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# Reducing Impacts to Birds from Exploration and Research Projects on the Arctic Tundra

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Environment Canada

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Prairie and Northern Region

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Canadian Wildlife Service  
Technical Report Series Number 522

Canada



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# **REDUCING IMPACTS TO BIRDS FROM EXPLORATION AND RESEARCH PROJECTS ON THE ARCTIC TUNDRA**

**Environment Canada**

**Technical Report Series No. 522  
Canadian Wildlife Service  
Prairie and Northern Region**

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## EXECUTIVE SUMMARY

This document has been prepared as a general guideline to help industry, researchers and small-scale operators develop and implement appropriate mitigation measures for minimizing human disturbance to migratory birds in tundra habitat in Canada. The geographic focus is for the largest regions of tundra in Canada—Nunavut and the Northwest Territories (N.W.T.). However, the principal recommendations described for mitigation apply to tundra birds and habitat across Canada (Yukon, Quebec, and Newfoundland and Labrador). The document summarizes key legislation and policy with regard to migratory birds in Canada, and provides an overall description of tundra birds and their habitats. Key habitat sites for birds in the NWT and Nunavut are mapped and their importance explained. Potential impacts on tundra birds and their habitat from human disturbance are listed, and corresponding prevention and/or mitigation measures are provided for each impact.

***Disclaimer:***

***Implementing these measures may help to reduce or eliminate some effects that a project may have on migratory birds, but will not necessarily ensure that the project proponent remains in compliance with the Migratory Birds Convention Act, 1994, the Migratory Birds Regulations, the Species at Risk Act and applicable provincial/territorial wildlife laws and regulations. It is the responsibility of proponents to ensure that they remain in compliance with all applicable laws and regulations during all phases and in all undertakings related to a project. In the event of any inconsistency between this guide and the legislation, the latter would prevail.***

## **ACKNOWLEDGEMENTS**

Lindsay Armer expanded and revised an earlier version of the document originally developed by Myra Robertson. James Hodson finalized the document. Nesting dates were derived from an analysis completed by Daniel Coulton and Myra Robertson. Nest setback distances were from an analysis completed by James Hodson. Photographs used within this document were provided by the Canadian Wildlife Service (CWS), Yellowknife. Rae Braden produced bird silhouettes from photos provided by the CWS. Maps were generated by James Hodson and Troy Marsh. A special thank you is extended to the following reviewers: Jim Hines, Mark Mallory, Lynne Dickson, Mark Dionne, Jeanette Goulet, Helen Yeh and Hugo Saint-Jean.

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## 1.0 INTRODUCTION

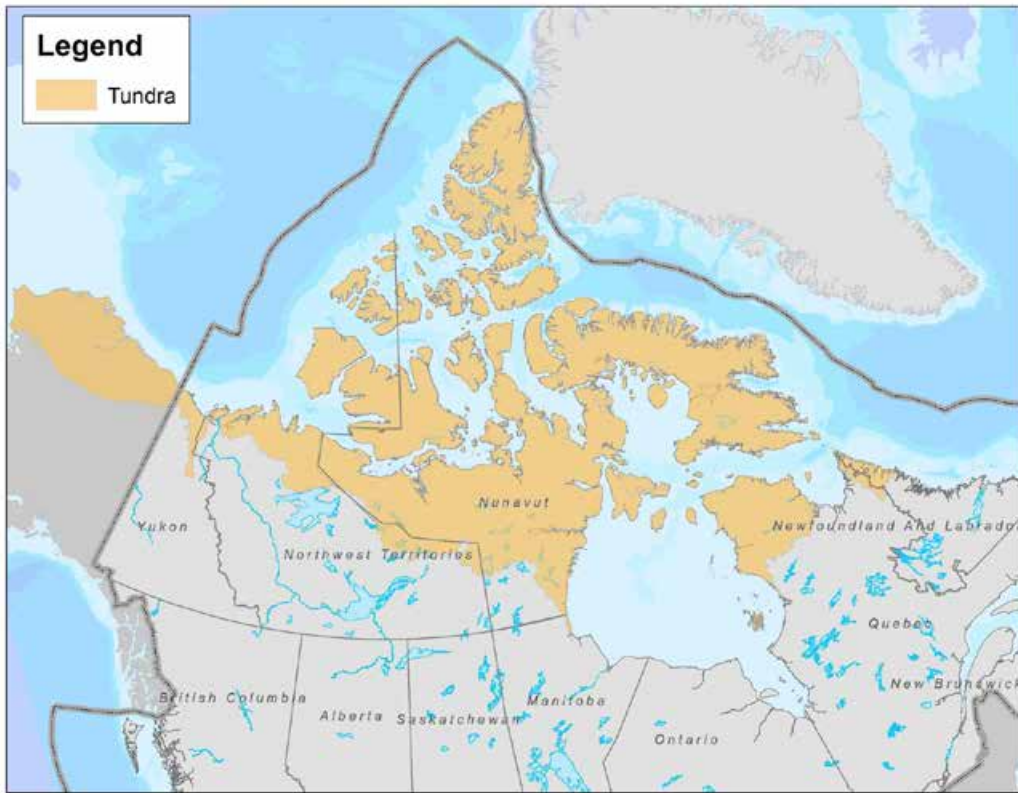
This document has been produced by Environment Canada’s Canadian Wildlife Service (CWS) as a guide to reducing impacts on migratory birds from small-scale projects on the Canadian Arctic tundra. Examples of small-scale projects include mineral exploration, small-scale oil and gas exploration, temporary research camps, outfitting camps, and small quarry operations. This document is not intended to provide a comprehensive review of impacts and mitigation measures from projects that involve large environmental disturbance and/or long-term impacts (e.g., mine sites, oil and gas facilities, pipelines, all-weather road development, and permanent infrastructure development). Large-scale, “high-risk” projects will likely have other impacts not considered here, and additional mitigation measures may be required. Nonetheless, many of the impacts and mitigation measures presented here may also be applicable to these other projects.

The document is primarily aimed at industry personnel and researchers. We hope it is also useful to regulators and other organizations involved in the environmental review of projects.

### **Key points throughout document**

- Key points are summarized in a yellow text box.

This document focuses on birds and mitigation measures for tundra habitat. The tundra region of North America includes regions within the following jurisdictions: Alaska in the United States of America; and in Canada, Yukon, the Northwest Territories (N.W.T.), Nunavut, Northern Quebec, and the northern tip of Labrador in the province of Newfoundland and Labrador. Bird conservation managers have classified this region as “Bird Conservation Region 3 – Arctic Plains and Mountains.” See Figure 1 for a map of tundra habitat in Canada.



*Figure 1: Map of North America's tundra region corresponding to Bird Conservation Region (BCR) 3 in Canada and Alaska (in orange)*

## 2.0 LEGISLATION

### 2.1 *Migratory Birds Convention Act, 1994 and Regulations*

The *Migratory Birds Convention Act, 1994* (MBCA) and the *Migratory Birds Regulations* (MBR) provide the basis for the conservation and management of migratory birds in Canada. The MBCA and MBR apply throughout Canada and are administered and enforced by Environment Canada. The MBCA and MBR protect migratory birds identified by the Act, including waterfowl, seabirds and other aquatic birds, shorebirds, and songbirds. Other birds such as hawks, eagles, owls, ptarmigan, ravens and blackbirds are protected by provincial/territorial legislation.

Several prohibitions may be relevant to small-scale exploration and research projects in Arctic tundra:

- Subsection 5(3) of the MBR prohibits persons from “hunting” migratory birds except as authorized by the Regulations. As defined in the MBCA, “hunting” includes any attempt to chase, harass, capture, or kill a migratory bird.
- Section 5 of the MBCA prohibits persons to be in possession of a migratory bird or nest except as authorized by the Regulations.
- Paragraph 6(a) of the MBR states that no one shall destroy or disturb the nests or eggs of migratory birds.
- Section 5.1 of the MBCA prohibits persons from depositing substances harmful to migratory birds in waters or areas frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

Permits can be issued for the capture or collection of migratory birds, eggs or nests for scientific purposes. However, under the current MBR, no permits can be issued for the incidental take (i.e., the inadvertent disturbance or destruction of nests or eggs during routine activities) of eggs or nests caused by industrial projects or other economic activities.

To find out more about Environment Canada’s approach to managing incidental take, visit

<http://ec.gc.ca/paom-itmb/default.asp?lang=En&n=C51C415F-1>

or consult the fact sheet “Planning Ahead to Reduce Risks to Migratory Bird Nests,” available at

<http://ec.gc.ca/Publications/default.asp?lang=En&xml=50C4FE11-801E-4FE3-8019-B2D8537D76CF>

### ***Migratory Birds Convention Act, 1994 (MBCA)***

- Migratory birds include waterfowl (ducks, geese and swans); seabirds (murre); loons; gulls and terns; shorebirds (sandpipers and plovers), and songbirds (sparrows and buntings).
- Under the MBCA and MBR, it is prohibited to do the following except under authority of a permit:
  - hunt, chase, harass, capture or kill a migratory bird
  - possess a migratory bird or part of a migratory bird or its nest or eggs
  - disturb or destroy the nest or eggs of a migratory bird
  - deposit harmful substances in or near water bodies frequented by migratory birds

For a **complete listing of birds** protected under the MBCA, consult Canadian Wildlife Service Occasional Paper No.1 – “Birds protected in Canada under the *Migratory Birds Convention Act*,” available at:

[www.ec.gc.ca/Publications/default.asp?lang=En&xml=97AC4B68-69E6-4E12-A85D-509F5B571564](http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=97AC4B68-69E6-4E12-A85D-509F5B571564)

## **2.2 *Species at Risk Act***

The federal *Species at Risk Act* (SARA) is intended to prevent wildlife species from being extirpated or becoming extinct, and to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activities. It is also intended to manage species of special concern and to prevent them from becoming endangered or threatened.

Sections 32–36 and 56–64 of SARA outline general prohibitions against

- killing, harming, harassing, capturing, taking, possessing, collecting, buying or trading a wildlife species that is listed as extirpated, threatened or endangered;
- damaging or destroying the residences of individuals of an endangered or threatened species, or of an extirpated species where its reintroduction into the wild has been recommended; and
- destroying critical habitat of an extirpated, threatened or endangered species, as defined in a recovery strategy or action plan.

**How and when these prohibitions apply will depend on the type of species** (e.g., aquatic species, migratory bird), its **status designation** (e.g., threatened, endangered) and **where it is located** (e.g., lands under the authority of the Minister of the Environment or the Parks Canada Agency, other federal lands, non-federal lands).

SARA also requires that species at risk be considered during a federal assessment of a project's potential environmental effects:

- Subsection 79(1) requires that every person who is required by or under an Act of Parliament to ensure that an assessment of the environmental effects of a project is conducted must, without delay, notify the competent minister or ministers in writing of the project if it is likely to affect a listed wildlife species or its critical habitat.
- Subsection 79(2) requires that, where a federal environmental assessment is being carried out in relation to a project that may affect a listed wildlife species or its critical habitat, the person responsible for ensuring the assessment is conducted must:
  - identify potential adverse effects on the listed wildlife species and its critical habitat; and
  - if the project is carried out:
    - § ensure that measures are taken to avoid or lessen those adverse effects and to monitor them, and
    - § ensure that such measures are consistent with any applicable recovery strategy and action plans.

For further information on species at risk in Canada, go to the Species at Risk Public Registry at:  
[www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)

For further information on SARA and environmental assessments, consult the following documents:

- “Addressing *Species at Risk Act* Considerations Under *the Canadian Environmental Assessment Act* for Species Under the Responsibility of the Minister responsible for Environment Canada and Parks Canada”
- “The *Species at Risk Act* Environmental Assessment Checklists for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada”
- “Environment Assessment Best Practice Guide for Wildlife at Risk in Canada”

The above documents are available at [www.ec.gc.ca/nature/default.asp?lang=En&n=132ADBFC-1&parent=0C1743A2-4D49-4183-AC5F-1DE909D2FEB1](http://www.ec.gc.ca/nature/default.asp?lang=En&n=132ADBFC-1&parent=0C1743A2-4D49-4183-AC5F-1DE909D2FEB1)

### ***Species at Risk Act (SARA)***

Under this act it is illegal to

- kill, harm, capture, harass, capture, take, possess, collect, buy, sell or trade a species listed as extirpated, endangered or threatened;
- destroy or damage the residences of extirpated, endangered or threatened species; and
- destroy critical habitat of an extirpated, threatened or endangered species, as defined in a recovery strategy or action plan

Visit the Act online at: [www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)

For a complete table of species that you can query by province or territory:

[www.sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.sararegistry.gc.ca/sar/index/default_e.cfm)

## **2.3 Provincial and territorial laws and regulations**

Each province and territory has specific acts and regulations to protect wildlife and, in some cases, wildlife habitat. The following is a brief description of applicable legislation in the provinces and territories where tundra habitat occurs. It should not be considered an exhaustive list of applicable laws.

The title of each act or regulation is hyperlinked to the corresponding website.\*

### ***Northwest Territories***

#### ***Northwest Territories Wildlife Act***

The N.W.T. *Wildlife Act* applies to all wildlife species in the N.W.T., including all birds, amphibians and animals. Under the legislation, it is illegal to

- chase, harass or molest wildlife;
- partake in activity that will result in a significant disturbance to a large number of wildlife;
- destroy, disturb, or take eggs or nests of any birds listed under the *Migratory Birds Convention Act* or any other bird species not listed under the MBCA, but occurring in the N.W.T.

#### ***Species at Risk (NWT) Act***

This territorial legislation regulates the protection and recovery of identified species at risk in the N.W.T. It applies to public and private land, and private lands owned under land claim agreements. The *Species at Risk (NWT) Act* assesses species status specifically in the N.W.T. A given species' status under the Act may be different than the status defined by federal legislation. The Species at Risk (NWT) Commissioner may regulate activities to conserve species, prohibit an activity that may have detrimental effects on a species (including detrimental effects to the species' habitat), and restrict the possession of species at risk.

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\* If hyperlinks are broken, please contact the relevant provincial or territorial government directly.

## ***Nunavut***

### ***Nunavut Wildlife Act***

The Nunavut *Wildlife Act* provides protection for wildlife and wildlife habitat in Nunavut. It provides additional protection for species at risk and their habitat. An important part of this legislation is Inuit Quajimajatuqangit—the traditional Inuit values and principles of respect for wildlife and wildlife habitat.

## ***Yukon***

### ***Yukon Wildlife Act***

This Act prohibits

- possession or destruction of nests or eggs of any bird that is wild in nature (excluding bird species already protected under the MBCA);
- killing of birds for defense of person or personal property;
- live capture of wild birds;
- harassment of wildlife by any means; and
- attracting wildlife (either purposefully or inadvertently through poor management of wildlife attractants like garbage).

## ***Quebec***

### ***An Act Respecting the Conservation and Development of Wildlife***

#### ***Loi sur la conservation et la mise en valeur de la faune***

Under Quebec's primary wildlife protection legislation and some of the regulations within, it is illegal to disturb, damage or destroy dens or nests of any bird or wildlife species in Quebec (unless specifically permitted). It includes restrictions when working near heron colonies, known areas of high concentration of aquatic birds, or islands or cliffs with bird colonies.

### ***An Act Respecting Threatened or Vulnerable Species***

#### ***Loi sur les espèces menacées ou vulnérables***

This legislation regulates species at risk and their habitat in Quebec. It includes species that are not federally listed.

## ***Newfoundland and Labrador***

### ***Wild Life Act***

This act reinforces the regulations of the MBCA. It also prohibits anyone from chasing or harassing any wildlife species with ATVs, snowmobiles, aircraft or other motorized vehicles. Under this legislation, dogs are not permitted from April 1 to August 31 in places frequented by wildlife.

Newfoundland and Labrador *Endangered Species Act*

Further to the federal legislation, the Newfoundland and Labrador *Endangered Species Act* includes some species that are not federally listed, and gives the province the power to protect these species and their habitat.



### 3.0 MIGRATORY BIRD SPECIES ON THE TUNDRA

Birds are a conspicuous and vital part of northern ecosystems. The Arctic tundra provides breeding habitat for numerous bird species, and the sheer geographic extent of the area means that even species that breed at low densities can occur in great numbers. Many non-breeding waterfowl also travel to the tundra for feeding, resting and moulting. Over 90% of the N.W.T. and Nunavut's bird species are migratory and spend parts of their annual life cycle in southern Canada, the United States, and Central and South American countries.

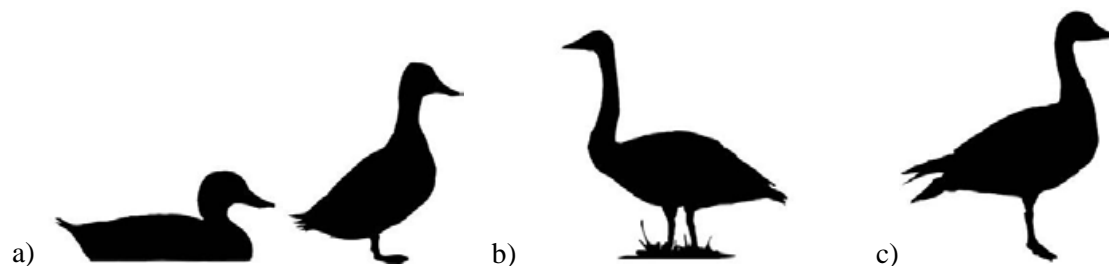
Migratory tundra birds include

- waterfowl (ducks, geese, swans);
- seabirds and other aquatic birds (murre, gulls, terns, loons, cranes);
- shorebirds (plovers, sandpipers); and
- songbirds (sparrows, larks, buntings).

#### *Waterfowl*

Waterfowl are a group of (generally) large-bodied birds with webbed feet. These birds tend to occupy aquatic habitat. This group includes ducks (approximately ten different species breed in the Arctic), geese (six different goose species breed in the Arctic), and swans (one species breeds in the Arctic).

Some nest in colonies (e.g., Snow Geese), and others nest some distance from other birds of the same species (e.g., Tundra Swans). Waterfowl are one of the most conspicuous groups of bird species that you may encounter on the Arctic tundra.



*Figure 2: Typical silhouette of (a) ducks, (b) swans, and (c) geese*

#### *Seabirds, loons, gulls, terns, and jaegers*

Seabirds are typically found feeding in marine areas and nesting in colonies on steep rocky cliffs beside the ocean. They are called “seabirds” because they spend so much time either in or above marine (sea)

regions. Seabird silhouettes are similar to those of some waterfowl. Seabirds found in the Canadian Arctic include Northern Fulmars, Thick-billed Murres and Black Guillemots.

Most gulls, terns and jaegers are usually quite conspicuous and are often curious visitors to camps on the tundra. Gulls and terns are typically white with grey backs. Some species of gull have black heads as well. In the Canadian Arctic, there are three different species of jaeger, only one species of tern (the Arctic Tern), and up to eight different species of gull (depending on which part of the tundra you visit).



*Figure 3: Silhouettes of (a) a typical gull, (b) an Arctic Tern sitting on the ground, and (c) a jaeger*

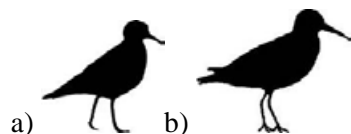
Loons are almost always observed swimming on the water or diving under water to pursue small fish and insects. Loons are larger than most ducks, and their legs are set very far back on their bodies, making it difficult for them to walk on land. There are four species of loon that nest in the Canadian Arctic.



*Figure 4: Typical silhouette of a loon*

### ***Shorebirds***

Shorebirds are common birds on the tundra. Over 25 species can be present at some locations. Shorebirds specialize in feeding on insects in wetland areas. They are typically small birds with long bills and long legs. Shorebirds have obvious distraction behaviours—feigning broken wings, or sitting in a manner to fool the observer into believing that the bird is on a nest.



*Figure 5: Silhouettes of (a) a sandpiper, and (b) a Dunlin*

### *Songbirds*

Tundra songbirds tend to be small, compact birds (smaller than an American Robin). Snow Buntings, Redpolls, Horned Larks and Longspurs are the most common songbirds encountered in the Arctic. There are also several sparrow species present in southern areas of the tundra. Most tundra songbirds build their nests in rock crevices, on the ground or in small shrubs.



*Figure 6: Typical silhouette of a songbird*

## **4.0 IMPORTANT BIRD HABITAT**

Some tundra areas are particularly important as feeding, nesting or staging habitat for birds.

The Canadian Wildlife Service has identified key terrestrial and marine habitat sites for migratory birds in the Northwest Territories and Nunavut. These sites support at least 1% of the Canadian population of at least one migratory bird species (or, in some cases, subspecies). These key sites are essential to the welfare of various bird species in Canada. It is important to know where these areas are, and how various activities might affect the habitat or birds at these key sites.

In Quebec, Newfoundland and Labrador, and Yukon you can refer to the “Important Bird Area” (IBA) initiative ([www.ibacanada.com](http://www.ibacanada.com)) for a list and map of important bird areas. Many of the IBAs are also protected as Migratory Bird Sanctuaries, or fall within the boundaries of a National Park.

Many important habitats are legally protected in the Arctic as well. Protected areas include National Wildlife Areas, Migratory Bird Sanctuaries, National Parks, territorial and provincial parks, and territorial or provincial protected areas.

It should be noted that there are many other areas that do not officially qualify as key bird habitat sites, but are still important to migratory bird conservation. Sound land-use practices should be adopted throughout all migratory bird ranges.

### **4.1 Key habitat sites and Important Bird Areas in the Northwest Territories and Yukon**

Within the N.W.T., there are two key marine habitat sites occurring in tundra regions: Cape Parry, and the Amundsen Gulf and Cape Bathurst Polynya. These sites have been identified as important habitat for Arctic waterfowl and seabirds like the Thick-billed Murre.

Twenty-three important terrestrial habitat sites are identified for the N.W.T. Twelve of those sites are in tundra habitat.

There are three IBAs that occur in tundra habitat in Yukon: Babbage and Spring rivers, Blow River Delta, and the Nuneluk Spit to Herschel Island. The CWS has also delineated key coastal wetlands in Yukon. Contact the regional CWS office for further information on these sites.

It is important to know when and how operations may affect migratory birds in these regions. Almost all of the terrestrial sites listed are highly susceptible to habitat degradation and disturbance, and many bird species nest in large concentrations within these regions. Some of these important habitat sites have

further protection under the *Migratory Birds Convention Act, 1994*, and permits are required for any activity carried out at those sites. See Section 4.3 of this document for more information on these sites.

If you will be operating within or near a key habitat site or Important Bird Area, contact the regional CWS office to determine the best time and specific best practices for operations to reduce impact on the habitat and birds at that site.

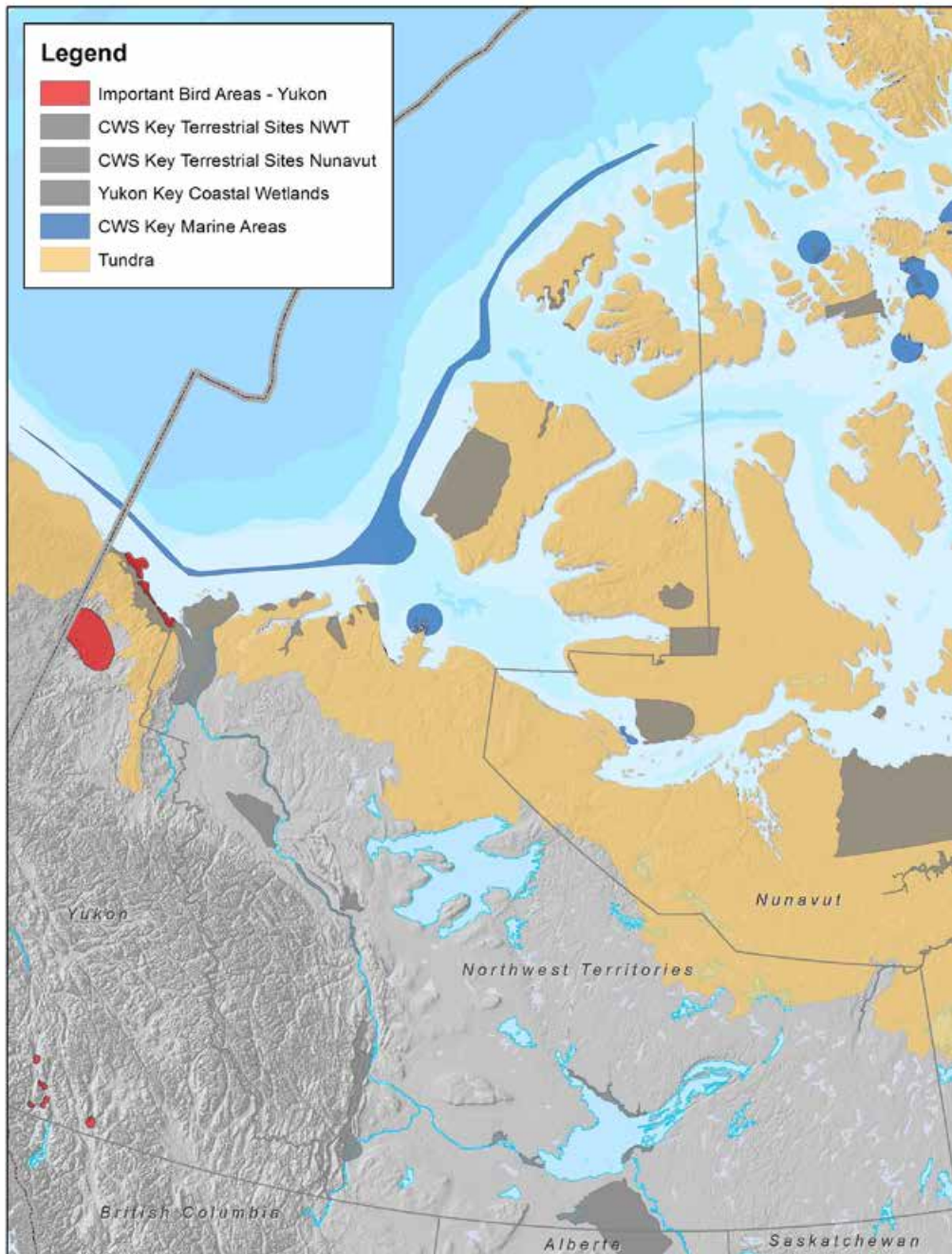


Figure 7: Locations of key migratory bird terrestrial and marine habitat sites in the Northwest Territories and Important Bird Areas in Yukon

## **4.2 Key terrestrial and marine habitat sites and Important Bird Areas in Nunavut, Quebec and Labrador**

There are over 30 key marine habitat sites in Nunavut. These have been identified as important staging and feeding areas for Arctic waterfowl and seabirds, and also as important winter habitat for some species in cases where polynyas occur. Some sites have also been identified for their sensitivity to cruise ship tourism and potential concern over oil spills.

Sixty key terrestrial habitat sites have been identified in Nunavut (see Figure 8). All of these occur in tundra habitat. These sites encompass important breeding habitat for Arctic waterfowl, shorebirds and seabirds. Some of the sites identified in the High Arctic are invaluable habitat for the endangered Ivory Gull.

Many of the key terrestrial habitat sites are breeding areas for seabirds. Typically these birds are very sensitive to human disturbances, including boat and air traffic.

Ten IBAs occur in tundra habitat in the Quebec and Labrador region (note that offshore islands are part of Nunavut).

If you will be operating within or near a key habitat site or Important Bird Area, contact the CWS to determine the best time and best practices for operations in order to reduce impact on the habitat and birds at that site.

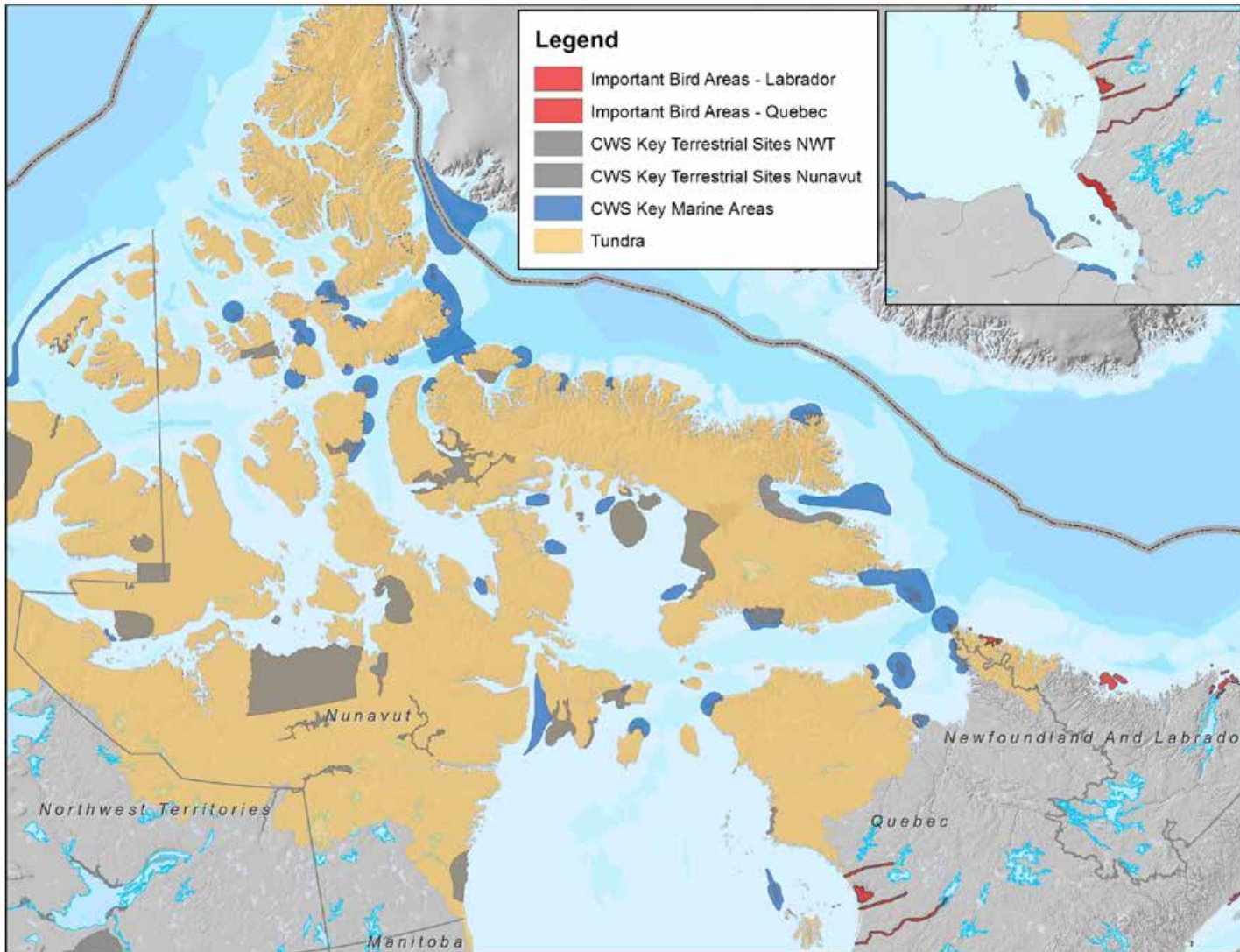


Figure 8: Locations of key migratory bird terrestrial and marine habitat sites in Nunavut and Important Bird Areas in Quebec and Labrador

### Identifying Key Habitat Sites

- Review the maps provided in sections 4.1 (N.W.T. and Yukon) and 4.2 (Nunavut, Quebec and Labrador).
- Determine if your project will involve activities within, near or above any of these key habitat sites.
- Consult the related documents to find out specifics on the region:

Occasional Paper No. 114 – Key migratory bird **terrestrial** habitat sites in the Northwest Territories and Nunavut  
[www.ec.gc.ca/Publications/default.asp?lang=En&xml=4625F589-01A1-4A7B-BBCE-C8E36573B657](http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=4625F589-01A1-4A7B-BBCE-C8E36573B657)

Occasional Paper No. 109 – Key **marine** habitat sites for migratory birds in Nunavut and the Northwest Territories  
[www.ec.gc.ca/Publications/default.asp?lang=En&xml=EDE64CAE-69CA-4C9A-9A6E-55757C59DF36](http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=EDE64CAE-69CA-4C9A-9A6E-55757C59DF36)

Important Bird Areas (IBAs)  
[www.ibacanada.com/explore.jsp?lang=en](http://www.ibacanada.com/explore.jsp?lang=en)  
Select “Arctic Plains and Mountains” under Bird Conservation Regions to get a complete list of IBAs within tundra environments, then click on the area of interest to get more information.

- Contact the CWS for advice and requirements for operating in or near these sites.

### 4.3 Protected areas

Some key migratory bird sites have formal legal protection as [Migratory Bird Sanctuaries](#), [National Wildlife Areas](#), or [National Parks](#). Certain activities that could potentially impact wildlife or wildlife habitat may not be allowed in these areas or may only be allowed provided certain mitigation measures are in place.

A permit is required from the CWS for activities in a Migratory Bird Sanctuary or National Wildlife Area. A permit is required from Parks Canada for activities in a National Park.

The tundra region in northern Quebec and Labrador is included as part of the Nunavik land claim. Nunavik has delineated a set of parks and protected areas within the region. A map of parks in Nunavik can be found at:

[www.nunavikparks.ca/docs/pdf/cartereseau\\_low\\_res.pdf](http://www.nunavikparks.ca/docs/pdf/cartereseau_low_res.pdf)



If you will be doing research in these parks or protected areas, a permit is required from Nunavik Parks ([www.nunavikparks.ca/docs/pdf/en/Research\\_guide.pdf](http://www.nunavikparks.ca/docs/pdf/en/Research_guide.pdf)).

Note that some parks in Quebec are designated as “national” but are not associated with Parks Canada. The provincial authority should be contacted.

### **Identifying Protected Areas**

- Review the maps provided in Figures 9 (N.W.T. and Yukon) and 10 (Nunavut, Quebec and Labrador)
- Determine if your project will involve activities within, near or above any of the legally protected areas.
- Contact the CWS to apply for a permit to operate in a Migratory Bird Sanctuary or National Wildlife Area.
- Contact Parks Canada to apply for a permit to operate in a National Park.
- Contact the appropriate provincial or territorial authority to apply for a permit to operate within a provincial or territorial park or protected area.
- If work will take place in areas designated as critical habitat for a federal species at risk, a permit under SARA may be required.

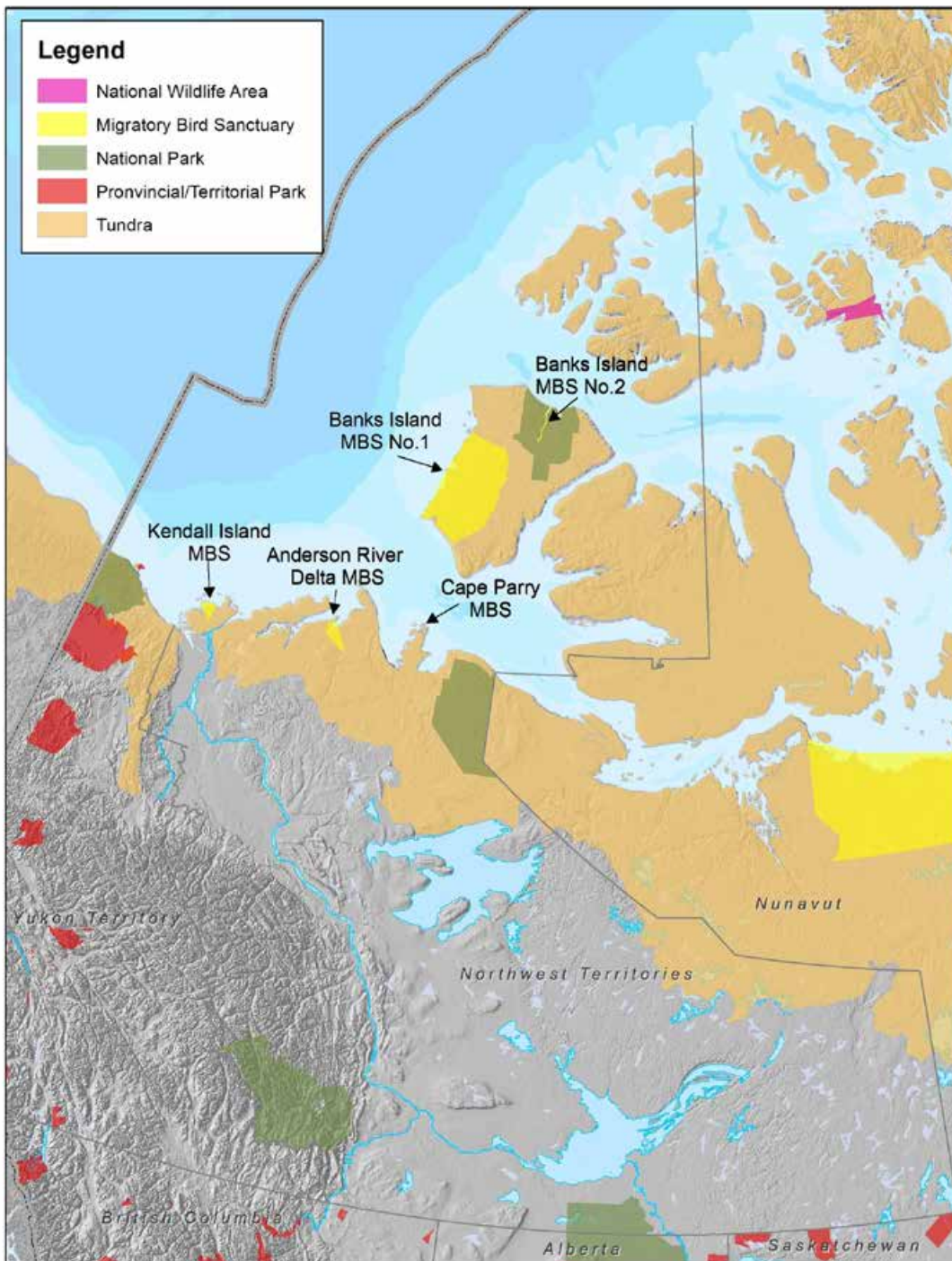


Figure 9: There are five Migratory Bird Sanctuaries that occur in tundra habitat in the Northwest Territories

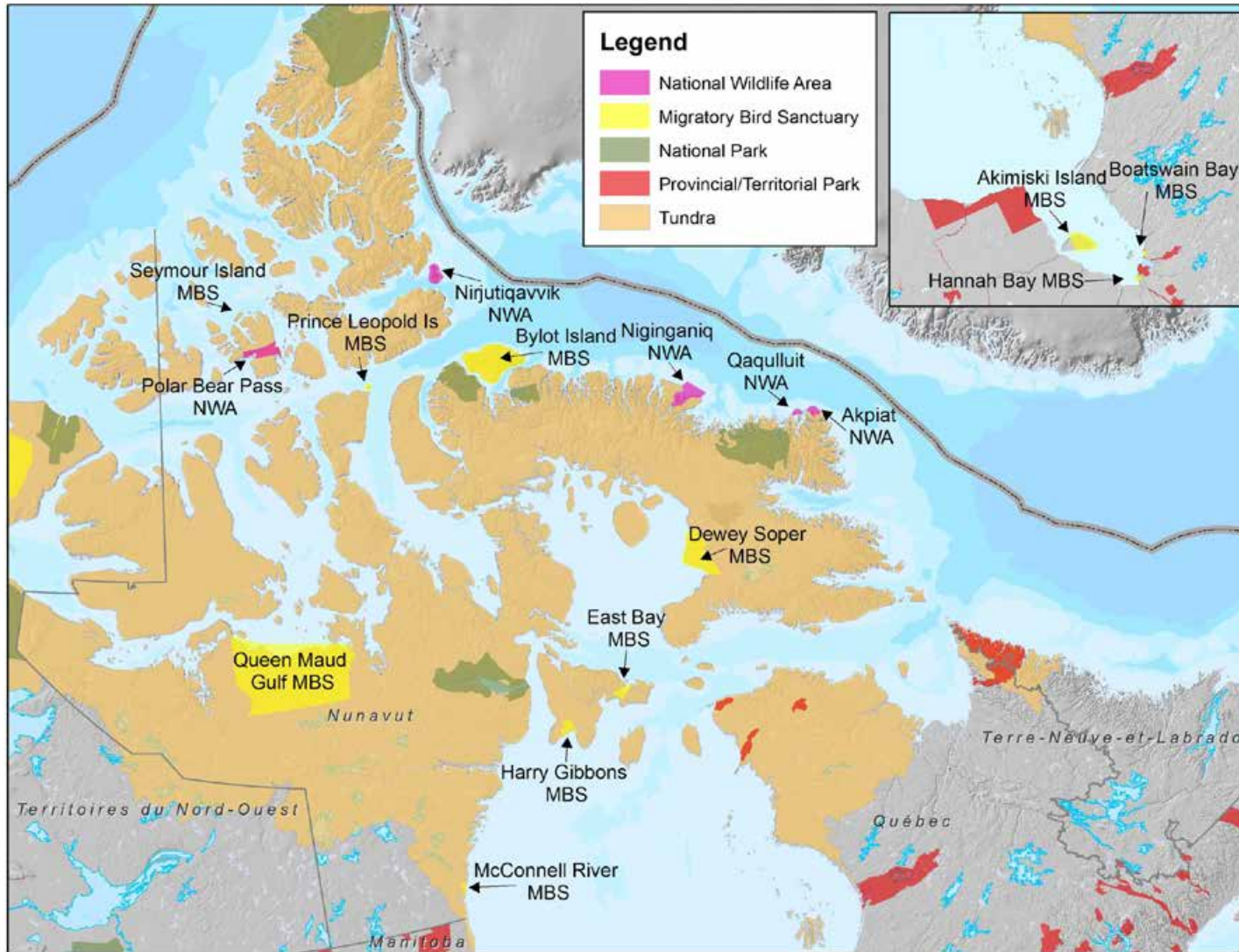


Figure 10: There are eleven Migratory Bird Sanctuaries and five National Wildlife Areas that occur in tundra habitat in Nunavut and the James Bay area of Ontario, Nunavut and Québec

## 5.0 POTENTIAL IMPACTS AND MITIGATION

### 5.1 Disturbance or destruction of nests or eggs

Disturbance or destruction of an active nest or eggs, even if inadvertent, is illegal under the *Migratory Bird Regulations* and/or SARA for species listed as endangered or threatened, or for extirpated species where a recovery strategy has recommended their reintroduction into the wild. It is the proponents' responsibility to ensure that they remain in compliance with the regulations at all times.

Tundra birds nest on the ground, sometimes in relatively open areas. Nests can be surprisingly cryptic and a nest may not be seen until a person is quite close. Nests are at risk of being driven over by all-terrain or other vehicles, or even stepped on by an unsuspecting person. Often it is the behaviour of the bird that indicates that a nest is nearby rather than an actual observation of a nest.

If your project involves activities that carry a high risk of disturbing or destroying nests or eggs, the best mitigation measure is to conduct these activities outside of the migratory bird nesting season. High-risk activities include disturbance of large amounts of habitat such as during land-clearing or road-building operations, or conducting activities in areas known to have large concentrations of nesting birds.

For lower-risk activities, areas should be checked for nests before work begins, and all crew members should be trained on how to recognize signs that a bird might be nesting in the area. If an active nest is found, the area should be avoided until nesting is completed (i.e., the young have left the vicinity of the nest).

See [Appendix A](#) for the approximate nesting dates for birds in different regions.

- Undertake activities with a high risk of accidental nest destruction, such as land clearing or road building, either well before or after the nesting season.
- Avoid bird colonies and other known nesting areas.
- Ensure there are no nests in work areas before starting work.
- Train all crew members to recognize nesting clues.
- If an active nest is found, avoid the area until nesting is completed.

## 5.2 Flushing nesting birds

Disturbing birds from their nests increases the chance that predators will raid the nests and eat the eggs or young. As well, repeated nest disturbance may cause birds to abandon their nests. As there is very little vegetation to cover nests on the tundra, eggs can become overheated or too cold because of exposure to the elements when a bird is forced off of the nest for extended periods of time.

The best way to limit your disturbance to nesting birds is to keep your distance. Avoid approaching a nest, as this will cause stress to incubating birds and may also cause them to flush from the nest. If taking photographs, use a zoom lens and/or a blind.

The response of nesting birds to human disturbance can depend on a number of factors such as distance from the nest, species, type of activity, frequency of disturbance, stage of incubation, and individual differences among birds. Setback distances to minimize disturbance to nesting birds are recommended below.

The following **setback distances** are recommended to protect nests of different bird groups breeding in tundra habitat (see footnotes for adjustments to setbacks for sensitive species and species at risk):

Species Group	Pedestrians/ATVs (m)	Roads/Construction/ Industrial Activities (m)
Songbirds	30	100
Shorebirds	50 <sup>a</sup>	100 <sup>a</sup>
Terns/Gulls	200 <sup>b</sup>	300 <sup>b</sup>
Ducks	100	150
Geese	300	500
Swans/Loons/Cranes	500	750

<sup>a</sup> If project activities are within the breeding ranges of American Golden Plover or Ruddy Turnstone, these setbacks should be increased to 150 m and 300 m respectively. If project activities are within the breeding range of Black-bellied Plover, Whimbrel or Redknot (a species at risk), these setbacks should be increased to 300 m and 500 m respectively. If field crew are trained in the identification of these species, these higher setbacks need only apply to these more sensitive species, and lower setbacks can be used for the remaining shorebird species.

<sup>b</sup> If project activities are in proximity to breeding colonies of Ross's Gull (a species at risk), these setbacks should be increased to 500 m and 750 m respectively. For Ivory Gull (a species at risk) a 2-km setback for all activities must be used.

- When marking buffer zones around nests, avoid flagging or other bright materials that might draw the attention of predators. Markers such as small rock cairns should be used instead.

In the event that a bird establishes a nest once a field camp is set up or project activities have already begun, take an adaptive management approach such as those below to minimize disturbance to the nest.

- Move temporary structures or activities away from the active nest to the extent possible.
- If moving structures or project sites is not feasible, minimize activity around the nest as much as possible and monitor nesting activity from a distance until nesting is complete.
- Remember, it is illegal under the MBR to move a nest.
- If possible, record the following information in the camp wildlife log (see below): species, nest location, approximate distance from structures or project activities, whether the bird flushes or sits tight on the nest when crew members conduct activities or pass by, and whether the nest is successful (i.e., eggs hatched and young have fledged).
- Sharing these observations with the CWS can help to improve mitigation measures and guidelines for protecting nesting birds.

### **5.3 Attraction of predators**

Human activities can attract predators of birds such as foxes, bears, ravens and gulls to the area. Although these animals may initially be attracted to food, domestic wastes or petroleum-based chemicals (e.g., greases, gasoline, glycol-based antifreeze), they will also eat eggs and young birds in the area. These predators can have significant negative effects on the local bird population, especially when activities are concentrated in local areas by human activity.

- Do not feed or try to attract wildlife.
- Ensure that food, domestic waste and petroleum-based chemicals are inaccessible to wildlife at all times by using airtight, wildlife-proof containers.
- Train all crew members on proper waste management and the implications of feeding wildlife.
- Report problem wildlife to territorial/provincial wildlife officers.
- For more guidelines on setting up and maintaining your camp, please refer to Northern Land Use Guidelines – Camp & Support Facilities ([www.aadnc-aandc.gc.ca/eng/1100100028007](http://www.aadnc-aandc.gc.ca/eng/1100100028007))

### **5.4 Aircraft disturbance**

Most birds alter their behaviour when an aircraft is flying in the vicinity. Typically, the first response of birds to aircraft is the “alert” posture in which birds raise their heads and straighten their necks. This can occur when the aircraft is 10 km or more away. Flocked birds may also mass together (move together in a tight group without flying). If the aircraft continues to approach, birds may fly and circle their previous

location, or they may fly to a new location. Some birds will also dive below the surface of the water. Moulting waterfowl are flightless and they usually swim or run away from the aircraft. The response of birds to aircraft can depend on a number of factors such as distance from birds (both horizontal and vertical), reproductive status of the birds, time of year, frequency of flights, aircraft type, species, flock size and individual differences among birds.

Aircraft disturbance can negatively affect birds in a number of different ways. Disturbance during the breeding season may result in nest abandonment and increased mortality of eggs and young from predation, exposure to adverse weather conditions, and accidental damage or injury. Injuries can be caused when a nesting bird is suddenly flushed and the bird inadvertently crushes an egg or chick. Disturbance that disrupts feeding can lead to low-weight birds that may have reduced survival and reproductive success. As well, birds may avoid disturbed areas, resulting in short- or long-term changes in population distributions.

The best mitigation measure for avoiding impacts to birds from aircraft is to fly when few birds are present on the tundra, such as early spring, late fall, and winter. If this is not possible, other mitigation measures include planning flight paths to avoid birds, and flying at high altitudes.

Areas to avoid include Migratory Bird Sanctuaries, key migratory bird habitat sites, Important Bird Areas, breeding colonies, and areas where birds congregate during migration or moulting.

Based on a review of scientific literature on the response of birds to aircraft, birds reacted in only 25% of the studies when an aircraft was above 650 m (2100 feet). Thus, a minimum aircraft altitude of 650 m (2100 feet) would minimize much of the disturbance. The studies in which birds flew when the aircraft was at an altitude of > 650 m were all situations in which geese were in large moulting or migration flocks. Therefore, higher aircraft altitudes may be required to minimize disturbance when birds are in large concentrations. Most of the studies in the review were done in the Arctic with small helicopters and planes that are similar to aircraft that would be used for small-scale exploration and research projects.

Obviously, lower altitudes will be needed for take-off and landing. There may be conditions where weather conditions or other safety considerations do not permit avoidance of areas with birds or do not permit high-flight altitudes. As well, high altitudes may not be obtainable for short distances.\* Nonetheless, if aircraft avoid important areas with birds and fly high whenever possible, this will decrease the cumulative impact of aircraft flights in the area.

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\* The distance required to obtain specific flight altitudes may depend on several factors such as aircraft type, weather conditions, whether the pilot is operating under instrument or visual flight rules, and load.

Exceptions to these recommendations may be warranted for scientific studies (e.g., wildlife surveys) in which the benefits for conservation clearly outweigh the risks.

Table 1 outlines some general minimum flight altitude guidelines developed by the Environmental Impact Screening Committee for the Inuvialuit Settlement Region (NWT). Although developed for a specific region, they are applicable in all tundra regions.

Table 1: Minimum flight altitude guidelines for aircraft flying over or near migratory birds  
(adapted from: *Environmental Impact Screening Committee – Environmental Impact Screening Guidelines. Appendix D – Flight Altitude Guidelines. Available at [www.screeningcommittee.ca/screening/operating\\_guidelines.html#1](http://www.screeningcommittee.ca/screening/operating_guidelines.html#1)*)

<b>Aircraft Type</b>	<b>Species/Situation</b>	<b>Recommended Altitude</b>
All types	Over areas likely to have birds (anytime during the breeding season)	> 650 metres (2100 ft)
All types	Over areas where birds are known to concentrate (sanctuaries, colonies, moulting areas, Important Bird Areas)	> 1100 metres (3500 ft)
All types	Over parks, reserves, and refuges	> 610 metres (2000 ft)

- Fly at times when few birds are present (e.g., early spring, late fall, winter).
- If flights cannot be scheduled when few birds are present, plan flight paths that minimize flights over habitat likely to have birds and maintain a minimum flight altitude of 650 m (2100 feet).
- Minimize flights during periods when birds are particularly sensitive to disturbance, such as during the migration, nesting and moulting seasons.
- Plan flight paths to avoid known concentrations of birds (e.g., bird colonies, moulting areas) by a lateral distance of at least 1.5 km. If avoidance is not possible, maintain a minimum flight altitude of 1100 m (3500 feet) over areas where birds are known to concentrate.
- Avoid the seaward side of seabird colonies and areas used by flocks of migrating waterfowl by 3 km.
- Avoid excessive hovering or circling over areas likely to have birds.
- Inform pilots of these recommendations and of areas known to have birds.



## 5.5 Alteration of bird habitat

Adequate habitat is essential for all wildlife species. Habitat provides the water, food and shelter needed by migratory birds for survival and reproduction. If habitat is destroyed or becomes highly degraded, species may become threatened or even locally extirpated. Habitat loss and degradation are the leading causes of species endangerment in Canada. Over 60% of Canada's terrestrial species at risk are affected by habitat-related threats.

Degradation of habitat can be physical and direct in nature, such as through habitat destruction or alteration. Indirect habitat degradation can occur through visual or acoustic disturbance, or through increased predator populations that effectively reduce the ability of habitat to support birds.

Depositing fuel, oil, or other deleterious substances into the habitat of migratory birds is also an offence under the MBCA. A preventative approach to spill management should be taken, and a spill response plan should be in place.

Protection of habitat from the impacts of industrial development is vital to maintaining species in a landscape and to managing the impacts of cumulative effects on migratory birds and other wildlife.

- Minimize your project footprint.
- Set up your camp and other project infrastructure on terrain that is resilient to impacts or on previously disturbed terrain.
- For winter operations, ensure that snow and ice pads adequately protect the underlying habitat.
- Avoid driving motorized vehicles (e.g., ATVs) over sensitive terrain.
- Inform crew members of the importance of minimizing your impacts on the terrain.
- Have a spill response plan, even for small amounts of fuel.
- Consult Aboriginal Affairs and Northern Development Canada's publication: [Northern Land-use Guidelines](#)

## 5.6 Species at risk

If species at risk occur within your project area, additional mitigation measures may be required to ensure there are no potential adverse effects to the species, its habitat and/or its residence. All crew members should know what species at risk may be found within the project area, how to identify each species, and any special mitigation measures required.

Monitoring may also be required to determine the effectiveness of mitigation and/or identify where further mitigation is required. As a minimum, this monitoring should include recording the locations and dates of any observations of species at risk, behaviour or actions taken by the animals when project activities are encountered, and any actions taken by the crew members to avoid contact or disturbance to the species, its habitat and/or its residence.

Refer to species status reports and other information on the [Species at Risk Public Registry](#) and the booklet “[Species at Risk in the Northwest Territories](#)” for additional information on specific species. Further information on specific mitigation measures to reduce impacts to species at risk may also be found in recovery strategies, action plans and management plans for each species; these are available on the SARA registry.

Bird observations of species at risk can be submitted to the following:

[NWT/Nunavut Bird Checklist Survey program](#) (see Section 6.2)

[Atlas of the Breeding Birds of Quebec](#)

[Yukon Bird Club](#)

[Yukon Conservation Data Centre](#)

- Ensure all crew members can identify species at risk within the project area and know what special mitigation measures are required.
- Record **all** observations of species at risk.
- Submit bird species at risk observations to the appropriate bird survey program or directly to the CWS.
- Consult the SARA registry to determine which species may be present where you will be working: [www.sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.sararegistry.gc.ca/sar/index/default_e.cfm)

## 6.0 BIRD MONITORING

### 6.1 Wildlife logbooks

Maintaining a log of wildlife sightings at your work and camp locations has many benefits. Accurate records of wildlife use in your area can help you determine the impact of your activities on wildlife in the area, and this information may be useful for future applications for further work in the area. Wildlife observations can also indicate if there is an immediate wildlife problem that needs attention. For example, regular sightings of foxes near the kitchen tent may indicate that there is a problem with food attractants or garbage disposal.

Wildlife logbooks can record all observations of animals, or can be restricted to certain species (e.g., large mammals, large birds, species at risk). All crew members should be instructed as to what types of animals to record on the log so that data are recorded in a consistent manner. It is best to have crew members enter observations daily; otherwise, details of the observations may be forgotten.

Useful information to record in the wildlife logbook includes

- species (or type of animal such as duck or gull if species unknown);
- number of animals;
- date;
- location;
- observer(s);
- brief description of animal action/behaviour (e.g., feeding, running/flying away, on nest);
- any actions taken by crew members to reduce disturbance to animal (e.g., work stopped until animal left, nesting area avoided, no action required); and
- when appropriate, a photo of the species observed.

Bird observations collected from camp wildlife logs can be submitted to the NWT/Nunavut Bird Checklist Survey program (see Section 6.2), the Atlas of Breeding Birds of Quebec, or the Yukon Bird Club.

- Maintain a wildlife logbook and enter observations on a daily basis.
- Encourage all crew members to record their sightings in the log.

## 6.2 NWT/Nunavut Bird Checklist Survey and other checklist programs

The [NWT/Nunavut Bird Checklist Survey](#) program is a bird monitoring program that relies on the observations and reports of volunteers. It was initiated in 1995 by the CWS to collect information on the distribution, abundance and breeding status of birds in the N.W.T. and Nunavut. Your participation in the program will increase the baseline knowledge of bird species in the North.

Checklist data can provide a great deal of useful information that is otherwise difficult to collect in a large, remote area like the North. By working cooperatively with volunteers, the CWS can use this database of bird sightings to provide baseline information for further studies, environmental assessments, more accurate mapping of bird distributions, and (if the database becomes large enough) detecting major changes in bird populations.

The program is designed for convenience. Bird observations can be as specific as reporting an actual point count for birds, or as simple as the number of species observed at a camp over a one-week period. The program collects information on all birds, including breeding status, nest information, and general location and habitat type where the birds were observed.

Anyone can access the data. Information from the Checklist Database may be obtained by contacting the [Canadian Wildlife Service](#). Data can be sorted and retrieved by geographic coordinates, individual species, species groups, land claim, Bird Conservation Regions, National Parks or territory.

In Quebec, bird observations should be sent to [www.oiseauxqc.org/english.jsp](http://www.oiseauxqc.org/english.jsp) or to the Atlas of Breeding Birds of Quebec. Observations made in Yukon can be sent to the [Yukon Bird Club](#) or to the [NWT/Nunavut Bird Checklist Survey](#).

**Bird observations collected during your project activities are a valuable contribution to wildlife monitoring and management!**

## 7.0 SUMMARY

Bird conservation is everyone's responsibility. Learning the general groups of birds and some of their behaviours is an important part of the mitigation process. Providing crew members with the ability to recognize nesting or moulting birds, and giving them information on how to avoid additional stress to these birds, will decrease the overall impact of activity on tundra birds.

**Appendix G** provides a **checklist** of questions to answer when planning any exploration or research activity in the Arctic tundra.

By carefully considering these questions and implementing the appropriate mitigation measures and monitoring programs found within this guide, you will help to minimize your impact on birds and their habitat in the Arctic.

## 8.0 SELECTED REFERENCES

The following references and websites may assist in developing a mitigation plan for a project. Important links are also provided throughout the document.

### **Species at risk**

[www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)

<http://nwt-species-at-risk.ca/tiki/tiki-index.php>

[www.env.gov.yk.ca/wildlifebiodiversity/speciesrisk.php](http://www.env.gov.yk.ca/wildlifebiodiversity/speciesrisk.php)

[www.env.gov.nl.ca/env/wildlife/endangeredspecies/index.html](http://www.env.gov.nl.ca/env/wildlife/endangeredspecies/index.html)

[www.mddep.gouv.qc.ca/biodiversite/especes/protection/index-en.htm](http://www.mddep.gouv.qc.ca/biodiversite/especes/protection/index-en.htm)

[www.gov.nu.ca/env/wild.shtml](http://www.gov.nu.ca/env/wild.shtml)

### ***Migratory Birds Convention Act, 1994***

Enforcement:

[www.ec.gc.ca/alef-ewe/default.asp?lang=en&n=3DF2F089-1](http://www.ec.gc.ca/alef-ewe/default.asp?lang=en&n=3DF2F089-1)

Incidental take:

<http://ec.gc.ca/paom-itmb/default.asp?lang=En&n=FA4AC736-1>

The pipeline industry and the *Migratory Birds Convention Act* (June 2004):

[www.cepa.com](http://www.cepa.com)

Inuvialuit Settlement Region: Environmental Impact Screening Committee

[www.screeningcommittee.ca/screening/operating\\_guidelines.html#1](http://www.screeningcommittee.ca/screening/operating_guidelines.html#1)

See: *Appendix D – Flight Altitude Guidelines*

### **Territorial and provincial legislation**

Northwest Territories *Wildlife Act*

[www.justice.gov.nt.ca/PDF/ACTS/Wildlife.pdf](http://www.justice.gov.nt.ca/PDF/ACTS/Wildlife.pdf)

*Species at Risk (NWT) Act*

[www.justice.gov.nt.ca/PDF/ACTS/Species%20at%20Risk.pdf](http://www.justice.gov.nt.ca/PDF/ACTS/Species%20at%20Risk.pdf)

Nunavut *Wildlife Act*

[www.justice.gov.nu.ca/apps/docs/download.aspx?file=Consolidated Law/Current/633621686364491250-1861554934-conssnu2003c26.pdf](http://www.justice.gov.nu.ca/apps/docs/download.aspx?file=Consolidated%20Law/Current/633621686364491250-1861554934-conssnu2003c26.pdf)

Yukon *Wildlife Act*

[www.gov.yk.ca/legislation/acts/wildlife.pdf](http://www.gov.yk.ca/legislation/acts/wildlife.pdf)

*An Act Respecting the Conservation and Development of Wildlife* (Quebec)

*Loi sur la conservation et la mise en valeur de la faune*

[www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=/C\\_61\\_1/C61\\_1\\_A.html](http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=/C_61_1/C61_1_A.html)

*An Act Respecting Threatened or Vulnerable Species* (Quebec)

*Loi sur les espèces menacées ou vulnérables*

[www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=/E\\_12\\_01/E12\\_01\\_A.html](http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=/E_12_01/E12_01_A.html)

*Wild Life Act* (Newfoundland and Labrador)

[www.assembly.nl.ca/legislation/sr/statutes/w08.htm](http://www.assembly.nl.ca/legislation/sr/statutes/w08.htm)

Newfoundland and Labrador *Endangered Species Act*

[www.assembly.nl.ca/legislation/sr/statutes/e10-1.htm](http://www.assembly.nl.ca/legislation/sr/statutes/e10-1.htm)

## **Protected areas in tundra regions of Canada**

A general description of Canada's Protected Areas Network:

[www.hww.ca/hww2.asp?cid=4&id=231](http://www.hww.ca/hww2.asp?cid=4&id=231)

Parks Canada

[www.pc.gc.ca](http://www.pc.gc.ca)

Migratory Bird Sanctuaries

[www.ec.gc.ca/ap-pa/default.asp?lang=En&n=E11C9243-1](http://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=E11C9243-1)

National Wildlife Areas

[www.ec.gc.ca/ap-pa/default.asp?lang=En&n=058F76A4-1](http://www.ec.gc.ca/ap-pa/default.asp?lang=En&n=058F76A4-1)

Northwest Territories Protected Areas Strategy:

[www.nwtpas.ca](http://www.nwtpas.ca)

Quebec's protected areas:

[www.mrnf.gouv.qc.ca/publications/aires/aires-protegees.pdf](http://www.mrnf.gouv.qc.ca/publications/aires/aires-protegees.pdf)

Network of Protected Areas in Nunavut:

[www.nunavikparks.ca/docs/pdf/cartereseau\\_low\\_res.pdf](http://www.nunavikparks.ca/docs/pdf/cartereseau_low_res.pdf)

Newfoundland and Labrador's Ecological Reserves

[www.env.gov.nl.ca/env/parks/maps/reserves\\_map.pdf](http://www.env.gov.nl.ca/env/parks/maps/reserves_map.pdf)

Yukon Land Status

[www.emr.gov.yk.ca/mining/pdf/LandStatusMap.pdf](http://www.emr.gov.yk.ca/mining/pdf/LandStatusMap.pdf)

Yukon Parks and Conservation

[www.env.gov.yk.ca/parksconservation](http://www.env.gov.yk.ca/parksconservation)

## **Land use guidelines**

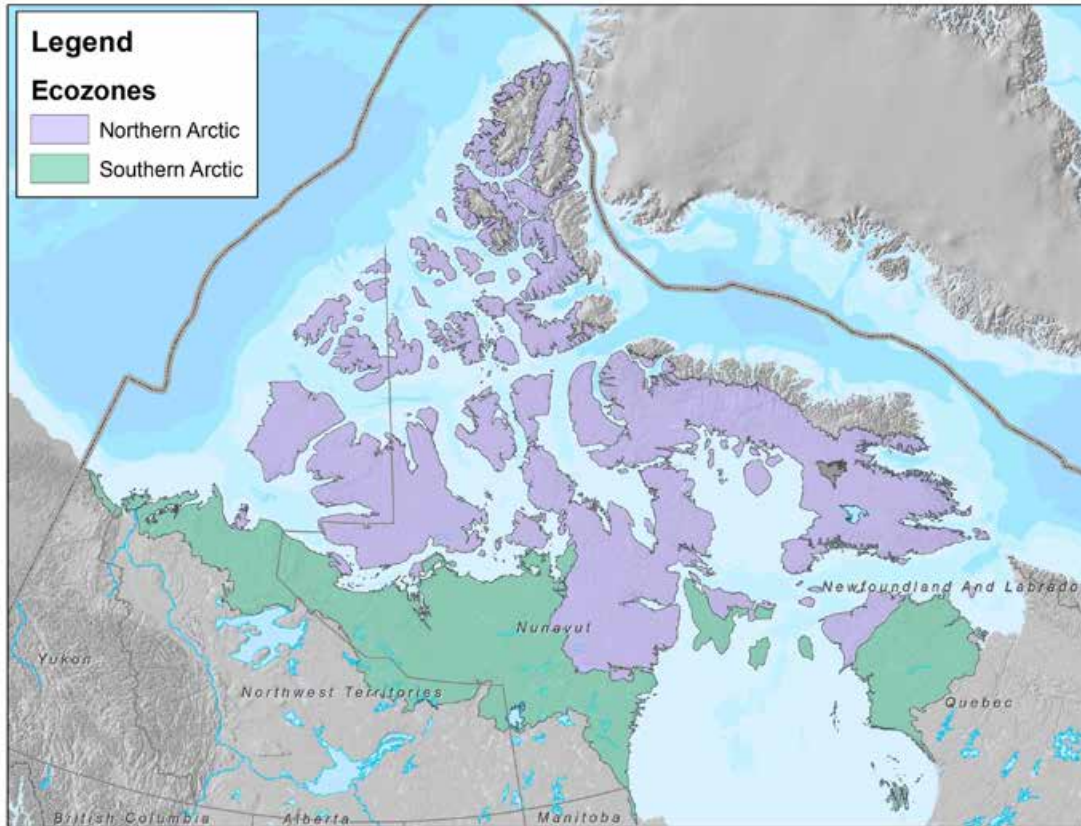
Aboriginal Affairs and Northern Development (AANDC) – Northern Land Use Guidelines  
[www.aadnc-aandc.gc.ca/eng/1100100028007](http://www.aadnc-aandc.gc.ca/eng/1100100028007)

Environmental Impact Screening Committee – Environmental Impact Screening Guidelines –  
Appendix D. Flight Altitude Guidelines  
[www.screeningcommittee.ca/screening/operating\\_guidelines.html](http://www.screeningcommittee.ca/screening/operating_guidelines.html)



## APPENDIX A: Nesting Dates for Arctic Birds (N.W.T. and Nunavut)

Part I. The nesting date ranges are geographically separated based on ecozones – Northern Arctic and Southern Arctic.



Part II. Date ranges were derived from an analysis of nesting data in the Northwest Territories and Nunavut. Date ranges do not include ALL migratory bird groups, but are meant to be interpreted as a general guideline.

Ecozone	Pre-laying	Nesting	Brood rearing
<b>Northern Arctic</b>	(NWT) April 23 to July 3 (Nunavut)	May 31 to August 4	June 13 to August 28
<b>Southern Arctic</b>	(NWT) April 15 to July 10 (Nunavut) May 7 to June 29 (Nunavut) April 29 to July 6	May 14 to July 30	June 14 to September 12

Source: Coulton, D.R., and Wiebe-Robertson, M. 2009. *Periods related to the breeding season of migratory birds in the Northwest Territories and Nunavut. Unpublished. 15 p.*

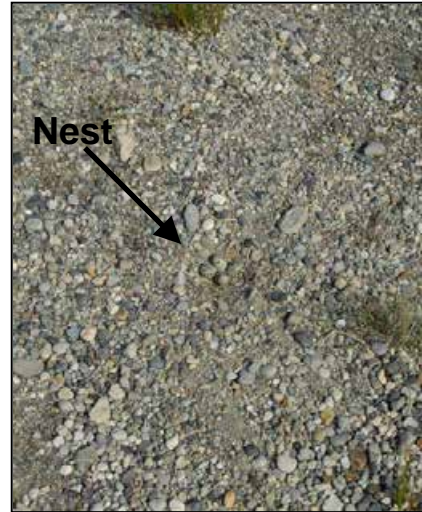
## APPENDIX B: Recognizing Nesting Birds

### Nests

Nests of birds can be surprisingly cryptic, sometimes you cannot see a nest until you are relatively close to it (see photos below). Even at close range the actual eggs are not that obvious. Often it is the behaviour of the bird that indicates that a nest is nearby rather than an actual observation of a nest.



© Environment Canada



### Distraction displays

When you are near a nest, sometimes the nesting bird will simply fly away as you approach. Other birds may perform distraction displays to lure you away from either their eggs or young. The photographs here show distraction displays by shorebirds—often they will feign a broken wing or even sit down on non-nesting sites to draw your attention away from the nest.



© Environment Canada, 2007  
Photos: Charles Francis



Other types of distraction display can include vocalizations, “rodent run” (the bird walks on the ground with head low, moving back and forth stealthily), and mobbing (gulls and terns will often aerially dive-bomb people or predators approaching their nests or young).

## APPENDIX C: Recognizing Bird Broods



A “brood” of Snow Geese  
© Environment Canada

Waterfowl broods may be a single family group or combined family groups. Combined family groups sometimes have up to 100 or more adults plus young. The combined family groups appear much like "moulting flocks," especially later in summer. The photograph here shows a brood of Snow Geese.

Although young can swim on the water, they still have downy feathers; they cannot get excessively wet or they will be unable to stay warm enough to survive. It is also important that young birds do not get separated from the flock, since the young birds cannot survive on their own.

To avoid unnecessary stress to waterfowl broods there are several steps you can take. First, avoid approaching groups on foot, or with a vehicle or boat. Second, ensure that your pilot does not fly at low altitude when broods are in the vicinity.

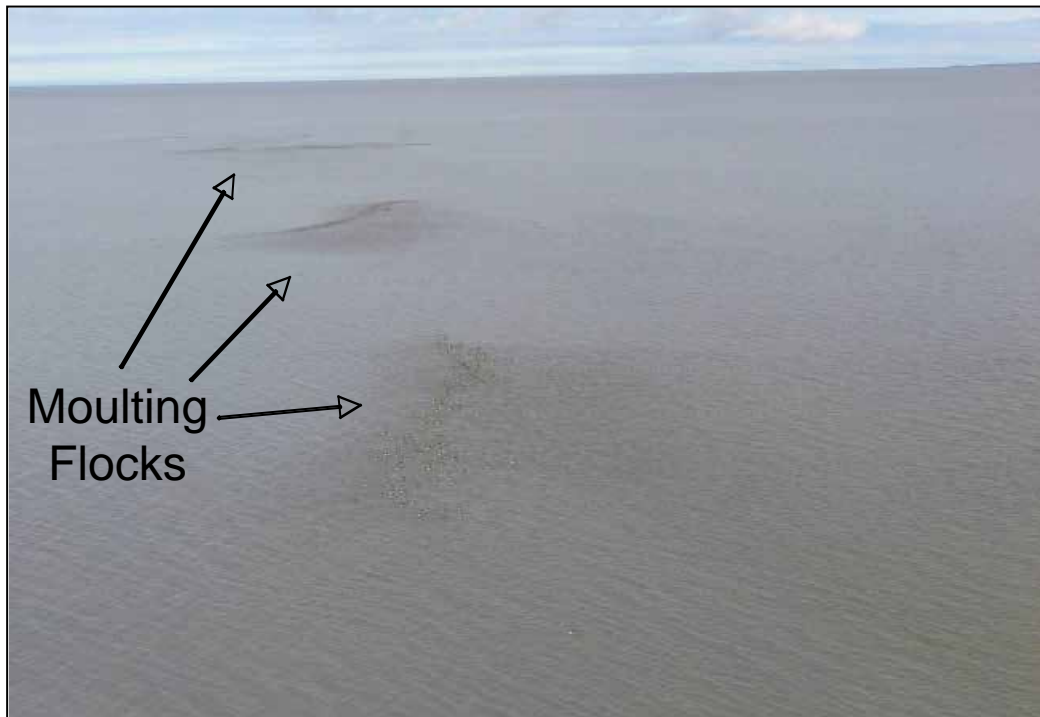
## APPENDIX D: Recognizing Moulting Waterfowl

Moulting is when birds shed their old feathers and grow new ones. Because waterfowl shed all their flight feathers at one time, they are flightless during the moulting period.

Non-breeding waterfowl typically moult in mid-summer. Young geese and ducks are flightless during brood rearing, and adult waterfowl that raised young will delay their own summer moult until the brood-rearing period.

Flightless groups of moulting waterfowl can number from a few dozen to hundreds of birds. Moulting waterfowl are usually seen out on the sheltered water or on land near a lake, pond, bay or lagoon. From a distance they are readily visible to the trained eye and appear as darker than the water surface.

Moulting waterfowl are sensitive to human disturbance (including aircraft disturbance) and should be avoided during this critical time.



Aerial view of moulting flocks of waterfowl  
© Environment Canada

## **APPENDIX E: Contact Information**

### ***NORTHWEST TERRITORIES***

Environment Canada, Canadian Wildlife Service – Yellowknife  
Phone: 867-669-4706  
Address: 4<sup>th</sup> Floor, 5109–52<sup>nd</sup> Street, Yellowknife NT X1A 2P7

NWT/Nunavut Bird Checklist Survey  
Email: [NWTChecklist@ec.gc.ca](mailto:NWTChecklist@ec.gc.ca)  
Website: [www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=60E48D07-1](http://www.ec.gc.ca/reom-mbs/default.asp?lang=En&n=60E48D07-1)  
Phone: 867-669-4771

Environment and Natural Resources, Government of Northwest Territories  
Phone: 867-920-8064  
Address: Box 1320, 5102 50<sup>th</sup> Avenue, Yellowknife NT X1A 2L9  
Website: [www.enr.gov.nt.ca](http://www.enr.gov.nt.ca)

### ***NUNAVUT***

Environment Canada, Canadian Wildlife Service – Iqaluit  
Phone: 867-975-4633  
Address: Qimugjuk Building, P.O. Box 1870, Iqaluit NU X0A 0H0

Department of Environment, Government of Nunavut  
Email: [environment@gov.nu.ca](mailto:environment@gov.nu.ca)  
Phone: 867-975-7770  
Address: P.O. Box 1000, Station 1300, Iqaluit NU X0A 0H0  
Website: <http://env.gov.nu.ca>

### ***YUKON***

Environment Canada, Canadian Wildlife Service – Whitehorse  
Phone: 867-393-6700  
Address: 91780 Alaska Highway YT Y1A 5X7

Environment Yukon – Fish and Wildlife  
Email: [fish.wildlife@gov.yk.ca](mailto:fish.wildlife@gov.yk.ca)  
Phone: 867-667-5715  
Address: Box 2703 (V-5), Whitehorse YT Y1A 2C6  
Website: [www.env.gov.yk.ca](http://www.env.gov.yk.ca)

### ***QUEBEC***

Environment Canada, Canadian Wildlife Service – Gatineau  
Phone: 819-956-5975  
Address: 10 Wellington Street, Gatineau QC K1A 0H3

Environment Canada, Canadian Wildlife Service – Quebec City  
Phone: 418-649-6008  
801–1550 D’Estimauville Avenue, Québec QC G1J 0C3

Ministère des Ressources naturelles et de la Faune  
Email: [services.clientele@mnr.gc.ca](mailto:services.clientele@mnr.gc.ca)  
Phone: 866-248-6936  
Address: 880 Sainte-Foy Road, RC 120-C Québec QC G1S 4X4  
Website: [www.mrn.gc.ca/english/home.jsp](http://www.mrn.gc.ca/english/home.jsp)

### ***NEWFOUNDLAND AND LABRADOR***

Environment Canada, Canadian Wildlife Service – St. John’s  
Email: [cws.nf&lab@ec.gc.ca](mailto:cws.nf&lab@ec.gc.ca)  
Phone: 709-772-2154  
Address: 6 Bruce Street, Mount Pearl NL A1N 4T3

Newfoundland and Labrador Department of Environment and Conservation – Wildlife Division  
Phone: 709-637-2025  
Address: P.O. Box 8700, 4<sup>th</sup> Floor, West Block, Confederation Building, St. John’s NL A1B 4J6  
Website: [www.env.gov.nl.ca/env/wildlife/index.html](http://www.env.gov.nl.ca/env/wildlife/index.html)

## **APPENDIX F: Glossary of Terms**

**Brood** – A group of young birds hatched at the same time and raised and guarded by one female

**Degradation** – Making habitat unsuitable or less suitable for use by birds

**Flushing** – Causing a bird to fly or run away from its roost, perch or nest

**Moult**ing – (In birds) the routine shedding of old feathers, which are replaced with new feathers

**Nesting** – The period when birds are laying eggs in nests, and while birds are occupying nests to incubate eggs

**Polynya** – An area of water surrounded by sea ice; often remains unfrozen all year

**Pre-laying** – The period before eggs are laid by birds; pairs may be courting and/or mating or nest-building during this time period

**Staging** – Used to describe the behaviour of migratory birds when they congregate in an area during migration to rest or feed

## APPENDIX G: Mitigation Checklist

Be sure to answer the following set of questions when planning any exploration or research activity in the Arctic tundra:

- C How will the proposed activity affect migratory birds?
- C Can work take place in the winter to avoid disturbing migratory birds during key nesting, moulting and brood-rearing periods?
- C Are there any bird species at risk with ranges that overlap where the activity will take place? *Not sure? Consult: [www.sararegistry.gc.ca/sar/index/default\\_e.cfm](http://www.sararegistry.gc.ca/sar/index/default_e.cfm)*
- C Are all crew members aware of their responsibilities under federal and provincial/territorial legislation?
- C Are all crew members trained in identifying species at risk? Nesting birds? Moulting waterfowl? Broods? If not, provide them with appropriate training on wildlife that they are likely to encounter.
- C Does the proposed project occur in key bird habitat? What additional mitigation measures are required in the key bird habitat site to protect birds and their habitat in this area? Has the CWS been contacted for further advice on mitigation measures within the key bird habitat site?
- C Does the proposed project occur in a Migratory Bird Sanctuary, National Wildlife Area, or National Park? If yes, an appropriate permit must be obtained.
- C Is there a waste management plan in place for the work site (to decrease predator attraction)?
- C Is there a spill response plan in place for hazardous substances?
- C Have pilots and/or charter companies for your project been informed of best practices to reduce impacts to birds?
- C How will the proposed project impact bird habitat? How can the project footprint be minimized?
- C Are all crew members aware of the wildlife logbook and the importance of recording bird and wildlife observations?



**[www.ec.gc.ca](http://www.ec.gc.ca)**

Additional information can be obtained at:

Environment Canada

Inquiry Centre

10 Wellington Street, 23rd Floor

Gatineau QC K1A 0H3

Telephone: 1-800-668-6767 (in Canada only) or 819-997-2800

Fax: 819-994-1412

TTY: 819-994-0736

Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)