

Action Plan for the Piping Plover (*Charadrius melodus circumcinctus*) in Ontario

Piping Plover



2013

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For copies of the action plan, or for additional information on species at risk, including COSEWIC Status Reports, residence descriptions, recovery strategies, and other related recovery documents, please visit the Species at Risk (SAR) Public Registry (www.sararegistry.gc.ca).

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PREFACE

The Piping Plover is a migratory bird protected under the *Migratory Birds Convention Act, 1994* (MBCA) and is under the management jurisdiction of the federal government. The *Species at Risk Act* (SARA, Section 47) requires the competent minister to prepare an action plan(s) in respect of a recovery strategy. A final recovery strategy for the Piping Plover, *circumcinctus* subspecies was posted on the Species at Risk Public Registry in October 2006. Environment Canada, Canadian Wildlife Service – Ontario led the development of this action plan for the Ontario populations of the Piping Plover. It was developed in cooperation with the Ontario Ministry of Natural Resources and Parks Canada Agency.

This is one of four action plans for the Piping Plover, *circumcinctus* subspecies which will be posted on the Species at Risk Public Registry. Action Plans for the Piping Plover, *circumcinctus* subspecies have been posted for Alberta and Saskatchewan and one is in preparation for Manitoba.

This action plan is designed to implement the Ontario portion of the Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada (2006) and the Addendum to the Final Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada Re: Identification of Critical Habitat (2007). Refer to the recovery strategy for more complete information on the biology, status, and threats to the Piping Plover.

Implementation of this action plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

ACKNOWLEDGMENTS

This action plan was prepared by Barbara Slezak with assistance from John Brett (Environment Canada, Canadian Wildlife Service – Ontario) based on previous iterations written by Mary Vallianatos, formerly Environment Canada, Canadian Wildlife Service – Ontario, and Leo Heyens, Ontario Ministry of Natural Resources.

The following people provided information for and reviewed this action plan: Chris Risley, Leo Heyens, and Suzanne Robinson from the Ontario Ministry of Natural Resources; Jeff Robinson, Krista Holmes, and Madeline Austen of Environment Canada, Canadian Wildlife Service – Ontario; and Meghan Gerson, formerly of Environment Canada, Canadian Wildlife Service – Ontario.

Contributions were also made by the following people to earlier versions of this action plan: Jeff Robinson, Environment Canada, Canadian Wildlife Service – Ontario; Karen Hartley, Scott Jones, Donald Sutherland, and Hilary Gignac from the Ontario Ministry of Natural Resources; Burke Korol, formerly Ontario Parks; and Jon McCracken, Bird Studies Canada.

EXECUTIVE SUMMARY

In Ontario, the Piping Plover (*Charadrius melodus circumcinctus*) is listed as Endangered under the federal *Species at Risk Act* and the provincial *Endangered Species Act, 2007*. Two populations of Piping Plovers are found in Ontario; the Prairie Canada Population which is located on Lake of the Woods, and the Canadian Great Lakes Population, which is found along the shores of the Great Lakes. Since the completion of the Piping Plover Recovery Strategy, many successes have been achieved with both of these populations. In 2009, at Windy Point (Lake of the Woods), Piping Plovers nested and fledged young, the first successful breeding attempt since 2003. In 2007, a pair of Piping Plovers nested at Sauble Beach after a 30 year absence of nesting pairs on the Canadian Great Lakes. Breeding here continued in 2008 with nests at Sauble, Oliphant and Wasaga Beaches, and in 2009 four pairs nested at Sauble Beach and two pairs had nests on Wasaga Beach. In addition, a male and four fledglings were found on Manitoulin Island in July 2009, which indicated successful breeding there.

This action plan builds on the Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada (Environment Canada 2006). The long-term recovery goal from the recovery strategy for the Canadian population of this subspecies is to achieve a viable, self-sustained, and broadly distributed population, within the current prairie population range, and the reestablishment of the Piping Plover in the historical southern Ontario range. The recovery goal from the recovery strategy (Environment Canada 2006) also includes additional detailed recovery goals for each population which are used in this action plan as the population and distribution objectives. These are further elaborated for the Canadian Great Lakes Population due to recent breeding occurrences. The population and distribution objectives for the Great Lakes Population in Ontario are: 1) to ensure the protection and monitoring of historical breeding habitat and 2) to maintain a minimum of four breeding pairs while maintaining, and where feasible increasing, the current distribution in Ontario. The population and distribution objective for the Prairie Canada Population in Ontario is to achieve a minimum population of six adults for each of three consecutive international censuses.

Critical habitat has been identified in this action plan and includes four sites: one site at Windy Point (Lake of the Woods), one site at Wasaga Beach Provincial Park (Georgian Bay), one site at Sauble Beach (Lake Huron) and one site at Oliphant Beach (Lake Huron).

Recovery actions that have been outlined in this document fall under four categories: Protection, Management, Research, Monitoring and Assessment, and Outreach and Communication. An implementation schedule has also been developed which prioritizes these recovery actions.

It is anticipated that recovery actions associated with this action plan will have minimal socio-economic impacts. While some socio-economic impacts will be observed during the breeding season primarily on recreational use beaches, these can be mitigated through various stewardship and education activities coordinated with local landowners and beach users.

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1. SYNOPSIS OF RECOVERY STRATEGY AND UPDATE

1.1. Associated Recovery Strategy

Environment Canada. 2006. Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. vi + 30 pp.

Environment Canada. 2007. Addendum to the Final Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada Re: Identification of Critical Habitat. *Species at Risk Act* Recovery Strategy Series. Environment Canada, Ottawa. 12 pp.

1.2. Species Assessment Information from COSEWIC*

Date of Assessment: May 2001

Common Name (population): Piping Plover *circumcinctus* subspecies

Scientific Name: *Charadrius melodus circumcinctus*

COSEWIC Status: Endangered

Reason for Designation:

The number of individuals of this subspecies breeding in Canada is small and the population is in decline. Reproductive success is low, especially in years of drought, and nests are regularly lost because of flooding. The quality of nesting habitat is decreasing in many places.

Canadian Occurrence: Alberta, Saskatchewan, Manitoba, Ontario

COSEWIC Status History:

The species was considered a single unit and designated Threatened in April 1978. Status re-examined and designated Endangered in April 1985. In May 2001, the species was re-examined and split into two groups according to subspecies. The *circumcinctus* subspecies was designated Endangered in May 2001.

*COSEWIC: Committee on the Status of Endangered Wildlife in Canada

1.3. Description of the Species

The Piping Plover (*Charadrius melodus*) is a small, migratory shorebird with a pale, dry sand coloured back and head, white under-parts and orange legs. In breeding plumage, the short bill is orange with a black tip, a single black band stretches between the eyes, and one black band stretches across the breast (Haig 1992).

1.4. Populations and Distribution

The Piping Plover breeds in the United States and Canada. Two subspecies are recognized, with *C. m. melodus* breeding along the Atlantic coast, and *C. m. circumcinctus* breeding inland (Elliott-Smith and Haig 2004). The species winters along the Atlantic coast of the southern United States, along the entire Gulf Coast, and in some areas of Mexico and the Caribbean.

Within Canada, *C. m. circumcinctus* breeds in the provinces of Alberta, Saskatchewan, Manitoba, and Ontario. In Ontario, *C. m. circumcinctus* is divided into two populations, the Prairie Canada Population¹ and the Canadian Great Lakes Population² (Figure 1). Results from the 2006 International Piping Plover Census estimated the Great Lakes and Northern Great Plains/Prairies Populations at 4,772 adults. Of these, 1,704 adults (36%) were found in Canada (Elliott-Smith et al. 2009).

1.4.1. Ontario Population and Distribution

Since the completion of the Piping Plover Recovery Strategy (Environment Canada 2006), many successes have been achieved with the two populations in Ontario:

Prairie Canada Population

In 2009, Piping Plovers nested and fledged young at Windy Point, on Lake of the Woods, which was the first successful breeding attempt there since 2003. An unsuccessful nesting attempt occurred at the Sable Islands Provincial Nature Reserve on Lake of the Woods in 2007.

Canadian Great Lakes Population

In 2007, a pair of Piping Plovers nested at Sauble Beach after a 30 year absence of nesting pairs on the Ontario side of the Great Lakes. Breeding here continued in 2008 with nests at Sauble, Oliphant and Wasaga Beaches, and in 2009 four pairs nested at Sauble Beach and two pairs had nests on Wasaga Beach. In addition, a male and four fledglings were found on Manitoulin Island in July 2009, which indicated successful breeding there.

¹ The Prairie Canada Population or Prairie Population includes those birds found in Alberta, Manitoba, Saskatchewan, and the Lake of the Woods area in Ontario.

² The Canadian Great Lakes Population includes those birds found on the Canadian side of the Great Lakes in Ontario, excluding the Lake of the Woods area.

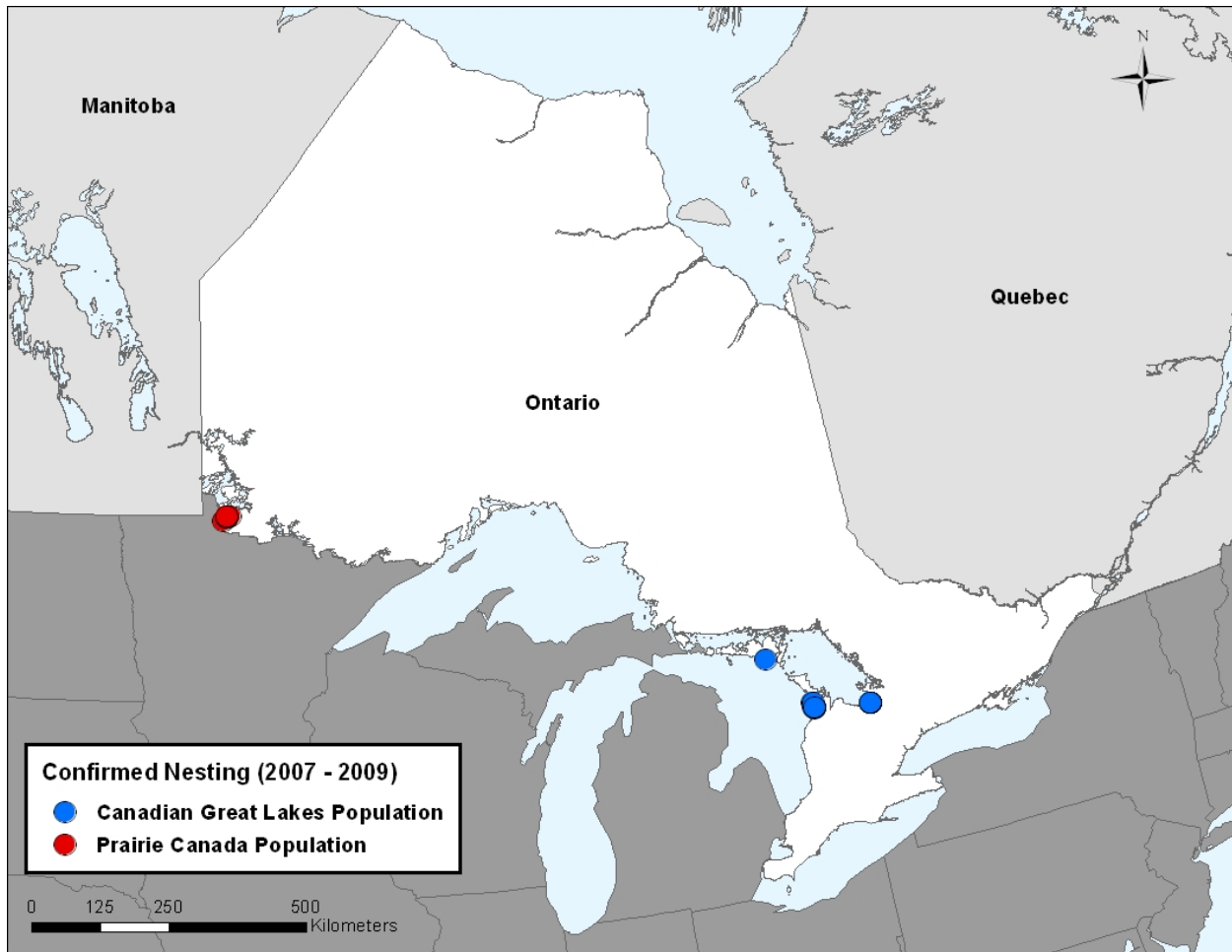


Figure 1. Confirmed nesting occurrences of the Piping Plover in Ontario, 2007 to 2009. Data from Ontario Ministry of Natural Resources and Environment Canada, Canadian Wildlife Service – Ontario.

1.5. Threats

Threats to the Piping Plover in Canada were identified in the recovery strategy (Environment Canada 2006) with the most significant of these being predation, habitat loss, and human disturbance.

Since publication of the recovery strategy and the return of nesting Piping Plovers to the Canadian Great Lakes, additional human activities that may potentially threaten this species in Ontario have been observed at areas with high levels of human recreational use, including: kites flown above or adjacent to nest sites; fireworks directed above or around nesting areas; off-leash dogs; kite boarding; the feeding of gulls (*Larus* spp.) around nesting areas, and the grooming or raking of beaches.

Kites, fireworks, off-leash dogs, and kite boarding have potential to disturb nesting Piping Plovers and scare them off their nests. Intentional feeding and the presence of food garbage around nesting areas attract a high density of gulls to these areas, which can increase the risk of

predation to Piping Plover eggs and young. The grooming and raking of beaches for aesthetics and human recreational use reduces the quality of the habitat available to Piping Plovers, by removing the vegetation and debris used by roosting and brooding birds for shelter.

Breeding success has also been affected in Ontario by natural events such as storms, flooding, and heavy wind, which can cover a nest with snow, water, or sand. Nest failure has been documented in both the Canadian and United States Great Lakes Populations following these events.

1.6. Goals and Objectives for the Piping Plover

1.6.1. Goals

The long-term recovery goal identified in the recovery strategy for *C. m. circumcinctus* (Environment Canada 2006) is to achieve a viable³, self-sustained, and broadly distributed population, within the current prairie population range, and the reestablishment of the Piping Plover in the historical southern Ontario range.

Although there has been recent successful breeding of Piping Plovers in southern Ontario, it is premature to conclude that the Canadian Great Lakes Population has been re-established within its historical range. Information is not yet available to reasonably predict the potential future population size or distribution of *C. m. circumcinctus* on the Canadian Great Lakes without a more complete understanding of annual return rates, fledgling success, and habitat use and availability. Thus, the above long-term goal for this population is still valid.

1.6.2. Population and Distribution Objectives

The recovery goal from the recovery strategy (Environment Canada 2006) also includes additional detailed recovery goals for each population which are used in this action plan as the population and distribution objectives⁴. These are further elaborated for the Canadian Great Lakes Population due to recent breeding occurrences.

Prairie Canada Population

The recovery goal from the recovery strategy for the Prairie Canada population is 1,626 adult Piping Plovers and is based on historical provincial counts and/or estimates. The minimum provincial population (adults) targets are as follows: Alberta 300; Saskatchewan 1,200; Manitoba 120; and Ontario (Lake of the Woods) 6. The recovery goal will be considered achieved if met for each of three consecutive international censuses⁵. Thus, the population and distribution objective for the Prairie Canada Population in Ontario is a minimum of six individuals for each of three consecutive international censuses.

³ A viable population has a less than 5% probability of becoming extinct within the next 100 years (U.S. Fish and Wildlife Service, 1996)

⁴ **Recovery goal** and **population goal** terms from Environment Canada (2006) have been elaborated and replaced by **population and distribution objective** in this action plan.

⁵ The International Piping Plover Census is a comprehensive survey of Piping Plovers in North America that takes place every five years (Haig et al. 2005).

Canadian Great Lakes Population

The recovery goal from the recovery strategy for the Canadian Great Lakes Population is to ensure protection and monitoring of historical breeding habitat and any breeding pairs or individuals that may appear (Environment Canada 2006).

Since the posting of the Piping Plover Recovery Strategy (Environment Canada 2006), there have been several successful breeding occurrences on the Ontario shores of the Great Lakes. Therefore, the population and distribution objective for the Canadian Great Lakes Population in Ontario is further elaborated as follows: (1) ensure protection and monitoring of historical breeding habitat and (2) maintain a minimum of four breeding pairs while maintaining, and where feasible increasing, the current distribution in Ontario.

1.6.3. Recovery Objectives (2006-2010)

Recovery objectives were identified in the Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada (Environment Canada 2006):

1. Update Prairie Canada population status (numbers and distribution).
2. Increase knowledge of population dynamics and predators.
3. Achieve and maintain a fledging rate of at least 1.25 fledglings per pair per year for managed sites.
4. Identify critical habitat and achieve critical habitat protection to the extent possible through the setting of cooperative conservation measures.
5. Support relevant conservation practices, policies, and legislation.
6. Achieve effective protection of wintering habitat through international efforts.
7. Prepare for potential reestablishment of Canadian Great Lakes Population.

Note: Recent successful breeding on the Canadian Great Lakes has resulted in this objective moving beyond 'preparation' and into active re-establishment.

1.7. Critical Habitat Addressed in the Recovery Strategy

Although no critical habitat was identified in Ontario in the Addendum to the Final Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada, critical habitat was identified in Alberta and Saskatchewan in 65 quarter sections within 20 basins (Environment Canada 2007). In the addendum, a set of Basin Criteria were applied to determine which basins within the range of Piping Plover, *circumcinctus* subspecies were likely to contain critical habitat for this subspecies. In Ontario, the Lake of the Woods basin satisfied those criteria, and was identified in the addendum as likely containing critical habitat, although critical habitat and its boundaries were not identified at that time.

2. RECOVERY ACTIONS

2.1. Scope of the Action Plan

This Action Plan applies to the Ontario population of *C. m. circumcinctus* and recommends specific activities in Ontario that are consistent with the Recovery Strategy and associated objectives (Environment Canada 2006) and that of the United States Fish and Wildlife Service's Recovery Plan for the Great Lakes Piping Plover (USFWS 2003).

This action plan outlines actions intended to address:

- (1) the recovery goal stated in section 1.6.1;
- (2) the Ontario portions of the population and distribution objectives in section 1.6.2; and
- (3) the recovery objectives in section 1.6.3, as they pertain to Piping Plovers in Ontario.

2.2. Critical Habitat

Since the posting of the Recovery Strategy for the Piping Plover (*Charadrius melodus circumcinctus*) in Canada and its subsequent 2007 addendum, new information has been evaluated regarding the critical habitat for the Ontario breeding population of Piping Plover (*Charadrius melodus circumcinctus*). Critical habitat is identified for *C. m. circumcinctus* in Ontario based on the current available information (up to and including 2009 data). The identification of critical habitat for Piping Plover is based on multiple year occupancy of sites and confirmed breeding of Piping Plovers in suitable habitat, using the criteria described in sections 2.2.1 and 2.2.2. Critical habitat has been identified at four sites in Ontario: one site at Windy Point (Lake of the Woods), one site at Wasaga Beach Provincial Park (Georgian Bay), one site at Sauble Beach (Lake Huron) and one site at Oliphant Beach (Lake Huron). The extent and boundaries of critical habitat in the Ontario range of *C. m. circumcinctus* will be refined and updated as more information becomes available on the distribution, site occupancy, and habitat usage of Piping Plovers in the province. Updates to Piping Plover critical habitat in Ontario will be included in addenda to this action plan, which will be posted on the Species at Risk Public Registry.

2.2.1. Site Occupancy

Site Occupancy Criterion: The site occupancy criterion defines an occupied site as a site that has been occupied by a minimum of one breeding pair⁶ of Piping Plovers during the breeding season for at least two separate years from 1995 to 2009 AND where a Piping Plover nest is confirmed in any single year from 1995 to 2009.

⁶ The definition of one breeding pair can include a confirmed nest, a confirmed breeding pair or a probable breeding observation. A probable breeding observation, in suitable nesting habitat during the breeding season, includes a male and female pair, a courtship or display between a male and a female or 2 males (including courtship feeding or copulation), an adult visiting a probable nest location or building a nest, agitated behaviour or anxiety calls of an adult, or breeding evidence such as a brood patch or cloacal protuberance.

A site is defined as a distance of 500 metres parallel to the water's edge (i.e., lengthwise) in both directions from a known observation of a breeding pair or Piping Plover nest observed between 1995 and 2009. The water's edge defines the boundary on the water side of the nest while the extent of suitable habitat defines the inland boundary of the site. Thus, contiguous suitable habitat extending 500 metres parallel to the water's edge on either side of the nest, down to the water's edge and inland to the extent of suitable habitat defines the site. The 500 metre lengthwise distance is applied to each observation, with spatially overlapping areas merged together to form larger sites. In Ontario, Piping Plovers have been observed using anywhere from 400 metres to 1 kilometre of shoreline length for nesting, feeding and brood rearing depending on the size of the beach in question (Lambert and Risley 1989, J. Robinson, pers. comm.). Based on this information, the 500 metres of contiguous suitable habitat is used to approximate the areas used by Piping Plovers during their breeding cycle. In cases where local geography (e.g. a nest being close to the end of a beach) limits the amount of shoreline available on one side of the nest, the 1 km of total shoreline may be configured differently to adjust for these limitations. For example, a site with only 100 metres of beach available on one side of a nest would extend 900 metres on the other side of the nest to compensate.

In order to identify critical habitat sites for the Piping Plover, *circumcinctus* subspecies in Ontario, the Basin and Quarter Section Criteria that were described in the addendum to the Piping Plover recovery strategy (Environment Canada 2007) were replaced with a criterion to better reflect the geography of Ontario breeding locations. The resulting Site Occupancy Criterion is used to determine if a site meets the multiple year occupancy requirements to qualify as critical habitat.

The Site Occupancy Criterion identifies sites where confirmed nesting has been observed in a minimum of one year and where the site has evidence of species' fidelity (i.e., where Piping Plover breeding pairs have been present in multiple years). As Piping Plovers may occupy small, isolated pockets of habitat for only one year and never return, these one-time breeding sites will not be included as critical habitat unless pair re-occupancy is observed. Confirmed and probable breeding evidence must be obtained on the site from reliable sources⁷ in order for the site to contribute to critical habitat identification.

2.2.2. Suitable Habitat

The approach for identifying critical habitat is based on a description of the species' habitat needs and known ecology during the breeding cycle, including sparsely vegetated sand or mixed sand and gravel beaches usually associated with dunes or swales of islands or mainland beaches.

In Ontario, Piping Plovers inhabit sand and pebble beaches on barrier islands, peninsulas or shorelines of large lakes. They often choose sections of shoreline with the greatest available width of beach below the high water mark and most commonly this area is between the shore and the crest or peak of the vegetated dune.

⁷ Reliable sources may include but are not limited to: records within the Ontario Natural Heritage Information Centre, records in the Ontario Breeding Bird Atlas, observations from acknowledged species experts, observations from recognized birders with photographic evidence, OMNR, CWS, or BSC survey reports, etc.

Suitable habitat for the Piping Plover is described using the Ecological Land Classification (ELC) framework for Ontario (from Lee et al. 1998). The following ELC Community Series designations include the habitat attributes that have been documented from sites currently and historically occupied by Piping Plovers in Ontario:

- Open Beach / Bar (BBO)
- Open Sand Dune (SDO)

The ELC framework provides a standardized approach to the interpretation and delineation of dynamic ecosystem boundaries. The ELC approach classifies habitats not only by vegetation characteristics but also considers hydrology and topography, and as such is able to adequately capture the ecosystem requirements for the Piping Plover. The portions of the shore that constitute critical habitat are identified using the appropriate ELC communities. Drainage channels running down the beach, whether natural or anthropogenic in origin, do not constitute a separation in the contiguous ELC community (i.e., drainage channels are considered a part of critical habitat). Unsuitable habitat features such as existing anthropogenic features (e.g., existing infrastructure, including piers, boardwalks, parking lots, buildings, marinas, irrigation equipment, etc.) within a site are not necessary for the survival or recovery of the species and are therefore not critical habitat.

2.2.3. Application of Piping Plover Critical Habitat Criteria

The application of the Site Occupancy Criterion and evaluation of suitable habitat results in the identification of four critical habitat sites (Table 1): one site at Windy Point, Lake of the Woods (Prairie Canada Population), one site at Wasaga Beach Provincial Park, Georgian Bay (Canadian Great Lakes Population), one site at Sauble Beach, Lake Huron (Canadian Great Lakes Population) and one site at Oliphant Beach, Lake Huron (Canadian Great Lakes Population). As new information becomes available, additional critical habitat sites may be identified where they meet the critical habitat criteria across the range of the Ontario Piping Plover population.

The critical habitat boundaries are defined by the extent of the Open Beach / Bar and/or Open Dune ELC community series (Lee et al. 1998), by the water's edge and by the approximate area used by Piping Plovers during their breeding cycle. As critical habitat boundaries are defined by the extent of beach and dune habitat, annual variations in the size, shape, and centroid of critical habitat patches are possible due to fluctuations in water levels and other natural processes. In addition, storm events and fluctuations in water levels may subdivide a site. For example, the point at Windy Point was breached in the past resulting in two small islands and the point itself, all of which is still considered critical habitat.

Table 1. Sites in Ontario Identified as Containing Critical Habitat for the Piping Plover (*circumcinctus* subspecies) as of 2009.

Site Name	County	Basin	Land Tenure	Geographic Centroid of Site*	
				Latitude	Longitude
Sauble Beach	Bruce	Great Lakes	Non-federal	44.66	-81.28
Wasaga Beach Provincial Park	Simcoe	Great Lakes	Non-federal	44.53	-80.01
Oliphant Beach	Bruce	Great Lakes	Non-federal	44.75	-81.28
Windy Point	Rainy River	Lake of the Woods	Non-federal	48.97	-94.55

* Coordinates for the centroid may not fall within critical habitat and are provided as a general location only.

Additional sites

Due to certain factors such as continuing low lake levels (which increase the amount of available beach habitat) in the Great Lakes and the success in recovery of the United States Great Lakes Population, the Canadian Great Lakes Population may continue to grow. This may mean that Piping Plovers will occupy other areas with suitable habitat in Ontario. To date, nesting has been documented elsewhere in Ontario, for both the Canadian Great Lakes and the Prairie Populations, with a confirmed breeding occurrence at the Sable Islands Provincial Nature Reserve on Lake of the Woods in 2007 and at Carter Bay on Manitoulin Island in 2009, respectively; these sites do not yet meet the critical habitat criteria and, therefore, have not been identified as critical habitat. Transient birds have also been observed at various locations throughout the province. Areas will be surveyed, at a minimum, during the international breeding census (see Action 3 in Table 2) and if any of these areas meet the criteria as outlined above, additional critical habitat will be identified as needed.

Nests in non-critical habitat

Piping Plovers in Atlantic Canada and the U.S. Great Lakes have been known to nest on human made structures such as gravel parking lots and dredge spoils. Many of the key habitat features normally required by the species are usually lacking in these sites making them suboptimal as regular breeding sites. In most cases these non-traditional/suboptimal sites will not be formally identified as critical habitat. However, the general prohibitions under the *Species at Risk Act* protect the birds and their residences (nests) anywhere they occur from destruction and harassment, and the Ontario *Endangered Species Act, 2007* (ESA) also has provisions for protecting the species and its habitat where it occurs. In addition, the MBCA protects migratory birds' nests (which are a component of Piping Plover critical habitat) and offers protection to the species' habitat through the prohibitions noted in section 2.4.1.

2.3. Examples of Activities Likely to Result in the Destruction of Critical Habitat

Destruction is determined on a case by case basis. Destruction would result if part of the critical habitat was degraded, either permanently or temporarily, such that it would not serve its function when needed by the species. Destruction may result from a single activity or multiple activities at one point in time or from the cumulative effects of one or more activities over time (Government of Canada 2009).

Activities that are likely to result in the destruction of Piping Plover critical habitat and its attributes are those which cause significant or lasting alterations to the beach or dune habitat (including changes in water levels, a reduction in food sources, nesting habitat, or shelter, compaction of soils, or fragmentation of habitat).

The Piping Plovers found in Ontario are from two different populations, and the habitats occupied by these two populations in Ontario have different levels and types of usage.

The site on Lake of the Woods is located in northwestern Ontario and human use at this site is limited due to its remote nature. As such, this site is more vulnerable to broad-scale alterations to habitat, including (but not limited to):

- Activities that result in water level fluctuations, such as hydroelectric dam construction and operation, can result in the destruction of critical habitat by changing habitat suitability, availability and flooding of nests;
- Activities that result in changes to habitat availability and suitability resulting from changes in wetland/watershed management such as cottage, residential or commercial development, and landscaping can result in the loss of critical habitat.

Piping Plovers nesting on the Canadian Great Lakes have been found on very populated recreational beaches, which makes these sites vulnerable to the following activities, including (but not limited to):

- Activities that create soil compaction such as: cottage, residential or commercial development including construction and associated activities; landscaping; use of off-road, motorized and non-motorized vehicles (e.g. all terrain vehicles) and increased recreational activities can destroy critical habitat because soils are too compact for nest creation resulting in a loss of nesting habitat.
- Activities that trample or remove vegetation and debris such as: beach raking (removal of vegetation and debris); use of off-road, motorized and non-motorized vehicles (e.g. all terrain vehicles); and beach improvement (replacing lost sand from beach erosion) can destroy critical habitat used as food sources and shelter.
- Activities that result in changes habitat availability and suitability resulting from changes in wetland/watershed management such as cottage, residential or commercial development, and landscaping can result in the loss of critical habitat.
- Activities that result in changes to offshore currents, such as construction of breakwater structures and marinas, can alter beach and dune dynamics limiting critical habitat availability and thus reducing nesting and foraging habitat.

2.4. Critical Habitat Protection

In Ontario, critical habitat is identified on non-federal lands. Critical habitat conservation and protection may be facilitated through various mechanisms including, but not limited to: federal and provincial legislation, stewardship activities, permitting, education of beach users and landowners, and municipal bylaws and beach management plans. In most cases a combination of these mechanisms will be used. Where necessary, active on-the-ground protection of Piping Plover breeding habitat in Ontario have been undertaken, and are proposed to continue, including: the modification of beach management activities, removal of invasive species and the establishment of symbolic fencing⁸ to restrict public access and motorized vehicles to nesting areas.

The information below outlines the potential protection measures known to Environment Canada, at the time of publication, for critical habitat of Piping Plovers in Ontario. This Action Plan does not make a determination of whether these measures constitute effective protection under SARA.

2.4.1. Federal Legislation

The MBCA protects migratory birds' nests (which are a component of Piping Plover critical habitat) and offers protection to the species' habitat through the following processes: Section 5 "...no person shall, without lawful excuse, (a) be in possession of a migratory bird or nest; or (b) buy, sell, exchange or give a migratory bird or nest or make it the subject of a commercial transaction." and Section 5.1 (1) "No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area."

2.4.2. Provincial Legislation

In Ontario, the Piping Plover is listed as Endangered on the Species at Risk in Ontario (SARO) List regulation under Ontario's *Endangered Species Act, 2007*. Habitat provisions protect the area on which the Piping Plover depends directly or indirectly to carry out its life processes from damage or destruction. These life processes include, but are not limited to nesting, feeding, and migration.

In addition, Piping Plover habitat may also receive policy-level protection on municipal lands under the Provincial Policy Statement. The Provincial Policy Statement, under Ontario's *Planning Act*, can restrict the development or site alteration of the significant habitat of endangered and threatened species, and may therefore contribute to protection of critical habitat for species at risk under SARA.

One of the objectives of Ontario's *Provincial Parks and Conservation Reserves Act, 2006* (PPCRA) is to permanently protect representative ecosystems, biodiversity and provincially significant elements of Ontario's natural and cultural heritage and to manage these areas to

⁸ Symbolic, or psychological, fencing is a physical perimeter to deter entry in to a particular area. It is symbolic in that it tends not to physically prevent entry (e.g. a single rope fence), but instead communicates the message that entry is prohibited or discouraged.

ensure ecological integrity is maintained. Within the Act, ecological integrity refers to a condition in which biotic and abiotic components of ecosystems are characteristic of their natural regions and where ecosystem processes are unimpeded. Included in the ecological integrity concept is healthy and viable populations of native species, including species at risk, and maintenance of the habitat on which the species depend. Wasaga Beach Provincial Park has been actively restoring beach habitat through management tools including modification to beach management, control of invasive species and education of park visitors. These measures support the protection of Piping Plover critical habitat at Wasaga Beach Provincial Park.

2.5. Measures to be Taken and Implementation Schedule

The measures to be taken and implementation schedule proposed to meet the recovery objectives outlined in section 1.6.3 are presented in Table 2. Environment Canada will endeavour to support implementation of this plan, subject to availability of resources and species at risk conservation priorities.

2.6. Measuring Progress

The action plan must follow the adaptive management approach, whereby new information feeds back into planning on a regular basis in order to take advantage of new tools, knowledge, challenges, and opportunities. Every five years, success of this action plan implementation will be measured against the following performance indicators:

- The size and distribution of the Prairie Canada Population in Ontario achieves a minimum population of 6 adults for each of three consecutive international censuses.
- The size and distribution of the Canadian Great Lakes Population is maintained at a minimum of 4 breeding pairs while maintaining and, where feasible, increasing the current distribution in Ontario;

Table 2. Measures to be taken and Implementation Schedule

Action	Recovery Objectives	Priority	Threats or concerns addressed	Timeline
1. Protection and management				
1.1 Assess nesting sites on a site-by-site basis to determine if predator exclosures are required and erect as needed.	2,3,4	High	Predation	Annual, as required
1.2 Identify and assess other threats to nesting Piping Plovers on a site-by-site basis and determine the feasibility of various mitigation measures, if required.	2,3	High	Threat identification and mitigation	Annual, as required
1.3 Develop and implement protocols on nest management (e.g. relocating nests) to ensure alternative actions are considered before human intervention on the nest is carried out.	2,3,5,7	High	All threats	2011 and ongoing, as required

Action	Recovery Objectives	Priority	Threats or concerns addressed	Timeline
1.4 Continue to provide advice and recommendations to the Lake of the Woods Control Board regarding water level management on Lake of the Woods.	4,5	High	Water level fluctuations	Ongoing
1.5 Encourage stewardship activities that conserve or enhance Piping Plover habitat and increase nesting success.	3,5	Medium	All threats	Ongoing, as required
1.6 Incorporate Piping Plover habitat needs in beach management plans for public and municipal lands.	3,5	Medium	All threats	Ongoing as new sites emerge
2. Research				
2.1 Develop methods and criteria to rate the quality of habitat in Ontario and apply to extant and historic sites to help prioritize for surveying and monitoring.	2,4	Medium	Habitat loss and degradation	2013
2.2 Identify projects and mechanisms to eliminate knowledge gaps listed in the recovery strategy that need to be addressed through research projects, and support implementation where appropriate.	2,4	Low	Lack of species information in Ontario	2015
3. Monitoring and assessment				
3.1 Compile information on extant and historic sightings of Piping Plover in Ontario and prioritize survey/monitoring locations. At a minimum, survey sites during every International Piping Plover Census.	1,4	High	Lack of species information in Ontario	2011
3.2 Determine population trends, distribution, and status by participating in and carrying out local, regional, national, and international surveys.	1,2	Medium	Lack of species information in Ontario	Ongoing
4. Outreach and communication				
4.1 Encourage the reporting of Piping Plover sightings to Environment Canada, Canadian Wildlife Service and Ontario Ministry of Natural Resources through various birding groups and volunteer events.	2,5	High	Public awareness	Ongoing
4.2 Maintain a Guardian Manual that will include information for guardians, data collection forms and protocols for various aspects of Piping Plover recovery.	All	Medium	All threats	Ongoing
4.3 Communicate Piping Plover conservation issues and needs to public at high-traffic and high recreational-use areas where Piping Plovers breed.	3,5	High	Public awareness	Ongoing, as required

Action	Recovery Objectives	Priority	Threats or concerns addressed	Timeline
4.4 Maintain communication with the U.S. Fish and Wildlife Service to help identify and address threats to wintering habitat and populations, where feasible.	2,5,6	Medium	All threats	Ongoing

3. SOCIO-ECONOMIC EVALUATION

The following sections evaluate to the extent possible, the potential costs and benefits associated with the implementation of this action plan as required by section 49e of the *Species at Risk Act*. The primary approaches to Piping Plover recovery in Ontario have been and will continue to be through federal and provincial government cooperation along with the implementation of stewardship initiatives with land managers, volunteers and others.

Habitats occupied by the two Piping Plover populations in Ontario have different levels and types of usage, resulting in different degrees and types of socio-economic impacts. Piping Plovers nesting on the Ontario side of the Great Lakes have been found on very populated recreational beaches classified as Open Beach/Bar and Open Sand Dune under the Ecological Land Classification (ELC) system. For example, Wasaga Beach and Sauble Beach are heavily used during the summer months by tourists and locals for sun bathing, water sports and other recreational beach activities (e.g. beach volleyball, dog walking, kite boarding, etc.) and are subject to beach raking. Portions of these sites are also adjacent to cottages and retail stores.

Lake of the Woods is located in northwestern Ontario and human use at this site is limited due to its remote nature, with access only achievable via boat. This area is subject to water level fluctuations directed by the Lake of the Woods Control Board (LWCB).

Given this information, the socio-economic analysis is presented in two parts:

1. The socio-economic effects associated with implementing this Action Plan for the Prairie Canada Population; and
2. The socio-economic effects associated with implementing this Action Plan for the Canadian Great Lakes Population.

3.1. Costs

3.1.1. Prairie Canada Population

The primary socio-economic cost associated with the Prairie Canada Population (at Lake of the Woods) would be through altering existing water level management, conducted by the Lake of the Woods Control Board (LWCB), for the benefit of the Piping Plover. This could result in the loss of revenue to local stakeholders who rely on the existing pattern of water levels such as: hydro-electric power generation, local industry, cottagers, shoreline residents and tourism operators. The LWCB currently manages the water levels in the area to ensure that the needs and concerns of all local stakeholders who rely on the water are met.

Given the remote location of this site, costs may also be incurred while protecting nesting habitat (from predation and rising water levels) and conducting surveys for any Piping Plovers at this site. These costs are likely to be modest due to the limited number of visits required to effectively monitor or manage the site. Costs would include transportation to and from the site, material for constructing predator exclosures and staff time to conduct the work.

3.1.2. Canadian Great Lakes Population

The habitat of the Canadian Great Lakes Population of the Piping Plover is primarily found on dune beaches. These types of beaches also tend to be used by the public for recreational purposes as discussed above; therefore, by implementing this action plan, the public could experience some restrictions in beach access or use when and where a nest is found on such recreational beaches, which may also result in a loss of revenue for local land owners, businesses, parks and municipalities who rely on public access. Additional costs may be experienced by local municipalities and agencies which maintain the beach if restrictions on beach use or beach maintenance are introduced. Beach use may be temporarily restricted or limited on certain portions of the beach due to the presence of nesting birds and associated protection measures required. These restrictions may involve the alteration of timelines for or cessation of various activities (such as beach raking, dog walking) on selected portions of the beach. For example, if a beach containing Piping Plovers is ordinarily used as an off leash dog area, the off leash dog area may be relocated until the Piping Plovers have left the beach. Another example would be the raking of the beach; beach raking may be limited or restricted in areas used by Piping Plovers to allow for the growth of vegetation and provision of hiding locations that the Piping Plovers use. While saving resources spent on raking (see Section 3.2.2.), a natural, un-raked beach is considered unsightly by some beach users. These restrictions have and may continue to affect beach users and the local landowners and businesses that have property on or adjacent to the Piping Plover habitat. However, through collaboration with the landowners, and by implementing proper management techniques, restrictions are expected to be implemented only at sites with breeding Piping Plovers and may only be seasonal in nature. Ideally Environment Canada and its partners will be able to foster a change in the public's attitudes and behaviors regarding beach use and management through outreach and stewardship activities at sites with breeding Piping Plovers.

Some costs would also be associated with the installation and maintenance of the predator exclosures, including costs to erect the predator exclosure, educational signs, and to potentially provide assistance in funding a coordinator to organize volunteers to monitor the birds. Additionally, there may be some costs associated with site visits and surveys and the monitoring of known birds or nests.

3.2. Benefits

Many of the benefits derived are non-market commodities which are difficult to quantify. Wildlife, in all its forms, has value in and of itself, and is valued by Canadians for aesthetic, cultural, spiritual, recreational, educational, historical, economic, medical, ecological, and scientific reasons. The conservation of wildlife at risk is an important component of the Government of Canada's commitment to conserving biological diversity. For Ontario,

biodiversity is important to its current and future economy and natural wealth. A self-sustaining healthy ecosystem with its various elements in place, including species at risk, contributes positively to landowner and public livelihoods.

Results of a 1991 survey on the importance of wildlife to Canadians show that 83.3% of Canadians feel that it is very or fairly important to ensure diversity in Canadian wildlife by protecting endangered or declining wildlife populations (Filion 1993). Canadians value diverse wildlife for aesthetic, cultural, spiritual, recreation, educational, historical, economic, medical, ecological, and scientific reasons. This is supported by a follow-up survey that showed Ontario Residents spent approximately \$4.3 billion in 1996 on nature-related activities in Canada (Federal-Provincial-Territorial Task Force on the Importance of Nature to Canadians 2000).

At locations where Piping Plover have been observed and human beach use is affected, there is potential for an increase in wildlife tourism to offset some or all of the possible decrease in tourism resulting from beach use restrictions.

3.2.1. Prairie Canada Population

Wildlife viewing is a popular pastime and interest for many people. It is possible that the presence of the Piping Plovers could provide an increase in tourism related revenues. Wildlife viewing, particularly in remote areas such as Lake of the Woods, must be in keeping with the species' best interests and adhere to any measures in place to protect the birds, their nests and their habitat (i.e., SARA and MBCA).

3.2.2. Canadian Great Lakes Population

A number of benefits may be realized with the implementation of this action plan. Piping Plovers nest on public beaches with high use, therefore beach grooming activities at these sites will be reduced or restricted in areas with Piping Plovers (with associated cost-savings). In areas where habitat is protected for Piping Plovers, dune vegetation will regenerate, naturally stabilizing (cost savings over other dune stabilizing methods) and increasing the biodiversity of native plant species and other species that would use this habitat. Dunes and their vegetation also provide several natural functions such as preventing beach loss (through beach regeneration and keeping sand on the beach); providing a natural barrier to flood and storm events thereby protecting the homes/property close by; and providing habitat for many species, including rare and endangered species. These benefits may provide a significant cost savings to residents and land managers in the area, while also promoting awareness of dune grasslands/beach ecosystems. The protection of existing natural habitats to aid in recovery is a far less expensive endeavor than creating or restoring habitat.

The presence of the Piping Plovers may also provide opportunities for citizens to be engaged in conservation initiatives through volunteering to monitor the nesting Piping Plovers. Opportunities also exist for reconnecting people, including children, with nature and educating citizens about dune protection and species at risk issues through outreach materials and interaction.

Wildlife viewing is a popular past time and interest for many people. It is possible that the presence of the Piping Plovers could provide an increase in tourism (and associated economic benefits) and provide marketing opportunities at some of the beaches where the birds are found (i.e., Sauble Beach, Wasaga Beach Provincial Park), thereby shifting revenue from other recreational activities to wildlife tourism. This has already been observed at some sites (e.g., Bruce peninsula) where there has been an increase in the number of wildlife observers on these beaches due to the presence of Piping Plovers.

4. ASSOCIATED PLANS

The Piping Plover, *circumcinctus* subspecies is found in four provinces and an action plan is being prepared for each province. Two of these have been posted on the Species at Risk Public Registry to date:

- Environment Canada. 2009. Action Plan for the Piping Plover (*Charadrius melodus circumcinctus*) in Alberta [Proposed]. *Species at Risk Act* Action Plan Series. Environment Canada, Ottawa. ii + 11 pp. with Appendix.
- Environment Canada. 2009. Action Plan for the Piping Plover (*Charadrius melodus circumcinctus*) in Saskatchewan [Proposed]. *Species at Risk Act* Action Plan Series. Environment Canada, Ottawa. vi + 24 pp. with Appendices.

All provinces will be working together with the federal government to achieve the actions set out in the associated action plans as many will overlap and jurisdictions involved will be able to learn from each other to move forward in the protection of this species.

Collaboration with the U.S. Great Lakes Piping Plover Recovery Team has been a key to the success and knowledge obtained by Canadian Piping Plover groups, namely the Prairie Piping Plover Recovery Team and the Ontario Piping Plover Recovery Implementation Group. Further sharing of knowledge regarding recovery efforts and protocols, banding, population monitoring and protection efforts will contribute to the recovery of Piping Plover in Ontario.

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APPENDIX A: EFFECTS ON THE ENVIRONMENT AND OTHER SPECIES

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the *Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals*. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that plans may also inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts on non-target species or habitats. The results of the SEA are incorporated directly into the plan itself, but are also summarized below.

This action plan will benefit the environment by promoting the recovery of the Piping Plover, *circumcinctus* subspecies. Regeneration of beach habitat (vegetation) has been observed during breeding seasons where the beaches were not groomed. This has allowed the seed bank, present in the sand, to emerge and provide additional habitat (shelter and foraging material) for other species of birds that make use of the beach. Providing protection for Piping Plover breeding habitat is likely to afford protection to other beach-dune dependent species of flora and fauna.

The potential for the plan to inadvertently lead to adverse effects on other species was considered. It is recognized that management of habitat for the benefit of Piping Plover populations could potentially have adverse effects on other species with differing habitat preferences (e.g. beach vegetation requirements), so any specific management prescriptions resulting from the actions in this plan should be assessed on a site-by-site basis given the needs of other species found in the immediate area.