



ΛΓΔΕΖΗΘΙΚ
 ΞΟΠΑΡΧΣΥΓ: Scientific Research

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Informations sur le projet de cartographie du littoral du CECC pour la préparation aux déversements d'hydrocarbures dans l'Arctique (2024)¹. Informations sur le promoteur Secteur Gouvernement du Canada, Environnement et Changement climatique Canada, Direction générale de la science et de la technologie, Division de la science de la faune et du paysage, Division de la science et de la technologie du paysage, Section de la recherche géomatique. Auteur Valerie Wynja, spécialiste en sciences physiques. Valerie.wynja@ec.gc.ca Cellulaire : 613-296-3540 Description de l'auteur de la proposition La Section de recherche en géomatique se concentre sur l'utilisation de données et d'informations géospatiales pour soutenir le mandat de conservation et de protection de la faune d'Environnement et Changement climatique Canada. La Section de la recherche en géomatique contribue à un certain nombre de programmes ministériels prioritaires, notamment la délimitation des habitats essentiels des espèces en péril et la conservation des oiseaux migrateurs. 2. Résumé du projet Résumé non technique du projet La santé globale des océans du Canada est fortement influencée par l'environnement marin côtier. Dans le cadre du Plan de protection des océans (PPO), Environnement et Changement climatique Canada s'efforce de protéger, de préserver et de restaurer l'environnement marin du Canada. Dans le cadre du PPO, notre équipe a été financée pour recueillir des données de base sur le littoral en vue de la préparation aux déversements d'hydrocarbures.

L'objectif principal du processus de segmentation du littoral est de collecter des informations pour aider les intervenants d'urgence à planifier et à se préparer à d'éventuels incidents de pollution marine. Un ensemble de données sur le littoral avant la marée noire comprend des informations côtières de base telles que le type et la forme du littoral, le substrat et la végétation. • Pour recueillir les principales informations sur le littoral, des survols en hélicoptère à basse altitude sont effectués sur les sites d'étude afin de capturer des vidéos et des photos géolocalisées des caractéristiques du littoral. • Une fois les données recueillies, elles sont enregistrées dans une base de données SIG. • L'interprétation du trait de côte est réalisée en examinant la vidéographie oblique et les photos géolocalisées. Le produit final est une géodatabase vectorielle détaillée qui décrit chaque segment du littoral et les zones intertidales qui lui sont associées. Utilisation des données sur le littoral dans le cadre d'une intervention environnementale La base de données vectorielle de caractérisation du littoral peut être utilisée pour identifier les types de littoral écologiquement sensibles, pour soutenir une réponse rapide aux incidents de pollution et pour contribuer à l'efficacité des efforts de nettoyage. En présentant les données sur une carte interactive, nous visons à améliorer la prise de décision lors des interventions en cas de déversement d'hydrocarbures. Avec l'inclusion d'informations provenant d'images satellites et de drones, nous espérons fournir une couverture plus large des littoraux canadiens afin de soutenir les interventions en cas de déversement et de protéger les écosystèmes marins. Au-delà de l'intervention en cas de déversement d'hydrocarbures, les ensembles de données et l'imagerie ont été utilisés par les communautés locales et les gestionnaires de l'environnement pour la planification de projets, la préparation à la sécurité et à l'intervention en mer, l'évaluation des zones de restauration marine, la planification marine, la sécurité alimentaire, entre autres. Date(s) et calendrier Nous espérons réaliser des activités de cartographie pendant plusieurs périodes différentes au cours de l'été (juin-sept) 2024. 1) Été 2024 - cartographie du sud du bras de mer Bathurst (basé à Cambridge Bay/Bathurst Inlet, NU - soutien logistique par le biais du Programme du plateau continental polaire (PPCP)) 2) Été 2024 - cartographie de la baie Frobisher près d'Iqaluit (Iqaluit/basé sur un navire de la Garde côtière canadienne) 3) Été 2024 - cartographie de Rankin Inlet, Chesterfield Inlet et d'une partie du lac Baker (Rankin Inlet/basé sur un navire de la Garde côtière canadienne). Remédiation S.O. - Ce projet ne comprendra pas d'échantillonnage ni de modification du paysage. Alternatives au projet L'éloignement et l'étendue du littoral canadien ont rendu difficile la cartographie du littoral par hélicoptère et par des techniques manuelles. Par conséquent, il n'y a jamais eu de classification pancanadienne du littoral pour l'ensemble du pays. Il s'agit d'une lacune importante en matière d'information et d'un risque pour la préparation à la lutte contre les déversements d'hydrocarbures. L'imagerie satellitaire récente et à haute résolution offre une bonne occasion de commencer à explorer les options de cartographie et de classification du littoral à l'échelle de la côte. Comme alternative à la cartographie par hélicoptère, nous développerons des méthodologies de classification du littoral en utilisant une variété de technologies de télédétection. Cela inclut l'imagerie satellitaire à haute résolution, ainsi que l'imagerie par drone à très haute résolution. Nous aimerions comparer les techniques de télédétection aux méthodes héliportées afin de déterminer si les méthodes de télédétection s'avèrent aussi fiables et informatives que les méthodes héliportées.

Δεῖνδῆ: Hanayakhat tuhagutikhait mikhaanut ECCCKut Hinaani Nunaulyaliuktait Ukhukyuanik Kuviyut Paknaiyautikhait Ukiuktaktumi (2024) 1. Hananiaktut tuhagutikhait Ilanganiitut Kavamatukatkut Avatiligiyyit ovalo Hilat Aalanguktigutainik Kanatami, Kauyimayatut & Hanaatiligiyyit Havakviit, Umayuligiyyit ovalo Nunanik Kauyimayatut Havakvia, Nunaligiyyit ovalo Hanatiligiyyit Havakviani, Kimilguuktit Hanahimayait Valerie Wynja, Kauyimay Valerie.wynja@ec.gc.ca Alguyaktungit Hivatautaa: 613-296-3540 Hanayukhat Ukautait Nunaulyaliuktut Kimilguuktiit Havakvia kungiaktut atukhutik nunaulyaliugutainik katitikhimayut ovalo tuhagutikhait Avatiligiyyit ovalo Hilat Aalanguktigutaini Kanatami umayuligiyyit minguiikhikviinit ovalo munagiyaunik maliklugit. Nunaulyaliuktut Kimilguuktiit Havakvia ikayuktut amigaivyktunik hivuliuyukhat munagiyyit pilihimatjutainik, ilauyut Hugaat tamalaaliktut nunait ilangit ovalo Nuutitiviit tingmiat minguiikhikviit. 2. Naitumik Kimilguuktaungitut Hanayakhat Naitumik Tamaat Aniaktitailigiyyit Kanatami tagiut akhut pipkaivaktut hinaanit tagiut avatiligiyyagit. Mikhaanut Tagiut Munagitjutikhait Paknaiyautait (OPP), Avatiligiyyit ovalo Hilat Aalanguktigutainik Kanatami havakpaktut munagilugit, tamaktitailigilugit ovalo utiktinahualugit Kanataup hinaat avatiligiyyingit. Ataani OPP, havakaatigiyyavut manikhakhimaliktuk katitiklugit hunavaluit hinaanit katitikhimayut ukhukyuat kuvihimayut paknaiyautikhainik. Kitkaniitut huliniaktut hinaanit nunauyait katitigutait ilanga katitiklugit tuhagutikhait ikayugiaganik ayokhalaagutainik. Kiuyukhat paknaiyautikhainut ovalo upalugaiyagiaganik pilaaktumik hinaani kanugitjutait nunauyainik ovalo hunavalunik. • Katitiklugit kitkaniitut hinaanit tuhagutikhait, imaiyagaagat halikaptakut kimilguugiaganik tahamna kanugitaakhaak kungialiulugit ovalo piksaliulugit hinaat kanugilugitait. • Pitaagumik hinaat katitigutikhait, katitikhimaligumik, tuhagutikhait titigakhimayukhat ilanganut GISmi katitigutainut. • Hinaa ukautait kimilguuktauyukhat kungialiukhimayunit ovalo nunauyait piksaliuklugit. Kinguliit hanahimayut nunaualiumut iliyukhat ukakhimalugit tamamik hinaat nunauyait ovalo ilangit imaiyakhimatitlugit nanihimayait imaukagutainut. Atuklutik hinaanit katitigutait avatiligiyyiinit kiutjutait Hinaani kanugitjutait katitikhimayut atulaaktut naunaiyaklugit avatiligiyyit hinaat, ikayulugit kiulaaktut halumaihimayunik ovalo ikayuklugit halumaktigutainik. Tunilugit katitikhimayut nunauyamix,

pinaluualutik angiktigitutikhainik kuvihimayunik halumaktigitikhait. Ilaulugit tuhagutikhait kungmuuhimayunik tingmitjutit ovalo tingmiuyat piksaliugutainik, tuniyumayugut angiyumik piksakhainik Kanataup hinaat ikayugiaganik kuvihimayunik kitjutainut kilamik ovalo munagilugit tagiut hinaangit. Avataanut ikayuktut ukhukyuunik kuviyunik kiuyut, katitikhimayut ovalo piksaliukhimayut atukhutik nunalaanit ovalo avatiligiyyit munagiyyit hanayakhat paknaiyautikhainik, tagiut naamagutikhainik ovalo kiuyukhat paknaiyautainik, kimilguukhimayut hinaat halumaktikhimayut, tagiut paknaiyautilikaktut, nikinik kaaktailigitiktunut, ilanganutlu.Ubluit ovalo UblukhiutaitNunaulyaliugumayugut ilangani auyakat (Junemit-Septmut) 2024mi. 1)Auyak 2024 – nunaulyaliuluta Kiluhitumi (Ikluktutiamit/Kingaumit, NU – hanalgutiit ikayuktaulutik Kimilguuktinit Polar Continental Shelf Program (PCSP))2)Auyak 2024 – nunaulyaliulugit Hinaat Iqaluit (Iqaluit/uhiiyakviit Hikulikiiyyit Umiat)3)Auyak 2024 nunaulyaliuklugit Kangiklinik, Igluligaarjuq ovalo ilanga Kamanituak (Kangiklinik/uhiiyakviit Hikulikiiyyit Umiat)IhuakhaitjutikhaitNA – Hamna hanayakhak ilaulaituk kimilguugutainik ovaluniit ihuakhaitjutainik nunaat. Hanayakhat AalanguyatututNunaat ovalo angiyuk Kanatami hinaangit pipkaivaktut hinaani nunaulyaliugutait halikaptakut ovalo titigauyakhutik atukhutik ilaani ayonakpaktuk. Taimaimat, Kanatami tamaat hinaat naunaiyagutait inikhimaitut tamaat Kanatami. Hamna ilautihimayuk angiyumik tuhagutikhait keeliniit ovalo kuvulaakhtuik ukhukyuat paknaiyautikaktukhak. Nutaat, hakugiktut kungmuukhimayut kungialiugutit tunilaaliktut nakuuyumik kinikhiajtutikhaik atulaaktut hinaanut nunaulyaliugutikhait ovalo iniktigitikhait. Aalanit halikaptat nunaulyaliuktut, hanalaaliktugut hinaanit naunaiyautainik atukhutik aalatkiinik piksaliugutikhait atuklutik. Aatjikutiliugumayugut piksaliugutikhanik atugutikhait aalanit halikaptat, naunaiyagiaganik kimilguugutikhait. Atuklugit naamagiaganik ovalo tuhagutikhait nakuutkiyat atugumik halikaptat.

Operations Phase: from 2024-06-01 to 2024-09-30

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Frobisher Bay Study Site	Aerial surveys	Inuit Owned Surface Lands	NA	NA	Proximity to nearest communities: Iqaluit, Apex are within the study site. Proximity to nearest protected areas: Katannilik Territorial Park, Sylvia Grinnell and Qaummaarviit Territorial Park are within the study site, Dewy Soper MBS (285 km away)
Frobisher Bay Study Site	Aerial surveys	Crown	NA	NA	Proximity to nearest communities: Iqaluit, Apex are within the study site. Proximity to nearest protected areas: Katannilik Territorial Park, Sylvia Grinnell and Qaummaarviit Territorial Park are within the study site, Dewy Soper MBS (285 km away)
Rankin Inlet, Chesterfield Inlet and Baker Lake Study Site	Aerial surveys	Inuit Owned Surface Lands	NA	NA	Proximity to nearest communities: Rankin Inlet, Chesterfield Inlet and Baker Lake are within the study site. Whale Cove and Arviat are close to the study site. Proximity to nearest protected

					<p>areas: Iqalugaarjuup Nunanga Territorial Park is close to the study site. McConnel River MBS is 250 km away.</p>
Rankin Inlet, Chesterfield Inlet and Baker Lake Study Site	Aerial surveys	Inuit Owned Sub-Surface Lands	NA	NA	<p>Proximity to nearest communities: Rankin Inlet, Chesterfield Inlet and Baker Lake are within the study site. Whale Cove and Arviat are close to the study site. Proximity to nearest protected areas: Iqalugaarjuup Nunanga Territorial Park is close to the study site. McConnel River MBS is 250 km away.</p>
Rankin Inlet, Chesterfield Inlet and Baker Lake Study Site	Aerial surveys	Crown	NA	NA	<p>Proximity to nearest communities: Rankin Inlet, Chesterfield Inlet and Baker Lake are within the study site. Whale Cove and Arviat are close to the study site. Proximity to nearest protected areas: Iqalugaarjuup Nunanga Territorial Park is close to the study site. McConnel River MBS is 250 km away.</p>
Southern Bathurst Inlet Study Site	Aerial surveys	Crown	NA	NA	<p>Proximity to nearest communities: Cambridge Bay (280 km away) and Kugluktuk (340 km away) are close to the</p>

					study site. Proximity to nearest protected areas Queen Maud Gulf MBS is 120 km away. Thelon Wildlife Sanctuary is 260 km away.
Southern Bathurst Inlet Study Site	Aerial surveys	Inuit Owned Surface Lands	NA	NA	Proximity to nearest communities: Cambridge Bay (280 km away) and Kugluktuk (340 km away) are close to the study site. Proximity to nearest protected areas Queen Maud Gulf MBS is 120 km away. Thelon Wildlife Sanctuary is 260 km away.
Southern Bathurst Inlet Study Site	Aerial surveys	Inuit Owned Sub-Surface Lands	NA	NA	Proximity to nearest communities: Cambridge Bay (280 km away) and Kugluktuk (340 km away) are close to the study site. Proximity to nearest protected areas Queen Maud Gulf MBS is 120 km away. Thelon Wildlife Sanctuary is 260 km away.

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ᐃᓪᓐᓐᓐᓐᓐ	Ivorson Maksagak	EHTO	2024-01-09
ᓪᓐᓐᓐᓐᓐ	Baker Lake HTO	Baker Lake HTO	2024-02-15
ᐃᓪᓐᓐᓐᓐ	Chesterfield Inlet HTO	Chesterfield Inlet HTO	2024-02-15
ᓪᓐᓐᓐᓐᓐ	Rankin Inlet HTO	Rankin Inlet HTO	2024-02-15

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ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ	Application will be submitted for a scientific research license for conducting shoreline videography in Nunavut. This will be done following NIRB review.	Not Yet Applied		
ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ	Seeking permission to potentially place one fuel cache on Inuit owned lands. Fuel cache will allow the helicopter to refuel during helicopter surveys in Bathurst Inlet.	Not Yet Applied		
ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ	CIRNAC - Lands administration office. Permission to potentially cache fuel on crown lands.	Not Yet Applied		

Project transportation types

Transportation Type	ᑕᑕᑦᑦᑦ ᑕᑕᑦᑦᑦ	Length of Use
Air	Helicopter survey over the coast	

Project accomodation types

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Λ⁵δ^c ^αΓ⁵ζ^b ^δζ^b C>σ>ι⁵ζ^b Δ^cζ^bγ>Π>Γ^c Δδ^cΔ^c, Γ^cΔ>Π^c, ζ^bε^cLCⁱζ^b, φ^cε^cγ>^c ^αΓ^cΔ

[illegible]

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Aviation fuel	fuel	0	208	0	Liters	Access to aviation fuel from the coastguard ship for mapping in Frobisher Bay and Rankin/Chesterfield Inlets.
Aviation fuel	fuel	0	208	0	Liters	Access to aviation fuel from the Cambridge Bay Airport with the Southern Bathurst Inlet Study Site.
Aviation fuel	fuel	15	208	3120	Liters	We have applied to the Polar Continental Shelf Program for logistical research support in the Arctic. We have proposed one a fuel

						cache with 10-15 drums at the Bathurst Inlet Lodge. Coordinates: 66 50' 14.62N; 108 00' 57.64
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$$\Delta^b C d r n \sigma \Delta^s \sigma^s$$

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We anticipate the low-altitude helicopter overflight will have a relatively low potential impact of wildlife and the environment. Wildlife may be impacted by: Noise, sudden movements, physical contact with helicopter (unlikely). Anticipated wildlife impact may include: brief periods of alertness while maintaining activities, animals may watch the aircraft, minor changes in animals existing travel speeds, methods and routes, and no change in animal group size or movements. Some moderate impacts might include flight to escape terrain, or flocks of birds taking flights or other changes in animal behavior. Mitigation measures: - Prior to initiation, identify and map sensitive sites (such as breeding, nesting, calving, migration) so we are aware of their location. - Seasonally (mid May-mid-July) avoid caribou birthing/rearing habitats by limiting helicopter flights altitudes to a minimum of 400m above the ground. - Select particular routes, heli-pads, heli-spots for all helicopter activities to avoid caribou birthing/rearing areas. - Avoid landing sites on or near critical seasonal caribou habitats. - No circling above wildlife if spotted. - Avoid bear feeding sites, by limiting helicopter flights altitudes to a minimum of 400m above the ground and avoid general bear habitat by limiting helicopter flights altitudes to a minimum of 200m above the ground. - Limiting helicopter overflights to a minimum of 400m above the ground in areas around waterfowl and shorebirds, and no circling over wetlands and flocks of birds. - Utilizing existing airstrips or using existing disturbed areas for helicopter takeoff and landings. - Predetermine suitable flight routes to: maintain avoidance distance, visual screening and reduced frequency of flights near critical areas. - Identify suitable landing sites in advance. - Plan fieldwork outside of calving/nesting/birthing season. - Convey the mitigation measures to all staff.

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

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This year, our work falls outside of any Migratory Bird Sanctuaries, National Parks, and other Conservation Areas. The Sylvia Grinnell Territorial Park and Katannilik Territorial parks are within the study site's boundaries for the proposed work around Frobisher Bay. For the Frobisher Bay Study site: Proximity to nearest communities: Iqaluit, Apex are within the study site. Proximity to nearest protected areas: Katannilik Territorial Park, Sylvia Grinnell and Qaummaarviit Territorial Park are within the study site, Dewy Soper MBS (285 km away) For the Rankin Inlet study site: Proximity to nearest communities: Rankin Inlet, Chesterfield Inlet and Baker Lake are within the study site. Whale Cove and Arviat are close to the study site. Proximity to nearest protected areas: Iqalugaarjuup Nunanga Territorial Park is close to the study site. McConnel River MBS is 250 km away. For the Bathurst Inlet Study site: Proximity to nearest communities: Cambridge Bay (280 km away) and Kugluktuk (340 km away) are close to the study site. Proximity to nearest protected areas Queen Maud Gulf MBS is 120 km away. Thelon Wildlife Sanctuary is 260 km away.

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This year, our work falls outside of any Migratory Bird Sanctuaries, National Parks, and other Conservation Areas. The Sylvia Grinnell Territorial Park and Katannilik Territorial parks are within the study site's boundaries for the proposed work around Frobisher Bay. The proposed project would take place within habitats of far-ranging wildlife species such as migratory and non-migratory birds, arctic fox, arctic hare and Species at Risk or Special Concern such as Polar Bears, Grizzly Bears, Wolverine, Harlequin Duck, Peregrine Falcon, Red Knot, Red-necked Phalarope, Short-eared Owl and Caribou.

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This work will be taking place in several different locations a) Frobisher Bay and the nearest community is Iqaluit. We plan to fly past and map the coastline of Frobisher Bay from Iqaluit up to Ward Inlet/Eggleston Bay. B) Southern Bathurst Inlet and the nearest communities are Cambridge Bay, Kugluktuk and Gjoa Haven. We plan to fly around the inlet south of Ekalulia Island. C) Hudson Bay and the nearest communities are Rankin Inlet, Chesterfield Inlet and Baker Lake and Whale Cove. We plan to fly the coast of Rankin Inlet, Chesterfield Inlet and possibly Baker Lake if the helicopter range permits this. We anticipate that the overall impact of this work will be positive on the socioeconomic environment as it will equip communities with resources/information about the coastline to support decisions about shoreline management during an environmental emergency.

Miscellaneous Project Information

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The helicopter makes a single pass along the shoreline and moves along the coast. We typically fly at 110km an hour, so we pass by sites fairly quickly, reducing and limiting impact to the wildlife present. We anticipate the low-altitude helicopter overflight will have a relatively low potential impact of wildlife and the environment. Wildlife may be impacted by: Noise, sudden movements, physical contact with helicopter (unlikely). Anticipated wildlife impact may include: brief periods of alertness while maintaining activities, animals may watch the aircraft, minor changes in animals existing travel speeds, methods and routes, and no change in animal group size or movements. Some moderate impacts might include flight to escape terrain, or flocks of birds taking flights or other changes in animal behavior. As we are doing a single pass in the helicopter, past the coastline, we do NOT

anticipate the single flight having an impact on changes in animal activity periods, change in animal bedding and feeding areas, lower productivity or abandonment of preferred habitats. Aircraft are noisy machines that travel at high speed with the ability to approach wildlife closely. All aircraft approaches will invoke some kind of reaction from animals. It is difficult to assess the impact of short-term reaction on populations, productivity and habitat use. Helicopters are also associated with rotor downwash and brownouts: high velocity wind vortices are generated by helicopter blades when the machine is hovering above a runway or bushland. This generates blankets of airborne dust particles, reduces habitat values and exposes vegetation and wildlife to lethal wind velocities. Direct physical damage such as to hearing or vegetation being shredded by rotor downwash. Mitigation measures: -Prior to initiation, identify and map sensitive sites (such as breeding, nesting, calving, migration) so we are aware of their location. -Seasonally (mid May-mid-July) avoid caribou birthing/rearing habitats by limiting helicopter flights altitudes to a minimum of 400m above the ground. -Select particular routes, heli-pads, heli-spots for all helicopter activities to avoid caribou birthing/rearing areas. -Avoid landing sites on or near critical seasonal caribou habitats. -No circling above wildlife if spotted. -Avoid bear feeding sites, by limiting helicopter flights altitudes to a minimum of 400m above the ground and avoid general bear habitat by limiting helicopter flights altitudes to a minimum of 200m above the ground. -Limiting helicopter overflights to a minimum of 400m above the ground in areas around waterfowl and shorebirds, and no circling over wetlands and flocks of birds. -Utilizing existing airstrips or using existing disturbed areas for helicopter takeoff and landings. -Predetermine suitable flight routes to: maintain avoidance distance, visual screening and reduced frequency of flights near critical areas. -Identify suitable landing sites in advance. -Plan fieldwork outside of calving/nesting/birthing season. -Convey the mitigation measures to all staff.

Cumulative Effects

Disturbance for wildlife is an additive effect. While the occasional disturbance may be of limited short-term impact (such as this shoreline mapping project), each successive disturbance (other projects in the area) can escalate the impact. The duration of disturbances can be of escalating importance. Wildlife initial response to disturbance is to flee to a secure area, so the ability to have a security area available where there is no disturbance is crucial for mitigation for short-term and long-term impacts. We plan to minimize cumulative impacts by limiting the overflights to one pass.

Impacts

$\mathbb{A}^1_{\mathbb{A}^1} \xrightarrow{\sigma} \mathbb{A}^1_{\mathbb{A}^1} \xrightarrow{\tau} \mathbb{A}^1_{\mathbb{A}^1} \xrightarrow{\rho} \mathbb{A}^1_{\mathbb{A}^1}$

[illegible]
$$(P = \langle b \rangle \dot{a} p \cap \dot{a}^c \supset c, N = \langle b \rangle \dot{a} p \dot{a}^c \supset c \supset \langle c \rangle \dot{a} p \dot{a}^c \supset c, M = \langle b \rangle \dot{a} p \dot{a}^c \supset c \supset \langle c \rangle \dot{a} p \dot{a}^c \supset c, U = \langle b \rangle \dot{a} p \dot{a}^c \supset c)$$

List of Project Geometries

- | | | |
|---|---------|--|
| 1 | polygon | Frobisher Bay Study Site |
| 2 | polygon | Rankin Inlet, Chesterfield Inlet and Baker Lake Study Site |
| 3 | polygon | Southern Bathurst Inlet Study Site |

