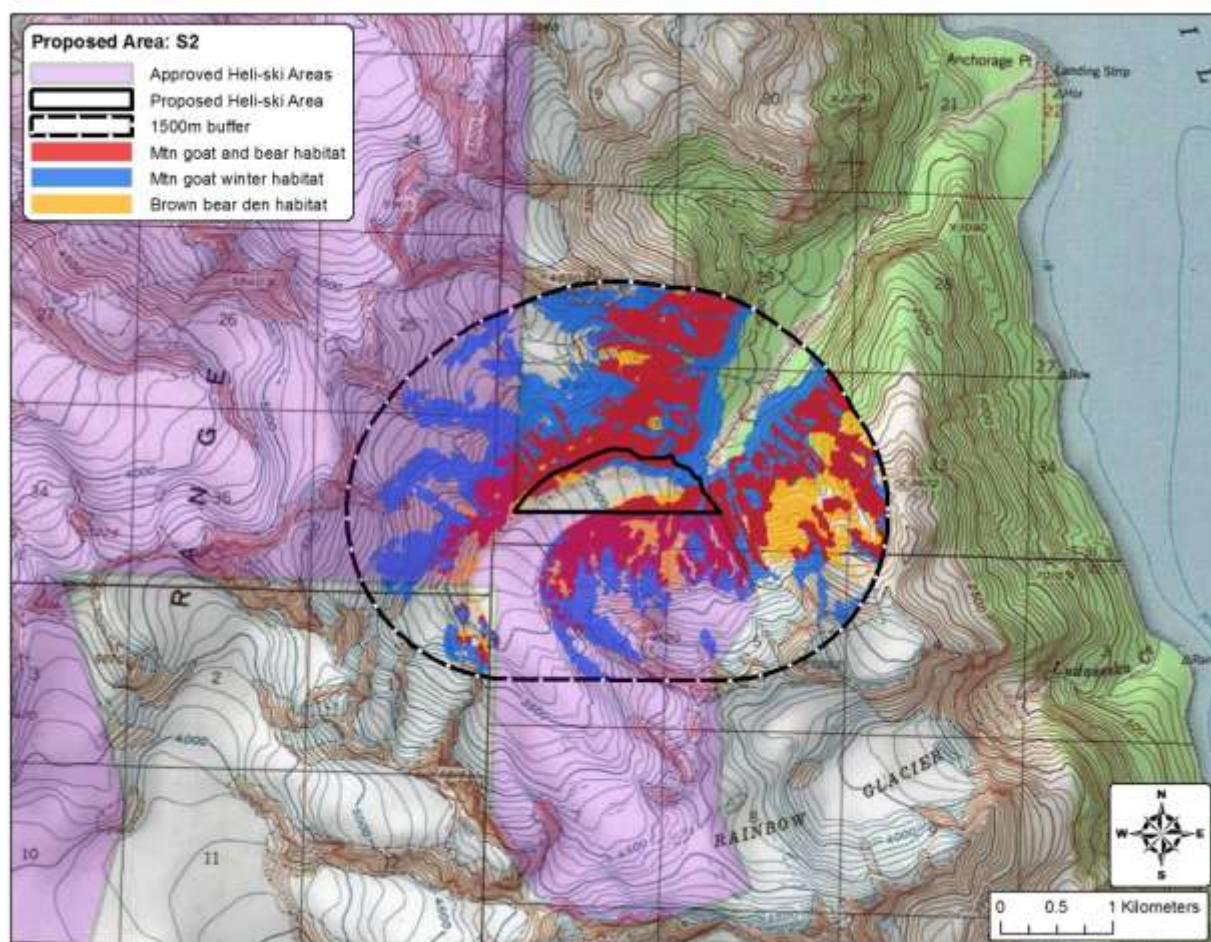
Proposed Area: S1 (Takhinsha), area size = 8,322 acres, 1,500m buffer size = 19,620 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	336	4.0%	15	0.2%	342	4.1%	
1,500 m buffer	1,254	6.4%	304	1.6%	1,311	6.7%	



S2, Comments:

The proposed area (174 acres) contains 84 acre of mountain goat winter habitat (48.1% of the area) and 74 acres of brown bear denning habitat (42.3% of the area); there are 99 acres (56.9% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 3,456 acres) 1,766 acres of mountain goat winter habitat (51.1%), 1,052 acres of brown bear denning habitat (30.4%) and 1,983 acres of combined habitat (57.4%) were present. No brown bear dens were observed within the 1,500m buffer. Mountain goats have been observed within 1,500m during fall aerial surveys. This site is likely to disturb overwintering mountain goats and has the potential to disturb denning brown bears.

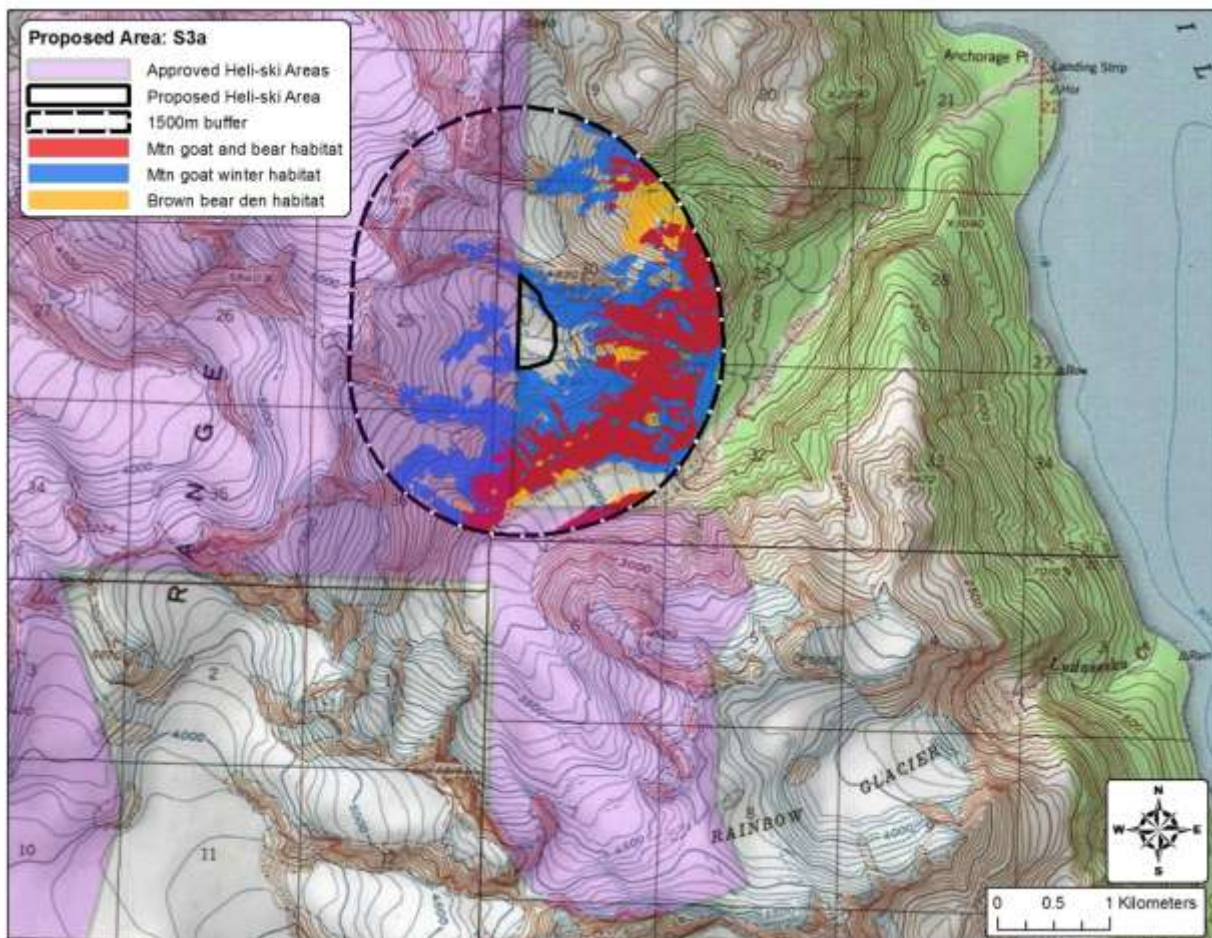
Proposed Area: S2 (Takhinsha), area size = 174 acres, 1,500m buffer size = 3456 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	84	48.1%	74	42.3%	99	56.9%	
1,500 m buffer	1766	51.1%	1052	30.4%	1983	57.4%	



S3a, Comments:

The proposed area (48 acres) contains 6 acre of mountain goat winter habitat (13.2% of the area) and 0 acres of brown bear denning habitat; there are 6 acres (13.2% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 2538 acres) 1058 acres of mountain goat winter habitat (41.7%), 547 acres of brown bear denning habitat (21.6%) and 1140 acres of combined habitat (44.9%) were present. No brown bear dens were observed within the 1,500m buffer. Mountain goats have been observed within 1,500m buffer during fall aerial surveys. This site is likely to disturb overwintering mountain goats and has the potential to disturb denning brown bears.

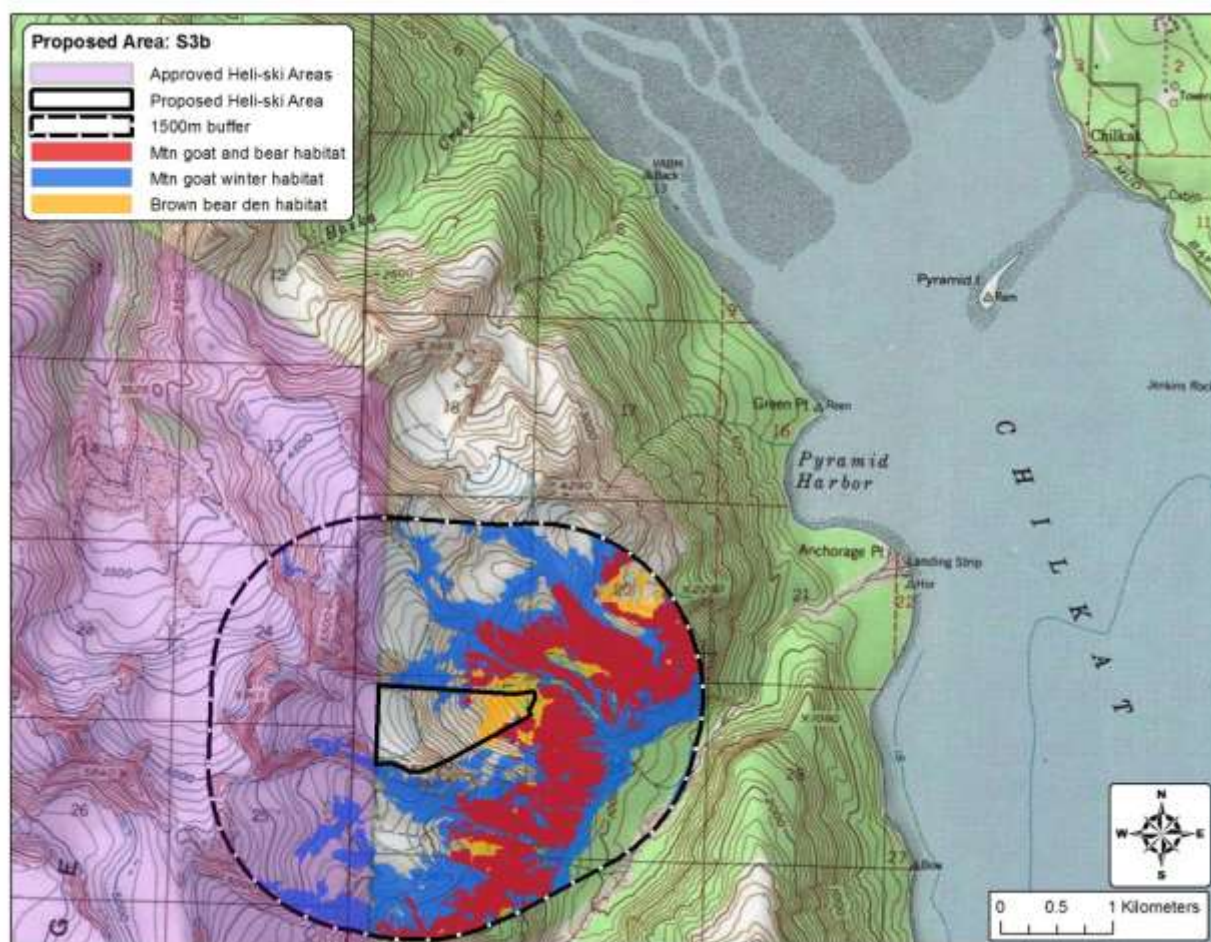
Proposed Area: S3a (Takhinsha), area size = 48 acres, 1,500m buffer size = 2538 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	6	13.2%	0	0.0%	6	13.2%	
1,500m buffer	1058	41.7%	547	21.6%	1140	44.9%	



S3b, Comments:

The proposed area (187 acres) contains 13 acres of mountain goat winter habitat (7.0% of the area) and 35 acres of brown bear denning habitat (18.6 % of the area); there are 45 acres (23.9% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 3359 acres) 1454 acres of mountain goat winter habitat (43.3%), 758 acres of brown bear denning habitat (22.6%) and 1560 acres of combined habitat (46.4%) were present. Two brown bear dens were observed within the 1,500m buffer. Mountain goats have been observed within the 1,500m buffer during fall aerial surveys. This site is likely to disturb overwintering mountain goats and denning brown bears.

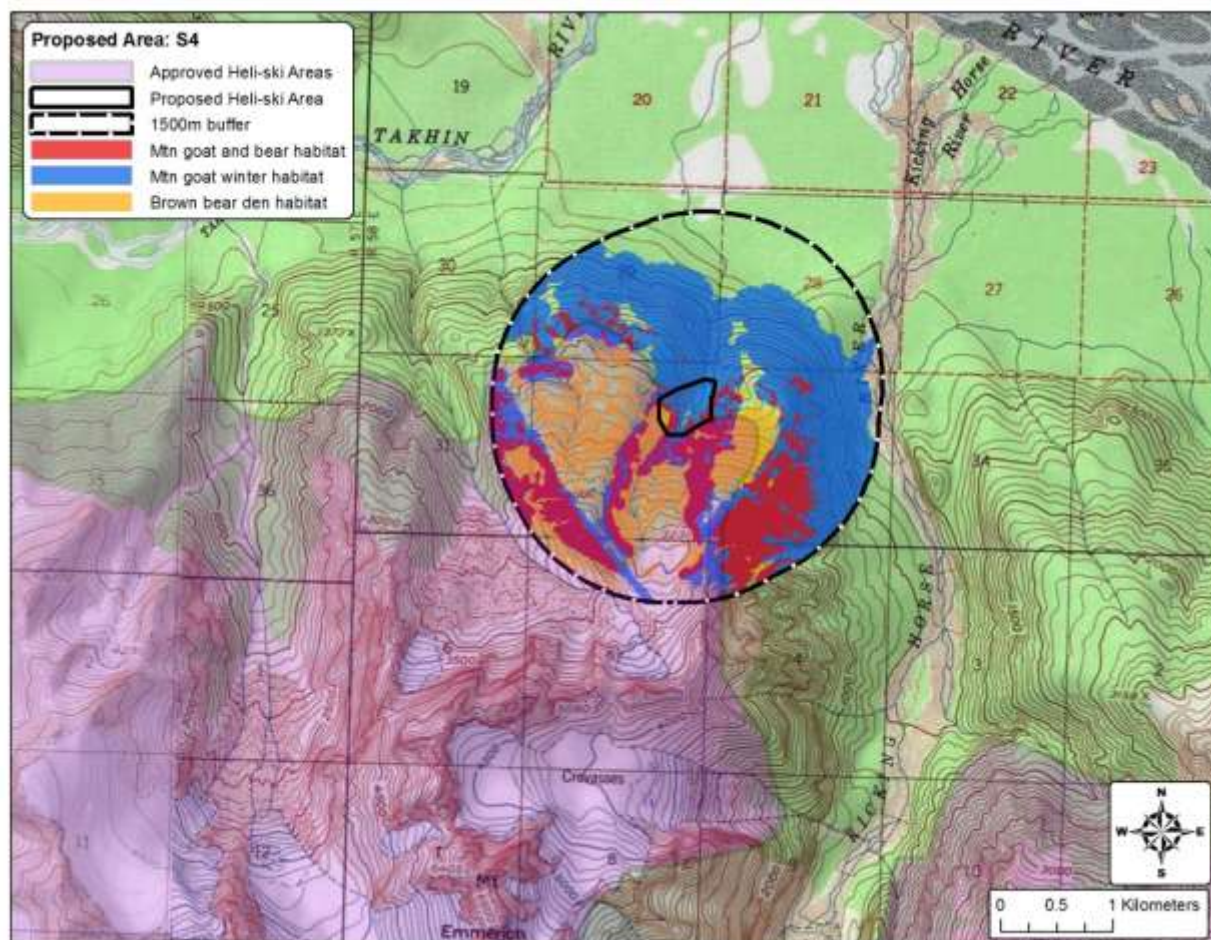
Proposed Area: S3b (Takhinsha), area size = 187 acres, 1,500m buffer size = 3359 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	13	7.0%	35	18.6%	45	23.9%	
1,500 m buffer	1454	43.3%	758	22.6%	1560	46.4%	



S4, Comments:

The proposed area (43 acres) contains 40 acres of mountain goat winter habitat (91.7% of the area) and 13 acres of brown bear denning habitat (30.6% of the area); there are 43 acres (98.8% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 2,400 acres) 1,368 acres of mountain goat winter habitat (57%), 801 acres of brown bear denning habitat (33.4%) and 1,732 acres of combined habitat (72.2%) were present. Mountain goats have been observed within the 1,500m buffer. In April of 2016 a skier was mauled by a brown bear that had recently emerged from a den (within 50 m of S4) and 2 dens have been observed within the 1,500m buffer during aerial surveys. This site is likely to adversely affect both overwintering mountain goats and denning brown bears.

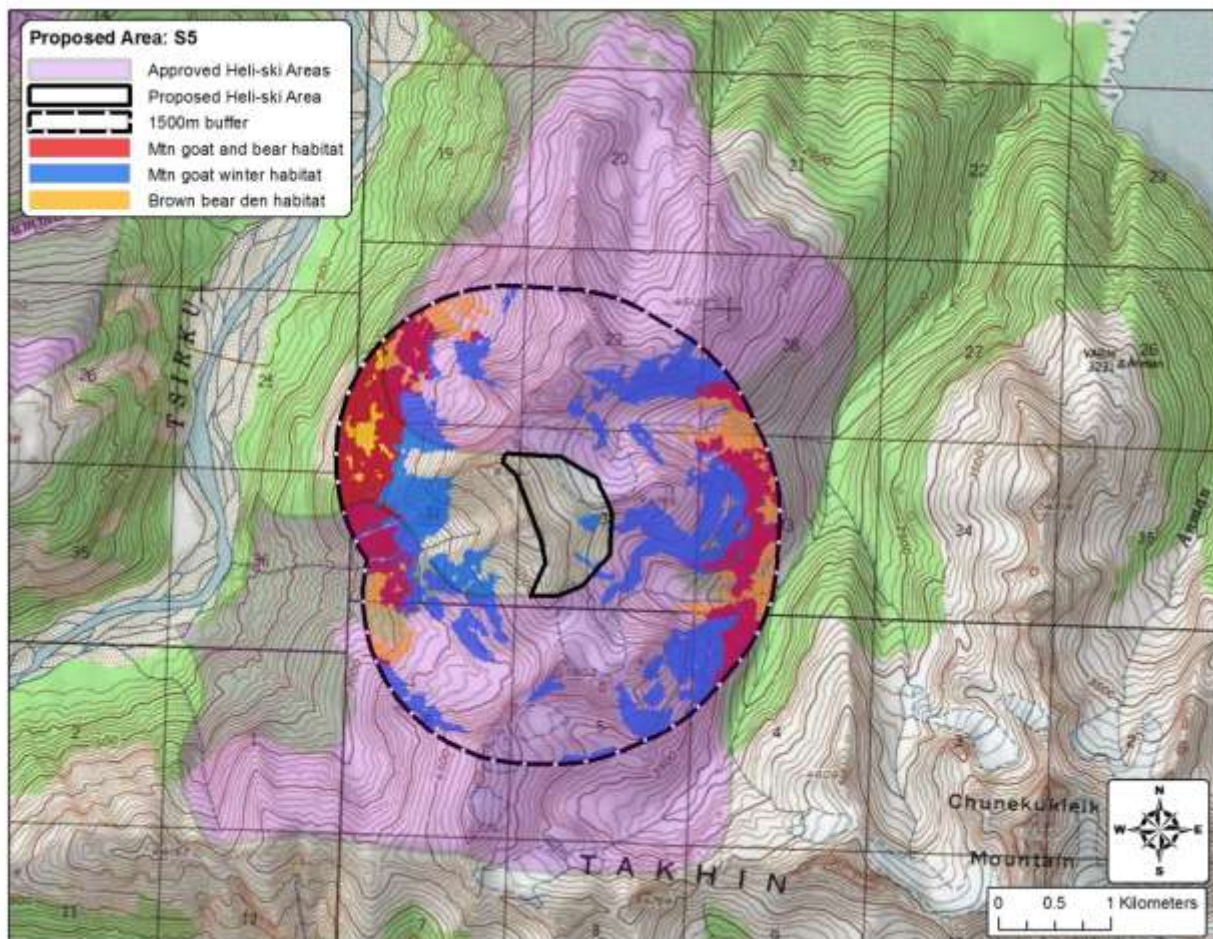
Proposed Area: S4 (Takhinsha), area size = 43 acres, 1,500m buffer size = 2,400 acres						
Area	Mountain goat		Brown bear		Combined	
	acres	% of area	acres	% of area	acres	% of area
Proposed Area	40	91.7%	13	30.6%	43	98.8%
1,500 m buffer	1,368	57.0%	801	33.4%	1,732	72.2%



S5, Comments:

The proposed area (188 acres) contains 8 acres of mountain goat winter habitat (4.4% of the area) and 0 acres of brown bear denning habitat; there are 8 acres (4.4 % of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 3,343 acres) 1,090 acres of mountain goat winter habitat (32.6%), 579 acres of brown bear denning habitat (17.3%) and 1285 acres of combined habitat (38.4%) were present. Two brown bear dens were observed within the 1,500m buffer and mountain goats have been observed within the buffer during fall aerial surveys. This site is likely to disturb overwintering mountain goats and denning brown bears.

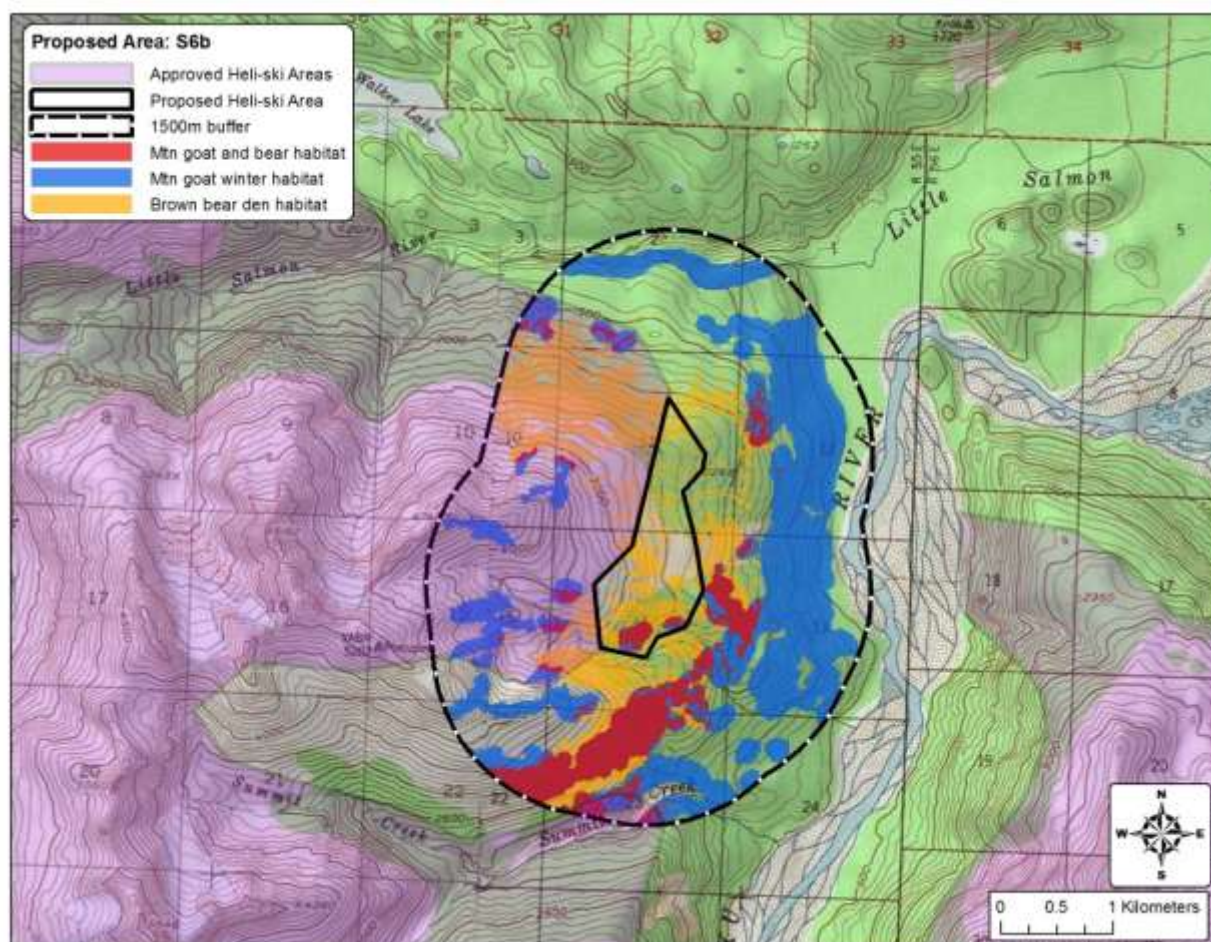
Proposed Area: S5 (Takhin), area size = 188 acres, 1,500m buffer size = 3343 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	8	4.4%	0	0.0%	8	4.4%	
1,500 m buffer	1,090	32.6%	579	17.3%	1,285	38.4%	



S6b, Comments:

The proposed area (299 acres) contains 19 acres of mountain goat winter habitat (6.5% of the area) and 147 acres of brown bear denning habitat (49.1% of the area); there are 150 acres (50.1% of the total area) of combined mountain goat winter and brown bear denning habitat. Within 1,500m of the proposed area (inclusive area size = 4,086 acres) 1,397 acres of mountain goat winter habitat (34.2%), 1,027 acres of brown bear denning habitat (25.1%) and 2,107 acres of combined habitat (51.6%) were present. Based on GPS data mountain goats overwinter within the 1,500 m buffer and one brown bear den was observed within the buffer. This site is likely to disturb overwintering mountain goats and denning brown bears.

Proposed Area: S6b (Porcupine), area size = 299 acres, 1,500m buffer size = 4086 acres							
Area	Mountain goat		Brown bear		Combined		
	acres	% of area	acres	% of area	acres	% of area	
Proposed Area	19	6.5%	147	49.1%	150	50.1%	
1,500 m buffer	1,397	34.2%	1027	25.1%	2,107	51.6%	



This document represents a culmination of several years of research and is an example of the biologically based data and information the Alaska Department of Fish and Game is able to provide as the Borough considers requests that may impact the wildlife resources in the area.

Thank you for reviewing the updated information provided here and feel free to contact me or my staff (Stephanie Sell-Area Biologist, Carl Koch-Assistant Area Biologist, Anthony Crupi-Bear Research Biologist, or Kevin White-Mountain Goat Research Biologist) if you have any questions. I can be reached by phone at (907) 465-4359 or email at ryan.scott@alaska.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Ryan Scott", with a stylized flourish at the end.

Ryan Scott
Southeast Regional Supervisor

cc: Scott Sunberg, SEABA, Haines
Sean Brownell, Alaska Heliskiing, Haines
Sean Gaffney, Alaska Mountain Guides, Haines
Eric Holley, LCC, Haines
Kimberly Strong, Chilkat Indian Village of Klukwan, Klukwan
Derek Poinsette, Takshanuk Watershed Council, Haines
Tim McDonough, Haines-Skagway, Haines
Ryan Cook, Haines-Skagway AC, Haines
Bruce Dale, ADF&G, Palmer
Marla Carter, ADF&G, Anchorage
Jesse Hankins, BLM, Glennallen
Steve Winker, DNR, Juneau
Ben White, DNR, Juneau