



Photo 5.3-2: Possible historic wolf den at quarry site Q20-21, August 2020.

5.4.1 Mitigation for Blasting

Prior to any quarry blasting in 2020, surveys for wildlife were conducted by Sabina personnel to identify if wildlife were present. If animals were within a “trigger distance” of quarries, then certain mitigation applied.

During pre-construction, only quarry blasting occurred. Trigger distances and management actions for quarries are summarized in Table 5.4-1.

5.4.2 Monitoring Prior to Blasting

5.4.2.1 Methods

Blasting at the Goose Site occurred in outcrops of suitable, exposed rock. Prior to blasts, Sabina personnel conducted a height of land survey of the surrounding tundra for caribou or other wildlife (muskox, grizzly bear, or wolverine). If any caribou or wildlife were observed, management actions described in Table 5.4-1 would be followed.

5.4.2.2 Results and Discussion

Blasting at the Goose Site occurred on 32 occasions between July 26 and December 8, 2020 (two days in July, seven days in August, two days in September, eight days in October, nine days in November, four days in December). Blasting occurred at the Airport Quarry (12 blasts), the Box Cut (11 blasts), and the Tank Pad (nine blasts). Table 5.4-2 summarizes all blasting activity in 2020.

No caribou were observed during pre-blast surveys in 2020; however, all operations throughout the Goose Site, including blasting, were suspended on August 2 due to the presence of caribou in the area (see Section 4.1 for additional information).

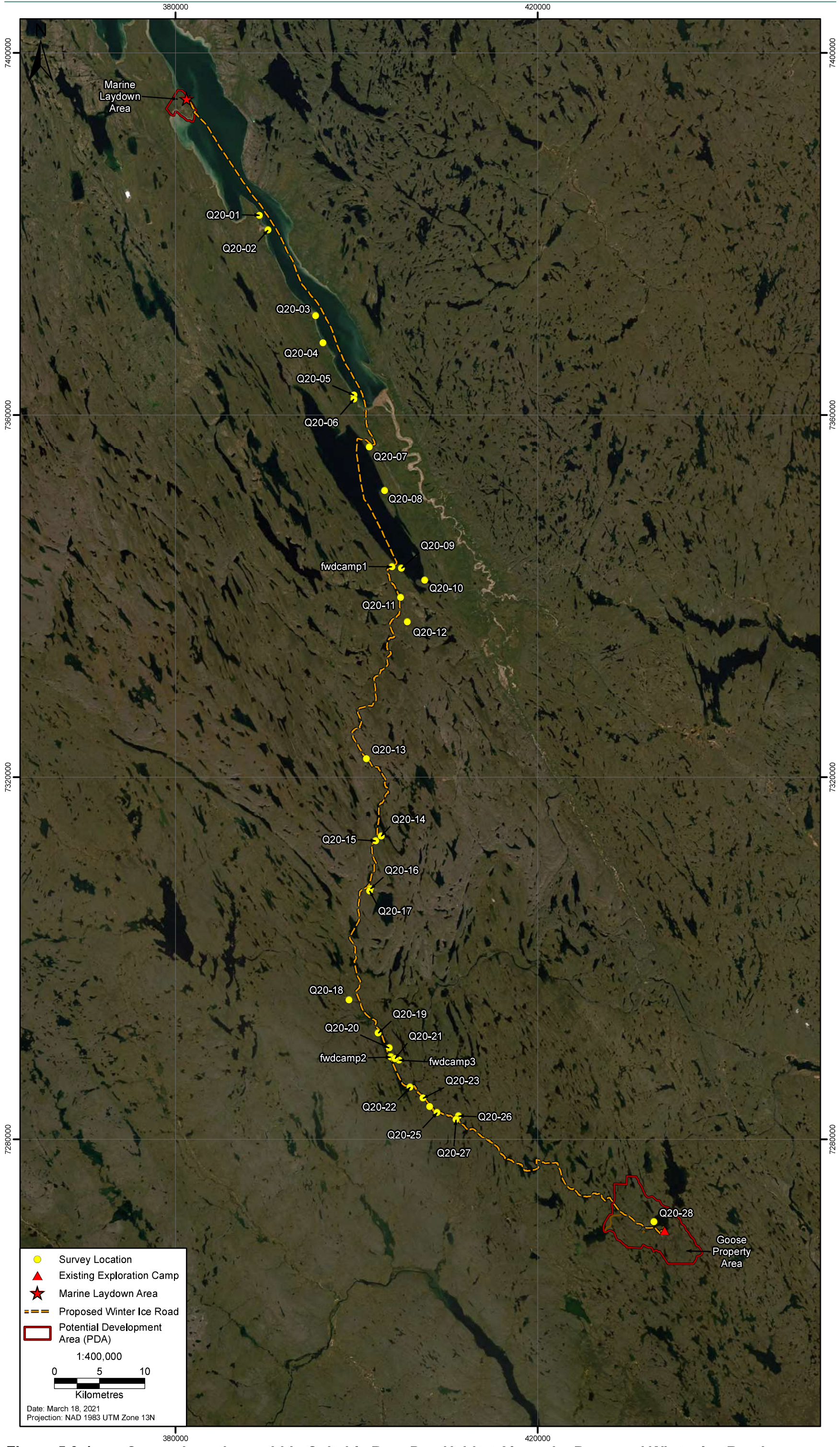


Figure 5.3-1 **Survey Locations within Suitable Bear Den Habitat Along the Proposed Winter Ice Road, August 2020**

Table 5.4-1: Management of Blasting When Wildlife Are Observed

Species	Timing Window	Number of Animals	Distance	Notes
Caribou	Calving (June 5-15)	≥10 breeding female	≤2.5 km	Stop blasting until animals leave.
Caribou	All year	Group of ≥25 animals	≤2.5 km	Stop blasting until animals leave.
Caribou	All year	1-25 animals	≤2.5 km	Conduct behavioural monitoring. Blasting can proceed.
Caribou, muskox, grizzly bear or wolverine	All year	≥1	Blast safety distance (~500 m)*	If ≥1 animal is observed in the blast safety distance, then delay the blast until animals leave.

* Note, the blast safety distance is often 500 m or greater, but is determined on a case by case basis by the blasting manager.

Table 5.4-2: Summary of Blasting Activity at the Goose Site, July to December, 2020

Month When Blasting Occurred	Number of Days with Blasting
Airport Quarry	
July	2
August	7
September	1
October	2
Box Cut	
September	1
October	5
November	4
December	1
Tank Pad	
October	1
November	5
December	3
Grand Total	32

5.5 Camp and Waste Management

NIRB Condition #48 requires Sabina to limit the attractiveness of the site to wildlife. The WMMP Plan includes design mitigation and management to reduce the attractiveness of the Goose and MLA camps and infrastructure to wildlife. This is an important safety issue because grizzly bears and wolverine can be attracted to camps. To accomplish this, Sabina conducted the following:

- Managed the camp to reduce attractiveness (Section 5.5.1.1).
- Reviewed waste management during routine inspections (Section 5.5.1.2).
- Conducted monitoring for grizzly bears and wolverine in the vicinity of the camp (Section 5.5.2).

5.5.1 Mitigation for Attractants

5.5.1.1 Mitigating Attractants

Section 9.1.7 of the WMMP Plan lists the mitigation to be conducted on site starting during construction of the project. During the pre-construction phase, Sabina used mitigation measures appropriate to the activities being conducted at the Goose Site and the MLA, including the following:

- Design mitigation – constructing buildings to exclude wildlife and skirting buildings.
- Mitigating attractants – storing wastes in bear-proof containers, keeping the camp clean, incinerating wastes and disposing non-wildlife attracting wastes in approved landfills.

Photos of the Goose Camp and the MLA are provided in Photos 5.5-1 through 5.5-5, to illustrate that the camps were kept clean and free of attractants for wildlife.



Photo 5.5-1: Goose Camp.

5.5.1.2 Review of Camp Management and Adaptive Management

The following Standard Operating Procedure (SOP) for waste management was reviewed and updated in 2020, in response to comments from the NIRB in 2020:

- The Back River Project; Waste Management SOP (#ENVIRO-08) defines the management and operational processes for waste management to reduce the risks associated with the various safety hazards to people and environmental aspects identified at the Back River Project as they relate to regional wildlife (last revision: July 2020; Appendix 5D).

In addition, Sabina provided photo logs and descriptions to the NIRB and the KIA regarding cleanliness of the camp and potential wildlife interactions, in-line with previous annual inspections, and included checklists created by the NIRB and KIA. No waste management concerns were identified in 2020.



Photo 5.5-2: Exploration drilling fuel laydown area, Goose Camp.



Photo 5.5-3: Goose Camp kitchen and expansion.



Photo 5.5-4: MLA Camp accommodations.



Photo 5.5-5: MLA Camp at Bathurst Inlet.

5.5.2 Monitoring for Grizzly Bears and Wolverine

5.5.2.1 Methods

Camp personnel reported incidental observations of grizzly bears and wolverine whenever personnel were on site.

5.5.2.2 Results and Discussion

There were three grizzly bear and five wolverine incidental sightings during 2020 (Section 5.6.2). None of the grizzly bear sightings were inside the camp perimeter. Four of the wolverine sightings were within the camp perimeter: one individual was observed on March 18, 200 yards from the Major Drilling workshop; one was observed on September 1 near the surveyor station; one on October 16 around the box cut; and one was observed on December 7 by the lake in front of Goose Camp. None of the sightings required the use of deterrents, as in all four occasions the wolverines moved away on their own.

There were no reports of repeated sightings of animals over multiple days, animals accessing wastes, or other signs of grizzly bears or wolverine being attracted to the camp or habituated near the camp. Therefore, it is concluded that the measures taken to keep the camp clean and free of attractants were successful. Sabina continues to ensure safety of personnel and wildlife by meeting all waste management requirements and minimizing attractants on site.

5.6 Incidental Observations

All personnel are responsible for recording wildlife sightings in the camp's wildlife logs (Appendices 4A and 5E). These logs provide an indication of the wildlife species that occur in proximity to and interact with Project infrastructure. Caribou are discussed separately in Section 5.6.1, and all other terrestrial mammals are summarized in Section 5.6.2.

Personnel were on site at the Goose Camp in March, and between June and December, and at the MLA from August 22 to August 31, 2020 (Table 5.6-1). The average daily occupancy at the Goose Site throughout the 2020 season was 55 people with a peak of and average of 87 people in September. The 2020 field season consisted of two camp opening events at the Goose Camp: March 5 to March 20 and June 30 to December 14 for a total of 184 operating days.

Table 5.6-1: Average Number of On-site Personnel in 2020

Month	Number of Personnel on Site	
	MLA	Goose
January	-	0
February	-	0
March	-	38
April	-	0
May	-	0
June	-	18
July	-	69
August	10	81
September	-	87
October	-	57

Month	Number of Personnel on Site	
	MLA	Goose
November	-	52
December	-	38

The MLA was opened temporarily for access to Environment Staff to complete environmental work, including pre-clearing den surveys along the WIR. The camp was open between August 22 and 31 with minimal staff (approximately 10 people were on site during the 10 days). Incidental observations are restricted to those periods.

5.6.1 Caribou Observations

Caribou recorded in the Goose Camp wildlife logs for 2020 are summarized in Table 5.6-2. Overall, there was a total of 40 separate incidental observations of caribou of approximately 3,332 animals (Appendix 4A; Section 5.5.1). This does not indicate that 3,332 individual animals were observed, as animals likely were observed on more than one occasion.

Table 5.6-2: Summary of Incidental Observations of Caribou Recorded by Sabina Staff during Each Season in 2020

Season	Locations	Number of Sightings	Total Number of Individuals Observed
Winter (November 1, 2019 – April 14, 2020)	Goose	4	21
Spring Migration (April 15 – June 4, 2020)	Goose	1	2
Calving (June 5 – June 15, 2020)	Goose	0	0
Post-Calving (June 16 – July 20, 2020)	Goose	1	1
Summer (July 21 – August 31, 2020)	Goose	27	3,071
Fall Migration (September 1 – October 31, 2020)	Goose	5	16
Winter (November 1, 2020 – December 31, 2020)*	Goose	2	220
Total		40	3,332

**Winter sightings in November and December 2020 are included in this report, but do not cover the entire 2020-2021 winter season, as the WMMP reporting year ends on December 31, 2020.*

Twenty-seven of the total 40 incidental observations of caribou, accounting for 92% of observed animals (approximately 3,071 animals), occurred during the summer (July 21 to August 31). During the summer period, group sizes ranged from one individual to greater than 1,000 animals, and were observed near Goose Camp, and calves were reported on six occasions (22% of sightings during the summer). This is consistent with the collar data from 2020 (Appendix 5D).

In December 2020, one group of approximately 20 animals was observed over three separate days between December 2 and December 8. In addition, a group of 200 caribou was observed over two separate days on December 8 and 9.

Very few sightings occurred during spring migration (one sighting of two animals), which is in contrast to 2019, when the majority of animals observed (13,310 animals, % of all animals observed) were during spring migration (Table 5.6-3). In 2019, all sightings during the spring migration period were of large groups travelling or feeding, and were all observed between 2 km and 170 km from Goose or MLA camps.

Table 5.6-3: Summary of Incidental Observations of Caribou during Each Season, 2018 to 2020

Season	Number of Sightings			Total Number of Animals Observed		
	2018	2019	2020	2018	2019	2020
Winter	14	4	6	1,603	252	21
Spring Migration	0	18	1	0	13,310	2
Calving	0	4	0	0	1,400	0
Post-Calving	3	4	1	7	7	1
Summer	9	5	27	128	7	3,071
Fall Migration	2	0	5	21	0	16
Total	28	35	40	1,759	14,976	3,111

During the calving season (June 5 to June 15), no caribou were observed in 2020 or in 2018. In 2019, all of the caribou observations (four separate sightings) during the calving season occurred on June 8 between 2 and 4 km from Goose Camp. These sightings of caribou in 2019 were of large groups (greater than 100 or greater than 1,000) travelling past the area (presumably migrating to the calving area), confirming that the Project does not overlap with the calving grounds.

Between 2018 and 2020, winter and summer are the only two seasons when caribou are consistently observed near the project. This is consistent with both collar data and baseline data.

Additional incidental sightings were recorded by ERM field biologists between August 22 and 31 while on site conducting pre-clearing den surveys near the MLA and along the proposed WIR (Table 5.6-4). Sightings included seven incidental observations of caribou (20 individuals).

Table 5.6-4: Summary of Incidental Observations of Caribou Recorded by ERM Field Crew, August 2020

Date	Location	Number Observed
August 22	MLA camp	1
August 24	WIR	8
August 24	WIR	4
August 24	WIR	1
August 26	WIR	1
August 28	WIR	1
August 28	WIR	4

5.6.2 Other Terrestrial Mammal Observations

In addition to caribou, six other terrestrial mammal species were observed in 2020, including fox, grizzly bear, wolverine, muskox, wolf, and weasel, on 37 separate occasions (Table 5.6-5; Appendix 5E).

All observations of terrestrial mammals made by staff were at or near the Goose Site, where the majority of on-site personnel were located throughout the year (Table 5.6-1). The most commonly observed mammals were muskox (289 individuals recorded over 12 separate sightings) and fox (11 animals

recorded over 11 separate sightings). The largest group of animals observed was a group of approximately 50 muskox near drill 1466 at the Goose Site on August 17, 2020.

Table 5.6-5: Summary of Incidental Observations of Terrestrial Mammals in 2020

Mammal	General Locations	Number of Observations	Total Number of Individuals Observed ¹
Unknown Fox ²	Goose	11	11
Grizzly Bear	Goose	3	5
Muskox	Goose	12	289
Weasel	Goose	1	1
Wolf	Goose	5	5
Wolverine	Goose	5	5

Notes:

¹ Note that it is not possible to identify individuals and it is likely that some of the same animals observed were observed on multiple occasions.

² All fox sightings (with the exception of one) were recorded as "fox"; therefore species (i.e., red fox or Arctic fox) are unknown. One of the fox sightings, on November 14, 2020, was recorded as red fox, observed near the camp offices.

Additional incidental sighting recorded by ERM field biologists between August 22 and 31 while on site conducting den suitability surveys near the MLA and along the proposed WIR. Sightings included one incidental observation of muskox (five individuals) along the WIR, and one incidental observation of Arctic hare (two individuals) at the MLA Camp.

Grizzly bear and wolverine are both assessed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and are listed as such on Schedule 1 of the *Species at Risk Act* (SARA; Government of Canada 2019). They are also both territorially ranked as vulnerable (CESCC 2015). There were three observations of grizzly bears in 2020. Two of the observations were of single animals. One sighting involved more than one animal: on October 20, 2020, a sow and two cubs were observed approximately 2 km north of Goose Camp travelling past the area.

There were five sightings of wolverine, each of only one individual, in March, September, October, and December, 2020, all observed near the Goose Site.

6. TERRESTRIAL BIRDS, WATERBIRDS, AND RAPTORS

During 2020, mitigation and monitoring for birds was appropriate for the activities conducted during the pre-construction phase of the project. Specific mitigation and monitoring activities for avian species that occurred in 2020 during the pre-construction phase of the project included the following:

- Aircraft management;
- Pre-clearing surveys; and
- Incidental observations.

6.1 Aircraft Management

As per the Back River Project's NIRB Project Certificate (No. 007) Condition #60 and #61, fixed wing and helicopter aircraft operation guidelines were developed and provided to pilots to guide aircraft operation at the Project. Details regarding general aircraft management methods are described in Section 5.1.

Additional aircraft mitigation for waterbirds as well as a summary of the outcomes of the mitigation includes the following:

- As part of pilot induction, pilots were informed of their responsibilities to monitor, report, and avoid waterbirds.
 - Outcome: An aircraft SOP with maps was provided to pilots that identifies areas with concentrations of waterbirds during certain seasons, including areas such as lakes used for staging by waterbirds.
- Disturbance to colony-nesting birds and important staging areas was reduced during sensitive periods by maintaining an aircraft flight altitude of at least 650 m during horizontal (point to point) flights. The three waterbird staging areas closest to the Project are on Beechey Lake, approximately 35 km south/southwest of the Goose Site, at an unnamed lake approximately 15 km north of the George site and in the cove south of the MLA.
 - Outcome: No fixed wing flights and a low frequency of helicopter flights (approximately one) occurred near these area in 2020 (Figure 5.1-1).
- Pilots reported all incidental sightings of significant aggregations of waterbirds to the Environment Department.
 - Outcome: No incidental observations of birds were reported by pilots in 2020.

6.2 Mitigation for Birds

Two forms of mitigation are generally required for birds: 1) timing ground-clearing outside of the bird breeding season, and 2) management of incidentally observed birds nesting on infrastructure. One pre-clearing survey for nests was conducted in 2020 (Section 6.2-1). There were no birds observed nesting on infrastructure in 2020.

6.2.1 *Pre-clearing Surveys, July 2020*

The WMMP Plan, Section 11.1.3.2, includes a commitment to plan ground clearing/construction of new pads on the tundra outside of the bird breeding season. Ground clearing was required in July in 2020 for construction of the airstrip. Because ground clearing activities were required during the breeding season, pre-clearing surveys were required. Seven transects were surveyed on July 4, 2020 prior to ground clearing activities and no nests observed. The rest of ground clearing activities occurred outside of the breeding bird sensitive period (i.e., after August 15) and no pre-clearing nest surveys were required.

6.3 Incidental Observations of Birds

In 2020, there were two incidental observations of birds recorded. On May 17, 2020, a flock of 200 geese was observed flying overhead at Goose. The species of geese was not determined. On September 4, 2020, another flock of approximately 200 geese was observed flying overhead at Goose. The species of geese was not determined (Appendix 6A). These sightings provide information regarding timing of spring and fall migration. For example, a large flock of approximately 200 geese was observed on the same date (May 17) in 2019. Perhaps this indicates general timing for geese spring migration passing over the Goose Site, and illustrates the importance of recording incidental observations of notable bird sightings.

7. MARINE MAMMALS AND SEABIRDS

No management and monitoring activities for marine mammals and seabirds occurred in 2020 during the pre-construction phase of the Project, as there were no vessels servicing the project, nor was the on-ice airstrip constructed at the MLA; however, if marine wildlife were observed incidentally, these sightings would be recorded in the wildlife camp logs. Marine shipping monitoring and pre-construction surveys and management for seal lairs are discussed below.

7.1 Marine Shipping Mitigation and Monitoring

During 2020, there were no sealifts for the Back River project, therefore no marine mammal or seabird monitoring occurred.

NIRB Conditions #58 and #64 require Sabina to mitigation impacts and disturbance to seabirds and marine mammals during marine shipping.

The objectives of the marine mammal and seabird monitoring program during shipping included the following:

- Recording incidental observations of seabirds and marine mammals in the Northwest Passage made by bridge staff.
- Documenting and reporting measures taken to mitigate impacts to marine mammals and large groups of seabirds.
- Documenting and report ship strikes of marine mammals or seabirds, if they occurred.

Prior to the 2020 shipping season, Sabina updated the marine shipping SOP to improve data collection by the shipping contractors, which describes the management and monitoring requirements for the Project (Appendix 7A). In addition, a brochure was produced in 2020 for the shipping companies to review prior to transit to Bathurst Inlet to ensure captains and crew were aware of Sabina's Project Conditions (Appendix 7B).

7.2 Seal Lair Mitigation and Monitoring

In 2020, Sabina did not construct the on-ice airstrip at the MLA; therefore, no pre-construction surveys were required. In addition, as construction of the WIR between the MLA and the Western River did not occur in 2020, no pre-construction surveys were required.

As part of the operation of the MLA, Sabina may construct an on-ice landing strip for aircraft on the sea ice in front of the MLA and may construct a winter ice road (WIR) to transport equipment and supplies from the MLA to the Goose Site. The WIR travels south on sea ice from the MLA to the mouth of the Western River before heading inland. Construction of both on-ice infrastructure are generally scheduled for December and January of each year they are required, which is prior to the seal pupping season (which begins approximately February 15).

NIRB Condition #63 and the WMMP Plan Section 14.1.3 indicate that if construction of the on-ice landing strip or the WIR occurs during the seal pupping period (i.e., after February 15), then pre-construction surveys will be conducted and construction will be altered to avoid any identified seal lairs. Sabina produced an SOP to guide pre-construction surveys and mitigation for seal lair.

7.3 Incidental Observations

There were no incidental observations of marine mammals recorded in the camp wildlife logs in 2020.

8. SPECIES OF CONSERVATION CONCERN

NIRB Condition #55 requires Sabina to ensure mitigation and monitoring is updated regularly to maintain consistency with changes to species at risk listings. Table 8-1 is an updated version based originally on Table 4.1-1 from the WMMP Plan (Version 9; September 2018, conservation status' in the WMMP Plan are consistent with the 2013 FEIS), and updated annually as part of the WMMP report. This table summarizes the species of conservation concern known to occur or potentially occurring in the Project area, updated annually with any new species additions or status changes as of February 2020.

Table 8-1: Species of Conservation Concern Known or Potentially Occurring at the Project, 2020

VEC or VEC Group	Species	Scientific Name	Federal Designation		Territorial Status ¹
			COSEWIC Status	Species at Risk Act Schedule 1	
Species Confirmed to Occur in the Project Terrestrial or Marine Regional Study Areas					
Caribou (Beverly/ Ahiak herd and Bathurst herd)	n/a	<i>Rangifer tarandus groenlandicus</i>	Threatened	No	Apparently Secure
Grizzly Bear	n/a	<i>Ursus arctos horribilis</i>	Special Concern	Yes	Vulnerable
Wolverine	n/a	<i>Gulo gulo</i>	Special Concern	Yes	Vulnerable
Upland Birds	American Golden-plover	<i>Pluvialis dominica</i>		No	Vulnerable
	Harris’s Sparrow	<i>Zonotrichia querula</i>	Special Concern	No	Unrankable
	Hoary Redpoll	<i>Carduelis homemanni</i>		No	Vulnerable
	Least Sandpiper	<i>Calidris minutilla</i>		No	Vulnerable
	Red-necked Phalarope	<i>Phalaropus lobatus</i>	Special Concern	Yes	Vulnerable
	Semipalmated Sandpiper	<i>Calidris pusilla</i>		No	Vulnerable
Raptors	Golden Eagle	<i>Aquila chrysaetos</i>	Not at Risk	No	Vulnerable
	Peregrine Falcon	<i>Falco peregrinus anatum/tundrius</i>	Not at Risk	Yes	Apparently Secure
	Short-eared Owl	<i>Asio flammeus</i>	Special Concern	Yes	Vulnerable
Seabirds and Seaducks	Common Eider ²	<i>Somateria mollissima</i>		No	Vulnerable

VEC or VEC Group	Species	Scientific Name	Federal Designation		Territorial Status ¹
			COSEWIC Status	Species at Risk Act Schedule 1	
Species that Could Occur in the Project Terrestrial or Marine Regional Study Areas					
Caribou (Bathurst herd)	n/a	<i>Rangifer tarandus groenlandicus</i>	Threatened	No	Apparently Secure
Upland Birds	Black-bellied Plover ²	<i>Pluvialis squatarola</i>		No	Vulnerable
	Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Special Concern	Yes	Vulnerable
	Hoary Redpoll ²	<i>Acanthis hornemanni</i>		No	Vulnerable
	Ruddy Turnstone	<i>Arenaria interpres</i>		No	Vulnerable
	Red Knot	<i>Calidris canutus rufa/islandica</i>	Endangered/ Special Concern	Yes	Imperiled
	Sanderling	<i>Calidris alba</i>		No	Vulnerable
	Snow Bunting	<i>Plectrophenax nivalis</i>		No	Vulnerable
Species that Could Be Encountered along the Project Shipping Route					
Caribou (Dolphin and Union herd)	n/a	<i>Rangifer tarandus groenlandicus</i>	Endangered	Yes	Apparently Secure
Caribou (Peary caribou)	n/a	<i>Rangifer tarandus pearyi</i>	Threatened	Yes	Apparently Secure
Waterbirds	Horned Grebe	<i>Podiceps auritus</i>	Special Concern	Yes	Unrankable
Upland Birds	Hudsonian Godwit	<i>Limosa haemastica</i>	Threatened	No	Vulnerable
	Lesser Yellowlegs	<i>Tringa flavipes</i>	Threatened	No	Vulnerable
Seabirds and Seaducks	King Eider	<i>Somateria spectabilis</i>		No	Vulnerable
	Ivory Gull	<i>Pagophila eburnea</i>	Endangered	Yes	Critically Imperiled
	Ross's Gull	<i>Rhodostethia rosea</i>	Threatened	Yes	Critically Imperiled
Marine Mammals	Bowhead Whale (Eastern Canada - West Greenland population)	<i>Balaena mysticetus</i>	Special Concern	No	No Status Rank
	Beluga (Eastern High Arctic - Baffin Bay population)	<i>Delphinapterus leucas</i>	Special Concern	No	No Status Rank

VEC or VEC Group	Species	Scientific Name	Federal Designation		Territorial Status ¹
			COSEWIC Status	<i>Species at Risk Act</i> Schedule 1	
Marine Mammals (cont'd)	Narwhal	<i>Monodon monoceros</i>	Special Concern	No	No Status Rank
	Walrus	<i>Odobenus rosmarus rosmarus</i>	Special Concern	No	Vulnerable
	Polar Bear	<i>Ursus maritimus</i>	Special Concern	Yes	Vulnerable

Notes:

Gray cells refer to species' statuses that have changed or been added since the 2019 WMMP Report.

¹ Territorial status is current to 2015 and are presented in the 2015 Wild Species Report (CESCC 2015), and/or updated based on species search using NatureServe (NatureServe 2021).

² Species are also likely to be encountered along the Project shipping routes.

Species of conservation concern include those listed in Nunavut by the Canadian Endangered Species Conservation Council (CESCC 2015), or those listed as Endangered, Threatened, or Special Concern on Schedule 1 of the SARA (2002; Government of Canada 2019). The federal or territorial conservation status of one bird species changed since the species at risk table was updated for the 2019 WMMP Report. Since 2019, there was a change in the status of the lesser yellowlegs, which was designated as Threatened by COSEWIC in 2020, and territorially as Vulnerable (Table 8-1). No updated recovery strategies, action plans, or management plans for any of the listed species have been made available since 2013.

The WMMP Plan (Version 10, October 2019) includes mitigation, management and monitoring activities for each of the species at risk groups listed in Table 8-1. No additional mitigation, management or monitoring is required due to the change in status listed above.

9. WILDLIFE MORTALITIES

No wildlife mortalities were reported at the Project site in 2020. This is in contrast to previous years, when one grizzly bear mortality occurred near the Project in 2019, and one long-tailed duck mortality occurred at the MLA in 2018 (Table 9-1).

Table 9-1: Wildlife Mortalities at Back River, 2018 to 2020

Species	2018	2019	2020	Total
Long-tailed Duck	1	0	0	1
Grizzly Bear	0	1	0	1
Total	1	1	0	2

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APPENDIX 2A OVERVIEW OF WILDLIFE MITIGATION AND MONITORING PROGRAMS DURING PHASES OF THE BACK RIVER PROJECT

Appendix 2A: Overview of Wildlife Mitigation and Monitoring Programs during Phases of the Back River Project

Monitoring Programs that Trigger Management (section of the document where they are described)	Baseline/ Pre-Construction	Mobilization and Construction	Operations	Temporary Closure	Care and Maintenance	Reclamation/ Closure	Post- Closure
Caribou (Section 7.2)							
1) Monitor Seasonal Caribou Ranges <i>Use collar data to track during which seasons caribou are likely to interact with the Project</i>	--	Yearly	Yearly	Yearly	Yearly	Yearly	--
2) Near Real-time Collar Monitoring <i>Use collar data to track near real-time location of caribou herds</i>	--	Ongoing	Ongoing	--	--	Ongoing	--
3) Active Caribou Monitoring <i>Wildlife monitors will survey for caribou from raised platforms or using cameras</i>	--	Ongoing	Ongoing	--	--	Ongoing	--
4) Incidental Wildlife Reporting <i>Incidental observations of wildlife and incidents</i>	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--
5) On-site Camera Monitoring <i>Use motion-trigger cameras to track caribou interactions with Project infrastructure</i>	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--
6) Over the Horizon Monitoring <i>If ZOI monitoring indicates that management must be conducted for caribou when they are over the horizon (greater than can be observed from site)</i>	--	If triggered	If triggered	--	--	If triggered	--
7) Human Activity Monitoring <i>Reporting hunting and fishing on the Project site</i>	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing	--
8) Noise Monitoring <i>Monitor noise levels outside the footprint</i>	One time	One time	Every three years	--	--	One time	--
Muskox (Section 8.2)							
1) On-site Camera Monitoring <i>Use motion-trigger cameras to track muskox interactions with Project infrastructure</i>	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--
2) Incidental Wildlife Reporting <i>Incidental observations of wildlife and incidents</i>	Ongoing	Ongoing	Ongoing	--	Ongoing	Ongoing	--

APPENDIX 4A INCIDENTAL CARIBOU OBSERVATIONS, 2020

Appendix 4A: Incidental Caribou Observations, 2020

Date	Location	Distance from Camp	Direction Travelling	Number	Comments (# of calves, etc.)	Name of Observer
15-Mar-20	Goose	0.3 km		4		RmD
18-Mar-20	Goose	1 km		6		Ryan
19-Mar-20	Goose	Airstrip		5		Andre
28-Mar-20	Goose	2 km	E	6		RmD
8-May-20	Not Reported		E	2	1 baby	-
3-Jul-20	Goose	1 km		1		RmD
29-Jul-20	Goose	East side of camp across Goose Lake		50+		LB
29-Jul-20	Goose	2 km		200+	Unknown	MR
29-Jul-20	Goose	Near fuel hub / quarry entrance		2	Cow and calf	Dave Sherlock
30-Jul-20	Goose	Runway		100+	Unknown	JS
30-Jul-20	Goose	Between quarry and airstrip		<20		Dave Sherlock
31-Jul-20	Goose	5.9 km		100+	Unknown	JS
31-Jul-20	Goose	1.6 km	W	20+	Unknown	JS
31-Jul-20	Goose	1.6 km	W	20+	Unknown	JS
1-Aug-20	Goose	1.6 to 3.2 km	W	1000+		LB
2-Aug-20	Goose	0.3; 0.2 km		100+	Calves spotted	JS
2-Aug-20	Goose	1; 1 km		100	Calves spotted	JS
2-Aug-20	Goose	0.2 km		1	Bull; haning around Acasta, "Acasta Bull"	JS
2-Aug-20	Goose	0.75 km		1	"Acasta Bull"	JS
2-Aug-20	Goose	1 km		25+	Calves spotted	JS
2-Aug-20	Goose	1 km	SW	100+	Calves spotted	JS
2-Aug-20	Goose	Caribou herd moving through Goose		>1000		Dave Sherlock
3-Aug-20	Goose	1.5 km		50	Unknown	JS
3-Aug-20	Goose	1.5 km		50	Unknown	JS
3-Aug-20	Goose	1 km		10 to 12	Scattered small herds; unknown	JS
3-Aug-20	Goose	3.2 to 4.8		3 to 4	Unknown	JS
3-Aug-20	Goose	0.4 nautical miles SSW of pit		10	Unknown	JS
3-Aug-20	Goose	550m SSW of pit, walking W	W	10	Unknown	JS
3-Aug-20	Goose	South West of Echo Crossing 1 km		10	Small herd	Dave Sherlock
4-Aug-20	Goose	0.75	W	12	Some calves	JS
7-Aug-20	Goose	1 km S		50		RmD
8-Aug-20	Goose	1507 Drill		4		Bks
10-Aug-20	Not Reported			23		J.H.
3-Sep-20	Goose	East of Goose Lake		4	Milling around east edge Goose Lake	Merle[?]
9-Sep-20	Goose	Runway		2		Dave Sherlock
11-Sep-20	Goose	North of rock quarry		6		Dave Sherlock
11-Oct-20	Goose	Heading towards runway		3		Dominik Obad
12-Oct-20	Goose	Between airstrip and camp		1	Passing through - past the major ship	Joan Mc
3-Nov-20	Goose	Lake		1	On lake	-

Appendix 4A: Incidental Caribou Observations, 2020

Date	Location	Distance from Camp	Direction Travelling	Number	Comments (# of calves, etc.)	Name of Observer
5-Dec-20	Goose	Goosneck		10		RmD
7-Dec-20	Goose	Around outside of Goose Camp		20	Approximately 10-30 caribou seen over three separate days in early December (same group observed)	
8-Dec-20	Goose	Around outside of Goose Camp		200	200 around camp for about 2 days. Loosely together as one group. Spotted by night shift operators both night, they didn't come into or within visual of the main camp during the days	

APPENDIX 5A FIXED-WING AND HELICOPTER OPERATIONS SOP – ENVIRO-003



Back River Project

Fixed-Wing and Helicopter Operations

STANDARD OPERATING PROCEDURE

ENVIRO-03

20 August 2020

Version B.1

Scope of Work: This SOP provides guidance for pilots operating fixed-wing aircraft or helicopters for Back River. The purpose of this document is to identify flight procedures for pilots contracted by Sabina to avoid potential effects to wildlife.

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1. PROGRAM DESCRIPTION AND OBJECTIVES

As per the Back River Project's NIRB Project Certificate (No. 007) Condition #60 and #61, a Fixed-Wing and Helicopter Aircraft Operations Standard Operating Procedure (SOP) has been developed to guide aircraft operations at the Project. The Conditions state the following:

Condition 60:

Term and Condition: Subject to safety requirements, Sabina shall ensure that project aircraft maintain sufficient cruising altitudes to avoid disturbance to migratory birds. In particular, the Proponent shall maintain appropriate altitudes in proximity to observed concentrations of migratory birds, caribou and muskoxen that may be encountered during aircraft flights to the George property and other exploration areas, as well as during the transfer of employees between project facilities.

Reporting: Initially, until aviation contracts have been established, the Proponent shall provide details on an annual basis regarding the Proponent's measures taken to fulfill this Term and Condition in the Proponent's annual report to the Nunavut Impact Review Board. Once longer term arrangements with contractors have been established, the Proponent shall provide these details in the Proponent's annual report to the Nunavut Impact Review Board every two (2) years or whenever there is a change or addition to the contractors.

Condition 61:

Term and Condition: The Proponent shall ensure that pilots are informed of minimum cruising altitude guidelines and that a daily log or record of flight paths and cruising altitudes for project aircraft is maintained to monitor adherence and to follow up on complaints.

Reporting: The Proponent shall provide a summary of this information in the Proponent's annual report to the Nunavut Impact Review Board, and will make specific logs or records available to the Nunavut Impact Review Board upon request.

The purpose of this document is to identify flight procedures for fixed-wing and helicopter aircraft pilots contracted by Sabina to avoid potential effects to wildlife, as per outlined in the Back River Wildlife Mitigation and Monitoring Program (WMMP) Plan.

In addition, all pilots are required to have the "Incidental Wildlife Observation Datasheet" (Attachment A) with them at all times to record observations of wildlife.

This document outlines:

- Flight altitude/horizontal guidelines when operating aircraft over/near wildlife;
- Locations of sensitive wildlife features;
- Wildlife reporting procedures for pilots; and
- Flight tracking requirements.

2. FIXED-WING AIRCRAFT OPERATIONS

2.1 Fixed-Wing Flight Operations

Fixed-wing aircrafts are to maintain **610 m** above local ground level except during take off and landing at the Goose Site, George Site and the Marine Laydown Area (MLA). A special exception to this flight rule is in proximity to known waterbird staging areas at the Project (Figures 1 and 2). During the times when these sites are actively used, aircraft are to maintain a horizontal distance of **3,000 m** and vertical distance of **650 m** (Figure 1). Flight altitude restrictions will apply during different times of the year, as indicated below based on when waterfowl use these sites:

1. Beechey Lake: Management applies during the spring migration, **May 1 to June 15**.
2. Duckpot Lake (George Staging): Management applies during the spring migration, **May 1 to June 15** and fall migration, **August 1 to September 15**.
3. MLA South Bay: Management applies during the late summer moulting and staging periods, **July 15 to September 15**.

2.2 Fixed-Wing Landing and Taking off at Airstrips

Fixed-wing aircraft flights may be suspended or delayed if large groups of caribou are observed near the runway during calving and post-calving. Prior to aircraft landing on the airstrip, a visual inspection will be conducted by Sabina ground personnel to identify the presence of any wildlife on the airstrip. Small groups of wildlife will be escorted off the airstrip; the flight crew will be notified by radio that such action is taking place and aircraft will not be approved to land until the airstrip is clear. If groups of greater than 25 caribou are observed on the airstrip then no action will be taken. If the wildlife cannot be escorted from the airstrip within a reasonable length of time, the flight crew will be instructed to divert to another location.

3. HELICOPTER OPERATIONS

Helicopters are to observe vertical and/or horizontal setbacks from wildlife as outlined below wherever it is safe to do so.

Setback distances are specific to wildlife species and the time of year. This SOP is divided into two sections:

1. Setback guidelines active year round; and
2. Setback guidelines around wildlife sensitive habitats (dens and nests) when those features are active. Figure 2 displays sensitive wildlife features (dens and nests).

Pilots are to report observations of wildlife seen during flights to the Sabina Environment Department (Section 5). Caribou observations should be reported immediately while other wildlife observations can be reported at the end of the day.

In addition to flight setbacks for wildlife, helicopter companies contracted with Sabina will be required to keep a daily flight log, outlining flight paths and cruising altitudes (Section 5). It is expected that helicopter companies will provide this information to Sabina at the end of each month (or pilot's shift).

3.1 Year Round Helicopter Operations

For day to day operations at the Project year round, helicopters are to maintain a flight altitude of **300 m** above all large wildlife species including muskox, grizzly bear, wolverine, wolf, and fox.

Different flight rules apply to caribou. For caribou, helicopters are to maintain a vertical distance of **610 m** above OR a horizontal distance of **1,000 m** away from caribou at all times when any number of caribou are observed. Special rules apply during the calving, post-calving, and early summer (June 5 to July 31), where pilots are to avoid 25 or more caribou by **610 m** vertically or **2,000 m** horizontally. These flight restrictions will apply to engine start up, take-off, landing, as well as in flight.

Pilots are to record observations of wildlife on the Incidental Wildlife Observation Datasheet (Attachment A) and report observations of wildlife seen during flights to the Sabina Environment Department (Section 5). Caribou observations are to be reported immediately while other wildlife observations are to be communicated within 24 hours.

Flight setbacks for large wildlife species that are applicable year round are described in Figure 1.

3.2 Helicopter Operations near Sensitive Wildlife Habitat

Carnivore dens, raptor nests, and waterbird staging areas are the three types of sensitive wildlife habitat that will have horizontal or vertical helicopter management. These are used seasonally and are not occupied year round. Therefore, helicopter management will only apply at certain times of the year and in a certain proximity to these features. Figure 2 displays known dens, nests, and staging areas in the Project area.

Flight guidelines for carnivore dens, raptor nests, and waterbird staging areas are as follows and are summarized in Figure 1:

- Direct overflights of known carnivore dens should be avoided wherever possible when the dens may be active, **February 21 to May 7** for wolverines and **May 1 to September 15** for wolves and foxes. The suggested flight altitude over known den sites is **300 m**.
- Pilots should maintain a **650 m** horizontal distance and **300 m** vertical distance from known raptor nest sites when nests may be active, **April 15 to August 15**.
- Pilots should maintain **610 m** vertical or **3,000 m** horizontal distance from known waterbird staging areas when they may be actively used. Three known staging areas have been documented near the Project area:
 - Beechey Lake: helicopter management applies during the spring migration, **May 1 to June 15**.
 - Duckpot (George Staging): helicopter management applies during the spring migration, **May 1 to June 15** and fall migration, **August 1 to September 15**.
 - MLA South Bay: helicopter management applies during the late summer moulting and staging periods, **July 15 to September 15**.

Flight setbacks for sensitive wildlife habitats are described in Figure 1.

4. PROJECT SHUTDOWNS AND AIRCRAFT

Following terms and conditions from the NIRB, Sabina may conduct a Rapid Operational Shutdown if large groups of caribou approach the project site during calving and post-calving for caribou. This scenario is unlikely because the project is outside of the calving and post-calving ranges of caribou herds. Sabina will inform the fixed-wing company of measures being taken. These may include:

- Non-essential cargo flights will be suspended.
- Personnel flights and essential cargo will be paused for up to 2 days.

- If flights remain necessary, aircraft with a smaller noise profile or aircraft with greater capacity may be used.

Sabina may also conduct a Planned Operational Shutdown if caribou move their calving or post-calving area to overlap the Project. Sabina will inform the fixed-wing company of measures being taken. These may include:

- Cessation of fixed-wing aircraft use.
- Cargo flights will be suspended. Personnel flights will be suspended.
- Should a flight be required due to emergency of unforeseen conditions, aircraft with a smaller noise profile will be used.

Sabina will also inform the helicopter company of measures being taken during rapid or planned operational shutdowns. These may include:

- Cessation of helicopter usage including landings and take-offs.

5. REPORTING

5.1 Wildlife Observations

Pilots will record observations of wildlife during any flights at the Project on the Incidental Wildlife Observation Datasheet (Attachment A), including observations of large mammals (e.g., caribou, muskox, carnivores), raptors, and waterbirds. These observations are to be communicated to the Sabina Environment Department and may be used to trigger additional mitigation actions, particularly for caribou. For caribou, pilots will immediately report sightings to the Sabina Environment Department. For other wildlife, reporting should be prompt, preferably the same day.

Pilots are to record the following information when wildlife are observed:

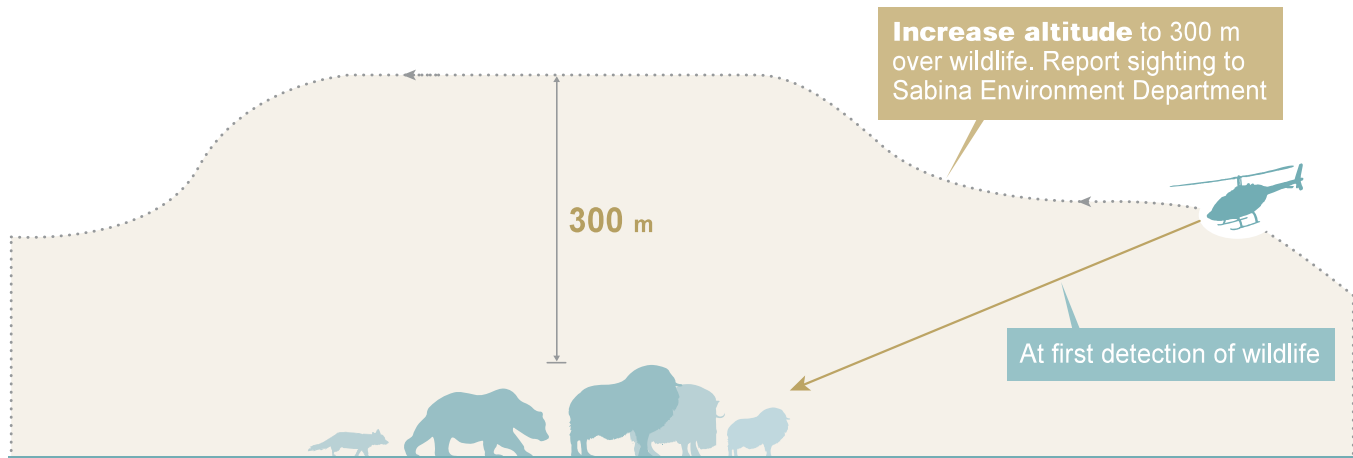
1. Date and time;
2. Location (UTM will be preferred);
3. Species;
4. Number of animals;
5. Direction of travel (if any); and
6. Mitigation actions taken to avoid disturbance (e.g., increased altitude over waterbird staging area).

5.2 Daily Flight Logs

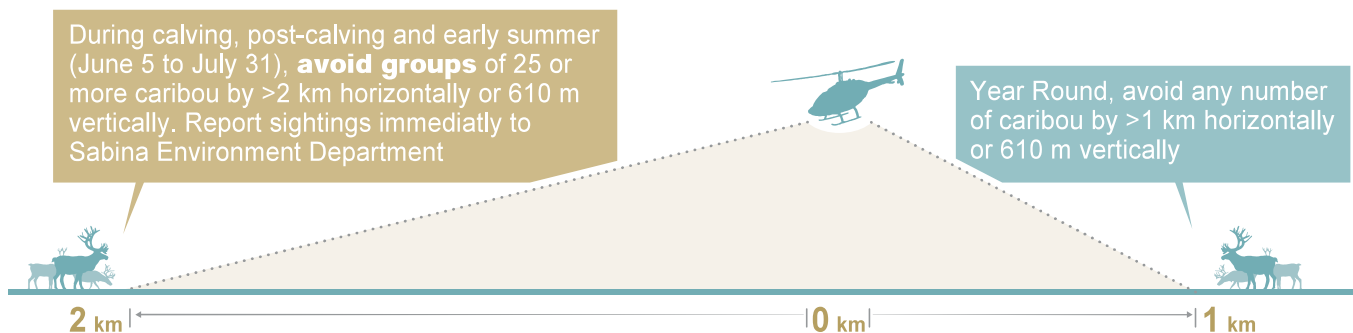
Both fixed-wing and helicopter companies contracted with Sabina will be required to keep a daily flight log, outlining flight paths and cruising altitudes. Flight data from an onboard flight tracking system is to be downloaded and submitted to the Sabina Environment Department on a monthly basis. Acceptable file formats include google earth extensions (.kml, .kmz) and garmin extensions (.gdb, .gpx).

Flight Setback Distance for Sensitive Wildlife (Year Round)

Muskox, Grizzly Bear, Wolverine, Wolves, and Foxes



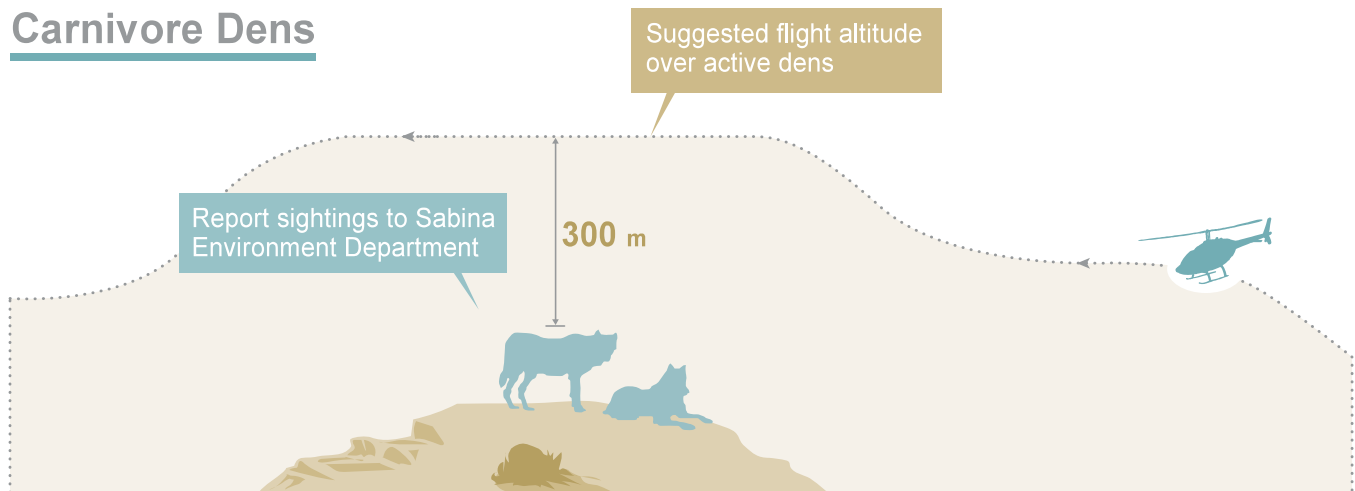
Caribou



Do not start engine, take off or land when caribou are within the prescribed setbacks

Flight Setback Distances for Sensitive Wildlife Habitat Features (Season-specific)

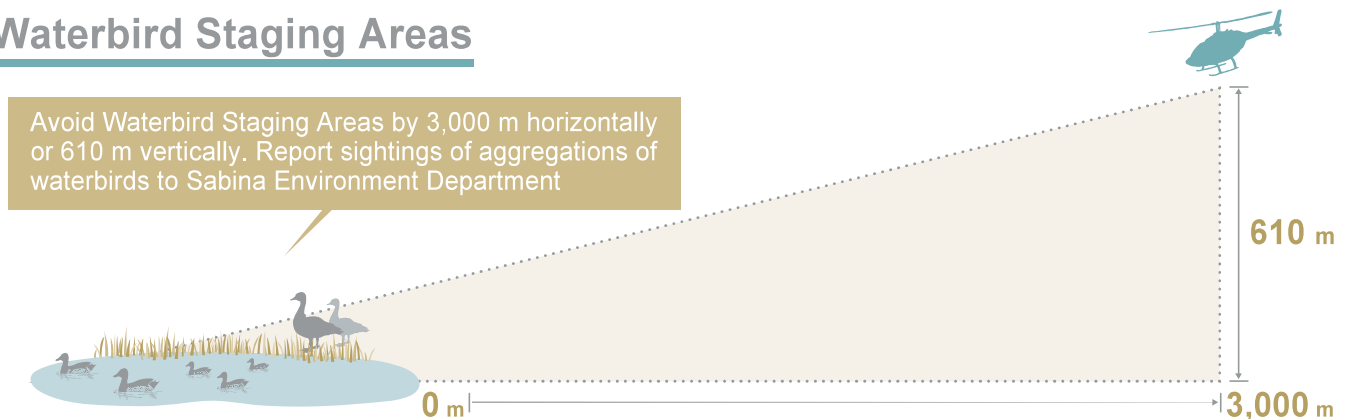
Carnivore Dens



Raptor Nests

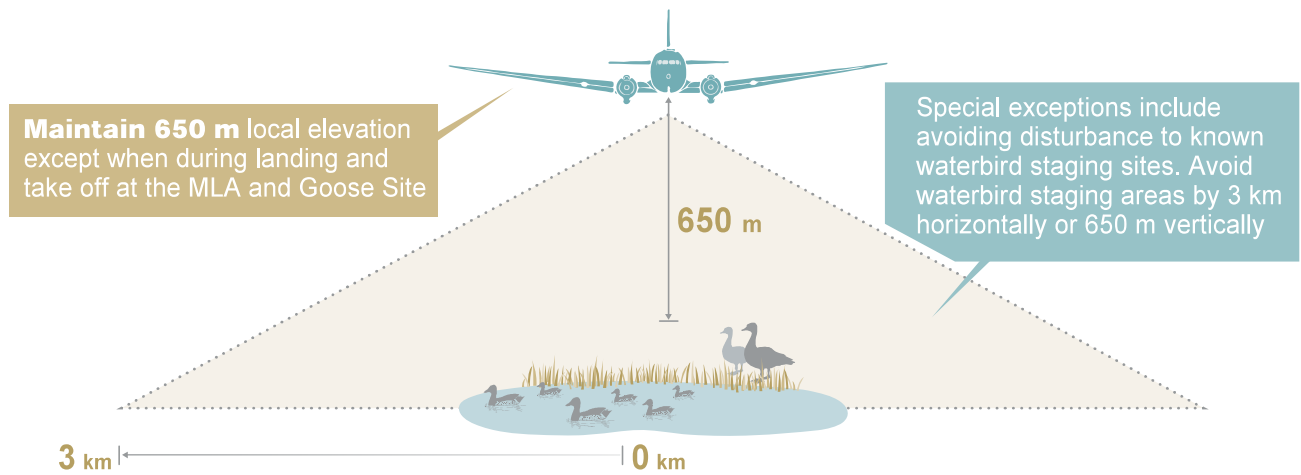


Waterbird Staging Areas



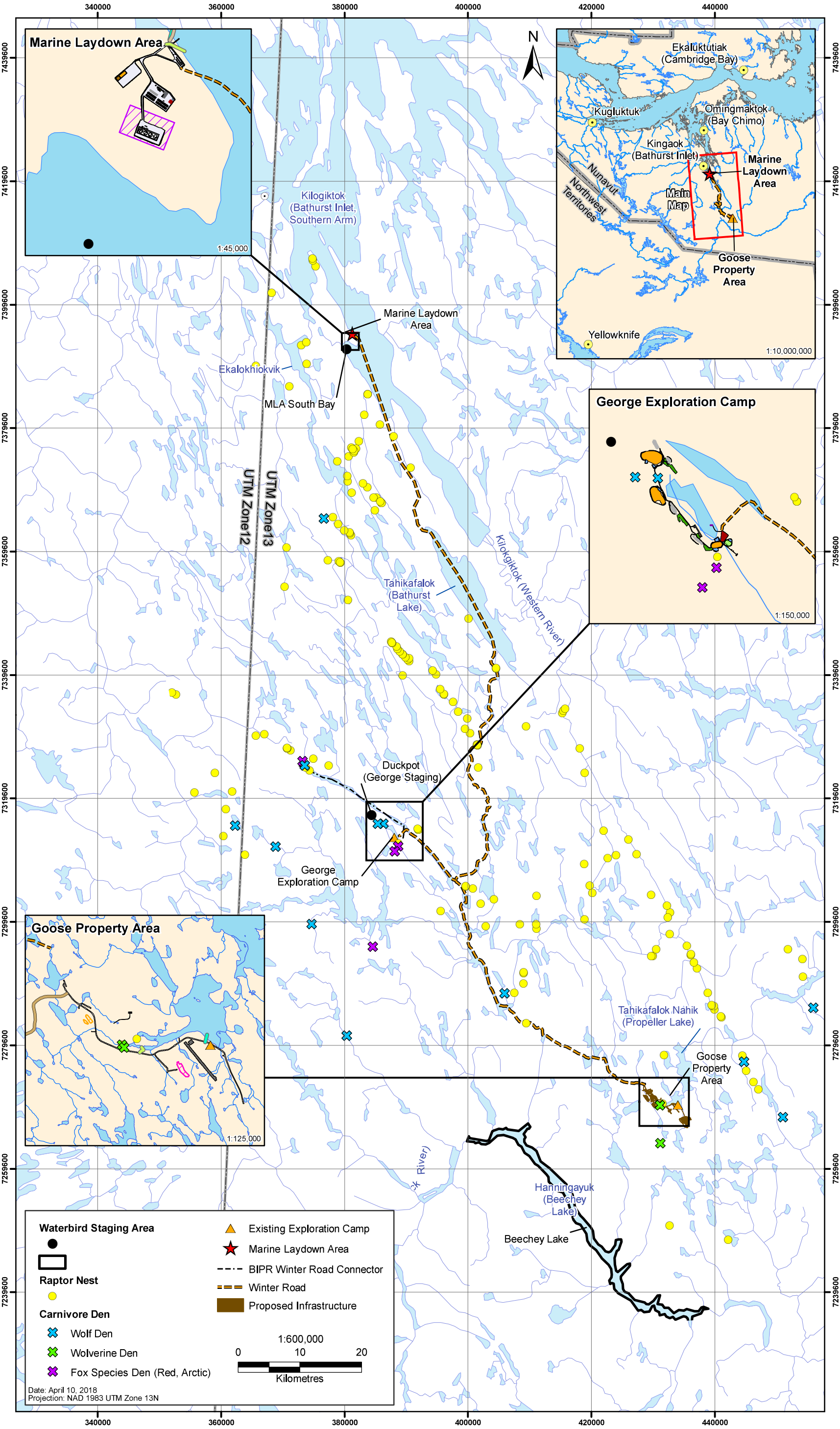
Wildlife Habitat Features	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Seasonal Dates
Wolverine Den													Feb 21 to May 7
Wolf and Fox Den													May 1 to Sep 15
Raptor Nest													Apr 15 to Aug 15
Waterbird Staging Areas:													
Beechey Lake													May 1 to Jun 15
Duckpot (George Staging)													May 1 to Jun 15, Aug 1 to Sep 15
MLA Staging													Jul 15 to Sep 15

Fixed Wing Aircraft Setbacks




Waterbird Staging Areas:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Seasonal Dates
Beechey Lake													May 1 to Jun 15
Duckpot (George Staging)													May 1 to Jun 15, Aug 1 to Sep 15
MLA Staging													Jul 15 to Sep 15

Figure 2
Back River Project: Wildlife Features in the Project Area



6. ATTACHMENTS

Attachment A: Incidental Wildlife Observation Datasheet

	Back River Project	July 2020
	INCIDENTAL WILDLIFE OBSERVATION DATASHEET	vA.1

Complete this form if:

- you observe wildlife (caribou, grizzly bear, wolf, wolverine, muskox, or fox) on the Project Site, including while flying, on-site roads and the winter ice road;
- there is a project-related wildlife fatality or injury; or
- you observe dead or injured wildlife, even if the fatality or injury was not project-related.

Submit the completed form to the Environment Department at the end of your shift.

GENERAL INFORMATION						
Date of Sighting (yy mm dd)			Time First Sighted (24 hr)			
Observer Name			Time Last Sighted (24 hr)			
Job Activity During Observation						
LOCATION INFORMATION						
Location Description (e.g., Road KM or facility)						
Animal Location (if known)	UTM East			UTM North		
Observer Location	UTM East			UTM North		
Habitat Description (circle one)	Boulder Field	Tundra	Shrubs	Stream/River	Lake/Pond	Open Water
	Wetland	Un-vegetated	Shoreline	Esker	Other:	
Photos (record photo numbers)						
WILDLIFE INFORMATION						
Species (circle)	Caribou	Grizzly Bear	Wolf	Wolverine	Muskox	Other (describe):
Number of Animals	Adult Female:	Adult Male:	Young:	Unknown:	Total Number:	
Condition of Animals (circle one)	Alive	Dead	Injured	Animal Behaviour What was/were the animal(s) doing (e.g., walking, resting, eating, running, sleeping, playing, flying, nesting, or crossing the road)?		
Was there an Accident? If YES, complete back of form						
Other Notes ○ Did the animal(s) have a collar? ○ If the animal was deceased or injured please describe and report to Environment Department						
For Office Use						
These data were entered into the wildlife database by:			These data were entered into the wildlife database on:			

APPENDIX 5B HELICOPTER OPERATIONS GUIDANCE AND WILDLIFE LOG; FIXED-WING OPERATIONS GUIDANCE AND WILDLIFE LOG



HELICOPTER OPERATIONS GUIDANCE and WILDLIFE LOG



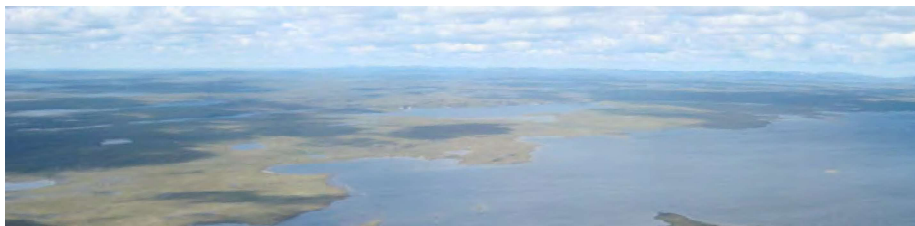
OBJECTIVES

The purpose of this booklet is to identify flight procedures and provide guidance for helicopter pilots contracted by Sabina so that potential effects to wildlife are avoided, as per Back River Project's NIRB Project Certificate (No. 007) Condition #60 and #61.

This document outlines:

- Flight altitude/horizontal guidelines when operating aircraft over/near wildlife;
- Locations of sensitive wildlife features;
- Wildlife reporting procedures for pilots; and
- Flight tracking requirements.

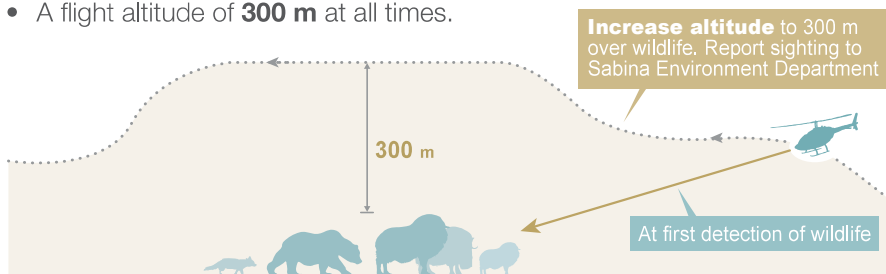




YEAR-ROUND HELICOPTER OPERATIONS

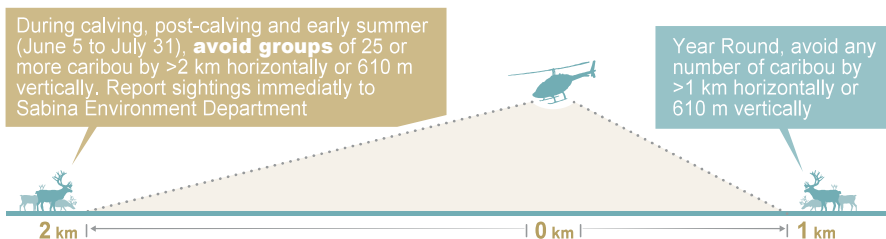
When flying above muskox, grizzly bear, wolverine, wolf, and fox, helicopters must maintain:

- A flight altitude of **300 m** at all times.



When flying close to caribou, helicopters must maintain:

- A **vertical distance of 610 m** above, OR;
- A **horizontal distance of 1,000 m** away at all times.



Do not start engine, take off or land when caribou are within the prescribed setbacks

During the caribou calving, post-calving, and early summer periods (**June 5 - July 31**), pilots are to avoid 25 or more caribou by;

- A **vertical distance of 610 m** above, OR;
- A **horizontal distance of 2,000 m** away at all times.



HELICOPTER OPERATIONS NEAR SENSITIVE WILDLIFE HABITAT

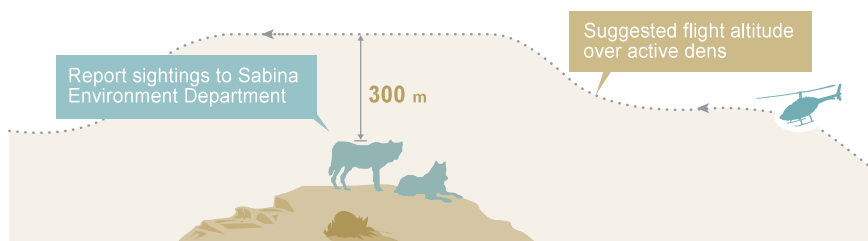
Avoid direct overflights of sensitive wildlife habitat wherever possible. If these must occur, follow these guidelines:

Wolverines

- Flight altitude of **300 m** over known den sites (see map on page 6).
- Active period
February 21 to May 7.

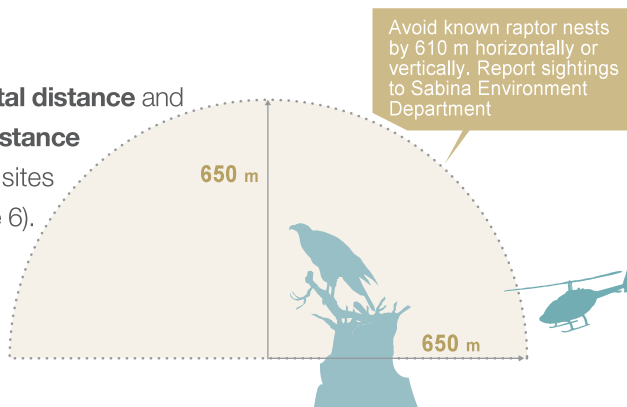
Wolves and foxes

- Flight altitude of **300 m** over known den sites (see map on page 6).
- Active period
May 1 to September 15.



Raptors

- A **650 m horizontal distance** and **650 m vertical distance** from known nest sites (see map on page 6).
- Active period
April 15 to August 15.

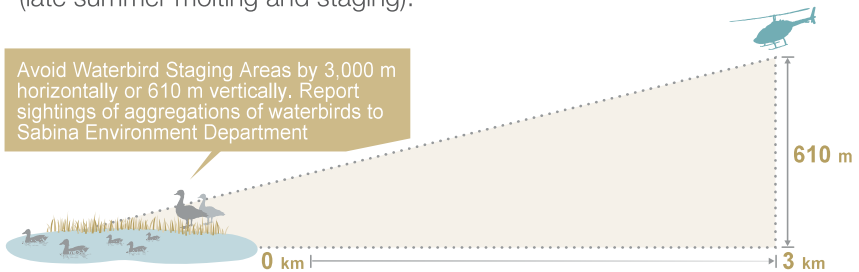




Waterbirds

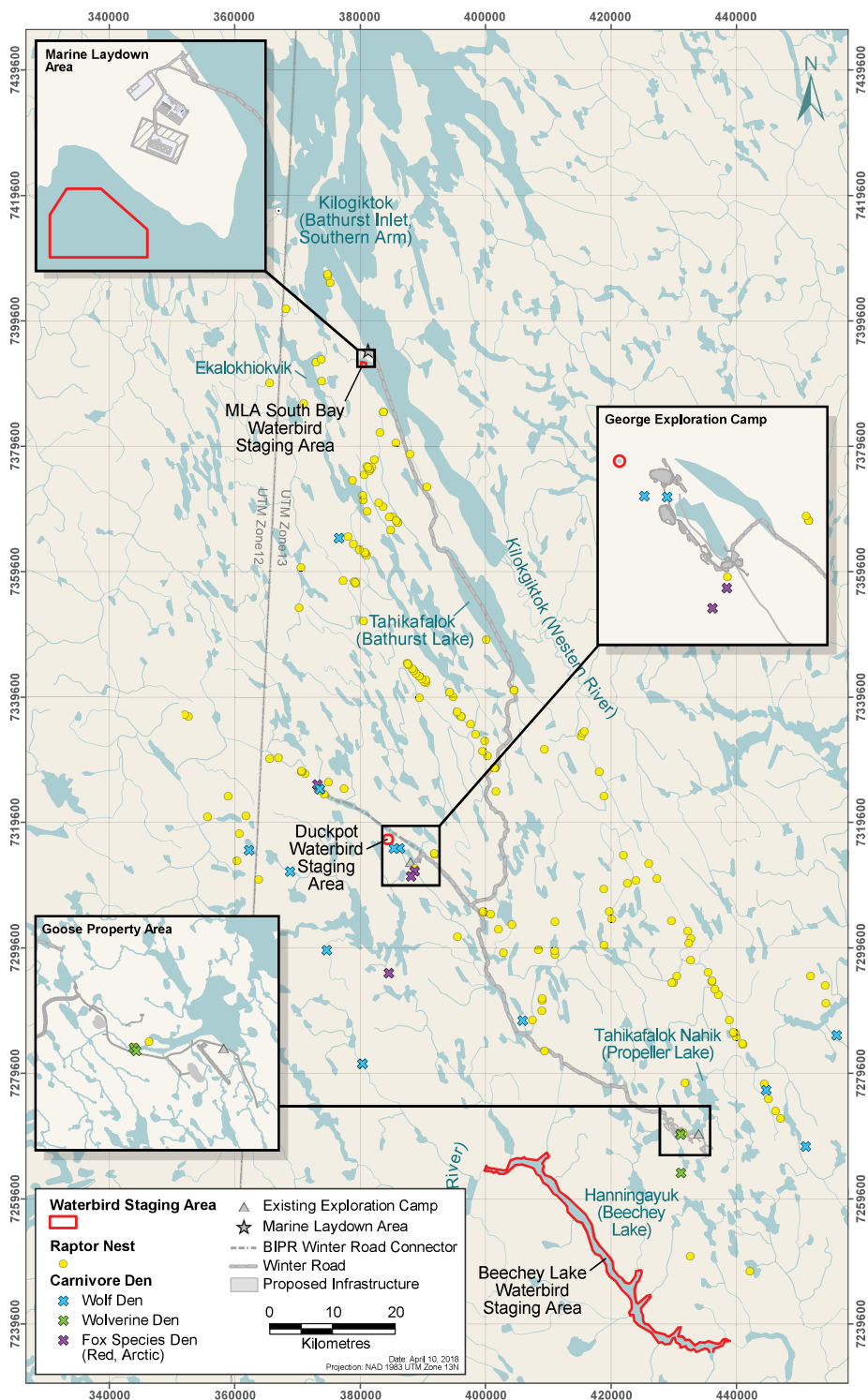
A **610 m vertical or 3,000 m horizontal distance** from known staging areas (see map on page 6).

- Beechey Lake: **May 1 - June 15** (spring migration).
- Duckpot (George Staging): **May 1 - June 15** (spring migration) and **August 1 - September 15** (fall migration).
- MLA South Bay: **July 15 - September 15** (late summer molting and staging).



Seasonal Dates When Flight Restrictions Apply Near Wildlife Habitat Features

Wildlife Habitat Features	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Seasonal Dates
Wolverine Den													Feb 21 to May 7
Wolf and Fox Den													May 1 to Sep 15
Raptor Nest													Apr 15 to Aug 15
Waterbird Staging Areas:													
Beechey Lake													May 1 to Jun 15
Duckpot (George Staging)													May 1 to Jun 15, Aug 1 to Sep 15
MLA Staging													Jul 15 to Sep 15





REPORTING OBSERVATIONS

Record all observations of wildlife during all flights at the Project on the Incidental Wildlife Observation Datasheet (page 9), including;

1. Date and time that the animal was spotted;
2. Animal location (UTM preferred) and description (e.g., road KM or facility, if any);
3. Species of the animal;
4. Number of animals;
5. Mitigation actions taken to avoid disturbance (e.g., increased altitude over waterbird staging area); and
6. Other notes (e.g., if the animal had a collar, if it was crossing the road, if it was deceased or injured, if there were any photos taken).

Communicate all observations to the Sabina Environment Department, as these are required for Sabina's Annual Compliance Reporting.

- For caribou observations, report **immediately** to the Sabina Environment Department.
- For all other wildlife, report to Sabina Environment Department, **the same day**.

Hand in the datasheet to the Environment Department by the end of the shift.



PROJECT SHUTDOWNS

- Sabina may conduct a Rapid Operational Shutdown if large groups of caribou approach the project site during calving and post-calving periods.
- This scenario is unlikely because the project is outside of the calving and post-calving ranges of caribou herds. Sabina will inform the helicopter company of measures being taken.

These may include:

- Cessation of helicopter usage including landings and take-offs.

DAILY FLIGHT LOG

- A daily flight log must be kept, outlining flight paths and cruising altitudes.
- Flight data from an onboard flight tracking system is to be downloaded and submitted to the Sabina Environment Department on a monthly basis.
- Acceptable file formats include google earth extensions (.kml, .kmz) and garmin extensions (.gdb, .gpx).



Submit the completed form to the Environment Department at the end of your shift.

Pilot's Name:

OBSERVATION #					
Date of Sighting (yy/mm/dd)				Time of Sighting (24 hr)	
LOCATION INFORMATION					
Location Description <i>(e.g. Road KM or facility, boulder field, esker, lake)</i>					
UTM East				UTM North	
WILDLIFE INFORMATION					
Species (<i>circle</i>)	Caribou	Grizzly Bear	Wolf	Wolverine	Muskox
					Other: (<i>describe</i>)
Number of Animals		Best Estimate:		OR Maximum/Minimum:	
Mitigation Measures?					
Other Notes <i>e.g. Did the animal(s) have a collar? If the animal was deceased or injured?</i>					

OBSERVATION #					
Date of Sighting (yy/mm/dd)				Time of Sighting (24 hr)	
LOCATION INFORMATION					
Location Description <i>(e.g. Road KM or facility, boulder field, esker, lake)</i>					
UTM East				UTM North	
WILDLIFE INFORMATION					
Species (<i>circle</i>)	Caribou	Grizzly Bear	Wolf	Wolverine	Muskox
					Other: (<i>describe</i>)
Number of Animals		Best Estimate:		Maximum/Minimum:	
Mitigation Measures?					
Other Notes <i>e.g. Did the animal(s) have a collar? If the animal was deceased or injured?</i>					





FIXED-WING OPERATIONS GUIDANCE and WILDLIFE LOG



OBJECTIVES

The purpose of this booklet is to identify flight procedures and provide guidance for fixed-wing aircraft pilots contracted by Sabina so that potential effects to wildlife are avoided, as per Back River Project's NIRB Project Certificate (No. 007) Condition #60 and #61.

This document outlines:

- Flight altitude/horizontal guidelines when operating aircraft over/near wildlife;
- Wildlife reporting procedures for pilots; and
- Flight tracking requirements.

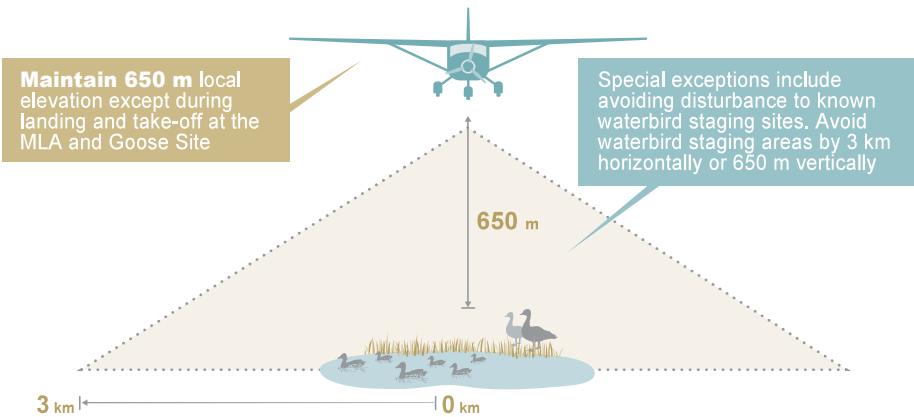




FLIGHT OPERATIONS

Maintain **650 m** above local ground level except:

- During take-off and landing.
- Maintain a **horizontal distance of 3,000 m** and **vertical distance of 650 m** when in proximity to waterbird staging areas during active periods (see table).



Waterbird Staging Areas:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Seasonal Dates
Beechey Lake													May 1 to Jun 15
Duckpot (George Staging)													May 1 to Jun 15, Aug 1 to Sep 15
MLA Staging													Jul 15 to Sep 15



LANDING AND TAKING OFF

Prior to aircraft landing on the airstrip:

- Sabina ground personnel will conduct a visual inspection to identify the presence of any wildlife on the airstrip.
- If caribou or other wildlife are observed, the flight crew will be notified by radio and pilots will await further instruction from the ground crew (e.g., approval to land when airstrip is clear, instructed to divert to another location).
- If large groups of caribou are observed near the runway during calving and post-calving (June 5 to July 25), flights may be suspended or delayed.

PROJECT SHUTDOWNS

- Sabina may conduct a Rapid Operational Shutdown if large groups of caribou approach the project site during calving and post-calving periods.
- This scenario is unlikely because the project is outside of the calving and post-calving ranges of caribou herds. Sabina will inform the fixed-wing company of measures being taken.

These may include:

- Non-essential cargo flights will be suspended.
- Personnel flights and essential cargo will be paused for up to 2 days.
- If flights remain necessary, aircraft with a smaller noise profile or aircraft with greater capacity may be used.



REPORTING OBSERVATIONS

Record all observations of wildlife during all flights at the Project on the Incidental Wildlife Observation Datasheet (page 7), including:

1. Date and time that the animal was spotted;
2. Animal location (UTM preferred) and description (e.g., road KM or facility, if any);
3. Species of the animal;
4. Number of animals;
5. Mitigation actions taken to avoid disturbance (e.g., increased altitude over waterbird staging area); and
6. Other notes (e.g., if the animal had a collar, if it was crossing the road, if it was deceased or injured, if there were any photos taken).

Communicate all observations to the Sabina Environment Department, as these are required for Sabina's Annual Compliance Reporting.

- For caribou observations, report **immediately** to the Sabina Environment Department.
- For all other wildlife, report to Sabina Environment Department, **the same day**.

Hand in the datasheet to the Environment Department by the end of the shift.



DAILY FLIGHT LOG

- A daily flight log must be kept, outlining flight paths and cruising altitudes.
- Flight data from an onboard flight tracking system is to be downloaded and submitted to the Sabina Environment Department on a monthly basis or at the end of the shift.
- Acceptable file formats include google earth extensions (.kml, .kmz) and garmin extensions (.gdb, .gpx).



Submit the completed form to the Environment Department at the end of your shift.

Pilot's Name:

OBSERVATION #					
Date of Sighting (yy/mm/dd)				Time of Sighting (24 hr)	
LOCATION INFORMATION					
Location Description <i>(e.g. Road KM or facility, boulder field, esker, lake)</i>					
UTM East				UTM North	
WILDLIFE INFORMATION					
Species (<i>circle</i>)	Caribou	Grizzly Bear	Wolf	Wolverine	Muskox
					Other: (<i>describe</i>)
Number of Animals		Best Estimate:		OR Maximum/Minimum:	
Mitigation Measures?					
Other Notes <i>e.g. Did the animal(s) have a collar? If the animal was deceased or injured?</i>					

OBSERVATION #					
Date of Sighting (yy/mm/dd)				Time of Sighting (24 hr)	
LOCATION INFORMATION					
Location Description <i>(e.g. Road KM or facility, boulder field, esker, lake)</i>					
UTM East				UTM North	
WILDLIFE INFORMATION					
Species (<i>circle</i>)	Caribou	Grizzly Bear	Wolf	Wolverine	Muskox
					Other: (<i>describe</i>)
Number of Animals		Best Estimate:		Maximum/Minimum:	
Mitigation Measures?					
Other Notes <i>e.g. Did the animal(s) have a collar? If the animal was deceased or injured?</i>					



APPENDIX 5C WINTER ICE ROAD BEAR DEN SURVEY, 2020

**Memo**

To	Merle Keefe, Manager, Environmental Permitting, Sabina Gold & Silver Corp. Matthew Pickard, VP Environment and Sustainability, Sabina Gold & Silver Corp.
From	Greg Sharam and Shannon Seahra, ERM
Date	31 March 2021
Reference	Back River Project; 0333261-0409
Subject	Winter Ice Road Bear Den Survey 2020

1. INTRODUCTION

Sabina Gold and Silver Corp's (Sabina's) Back River Project (the Project) occurs in the Kitikmeot Region of Nunavut. A Winter Ice Road (WIR) connects the Marine Laydown Area (MLA) located in Bathurst Inlet, and the Goose Property Area (Goose site) south of the MLA where the mine will be located. The WIR will be built 160 km across lakes and portages and on the sea ice of southern Bathurst Inlet.

Some portage areas of the WIR between lakes will require surface preparation at lake shores to smooth slopes and in rocky areas. Borrow sites have been identified for construction material, including eskers, perched beaches formed from isostatic rebound and other gravel deposits. Some of these upland gravel sources could support denning by grizzly bears, depending on the slope, material, and presence of vegetation.

Surveys for suitable conditions for grizzly bear dens were conducted in 2020 along the proposed Winter Ice Road (WIR) in potential borrow areas. These surveys were conducted to inform design of the WIR for construction and to ensure the WIR does not interfere with denning sites, as per Sabina's NIRB Project Certificate 007 (NIRB 2017), Condition #45, which states the following:

"The Proponent shall ensure that safety barriers, berms, and designed crossings associated with project infrastructure, including site roads and the winter ice road, are constructed as necessary to allow for the safe passage of caribou and other terrestrial wildlife and do not interfere with wildlife denning sites."

Grizzly bear (*Ursus arctos*) was identified as a valued ecosystem component (VEC) in the Final Environmental Impact Statement (FEIS; ERM 2015). Construction of the WIR was evaluated as potentially leading to loss of denning habitat for grizzly bears through removal or disturbance of winter (hibernation) dens in the tundra. Carnivore dens are protected in Nunavut under the *Wildlife Act* (2003) and construction activities must take place outside of a 1 km buffer around any active maternal or winter carnivore dens. The Government of Nunavut (GN) requested that if suitable denning habitat cannot be avoided when designing the WIR, then pre-construction surveys be conducted for grizzly bear dens prior to construction.

The grizzly bear denning period occurs between October 15 and May 7 (ERM 2019). Dens are generally an excavated hole in the ground, on a moderate to steep slope, typically on eskers. Where conditions are optimal, more than one den site may be found in a relatively small area (e.g., within approximately 1 to 2 ha; McLoughlin et al. 2002). Grizzly bears may use the same area year after year as hibernation sites. Grizzly bears are listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; Government of Canada 2020) and on Schedule 1 of the Species at Risk Act (2002). They are also considered Vulnerable in Nunavut by the National General Status Working Group (CESCC 2015).

2. METHODS

Surveys were conducted in August 2020 at sites within suitable bear denning habitat along the length of the proposed WIR. A field crew of six completed the surveys: an ERM environmental biologist lead the surveys, accompanied by Sabina's Environmental Manager, a wildlife monitor, two archaeologists and one terrestrial ecologist.

Potential borrow sites were identified by Sabina from satellite imagery. Surveys were completed on the ground by walking the perimeter of each potential borrow site to assess an area. For each potential borrow site, a survey track was recorded on the Garmin GPS unit. Waypoints along the track were taken at notable habitat features, such as when there was a change in dominant vegetation type and/or esker material, or when wildlife dens were observed. Tracks and waypoints were used to create quarry polygons in ArcMap with suitability ratings for each surveyed segment.

Using a Survey123 form on a tablet, the following data were collected at each notable habitat feature:

- Representative photos of the area.
- Any holes/dens present and the type of den: bear, wolf, ground squirrel, other.
- Site characteristics:
 - Feature shape: high (≥ 5 m tall), low (< 5 m), or piles of gravel.
 - Material: cobble, gravel, sand, soil, mixed (details in comments).
 - Vegetation communities present in descending order of dominance (e.g. low shrub (< 1 m), tall shrub (≥ 1 m), lichen, grass).
- Bear denning suitability:
 - 1 - High: Esker is 5-10 m tall and well above water table. Esker is composed of soil, not loose sand or cobbles, dense band of shrubs (> 10 m² in extent) are present that are at least 1 m tall and robust enough to have a strong root system that the bear can dig under.
 - 2 – Moderately high: Esker, riverbank or perched beach is less than 5 m tall, but is likely above water table. Esker is composed of soil or soil/sand mix, not loose sand or cobbles. Small groups of shrubs (< 10 m² in extent) are at least 1 m tall.
 - 3 - Moderate: Esker or feature is less than 5 m tall, likely above water table. Esker is composed of a mix of soil, sand and cobbles – generally loose. Individual, disparate shrubs.

- 4 - Low: Esker is sand/gravel and less than 2 m tall, no shrubs or very little shrubs but heath tundra is present.
- 5 - Nil: Esker is sand/gravel and less than 2 m tall, no vegetation.

Each survey transect was conducted around the periphery of the potential borrow site, with the GPS track log recording the periphery and waypoints recording changes in vegetation and denning suitability. Areas of habitat within each site were identified by drawing a line from these waypoints to the centre of the feature. This allowed for detailed mapping of the habitat in the field.

3. RESULTS

Surveys were conducted between August 23 and 28, 2020 during daylight hours (08:00 to 18:00) in clear weather. Average daily temperature ranged from 6.2 – 9.3 °C, with a high of 15.7 °C. Thirty-one potential quarry sites were surveyed during the trip (Figure 1). Within the 31 quarry sites, data was collected at a total of 135 notable habitat features (Table 1; Figures 2 to 32).

Each site included a variety of micro-sites of varying quality as denning habitat. Habitat quality was mapped for each site (Figures 2 to 32). This will allow construction personnel to identify areas within eskers or other borrow sites where material can be removed with a reduced risk of disturbing denning bears.

Of the 31 quarry sites surveyed, eight were classified as moderately high to high suitability for grizzly bear winter denning; however there were no observed grizzly bears or confirmed bear dens at any of the proposed quarry sites along the WIR. One potential quarry site, Q20-18 (Photo 1), had high bear den habitat suitability, and seven sites had moderately high bear den habitat suitability (Q20-01, Q20-05, Q20-12, Q20-20, Q20-21, Q20-22, Q20-25). The remaining 23 quarry sites were considered moderate to nil suitability for grizzly bear denning habitat.

Of the notable habitat features, 79.3% surveyed at the potential quarry sites had a high shape (≥ 5 m tall), and 88.1% had bands of continuous shrubs or patches of single shrubs. Soil was present in the substrate in 42.1% of the sites surveyed. Twenty-nine possible wildlife dens were observed during the survey, including one possible wolf den (Q20-21, Photo 2), seven other dens, which could have been fox or hare dens (Photo 3), and 21 possible ground squirrel dens (Photo 4). No wildlife activity was observed near the potential den areas, aside from ground squirrels.

The WIR will be constructed during winter months when breeding activity does not occur and dens are not actively in use by most mammals; therefore, these dens would not be disturbed during the winter season.

Additional incidental wildlife observations included caribou (at Q20-15, Q20-20, Q20-24, Q20-27, Q20-28), muskox, arctic hares, and rock ptarmigans.

4. CONSTRUCTION MITIGATION

Prior to construction, construction crews will be trained on how to identify dens in the field. If a likely grizzly bear den is discovered during construction of the WIR, the following actions will be taken in order to reduce the chance of disturbance or mortality of bears:

- record the location of the bear den with a GPS;
- communicate the location of the den to construction and environmental personnel;
- avoid the bear den by 1 km;
- under special circumstances, implement an exception to the 1 km buffer for logistical reasons following consultation with the GN; and
- monitor the feature for the duration of the season and report the success of the bears in the annual WMMP report.

5. SUMMARY

In summary, eight potential quarry sites were classified as moderate to high suitability for grizzly bear winter denning, however there were no observed grizzly bears or bear dens at any of the proposed quarry sites along the WIR.

6. REFERENCES

Wildlife Act. 2003. S.Nu., c.26

CESCC. 2015. *Wild Species 2015: The General Status of Species in Canada*. Presented at National General Status Working Group.

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ERM. 2019. *Back River Project: 2019 Wildlife Mitigation and Monitoring Program Plan*. Prepared for Sabina Gold & Silver Corp. by ERM Consultants Canada Ltd.: Vancouver, British Columbia.

Government of Canada. 2020. *Species at Risk Public Registry*:
<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html> (accessed February 2020).

McLoughlin, Philip. D., Cluff, D.H., Messier, Francois. 2002. Denning Ecology of Barren-Ground Grizzly Bears in the Central Arctic. *Journal of Mammalogy*, 83 (1) : 188–198.

NIRB. 2017. *NIRB Project Certificate [NO.: 007]*. Prepared for Sabina Gold & Silver Corp. by the Nunavut Impact Review Board: Nunavut.

FIGURES, PHOTOS, AND TABLES

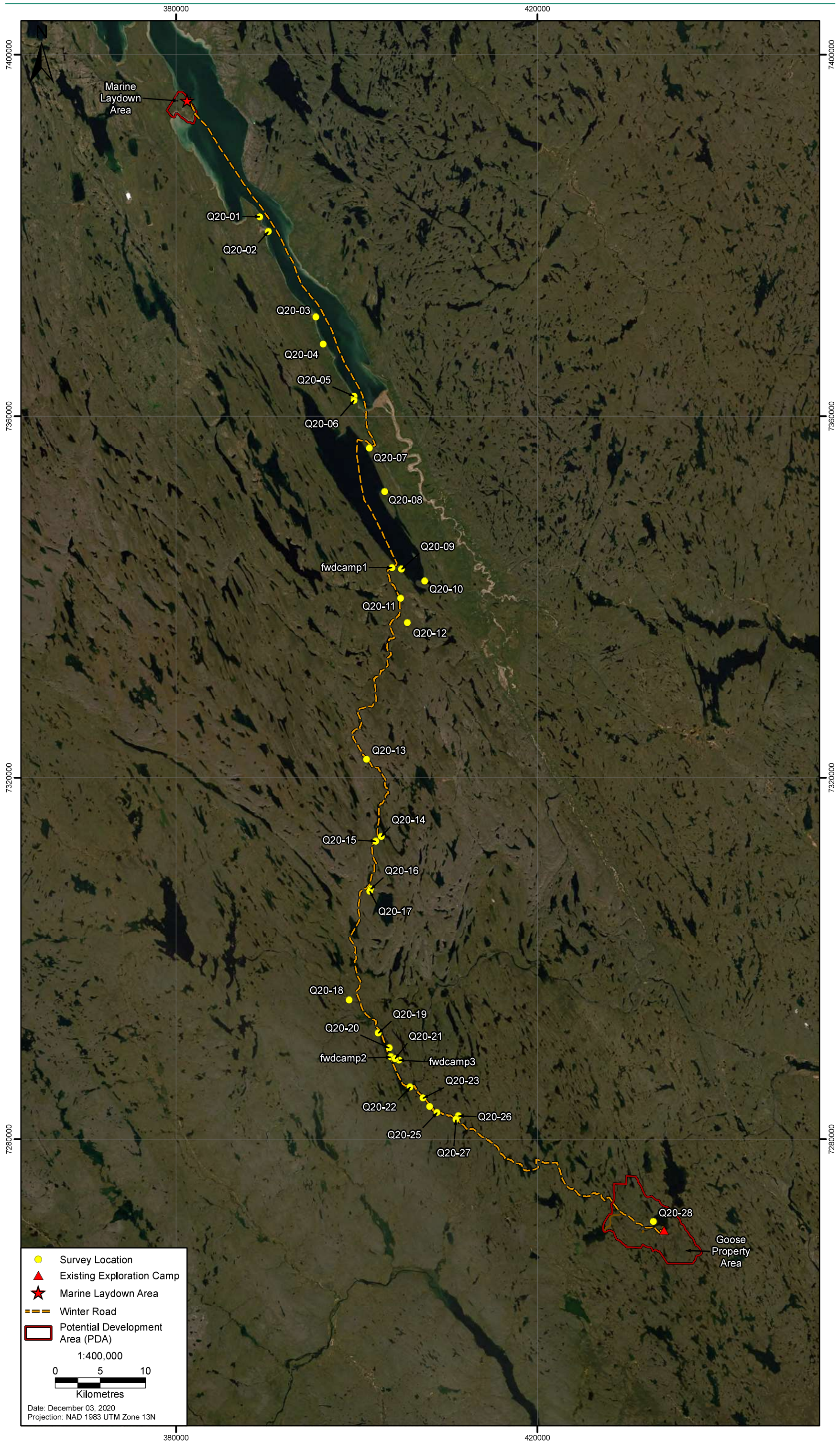


Figure 1: Map of Entire Area Surveyed for Bear Den Habitat at Back River

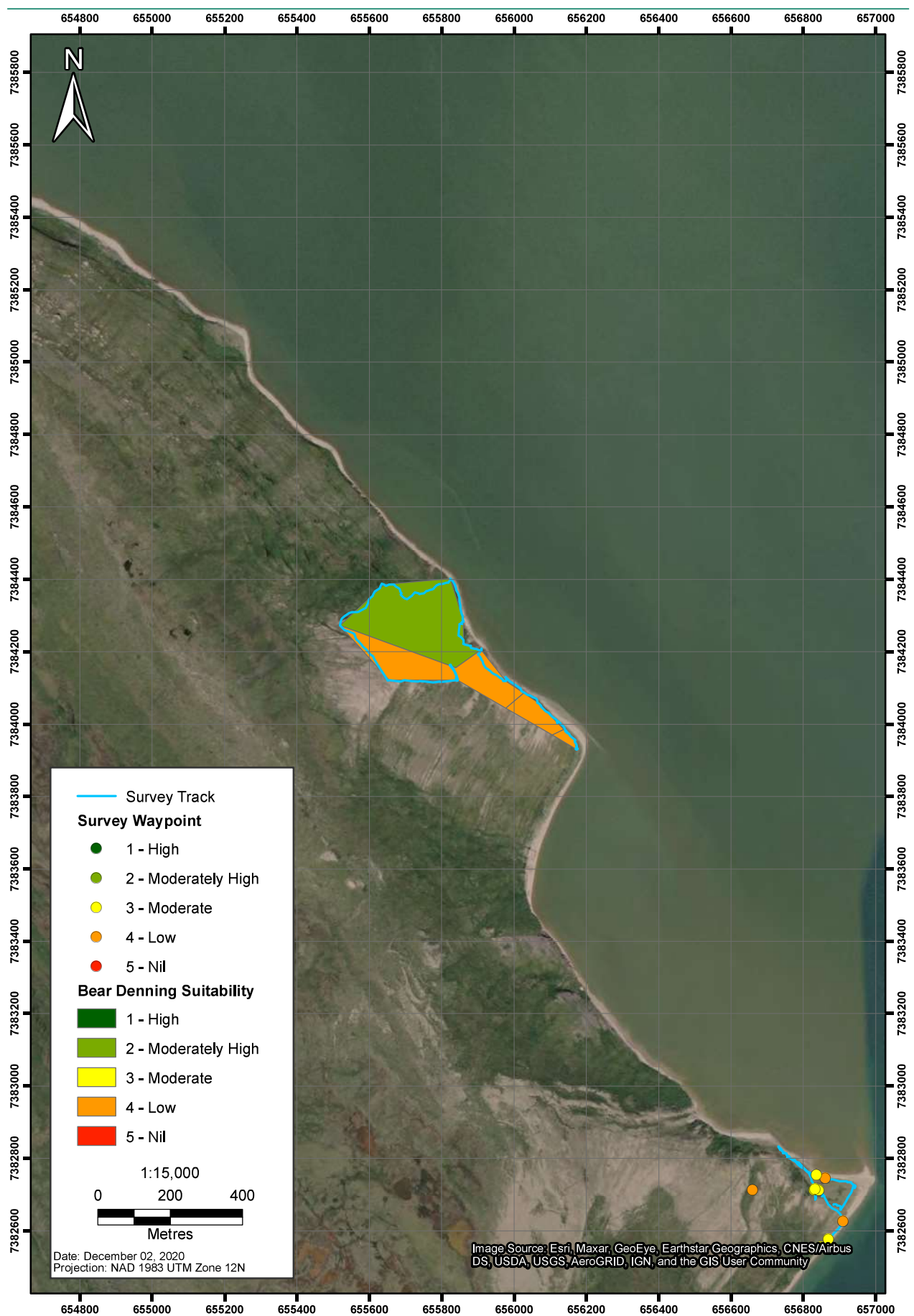


Figure 2: Map of Q20-01 Showing Bear Den Habitat Suitability By Colour

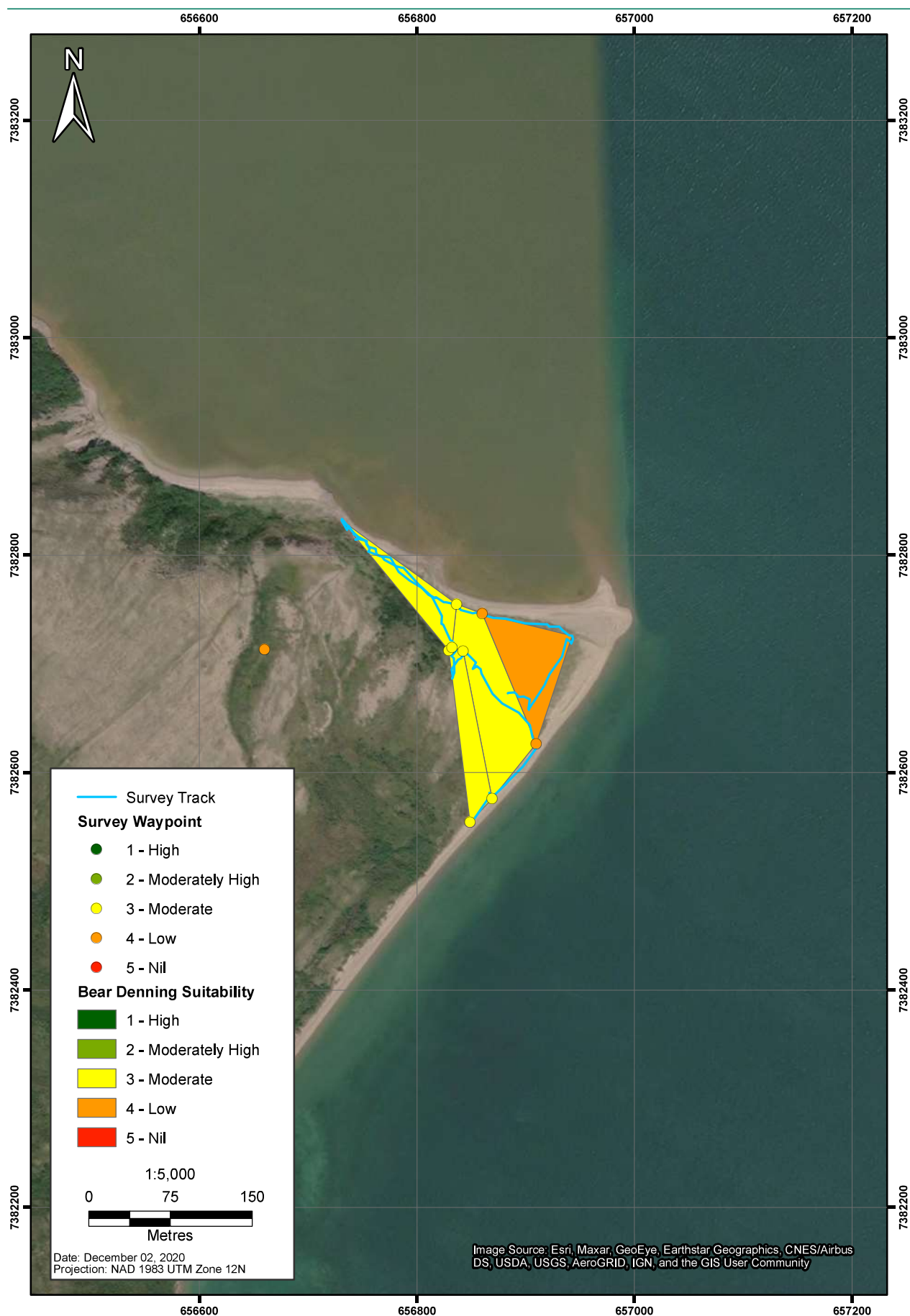


Figure 3: Map of Q20-02 Showing Bear Den Habitat Suitability By Colour

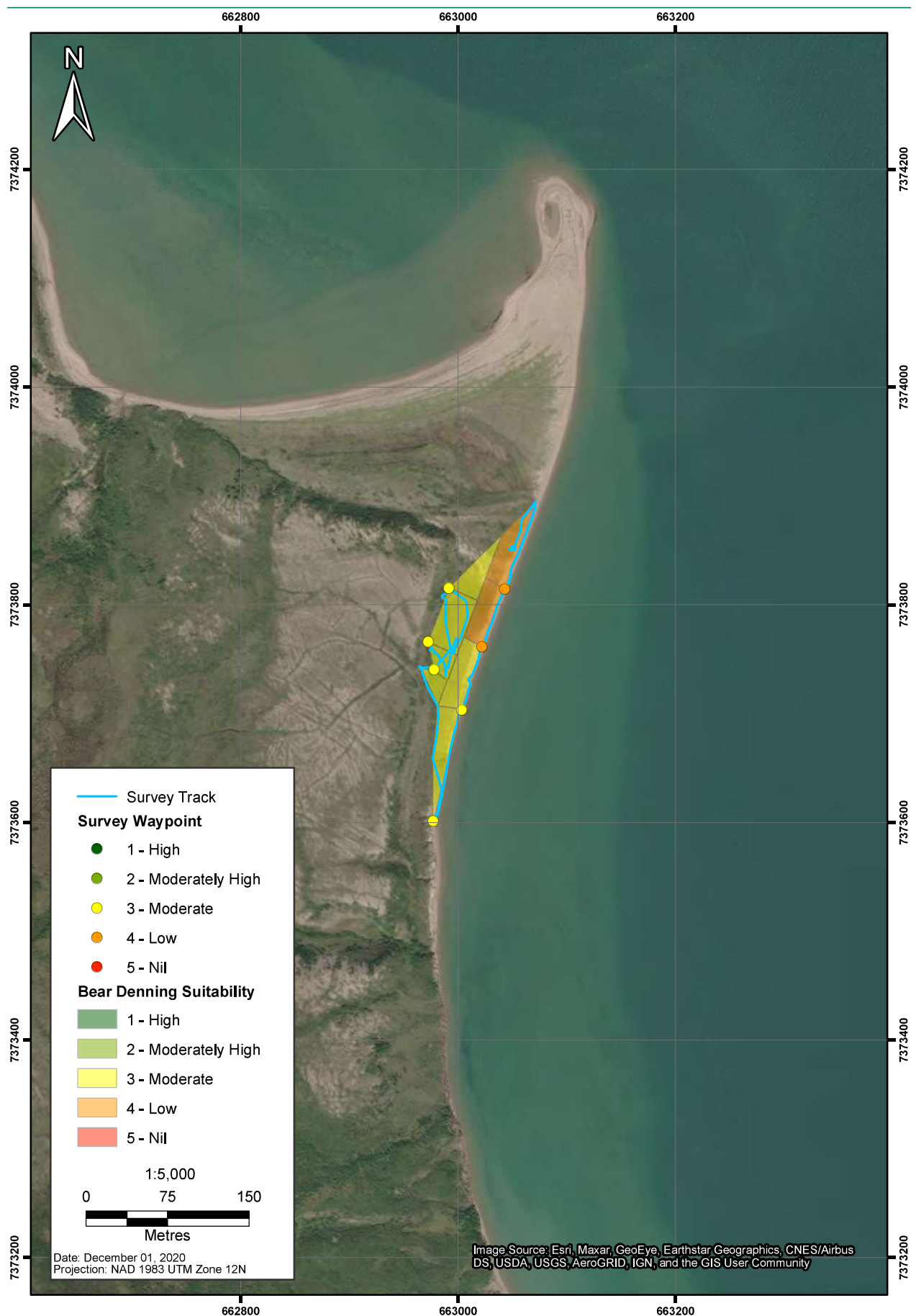


Figure 4: Map of Q20-03 Showing Bear Den Habitat Suitability By Colour

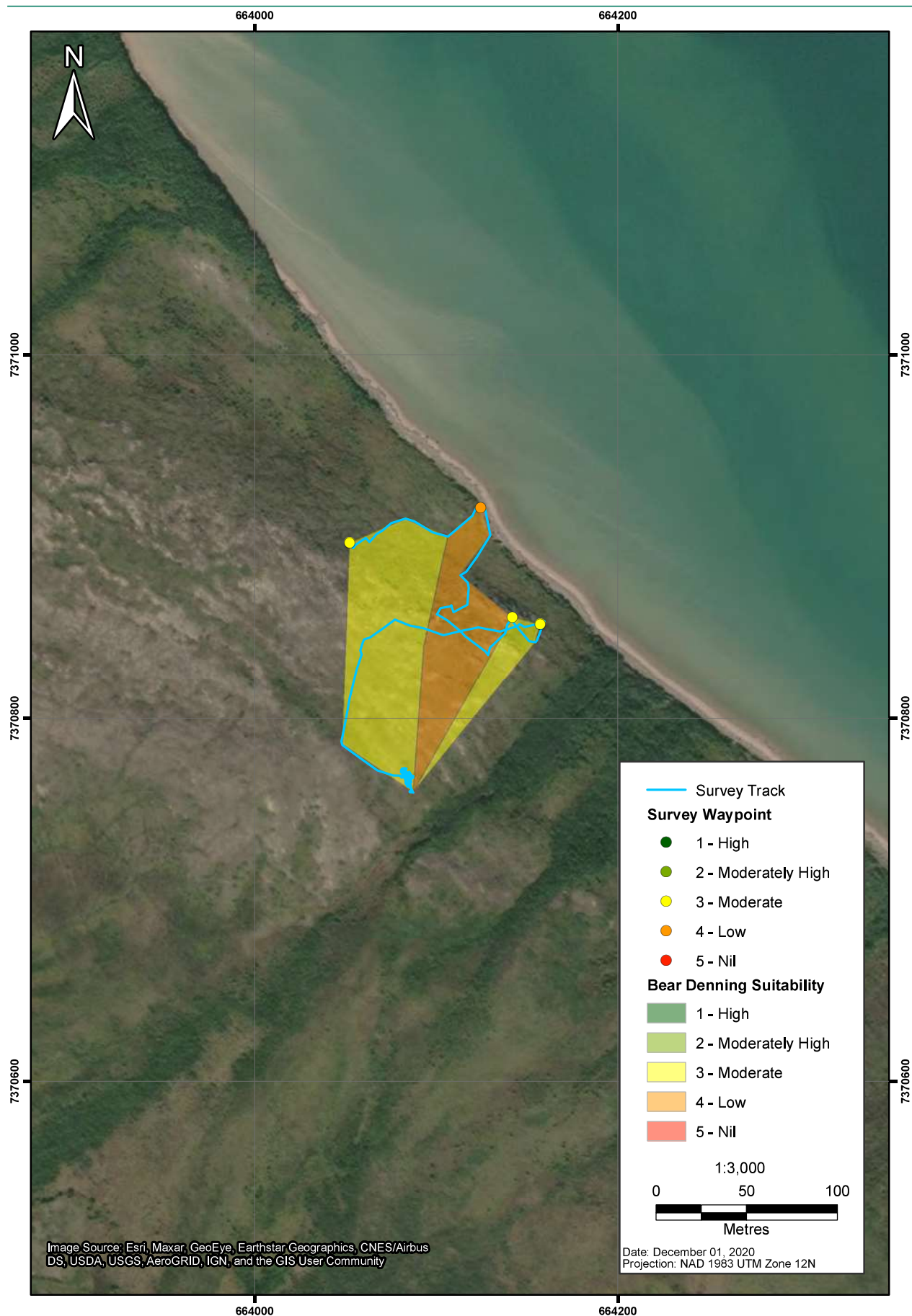


Figure 5: Map of Q20-04 Showing Bear Den Habitat Suitability By Colour



Figure 6: Map of Q20-05 Showing Bear Den Habitat Suitability By Colour



Figure 7: Map of Q20-06 Showing Bear Den Habitat Suitability By Colour

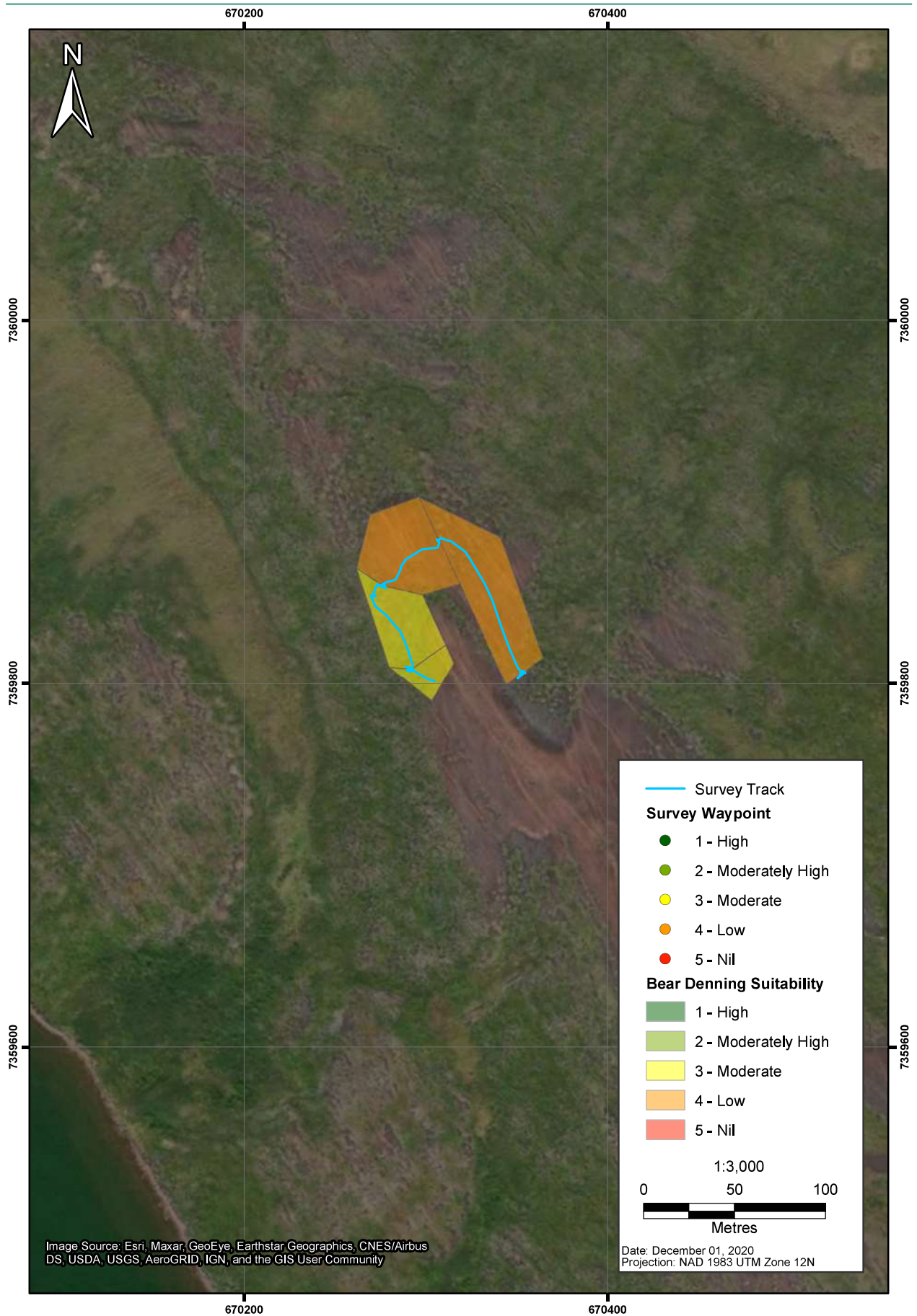


Figure 8: Map of Q20-07 Showing Bear Den Habitat Suitability By Colour

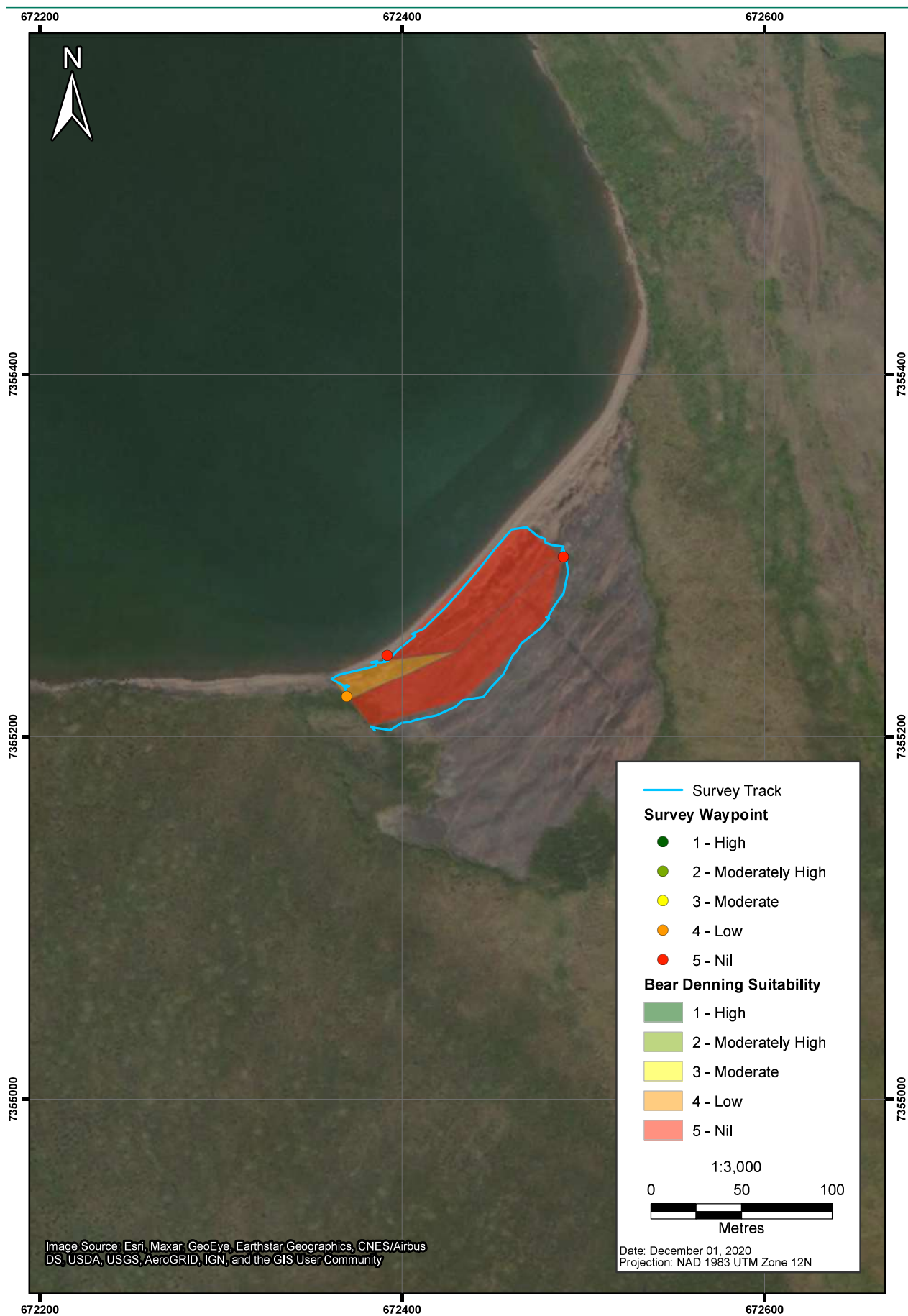


Figure 9: Map of Q20-08 Showing Bear Den Habitat Suitability By Colour

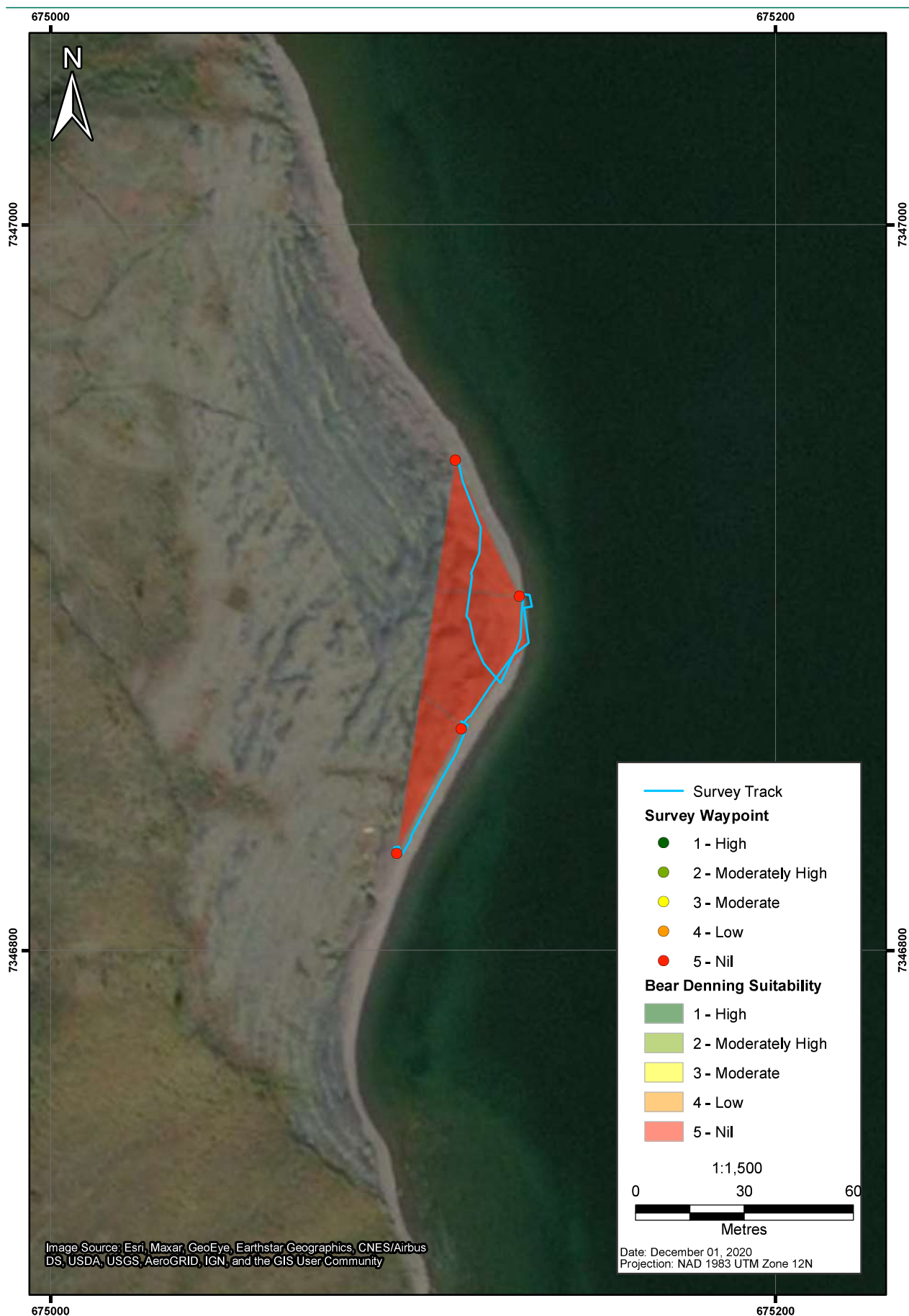


Figure 10: Map of Q20-09 Showing Bear Den Habitat Suitability By Colour

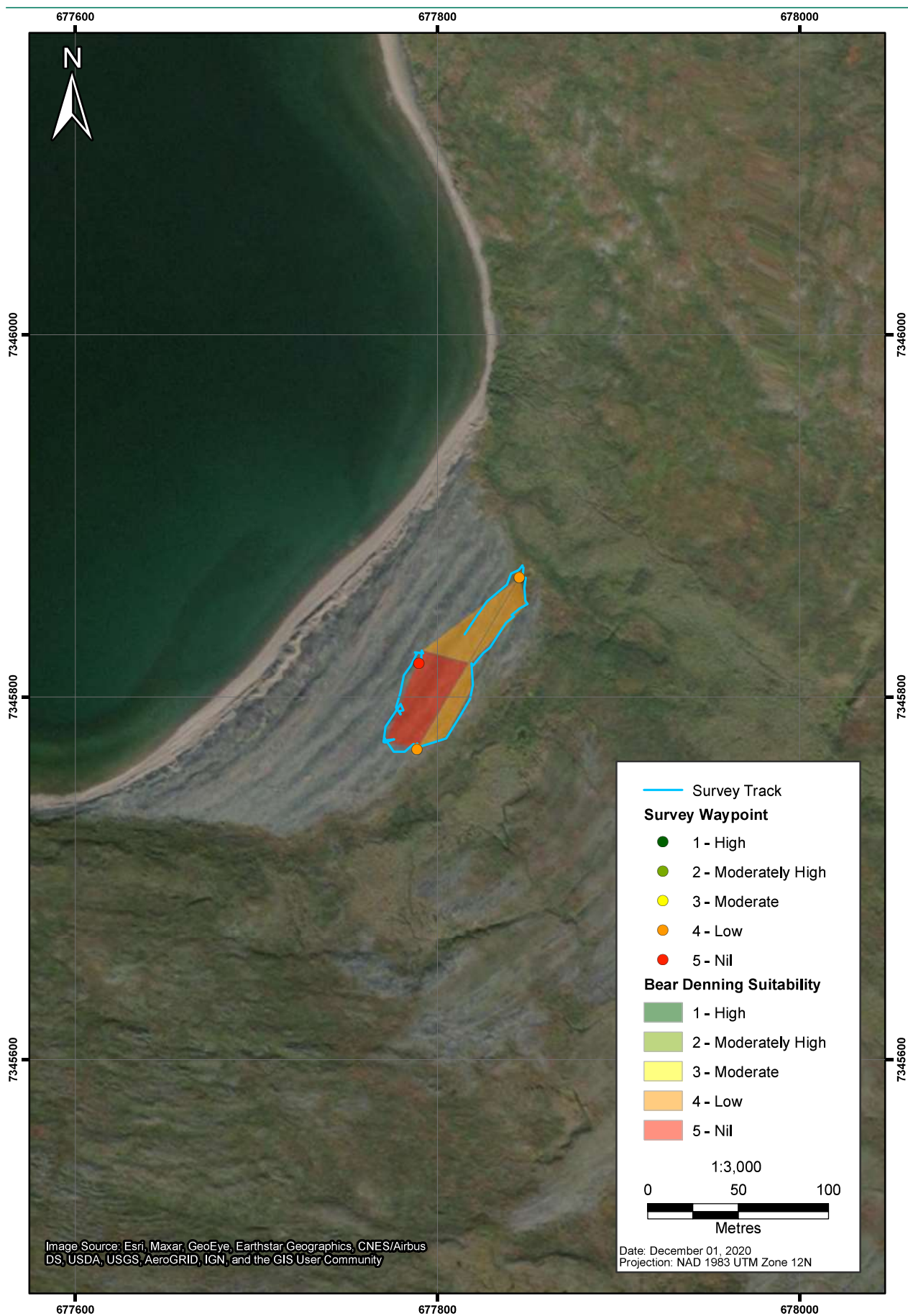


Figure 11: Map of Q20-10 Showing Bear Den Habitat Suitability By Colour

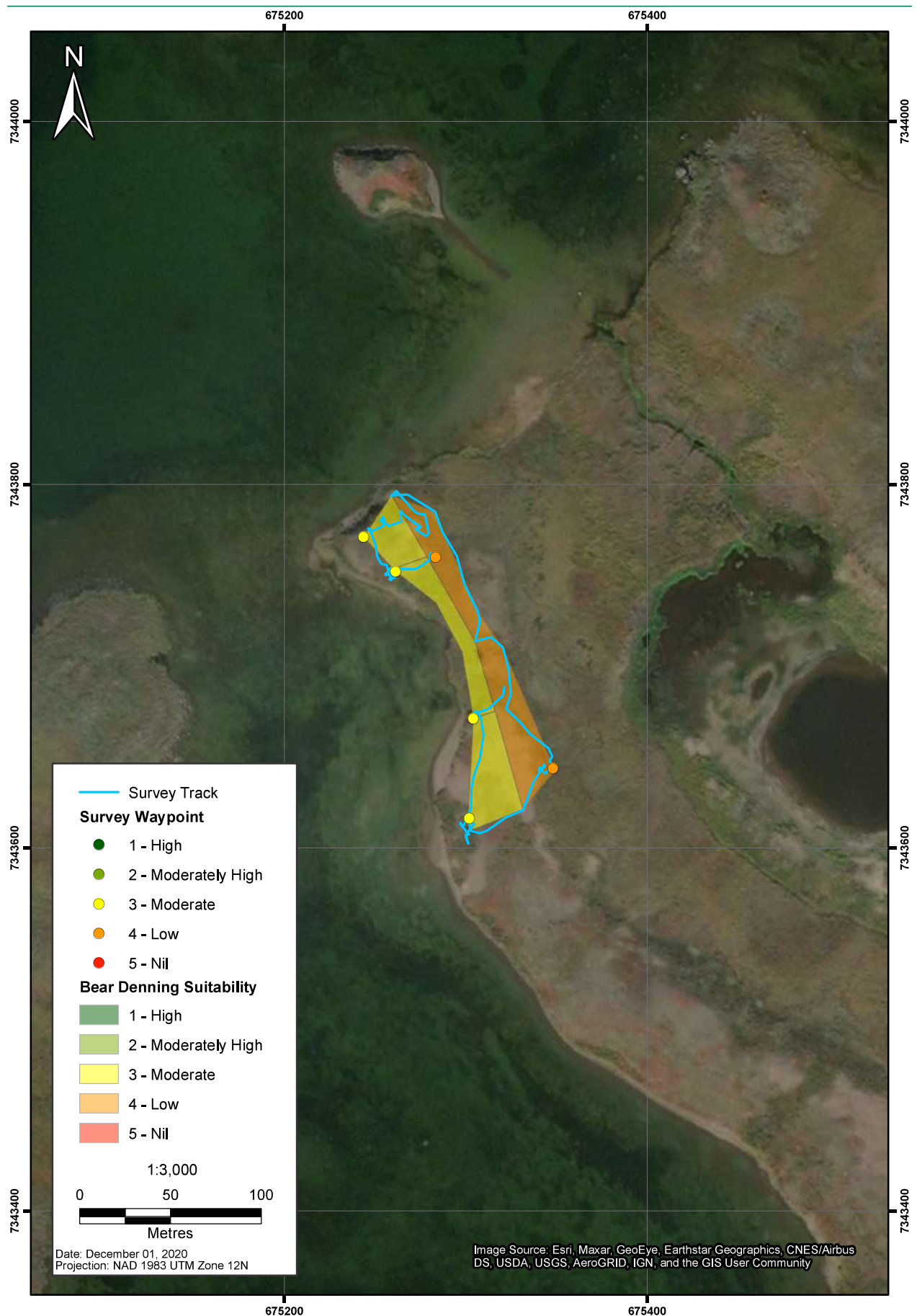


Figure 12: Map of Q20-11 Showing Bear Den Habitat Suitability By Colour

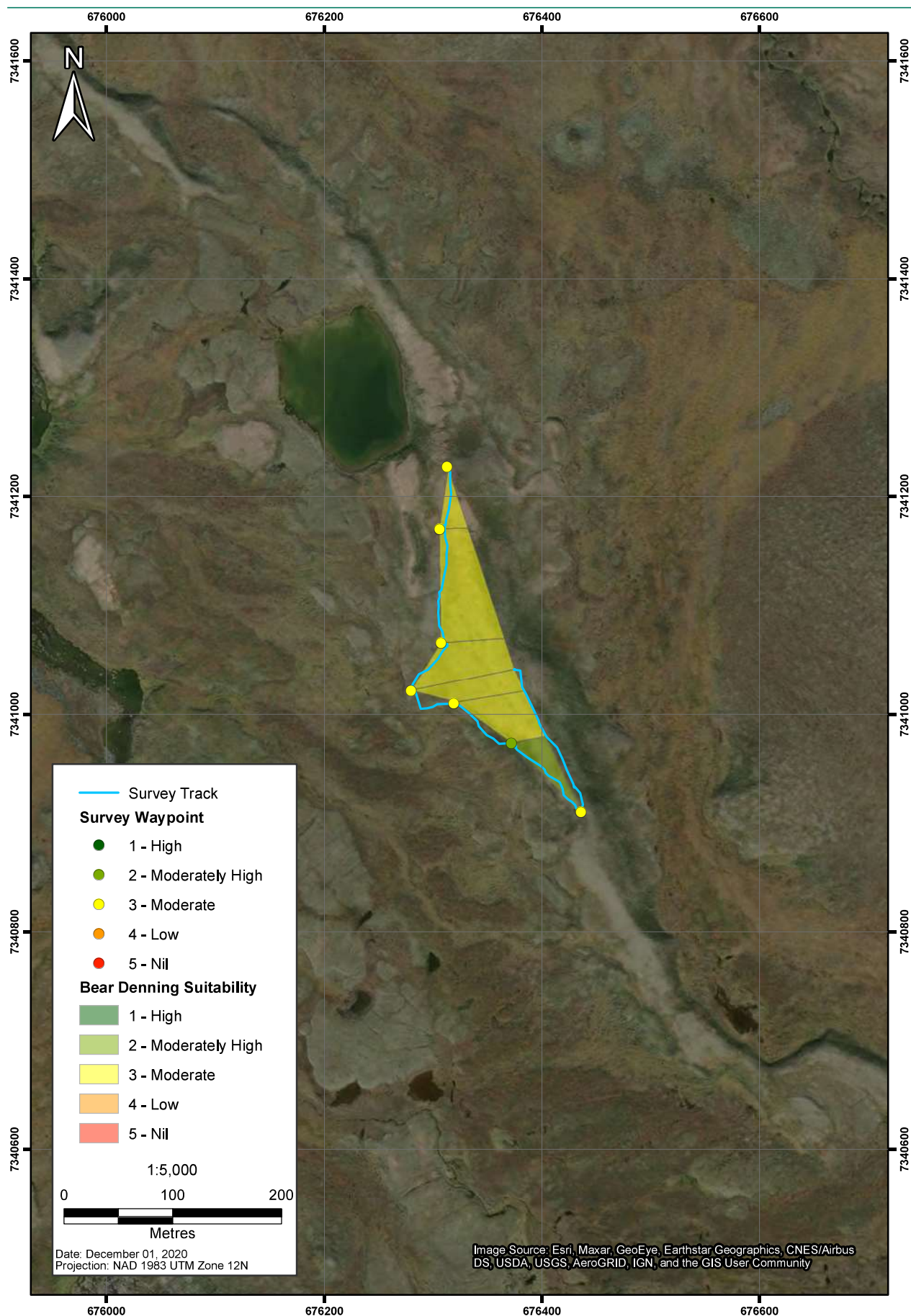


Figure 13: Map of Q20-12 Showing Bear Den Habitat Suitability By Colour

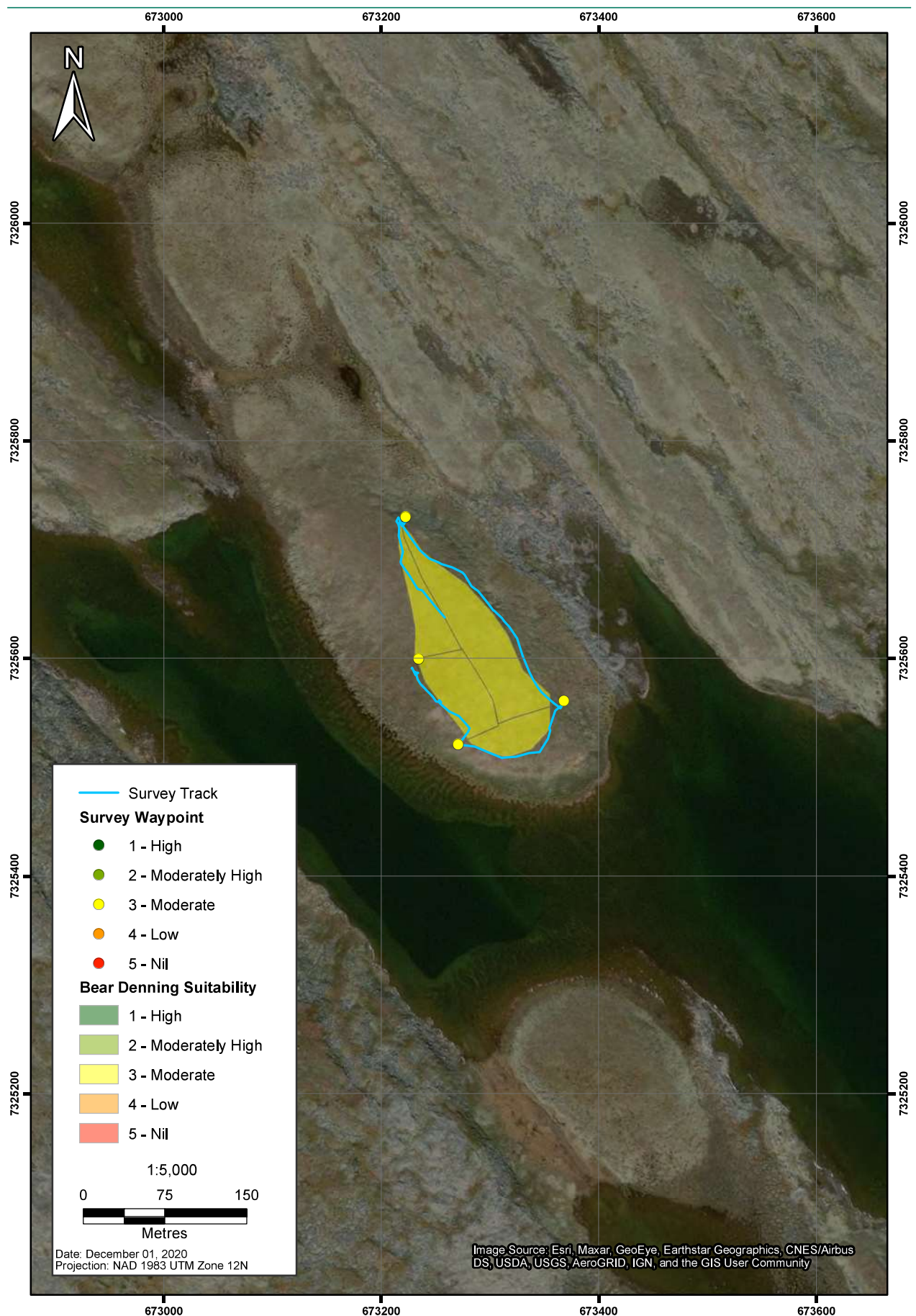


Figure 14: Map of 20-13 Showing Bear Den Habitat Suitability By Colour

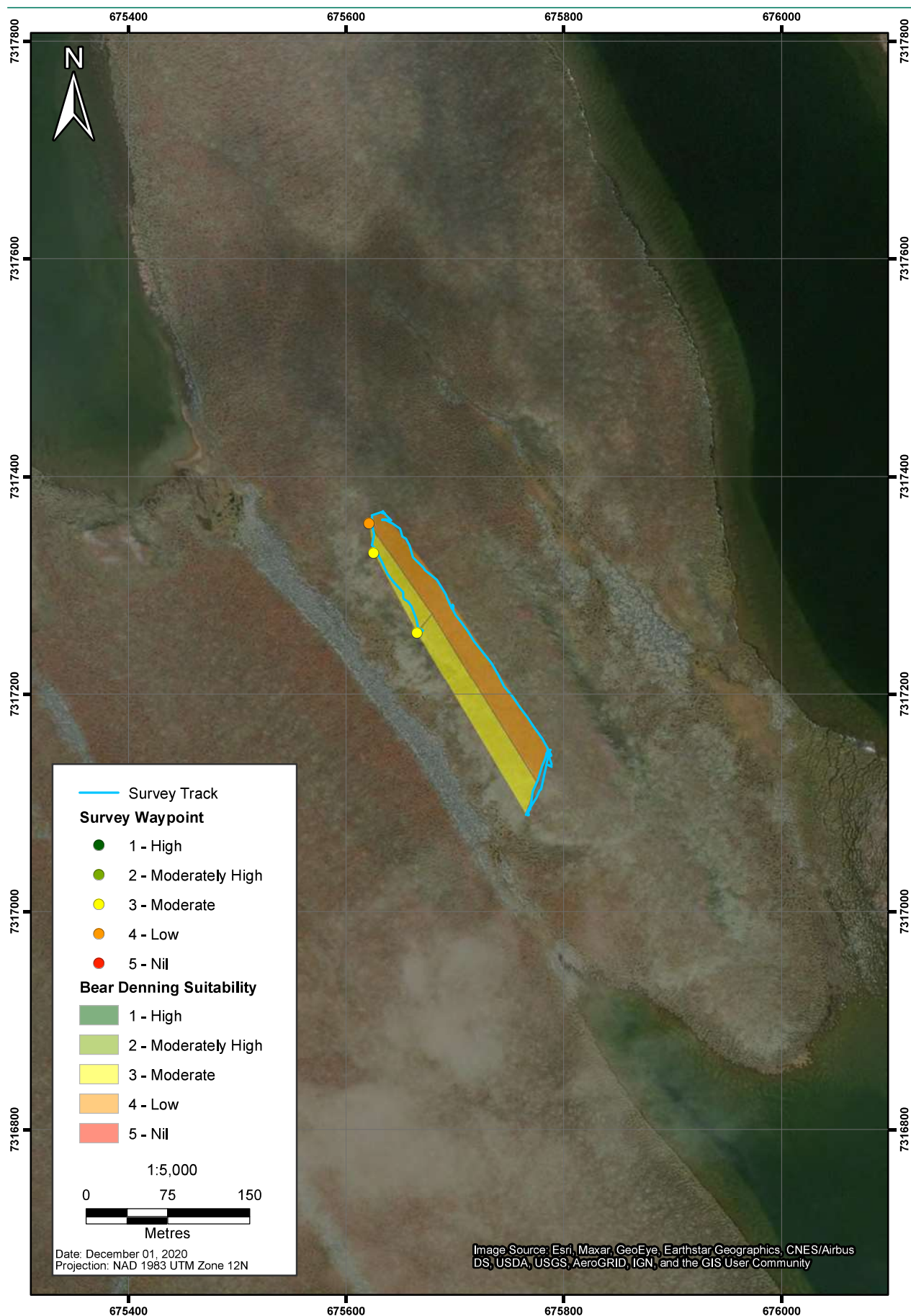


Figure 15: Map of Q20-14 Showing Bear Den Habitat Suitability By Colour

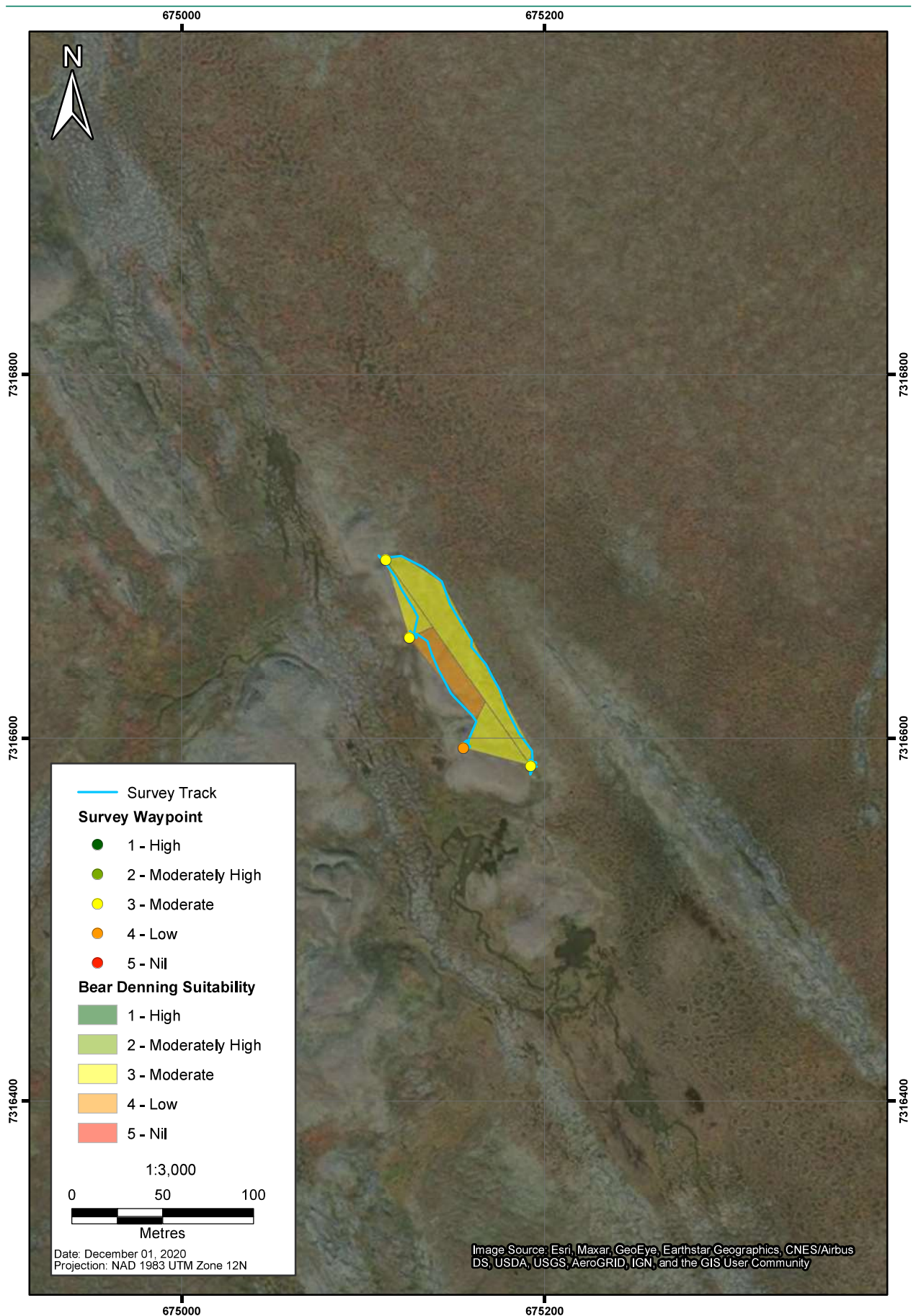


Figure 16: Map of Q20-15 Showing Bear Den Habitat Suitability By Colour

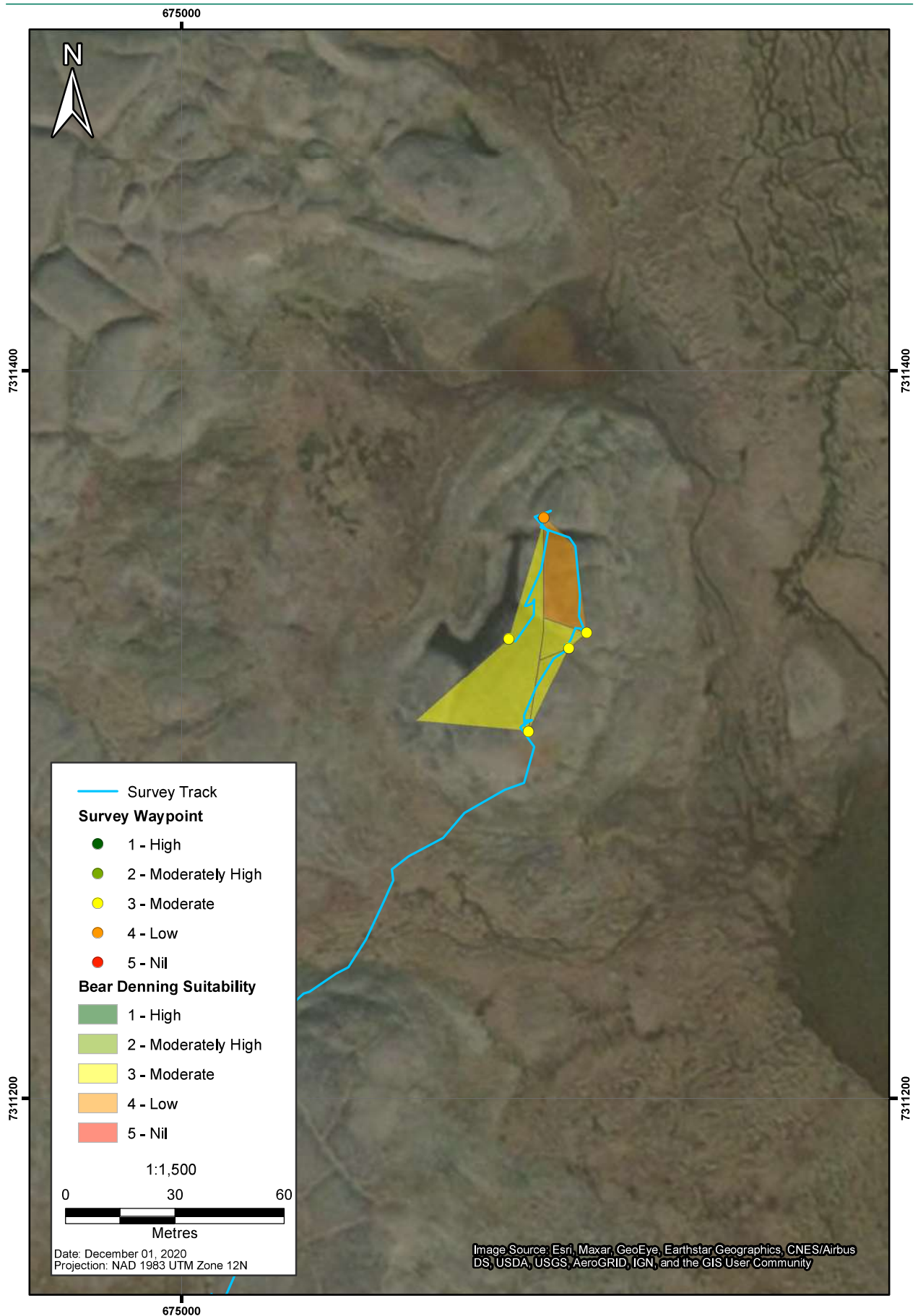


Figure 17: Map of Q20-16 Showing Bear Den Habitat Suitability By Colour

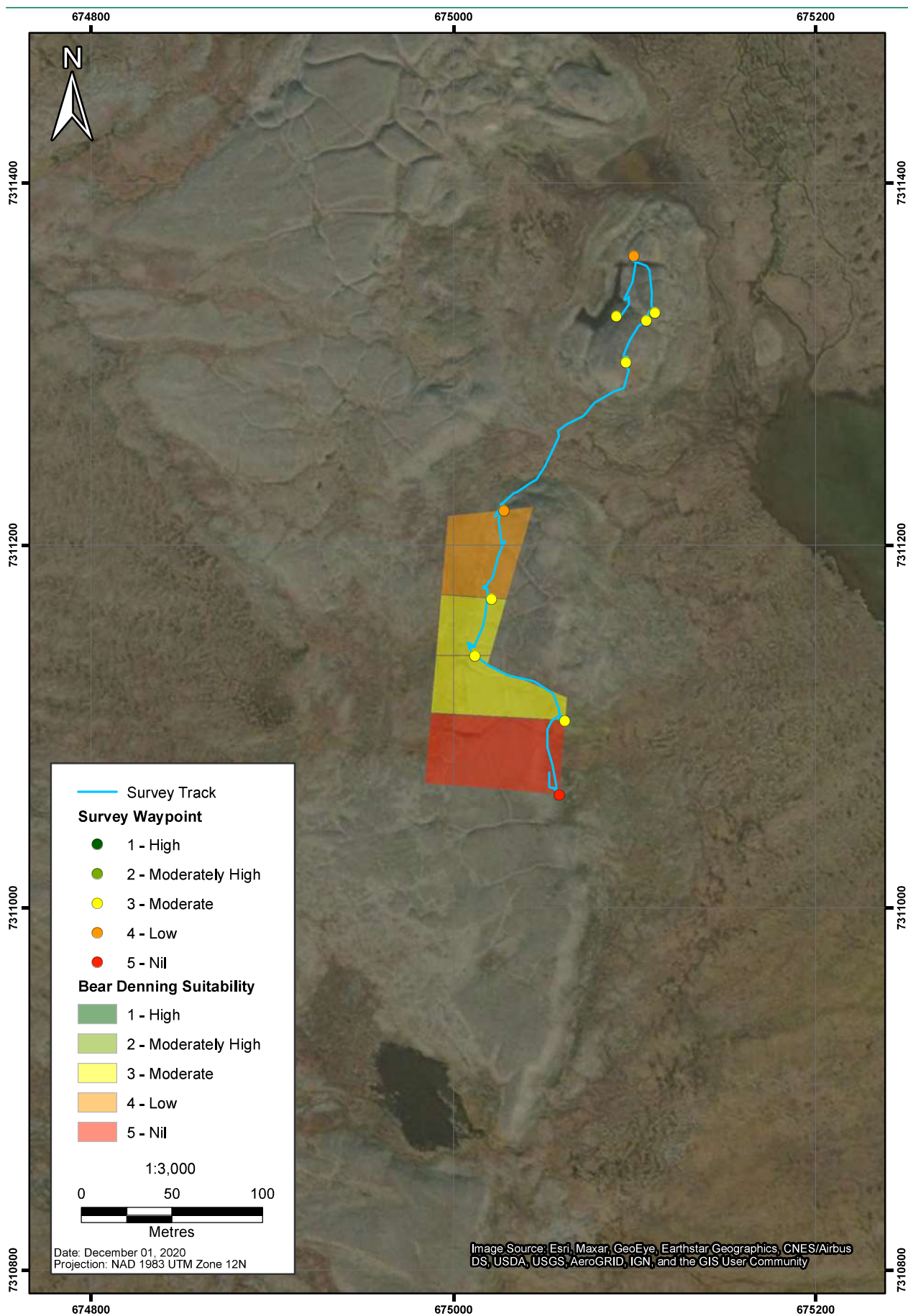


Figure 18: Map of Q20-17 Showing Bear Den Habitat Suitability By Colour

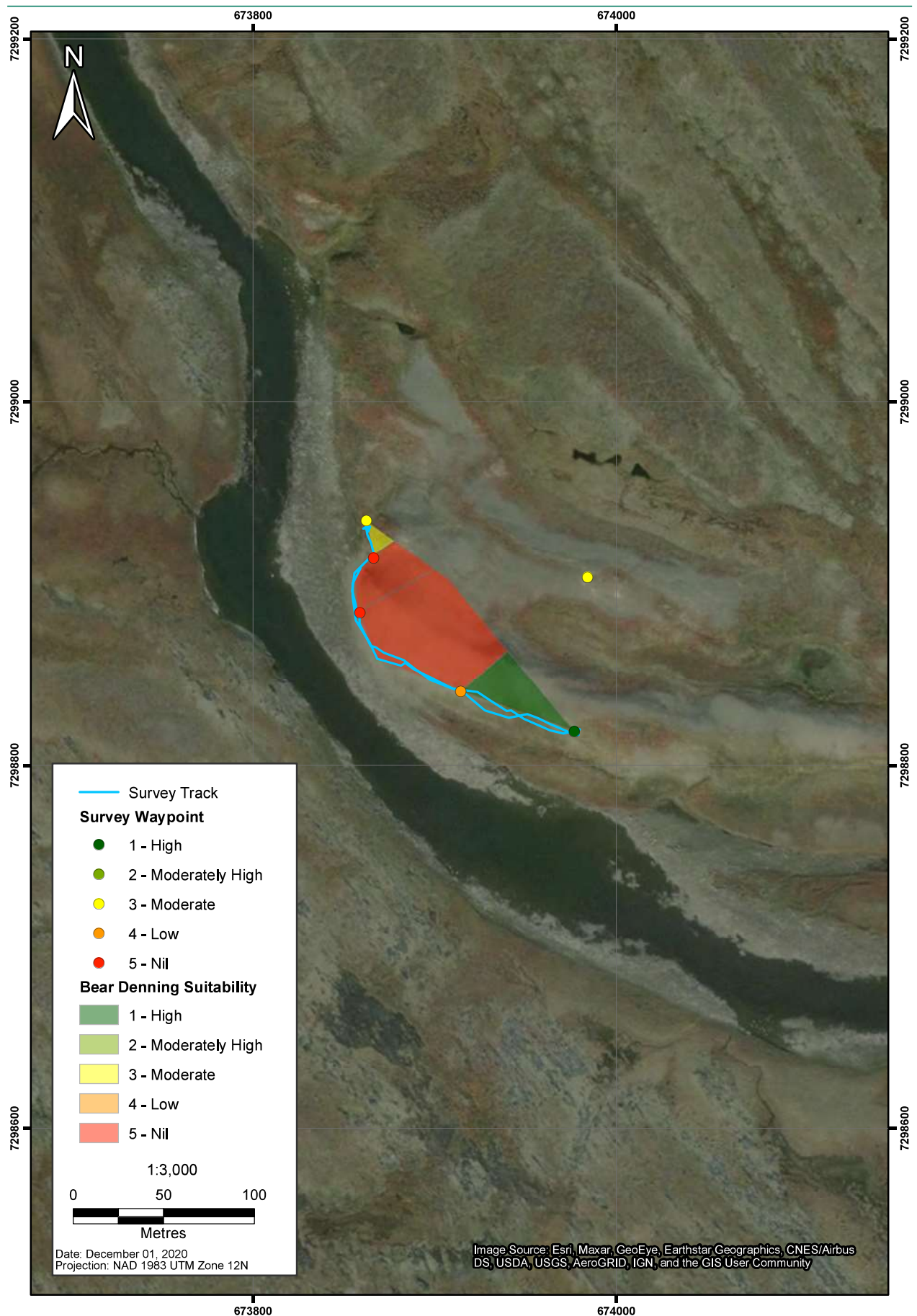


Figure 19: Map of Q20-18 Showing Bear Den Habitat Suitability By Colour



Figure 20: Map of Q20-19 Showing Bear Den Habitat Suitability By Colour

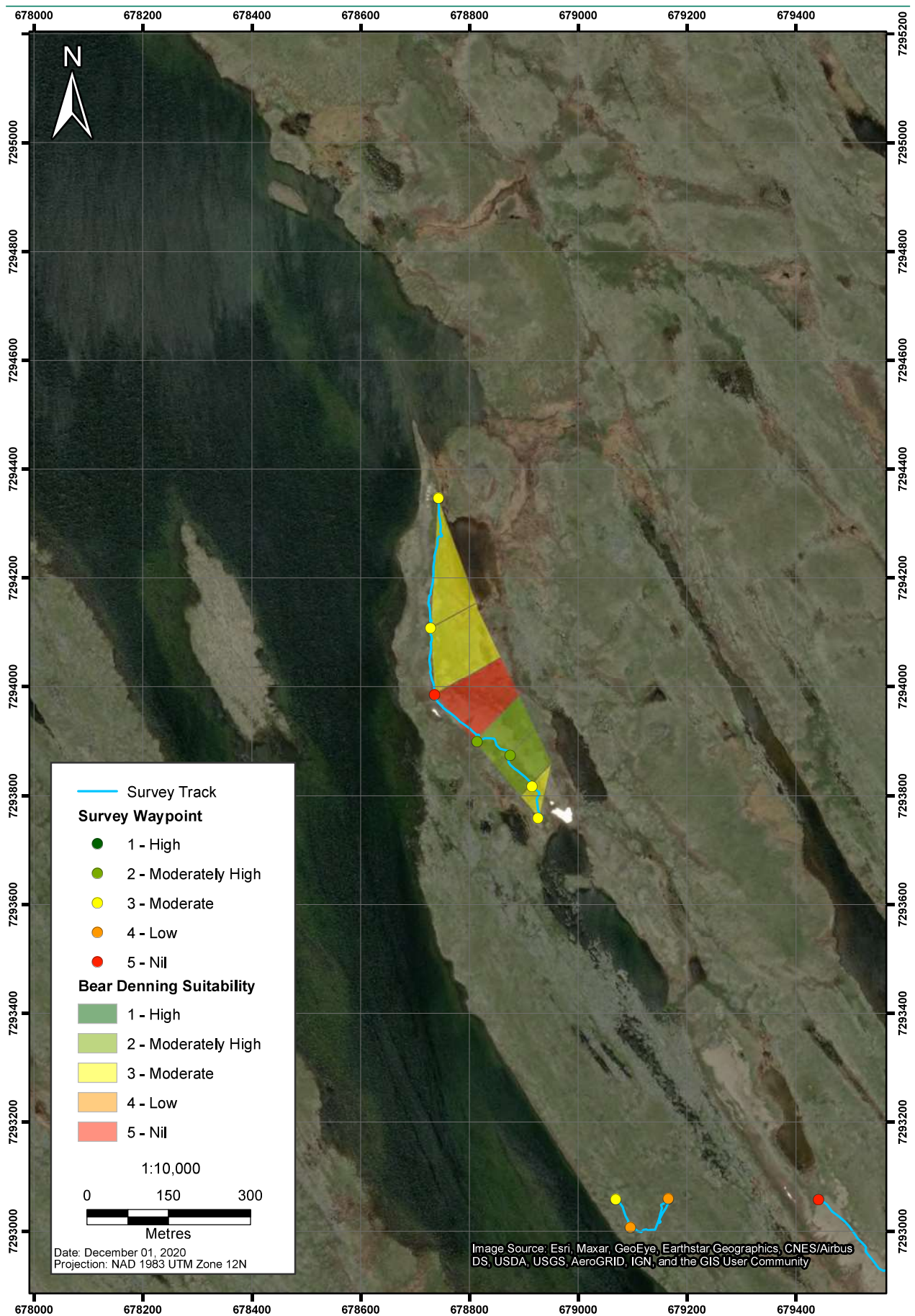


Figure 21: Map of Q20-20 Showing Bear Den Habitat Suitability By Colour

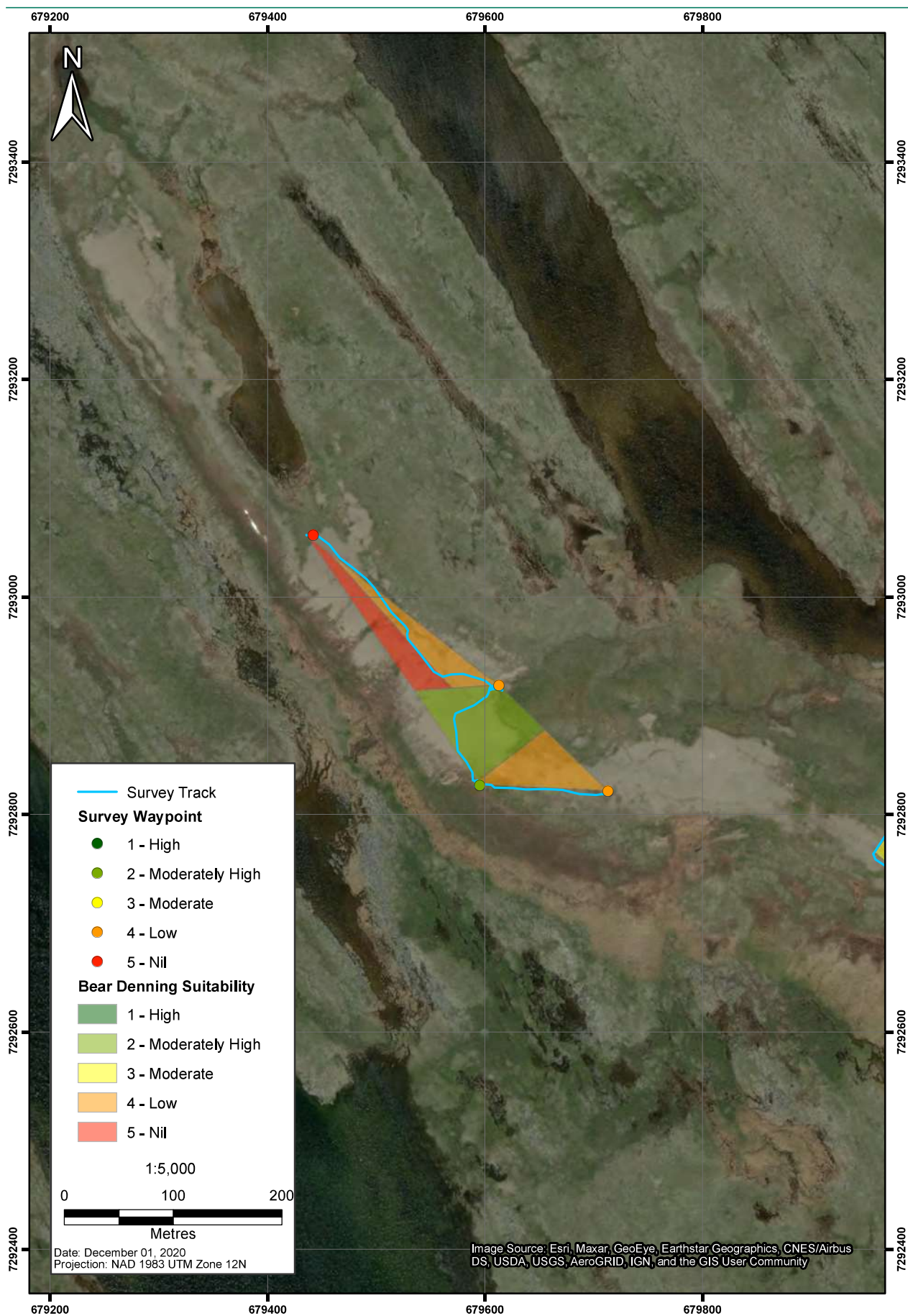


Figure 22: Map of Q20-21 Showing Bear Den Habitat Suitability By Colour

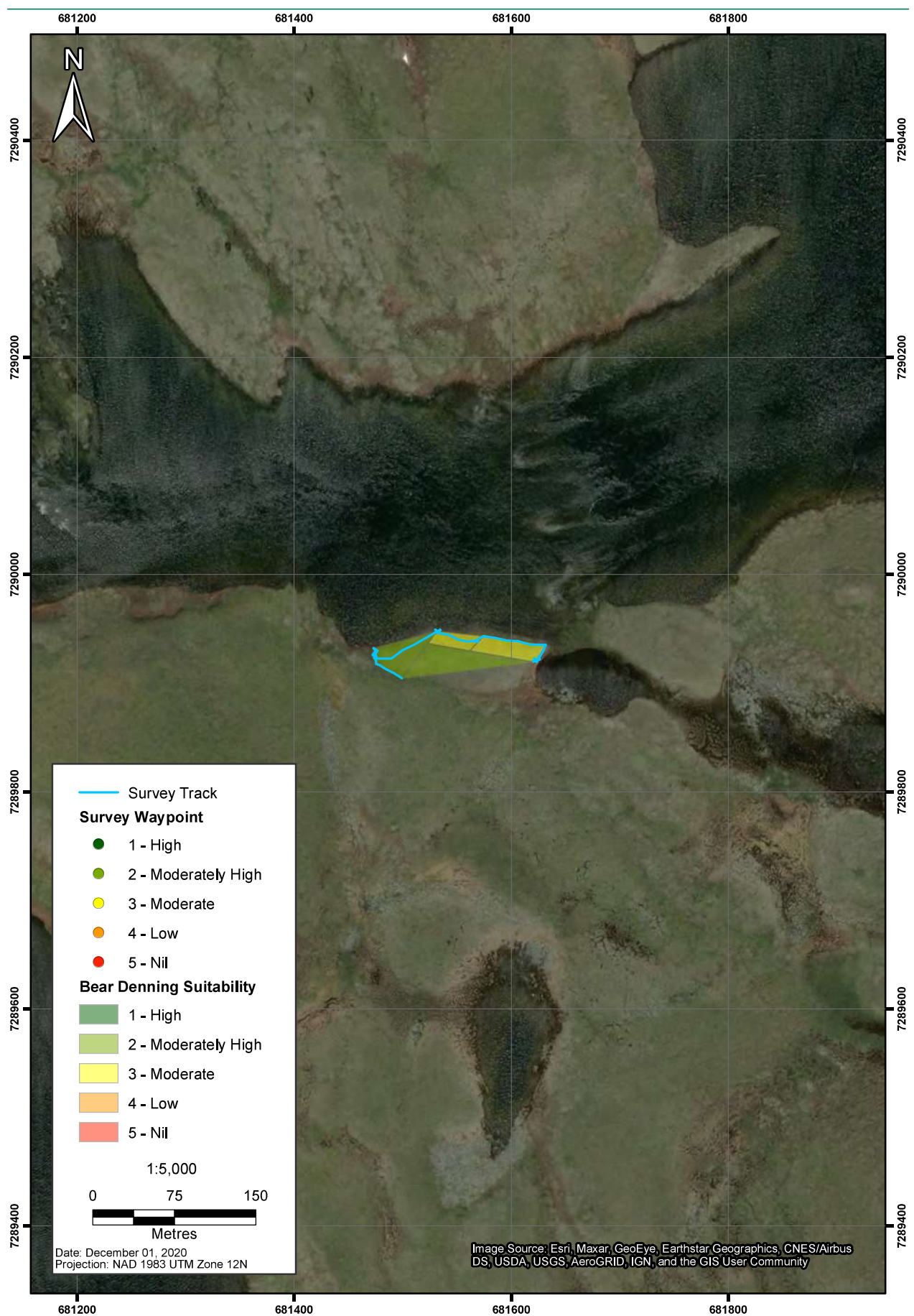


Figure 23: Map of Q20-22 Showing Bear Den Habitat Suitability By Colour

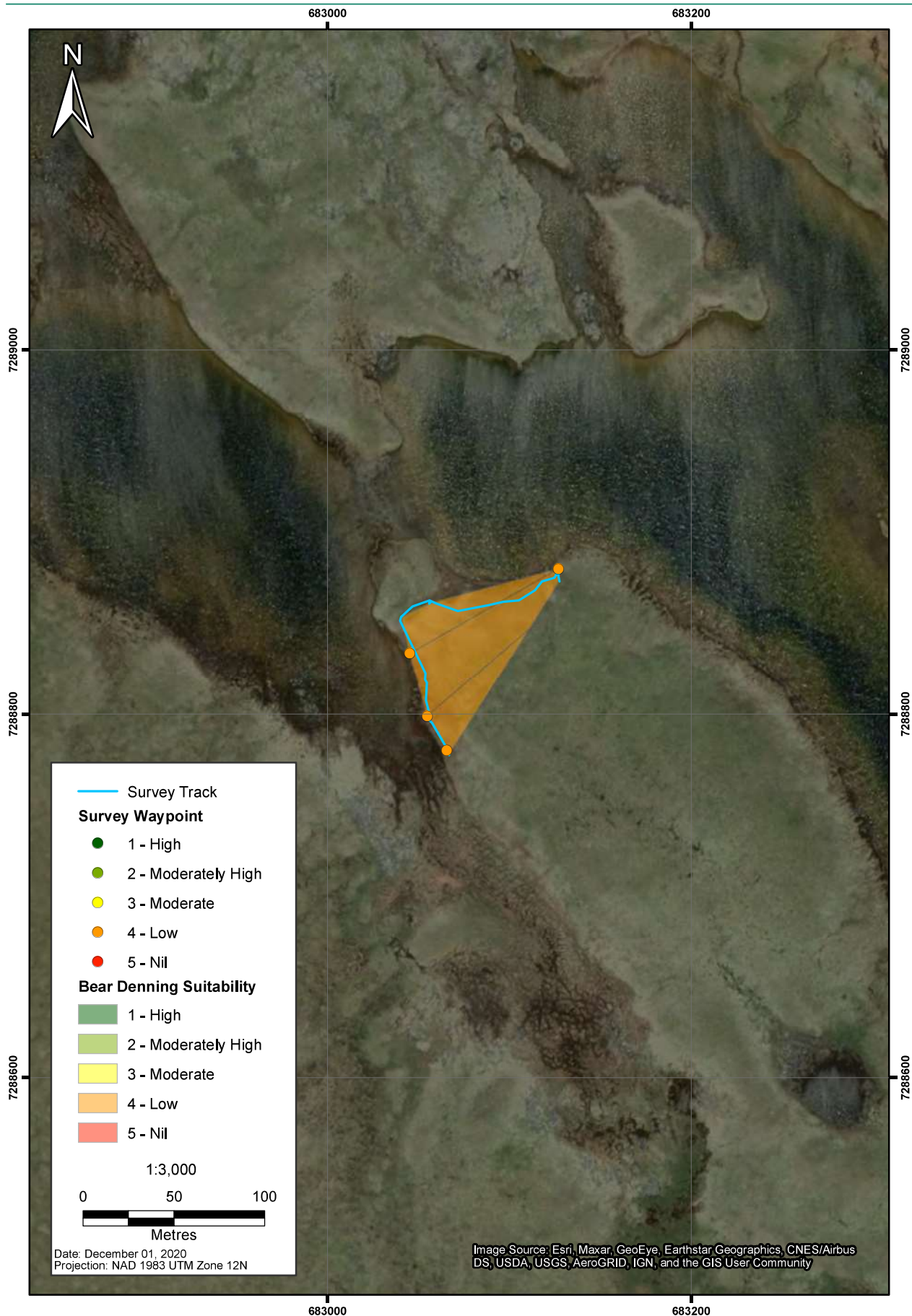


Figure 24: Map of Q20-23 Showing Bear Den Habitat Suitability By Colour

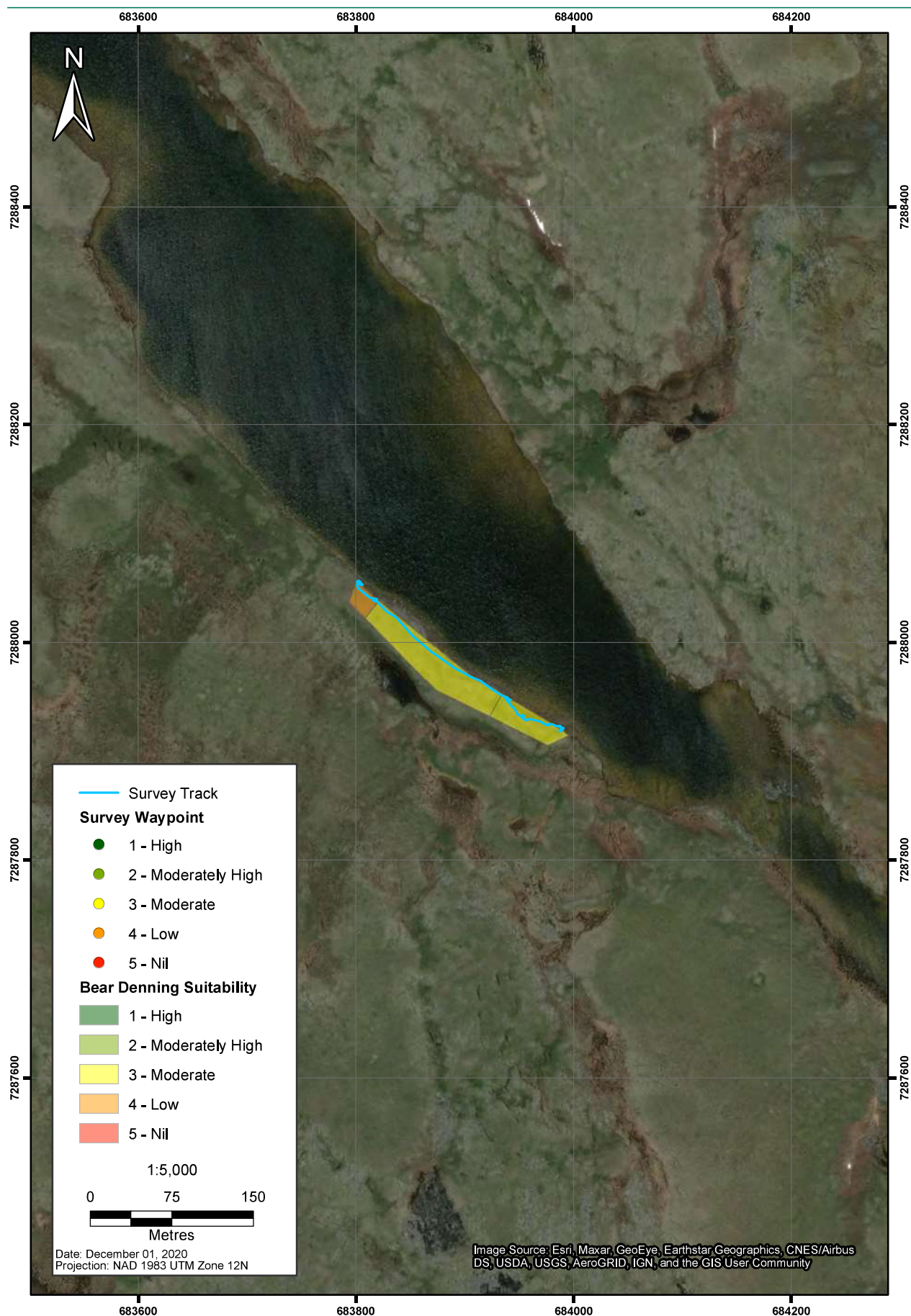


Figure 25: Map of Q20-24 Showing Bear Den Habitat Suitability By Colour

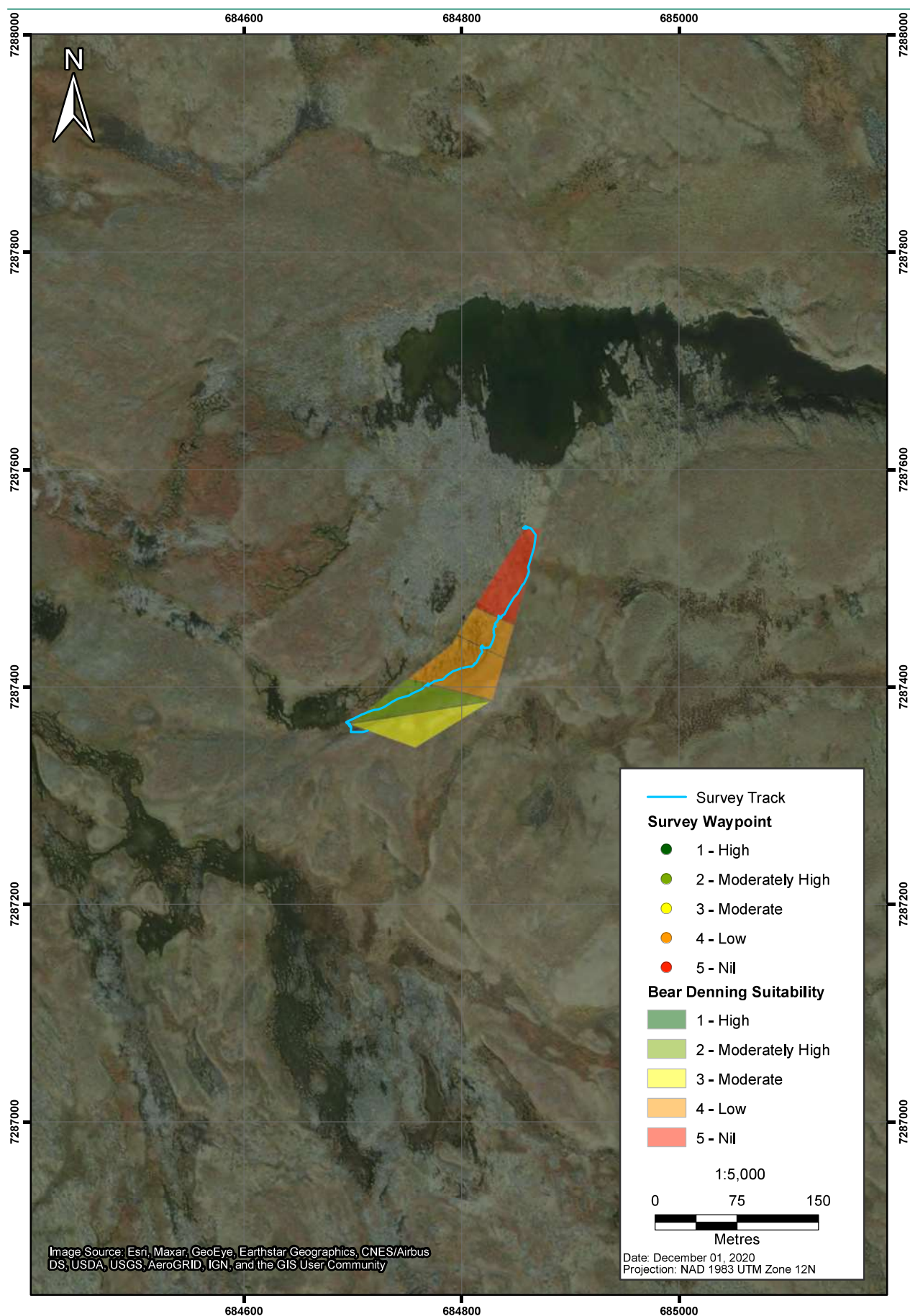


Figure 26: Map of Q20-25 Showing Bear Den Habitat Suitability By Colour

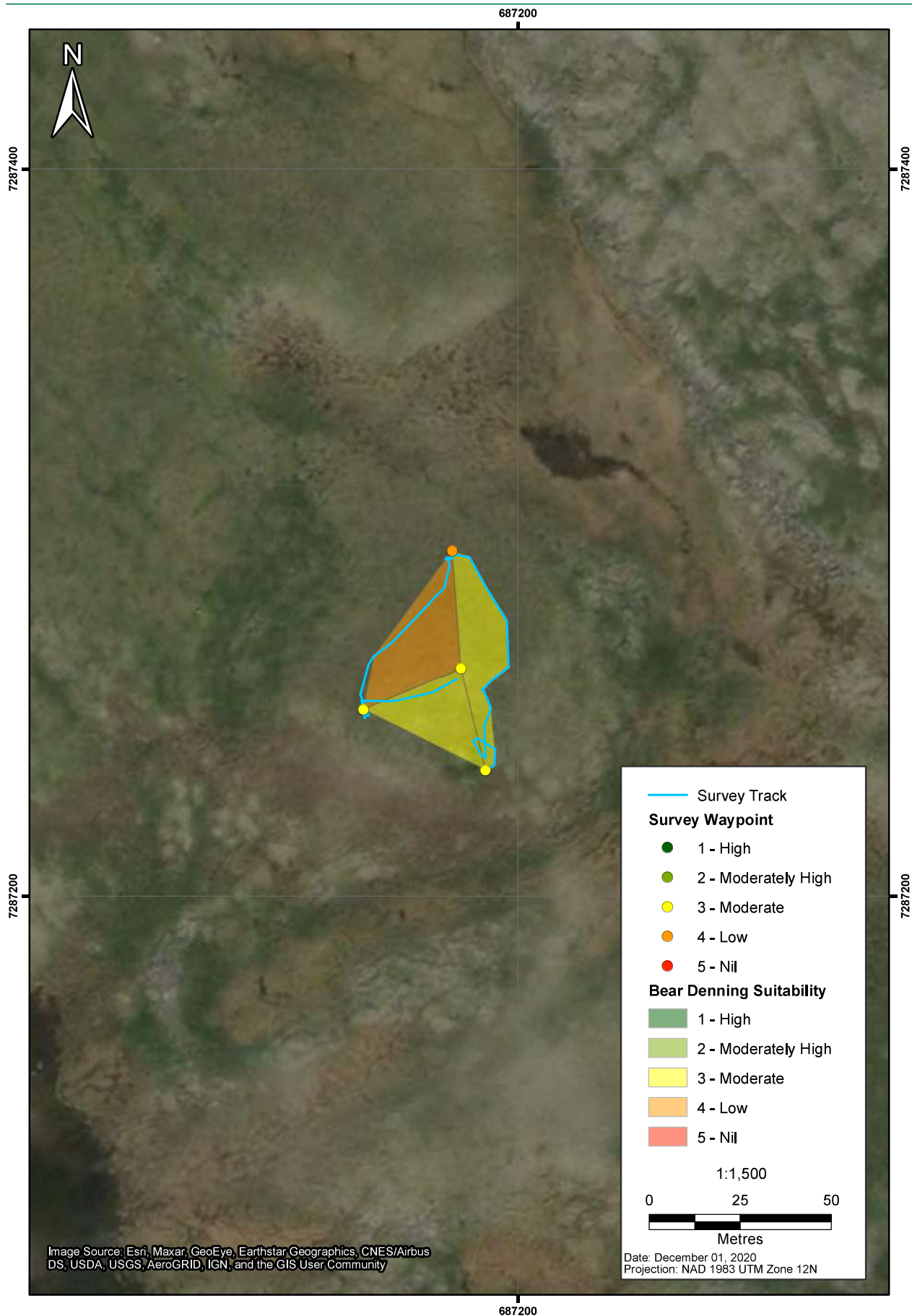


Figure 27: Map of Q20-26 Showing Bear Den Habitat Suitability By Colour

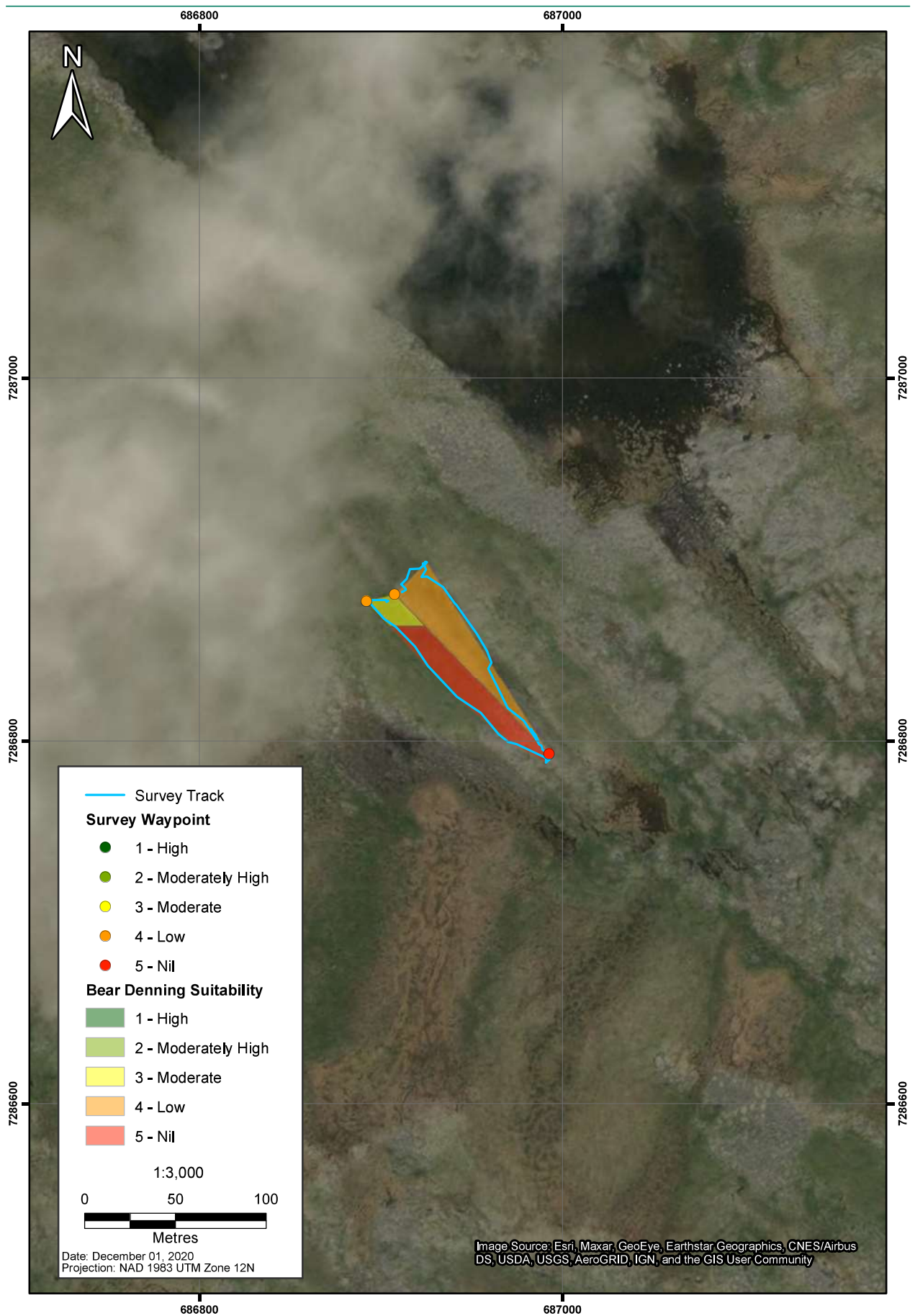


Figure 28: Map of Q20-27 Showing Bear Den Habitat Suitability By Colour

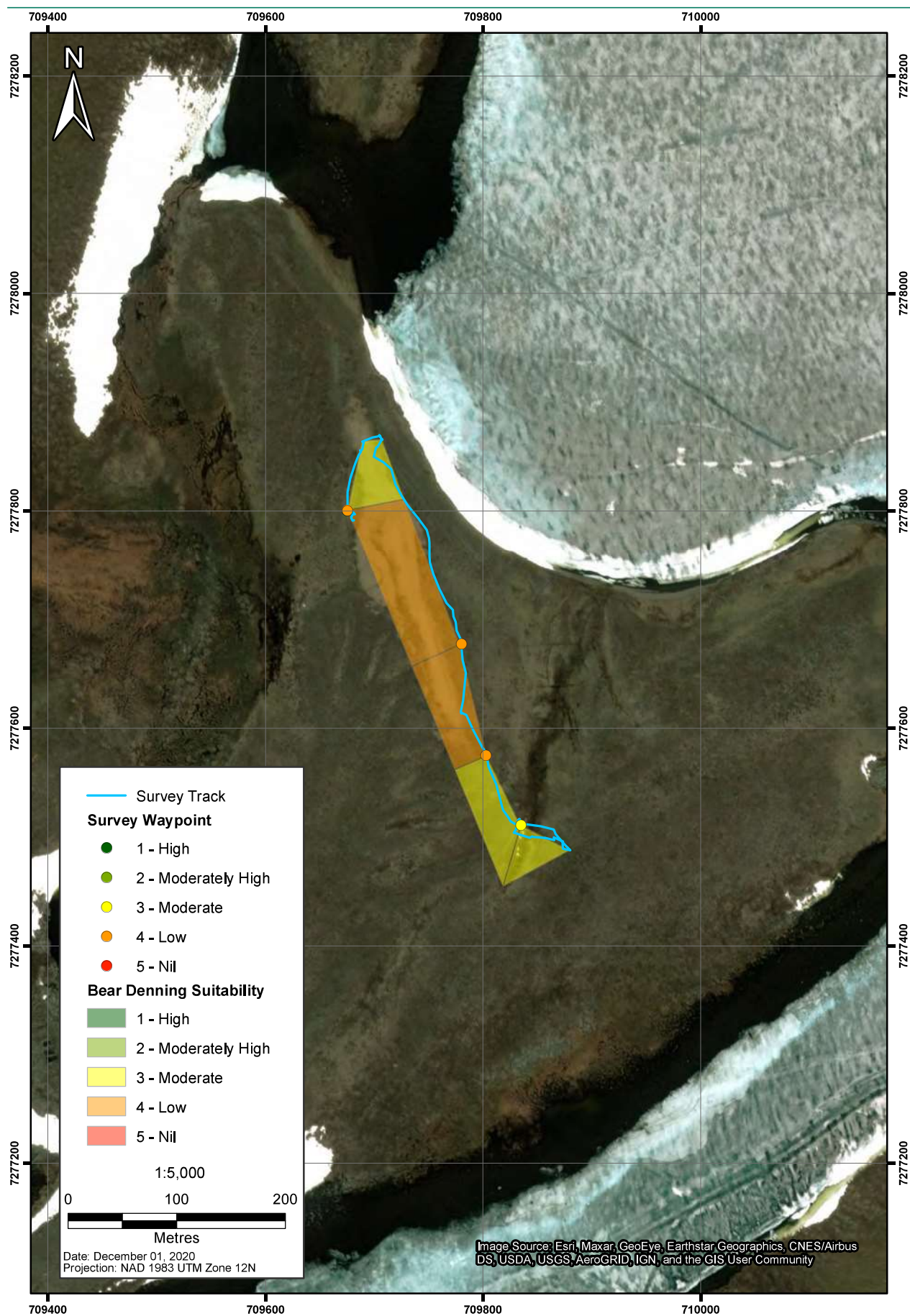


Figure 29: Map of Q20-28 Showing Bear Den Habitat Suitability By Colour

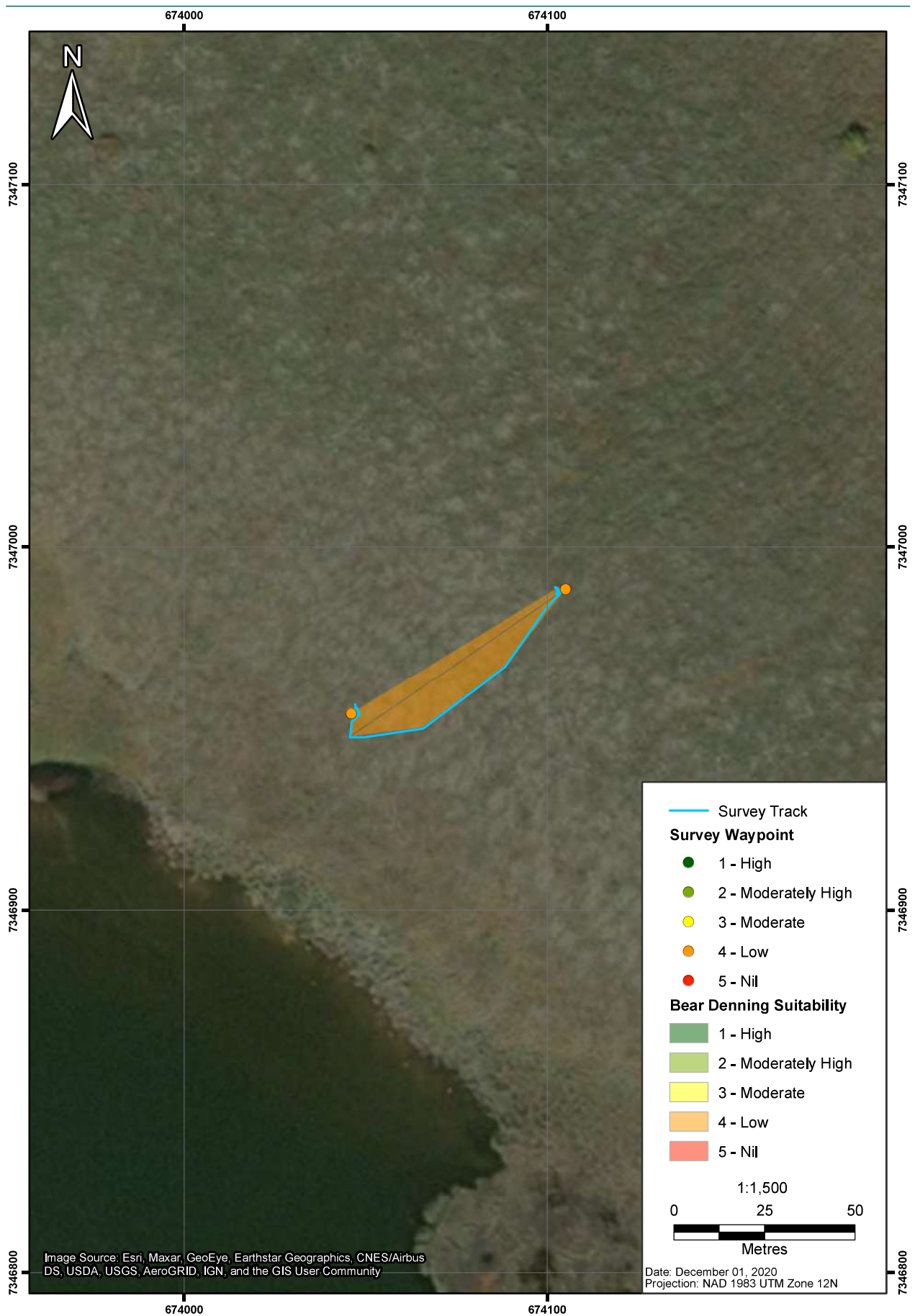


Figure 30: Map of fwdcamp1 Showing Bear Den Habitat Suitability By Colour

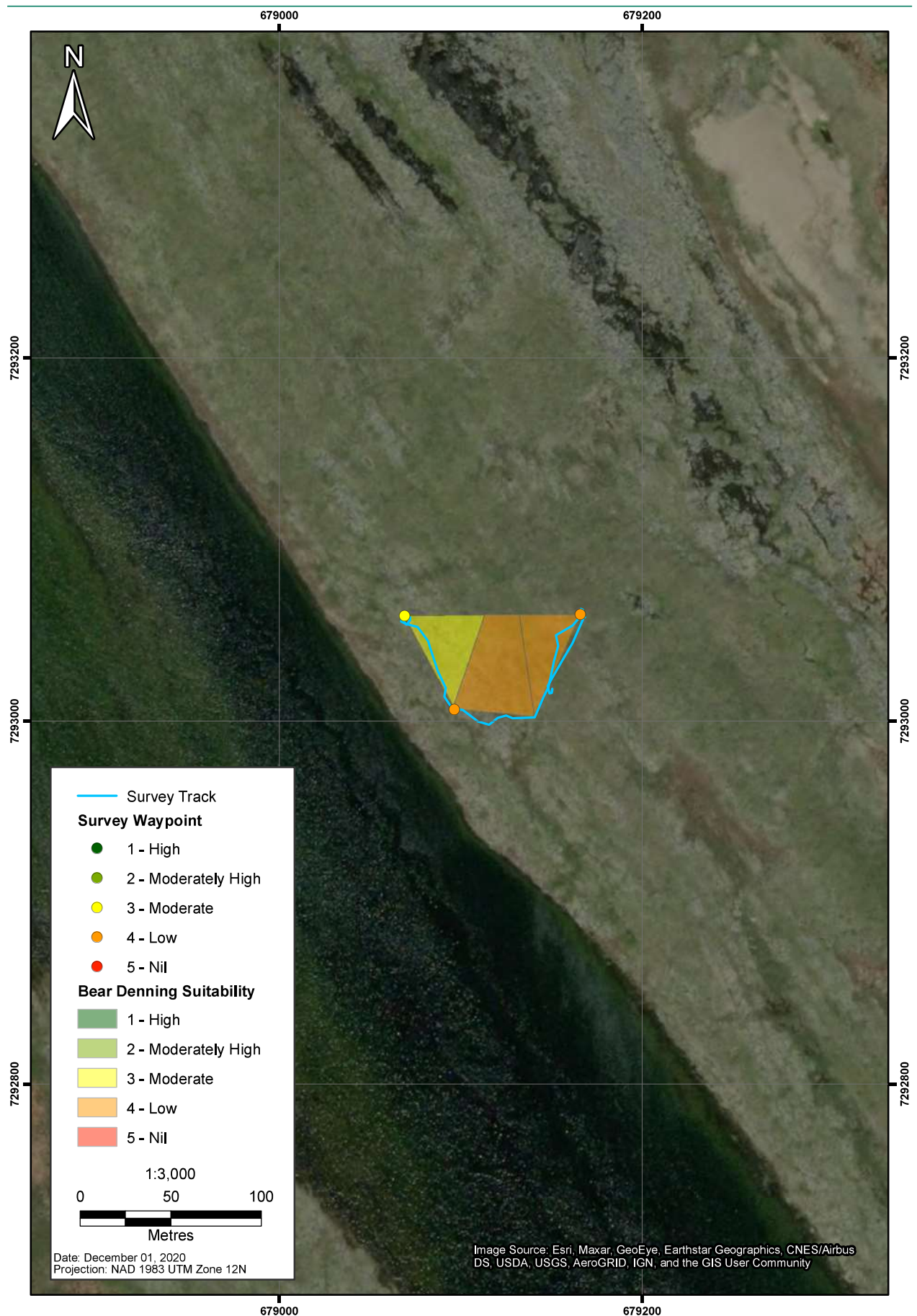


Figure 31: Map of fwdcamp2 Showing Bear Den Habitat Suitability By Colour

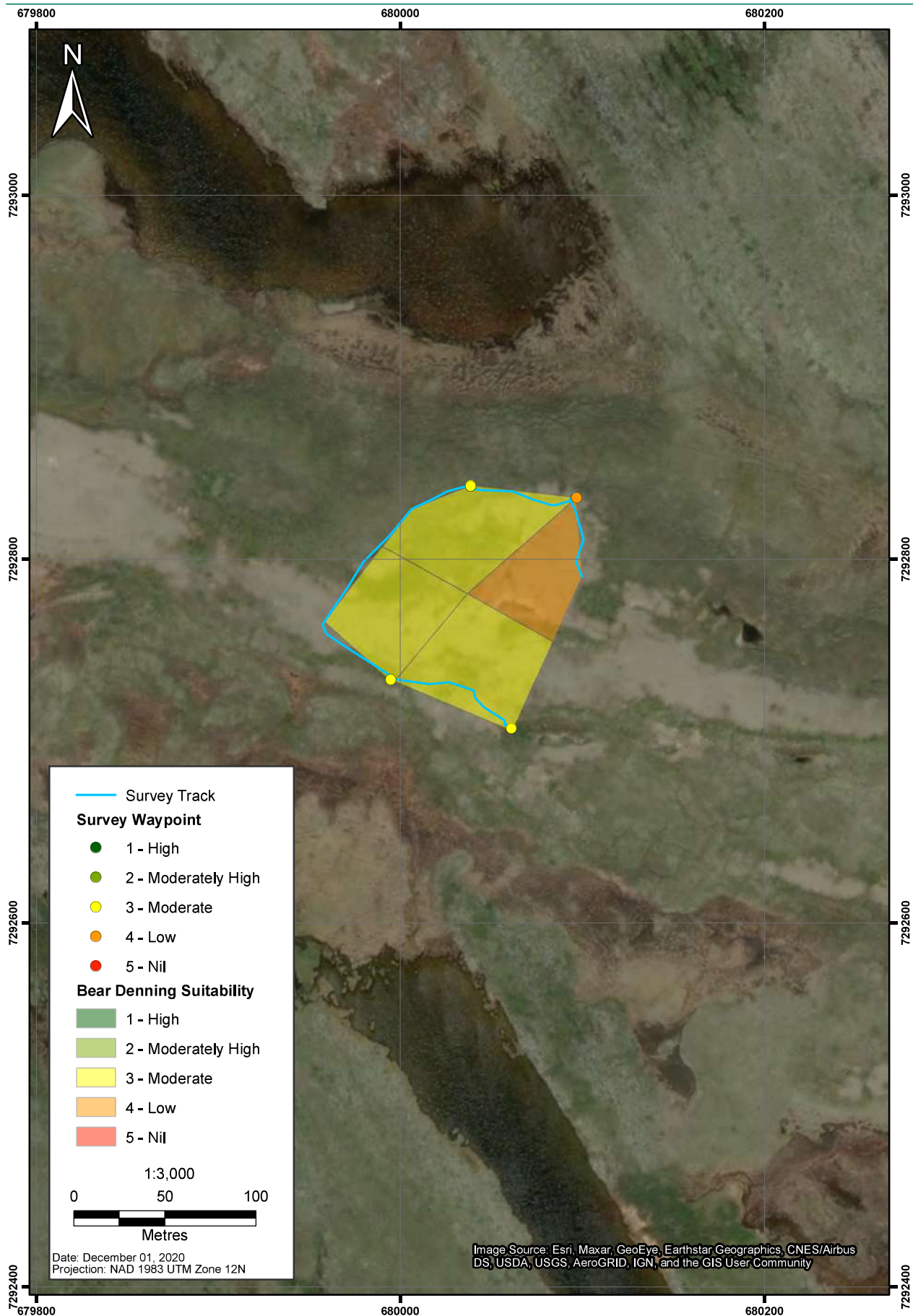


Figure 32: Map of fwdcamp3 Showing Bear Den Habitat Suitability By Colour



Photo 1. Potential quarry site Q20-18 with high suitability for bear denning habitat (high esker shape, continuous tall shrub vegetation, soil substrate), August 2020.



Photo 2: Possible wolf den at Q20-21, August 2020.



Photo 3. Possible fox or hare den at Q20-03, August 2020.



Photo 4. Ground squirrel colony at Q20-20, August 2020.

Table 1: Bear Den Habitat Suitability Ratings for Each Quarry Polygon Segment Surveyed at Back River, NU, August 2020

Quarry Name	UTM Easting ¹	UTM Northing ¹	Date Surveyed	Bear Den Habitat Suitability
Q20-01	389649.72	7381726.24	8/23/2020	2-moderately high
Q20-01	389649.72	7381726.24	8/23/2020	4-low
Q20-01	389649.72	7381726.24	8/23/2020	4-low
Q20-01	389649.72	7381726.24	8/23/2020	4-low
Q20-02	390264.56	7380404.23	8/23/2020	3-moderate
Q20-02	390264.56	7380404.23	8/23/2020	4-low
Q20-02	390264.56	7380404.23	8/23/2020	3-moderate
Q20-02	390264.56	7380404.23	8/23/2020	3-moderate
Q20-03	392648.34	7374150.15	8/23/2020	4-low
Q20-03	392648.34	7374150.15	8/23/2020	3-moderate
Q20-03	392648.34	7374150.15	8/23/2020	3-moderate
Q20-03	392648.34	7374150.15	8/23/2020	3-moderate
Q20-03	392648.34	7374150.15	8/23/2020	4-low
Q20-03	392648.34	7374150.15	8/23/2020	3-moderate
Q20-03	392648.34	7374150.15	8/23/2020	3-moderate
Q20-03	392648.34	7374150.15	8/23/2020	3-moderate
Q20-04	396254.18	7367996.85	8/23/2020	3-moderate
Q20-04	396254.18	7367996.85	8/23/2020	3-moderate
Q20-04	396254.18	7367996.85	8/23/2020	4-low
Q20-05	399710.83	7362214.64	8/25/2020	2-moderately high
Q20-05	399710.83	7362214.64	8/25/2020	3-moderate
Q20-06	399694.13	7361748.95	8/25/2020	3-moderate
Q20-06	399694.13	7361748.95	8/25/2020	3-moderate
Q20-07	401474.79	7356353.57	8/25/2020	4-low
Q20-07	401474.79	7356353.57	8/25/2020	4-low
Q20-07	401474.79	7356353.57	8/25/2020	3-moderate
Q20-07	401474.79	7356353.57	8/25/2020	3-moderate
Q20-08	403015.80	7351609.30	8/25/2020	5-nil
Q20-08	403015.80	7351609.30	8/25/2020	5-nil
Q20-08	403015.80	7351609.30	8/25/2020	4-low
Q20-09	404926.87	7342986.46	8/25/2020	5-nil
Q20-09	404926.87	7342986.46	8/25/2020	5-nil
Q20-09	404926.87	7342986.46	8/25/2020	5-nil

Quarry Name	UTM Easting ¹	UTM Northing ¹	Date Surveyed	Bear Den Habitat Suitability
Q20-10	407544.86	7341726.02	8/25/2020	4-low
Q20-10	407544.86	7341726.02	8/25/2020	4-low
Q20-10	407544.86	7341726.02	8/25/2020	5-nil
Q20-11	404823.44	7339919.22	8/26/2020	3-moderate
Q20-11	404823.44	7339919.22	8/26/2020	4-low
Q20-11	404823.44	7339919.22	8/26/2020	3-moderate
Q20-11	404823.44	7339919.22	8/26/2020	3-moderate
Q20-12	405593.16	7337296.73	8/26/2020	3-moderate
Q20-12	405593.16	7337296.73	8/26/2020	3-moderate
Q20-12	405593.16	7337296.73	8/26/2020	3-moderate
Q20-12	405593.16	7337296.73	8/26/2020	3-moderate
Q20-12	405593.16	7337296.73	8/26/2020	2-moderately high
Q20-12	405593.16	7337296.73	8/26/2020	3-moderate
Q20-13	401041.95	7322032.45	8/26/2020	3-moderate
Q20-13	401041.95	7322032.45	8/26/2020	3-moderate
Q20-13	401041.95	7322032.45	8/26/2020	3-moderate
Q20-13	401041.95	7322032.45	8/26/2020	3-moderate
Q20-14	402658.48	7313508.53	8/26/2020	4-low
Q20-14	402658.48	7313508.53	8/26/2020	3-moderate
Q20-14	402658.48	7313508.53	8/26/2020	3-moderate
Q20-15	402090.94	7312896.62	8/26/2020	4-low
Q20-15	402090.94	7312896.62	8/26/2020	3-moderate
Q20-15	402090.94	7312896.62	8/26/2020	3-moderate
Q20-15	402090.94	7312896.62	8/26/2020	3-moderate
Q20-16	401546.22	7307658.44	8/26/2020	3-moderate
Q20-16	401546.22	7307658.44	8/26/2020	4-low
Q20-16	401546.22	7307658.44	8/26/2020	3-moderate
Q20-16	401546.22	7307658.44	8/26/2020	3-moderate
Q20-17	401497.87	7307579.80	8/26/2020	5-nil
Q20-17	401497.87	7307579.80	8/26/2020	3-moderate
Q20-17	401497.87	7307579.80	8/26/2020	3-moderate
Q20-17	401497.87	7307579.80	8/26/2020	4-low
Q20-18	399155.19	7295445.22	8/26/2020	5-nil
Q20-18	399155.19	7295445.22	8/26/2020	5-nil
Q20-18	399155.19	7295445.22	8/26/2020	3-moderate

Quarry Name	UTM Easting ¹	UTM Northing ¹	Date Surveyed	Bear Den Habitat Suitability
Q20-18	399155.19	7295445.22	8/26/2020	1-high
Q20-19	402376.87	7291776.06	8/28/2020	3-moderate
Q20-19	402376.87	7291776.06	8/28/2020	3-moderate
Q20-19	402376.87	7291776.06	8/28/2020	3-moderate
Q20-20	403687.87	7289807.98	8/28/2020	5-nil
Q20-20	403687.87	7289807.98	8/28/2020	3-moderate
Q20-20	403687.87	7289807.98	8/28/2020	2-moderately high
Q20-20	403687.87	7289807.98	8/28/2020	3-moderate
Q20-20	403687.87	7289807.98	8/28/2020	3-moderate
Q20-20	403687.87	7289807.98	8/28/2020	2-moderately high
Q20-21	404389.20	7288799.80	8/28/2020	5-nil
Q20-21	404389.20	7288799.80	8/28/2020	4-low
Q20-21	404389.20	7288799.80	8/28/2020	2-moderately high
Q20-21	404389.20	7288799.80	8/28/2020	4-low
Q20-22	405989.17	7285738.14	8/28/2020	2-moderately high
Q20-22	405989.17	7285738.14	8/28/2020	2-moderately high
Q20-22	405989.17	7285738.14	8/28/2020	3-moderate
Q20-22	405989.17	7285738.14	8/28/2020	3-moderate
Q20-23	407327.69	7284460.27	8/24/2020	4-low
Q20-23	407327.69	7284460.27	8/24/2020	4-low
Q20-23	407327.69	7284460.27	8/24/2020	4-low
Q20-24	408171.76	7283516.58	8/24/2020	3-moderate
Q20-24	408171.76	7283516.58	8/24/2020	3-moderate
Q20-24	408171.76	7283516.58	8/24/2020	4-low
Q20-25	408985.80	7283063.70	8/24/2020	5-nil
Q20-25	408985.80	7283063.70	8/24/2020	2-moderately high
Q20-25	408985.80	7283063.70	8/24/2020	4-low
Q20-25	408985.80	7283063.70	8/24/2020	4-low
Q20-25	408985.80	7283063.70	8/24/2020	3-moderate
Q20-26	411270.57	7282530.97	8/24/2020	3-moderate
Q20-26	411270.57	7282530.97	8/24/2020	4-low
Q20-26	411270.57	7282530.97	8/24/2020	3-moderate
Q20-27	410984.40	7282206.32	8/24/2020	5-nil
Q20-27	410984.40	7282206.32	8/24/2020	4-low
Q20-27	410984.40	7282206.32	8/24/2020	3-moderate

Quarry Name	UTM Easting ¹	UTM Northing ¹	Date Surveyed	Bear Den Habitat Suitability
Q20-28	432902.11	7270698.55	8/24/2020	4-low
Q20-28	432902.11	7270698.55	8/24/2020	3-moderate
Q20-28	432902.11	7270698.55	8/24/2020	3-moderate
Q20-28	432902.11	7270698.55	8/24/2020	4-low
Q20-28	432902.11	7270698.55	8/24/2020	3-moderate
fwdcamp1	403897.91	7343214.32	8/25/2020	4-low
fwdcamp1	403897.91	7343214.32	8/25/2020	4-low
fwdcamp2	403756.00	7289097.46	8/28/2020	3-moderate
fwdcamp2	403756.00	7289097.46	8/28/2020	4-low
fwdcamp2	403756.00	7289097.46	8/28/2020	4-low
fwdcamp3	404705.99	7288655.48	8/28/2020	3-moderate
fwdcamp3	404705.99	7288655.48	8/28/2020	3-moderate
fwdcamp3	404705.99	7288655.48	8/28/2020	4-low
fwdcamp3	404705.99	7288655.48	8/28/2020	3-moderate

Notes:

1. UTM Zone 13 N WGS 84.

UTM coordinates represent first notable habitat feature surveyed at quarry track.

APPENDIX 5D WASTE MANAGEMENT SOP: PRE-CONSTRUCTION, CONSTRUCTION, AND OPERATIONS: ENVIRO-08



Back River Project

Waste Management Pre-construction, Construction, and Operations

STANDARD OPERATING PROCEDURE

ENVIRO-08

31 March 2021

Version B.1

Scope of Work:

This SOP provides guidance on waste management and monitoring protocols for all crews working on site. It is essential for all working crews to ensure attractants and waste are properly managed throughout the site for the safety of all personnel and wildlife.

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1. BACKGROUND

Sabina is committed to ensuring wildlife and personnel remain safe on site by minimizing wastes and odours that may attract wildlife species such as birds, bears, wolves, wolverines, and foxes. Proper waste management will reduce hazardous wastes and contaminant exposure to wildlife.

This Standard Operating Procedure (SOP) summarizes preventative measures, safe waste storage, management, disposal, and monitoring procedures for Project personnel.

2. TRAINING

Project personnel will be trained on the following topics prior to beginning work on-site:

- Wildlife identification and behaviour;
- Safe waste management actions to prevent wildlife presence on-site; and
- Safe waste storage and safe waste disposal procedures.

In addition, appropriate waste management personnel will be trained on the following:

- Waste collection schedules;
- Safe operation and daily maintenance of the incinerator;
- Treatment of incinerator waste (i.e., ashes); and
- Waste monitoring and reporting.

3. PREVENTATIVE MEASURES

All Project personnel working on site are responsible for following proper waste management procedures to minimize attractants for wildlife. The following sections describe how to prevent wildlife from becoming food conditioned and habituated to the site.

3.1 Personnel Responsibilities

3.1.1 *Managing Attractants in Camp*

- Do not feed wildlife under any circumstances.
- No littering.
- Store all food, wildlife attractants (e.g., hydrocarbons, cigarettes, cleaning products), and wastes in bear-proof storage containers, if stored outdoors. Bear-proof containers must be tightly secured at all times.
- Eating, drinking, smoking, and bathroom activities will be confined to designated areas.
- Do not dispose of liquids on the ground. Do not throw coffee and juices out of vehicles or anywhere on the land. Return unused portions to the camp kitchen for proper disposal.
- Cigarette butts must be placed in appropriate containers. If in an area where there is no container, then butt-out and put the filter and remnants in your pocket until you can dispose of it in a proper container. Ensure there is no risk of starting a fire on the tundra.
- Unsecured food is not permitted in any fabric walled buildings (tents, weather havens or sprung structures, including sleeping areas).

3.1.2 *Managing Attractants in the Field*

- Ensure any packed lunches are returned to camp each day, including any wastes generated.
- At remote sites follow the guidance; "...if you pack it in, pack it out....".

3.1.3 *Food Loading and Storage*

- When unloading food goods from the aircraft, transport them to the kitchen as soon as possible.
- Store all food goods as soon as they arrive.
- Do not store food outdoors.

3.1.4 *General Waste Management*

- Put all waste in appropriate waste containers – never leave waste on the ground or outside of a designated bin.
- Ensure doors on sea cans are kept closed at all times to avoid the chance of animals encountering wastes or becoming entrapped.
- If in doubt about where to place waste/scrap/garbage items, ask your Supervisor.
- Report all observations of misdirected waste or inappropriate waste storage to the Environment Department (Section 8).
- Report all observations of wildlife or signs of wildlife at waste facilities or attractants (Section 8).

3.2 **Buildings and Facilities**

- Buildings and facilities are designed to exclude wildlife, with skirting under the building, screens over vents and doors sufficient to exclude inquisitive wildlife.
- Regular road and camp cleanups will be conducted to ensure that no hazardous substances, wires, or loose materials are present to endanger wildlife and to ensure proper storage and disposal of hazardous wastes.
- Environment staff will routinely inspect all Project facilities to check for signs of wildlife interaction or conflict, including:
 - Storage facilities and buildings that may serve as wildlife refuge; and
 - Areas where chemicals may have been applied (e.g., dust suppressants).
- If wildlife are able to access buildings through damaged skirting, then skirting will be repaired immediately.
- If wildlife are able to access buildings through vents, windows, or by other means, then measures will be taken to exclude wildlife.

4. **WASTE SEGREGATION**

All waste must be segregated by type of material and disposal method (Sections 5 and 7), as per the *Back River Project Landfill and Waste Management Plan* as follows:

- Food waste, food packaging, grease, and domestic waste will be **incinerated**.

- Used cooking oil is stored separately and will be **incinerated** with wet wastes or sewage.
- Clean recyclables, plastic, rubber tires, and scrap metal will be **shipped** off-site, unless approved to be landfilled at the Project site.
- Additional industrial dry waste that does not attract wildlife and cannot be recycled will be sent to the **landfill (either onsite or offsite)**.
- Hazardous waste will be managed per the hazardous waste management plan.

All waste disposal and storage containers must be labelled with permitted waste types. Hazardous waste must be labelled as per the *Back River Project Hazardous Materials Management Plan*.

5. WASTE STORAGE

This section describes storage requirements for Project-generated waste, including the following:

- Kitchen waste;
- Non-hazardous dry waste;
- Sewage; and
- Hazardous waste.

All Project personnel are responsible for the proper disposal and storage of any waste they generate.

5.1 Kitchen Waste

- All food-related or food-contaminated waste must be stored indoors. Only clean cardboard may be stored outdoors.

5.1.1 Indoor Storage

- Kitchen waste to be stored indoors in clear plastic garbage bags includes the following:
 - Food wastes;
 - Grease;
 - Food packaging; and
 - Other domestic garbage (personal waste).
- Store used cooking oil as follows:
 - Cooking oil will be stored in pails and kept in a secure location (e.g. indoors or in a seacan).
- **Clean** recyclables (e.g., plastics, aluminum) can be separated and stored indoors for disposal or recycling.

5.1.2 Outdoor Storage

- Dry kitchen waste (**clean cardboard only**) may be stored outdoors in tightly sealed, bear-proof containers.

5.2 Non-hazardous Dry Waste

- Non-hazardous dry waste may include the following:

- **Clean** recyclables (i.e., cardboard, paper, plastics, aluminum);
 - Scrap metal for recycling; and
 - Other industrial dry waste, including unburnable plastics, treated wood, fiberglass insulation, roofing, asphalt, concrete, ash, etc.
- Dry waste with the potential to attract wildlife (e.g., clean recyclable beverage containers) must be secured and stored indoors in appropriate sealed and labelled containers (e.g., drums, crates) for off-site shipping or in clear plastic garbage bags for incineration.
 - Dry waste with no potential to attract wildlife may be stored outdoors in laydown yards or shipping containers at temporary waste storage facilities for off-site shipping, incineration or transport to the landfill.

5.3 Sewage

- Sewage contained in PACTO storage bags must be disposed of (incinerated) as soon as possible, and not stored.

5.4 Hazardous Waste

- Hazardous materials must be segregated by waste type and disposal method as per the *Back River Project Hazardous Materials Management Plan*.
- Hazardous materials with potential to attract wildlife must be securely stored indoors in labelled containers (e.g., drums, crates).
- Hazardous materials that pose no risk of attracting wildlife may be stored within lined containment facilities.
- Hazardous waste materials which may be stored for off-site shipping include:
 - Aerosol cans;
 - Combustible cylinders;
 - Waste oils, petroleum products, and hydrocarbons and empty containers;
 - Laboratory reagents, solvents and paints;
 - Wet and dry cell batteries;
 - Electronics and electrical waste;
 - Fluorescent light tubes; and
 - Hazardous medical waste.
- Hazardous waste materials to be stored for incineration may include (see Section 7):
 - Absorbent pads and snow contaminated with spills of gasoline, Jet-B, solvents, diesel fuel, or hydraulic fluid;
 - Oily or greasy rags from drilling operations; and
 - Engine oil filters.

6. WASTE CONSOLIDATION

- The Camp Manager is responsible for coordinating waste consolidation, including designating responsible Personnel, where appropriate.
- Waste will be consolidated from collection sites according to the following schedule:
 - Pacto sewage bags must be collected and incinerated as they are generated.
 - Kitchen and food waste, including stored cooking oil, must be collected daily and incinerated.
 - Other domestic garbage must be collected and incinerated daily.
 - Other waste will be removed from collection sites to the waste storage area regularly, daily if possible.
- The Incinerator Operator is responsible for collection and consolidation of waste destined to the incinerator.
- Any waste that is to be incinerated and is a potential wildlife attractant must be safely contained until incineration.

7. WASTE DISPOSAL

The Project waste disposal methods include the following:

- Incineration;
- On-site landfill; and
- Off-site shipping.

This section provides an overview of these waste disposal methods for the information of all Project personnel. Further details can be found in Sabina's Incinerator Management Plan and waste management plans.

7.1 Incinerator

The following waste will be incinerated:

- Kitchen waste and domestic garbage.
- Cooking oil, in quantities limited to 15 L per burn.
- Some hazardous wastes:
 - absorbent pads and snow contaminated with spills of gasoline, Jet-B, solvents, diesel fuel or hydraulic fluid (following special safety precautions);
 - oily or greasy rags from drilling operations (following special safety precautions); and
 - Engine oil filters after they are drained and cut in half to remove excess oil.
- Animal carcass remnants with approval by a GN Conservation Officer.

7.1.1 Incinerator Operations

- Only the designated Incinerator Operator may start or add waste to the incinerator and will follow the protocols outlined in Sabina Incinerator Management Plan and operating manuals.

- The operator will inspect the contents of clear garbage bags carefully to ensure there are no unauthorized substances (i.e., aerosol containers, sharps) present prior to incineration. If unauthorized substances are present, carefully remove and store appropriately and notify the Environment Department.
- Waste must not be left outside of the incinerator. Operate the incinerator as often as necessary to maintain minimal waste inventory.

7.1.2 *Incinerator Waste Handling*

- Close and seal ash drums when they are approximately 90% full.
- Store the drum in the waste storage area on a pallet and update the waste inventory log.

7.2 On-site Landfill

- Non-food dry waste will be transported from the waste storage area to the on-site landfill or shipped off site for disposal.

7.3 Off-site Shipping

- Off-site shipping of recycling will be coordinated by Sabina as available.
- Hazardous waste will be shipped off-site as soon as possible when a hazardous material handler is available, as coordinated by Sabina.

8. MONITORING AND ADAPTIVE MANAGEMENT

The objective of waste management monitoring is to evaluate if waste management is effective at limiting attractants for wildlife such as grizzly bears and wolverines.

Waste monitoring is divided into five components:

1. Waste inventory (Camp Manager);
2. Incidental observations of misdirected wastes (all staff);
3. Records of observations of wildlife at waste facilities (all staff);
4. Regular surveys of waste facilities (Waste Management staff); and
5. Regular audits of waste management and camps (Environment Department).

8.1 Waste Inventory – Camp Manager

- The Camp Manager (or designate) is responsible for maintaining a waste inventory at the waste storage area, including hazardous wastes. This includes the following:
 - Tracking waste materials, volumes and disposal locations (whether in on site facilities or shipped off site);
 - Detailed tracking and documentation of any inter-provincial movement of hazardous wastes.

8.2 Incidental Misdirected Waste Observations – All Staff

Incidental observations of misdirected waste will help identify improvements to waste management education and processes.

If you observe misdirected waste or inappropriate waste storage:

1. Pick up the waste and put it in the appropriate waste bin.
2. Report the observation to the work area supervisor or Environment Department.

If you observe misdirected waste or inappropriate waste storage that could attract wildlife (including wildlife accessing waste):

1. Report it to the work area supervisor or Environment Department immediately and await further direction.

Supervisors are responsible for ensuring routine worksite inspections confirm that their work areas are clean and wastes and wildlife attractants are being appropriately managed. The Environment Department will periodically audit worksites to confirm. Waste management staff will also periodically audit wastes generate to identify areas needing corrective actions. Cases of misdirected waste or wildlife-waste interaction will be recorded. Any wildlife-waste interactions are to be reported to the Environment Department along with location, date, time, type and amount of waste, and any damage to mine property.

8.3 Incidental Wildlife Observations at Waste Facilities – All Staff

If you observe wildlife (e.g., grizzly bear or wolverine), or any wildlife sign (e.g., scat or tracks) at waste facilities or near attractants:

1. Ensure you are a safe distance away from wildlife.
2. Notify the Environment Department immediately.
3. Record the sighting on the Incidental Wildlife Observation Datasheet (Attachment A) and submit it to the Environment Department no later than the end of your shift.

8.4 Waste Facility Surveys – Waste Management Staff

- Waste Management staff are responsible for regular daily inspection of waste storage areas and disposal facilities for the following:
 - Misdirected waste; and
 - Signs of wildlife (e.g., chew marks on waste, wildlife-mediated waste dispersion, wildlife scat or tracks).
- Waste Management staff are responsible for identifying, implementing and recording any follow-up management action from these surveys.

8.5 Waste Management Audits (Environment Department)

- Regular internal audits will be conducted of camps and waste management facilities to evaluate any opportunities for improvement in the handling of wastes and wildlife attractant management.
- The Environment Department may enlist help from Camp Manager to identify qualified personnel and designating responsibility for waste management audits.

- If any deficiencies are observed at waste management facilities, these will be addressed to eliminate attractants. If wildlife (i.e., grizzly bears and wolverine) are found to use elements of the Project infrastructure (e.g., the waste management facility) repeatedly, then a review of waste management activities and adaptive mitigation will be triggered.
- If wildlife persist in using infrastructure components despite updated waste management and site audits, then other exclusion infrastructure may be used (e.g., fencing).
- Waste facilities are also being monitored with remote motion-triggered cameras to detect any wildlife in the area. These photographs will be reviewed as needed to identify potential animals accessing waste facilities.


9. REPORTING

The Environment Department will report the incidental wildlife observations, wildlife-waste interactions, and any implemented mitigation in the annual Wildlife Mitigation and Monitoring Program (WMMP) report.

Waste management activities and monitoring results will also be reported as per the *Back River Project Landfill and Waste Management Plan* and the *Back River Project Hazardous Materials Management Plan*.

10. ATTACHMENTS

Attachment A: Incidental Wildlife Observation Datasheet

	Back River Project	July 2020
	INCIDENTAL WILDLIFE OBSERVATION DATASHEET	vA.1

<ul style="list-style-type: none"> Complete this form if: <ul style="list-style-type: none"> you observe wildlife (caribou, grizzly bear, wolf, wolverine, muskox, or fox) on the Project Site, including while flying, on-site roads and the winter ice road; there is a project-related wildlife fatality or injury; or you observe dead or injured wildlife, even if the fatality or injury was not project-related. Submit the completed form to the Environment Department at the end of your shift. 						
GENERAL INFORMATION						
Date of Sighting (yy mm dd)			Time First Sighted (24 hr)			
Observer Name			Time Last Sighted (24 hr)			
Job Activity During Observation						
LOCATION INFORMATION						
Location Description (e.g., Road KM or facility)						
Animal Location (if known)	UTM East		UTM North			
Observer Location	UTM East		UTM North			
Habitat Description (circle one)	Boulder Field Tundra Shrubs Stream/River Lake/Pond Open Water Wetland Un-vegetated Shoreline Esker Other:					
Photos (record photo numbers)						
WILDLIFE INFORMATION						
Species (circle)	Caribou	Grizzly Bear	Wolf	Wolverine	Muskox	Other (describe):
Number of Animals	Adult Female:	Adult Male:	Young:	Unknown:	Total Number:	
Condition of Animals (circle one)	Alive	Dead	Injured	Animal Behaviour What was/were the animal(s) doing (e.g., walking, resting, eating, running, sleeping, playing, flying, nesting, or crossing the road)?		
Was there an Incident? If YES, complete back of form						
Other Notes	<ul style="list-style-type: none"> Did the animal(s) have a collar? If the animal was deceased or injured please describe and report to Environment Department 					
For Office Use						
These data were entered into the wildlife database by:			These data were entered into the wildlife database on:			

APPENDIX 5E INCIDENTAL TERRESTRIAL MAMMAL OBSERVATIONS, 2020

Appendix 5E: Incidental Terrestrial Mammal Observations, 2020

Date	Location	Distance from Camp	Direction Travelling	Number	Mammal	Comments (# of calves, etc.)	Name of Observer
17-Mar-20	Goose	100 m from camp		1	Fox		Joan / Mana[?]
18-Mar-20	Goose	200 yards from major shop		1	Wolverine		Jim
5-Apr-20	Goose	Behind kit		1	Weasel		RmD
17-May-20	Goose	Cabin 17		Not Reported	Fox		RmD
2-Jul-20	Goose	1.5 km		1	Bear	Walking	RmD
9-Jul-20	Goose	0.5 km		1	Bear	Along shore at end of coveland,	Jme
13-Jul-20	Goose	1.5 km		1	Wolf	South of camp - 2 km, moving south	Jme
19-Jul-20	Goose	4 km		20	Muskox	1 km N 1466, just hanging out!	Jme
20-Jul-20	Goose	2 km		Not Reported	Wolf	East of camp 2 km	Jme
3-Aug-20	Goose	2.5 km	N	25	Muskox	Unknown	JS
3-Aug-20	Goose	West side of Goose Lake		~30	Muskox	Herd	Dave Sherlock
10-Aug-20	Goose	in camp		1	Fox		MM
13-Aug-20	Goose	1.5 km		1	Muskox	Seen by surveyors	JS[?]
16-Aug-20	Goose	4 km		20	Muskox		JP
17-Aug-20	Goose	Ladies dry in camp - to S.		1	Fox	Just travelling through camp	Jme
17-Aug-20	Goose	1466		50	Muskox	GSE20-577	MM
19-Aug-20	Goose	1507		29	Muskox	GSE-579-B	-
24-Aug-20	Goose	0.035 km		20	Muskox	Hanging out	Jme
26-Aug-20	Goose	0.035 km		20	Muskox	Hanging out	Jme
30-Aug-20	Goose	1509		35	Muskox	GSE-581	MM
1-Sep-20	Goose	Near surveyor station		1	Wolverine		J Straker
11-Sep-20	Goose	NW of Goose Lake		25	Muskox	Laying down	Jeremy Straker
11-Sep-20	Goose	North of rock quarry		14	Muskox		Dave Sherlock
22-Sep-20	Goose	Box cut area		1	Fox		Christa Higgins
25-Sep-20	Goose	Runway		1	Fox	Fox off to the side of the runway	-
26-Sep-20	Goose	On S. End of Airstrip		1	Fox	Trotting By	Michael
16-Oct-20	Goose	Around box cut		1	Wolverine		Jonathan Barthel
20-Oct-20	Goose	2 km		3	Bear	Mom and 2 cubs travelling.	Jme
24-Oct-20	Goose	0.5 km	E	1	Wolf	Away from camp 14[?]; on lake	Jett[?]
24-Oct-20	Goose	0.5 km	E	1	Wolverine	On lake running East	Jett[?]
26-Oct-20	Goose	Echo creek road		1	Wolf	Adult	A. McIntyre
3-Nov-20	Goose	Runway		1	Fox		Jacob Woods
14-Nov-20	Goose	In camp by Muna[?] office		1	Fox	Will monitor and make sure he	Jme
14-Nov-20	Goose	Around camp near offices		1	Fox	Adult Red Fox	Andrew Dannrath
1-Dec-20	Goose	Quarry		1	Wolf	Adult	Cocnel Jaccett
4-Dec-20	Not Reported	Airstrip	NE	Not Reported	Fox		AD
7-Dec-20	Goose	Lake in front of camp		1	Wolverine		RmD

APPENDIX 6A INCIDENTAL BIRD OBSERVATIONS, 2020

Appendix 6A: Incidental Bird Observations, 2020

Date	Location	Distance from Camp	Direction Travelling	Number	Species	Name of Observer
17-May-20	Goose Site	Over camp	N	200	Geese	RmD
4-Sep-20	Goose Site	Over camp		200	Geese	Merle

APPENDIX 7A MARINE SHIPPING SOP – WILDLIFE MITIGATION AND MONITORING: ENVIRO-02

Back River Project

Marine Shipping – Wildlife Mitigation and Monitoring

STANDARD OPERATING PROCEDURE

ENVIRO-02

28 August 2020

Version 0.3

Scope of Work: This SOP provides guidance for marine mammal and seabird monitoring procedures for shipping companies contracted by Sabina. Monitoring is conducted to avoid potential effects to marine mammals and seabirds. The shipping companies are required to record marine wildlife observations based on the protocols outlined in this SOP along the shipping route.

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1. PROGRAM DESCRIPTION AND OBJECTIVES

A Marine Shipping Wildlife Mitigation and Monitoring Standard Operating Procedure (SOP) has been developed to guide onboard monitoring for marine mammals and seabirds and mitigation of shipping operations in response to identified sensitive wildlife areas and wildlife observations.

This SOP satisfies the Back River Project's NIRB Project Certificate (No. 007) Conditions #58, #64, and #65. This SOP addresses Conditions #58 and #64 in full. It addresses the avoidance of sensitive wildlife habitat and species required in Condition #65. The protocols and equipment to reduce the potential of harmful release of a substance into the marine environment are detailed in the Shipboard Oil Pollution Emergency Plan (SOPEP) Oil Pollution Emergency Plan (OPEP).

The purpose of this SOP is to identify the monitoring and mitigation procedures for shipping companies contracted by Sabina to avoid potential effects to marine mammals and seabirds. This document outlines the following:

- how to avoid or adjust shipping speed near sensitive wildlife habitat along shipping routes;
- how to record observations of marine mammals and seabirds;
- how to conduct dedicated marine mammal surveys and dedicated seabird surveys;
- potential mitigation if marine mammals or large groups of seabirds are observed;
- how to record and report mitigation measures taken, if applicable; and
- how to record and report ship strikes of marine mammals or seabirds, if they occur.

Sabina will update this SOP as necessary, in response to feedback from the Inuit Environmental Advisory Committee (IEAC), the Department of Fisheries and Oceans (DFO), Environment and Climate Change Canada (ECCC) or in response to data collected in the field or scientific advances.

2. SHIPPING MITIGATION IN SENSITIVE HABITAT

2.1 Identified Sensitive Habitat Where Mitigation Applies

Sensitive habitat for marine birds has been identified along the Project shipping route in the following areas (ECCC 2016; Figure 2.1-1):

- Prince Leopold Island;
- Bathurst Inlet/Elu Inlet Key Marine Habitat Site;
- Lambert Channel Key Marine Habitat Site;
- Eastern Lancaster Sound Key Marine Habitat Site; and
- Eastern Jones Sound.

Sensitive habitat for marine mammals has been identified along the Project shipping route from Lancaster Sound to Franklin Strait (Figure 2.1-2).

2.2 Shipping Setback Distances

Except where the safety of the ship is a concern, ships will adhere to the following setback distances from these sensitive habitats, as identified in the WMMP Plan (ECCC 2016; Latour et al. 2008; Mallory and Fontaine 2004):

- **30 km** from Prince Leopold Island (Figure 2.1-1);
- **500 m** from observed marine bird colonies in the Bathurst Inlet/Elu Inlet, Lambert Channel, Eastern Lancaster Sound, and Eastern Jones Sound Key Marine Habitat Sites (Figure 2.1-1); and
- **2 km** from ivory gull breeding colonies, if they are observed.

3. MARINE MAMMAL AND SEABIRD MONITORING AND MITIGATION RESPONSE

3.1 Overview

The objectives of the marine mammal and seabird monitoring program are the following:

- record incidental observations of seabirds and marine mammals in the Northwest Passage made by bridge staff;
- document and report measures taken to mitigate impacts to marine mammals and large groups of seabirds;
- document and report ship strikes of marine mammals or seabirds, if they occur; and
- conduct dedicated marine mammal and seabird surveys if timing allows.

3.2 Training

Bridge staff on ships are required to:

- review the Marine Shipping Wildlife Mitigation and Monitoring SOP (this document);
- review marine mammal and seabird identification, including common species detailed in Tables 3.2-1 and 3.2-2;
- know how to estimate distances to animals observed;
- review how to fill out the *Incidental Marine Wildlife Sightings Form* (Attachment A), the *Marine Mammal Survey Sightings Form* (Attachment B) and the *Seabird Survey Sightings Form* (Attachment C); and
- For additional information on methodology, review the document which this Marine Shipping Wildlife Mitigation and Monitoring SOP is based: *Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms* (Gjerdrum et al 2012).

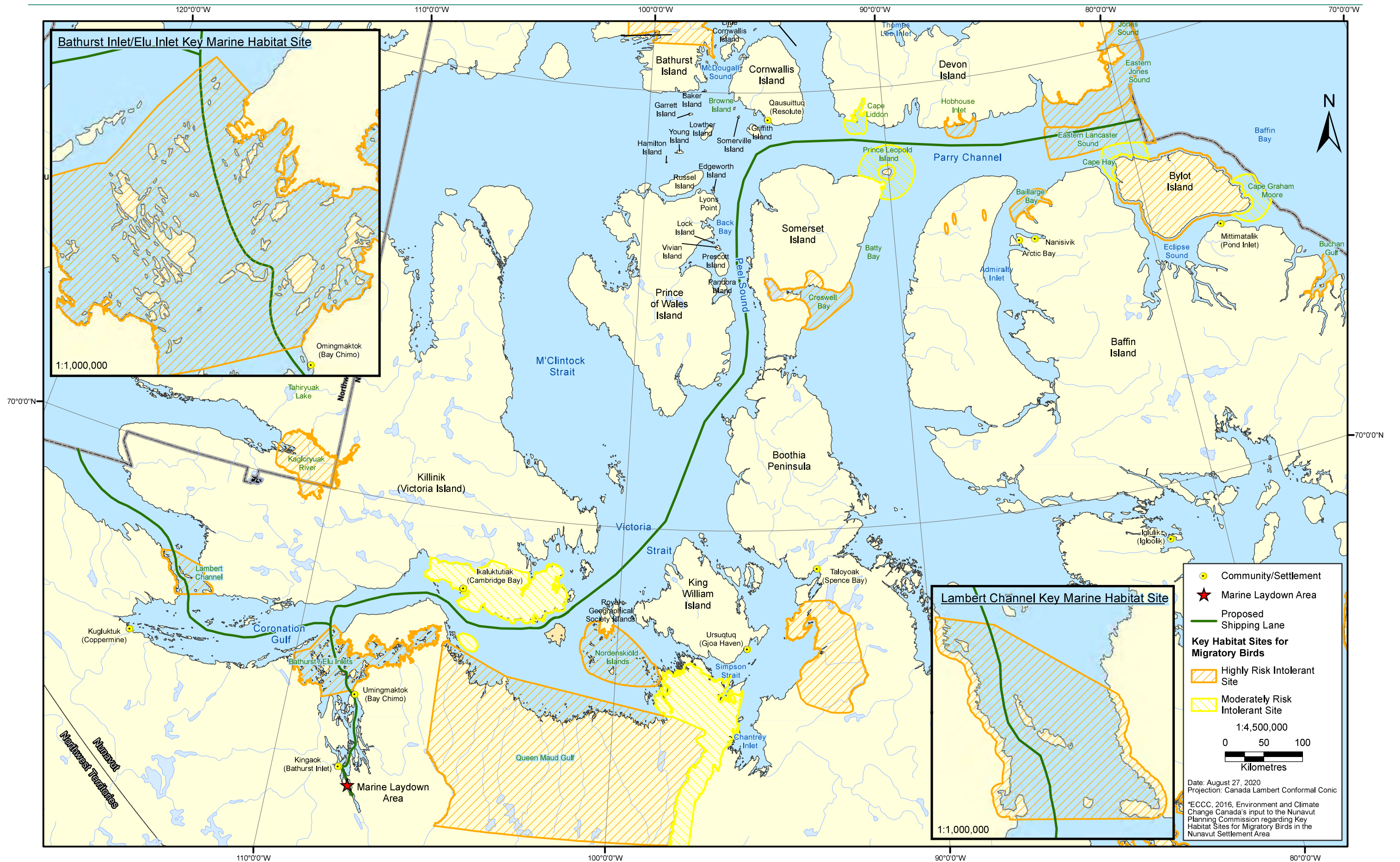


Figure 2.1-1: Sensitive Habitat and Setbacks for Seabirds and Seaducks along the Shipping Route