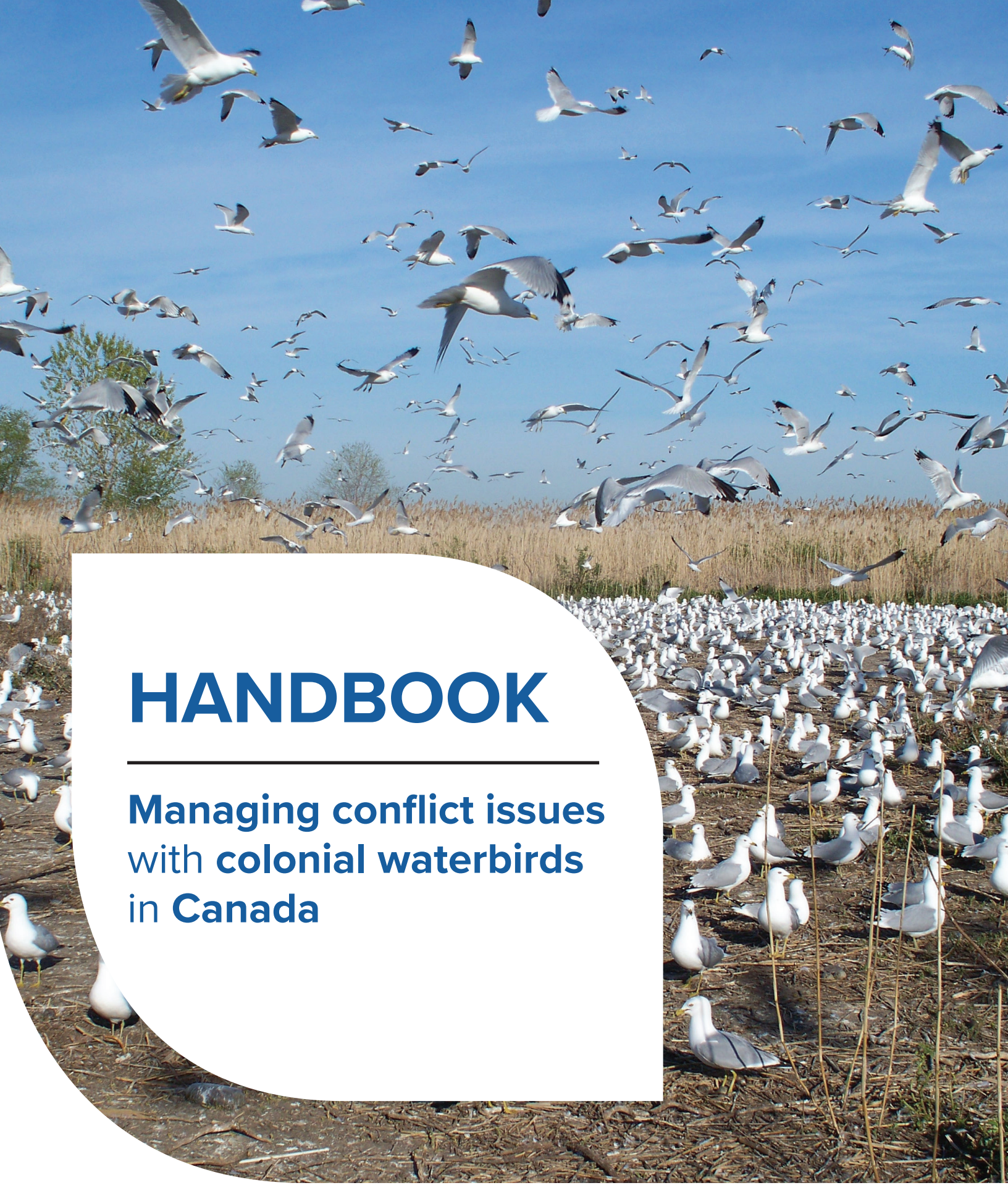

HANDBOOK

Managing conflict issues with colonial waterbirds in Canada

Environment and Climate Change Canada
Environnement et Changement climatique Canada

Canada

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HANDBOOK

Managing conflict issues with **colonial waterbirds** in **Canada**

Canadian Wildlife Service
Environment and Climate Change Canada

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1. About this handbook

This handbook is intended for people experiencing damage or danger caused by colonial waterbirds in Canada. Colonial waterbirds include gulls, terns and most herons and egrets. Areas where damage may occur include primarily urban habitats such as marinas, aquaculture facilities, landfill sites, urban parks, school grounds, fast food restaurants, parking lots, airports, residential properties and large flat roofs, especially those near wetland areas and water impoundments. This handbook provides general information about colonial waterbirds and outlines appropriate preventative and deterrent techniques for use in problem areas. It describes actions that can be taken by landowners to address damage or danger issues with colonial waterbirds which require a permit from Environment and Climate Change Canada. Finally, it provides contact information for users to obtain additional advice and the necessary permits.

This handbook is intended to provide general guidance for people experiencing damage or danger caused by colonial waterbirds and is not a substitute for the requirements of the *Migratory Birds Convention Act, 1994* (MBCA), the *Migratory Birds Regulations* (MBR), or the Species at Risk Act (SARA) or any of the regulations. The landowner or permit holder is responsible for compliance with the MBCA, MBR, SARA or any of the regulations and the permits when undertaking any actions affecting migratory bird species. In the event of any inconsistency between this document and the legislation or any of the regulations, the legislation and regulations will prevail. For the most up-to-date versions of the MBCA, MBR, SARA and the regulations, please consult the Department of Justice website: https://laws-lois.justice.gc.ca/eng/. Individuals with specific legal concerns are urged to seek advice from their legal counsel.

Legislative protection

Except for cormorants and pelicans (which are under provincial and territorial jurisdiction), all regularly-occurring colonial waterbirds in Canada (including gulls, terns, herons and egrets) are protected federally under the *Migratory Birds Convention Act* (MBCA) and the Migratory Birds Regulations (MBR). The legislation prohibits, for example, the deposition of substances harmful to migratory birds. They also prohibit the killing or capturing migratory birds, and damaging, destroying, removing, or disturbing their nests and eggs, except as authorized under a permit and the conditions.

Some species of migratory birds protected under the MBCA have also been listed in Schedule 1 of the *Species at Risk Act* (SARA). The SARA includes prohibitions related to the killing, harming or harassing of listed species, and destroying residences and critical habitat. Therefore, listed migratory bird species receive protection under both the MBCA and SARA. Compliance with both acts is required.

Environment and Climate Change Canada (ECCC) is the federal department responsible for these laws, and can undertake enforcement measures to protect migratory birds, nests and eggs.

The Canadian Wildlife Service (CWS), a branch of Environment and Climate Change Canada, can provide expert advice on migratory birds. Where appropriate, CWS may issue permits under the MBR and SARA to authorize **otherwise prohibited activities** if migratory birds are causing or are about to cause damage or danger to agriculture or other interests, including threats to human health and public safety.

Click here for a list of CWS regional permitting offices.

For conflicts resulting from cormorants or pelicans, please contact your local provincial or territorial wildlife agency.

2. Introduction

Colonial waterbirds are birds that frequent coastal areas; some are found exclusively in the marine environment while others are found in both marine and freshwater environments.

A list of colonial waterbirds most commonly associated with conflict issues in Canada includes:

- California Gull
- Franklin's Gull
- Great Black-backed Gull
- Glaucous-winged Gull
- Herring Gull
- Mew Gull
- Ring-billed Gull
- Caspian Tern
- Common Tern
- Great Blue Heron

Information on how to identify these species can be found at the All About Birds Website (Cornell University) or Dendroica and information on their range and status in Canada can be found at the Status of Birds in Canada website. For eastern Canada, the Identification guide: Five Common Gulls of Eastern Canada, provides information on how to identify five species that can be found in the area throughout the year.

3. Biological characteristics

3.1 Breeding behaviour

Colonial waterbirds typically gather together, particularly for nesting; in fact one of the terms used to describe some species is "colonial-nesting waterbirds". In addition to nesting in colonies, colonial waterbirds may also congregate together at nocturnal roosting sites and food sources. Some species such as gulls are opportunistic feeders consuming fish, invertebrates, insects, fruit, carrion, and trash; these characteristics may exacerbate conflict issues.

The biological characteristics of the species at issue, and the legislative or permitting requirements must be understood by the landowner before considering possible management techniques. CWS can provide expert advice on migratory birds.

3.1.1 Nesting

As their name implies, colonial waterbirds usually nest in colonies, which can range in size from few nests to several thousand, or even tens of thousands. However, individual pairs may nest on their own. Most species do not build elaborate nests; they usually clear a space in the gravel or groundcover, and sometimes they will create a ring of moss, grasses, or other material to surround their eggs. For most species of colonial waterbirds, individuals will return to the same nesting colony in subsequent years.

Ring-billed Gulls nesting © iStock.com/Nataliya Zozulya

Some species nest in wetlands, while others predominantly nest on islands, on cliffs and, more recently, on large flat rooftops, for example warehouses, car dealerships and marina facilities. Great Blue Herons usually nest in trees but in some instances are known to nest on the ground on islands.

3.1.2 Nest defence

Most species of colonial waterbirds will defend their nest site and their chicks from predators, and when people go near nests and/or chicks, they will be perceived as predators by the adult birds. In order to frighten the predator away, the parents will fly down quickly and aggressively to try to scare away the perceived threat. During these flights, they will sometimes make contact/hit the person; however, they will usually stop short before actually doing so. Since they are defending their young, the speed and aggressiveness with which the birds fly can be frightening. When this happens, the best approach is to leave the area. Typically, adult birds will become more aggressive as the nesting season progresses; however, there can be a lot of variation in defensive behaviour among individuals. Most birds are most aggressive when people are very close to the nest and when people are walking. They usually become less aggressive if someone is not moving or is in a location away from the nest, particularly if the birds are able to return to the nest site. For example, roof-nesting birds may be aggressive when someone arrives and is walking on the roof, but may settle if someone is crouched in an area away from them, particularly if they are then able to return to their nest. If work must be done in the area of a nest, wearing hard hats and goggles can help prevent injury. If birds are known to nest in an area, it is also advisable to undertake work prior to the nesting season. (For example, perform maintenance of heating, ventilation and air conditioning (HVAC) systems before the nesting season begins).

3.1.3 Multi-species nesting

In addition to nesting with others of their own species, colonial waterbirds may also nest with other species in multi-species colonies. Colonial waterbirds tend to breed synchronously, meaning that, for a given species, most nests at a colony site are initiated during a narrow window of time. However, other species nesting at the same colony may have different timing, so they may be at a different reproductive phase at a given point in time. For example, gulls tend to nest earlier than terns, so gulls may be in

Multi-species nesting – Ring-billed Gulls and Caspian Terns © Dave Moore, Environment and Climate Change Canada

the chick-rearing phase while terns may still be incubating eggs. **Prior to undertaking management activities, all species occupying an area must be identified because some species are more vulnerable than others, and deterrent activities may impact non-target species that are also protected under the MBCA.** For example, some species of gulls that are very common and occur in large numbers in some areas may nest with other species of gulls, terns or herons that are more sensitive or at greater risk.

3.1.3.1 Multi-species nesting by region

- In eastern Canada (Ontario, Quebec and Atlantic), the breeding gull species are: Herring Gulls, Ring-billed Gulls and Great Black-backed Gulls. They are known to nest in multi-species colonies with each other as well as with Common Terns, Caspian Terns, Great Blue Herons, Black-crowned Night-Herons and Double-crested Cormorants.
- In the Prairies, the breeding gull species are California Gulls, Herring Gulls, Ring-billed Gulls, and Franklin's Gulls. They are known to nest in multi-species colonies with each other and/or may also be associated with Common Terns, Caspian Terns, Great Blue Herons, Double-crested Cormorants, American White Pelicans, Forster's Terns, and Black-crowned Night-Herons, as well as several grebe species.
- In western Canada (Rocky Mountains and areas to the west), the breeding gull species are: Bonaparte's Gulls, California Gulls, Glaucous-winged Gulls, Herring Gulls, Mew Gulls and Ring-billed Gulls. They are known to nest with each other and/or with Arctic Terns, American White Pelicans, Double-crested Cormorants, Pelagic Cormorants, and Brandt's Cormorants. Bonaparte's Gulls usually nest in nest in loose colonies in conifer trees and do not nest with other species of colonial waterbirds.

- In northern Canada, south of the Arctic Circle (north of the treeline), the breeding gull species include: Herring Gulls, Ring-billed Gulls and Mew Gulls. They are known to nest in multi-species colonies with each other and/or with Common Terns, Arctic Terns and Caspian Terns. Bonaparte's Gulls also nest in this region but they nest in loose colonies in conifer trees and do not nest with other species of colonial waterbirds.
- While the above species are the usual ones in mixed species colonies, other loosely colonial species such as Canada Goose (*Branta canadensis*), Glaucous Gull (*Larus hyperboreus*), Green Heron (*Butorides virescens*), and others, could be present.

Table 1: Distribution of colonial waterbirds most commonly associated with conflict issues in Canada, by province and territory.

SPECIES	BC	AB, SK, MB	NT, NU, YK	ON	QC	NL, PE, NS, NB
California Gull	✓	✓	✓			
Franklin's Gull		✓				
Glaucous-winged Gull	✓					
Great Black-backed Gull				✓	✓	✓
Herring Gull		✓	✓	✓	✓	✓
Mew Gull			✓			
Ring-billed Gull	✓	✓	✓	✓	✓	✓
Common Tern		✓	✓	✓	✓	✓
Caspian Tern	✓	✓	✓	✓	✓	✓
Great Blue Heron	✓	✓		✓	✓	✓

3.2 Breeding dates

The breeding season for colonial waterbirds in Canada extends from March through September. Timing varies by species and by region, depending upon the local climate and annual weather conditions. Generally, birds tend to nest earlier in the south. In the southern portions of British Columbia, Ontario and Quebec, gulls and Great Blue Herons pair up and establish territories by mid to late March/early April. Most gulls and Great Blue Herons in British Columbia complete egg-laying by the end of the second or third week of June. However, timing varies considerably among species and within species, and by geographic location. In eastern and prairie Canada, nesting usually begins in mid-April and extends into May and June or even early July. Gulls and herons usually nest earlier than terns, which initiate nesting approximately three weeks later.

Specific information on nesting dates can be obtained by species and region using the Nesting Calendar Query Tool from Bird Studies Canada, or you may contact your regional CWS office.

3.3 Breeding cycle

Colonial waterbirds typically lay a single clutch of eggs per year, but may re-nest if the first nesting attempt fails early in the season. Commonly, re-nesters and younger birds represent a second 'peak' of nesting later in the season. The egg-laying, incubation and chick-rearing periods are long, and the development of young is protracted compared to other bird species. The chicks of all colonial waterbird species require extended care (e.g. thermoregulation, feeding and protection) by both parents, often beyond the fledging stage (i.e., when they learn to fly). As a result, adults and their dependent young may be tied to nesting sites for up to 4 months during the year (Table 2).

Herring Gulls © iStock.com/mauribo

Table 2: Chart showing nesting phenology by activity (and number of weeks) for colonial waterbirds most commonly associated with conflict issues.

SPECIES	APPROXIMATE NUMBER OF WEEKS FOR EACH ACTIVITY																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Great Black-backed Gull	Egg–laying (4-6 days) and Incubation (30-32 days)					Flightless Chicks (7-8 weeks)								Fledged chicks may be cared for on the breeding territory (approximately 3-4 weeks)			
Herring Gull	Egg–laying (4-6 days) and Incubation (30-32 days)					Flightless Chicks (6-7 weeks)							Fledged chicks may be cared for on the breeding territory (approximately 3 weeks)				
Ring-billed Gull and Franklin's Gull	Egg–laying (3-6 days) and Incubation (23-28 days)				Flightless Chicks (5-6 weeks)						Fledged chicks may be cared for on the breeding territory (1-2 weeks)						
Glaucous-winged Gull and California Gull	Egg–laying (1-4 days) and Incubation (26-28 days)				Flightless Chicks (5-6 weeks)						Fledged chicks may be cared for on the breeding territory (approximately 3 weeks)						
Mew Gull	Egg–laying (1-4 days) and Incubation (24-26 days)				Flightless Chicks (4-5 weeks)					Fledged chicks may be cared for on the breeding territory (1-2 weeks)							
Common Tern	Egg–laying (1-4 days) and Incubation (23-26 days)				Flightless Chicks (4-5 weeks)					Fledged chicks may be cared for on the breeding territory (2-3 weeks)							
Caspian Tern	Egg–laying (2-4 days) and Incubation (25-28 days)				Flightless Chicks (4-5 weeks)					Fledged chicks may be cared for on the breeding territory (1-2 weeks)							
Great Blue Heron	Egg–laying (1-4 days) and Incubation (25-29 days)				Flightless Chicks (7-8 weeks)								Fledged chicks may be cared for on the breeding territory (3-4 weeks)				

Birds will often scout potential nesting areas for approximately 5-15 days before nesting commences. At that time, they may be observed in pairs, bringing food to their partner (courtship feeding) and/or collecting nesting material and building a nest.

Most colonial waterbird chicks are semi-precocial, meaning that they hatch with their eyes open, are covered with down, and are able to walk. The breeding cycle of colonial waterbirds is long, as chicks remain on the nesting colony and are cared for by both parents for many weeks before they are able to fly and feed themselves. The approximate number of weeks for each breeding activity is shown in Table 2.

3.3.1 Behaviour outside of the breeding season

Once the breeding season is completed, most colonial waterbirds disperse away from their breeding grounds. Some go outside of Canada while others go to other areas within Canada. During the non-breeding season, species that do not breed locally may be present. For example, at feeding sites such as landfills and farms, there may be species of gulls present during the winter that do not breed locally (such as Arctic breeders that overwinter in southern Canada) and that may be of conservation concern. In winter, large numbers of colonial waterbirds, especially gulls, may congregate at mass feeding areas (landfills) and at areas of open water. If management techniques are being employed outside of the breeding season, care should be taken to accurately identify the species. Identification information can be found on the All About Birds website or Dendroica. For eastern Canada, the "Identification guide: Five Common Gulls of Eastern Canada" provides information on how to identify five species that can be found in the area throughout the year. In the event of any uncertainty, please consult an expert or CWS.

Also at this time of the year, colonial waterbirds adopt new loafing and roosting sites. Loafing sites are low disturbance areas used for preening and sleeping during the daylight hours; these include under-used parking lots, athletic fields, rooftops, open flat graveled areas, farm fields and pastures. Roosting sites are areas where the birds congregate and/or sleep at night; lakes, water reservoirs or small barren islands are common roosting sites for gulls and terns but rooftops are also used.

4. Techniques to address conflict issues with non-SARA colonial waterbirds

If colonial waterbirds are causing or likely to cause damage or danger to agriculture or other interests, they may be deterred or displaced using a variety of management techniques. The techniques used must be appropriate for the species and the specific circumstances, and must comply with the legislation and regulations. The specific facts (including the proposed management techniques) and migratory birds at issue will dictate whether a permit is required, the approval process, and the conditions imposed.

It is the responsibility of the landowner, person, and/or agency employing any management techniques to obtain all necessary permits and engage, as required, with ECCC, and/or other government agencies including municipalities, provinces and territories, and Indigenous communities. As Migratory Bird Damage Permits (hereafter referred to as Danger or Damage permits) are species-specific, permitted activities apply only to those species specified on the permit. For migratory birds not listed on the permit, it is illegal to harass or kill them, or to destroy or disturb their nests or eggs. A permit issued by ECCC does not exempt permit holders from complying with other laws and regulations. It is up to the person or agency undertaking management actions to be aware of, and comply with, all appropriate laws and regulations. Individuals with specific legal concerns are urged to seek advice from their legal counsel.

For the purposes of this handbook and this section, the focus is on non-SARA colonial waterbirds. In the case of colonial waterbirds listed in Schedule 1 of the SARA, the prohibitions and requirements of SARA would also apply. For example, the SARA imposes stringent pre-conditions before a permit can be issued and listed migratory birds can be killed or harassed, and before eggs, nests, residences and critical habitat can be moved, damaged or destroyed.

Architectural or habitat modification techniques provide the best chance of long-lasting resolution to conflict issues as they will make areas less attractive to the birds. However, care must be taken not to destroy wetland habitat. Removal of attractants is an obvious method to reduce conflicts. Scaring techniques can also be used to deter colonial waterbirds from an area. More than one technique is usually required to resolve conflicts because birds often become accustomed to the activities. These techniques, which are not mutually exclusive, will have the best chance of success if employed early on and frequently, particularly before birds initiate nesting activity. **Once the birds initiate nesting activity, they will become more committed to the site and it will become increasingly difficult to remove them, and it will require more invasive techniques and the possible need for a permit**. General information on these management techniques is provided below, techniques to use in each season can be found in Table 3 and by various locations in Table 4. More detailed information for each technique is outlined below and can be found in Appendix 1.

4.1 Architectural or habitat modification

Architectural or habitat modifications for dealing with conflicts are generally passive methods, i.e. they are not thought of as causing alarm to the birds and may not elicit alarm calls from them. The most effective strategy for reducing conflicts with colonial waterbirds is to ensure that they are not attracted to the site. In addition to being attracted to food sources (see below), colonial waterbirds may be attracted to an area if it is a safe undisturbed site suitable for breeding, loafing or roosting.

The most common forms of architectural or habitat modifications are those which prevent colonial waterbirds from landing on a given area, i.e. excluding them. These include, for example, placing a series of specially designed "spikes" along the apex of house or warehouse roofs to prevent birds from landing on them. Netting or wires may also be placed over feeding areas (for example, fish ponds, picnic areas, fruit trees) as a means of preventing or excluding colonial waterbirds from feeding in those areas. See the section 5.4 Techniques to Address Conflict Issues with Colonial Waterbirds, by Season (or by Location (Section 5.5) and Appendix 1 for more information.

Care must be taken to ensure that nests that can be re-occupied in following years, such as those of herons and egrets, are not disturbed or destroyed through habitat modification, even outside of the breeding season. The destruction or relocation of such nests requires a permit. For advice on any activities involving the nests or breeding sites of herons or egrets contact your regional CWS office.

4.2 Removal of attractants

Limiting access to food is often a key factor in addressing conflicts with gulls. This can alleviate problems at the feeding site, and other locations such as sites that are used for nesting, loafing and/or roosting, based on the availability of a reliable food source. Areas should be kept clean of items that colonial waterbirds consume; this includes limiting access to areas with food and other waste. For

example, operations such as fish docks, cattle feed lots, mink farms, landfills/composting operations and garbage disposal areas around stores, restaurants and recreational sites should be kept clean and measures should be taken to limit the access of birds to the food. At all beach and shoreline areas, the public should be advised not to feed the gulls. Garbage containers should have lids that restrict the birds' access and be kept tightly closed at all times. In addition, waste should be disposed of in a timely manner so that birds do not become accustomed to feeding in a particular location.

Often determining what is attracting the birds and then removing or modifying these attractants is the best way to address these kinds of conflicts. Opening these areas to human foot traffic can often be a very simple solution.

4.3 Scaring techniques

Techniques to scare colonial waterbirds from a site are generally active methods, i.e. methods that will alarm the birds and they may elicit alarm or distress calls. Under the MBR, any person may, without a permit, use equipment, other than an aircraft or firearms, to scare migratory birds that are causing or are likely to cause damage to crops or other property. Birds must not be killed. The most advanced bird dispersal techniques have been developed to combat bird problems at airfields where they can be used in conjunction with habitat modification. The use of gas exploders or electronic sirens has proven effective in some situations in the short term, and recordings of birds' alarm calls can also be effective. The presence of predators (such as falcons or hawks) is usually sufficient to disperse birds and models of predators or recordings of predator vocalizations can be effective. There are companies that provide falconry services for deterring migratory birds from specific areas. Because of these birds' instinct to kill, the property owner or manager must make an application for a federal kill permit, listing the name of the falconer conducting the work. Trained dogs can also be used to scare away birds from specific areas since the birds perceive them as predators. Dogs must be controlled at all times, and no migratory birds may be injured or killed, unless a kill permit has been issued. In addition, the dogs cannot be allowed to destroy eggs or nests without a permit. Information on scaring techniques that can be used when migratory birds are causing or likely to cause damage or danger (and the possible permit requirements) can be found, by season in Table 3 and by location in Table 4. Additional information on scaring techniques is provided in Appendix 1.

4.4 Techniques to address conflict issues with colonial waterbirds, by season

Management techniques that could be employed (e.g. based on the season and activity of the birds) are listed in Table 3. While suggestions are provided in Table 3, the landowner is responsible for assessing the facts, choosing the technique and obtaining all necessary permits.

Ring-billed Gull colony on a rooftop

Table 3: Summary of possible management techniques, by season, for non-SARA colonial waterbirds causing or likely to cause damage or danger. A green checkmark (✓) indicates the technique may be biologically feasible/ appropriate, a red cross (✗) indicates the technique may not be biologically feasible/appropriate.

SEASON/ ACTIVITY OF THE BIRDS	DAMAGE OR DANGER PERMIT NOT REQUIRED			DAMAGE OR DANGER PERMIT REQUIRED				
	Removal of the attractant (e.g. food, refuse)	Architectural or habitat modifications and/or exclusion	Scare birds (other than with a firearm or aircraft)	Scare birds with a firearm or aircraft (including drones, birds of prey, pyrotechnics)	Kill birds	Collect and destroy (or sterilize) eggs	Nest removal/ destruction	Relocation of birds eggs and nests*
Fall, Winter and Spring: loafing flying birds (includes young of the year no longer dependent on their parents)	✓	✓	✓	✓	✓	Not applicable	Not applicable	✗
Birds at a potential nesting site prior to egg-laying	✓	✓ Until nests are present. Once nests are present, a permit may be required. Contact CWS for advice.	✓ Until nests are present. Once nests are present, contact CWS for advice.	✓ Until nests are present. Once nests are present, contact CWS for advice.	Contact CWS for more information.	Not applicable	✓	✗
Birds at a nesting site, with eggs	✓	✗	✗	Only if you also have a permit to destroy (or sterilize) eggs and/or destroy or move nests.	Only if you also have a permit to destroy (or sterilize) eggs and/or destroy or move nests.	✓	✓	✗
Spring/ Summer: adults with dependent young	✓	✗	✗	✗	Not recommended, contact CWS for more information.	Not applicable	✗*	Not recommended, contact CWS for more information.

* For colonial waterbirds, relocation of birds is not effective since they do not have a flightless period, and are likely to return to the location where they were captured. During the breeding season relocation of birds, eggs and nests is not biologically feasible since there is a high probability of nest and/or chick abandonment.

4.5 Techniques to address conflict issues with colonial waterbirds, by location

Information on management (scaring and exclusion) techniques that can be used for colonial waterbirds causing or likely to cause damage or danger, at locations where conflict issues with colonial waterbirds have been known to occur is shown in Table 4. Information on additional management techniques that can be used, by location, are described in the text below. While suggestions are provided in Table 4, the landowner is responsible for assessing the facts, choosing the technique, and obtaining all necessary permits.

Table 4: General scaring and exclusion techniques (horizontal listing) by location (vertical listing). Click on each technique for more details, also see Appendix 1. A green checkmark (✓) indicates the technique may be biologically feasible/appropriate, a red cross (✗) indicates the technique may not be biologically feasible/appropriate.

	TECHNIQUE								
Location	Visual deterrents	Drones, (Damage or Danger Permit required)	Trained Dogs	Water guns and sprinklers	Auditory deterrents*	Recorded distress and alarm calls†	Anti-perch systems	Mono-filaments or gridwires over specific areas	Netting
Rooftops	✓	✓	✗	✓	✓	✓	✓	✓	✓
Farms or agricultural lands	✓	✓	✓	✓	✓	✓	✓	✓	✓
Landfills and other sites that provide food (e.g. fish processing plants, abattoirs, fishing wharves).	✓	✓	✓	✓	✓	✓	✓	✓	✓
Parks, beaches, cottages, cemeteries, school grounds, restaurants, golf courses, sport facilities, malls, residential properties	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water supply reservoirs	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Proximity to human activity or housing may make the use of scaring techniques, particularly auditory ones, unacceptable

4.5.1 Rooftops

Architectural or Habitat Modifications: Reducing suitability of roofs for nesting, loafing or roosting should be considered during the planning stage of new buildings in areas where colonization by colonial waterbirds is likely to occur or when the roofs of existing buildings require repair or replacement.

- Creating green or living roofs makes these sites less attractive to colonial waterbirds since they prefer open habitats to vegetated areas. Sites can also be made unattractive to colonial waterbirds by altering habitat, making perching sites uncomfortable using anti-perch systems (Appendix 1).
- Colonial waterbirds appear to prefer light-coloured gravel surfaces and avoid dark (i.e. black) tar or rubber surfaces for nesting, probably because of the increased temperatures of these dark surfaces and the tackiness of these materials when walked upon.
- Incorporating angled features onto the roof may help reduce suitable nesting surface area.
- Metallic cones placed on top of square ventilators with flat tops may reduce suitable nesting surface area.

Determining and controlling food sources: If feasible, it may be optimal to undertake management techniques on rooftops in combination with those at nearby feeding areas (e.g. restaurants) in order to ensure a long-term solution to the problem. For example, gulls may be nesting on a rooftop and obtaining food from nearby sources such as restaurants, farm fields or a landfill, creating very favourable habitat conditions for them.

Scaring: Kites that resemble birds of prey have been particularly effective for deterring roof-nesting gulls if they are set up before nesting occurs. For information on additional techniques, refer to Table 4 and Appendix 1.

Exclusion: Information on passive means of keeping birds out of the area can be found in Table 4 and Appendix 1.

4.5.2 Farms or agricultural lands

Architectural or Habitat Modifications:

- Limit opportunities for birds to feed:
  - Control food sources for birds: e.g. discards, offal, litter.
- Mow or plough fields late in the day or at night, if possible.
- Revegetate areas with plant species tall enough to prevent use by birds such as gulls. Allow grassy areas to grow at least 15-20 cm high, or allow growth of shrubs or trees, if possible.

Scaring and Exclusion: See information in Table 4 and Appendix 1.

4.5.3 Landfills and other sites that provide a food source for colonial waterbirds (e.g. fish processing plants, abattoirs, fishing wharves)

Architectural or Habitat Modifications:

- Limit opportunities for birds to feed:
  - Control food sources for birds: e.g. discards, offal, litter.
- At landfills: minimize the active area of landfilling by burying refuse and/or cover materials on a daily basis.
- Revegetate areas with plant species tall enough to prevent use by birds such as gulls. Allow grassy areas to grow at least 15-20 cm high, or allow growth of shrubs or trees.
- In addition to consultation with experts, you may wish to search the internet. Search could focus on "landfill cover products", for example.

Exclusion: Information on passive means of keeping birds out of the area can be found in Table 4 and Appendix 1.

Scaring:

- Consistently maintain a human presence at the site can be used to scare birds and prevent them from settling in the area.

Consistent pressure using various techniques may be the most effective approach, for example a combination of trained falcons, distress calls and pyrotechnics employed seven days a week.

4.5.4 Parks, beaches, cottages, cemeteries, school grounds, restaurants, golf courses, sport facilities, malls, residential properties

Architectural or Habitat Modifications:

Limit access to food:

- Prohibit and enforce no feeding regulations for birds. For example, municipalities should enact and enforce measures to prohibit the feeding of colonial waterbirds on public lands.
- Ensure garbage containers are covered.
- Clean up litter often.

- Revegetate areas with plant species tall enough to prevent use by birds such as gulls. Allow grassy areas to grow at least 15-20 cm high, or allow growth of shrubs or trees.

Scaring: Information on scaring techniques can be found in Table 4 and Appendix 1.

Exclusion: Suspended monofilament lines or wires can be used to exclude birds such as gulls from specific areas (e.g. picnic areas at beaches and parks). For information on additional techniques, refer to information in Table 4 and Appendix 1.

4.5.5 Water supply reservoirs

Architectural or Habitat Modifications:

- Revegetate adjacent areas with plant species tall enough to prevent use by birds such as gulls. Allow grassy areas to grow at least 15-20 cm high, or allow growth of shrubs or trees.

Scaring: Information on scaring techniques can be found in Table 4 and Appendix 1.

MOST IMPORTANTLY: PREVENTION AND REMOVING ATTRACTANTS ARE THE BEST LONG-TERM STRATEGIES WHEN ADDRESSING CONFLICT ISSUES WITH COLONIAL WATERBIRDS.

5. Related links

The sites listed below provide further information on the identification of colonial waterbirds and the timing of nesting in Canada.

Some of the following hyperlinks are to sites of organizations or other entities that are not subject to the *Official Languages Act*. The material found there is therefore in the language(s) used by the sites in question.

Status of Birds in Canada: https://wildlife-species.canada.ca/bird-status/index-eng.aspx?sY=2014&sL=e

Cornell All About Birds: https://www.allaboutbirds.org/a-second-look-at-seagulls-tips-for-id/

Nesting Calendar Query Tool from Bird Studies Canada: http://www.birdscanada.org/volunteer/pnw/rnest/

6. Migratory bird permit application forms and contact information, and services and information on species at risk

Migratory Bird Permit Application Forms and Contact Information can be found at this website:
https://www.ec.gc.ca/nature/default.asp?lang=En&n=677AEBD4-1

Services and Information on the Species at Risk Act can be found at this website:
https://www.canada.ca/en/services/environment/wildlife-plants-species/species-risk.html

7. Additional reading

Belant, J. L. 1997. Gulls in urban environments: landscape-level management to reduce conflict. Landscape and Urban Planning 38: 245-258.

Blokpoel, H. and G. D. Tessier. 1984. Overhead wires and monofilament lines exclude ring-billed gulls from public places. Wildlife Society Bulletin 12: 55-58.

Blokpoel, H. and G.D. Tessier. 1992. Control of Ring-billed Gulls and Herring Gulls nesting at urban and industrial sites in Ontario, 1987-1990. Proceedings of the Eastern Wildlife Damage Control Conference. 5:51-57.

Minnesota Department of Natural Resources. 2016. Exclusion Methods. Retrieved from Minnesota Department of Natural Resources. Available online at: http://www.dnr.state.mn.us/livingwith_wildlife/gulls/prev_exclusion.html

Transport Canada. 1998. Evaluation of The Efficacy of Products and Techniques for Airport Bird Control (03/1998). Available online at: https://www.tc.gc.ca/eng/civilaviation/publications/tp13029-menu-1503.htm

Ville de Rimouski. Environnement: Programme de contrôle des goélands. Available online at : http://www.ville.rimouski.qc.ca/fr/citoyens/nav/environnement/goelands.html?iddoc=284621

8. Appendix 1. Detailed information on techniques and internet searches for products that can be used to address conflict issues with colonial waterbirds.

8.1 Visual deterrents

Vision-based deterrents present a visual stimulus that is novel, startling, or that the birds associate with danger. It could be a simulated predator, the results of a predator attack (dead bird or model thereof), or some unusual object that birds avoid because it is unfamiliar. Some products incorporate both visual and auditory deterrents. These methods are most effective when used before birds have become established or have a routine associated with an area. They include scarecrows, kites and balloons, dead bird models (e.g. gull effigies), predator models (e.g. hawks, owls, coyotes, cats), reflectors and reflecting tape, lights and lasers, spindles), spinning deterrents.

ADVANTAGES	DISADVANTAGES
• Many are inexpensive and many are low maintenance. • Easy to deploy. • Most techniques are easy to transfer among sites • Can be used in conjunction with other techniques (e.g. auditory deterrents). • Kites that resemble birds of prey have been particularly effective for deterring roof-nesting gulls, particularly if they are set up before nesting occurs.	• Birds will become accustomed to the techniques less effective over the long-term. • Difficult to deploy over large areas. • May require many units to cover larger areas. • Use of lights may attract birds to a site on foggy, misty nights. • Predator models are not effective as long-term deterrents.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "bird control products – suppliers","bird deterrents", or "visual deterrents for birds".

8.2 Drones or robotic falcons

Drones, or drones designed to look like falcons, can be used to deter or scare birds away from a site. **A Damage or Danger permit is required since drones are considered aircraft, under the MBR.**

ADVANTAGES	DISADVANTAGES
• Appears to be an effective method that can be used on its own or in conjunction with other techniques.	• There are a limited number of suppliers.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "robotic falcons" and "using drones to scare birds".

8.3 Trained dogs

Trained dogs can be used to scare away birds from specific areas since the birds perceive them as predators. **Dogs must be controlled at all times, and no migratory birds may be injured or killed, unless a kill permit has been issued. In addition, the dogs cannot be allowed to destroy eggs or nests without a permit.**

ADVANTAGES	DISADVANTAGES
• Can be employed consistently to deter birds from specific areas. • Can be moved easily to different areas. • Can be scaled to large areas, depending on the number of dogs.	• Expensive. • Not suitable for all habitats (e.g. rooftops).

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "training dogs to scare birds away".

8.4 Water guns and sprinklers

Long-range water guns can be used to scare birds and discourage them from loafing in specific areas; sprinkler systems can also be used to keep birds away from small areas

ADVANTAGES	DISADVANTAGES
• Inexpensive.	• Labour intensive. • Not good for large areas.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "using water guns to scare birds away".

8.5 Auditory deterrents

Auditory deterrents present a stimulus that is startling. These methods are most effective when used as a short-term technique, or before birds have become established or have a routine associated with an area. Their efficacy can be enhanced when they are used at appropriate times and circumstances related to the behaviour of the birds, for example, using pyrotechnics to prevent birds from landing rather than allowing them to land and then dispersing them. They can also be combined with other scaring or exclusion techniques. Auditory deterrents include pyrotechnics, flares, rockets and mortars, gas cannons and exploders, screamer shells, acoustic hailing and dispersal systems.

ADVANTAGES	DISADVANTAGES
• Some are inexpensive. • Easy to deploy. • Most techniques are easy to transfer among sites. • Can be used in conjunction with other techniques (e.g. visual deterrents). • Can be used day or night-and in most weather conditions.	• Birds can habituate, making the techniques less effective over the long-term. Techniques will be more effective when combined with other types of deterrents. • May be labour intensive to use appropriately, employed in association with bird behaviour. • Difficult to deploy over large areas. • The presence of nearby alternative habitat can influence efficacy. If birds can move away from the sound to a nearby area, they will be more likely to return. • May cause disturbance to neighbouring properties. • Methods involving combustion pose fire hazards. • For some methods, skilled operators may be required to implement the methods effectively and safely.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "auditory deterrents – Transport Canada" or "auditory bird deterrents".

8.6 Recorded distress and alarm calls

Many birds use calls to signal danger and warn other members of the species to disperse. The link between distress/alarm calls and escape responses is very strong because of its high survival value. The biological relevance of the calls makes them a powerful tool for bird dispersal. For some species, alarm calls can vary among geographic regions; therefore, the recorded calls from one region may not work elsewhere. This method is most effective when used before birds have become established or have a routine associated with an area. Unlike other birds, gulls will initially fly towards distress calls; this should be taken into consideration when using this method. It is important to broadcast the sound at the most effective location and time in order to have the greatest possible deterrent effect. Using a mobile vehicle to deter birds from various locations can be helpful. In order to maximize effectiveness and minimize habituation, the sound should be played sparingly and at times when the birds are likely to be most responsive. This requires a human operator rather than an automatic timer. Playback equipment should be good quality for best results, and digital recordings are preferable. The use of distress and alarm calls have been found to be more effective when combined with the use of pyrotechnics, particularly when they are timed with each other, i.e. playing alarm calls first and then employing pyrotechnics immediately afterwards.

ADVANTAGES	DISADVANTAGES
• Inexpensive. • Easy to deploy. • Most techniques are easy to transfer among sites. • Can be used in conjunction with other techniques (e.g. visual deterrents). • Habituation to distress or alarm calls can be delayed if they are used sparingly and in conjunction with other deterrent methods. • Can be used day or night and in most weather conditions.	• Some birds will only respond to distress cries of their own species and region. • Difficult to deploy over large areas. • The presence of nearby alternative habitat can influence efficacy. If birds can move away from the sound to a nearby area, they will be more likely to return. • May cause disturbance to neighbouring properties.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "where to buy recorded distress calls for gulls in Canada" or "alarm/distress calls".

8.7 Anti-perch systems

Anti-perch systems can be applied to exclude birds from limited resting areas such as ledges and roof tops. They are available as spikes (stainless steel or plastic) coiled wire or angled ledges.

ADVANTAGES	DISADVANTAGES
• Inexpensive. • Provides a long-term option for barring birds from perching at specific sites. • Some products can be installed so that they are inconspicuous. • Low maintenance.	• Aesthetically displeasing (spikes). • Not practical for large areas.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "where to buy anti-perch systems for birds in Canada"

8.8 Monofilament lines and grid wire

A grid of wires can be used to cover an area that excludes birds by presenting a visual barrier to landing or taking off from the area. These can be used to exclude birds from areas where they may find food (e.g. picnic areas at beaches and parks as well as landfills). They have been used to exclude birds from nesting on roofs. The reasons for the repelling effect of overhead lines or wires are not well understood. Wires that are closely spaced (e.g., 1 m or less) exclude birds by forming a physical barrier. However, birds can also be deterred by wires whose spacing is greater than the dimensions of the bird as they may be startled by the wires or hesitant to fly under them.

There is the risk that birds could become caught, entangled and injured in the netting or wires. Attaching reflective tape and/or ribbons can increase visibility and minimize the risk that birds will become entangled. Wires must be checked several times a day for breakage and to make sure that

birds have not become entangled. However, this does not guarantee that entanglement will not occur, **it is the responsibility of the permit holder to ensure that no migratory birds are injured or killed.**

Installation: Installation can vary depending on the habitat and the species to be excluded. The height of installation can vary from 1 m (3') – 10m (33'). Height of lines does not appear critical although they must be high enough (e.g., 2 m on a roof) to allow access by maintenance personnel. Lines must be placed higher than features present on the area being protected.

The suggested strength and thickness are:

- Monofilament line: 7.2 kg (15.9lb) test – 45 kg (100 lb) test
- Steel wire: 0.36 mm (28 gauge) – 2 mm (12 gauge)

The suggested spacing based on the size of birds are:

- Small gulls, e.g. Ring-billed Gull: 2-3 m (6.6-9.8')
- Large gulls, e.g. Herring Gull, Great Black-backed Gull: 6-7 m (19.6-23.0')
- Additional information, including recommendations for specific locations can be found in the Transport Canada document: TP 13029 - Evaluation of The Efficacy of Products and Techniques for Airport Bird Control (03/1998).

For personnel safety it should be noted that the lines can create a tripping hazard for maintenance staff. Safe work practices and staff notification are required.

ADVANTAGES	DISADVANTAGES
• Following initial installation, minimal labour is required to maintain the system. • Birds that gain access to areas covered with fine wires are extremely nervous and, therefore, more susceptible to scare techniques.	• Wire systems must be checked regularly. • Stainless-steel wire is stronger but difficult to handle during installation, as it frequently kinks and breaks. • Monofilament lines deteriorate rapidly in sunlight and need to be replaced regularly. • Monofilament lines may break when birds collide with them. • Bird injury or mortality may occur when birds fly into lines or wires.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "where to buy monofilament lines for keeping birds away in Canada".

8.9 Netting

Netting can be used to exclude birds from specific locations (e.g. HVAC units). Sizes range from small, millimetre-sized mesh to openings of several centimetres. Care and maintenance is required to ensure that gaps are repaired and to detect entanglements of target and non-target animals. **It is the responsibility of the permit holder to ensure that no migratory birds are injured or killed**.

ADVANTAGES	DISADVANTAGES
• Barring birds from roosting and nesting sites (prior to egg-laying) reduces the overall numbers of birds in the area. • Does not require skilled operators to install and maintain. • Provides a long-term solution when installed and maintained to deny birds access to specific areas. • Can be used with other deterrents such as auditory deterrents to enhance effectiveness.	• Polypropylene netting deteriorates in sunlight and needs to be replaced regularly. • Nets need to be cleaned and cleared regularly to prevent their collapse during heavy rains or snow. • Nets must be checked several times a day for breakage and to make sure that birds have not become entangled. • The installation and removal of netting is labour intensive. • Not practical for large areas. • Can be damaged by high winds.

Suppliers: In addition to consultations with experts, you may wish to search the internet. Search could focus on: "where to buy bird scaring netting in Canada".

www.**canada.ca**

Additional information can be obtained at:

Environment and Climate Change Canada
Public Inquiries Centre
12th Floor, Fontaine Building
200 Sacré-Coeur Boulevard
Gatineau QC K1A 0H3
Telephone: 819-938-3860
Toll Free: 1-800-668-6767 (in Canada only)
Email: ec.enviroinfo.ec@canada.ca