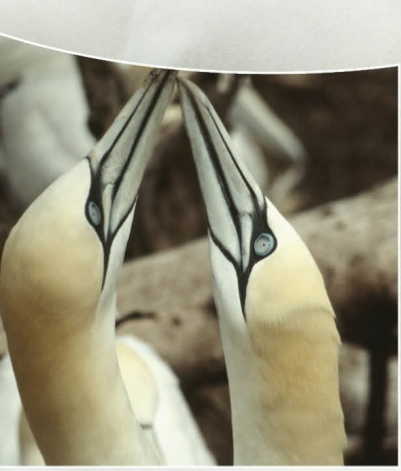
Environment Canada Environnement Canada

Bird Conservation Strategy for Bird Conservation Region 12 in Ontario and Manitoba: Boreal Hardwood Transition

- Abridged Version -

June 2014



Canada

Preface

Environment Canada led the development of all-bird conservation strategies in each of Canada's Bird Conservation Regions (BCRs) by drafting new strategies and integrating new and existing plans into an all-bird framework. These integrated all-bird conservation strategies will serve as a basis for implementing bird conservation across Canada, and will also guide Canadian support for conservation work in other countries important to Canada's migrant birds. Input to the strategies from EC's conservation partners is as essential as their collaboration in implementing their recommendations.

Environment Canada has developed national standards for strategies to ensure consistency of approach across BCRs. Bird Conservation Strategies will provide the context from which specific implementation plans can be developed for each BCR, building on the programs currently in place through Joint Ventures or other partnerships. Landowners including Aboriginal peoples will be consulted prior to implementation.

Conservation objectives and recommended actions in the conservation strategies will be used as the biological basis to develop guidelines and Beneficial Management Practices that support compliance with regulations under the *Migratory Birds Convention Act*, *1994*. Furthermore, these strategies will guide conservation action in support of *The State of Canada's Birds 2012* (North American Bird Conservation Initiative 2012), which points to the strong influence of human activity on bird populations, both positive and negative, and presents solutions towards keeping common birds common and restoring populations that are in decline.

Acknowledgements

Brigitte Collins and Paul Smith were the main authors of this document that follows templates developed by Alaine Camfield, Judith Kennedy and Elsie Krebs with the help of the BCR planners in each of the Canadian Wildlife Service regions throughout Canada. However, work of this scope cannot be accomplished without the contribution of other colleagues who provided or validated technical information, commented on earlier draft versions of the strategy and supported the planning process. We would especially like to thank the following people: Graham Bryan, Mike Cadman, Alaine Camfield, Lesley Carpenter, Jean-Michel DeVink, Britt Dupuis, Christian Friis, Jeanette Goulet, Krista Holmes, Jack Hughes, Judith Kennedy, Sarah Mainguy, Shawn Meyer, Jocelyn Neysmith, Marie-France Noel, Michele Rodrick, Daniel Rokitnicki-Wojcik, Richard Russell, Paul Watton, Chris Wedeles, Russ Weeber, D.V. Weseloh and Scott Wilson.

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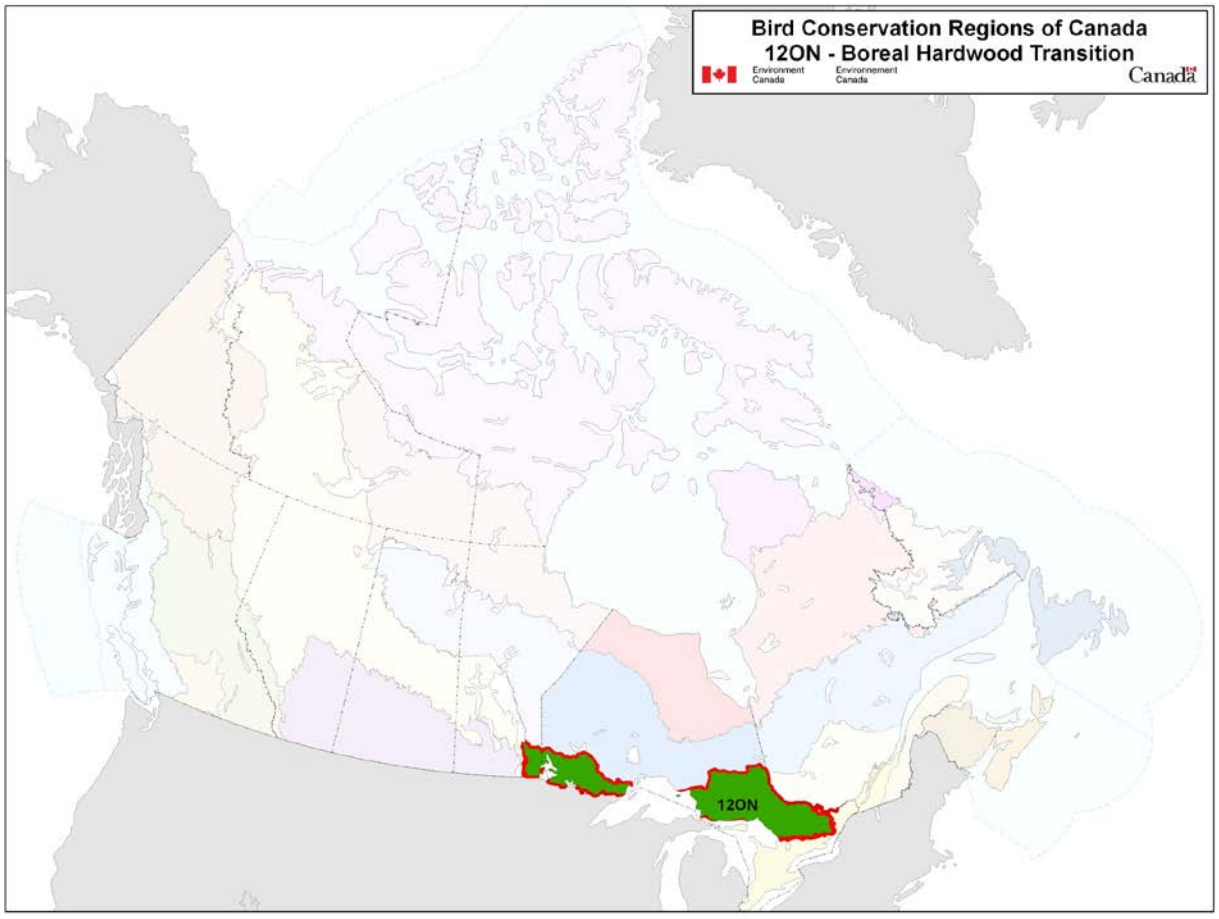

Executive Summary

The Boreal Hardwood Transition Bird Conservation Region, BCR 12, covers an area of about 611 300 km^2 from Quebec to Manitoba and south into the northern United States. A large portion of this region in Ontario, roughly 28% of the BCR, and a small portion in Manitoba (2%) are included in this strategy, while a separate strategy has been developed for BCR 12 in Quebec. Although reference information and data used in analyses for this strategy largely pertain to the Ontario portion of the BCR only, it was assumed to be sufficiently representative of the Manitoba portion of this BCR. These strategies will serve as a framework for implementing bird conservation nationally, and also identify international conservation issues for Canada's priority birds.

The Ontario portion of BCR 12 (BCR 12 ON) consists of a variety of forested habitats underlain by Precambrian Shield and interspersed with numerous lakes, rivers and wetlands. The region's forests are predominantly mixed, including elements of the temperate forests to the south and the boreal forests further north. The avifauna of the region reflects this transition; landbird species that are characteristic of both coniferous and deciduous forests occur here. The numerous lakes (including Lake Huron and Lake Superior), rivers and wetlands are used by a diverse assemblage of waterfowl, waterbirds and shorebirds.

Within BCR 12 ON, 260 species of birds regularly breed, overwinter, reside year-round or routinely migrate through the region.[1] Of these, 100 species are identified as priorities in this BCR. All bird groups are represented on the priority species list, although the list is dominated by landbirds (61% of the total list). The list also includes waterbirds (15%), waterfowl (17%) and shorebirds (7%). Over half of the waterfowl (55%) and waterbirds (52%) occurring in BCR 12 ON are identified as priority species, as compared to 36% of the landbirds and only 24% of shorebirds. Among the 100 priority species, 24 are assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as "at risk," 18 are listed under the federal *Species at Risk Act* (SARA) and 23 are listed under Ontario's *Endangered Species Act 2007* at the time of writing this strategy.

Identifying the broad habitat requirements for each priority species within the BCR allows species to be grouped by shared habitat-based conservation issues and actions. Priority species are associated with 10 habitat types in BCR 12 ON. Wetlands are used by the greatest number of priority species (28%), while mixed, deciduous and coniferous forests are a preferred habitat type for 27%, 15% and 15% of priority species, respectively. Waterbodies, including the Great Lakes, are used extensively by 21% of priority species.

The population objectives in this strategy are categorical and are based on a quantitative or qualitative assessment of species' population trends. Much of BCR 12 ON has good coverage by large-scale bird surveys, and the status of many birds in the region is adequately known. For 31% of priority species, monitoring data suggest declines with sufficient certainty to support an

[1] Species occurrence was determined using Ontario's Breeding Bird Atlas (Cadman et al. 2007), Birds of North America Online (Cornell Lab of Ornithology 2013) and expert opinion.

objective of increasing population size. In contrast, population sizes are sufficiently large to warrant a decreasing population objective for only a single priority species: the Canada Goose, Eastern Temperate-breeding population. Maintaining populations at current levels is the objective for 25% of the priority species in BCR 12 ON, while only 12% are assigned a population objective of Assess/Maintain because monitoring data is insufficient to propose an objective. A recovery objective is assigned to 23% of priority species, all of which are species at risk. Eight (8%) percent of priority species are identified as migrating through BCR 12 ON and are not assigned an objective, as those are set in other BCR strategies covering the breeding range of these species.

An assessment of threats identified a large number and diversity of conservation issues facing priority species in the various habitats of BCR 12 ON. Major threats to priority species relate to habitat loss and degradation from a variety of sources including residential and commercial development, biological resource use, pollution, and human disturbance. The lack of biological or demographic data for some priority species are also considered as important conservation issues in this strategy.

Conservation objectives have been designed to address threats and information gaps facing priority birds in the region. Objectives for many priority species are consistent with current forest management objectives, which aim to ensure that the supply of habitat types and forest attributes in each forest management unit and ecoregion is maintained within an Estimated Range of Natural Variation (ERNV). We recognize this rigorous, science-based approach to forest management in BCR 12 ON as a dominant vehicle for conservation of birds in the region. Also important is the need to continue efforts to improve bird population and habitat monitoring to gather the missing ecological and demographic information for some priority species.

Recommended actions indicate activities that will help to achieve the conservation objectives. Actions are strategic rather than highly detailed and prescriptive. Whenever possible, recommended actions benefit multiple species and/or respond to more than one threat. The majority of actions relate to developing and implementing effective policies and regulations, promoting the development and use of Beneficial Management Practices (BMPs), increasing awareness about conservation issues, developing partnerships, improving the scientific knowledge that underlies management decisions, and improving monitoring to track the effectiveness of conservation activities. Actions to address forestry-related threats in this region seek to improve implementation of existing guidelines, or to make small modifications that benefit particular priority bird species.

Priority species in BCR 12 ON also face threats that are difficult to analyze with the standardized methodology used in this strategy. These threats include widespread issues that may sometimes not apply to a particular habitat (e.g., climate change), research needs and population monitoring, as well as threats to migratory birds when they are outside Canada. An overview of these issues, the affected species and the recommended conservation actions is also presented.

Introduction: Bird Conservation Strategies

Context

This document is one of a suite of Bird Conservation Region Strategies (BCR Strategies) that have been drafted by Environment Canada for all regions of Canada. These strategies respond to Environment Canada's need for integrated and clearly articulated conservation priorities for birds in Canada to support the implementation of its migratory birds program, both domestically and internationally. This suite of strategies builds on existing conservation plans for the four "bird groups" (waterfowl,[2] waterbirds,[3] shorebirds[4] and landbirds[5]) in most regions of Canada, as well as on national and continental plans, and includes birds under provincial/territorial jurisdiction. These new strategies also establish standard conservation planning methods across Canada and fill gaps, as previous regional plans do not cover all areas of Canada or all species of birds.

These strategies present a compendium of required actions based on the general philosophy of achieving scientifically-based desired population levels as promoted by the four pillar initiatives of bird conservation. Desired population levels are not necessarily the same as minimum viable or sustainable populations but represent the state of the habitat/landscape at a time prior to recent dramatic population declines in many species from threats known and unknown. The threats identified in these strategies were compiled using currently available scientific information and expert opinion. The corresponding conservation objectives and actions will contribute to stabilizing populations at desired levels.

The BCR strategies are not highly prescriptive. In most cases, practitioners will need to consult additional information sources at local scales to provide sufficient detail to implement the recommendations of the strategies. Tools such as BMPs will also be helpful in guiding implementation. Partners interested in implementation, such as those involved in the habitat Joint Ventures established under the North American Waterfowl Management Plan (NAWMP), are familiar with the type of detailed implementation plans required to coordinate and undertake on-the-ground activities.

[2] NAWMP Plan Committee 2004.
[3] Milko et al. 2003.
[4] Donaldson et. al. 2000.
[5] Rich et al. 2004.

Strategy Structure

Section 1 of this strategy presents general information about the BCR and the subregion (i.e., Ontario's portion of the BCR), with an overview of the six elements[6] that provide a summary of the state of bird conservation at the subregional level. Section 2 provides more detail on the threats, objectives and actions for priority species grouped by each of the broad habitat types in the subregion. Section 3 presents additional widespread conservation issues that are not specific to a particular habitat or were not captured by the threat assessment for individual species, as well as research and monitoring needs, and threats to migratory birds while they are outside Canada. The approach and methodology are summarized in the appendices, and details are available in a separate document (Kennedy et al. 2012). A national database houses all the underlying information summarized in this strategy and is available from Environment Canada.

[6] The six elements are: Element 1– priority species assessment; Element 2 – habitats important to priority species; Element 3 – population objectives; Element 4 – threat assessment; Element 5 – conservation objectives; Element 6 – recommended actions.

Characteristics of Bird Conservation Region 12: Boreal Hardwood Transition

The Canadian portion of the Boreal Hardwood Transition, BCR 12, lies in the southern portion of the Canadian Shield and extends from Quebec to Manitoba (Fig. 1) The region covers 611 300 km², with a large fraction (170 868 km², 28%) in Ontario (Ontario Partners in Flight 2008). The Ontario portion of BCR 12 (BCR 12 ON) represents approximately one fifth (17%) of the land area of the province and occurs in two disjunct sections. The larger southern section extends from the eastern shore of Georgian Bay and Lake Superior to the Ottawa River (and then on to Quebec). The western section extends from the western shore of Lake Superior to southeastern Manitoba. Both sections of BCR 12 ON and the approximately 12 000 km² in Manitoba are included in this strategy. However, it should be noted that reference information and data used in analyses for this strategy largely pertain to the Ontario portion of the BCR only and were assumed to be sufficiently representative of the Manitoba portion of this BCR. Similarly, recommended conservation objectives and actions were assumed to apply in Manitoba's BCR 12 landscapes. A separate strategy has been developed for BCR 12 in Quebec (Environment Canada 2013).

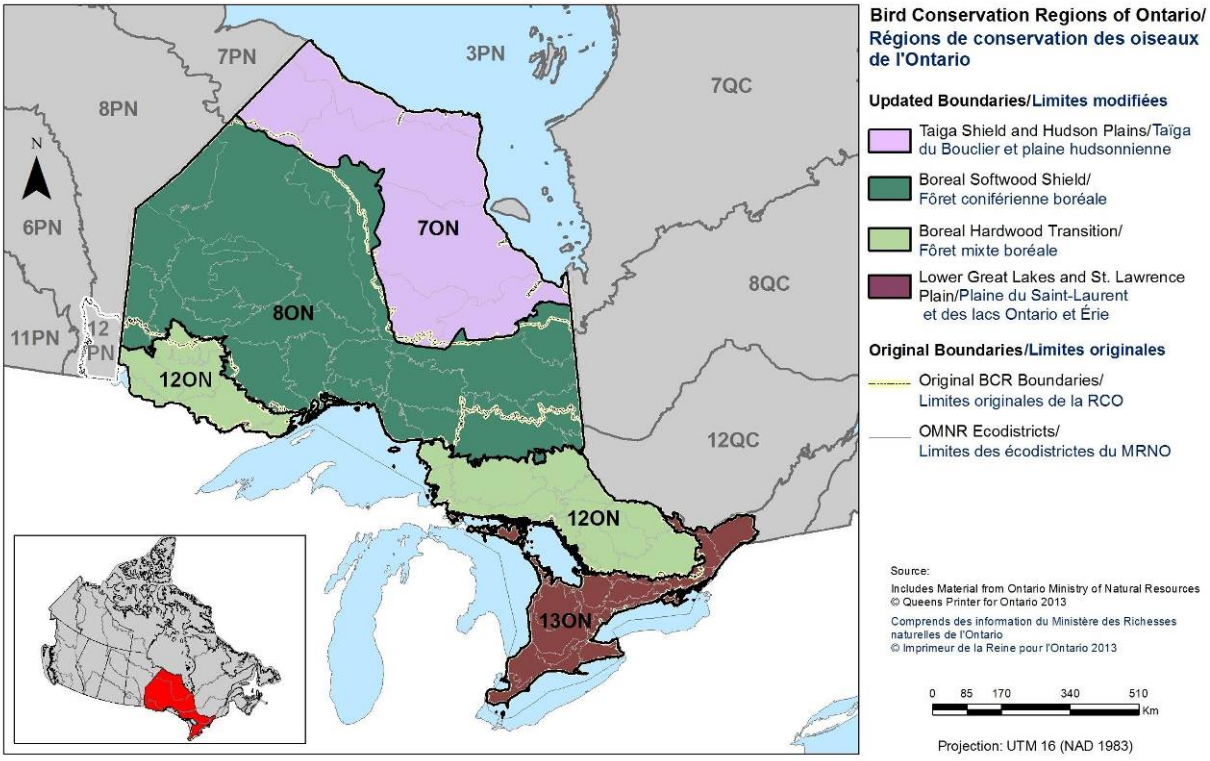

Figure 1. Map of boundary changes to Ontario's Bird Conservation Region 12: Boreal Hardwood Transition.

For conservation planning purposes, the original NABCI-defined boundaries of Ontario's BCR boundaries have been slightly modified to align with the Ontario Ministry of Natural Resources Ecodistrict boundaries.[7]

[7] Ecodistrict 4S-3 has been included in BCR 12 while 4S-1 and 4S-2 remain in BCR 8. Ecodistrict 6E-17 was placed in BCR 13, resulting in Cockburn and St. Joseph Islands being included in BCR 13 rather than BCR 12.

The physiography of the region is dominated by the Precambrian Shield, with rugged, rocky terrain and varied topography. Several areas of notable elevation include the Algonquin highlands in the southeast of the region, the peaks in Temagami including Ishpatina Ridge and Maple Mountain, the Algoma Highlands east of Lake Superior, and the Nor-Westers west of Lake Superior. The region shows evidence of extensive glacial activity; exposed bedrock, thin soils, and glacial till are common throughout BCR 12 ON. The natural landscape of this region is a mosaic of deciduous, mixed and coniferous forest stands interspersed with open wetlands, riparian meadows and rock barrens. Lakes, rivers and streams are also common within the forest matrix (Fig. 2, Table 1).

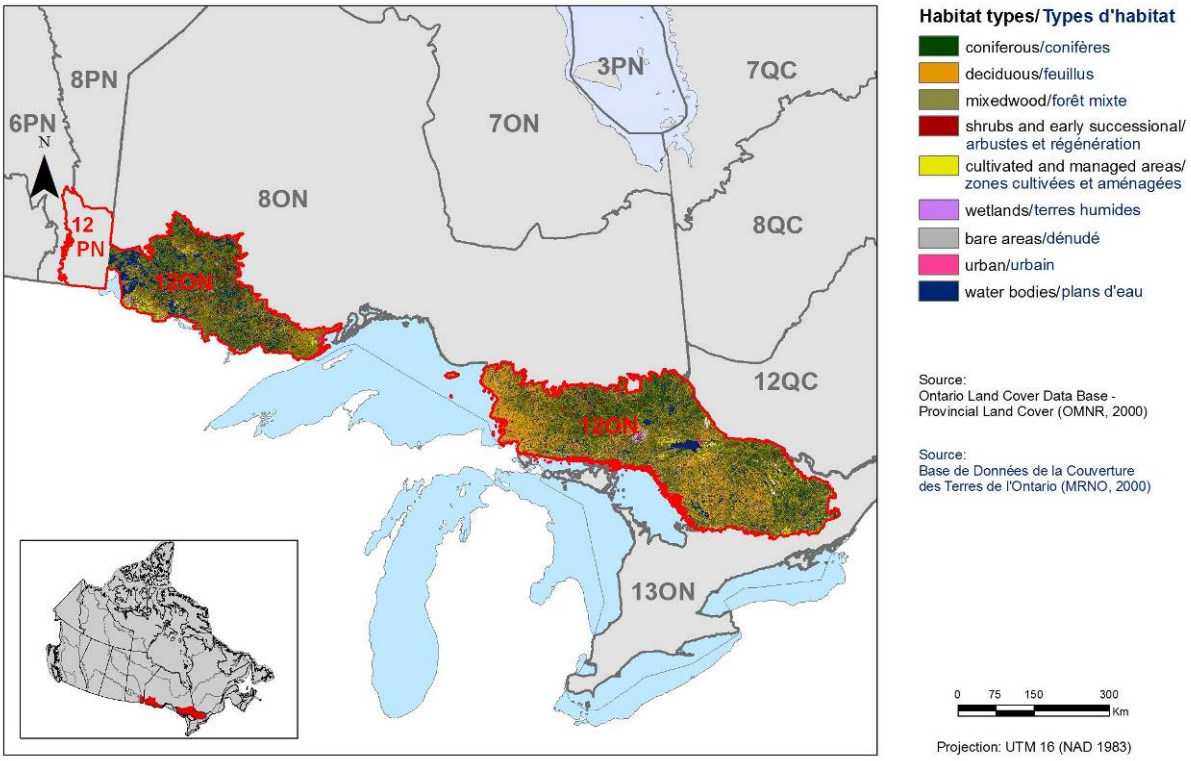

Figure 2. Map of land cover in BCR 12 ON.
Note: Riparian habitat areas are not depicted on this map because they represent a "zone" and are not a true land cover class.

Table 1. Major categories of land cover in BCR 12 ON and their proportions on the landscape.

BCR Habitat Class[1]	Provincial Land Cover (PLC 27 Class(es)	Area (ha)	% of Total Area
Coniferous Forest	Forest – Dense Coniferous	2 389 646	13.99%
Deciduous Forest	Forest – Dense Deciduous	2 679 992	15.68%
Mixed Forest	Forest – Dense Mixed Forest – Sparse	7 819 472	45.76%
Shrub/Early Successional	Forest Depletion – Cuts Forest Depletion – Burns Forest – Regenerating Depletion	443 054	2.59%
Cultivated/Managed Areas	Agriculture – pasture/abandoned fields Agriculture – cropland	385 825	2.26%
Bare Areas	Sand/Gravel/Mine Tailings Bedrock Coastal shoreline[2]	233 668 44 807	1.37% N/A
Urban	Settlement / Infrastructure	124 883	0.73%
Wetlands[3]	Marsh – inland Swamp – deciduous Swamp – coniferous Fen – open Fen – treed Bog – open Bog – treed	404 614	2.37%
Waterbodies	Water – deep clear Water – shallow/sedimented	2 502 402	14.65%
Riparian[4]	30 m inland from shoreline	661 489	N/A
Unknown	Unknown, Cloud/shadow	103 325	0.60%
	Total Area	**17 086 881**	**100%**

Data source: Spectranalysis Inc., 2004 (Provincial Land Cover (PLC) 27)

[1] BCR Habitat Classes are based on the United Nations Food and Agriculture Organization (2000) international Land Cover Classification System (LCCS).

[2] Length of coastal shoreline is 18 961km (based on Natural Resource and Values Information System [NRVIS] drainage scale mapping range of 1:10 000 for southern Ontario and 1:20 000 for the near north). Coastal shoreline area is defined as: 30 m of land adjacent to large body of water – eastern Georgian Bay, North Channel, Lake Nipissing, St. Mary's River, portion of eastern and western Lake Superior and Lake of the Woods. Coastal shoreline areas are not included in the total area as they are "zones" and do not represent a true provincial land cover class.

[3] Coastal wetlands are not differentiated at the resolution of PLC data.

[4] Riparian areas are not included in the total area as they are "zones" and do not represent a true provincial land cover class.

This heavily forested region marks the transition from the temperate forests of the south to the conifer-dominated boreal forests further north (Fig. 2). Forests in BCR 12 ON are a mosaic of deciduous, mixed and coniferous stands (Ontario Ministry of Natural Resources 2002), with species such as sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), and red oak (*Quercus rubra*) common in the southeast of the region, and boreal species such as black spruce (*Picea mariana*), white birch (*Betula papyrifera*), and jack pine (*Pinus banksiana*) more common in the north. The avifauna reflects this gradient of habitats; bird diversity in BCR 12 ON is high by Canadian standards (Ontario Partners in Flight 2008), with predominantly boreal species common in the north, and species characteristic of deciduous forests in the southern extent of the region.

BCR 12 ON is also characterized by the presence of numerous lakes, rivers, streams and wetlands (Fig. 2). These diverse aquatic habitats support a wide variety of waterbirds and waterfowl. Swamps are widespread and common throughout the region, and a number of large inland lakes (e.g., Lake of the Woods) are important for breeding colonial waterbirds. The aquatic habitats in the region are also of great importance to migrants. The coastal wetlands, beaches and nearshore waters of the Great Lakes are migratory stopovers for many waterfowl, shorebirds and waterbirds. Although used extensively by a number of bird species, non-forested upland habitats such as alvars, natural prairie, rock barrens and human-altered habitats are significantly less common here than in BCR 13 to the south and BCR 11 to the west in Manitoba.

Over 10% of the land base in BCR 12 ON is specifically managed as conservation lands, which include national parks, provincial parks, conservation reserves and one National Wildlife Area (Eleanor Island). The three largest Ontario provincial parks, namely Algonquin, Lake Superior and Quetico, when taken together, ensure the conservation and protection of over 8% of the landscapes in this portion of the BCR (Fig. 3).

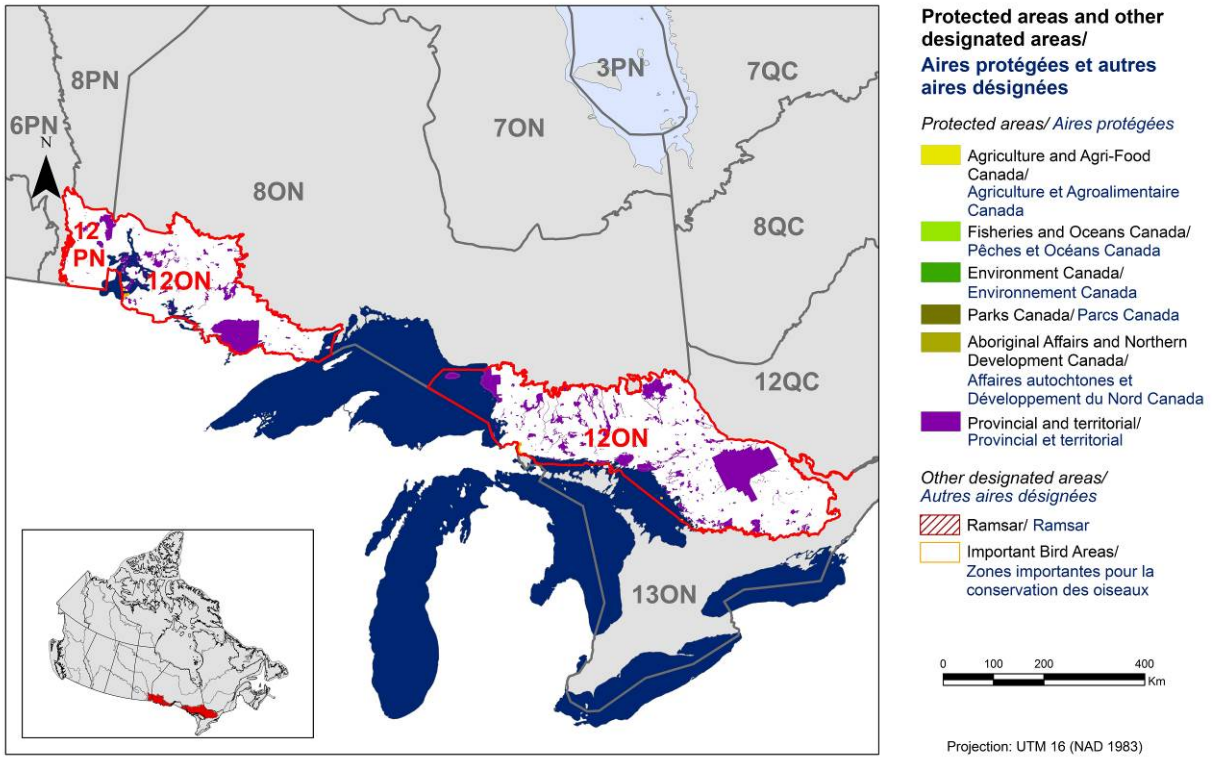

Figure 3. Map of protected and designated areas in BCR 12 ON.
Note: This figure does not reflect the updated boundaries of BCR 12 ON (see Figure 1).

Human settlements, agriculture and other forms of development are sparsely distributed across the region, in stark contrast to the highly developed BCR 13 to the south. However, humans have still had a pronounced effect on habitats throughout the region through forestry activities. Historically, Aboriginal peoples altered forest habitats through burning and harvest of forest materials on a small scale, but large-scale alteration of these habitats began 350 years ago with the arrival of Europeans (Thompson 2000; Ontario Partners in Flight 2008). Beginning in the 1700s, large, mature white pines (*Pinus strobus*) were harvested extensively for the British square-timber trade, and although this species remains widespread in the region, large white pines have never regained their former abundance. Logging increased in intensity throughout the 19th and 20th centuries due to expanded access corridors and increased mechanization. The extensive harvest of mature timber, along with the suppression of fire, has fostered a shift away from fire-dependent, shade-intolerant conifers and towards fire-sensitive, shade-tolerant deciduous species (Carleton 2000; Ontario Partners in Flight 2008).

A large majority of BCR 12 ON is forested (75%, see Table 1), and 85% of the productive forest is owned and managed by the Crown under the *Crown Forest Sustainability Act* (Government of Ontario 1994). The Act legally requires that Crown forest in Ontario be managed to conserve healthy, diverse and productive forests and their associated ecological processes and biological diversity (Pearce 2011). Management guidelines address harvest practices from a local to a landscape level, including consideration of everything from retention of individual wildlife trees

to the distribution of age classes across a landscape. In recent years, management guidelines have been devised to emulate natural disturbance patterns and maintain forest attributes within a Simulated (or estimated) Range of Natural Variation (SRNV). The rigorous, science-based approach to forest management in BCR 12 ON is a dominant vehicle for conservation of birds in the region.

Conservation of migratory birds must occur throughout the annual life cycle and across the range. For the many long-distance migrants breeding in or passing through BCR 12 ON, conservation may only be achieved through cooperation on a hemispheric scale. Identifying key conservation priorities at this scale can be challenging, but preliminary assessments of threats throughout the annual cycle are provided in this strategy.

The goal of this strategy is to further the conservation of all birds in BCR 12 ON, and maintain or restore populations to target levels. Recent decades have already seen significant progress towards bird conservation through effective forest management planning, stewardship programs, development and adoption of BMPs, municipal and provincial land use plans, the strategic protection of lands by environmental non-government organizations, and the efforts of partnerships such as the Eastern Habitat Joint Venture. Building on past achievements and strengthening partnerships are key goals of this strategy. Indeed, implementation of the actions suggested here could only be accomplished through a broad partnership of governments, industry and other stakeholders pursuing a common goal of biodiversity conservation in BCR 12 ON.

Section 1: Summary of Results – All Birds, All Habitats

Element 1: Priority Species Assessment

Bird Conservation Strategies identify "priority species" from all regularly occurring bird species in each BCR subregion. Species that are vulnerable due to population size, distribution, population trend, abundance and threats are included as priorities because of their "conservation concern." Some widely distributed and abundant "stewardship" species are also included. Stewardship species are included because they typify the national or regional avifauna and/or because they have a large proportion of their range and/or continental population in the subregion; many of these species have some conservation concern, while others may not require specific conservation effort at this time. Species of management interest are also included as priority species when they are at (or above) their desired population objectives and require ongoing management because of their socio-economic importance as game species or because of their impacts on other species or habitats.

The purpose of the prioritization exercise is to focus implementation efforts on the species and issues of greatest significance to Ontario's avifauna. As with any priority-setting exercise, some important species may be excluded; however, the issues of importance to any excluded species are usually captured by addressing the threats identified for species that are included on the priority list. With this in mind, species present in the region only as migrants were included as priority species only when their inclusion introduced new regional conservation issues, such as the protection of migratory staging sites. Otherwise, the BCR 12 ON strategy relies on conservation actions arising from threats to other priority species to address more general conservation concerns for migrants. Tables 2, 3 and 4 outline the priority species in BCR 12 ON, the relative breakdown by bird group, and the reasons for priority status.

A total of 260 bird species occur regularly in the region, 100 of which were assessed as priority species, including 24 species assessed by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as "at risk," 18 listed under the federal *Species at Risk Act* (SARA), and 23 species noted as species at risk in Ontario (as of November 2013; Ontario Ministry of Natural Resources 2013a). Landbirds show the greatest diversity in BCR 12 ON, representing nearly 66% of the candidate species list (Table 3). A large number of landbird species are uncommon or non-breeders in the region; only 36% qualified for priority status. Still, a majority of the priority species in BCR 12 ON are landbirds (61 species or 61%; Table 3). By comparison, waterbirds and waterfowl show lower diversity, but a higher proportion of these species qualified for priority status (52% and 55% respectively). The diversity of breeding shorebirds in the region is low, and although coastal beaches of the Great Lakes, wetlands and other habitats in BCR 12 ON are used by migrant shorebirds, few concentrate in large numbers within this region during migration. Only 7 shorebird species qualified for priority status, including 6 breeders and 1 migrant, the endangered *rufa* Red Knot.

Table 2. Priority species in BCR 12 ON, population objective and reasons for priority status.
Note: All assessments, listings and designations are current to November 2013. A species can be on the priority list for more than one reason.

Priority Species	Population Objective	COSEWIC[1]	SARA[2]	SARO[3]	Regional/Subregional Concern[4]	Regional/Subregional Stewardship[5]	National/Continental Concern	National/Continental Stewardship
Landbirds								
American Kestrel	Increase				Y			
Bald Eagle	Recovery objective[6]			SC	Y			Y
Bank Swallow	Increase	T			Y			
Barn Swallow	Recovery objective	T		T	Y			
Bay-breasted Warbler	Increase				Y		Y	
Belted Kingfisher	Increase					Y		
Black-billed Cuckoo	Increase					Y		
Blackburnian Warbler	Maintain current					Y	Y	Y
Black-throated Blue Warbler	Maintain current					Y		
Black-throated Green Warbler	Maintain current					Y	Y	Y
Bobolink	Recovery objective	T		T	Y		Y	
Broad-winged Hawk	Maintain current					Y		
Brown Thrasher	Increase				Y			Y
Canada Warbler	Recovery objective[6]	T	T	SC	Y	Y	Y	
Cerulean Warbler	Recovery objective	E	SC	T	Y		Y	

[1] Assessed by COSEWIC as E, Endangered; T, Threatened; SC, Special Concern.
[2] Species listed on Schedule 1 of SARA as E, Endangered; T, Threatened; SC, Special Concern (Species at Risk Public Registry 2013).
[3] Species listed as E, Endangered; T, Threatened; SC, Special Concern on the SARO List (Ontario Ministry of Natural Resources 2013a).
[4] Regional refers to BCR-wide (i.e. all jurisdictional data were used for the entire BCR) while Subregional refers to the Ontario portion of the BCR only (i.e. Ontario BCR data were used).
[5] Only the landbird group distinguishes stewardship species from other priority species (see Panjabi et al. 2005).
[6] This species is listed under the federal SARA, and/or the provincial *Endangered Species Act 2007*; however, its federal or provincial recovery documents have not yet been finalized.

Table 2 continued

Priority Species	Population Objective	COSEWIC[1]	SARA[2]	SARO[3]	Regional/Subregional Concern[4]	Regional/Subregional Stewardship[5]	National/Continental Concern	National/Continental Stewardship
Chestnut-sided Warbler	Maintain current					Y	Y	Y
Chimney Swift	Recovery objective[6]	T	T	T	Y		Y	
Cliff Swallow	Increase				Y			
Common Nighthawk	Recovery objective[6]	T	T	SC	Y		Y	
Common Yellowthroat	Maintain current					Y		
Connecticut Warbler	Increase				Y		Y	Y
Eastern Towhee	Increase				Y		Y	Y
Eastern Whip-poor-will	Recovery objective[6]	T	T	T	Y		Y	
Eastern Wood-Pewee	Increase	SC			Y			
Evening Grosbeak	Increase				Y			
Field Sparrow	Assess/Maintain				Y			
Golden-winged Warbler	Recovery objective[6]	T	T	SC	Y	Y	Y	
Gray Catbird	Increase				Y			
Great Gray Owl	Assess/Maintain				Y			
Kirtland's Warbler	Recovery objective	E	E	E	Y	Y	Y	
Least Flycatcher	Increase					Y		
Loggerhead Shrike (*migrans*)	Recovery objective	E	E	E	Y		Y	
Louisiana Waterthrush	Recovery objective	SC	SC	SC	Y		Y	Y
Mourning Warbler	Increase					Y	Y	Y
Nashville Warbler	Maintain current					Y		Y
Northern Flicker	Increase				Y			
Northern Goshawk	Assess/Maintain				Y			
Northern Rough-winged Swallow	Increase				Y			
Olive-sided Flycatcher	Recovery objective[6]	T	T	SC	Y		Y	

Table 2 continued

Priority Species	Population Objective	COSEWIC[1]	SARA[2]	SARO[3]	Regional/Subregional Concern[4]	Regional/Subregional Stewardship[5]	National/Continental Concern	National/Continental Stewardship
Peregrine Falcon (*anatum/tundrius*)	Recovery objective	SC	SC	SC	Y		Y	
Prairie Warbler	Assess/Maintain				Y		Y	
Purple Finch	Increase				Y			
Purple Martin	Increase				Y			
Red Crossbill	Increase				Y			
Red-headed Woodpecker	Recovery objective[6]	T	T	SC	Y		Y	
Red-shouldered Hawk	Assess/Maintain				Y			Y
Rose-breasted Grosbeak	Increase					Y		
Ruby-crowned Kinglet	Increase				Y			
Ruffed Grouse	Maintain current					Y		
Rusty Blackbird	Recovery objective[6]	SC	SC		Y		Y	
Sedge Wren	Maintain current					Y		
Short-eared Owl	Recovery objective[6]	SC	SC	SC	Y		Y	
Song Sparrow	Increase				Y			
Swamp Sparrow	Maintain current					Y	Y	Y
Tennessee Warbler	Increase				Y			Y
Tree Swallow	Increase				Y			
Veery	Increase				Y	Y		
Vesper Sparrow	Increase				Y			
White-throated Sparrow	Maintain current					Y	Y	Y
Wood Thrush	Maintain current	T			Y		Y	
Yellow-bellied Sapsucker	Maintain current					Y		Y
Shorebirds								
American Woodcock	Increase				Y		Y	

Table 2 continued

Priority Species	Population Objective	COSEWIC[1]	SARA[2]	SARO[3]	Regional/Subregional Concern[4]	Regional/Subregional Stewardship[5]	National/Continental Concern	National/Continental Stewardship
Killdeer	Increase				Y		Y	
Piping Plover (*circumcinctus*)	Recovery objective	E	E	E	Y		Y	
Red Knot (*rufa*)	Migrant (no BCR 12 ON population objective)	E	E	E	Y		Y	
Solitary Sandpiper	Assess/Maintain				Y		Y	
Spotted Sandpiper	Maintain current				Y		Y	
Wilson's Snipe	Assess/Maintain				Y			
Waterbirds								
American Coot	Maintain current				Y			
American White Pelican	Recovery objective			T	Y		Y	
Black Tern	Recovery objective			SC	Y		Y	
Black-crowned Night-Heron	Assess/Maintain				Y			
Caspian Tern	Increase				Y			
Common Gallinule	Assess/Maintain				Y			
Common Tern	Maintain current				Y		Y	
Great Black-backed Gull	Assess/Maintain				Y			
Green Heron	Increase				Y			
Herring Gull	Maintain current				Y		Y	
Horned Grebe (western population)	Recovery objective[6]	SC		SC	Y		Y	
Least Bittern	Recovery objective	T	T	T	Y		Y	
Red-necked Grebe	Assess/Maintain				Y			
Sandhill Crane	Assess/Maintain				Y			
Yellow Rail	Recovery objective	SC	SC	SC	Y		Y	
Waterfowl								
American Black Duck	Increase				Y		Y	

Table 2 continued

Priority Species	Population Objective	COSEWIC[1]	SARA[2]	SARO[3]	Regional/Subregional Concern[4]	Regional/Subregional Stewardship[5]	National/Continental Concern	National/Continental Stewardship
Black Scoter	Migrant (no BCR 12 ON population objective)				Y		Y	
Bufflehead	Maintain current				Y			
Canada Goose (Southern James Bay population)	Migrant (no BCR 12 ON population objective)				Y		Y	
Canada Goose (Eastern Temperate-breeding population)[7]	Decrease				Y			
Common Goldeneye	Maintain current				Y		Y	
Common Merganser	Maintain current				Y			
Greater Scaup	Migrant (no BCR 12 ON population objective)				Y			
Green-winged Teal	Maintain current				Y			
Hooded Merganser	Maintain current				Y			
Lesser Scaup	Migrant (no BCR 12 ON population objective)				Y		Y	
Long-tailed Duck	Migrant (no BCR 12 ON population objective)				Y		Y	
Mallard	Maintain current				Y		Y	
Ring-necked Duck	Maintain current				Y			
Surf Scoter	Migrant (no BCR 12 ON population objective)				Y		Y	
White-winged Scoter	Migrant (no BCR 12 ON population objective)				Y		Y	
Wood Duck	Maintain current				Y			

[7] A species of management interest due to its very high abundance.

Table 3. Summary of priority species, by bird group, in BCR 12 ON.

Bird Group	Number of Species	Percent of Total Number of Species	Number of Priority Species	Percent Listed as Priority by Bird Group	Percent of Total Number of Priority Species
Landbird	171	66%	61	36%	61%
Shorebird	29	11%	7	24%	7%
Waterbird	29	11%	15	52%	15%
Waterfowl	31	12%	17	55%	17%
Total	**260**	**100%**	**100**	**----**	**100%**

Table 4. Number of priority species in BCR 12 ON by reason for priority status.
Note: All assessments, listings and designations are current to November 2013.

Priority Listing[1]	Landbird	Shorebird	Waterbird	Waterfowl
COSEWIC[2]	19	2	3	0
SARA[3]	14	2	2	0
SARO[4]	16	2	5	0
National/Continental Concern	26	6	7	9
National/Continental Stewardship[5]	15	N/A	N/A	N/A
Regional/Subregional Concern[6]	44	7	15	17
Regional/Subregional Stewardship	21	N/A	N/A	N/A
Management Interest[7]	0	0	0	1

[1] A single species can be on the priority list for more than one reason.
[2] Assessed by COSEWIC as Endangered, Threatened or Special Concern.
[3] Species listed on Schedule 1 of SARA as Endangered, Threatened or Special Concern).
[4] Species listed as Endangered, Threatened or Special Concern on the SARO List.
[5] Only the landbird group distinguishes stewardship species from other priority species (see Panjabi et al. 2005).
[6] Regional refers to BCR-wide (i.e. all jurisdictional data were used for the entire BCR) while Subregional refers to the Ontario portion of the BCR only (i.e., Ontario BCR data were used).
[7] A species of management interest due to its very high abundance.

Element 2: Habitats Important to Priority Species

Identifying the broad habitat requirements for each priority species within the BCR allowed species to be grouped by shared habitat-based conservation issues and actions. If many priority species associated with the same habitat class face similar conservation issues, then conservation action in that habitat class may support populations of several priority species. BCR strategies use a modified version of the standard land cover classes (Land Cover Classification System, LCCS) developed by the United Nations (Food and Agriculture Organization 2000) to categorize habitats, and species were often assigned to more than one habitat class.

Priority species varied widely in their use of 10 habitat types in BCR 12 ON (Fig. 4). Wetlands were used by the greatest number of priority species (28%), while mixed, deciduous and coniferous forests were a preferred habitat type for 27%, 15% and 15% of priority species, respectively. Waterbodies, including the Great Lakes, were used extensively by 21% of priority species, followed by shrub and early successional habitats, which were used by 19%.

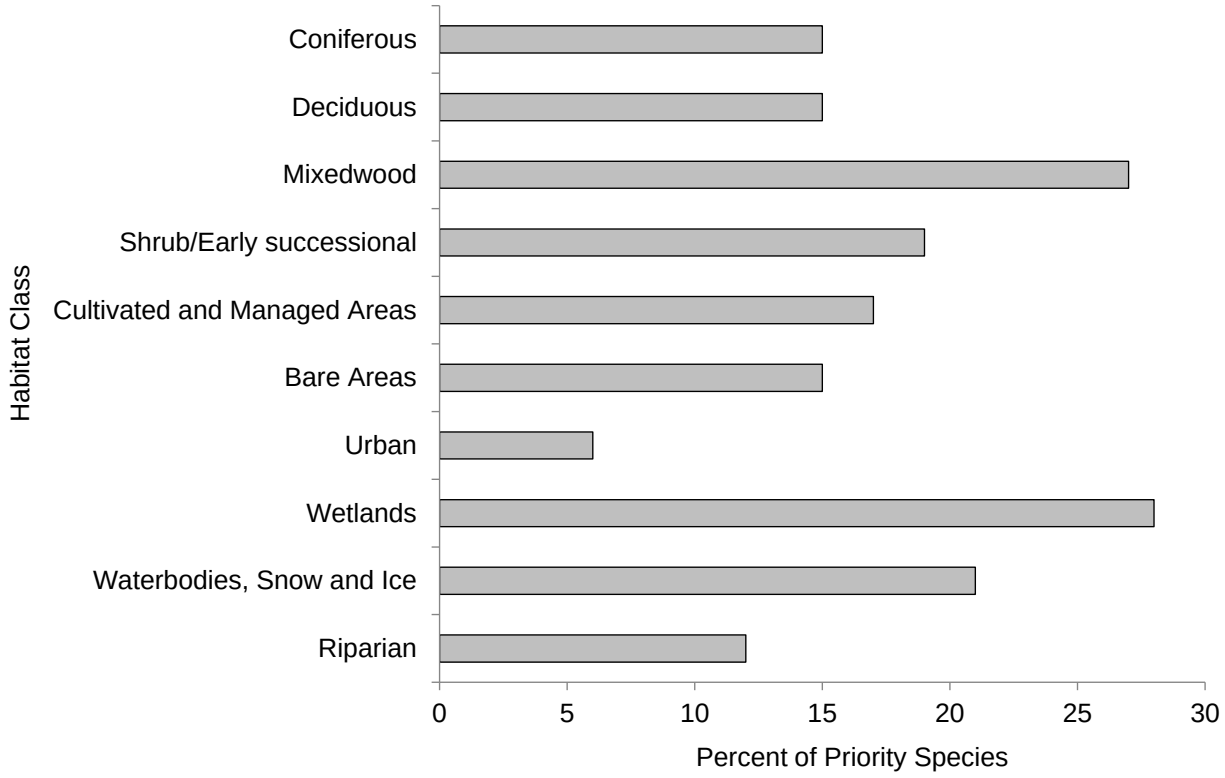

Figure 4. Percent of priority species that are associated with each habitat type in BCR 12 ON.
Note: The total exceeds 100% because each species may use more than one habitat.

Element 3: Population Objectives

Population objectives allow us to measure and evaluate conservation success. The objectives in this strategy are assigned to categories and are based on a quantitative or qualitative assessment of species' population trends. If the population trend of a species is unknown, the objective is set as "assess and maintain," and a monitoring objective is given. For any species listed under SARA or under provincial/territorial endangered species legislation, Bird Conservation Strategies defer to population objectives in available Recovery Strategies and Management Plans. When recovery objectives are available, they will replace the interim objectives. The ultimate measure of conservation success will be the extent to which population objectives have been reached within the timeframes set by national and continental bird conservation plans.

BCR 12 ON has good coverage by several large-scale bird surveys such as the Breeding Bird Survey, the Christmas Bird Count, the Ontario Breeding Bird Atlas, the Ontario Shorebird Survey, the Eastern Waterfowl Survey, the Great Lakes Marsh Monitoring Program and the Great Lakes Colonial Waterbird Monitoring Surveys. Consequently, in contrast to some other BCRs in Canada, data exist to evaluate the population status for a majority of species. For a large number of priority species (31%), monitoring data suggested declines with sufficient certainty to support an objective of increasing population size. Maintaining populations at current levels was the objective for 25% of the priority species in BCR 12 ON, while only 12% were assigned a population objective of Assess/Maintain because monitoring data was insufficient to propose an objective (Fig. 5).

Population objectives relating to species recovery were assigned to 23% of priority species, though many have interim objectives as mentioned above. In contrast, populations were sufficiently elevated to warrant a reduction in population size for only a single priority species: the Canada Goose, Eastern Temperate-breeding population. Priority species that were identified as migrating through BCR 12 ON were not assigned an objective (8%), as those were set in other BCR strategies covering the breeding range of these species (Fig. 5).

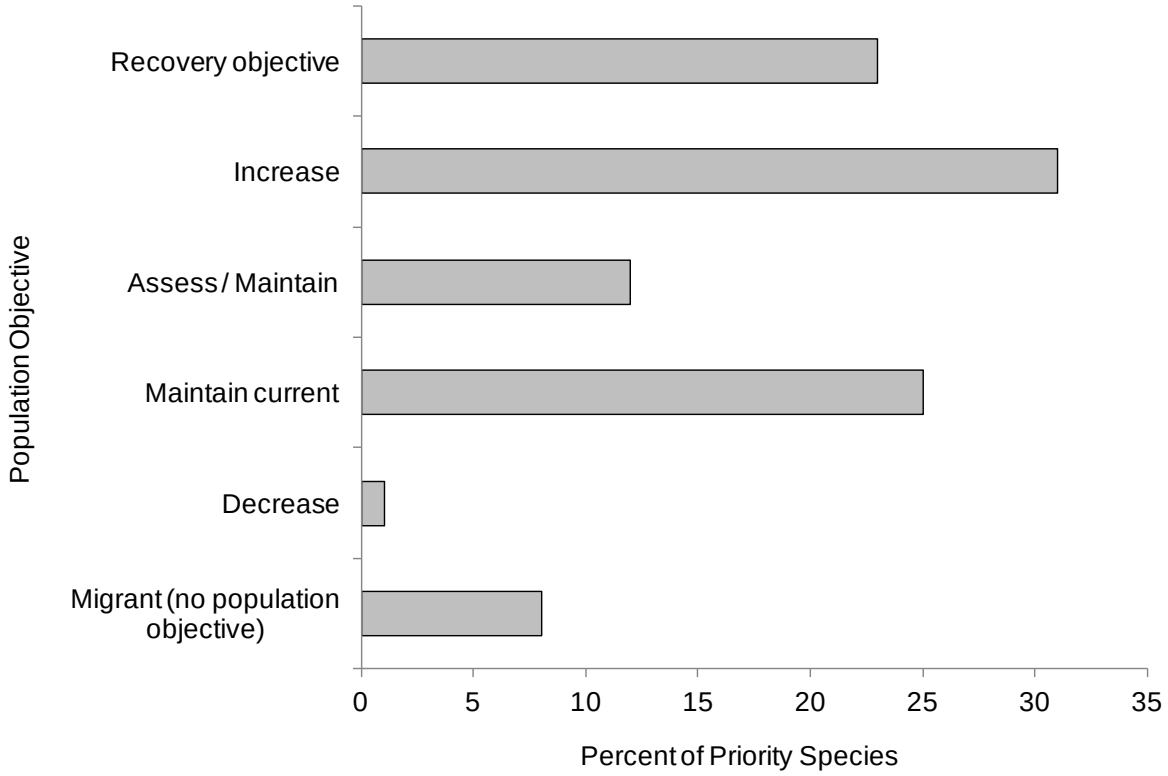

Figure 5. Percent of priority species that are associated with each population objective category in BCR 12 ON.

Element 4: Threat Assessment for Priority Species

Bird population trends are driven by factors that negatively affect either their reproduction or survival during any point in their annual life cycle. Threats that can reduce survival include, for example, reduced food availability at migratory stopovers or exposure to toxic compounds. Examples of threats that can reduce reproductive success may include high levels of nest predation or reduced quality or quantity of breeding habitat.

The threats assessment process (which is based on the methods described in Salafsky et al. 2008) identifies threats believed to have a population-level effect on individual priority species. These threats are assigned a relative magnitude (Low, Medium, High, Very High), based on their scope (the proportion of the species' range within the subregion that is impacted) and severity (the relative impact on the priority species' population). This allows us to target conservation actions towards threats with the greatest effects on suites of species or in broad habitat classes. Some well-known conservation issues may not be identified in the literature as significant threats to populations of an individual priority species and therefore may not be captured in the threat assessment. However, they merit attention in conservation strategies because of the large numbers of individual birds affected in many regions of Canada. Usually these issues transcend habitat types and are considered "widespread," and these issues are addressed in a separate section, but unlike other threats, they are not ranked (e.g., climate change and severe weather; threat category 11).

In BCR 12 ON, threat category 12 "other direct threats" and sub-category 12.1 "Information lacking" was used to identify priority species that lack adequate biological or demographic information required for population conservation and management. Using this category in this manner facilitated the development of targeted research and monitoring conservation actions to address knowledge gaps for these species, but unlike the other threats, they were not ranked (Fig. 6).

A large number and diversity of anthropogenic threats and other conservation issues facing priority species in the various habitats of BCR 12 ON were identified (Fig. 6 and Table 5). Major threats to priority species relate to habitat loss and degradation from a variety of sources including residential and commercial development (threat category 1), biological resource use (category 5), pollution (category 9), and human disturbance (category 6). Within BCR 12 ON, threats related to climate change and severe weather (category 11) were considered to be widespread.

Cumulative Effects of Threats to Priority Species

For several of the threats identified in this strategy, the long-term effects are equal to or greater than the sum of the effects of the individual threats. There is no standardized method for assessing these "cumulative effects." The threat ranking and roll-up procedures (Table 5) demonstrate the sum of effects for threats within and among threat categories, and are useful for identifying the most important threats within a habitat class. These procedures also identify whether a large number of low-level threats may be affecting a species. However, it is

important to consider that threats might interact in unanticipated ways, or that in aggregate, threats might exceed some ecological threshold to produce cumulative effects of an unanticipated magnitude. Cumulative impact studies assessing population responses to multiple stressors are an important tool to better understand the long-term consequences of some of the threats described in this strategy.

Threats to priority species while they are outside Canada during the non-breeding season were also assessed and are presented in the section Threats Outside Canada.

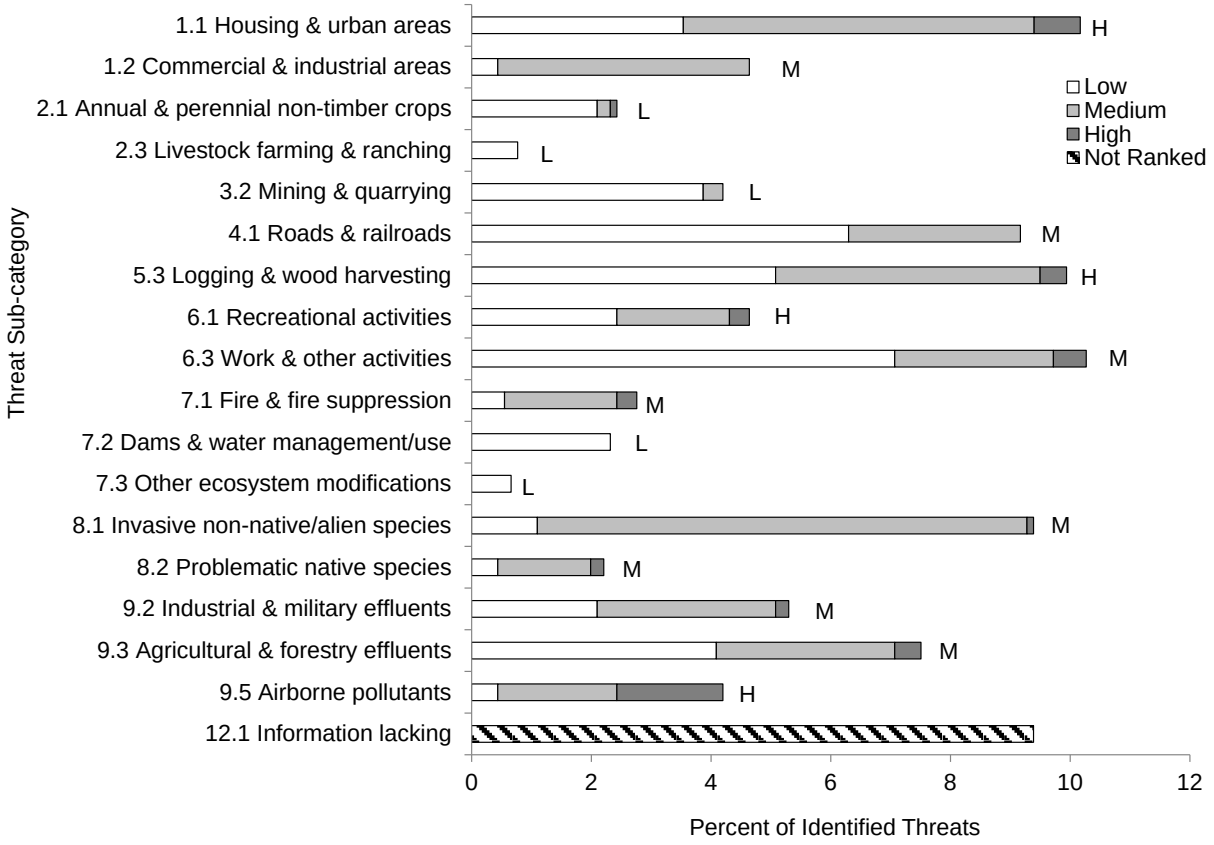

Figure 6. Percent of identified threats to priority species within BCR 12 ON by threat sub-category. Each bar represents the percent of the total number of threats identified in each threat sub-category in BCR 12 ON (for example, if 100 threats were identified in total for all priority species in BCR 12 ON, and 10 of those threats were in the category 9.5 Airborne pollutants, the bar on the graph would represent this as 10%). Shading in the bars (H = high, M = medium and L = low) represents the magnitude of the threats in each threat sub-category in the BCR. The bars are divided to show the distribution of Low (L), Medium (M) and High (H) rankings of individual threats within each threat sub-category. For example, the same threat may have been ranked H for one species and L for another; the shading illustrates the proportion of L, M and H rankings in the sub-category). The overall rolled up magnitude of the sub-threat is shown at the end of each bar (also presented in Table 5). Threat sub-category 12.1 Information lacking was not ranked. See Element 4 in Appendix 2 for details on how magnitude was assessed).

Table 5. Relative magnitude of identified threats to priority species within BCR 12 ON by threat category and broad habitat class.

Only threats with a population-level effect were considered, and overall ranks were generated through a roll-up procedure described in Kennedy et al. (2012). L represents Low Magnitude threats, M: Medium, H: High, and VH: Very High. Cells with hyphens indicate that no priority species had population-level threats identified in the threat category/habitat combination.

Threat Category	Habitat Class										
	Coniferous	Deciduous	Mixed Wood	Shrub/Early successional	Cultivated and Managed Areas	Bare Areas	Urban	Wetlands	Waterbodies	Riparian	Overall
Overall	**M**	**H**	**H**	**M**	**M**	**H**	**M**	**H**	**H**	**M**	
1. Residential & Commercial Development	M	H	H	M	-	H	M	H	-	M	**H**
2. Agriculture & Aquaculture	-	-	-	L	M	-	-	L	-	-	**L**
3. Energy Production & Mining	-	-	-	-	-	M	-	L	-	L	**L**
4. Transportation & Service Corridors	L	L	L	L	L	-	L	M	-	M	**M**
5. Biological Resource Use	H	H	H	-	-	-	-	M	-	M	**H**
6. Human Intrusions & Disturbance	L	L	L	L	M	H	M	H	H	M	**H**
7. Natural System Modifications	M	L	M	H	-	L	-	L	L	-	**M**
8. Invasive & Other Problematic Species & Genes	M	M	M	M	L	M	-	H	M	-	**M**
9. Pollution	L	L	L	L	H	L	-	H	VH	H	**H**

Element 5: Conservation Objectives

Conservation objectives were designed to address threats and information gaps that were identified for priority species. They describe the environmental conditions and research and monitoring that are thought to be necessary for progress towards population objectives and to understand underlying conservation issues for priority bird species. As conservation objectives are reached, they will collectively contribute to achieving population objectives. Whenever possible, conservation objectives were developed to benefit multiple species and/or respond to more than one threat.

For BCR 12 ON, many conservation objectives identified relate to ensuring an adequate supply and quality of habitat (conservation objective category 1; Fig. 7). Included in these objectives are the maintenance of the full range of naturally occurring habitat types, maintaining the quality of existing habitats, and retaining important features on the landscape (e.g., standing dead snags for cavity nesting birds). Also important is the need to manage individual species (category 3). Most of the objectives in this category relate to the prevention and control of invasive and exotic species as well as the development and/or implementation of recovery strategies and management plans for species at risk in BCR 12 ON. Another frequently identified conservation objective category reflects the need to improve understanding of factors causing population declines of priority species, as well as enhancing population/demographic and habitat monitoring across the BCR (category 7). Other objectives address the need to reduce human disturbance of priority species (category 4), ensure adequate food supply through the maintenance of natural food webs and prey sources (category 5), and to reduce mortality (and/or sub-lethal effects) through reductions in pesticide (including herbicide) use across the BCR (category 2).

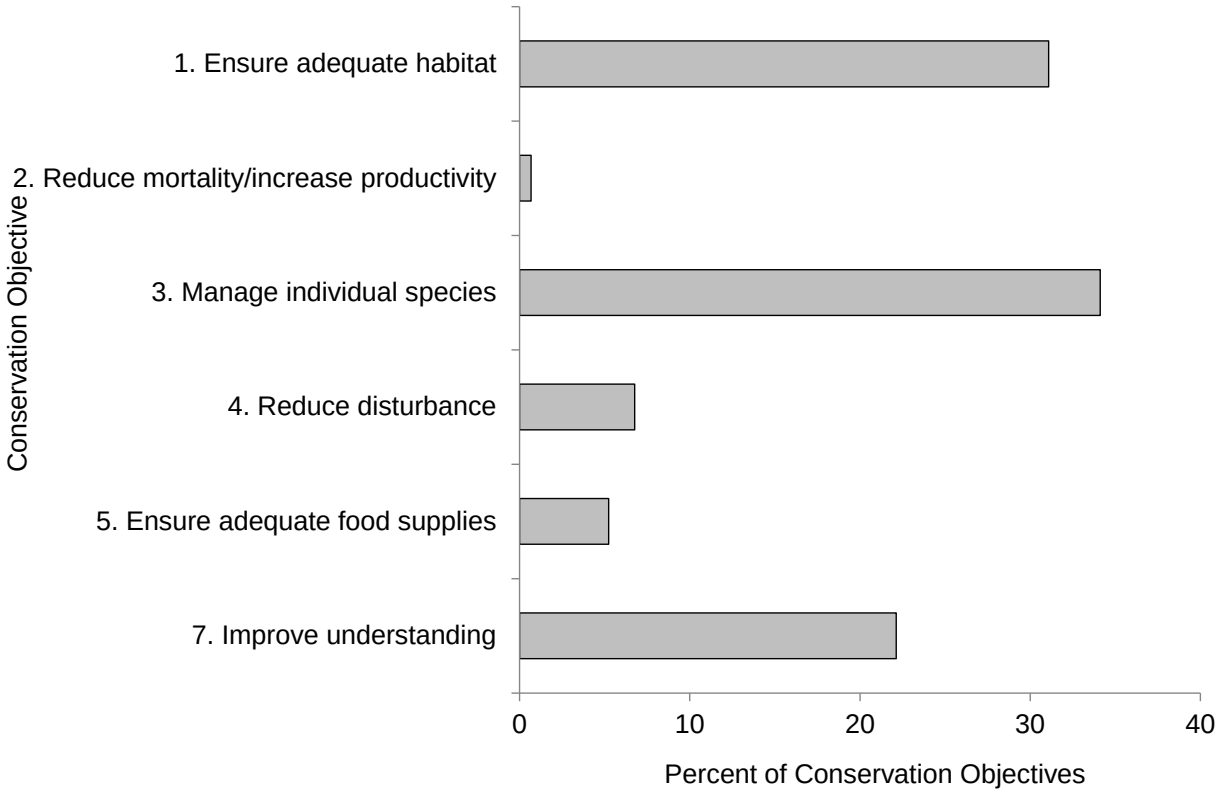

Figure 7. Percent of all conservation objectives assigned to each conservation objective category in Ontario BCR 12 ON.

Element 6: Recommended Actions

Recommended actions indicate on-the-ground activities that will help to achieve the conservation objectives (Fig. 8). Actions are strategic rather than highly detailed and prescriptive. Whenever possible, recommended actions benefit multiple species, and/or respond to more than one threat. Recommended actions defer to or support those provided in recovery documents for species at risk at the federal, provincial or territorial level, and will usually be more general than those developed for individual species. However, for detailed recommendations for species at risk, readers should consult published federal recovery documents (Species at Risk Public Registry 2013) or provincial recovery documents (Ontario Ministry of Natural Resources 2013b). Similarly, a number of landbird species included in this strategy are stewardship species as defined by Partners In Flight (Rich et al. 2004). These are species with stable populations or for which no specific conservation issues have been identified, but which depend on BCR 12 ON to such an extent that the region has a high responsibility for their protection. These species may not appear prominently in the threats, objectives and actions described herein, but should benefit from the implementation of recommended actions that target multiple species.

A majority of conservation objectives were related to the protection or restoration of habitats, and accordingly, the more specific conservation actions also relate to this theme. Recommended actions are diverse in their approach (Fig. 8) and include developing and implementing effective policies and regulations (action sub-category 5.2), promoting the development and use of BMPs (sub-category 5.3), undertaking actions to promote awareness of issues (sub-category 4.3), improving the scientific knowledge that underlies management decisions (sub-category 8.1), improving monitoring to track the effectiveness of conservation activities (sub-category 8.2), and restoring habitat and natural processes (sub-category 2.3), driven in part by the role of fire suppression and logging practices in altering natural cycles.

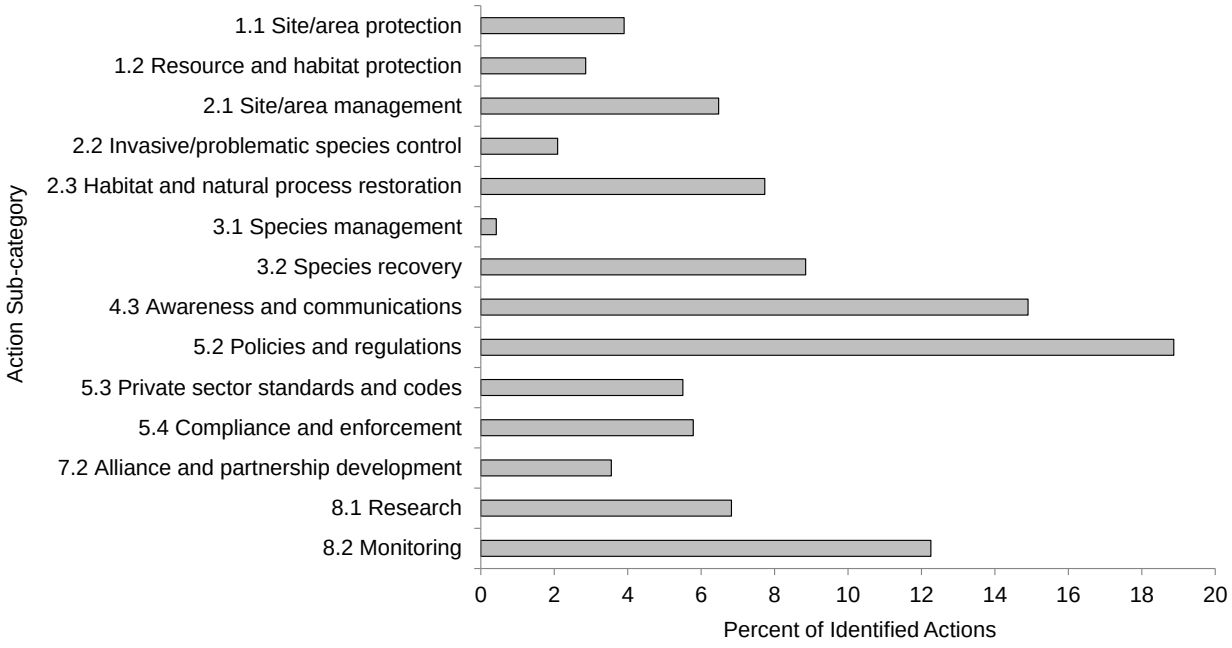

Figure 8. Percent of recommended actions assigned to each sub-category in BCR 12 ON.
"Research" and "Monitoring" actions refer to specific individual species where information is required to support conservation and management.

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