Environment Canada Environnement Canada

Bird Conservation Strategy for Bird Conservation Region 8 and Marine Biogeographic Units 10 and 12 in Newfoundland and Labrador: Boreal Softwood Shield, Newfoundland-Labrador Shelves, and Gulf of St. Lawrence

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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 strategies 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 Environment Canada'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 from 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*.

Acknowledgements

This document 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 like to extend a sincere thanks to the following people: Karyne Bellehumeur, Doug Bliss, Andrew Boyne, Paul Chamberland, Kevin Davidson, Michael Elliott, Carina Gjerdrum, Alan Hanson, Christie MacDonald, Paul MacDonald, Bryan Martin, Bruce Pollard, Martin Raillard, Isabelle Robichaud, Dane Stuckel, Peter Thomas, Kyle Wellband, Becky Whittam, and other reviewers.

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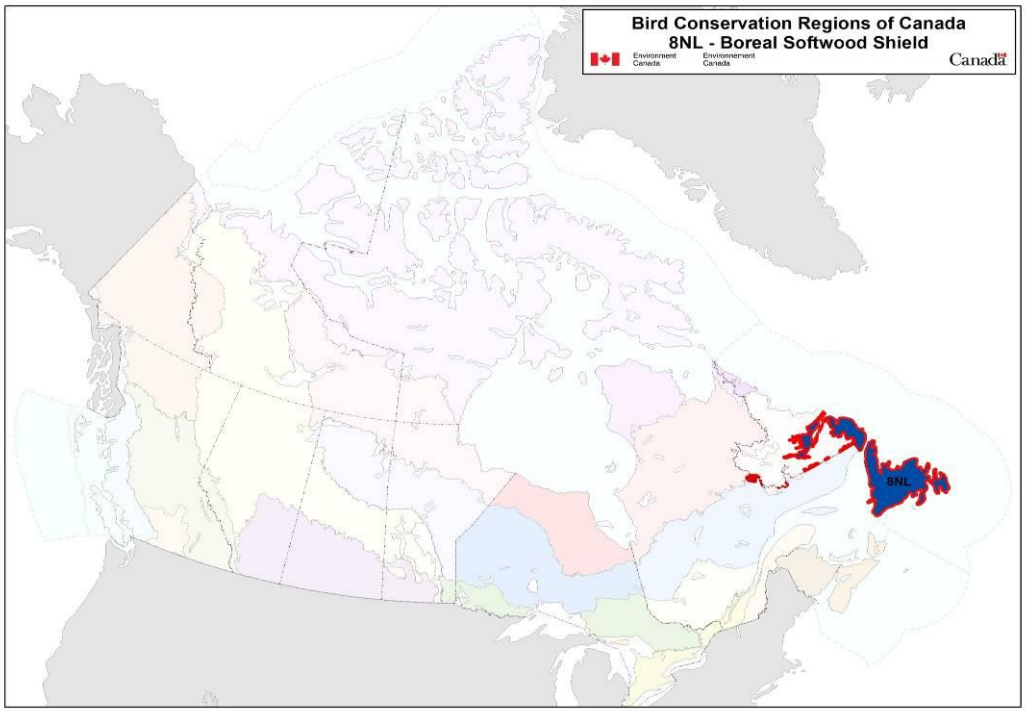

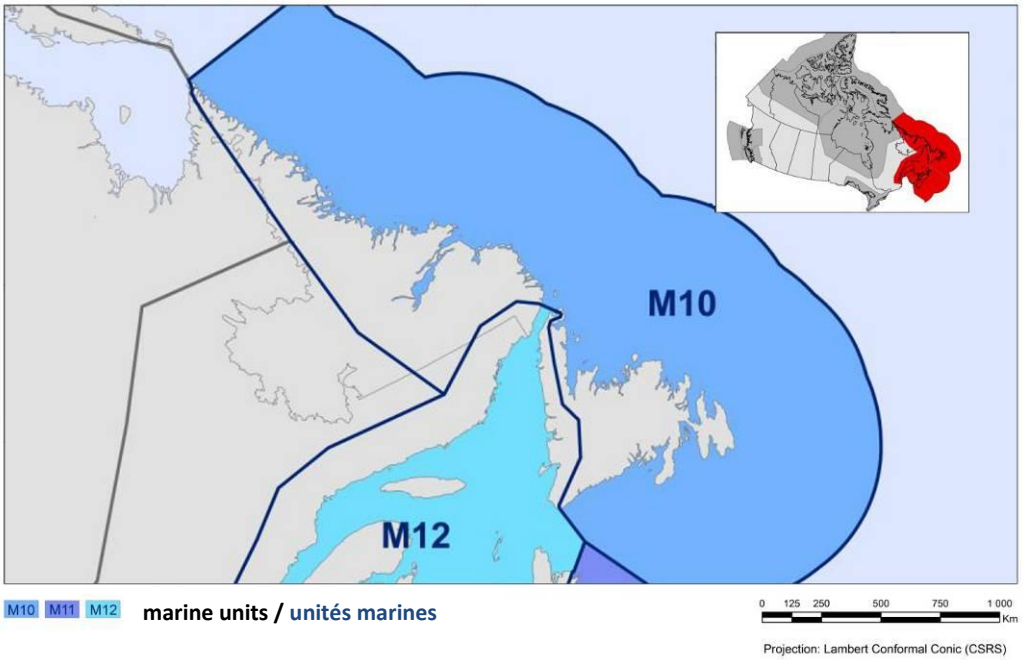

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Executive Summary

This strategy pulls together the best available information from the literature on bird conservation in Newfoundland and Labrador. It identifies priority species for conservation, the key threats affecting them and the major conservation actions required to protect them. Its goal is to become a tool for future conservation planning, a one-stop shop where important information on bird conservation is pulled together and displayed. The strategy builds on existing bird conservation strategies and complements those created for the other Bird Conservation Regions (BCR) across Canada. Collectively, these strategies will serve as a framework for implementing bird conservation nationally, and also identify international conservation issues for Canada's priority birds. Strategies are not highly prescriptive, but rather are intended to guide future implementation efforts undertaken by various partners and stakeholders.

This strategy covers three distinct planning units in Newfoundland and Labrador: the terrestrial unit of Bird Conservation Region 8 (BCR 8 NL), as well as two marine biogeographical units, the Newfoundland-Labrador Shelves (MBU 10 NL) and the Gulf of St. Lawrence (MBU 12 NL).

BCR 8 NL is comprised of the entire island of Newfoundland and 16% of the southeastern part of Labrador. This portion of the BCR 8, the Boreal Softwood Shield, is covered by a combination of coniferous forests and transitional or mixed wood forests, with wetlands, barrens, rock outcrops, waterbodies and coastal landforms also prevalent. The human population of BCR 8 NL is sparse and concentrated on the Avalon Peninsula of Newfoundland. There are 37 priority bird species in BCR 8 NL. These species are primarily associated with wetland, coniferous forest, coastal (above high tide) and riparian habitats.

The Newfoundland-Labrador Shelves (MBU 10 NL) encompass one of the largest areas of continental shelf in the world ranging from the northern tip of Labrador south to the Grand Banks off the island of Newfoundland. This diverse marine unit has significant oil and gas activity, a rich fishery, and extensive commercial traffic, all of which have the potential to affect birds using the area. There are 39 priority species found in the coastal and marine habitats of MBU 10 NL.

The Gulf of St. Lawrence (MBU 12 NL) represents one of the largest and most productive estuarine/marine ecosystems in Canada. Its large spatial and temporal variations in environmental conditions and oceanographic processes provide for a highly diverse and productive biological community. There is currently no oil or gas activity in this marine unit, but there is a fishery concentrated on the west coast of Newfoundland. Some marine transportation occurs around larger population centres. There are 29 priority species associated with the coastal and marine habitats of MBU 12 NL.

There is a variety of current and potential threats to the region's avifauna. The most prevalent threats in all planning units are chemical contamination from heavy metals, oil spills and/or discharges; gaps in knowledge of the distribution, abundance and population trends of priority

bird species; competition for resources between bird species and aquaculture or commercial fisheries; entanglement in fishing gear; and climate change.

The most frequently identified conservation objective in BCR 8 NL is ensuring the availability of adequate habitat for priority bird species, while in MBU 10 NL and MBU 12 NL the main objectives are reducing mortality or increasing productivity. However, in all planning units improving our understanding of priority bird species was a frequently identified conservation objective. A combination of beneficial management practices (for example, to manage shipping activities and minimize accidental oil discharges), site management or protection (such as limiting industrial activities within buffer zones around key sites), public education as to the impacts of disturbance from recreational and commercial activities, changes in legislation (for example, regulating the use of fishing gear that reduces bycatch) could help alleviate many of the threats identified in these three units.

We hope that the information in this strategy will become a useful tool for future conservation planning, especially in terms of habitat conservation, as it presents relevant information on priority species, threats and conservation actions in a summary format.

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 bird conservation priorities to support the implementation of Canada's migratory birds program, both domestically and internationally. This suite of strategies builds on existing conservation plans for the four "bird groups" (waterfowl,[1] waterbirds,[2] shorebirds[3] and landbirds[4]) 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 bird groups.

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 beneficial management practices will also be helpful in guiding implementation. Partners interested in participating in the implementation of these strategies, 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 planning required to coordinate and undertake on-the-ground activities.

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

Strategy Structure

This strategy includes three distinct Canadian planning units: Bird Conservation Region 8 in Newfoundland and Labrador (BCR 8 NL), as well as Marine Biogeographic Units 10 and 12 surrounding the provincial coasts (MBU 10 NL and MBU 12 NL). These units have distinct lists of priority bird species. The MBUs have only two habitat classes based on the Land Cover Classification System: waterbodies, snow and ice, and coastal. To distinguish them from the equivalent habitat classes in BCR 8 NL, they are referred to as marine waters and coastal (intertidal) in the MBUs, and as inland waterbodies and coastal (above high tide) in BCR 8 NL.

While the French islands of St. Pierre and Miquelon occur in MBU 10 NL, threats to priority birds in the French Exclusive Economic Zone are only covered under Section 3: Threats Outside Canada. None of the conservation actions that address threats to priority birds of MBU 10 NL are proposed for French territory or France's Exclusive Economic Zone. All maps presented in this strategy should also be understood to exclude French territory and the French Exclusive Economic Zone.

Section 1 of this strategy presents general information about the BCR/MBUs and the subregion, with an overview of the six elements[5] 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 of Canada. The approach and methodology are summarized in the appendices, but 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.

[5] The six elements are: Element 1 – Priority Species Assessment; Element 2 – Habitats Important to Priority Species; Element 3 – Population Objectives; Element 4 – Threat Assessment for Priority Species; Element 5 – Conservation Objectives; Element 6 – Recommended Actions.

Characteristics of Bird Conservation Region 8: Boreal Softwood Shield in Newfoundland and Labrador

The entire Bird Conservation Region 8 (Boreal Softwood Shield) is a broad, U-shaped region that covers approximately 1 800 000 km^2 and extends from northeast Alberta, northern Saskatchewan, sections of Manitoba, Ontario and Quebec, eastern Labrador and all of Newfoundland (Environment Canada 2000; 2011). The region is mostly comprised of seacoasts in the east and vast areas of closed coniferous forests in the north, whereas broad-leaved deciduous trees and pines are more widely distributed in the southern portions. BCR 8 is also a mosaic of boreal uplands, wetlands and peatlands interspersed by several small to medium-sized lakes (North American Bird Conservation Initiative 2013).

The Atlantic sub-region of BCR 8 extends into two geographical divisions as the Strait of Belle Isle separates the island of Newfoundland from mainland Labrador (Fig. 1). The island of Newfoundland (111 390 km^2) is entirely contained within BCR 8 NL, while only 16% of Labrador (47 000 km^2), mostly in the eastern region plus the areas surrounding Lake Melville and Paradise River, is included. The combined area of these two portions is 158 390 km^2. This region is characterized by a unique geological landscape strongly influenced by glacial erosion and the collision of tectonic plates (Environment Canada 2000). The Long Range Mountains on Newfoundland's west coast are the northeastern-most extension of the Appalachian mountain system in North America while Labrador is the eastern-most part of the Canadian Shield comprised of ancient bedrock (Encyclopedia Britannica Online 2013).

BCR 8 NL reflects the combination of coniferous forests, transitional or mixed wood forests, wetlands, barrens, rock outcrops, waterbodies and coastal landforms contained within the Boreal Softwood Shield (Fig. 1), which is atypical of the general landscape. The majority of the province is forested, and the principal species are conifers, of which balsam fir (*Abies balsamea)* and black spruce *(Picea mariana*) are the most abundant. In most parts of the province, but particularly on the island, conifers are mixed with deciduous species such as white (*Betula papyrifera*) and yellow birch (*Betula alleghaniensis*) and a wide variety of hardwood shrubs (NL Department of Natural Resources 2012a). The tallest and healthiest stands of forest occur in sheltered areas of deep and well-drained soils, while in other areas much of the forest growth is inhibited as a result of high wind exposure, water-logged soil, temperature limitations and poor soil conditions (NL Department of Natural Resources 2012b). In other areas within BCR 8 NL, repeated fires and subsequent erosion have created barrens that provide habitat for a great variety of small woody plants (NL Department of Natural Resources 2012a)**.**

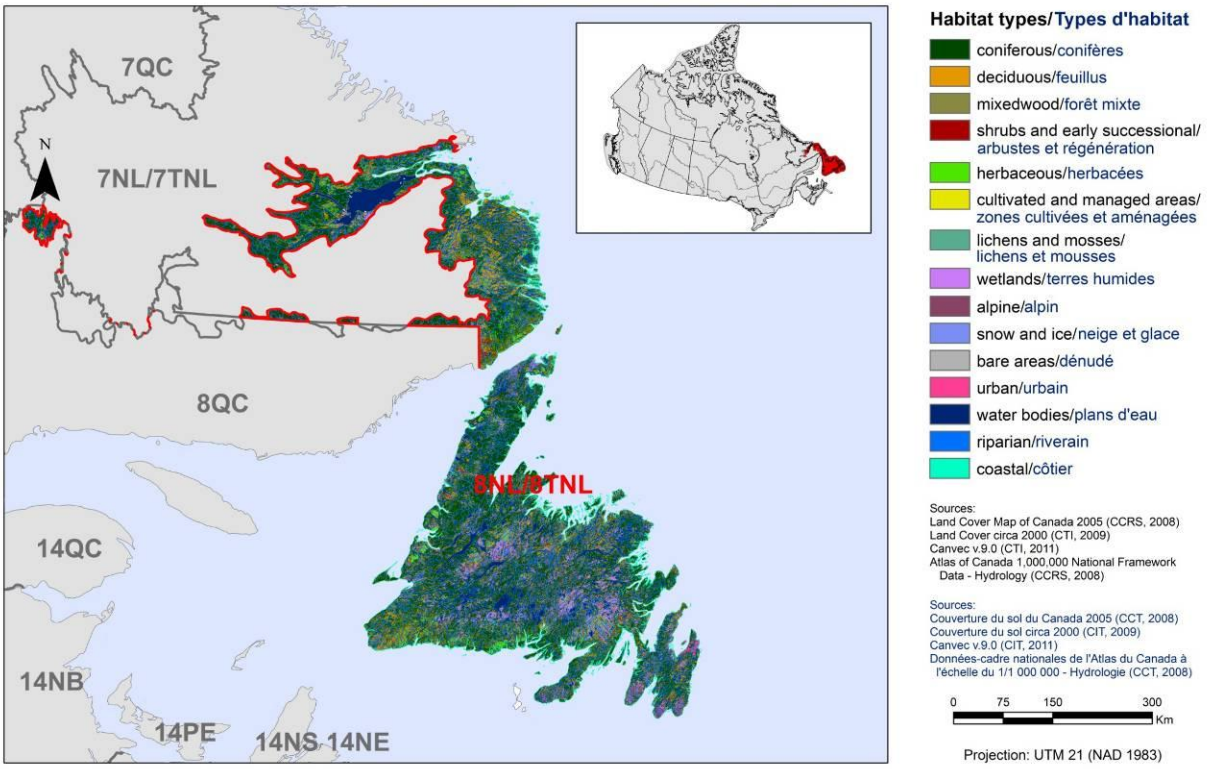

Figure 1. Land cover in BCR 8 NL.
The red line delineates the geographic boundaries established by the North American Bird Conservation Initiative for the BCRs. In this document, the boundaries of BCR 8 NL do not extend below the high-tide line.

The population of Newfoundland and Labrador is estimated at 512 659, of which approximately 94% reside on the island of Newfoundland, with the remainder located in Labrador (NL Statistics Agency 2013). The Avalon Peninsula on the southeastern coast of Newfoundland is the most densely populated part of the island and contains the capital and largest city of the province, St. John's, where resides almost 40% of the province's population (NL Statistics Agency 2013). Other adjacent cities are Mount Pearl, a number of smaller towns such as Conception Bay South, Harbour Grace, Carbonear, Trepassey and Placentia, as well as a host of small villages typically located at the edge of the sea (Encyclopedia Britannica Online 2013). In the Labrador portion of BCR 8 NL, the largest urban area is the town of Happy Valley-Goose Bay with a population of 7 552 (Statistics Canada 2013).

The climate in Newfoundland and Labrador is varied because of the north-south extent of the province, prevalent westerly winds, cold ocean currents, and local factors such as mountains and coastlines. The island of Newfoundland in general has a humid continental climate greatly influenced by the sea with long, cold winters, short, warm summers and abundant precipitation (Stantec 2010). Southern Labrador has a subarctic climate characterized by short, cool summers and long, cold winters; precipitation is low to moderate (Stantec 2010). The BCR 8 NL region is known for having the strongest winds of all the Canadian provinces while some areas around the island of Newfoundland and along the coast of Labrador are recognized for the occurrence

of dense fog due to the contrast between sea and air temperatures (Encyclopedia Britannica Online 2013).

The economy of Newfoundland and Labrador is substantially dependent on the exploitation of natural resources. In 2011, the provincial gross domestic product (GDP) of all industries was calculated at over $31.5 billion (NL Department of Finance 2012). Service industries accounted for roughly $14.1 billion, while resource-based industries such as mining, construction, oil extraction and support activities, utilities, fishing, hunting and trapping, agriculture, forestry and logging (e.g., sawmills, paper mills), and manufacturing (e.g., seafood processing, paper manufacture, oil refining, production of food/beverages or brewing and footwear) accounted for the remaining $17.4 billion (NL Department of Finance 2012). Tourism is also an important part of the services-producing sector and is of growing value to the economy. In 2010, nearly 518 500 non-resident tourists visited Newfoundland and Labrador, spending an estimated $410.6 million (NL Department of Finance 2011).

Mining is one of the largest and oldest industries in the province and a major contributor to the economy accounting for 10.4% or $3.3 billion of the GDP in 2011 (NL Department of Finance 2012). In BCR 8 NL, a number of mines and quarries on the island of Newfoundland produce copper, zinc, silver, gold, silica, barite, dolomite, gypsum, dimension stone, sand, gravel and peat. The major metal operations are Duck Pond and Beaver Brook in central Newfoundland, as well as Pine Cove and Ming Mine, both located in the Baie Verte Peninsula region. The non-metal operations are Burgoynes Cove near Clarenceville, Bishops Falls in central Newfoundland, Lower Cove on the Port au Port Peninsula in western Newfoundland, and Coal Brook also on the western coast. There is also a Long Harbour nickel processing plant, Nugget Pond milling facility and a series of other exploration properties on the island (NL Department of Natural Resources 2012c). In Labrador, there are no metal or non-metal operations; however, there are major rare earth, copper and ironsand exploration properties in BCR 8 NL such as Search Minerals in Port Hope Simpson, Silver Spruce Resources in Pope's Hill, Wolverine Exploration in Cache River and Grand River Ironsands in Churchill River (NL Department of Natural Resources 2012c).

Construction is also an important industry for the provincial economy as it contributed nearly $1.9 billion to the GDP in 2011 (NL Department of Finance 2012). Most of the construction was related to non-residential expenditures associated with the Long Harbour nickel processing facility, Hebron offshore oil project, as well as public sector investments such as the Trans-Labrador Highway, new student residences at Memorial University and new long-term care facilities (NL Department of Finance 2012).

The forestry and logging industry's estimated value for 2011 is $133.5 million in terms of provincial GDP, which is noticeably small (0.4%) considering the very large area of forested and wooded lands in Newfoundland and Labrador (NL Department of Finance 2012). In BCR 8 NL, the commercial forestry industry is limited to the island of Newfoundland where only a very small percentage of forest land is available for harvesting because the cool, moist climate slows nutrient cycling and produces few highly productive forests (Vasarhelyi and Kirk 2007). The major components of the commercial forestry industry are the production of newsprint from

a paper mill in Corner Brook, as well as a significant amount of domestic fuel wood (i.e., firewood) and to a lesser extent value-added wood products (e.g., cabinet doors, flooring) produced by large sawmills on the island (NL Department of Finance 2012; NL Department of Natural Resources 2013a).

The extent of land available for agriculture in Newfoundland and Labrador is very small, roughly 400 km^2, and only a fraction is used for crops because of acid soils, cool temperatures and short-growing seasons (NL Department of Natural Resources 2013b). In 2011, the agriculture sector's estimated value was $76.5 million but only accounted for 0.2% of the total provincial GDP (NL Department of Finance 2012). Agricultural lands in BCR 8 NL are limited to areas south of St. John's, near Deer Lake and in the Codroy Valley on the island of Newfoundland, as well as some marginal farm land areas in central Labrador. The main food crops produced for local consumption are potatoes, rutabagas, turnips, carrots and cabbage. Also, more than 75% of agricultural income originates from sales of poultry, dairy products and eggs. Wild blueberries, partridgeberries (lingonberries) and bakeapples (cloudberries) are harvested commercially and used in jams and wine making (NL Department of Natural Resources 2013b)**.**

The only Aboriginal peoples remaining on the island of Newfoundland at present are identified as Mi'kmaq. The indigenous Beothuk were also residing on the island at the time of European contact in the 15th and 16th centuries; however, they disappeared in 1829 (Pastore, 1997a). The Mi'kmaq people reside primarily on a reserve at Conne River (Miawpukek First Nation), but there are also various concentrations elsewhere in central and western Newfoundland known as Qalipu First Nations (Pastore 1997b). Anteriorly, the Mi'kmaq were semi-nomadic and harvested wildlife available to them such as seafood, big or small mammals, fish, seabirds and eggs (Pastore 1997b). The current traditions of these people have changed and evolved over time, largely as a result of French and British colonization of Canada (McMillan 1995). The Aboriginal peoples of Labrador include the Northern Inuit of Nunatsiavut, the Southern Inuit-Métis of NunatuKavut, and the Innu (Aboriginal Affairs and Northern Development Canada 2009)**.** The Inuit of Labrador are found in several regions on the north coast (i.e., Rigolet, Makkovik, Postville, both administrative capitals of Hopedale and Nain) and are direct descendants of the prehistoric Thule: hunters who spread from Alaska across the circumpolar regions of Canada and Greenland. In 2005, the Nunatsiavut Government was established as a regional government within the province of Newfoundland and Labrador (Nunatsiavut Government 2009). The Labrador Inuit-Metis are found in a number of communities on the central and southern coasts of Labrador (i.e., Happy Valley Goose Bay, Mud Lake, North West River, Cartwright, Paradise River, Black Tickle, Norman Bay, Charlottetown, Pinsent's Arm, Williams Harbour, Port Hope Simpson, St. Lewis, Mary's Harbour and Lodge Bay), where a significant part of the population are derived from European white-Inuit intermarriage (NunatuKavut 2012). Nowadays, Inuit-Metis traditional fishing, hunting and trapping methods still resonate with a number of community members (Pastore, 1997c). The Labrador Innu peoples occupy two settlements: Sheshatshiu, near Lake Melville, and Natuashish, along the northern coast, plus many have retained their original languages and a portion of their nomadic ancient cultures (Innu Nation 2013).

There is a variety of current and potential threats to the region's avifauna. The most prevalent are related to gaps in knowledge on the distribution, abundance and population trends of priority species and the effects of climate change including habitat degradation and change, changes to food webs, and increases in the frequency of storms causing mortality and affecting habitat quality.

On the island of Newfoundland, nearly 8% (terrestrial: 8 888 km^2, marine: 3 km^2) of the surface area is protected either as provincially or federally administered areas, while nearly 3.5% of the surface area is protected in Labrador (terrestrial: 9 893 km^2, marine: 83 km^2; Canadian Council on Ecological Areas 2011; Fig. 2). Though there are no Migratory Bird Sanctuaries in Labrador, Environment Canada manages three Migratory Bird Sanctuaries on the island of Newfoundland for a total land area of approximately 10 km^2: Île aux Canes (1.50 km^2) and Shepherd Island (0.135 km^2); both provide nesting habitat for Common Eiders, while Terra Nova (8.70 km^2) acts as a hunting exclusion zone around Terra Nova National Park. There are no National Wildlife Areas in Newfoundland or Labrador. Parks Canada Agency manages two National Parks on the island of Newfoundland: Gros Morne and Terra Nova, for a total terrestrial area of 2 205 km^2. Gros Morne National Park is also a UNESCO World Heritage Site. In addition, there are seven national historic sites (Signal Hill, Cape Spear, Castle Hill, Hawthorne Cottage, L'Anse aux Meadows, Port au Choix, Ryan Premises), all on the island of Newfoundland and one (Red Bay) in Labrador (Historic Sites Association of Newfoundland and Labrador 2013). There is also a series of ecological reserves in BCR 8 NL including the Avalon and Bay du Nord Wilderness Reserves, and the Little Grand Lake Provisional Ecological Reserve (NL Department of Environment and Conservation 2013a).

The total area of Newfoundland and Labrador is 405 720 km^2, of which 94% is owned by the Provincial Crown. As such, the majority of protected areas (in both number and total surface area) are provincially managed: 53 terrestrial areas (6 670 km^2) on the island of Newfoundland and three terrestrial (193 km^2) plus one marine (24 km^2) area in Labrador. In addition to these protected areas, there are a number of environmental non-governmental organizations engaged in securing and managing lands for conservation. The major organizations involved in these activities on the island of Newfoundland are:

- Ducks Unlimited Canada (43 projects totaling 33 km^2 of waterfowl habitat)
- Nature Conservancy Canada (owns 37 properties and easements on 27 km^2)

In Labrador, Nature Conservancy Canada is working on a habitat conservation plan with communities, environmental non-governmental organizations, universities, the Nunatsiavut (including the Innu Nation and NunatuKavut Community Council), and federal and provincial governments. In addition, designations that recognize ecological uniqueness (but do not formally protect habitat) have elevated public awareness and promoted the conservation of ecologically significant habitats. In BCR 8 NL these include:

- Grand Codroy Estuary on the island of Newfoundland recognized under the Ramsar Convention on Wetlands of International Importance (9 km^2)
- 25 Important Bird Areas (9 720 km^2) on the island of Newfoundland
- 10 Important Bird Areas (2 073 km^2) in Labrador

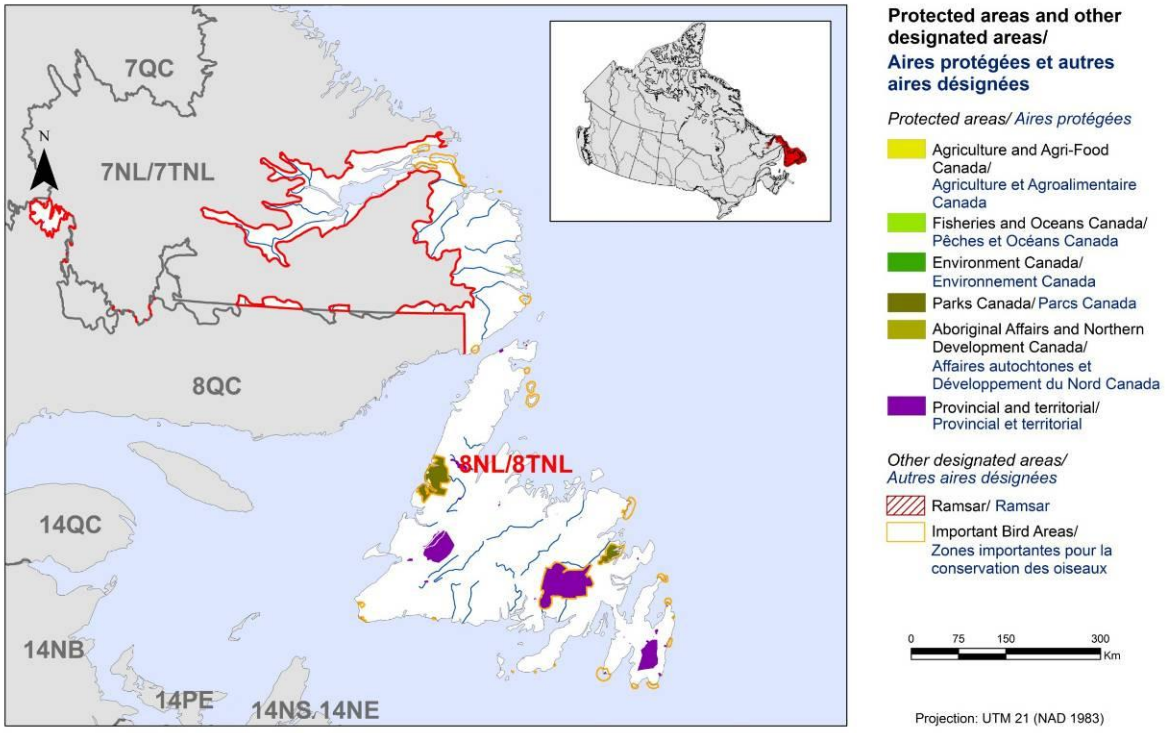

Figure 2. Map of protected and designated areas in BCR 8 NL.

Characteristics of Marine Biogeographic Unit 10: Newfoundland-Labrador Shelves

The Newfoundland-Labrador Shelves (corresponding to M10 in Fig. 3) extend off the eastern coast of Canada into the Atlantic Ocean and encompass one of the largest areas of continental shelf in the world (Department of Fisheries and Oceans 2010). Ranging from the northern tip of Labrador south to the Grand Banks off the island of Newfoundland, and bounded by the Canadian Exclusive Economic Zone, the total area of MBU 10 NL is greater than 2.5 million km^2 (Department of Fisheries and Oceans 2010). The Newfoundland-Labrador Shelves exhibit significant variation in seabed structure and are represented by extensive coastal forms, offshore banks, slopes and canyons (Department of Fisheries and Oceans 2010). The coastlines are continually modified by exposure to wave action, sea ice and fluctuating sea levels, with various elevation ranges from areas of low relief to steep cliffs, and consistent tidal ranges from 0.8 to 1.6 m (Templeman 2010). The continental shelf region is typically divided into three zones: (1) an inner shelf, a narrow zone parallel with the coast up to 20 km wide; (2) an inner-central shelf, consisting of a broad, fairly flat area, averaging 50 – 150 km in width, and ranging from 50 – 200m in depth; and (3) an outer shelf. The continental slope region lies beyond this continental shelf break, rapidly reaching depths over 3 000 m (Templeman 2010).

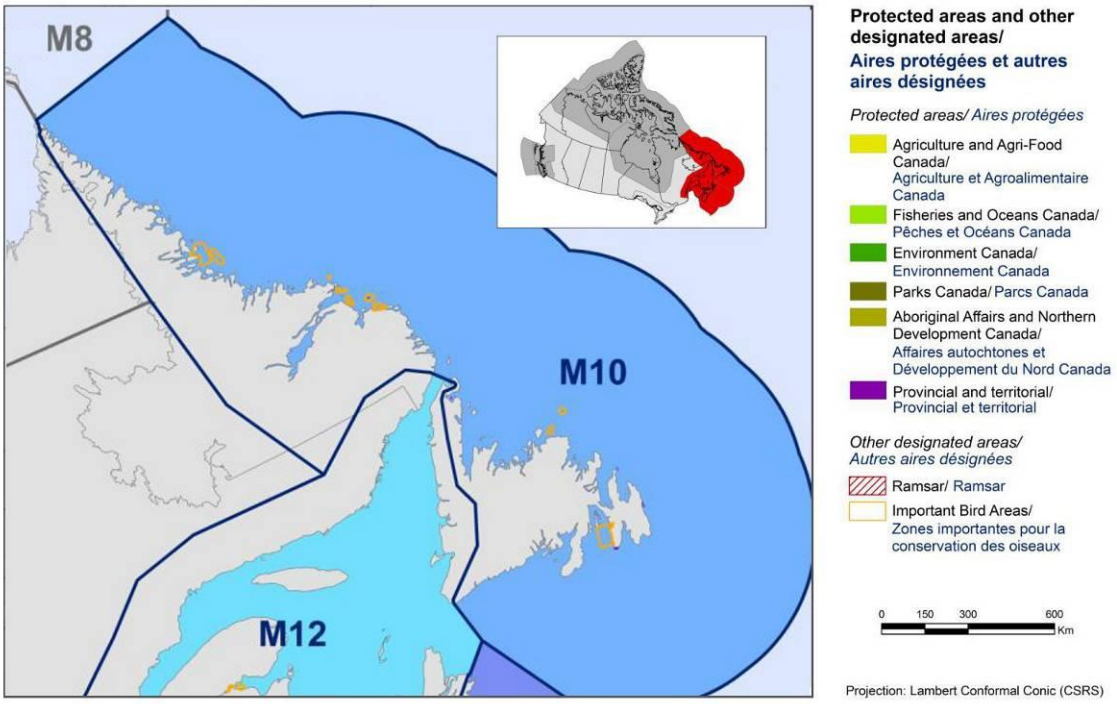

Figure 3. Map of marine protected areas and other designated areas in MBU 10 NL (M10) and MBU 12 NL (M12).

The waters off the Newfoundland-Labrador Shelves are mainly influenced by the Labrador Current that flows southward into inshore and offshore branches. The offshore branch originates from the West Greenland Current and borders the continental shelf plus the Grand

Banks. It also transports 10 times more water than the inshore branch, in addition to being saltier and warmer (Rose 2007). The colder, fresher inshore branch originates from the Canadian high Arctic, receives freshwater input from rivers along its route, and hugs the northeast coast of Newfoundland and Labrador with the Avalon Channel, and turns west along the south coast of the island, penetrating Placentia Bay before entering the Gulf of St. Lawrence (Rose 2007). A small area of MBU 10 NL is covered in sea ice 7 to 10 months of the year. Icebergs are abundant and occur year-round. Most of these icebergs are produced by glaciers on the Greenland coast that are detached and transported northward in a counter-clockwise direction around Baffin Bay then southward through the Davis Strait by the Labrador Current (Templeman 2010). The mixing of the Labrador Current with the warmer Gulf Stream along with the shape of the ocean floor in MBU 10 NL lifts nutrients to the surface, making these waters some of the most productive in the world (Department of Fisheries and Oceans 2010). The Newfoundland-Labrador Shelves support an impressive diversity of marine life given their temperate nature, including various species of cold-water corals, plankton, fish, mammals, amphibians and seabirds. In addition to the effects on nutrients, the mixing of the cold and warm currents often causes frequent and dense fog in the area, which is most common over the Grand Banks and along the southern and southeastern coasts of Newfoundland (Encyclopedia Britannica Online 2013). The marine waters of the Newfoundland-Labrador Shelves are also among the stormiest regions in North America (Templeman 2010).

In MBU 10 NL, extensive offshore oil and gas exploration/extraction is proceeding in the Grand Banks region, and this industry accounted for approximately 33% ($10.35 billion) of the provincial GDP in 2011 (NL Department of Finance 2012). The province currently has three major oil fields: Hibernia, Terra Nova and White Rose. The Hebron field will be Newfoundland and Labrador's fourth stand-alone offshore oil project; development activities have been ongoing since 2008, and the first oil is expected in 2017 (NL Department of Finance 2012; NL Department of Natural Resources 2013c).

Grand Banks is also one of the richest fishing grounds in the world; therefore the fishing industry, a combination of harvests of fish (cod, haddock, halibut and herring) and shellfish (crab, shrimp and clams; NL Department of Natural Resources 2013d), remains an important part of the provincial economy. This industry contributes over $215 million to the GDP annually when combined with hunting and trapping (NL Department of Finance 2012). Aquaculture is also an important industry to the province, and all sites within MBU 10 NL are situated around the island of Newfoundland and very near the coastline, with the largest concentration located in the Bay d'Espoir region (Templeman 2010). This industry is focusing development efforts on Steelhead Trout, Atlantic Salmon, blue mussels and Atlantic Cod. Other species such as scallops and Arctic Char are also being investigated for development potential (Department of Fisheries and Oceans 2011**;** Newfoundland Aquaculture Industry Association 2011).

Marine transportation is an important component of the economy as the major industries in MBU 10 NL are ocean-based (i.e., fisheries, oil and gas exploration). The strategic location of this region on the Great Circle Route between eastern North America and Europe is important for domestic and international shipping, while the Cabot Strait links trans-Atlantic shipping

routes to the St. Lawrence Seaway and the Great Lakes (Templeman 2010). On the island of Newfoundland, the major port that handles very large volumes of cargo (used mainly for the movement of oil) is Come By Chance in Placentia Bay. Other ports include Whiffen Head, Hibernia and Holyrood (Templeman 2010)**.** The port of St. John's is also a major commercial port for shipments of consumer and industrial goods, while in Labrador, Happy Valley-Goose Bay is the central hub (Transport Canada 2012). In addition to large cargo vessels, the marine transportation sector includes ferries, tugs/barges, recreational boating and cruise ship traffic. Several smaller ferries connect numerous other coastal towns and offshore island communities around the island of Newfoundland and up the Labrador coast. Inter-provincial ferry services operate auto-passenger ferries from North Sydney (N.S.) to the towns of Port aux Basques and Argentia on the southern coast of the island of Newfoundland (NL Department of Transportation and Works 2012). Tug, barge activities and recreational boating are also common and tend to be restricted to coastal, inland and harbour waters (Cruiseship Authority of Newfoundland and Labrador 2013).

There is a variety of existing and potential threats to the region's avifauna. Oil pollution is an increasing threat to priority species in the region as the industry's exploitation of reserves increases. Also, gaps in knowledge on the distribution, abundance and population trends of priority species makes it difficult to assess their status or understand the causes of population decline.

MBU 10 NL contains two important Marine Protected Areas representing 0.44% of the total area (Fig. 3). The Department of Fisheries and Oceans is responsible for the Eastport Marine Protected Area (3 km^2) in Bonavista Bay on the island of Newfoundland. In addition, the Laurentian Channel between the provinces of Nova Scotia and Newfoundland and Labrador is currently considered as a potential future Marine Protected Area (Department of Fisheries and Oceans 2012). There is one important Marine Protected Areas in Labrador: Gilbert Bay Marine Protected Area (59 km^2) managed by the Department of Fisheries and Oceans. There are also numerous ecological reserves in MBU 10 NL including the Gannet Islands Ecological Reserve (24 km^2), which is managed provincially and protects the largest and most diverse seabird colonies in North America (e.g., Razorbills, Atlantic Puffins, Common and Thick-billed Murres, Black-legged Kittiwakes, Great Black-backed Gulls, and Northern Fulmars). Other important seabird ecological reserves in MBU 10 NL include Baccalieu Island, Cape St-Mary's, Funk Island, Witless Bay, Hare Bay Islands and Lawn Islands Archipelago Provisional (NL Department of Environment and Conservation 2013a).

Characteristics of Marine Biogeographic Unit 12: Gulf of St. Lawrence

The Estuary and Gulf of St. Lawrence (corresponding to M12 in Fig. 3) represent one of the largest and most productive estuarine/marine ecosystems in Canada, and in the world, with a total area of approximately 247 000 km^2 (Therriault 1991). With a drainage basin that includes the Great Lakes, the St. Lawrence marine ecosystem receives more than half of the freshwater inputs from the Atlantic Coast of North America (Department of Fisheries and Oceans 2010). This ecosystem is also strongly influenced by ocean and climate variability in the North Atlantic, of both Arctic (Labrador Current) and tropical (Gulf Stream) origin. As a result, this area exhibits large spatial and temporal variations in environmental conditions and oceanographic processes (Benoît et al. 2012). This unique setting provides the conditions for a highly diverse and productive biological community and trophic structure (Benoît et al. 2012).

MBU 12 is situated downstream of some of the largest urban and industrial centres in Canada, areas of pronounced development on the continent and emitters of industrial and agricultural-based contaminants (Benoît et al. 2012). The massive influx of fresh water, especially during springtime and summer wet seasons, lowers salinity levels in the Gulf and Estuary. Increasing commercial, ecotouristic and recreational navigation are vectors for the propagation of aquatic invasive species (Benoît et al. 2012). Shoreline development and associated nutrient and sediment loading as well as a large and expanding shellfish aquaculture industry have transformed large portions of the coast, the estuarine and lagoon waters into farms (Benoît et al. 2012). Benoît and colleagues (2012) reviewed evidence that suggested important aspects of the food-web in MBU 12 changed in the early 1990s. Also, increasing average sea surface temperature and hypoxia, partly as a result of climate change and coastal zone deterioration related to anthropogenic pressures (e.g., coastal eutrophication), may be causing physiological stress in marine organisms (Benoît et al. 2012).

The Newfoundland and Labrador portion of MBU 12 encompasses an area of approximately 21 400 km^2 off the western coast of the island of Newfoundland (Fig. 3). The Newfoundland Shelf waters enter the gulf on the eastern side of the Cabot Strait, then drift northeast along the west coast of Newfoundland and, coupled with a westerly drift along the north shore, complete a large counter-clockwise gyre in the surface circulation (Alexander et al. 2010). Deep inflow of Atlantic water through the Cabot Strait compensates for the net outflow of surface waters. Winter cooling and contributions from the Labrador Shelf via Belle Isle Strait result in significant ice cover (and associated navigational hazards) in the gulf for at least 3 months each winter (Alexander et al. 2010).

There is currently no oil and gas exploitation in the MBU 12 NL region of the Gulf of St. Lawrence; however, a number of exploration companies currently hold onshore/offshore interests along western Newfoundland. In addition, the fishing industry in MBU 12 NL is focused mainly on the west coast of the island of Newfoundland and the northern Gulf of St. Lawrence for species such cod, mackerel, herring, capelin and shrimp (Alexander et al. 2010). Aquaculture activity is limited to 17 sites from Robinsons on the southwest coast to Pistolet Bay on the Northern Peninsula (Alexander et al. 2010). Shellfish operations (e.g., oysters, blue mussels) are the major contributors, but there are also a few seasonal sites for Atlantic Cod and many

established salmonid farms distributed along western Newfoundland (Department of Fisheries and Oceans 2010).

The major shipping port in MBU 12 NL is located in Corner Brook on the island of Newfoundland, while the shipping of newsprint occurs from Port Harmon in Stephenville (Transport Canada 2012). Ferry services are used as other forms of marine transport, such as a regular passenger and car ferry service across the Strait of Belle Isle connecting the province's island of Newfoundland with the region of Labrador on the mainland. Another ferry travels from St. Barbe, on the Great Northern Peninsula of Newfoundland, to the port town of Blanc-Sablon (Que.), located on the provincial border and beside the town of L'Anse-au-Clair in Labrador (NL Department of Transportation and Works 2012).

There is a variety of existing and potential threats to the region’s avifauna. Oil pollution is an increasing threat to priority species in the region as the industry’s exploitation of reserves increases. Also, gaps in knowledge on the distribution, abundance and population trends of priority species makes it difficult to assess their status or understand the causes of population decline.

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

Element 1: Priority Species Assessment

These Bird Conservation Strategies identify "priority species" from all regularly occurring bird species in each BCR/MBU subregion (see Appendix 1). Species that are vulnerable due to population size, distribution, population trend, abundance and threats are included 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 concern are also included as priority species when they are at (or above) their desired population objectives but require ongoing management because of their socio-economic importance as game species or because of their impacts on other species or habitats (see Appendix 2).

The purpose of the prioritization exercise is to focus implementation efforts on the issues of greatest significance for Canadian avifauna. Table 1 provides a full list of all priority species and their reason for inclusion in BCR 8 NL, MBU 10 NL and MBU 12 NL. Tables 2 and 3 summarize the number of priority species in BCR 8 NL, MBU 10 NL and MBU 12 NL by bird group and by the reason for priority status.

In BCR 8 NL, there are 37 priority species (Table 2); most of which are landbirds (20 species). There are also 6 shorebirds, 3 waterbirds, and 8 waterfowl species. Overall, 35% of waterfowl and 29% of shorebirds are priority bird species, compared to 18% of landbirds and 18% of waterbirds (Table 2). There are 9 (24%) priority species that are formally protected under the Government of Canada's *Species at Risk Act* (SARA; Species at Risk Public Registry 2012): 7 landbirds, 1 shorebird and 1 waterfowl species (Table 3).

In MBU 10 NL, there are 39 priority species (Table 2): 1 landbird, 8 shorebirds, 18 waterbirds, and 12 waterfowl species. Overall, 50% of waterfowl and 41% of waterbirds are priority bird species compared to 31% of shorebirds and 25% of landbirds. There are 5 (13%) priority species that are formally protected under the Government of Canada's SARA (Species at Risk Public Registry 2012): 2 shorebirds, 1 waterbird, and 2 waterfowl (Table 3).

In MBU 12 NL, there are 29 priority species (Table 2): 12 shorebirds, 9 waterbirds, and 8 waterfowl species. There are no landbirds identified as priority species in this planning unit. Overall, 48% of shorebirds are priority bird species compared to 36% of waterfowl and 20% of waterbirds. There are 6 (21%) priority species that are formally protected under the Government of Canada's SARA (Species at Risk Public Registry 2012): 2 shorebirds, 2 waterbirds, and 2 waterfowl (Table 3).

The most frequent reasons for considering landbirds as priority species for all planning units

in this strategy are because of regional concerns or stewardship, whereas the reasons for considering shorebirds or waterbirds as priority species are typically because of national or continental concerns (Table 3). The main explanation for this difference is due to a lack of information at the regional level for many of the shorebird and waterbird species. As for waterfowl, the main reason for including them as priority species is because their status was ranked as moderately high, high or highest under the North American Waterfowl Management Plan (NAWMP Committee 2004; Table 3).

Table 1. Priority bird species in BCR 8 NL, MBU 10 NL and MBU 12 NL, population objective, and the reason for priority status.
Note: A "Y" indicates a priority species occurrence within the planning unit followed by the reason for inclusion as a priority listing.

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
Y			Barn Swallow	Landbirds	Assess/Maintain		TH							
Y			Black-backed Woodpecker	Landbirds	Maintain current					Y		Y		
Y			Black-throated Green Warbler	Landbirds	Maintain current				Y	Y				
Y			Bobolink	Landbirds	Assess/Maintain		TH		Y					
Y			Chimney Swift	Landbirds	Assess/Maintain†	TH	TH	TH	Y					
Y			Common Nighthawk	Landbirds	Assess/Maintain†	TH	TH	TH	Y					
Y			Gray-cheeked Thrush	Landbirds	Assess/Maintain			VU						
Y			Magnolia Warbler	Landbirds	Maintain current				Y	Y				
Y			Mourning Warbler	Landbirds	Maintain current				Y	Y		Y		
Y			Northern Hawk Owl	Landbirds	Maintain current							Y		
Y			Olive-sided Flycatcher	Landbirds	Maintain current†	TH	TH	TH	Y		Y			

[1] Population objectives apply in all units where the species is priority (BCR 8 NL and/or MBU 10 NL and/or MBU 12 NL) unless otherwise indicated.
[2] Species listed on Schedule 1 under the SARA as Endangered (EN), Threatened (TH) or Special Concern (SC) (Species at Risk Public Registry 2012).
[3] Species assessed by the Committee on the Status of Endangered Wildlife in Canada as Endangered (EN), Threatened (TH) or Special Concern (SC; COSEWIC 2012).
[4] Species listed under Newfoundland and Labrador's *Endangered Species Act* as Endangered (EN), Threatened (TH) or Vulnerable (VU) (NL Department of Environment and Conservation 2013b).
[5] Waterfowl identified as "key species" in the Eastern Habitat Joint Venture Implementation Plan 2007 – 2012, or scored as "Moderately-High", "High" or "Highest" in either the breeding or non-breeding conservation and/or monitoring needs for waterfowl conservation regions 8 or 8.2 (analogous to BCR 8) of the North American Waterfowl Management Plan (NAWMP Committee 2004).
[6] Species added or removed by the NL Technical Working Group.
† This interim population objective will be replaced once recovery documents for this SARA-listed species are published.

Table 1 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
Y			Peregrine Falcon (*anatum/tundrius)*	Landbirds	Assess/Maintain†	SC	SC	VU		Y				
Y			Purple Finch	Landbirds	Maintain current						Y	Y		
Y			Red Crossbill (*percna*)	Landbirds	Recovery objective	EN	EN	EN	Y		Y	Y		
Y			Rusty Blackbird	Landbirds	Assess/Maintain†	SC	SC	VU	Y					
Y			Sharp-shinned Hawk	Landbirds	Maintain current							Y		
Y			Short-eared Owl	Landbirds	Assess/Maintain†	SC	SC	VU	Y					
	Y		Snowy Owl	Landbirds	Maintain current					Y				
Y			Swamp Sparrow	Landbirds	Maintain current				Y	Y		Y		
Y			White-throated Sparrow	Landbirds	Maintain current				Y	Y				
Y			Yellow-bellied Flycatcher	Landbirds	Maintain current					Y		Y		
Y			American Golden-Plover	Shorebirds	Assess/Maintain				Y					
		Y	Black-bellied Plover	Shorebirds	Assess/Maintain				Y					
		Y	Dunlin[7]	Shorebirds	Assess/Maintain				Y					
Y		Y	Least Sandpiper[7]	Shorebirds	Assess/Maintain				Y					
	Y	Y	Lesser Yellowlegs	Shorebirds	Assess/Maintain				Y					
Y	Y	Y	Piping Plover (*melodus*)	Shorebirds	Recovery objective	EN	EN	EN	Y					
	Y	Y	Purple Sandpiper	Shorebirds	Assess/Maintain				Y					
	Y	Y	Red Knot (*rufa*)	Shorebirds	Assess/Maintain†	EN	EN	EN	Y					
	Y	Y	Sanderling	Shorebirds	Assess/Maintain				Y					

[7] The shorebird priority species were selected based on Andres 2009. A recent assessment (Andres et al. 2012) now suggests that the populations of some of these shorebird species (e.g. Dunlin, Least Sandpiper and Solitary Sandpiper) are stable. Subsequent database versions will be modified to account for this new information.

Table 1 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
Y		Y	Semipalmated Sandpiper	Shorebirds	Assess/Maintain				Y					
	Y		Solitary Sandpiper[7]	Shorebirds	Assess/Maintain				Y					
Y	Y	Y	Whimbrel	Shorebirds	Assess/Maintain				Y					
	Y	Y	White-rumped Sandpiper	Shorebirds	Maintain current									Added
		Y	Willet	Shorebirds	Assess/Maintain				Y					
Y			Wilson's Snipe	Shorebirds	Maintain current				Y					
Y			American Bittern	Waterbirds	Maintain current				Y			Y		
	Y		Atlantic Puffin	Waterbirds	Maintain current									Added
		Y	Black-headed Gull	Waterbirds	Maintain current									Added
	Y		Black-legged Kittiwake	Waterbirds	Maintain current					Y		Y		Added (MBU 10 NL), Removed (MBU 12 NL)
Y	Y		Common Loon	Waterbirds	Maintain current (BCR 8 NL) Assess/Maintain (MBU 10 NL)				Y			Y		
	Y		Common Murre	Waterbirds	Assess/Maintain				Y					
Y	Y	Y	Common Tern	Waterbirds	Maintain current (BCR 8 NL) Assess/Maintain (MBU 10 NL, MBU 12 NL)				Y			Y		
	Y		Cory's Shearwater	Waterbirds	Assess/Maintain				Y					
	Y	Y	Dovekie	Waterbirds	Assess/Maintain						Y			
	Y	Y	Great Shearwater	Waterbirds	Assess/Maintain						Y			
	Y		Great Skua	Waterbirds	Assess/Maintain				Y					

Table 1 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
		Y	Horned Grebe	Waterbirds	Assess/Maintain[†]	EN[8]	EN[8] SC[9]		Y					
	Y	Y	Ivory Gull	Waterbirds	Recovery objective	EN	EN	EN	Y					
	Y		Leach's Storm-Petrel	Waterbirds	Assess/Maintain				Y					
	Y		Manx Shearwater	Waterbirds	Assess/Maintain				Y					
	Y	Y	Northern Gannet	Waterbirds	Maintain current					Y		Y		Added (MBU 12 NL)
	Y		Razorbill	Waterbirds	Assess/Maintain						Y			
	Y	Y	Red-necked Grebe	Waterbirds	Assess/Maintain				Y		Y			
	Y		Red-throated Loon	Waterbirds	Assess/Maintain				Y					
	Y	Y	Sooty Shearwater	Waterbirds	Assess/Maintain				Y					
	Y		Thick-billed Murre	Waterbirds	Assess/Maintain				Y					
Y	Y	Y	American Black Duck	Waterfowl	Maintain current				Y				EHJV, NAWMP	
	Y	Y	Barrow's Goldeneye (Eastern)	Waterfowl	Assess/Maintain	SC	SC	VU	Y				EHJV, NAWMP	
	Y	Y	Black Scoter	Waterfowl	Assess/Maintain				Y				NAWMP	Added (MBU 12 NL)
Y	Y	Y	Canada Goose (North Atlantic)	Waterfowl	Increase 50%				Y				EHJV, NAWMP	
	Y	Y	Common Eider	Waterfowl	Increase 100% (MBU 10 NL) Assess/Maintain				Y				EHJV, NAWMP	

[8] Status applies to the Magdalen Islands Population of Horned Grebe.
[9] Status applies to the Western Population of Horned Grebe.

Table 1 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	Population Objective[1]	SARA[2]	COSEWIC[3]	Provincial Listing[4]	National/Continental Concern	National/Continental Stewardship	Regional/Subregional Concern	Regional/Subregional Stewardship	Waterfowl[5]	Expert Review[6]
					(MBU 12 NL)									
Y	Y	Y	Common Goldeneye	Waterfowl	Maintain current (BCR 8 NL) Assess/Maintain (MBU 10 NL, MBU 12 NL)				Y			Y	EHJV, NAWMP	
Y	Y		Common Merganser	Waterfowl	Assess/Maintain							Y	NAWMP	
Y			Green-winged Teal	Waterfowl	Increase 50%								EHJV	
Y	Y	Y	Harlequin Duck (Eastern)	Waterfowl	Assess/Maintain	SC	SC	VU	Y				EHJV, NAWMP	
	Y		King Eider	Waterfowl	Assess/Maintain				Y				NAWMP	
	Y	Y	Long-tailed Duck	Waterfowl	Assess/Maintain				Y				EHJV, NAWMP	Added (MBU 12 NL)
Y			Ring-necked Duck	Waterfowl	Increase 100%							Y	EHJV, NAWMP	
Y	Y		Surf Scoter	Waterfowl	Assess/Maintain				Y				EHJV, NAWMP	Removed (MBU 12 NL)
	Y		White-winged Scoter	Waterfowl	Assess/Maintain				Y				NAWMP	Removed (MBU 12 NL)

Table 2. Summary of priority species, by bird group, in BCR 8 NL, MBU 10 NL and MBU 12 NL.

Bird Group	Total Species (% of avifauna)	Total Priority Species	Percent Listed as Priority	Percent of Priority List
BCR 8 NL				
Landbirds	109 (64%)	20	18%	54%
Shorebirds	21 (12%)	6	29%	16%
Waterbirds	17 (10%)	3	18%	8%
Waterfowl	23 (14%)	8	35%	22%
Total	**170**	**37**	**22%**	**100%**
MBU 10 NL				
Landbirds	4 (4%)	1	25%	3%
Shorebirds	26 (27%)	8	31%	20%
Waterbirds	44 (45%)	18	41%	46%
Waterfowl	24 (24%)	12	50%	31%
Total	**98**	**39**	**40%**	**100%**
MBU 12 NL				
Shorebirds	25 (28%)	12	48%	41%
Waterbirds	44 (48%)	9	20%	31%
Waterfowl	22 (24%)	8	36%	28%
Total	**91**	**29**	**32%**	**100%**

Table 3. Number of priority species in BCR 8 NL, MBU 10 NL and MBU 12 NL by reason for priority status.

Reasons for Priority Listing[1]	Landbirds	Shorebirds	Waterbirds	Waterfowl
BCR 8 NL Total	**20**	**6**	**3**	**8**
COSEWIC[2]	9	1	0	1
Federal SARA listed[3]	7	1	0	1
Provincially listed[4]	8	1	0	1
NAWMP[5]	–	–	–	8
National/Continental Concern	12	6	3	5
National/Continental Stewardship	8	–	–	–
Regional/Subregional Concern	3	–	–	–
Regional/Subregional Stewardship	8	–	3	3
Added during expert reviews[6]	0	0	0	0
MBU 10 NL Total	**1**	**8**	**18**	**12**
COSEWIC[2]	0	2	1	2
Federal SARA listed[3]	0	2	1	2
Provincially listed[4]	0	2	1	2
NAWMP[5]	–	–	–	12
National/Continental Concern	–	7	13	11
National/Continental Stewardship	1	–	2	–
Regional/Subregional Concern	–	–	4	–
Regional/Subregional Stewardship	–	–	4	2
Added during expert reviews[6]	0	1	2	0
MBU 12 NL Total	**0**	**12**	**9**	**8**
COSEWIC[2]	0	2	2	2
Federal SARA listed[3]	0	2	2	2
Provincially listed[4]	0	2	1	2
NAWMP[5]	–	–	–	8
National/Continental Concern	–	11	5	8
National/Continental Stewardship	–	–	1	–
Regional/Subregional Concern	–	–	3	–
Regional/Subregional Stewardship	–	–	2	1
Added during expert reviews[6]	0	1	2	0

[1] A single species can be on the priority list for more than one reason. Note that not all reasons for inclusion apply to every bird group (indicated by "-").

[2] COSEWIC indicates species assessed by the Committee on the Status of Endangered Wildlife in Canada as Endangered, Threatened or Special Concern (COSEWIC 2012).

[3] Species listed on Schedule 1 of *the Species at Risk Act* as Endangered, Threatened, or Special Concern (Species at Risk Public Registry 2012).

[4] Species listed under Newfoundland and Labrador *Endangered Species Act* as Endangered, Threatened or Vulnerable (NL Department of Environment and Conservation 2013).

[5] Waterfowl identified as "key species" in the Eastern Habitat Joint Venture Implementation Plan 2007 – 2012, or scored as "Moderately-High", "High" or "Highest" " in either the breeding or non-breeding conservation and/or monitoring needs for waterfowl conservation regions 8 or 8.2 (analogous to BCR 8) of the North American Waterfowl Management Plan (NAWMP Committee 2004).

[6] Species added by the NL Technical Working Group.

Element 2: Habitats Important to Priority Species

Identifying the broad habitat requirements for each priority species within the BCR and the MBU allowed species to be grouped by shared habitat-based conservation issues and actions (see Appendix 2 for details on how species were assigned to standard habitat categories). If many priority species associated with the same habitat face similar conservation issues, then conservation action in that habitat may support populations of several priority species. BCR strategies use a modified version of the standard land cover classes developed by the United Nations (Food and Agriculture Organization 2000) to categorize habitats, and species were often assigned to more than one habitat class.

The assignment of habitat associations for priority bird species was done through literature review and expert consultation. For each priority species in BCR 8 NL, MBU 10 NL and MBU 12 NL, all of their known habitat associations were considered, not just the primary habitat associations (see Table A-2 for a complete list of habitat associations). Because of variability in the quality and availability of information related to species-habitat associations, quantifying the relative importance of any given habitat was not possible. In this document, statements regarding the importance of habitat types for priority bird species are related to the number of priority birds associated with each habitat and may not reflect the overall importance of the habitat to all bird species in the planning unit.

In BCR 8 NL, wetlands are used by the greatest number of priority bird species (18 species; Fig. 4). More priority bird species are found in coniferous forests (15 species) than in mixed wood forests (2 species; Fig. 4). Coastal (above high tide) and riparian habitats are also important to priority bird species as they are used by 14 and 13 priority species, respectively. As for mixed woods, few priority bird species use cultivated and managed areas or herbaceous habitats (3 species; Fig. 4).

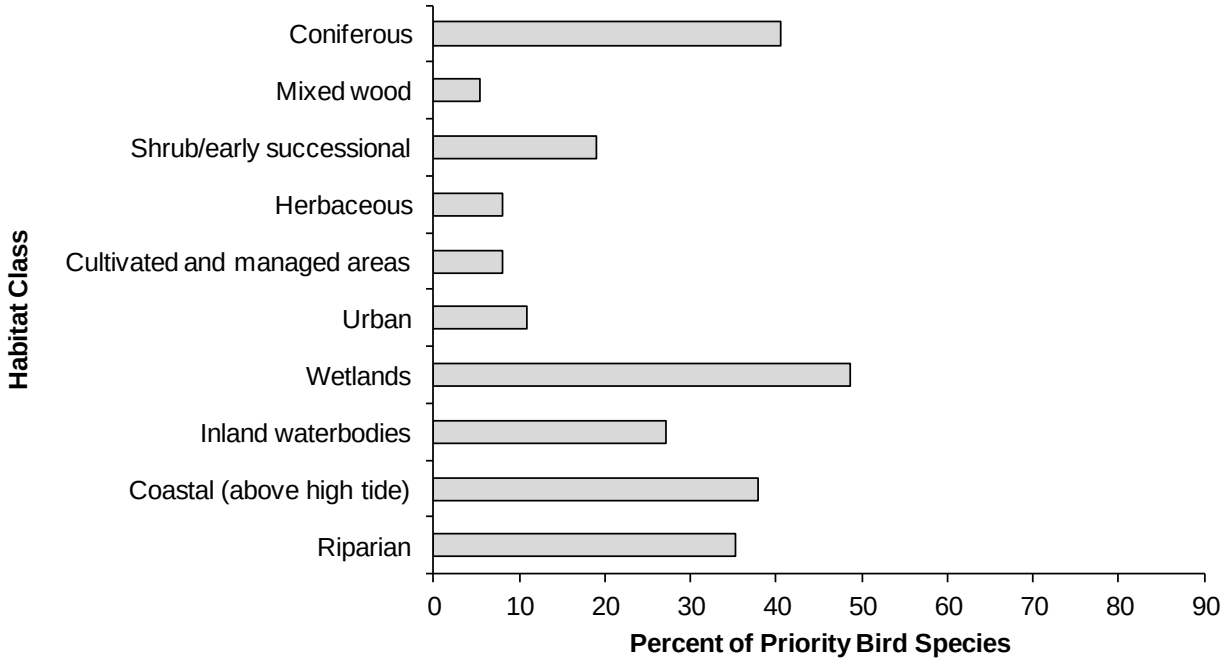

Figure 4. Percent of priority species that are associated with each habitat class in BCR 8 NL.
Note: The total exceeds 100% because each species may be assigned to more than one habitat.

There are only two habitat classes in MBU 10 NL and MBU 12 NL: coastal (intertidal) and marine waters (which include nearshore waters and continental shelf). In the Newfoundland-Labrador Shelves marine unit (MBU 10), there are 28 priority bird species associated with the intertidal coast while 30 priority bird species are found in marine waters (Fig. 5). In the Gulf of St. Lawrence marine unit (MBU 12), there are 23 priority bird species associated with the intertidal coast while 16 priority bird species are found in marine waters (Fig. 6).

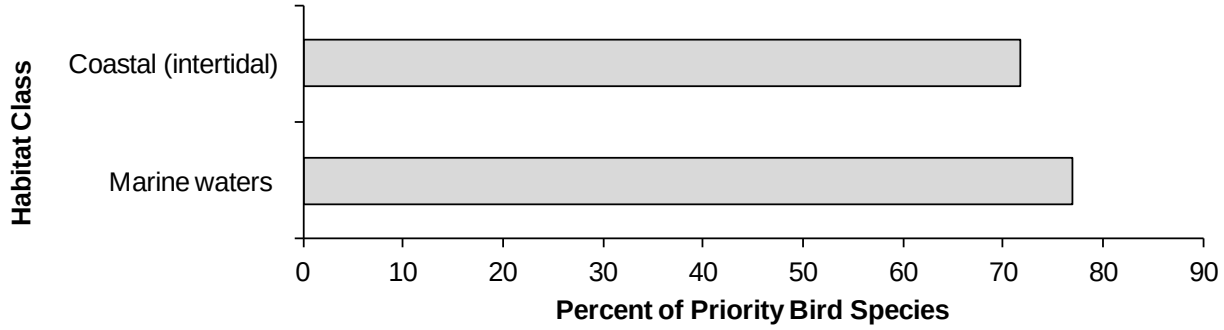

Figure 5. Percent of priority species that are associated with each habitat class in MBU 10 NL, the Newfoundland-Labrador Shelves.
Note: The total exceeds 100% because each species may be assigned to more than one habitat.

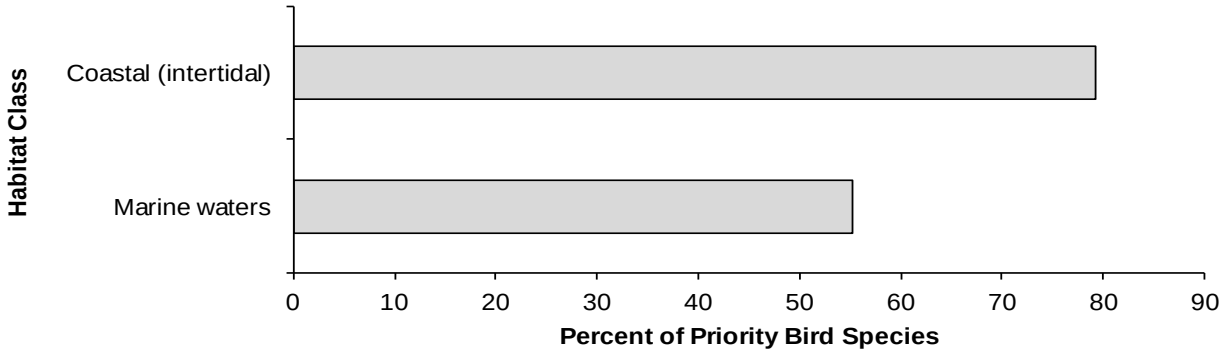

Figure 6. Percent of priority species that are associated with each habitat class in MBU 12 NL, the Gulf of St. Lawrence.

Note: The total exceeds 100% because each species may be assigned to 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 (see Appendix 2). For any species listed under the SARA or under provincial/territorial endangered species legislation, Bird Conservation Strategies defer to population objectives in available Recovery Strategies and Management Plans. The ultimate measure of conservation success will be the extent to which population objectives have been reached over the next 40 years. Population objectives do not currently factor in feasibility of achievement, but are held as a standard against which to measure progress.

In BCR 8 NL, the population objective for 17 priority bird species is to maintain current levels, an indication that population trends for these species are stable (Fig. 7). They are still considered priorities due to factors such as national/continental and regional/subregional concern or stewardship status (Table 1). Fifteen priority bird species have a population objective of "assess/maintain", which signifies that there are insufficient data to reliably assess a population trend therefore additional monitoring is required for these species (Fig. 7). There are 5 priority species with identified population declines and for which the objective is to recover or increase population size by 50% or 100% (Fig. 7). The Piping Plover (*melodus)* and Red Crossbill (*percna*) have specific recovery objectives described in their respective SARA Recovery Strategies (Table 1). The Canada Goose (North Atlantic) and Green-winged Teal both have a population objective to increase by 50% while the Ring-necked Duck has an EHJV objective to increase by 100% (Fig. 7).

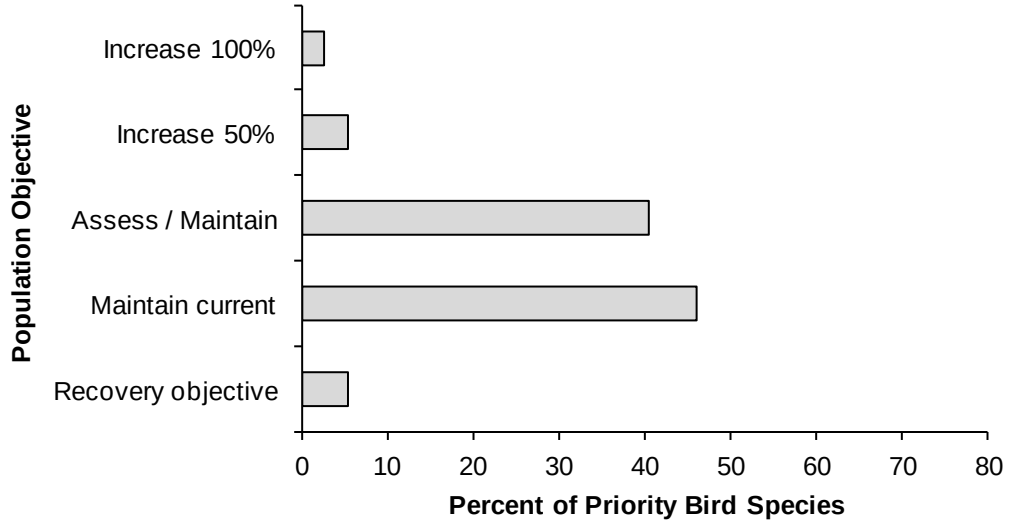

Figure 7. Percent of priority species that are associated with each population objective category in BCR 8 NL.

In MBU 10 NL, there is insufficient data to reliably assess a trend for the majority of priority species (29 species); therefore, their population objectives are to “assess/maintain” (Fig. 8). Six priority species have a population objective of “maintain current” while 4 priority species have identified population declines and were given population objectives to recover or increase population size by 50% or 100%. The Piping Plover (*melodus*) and Ivory Gull have specific recovery objectives described in their respective SARA Recovery Strategies (Table 1). The Canada Goose (North Atlantic) has a population objective to increase by 50% while the Common Eider has an EHJV objective to increase by 100% (Fig. 8).

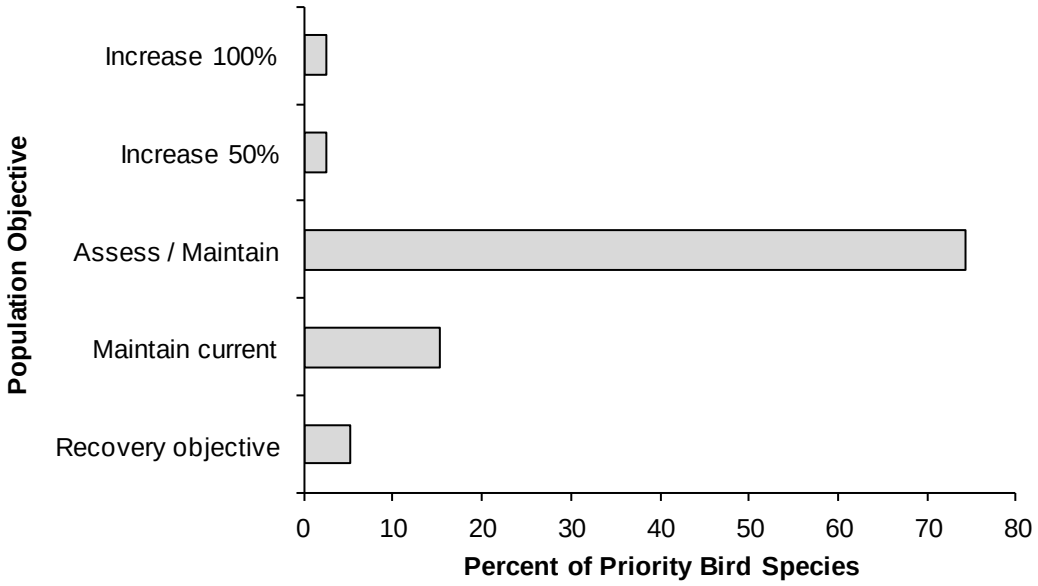

Figure 8. Percent of priority species that are associated with each population objective category in MBU 10 NL.

In MBU 12 NL, there is insufficient data to reliably assess a trend for the majority of priority species (22 species) and the objective is to “assess/maintain” populations (Fig. 9). Four priority species have a population objective of “maintain current”, while 3 priority species have identified population declines and were given population objectives to recover or increase population size by 50% or 100%. The Piping Plover (*melodus*) and Ivory Gull have specific recovery objectives described in their respective SARA Recovery Strategies (Table 1) while the Canada Goose (North Atlantic) has an EHJV objective to increase by 50% (Fig. 9).

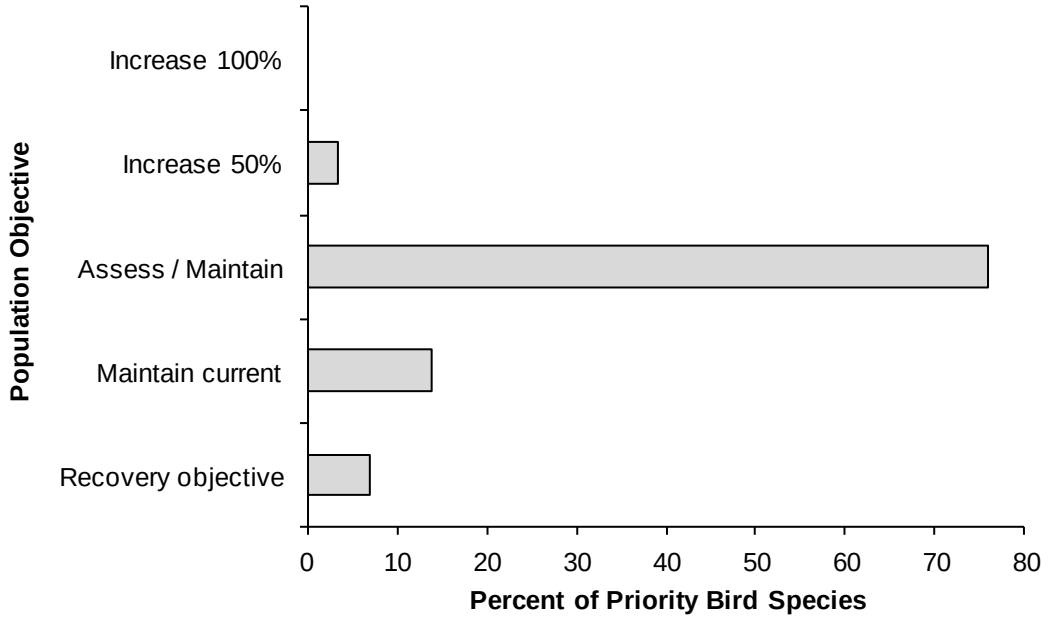

Figure 9. Percent of priority species that are associated with each population objective category in MBU 12 NL.

Element 4: Threat Assessment for Priority Species

The threats assessment process (see Appendix 2) 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 (such as predation by domestic cats or climate change) 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. We have incorporated them in a separate section on Widespread Issues, but, unlike other threats, they are not ranked. In BCR 8 NL, MBU 10 NL and MBU 12 NL, a category was added to the threats classification scheme to allow for the inclusion of inadequate monitoring or research information (category 12 "Other direct threats" and sub-category 12.1 "Information lacking"). The following discussion focuses mainly on the highest ranked threats and notes a few medium and low threats where appropriate.

A complete list of threats to priority species in each planning unit is included in Appendix 1 (Table A-3). Some of the threats identified are not unique to a particular planning unit or a type of habitat (for example, legal hunting or poaching and incidental take by hunters/trappers) while others are more specific (for example, habitat loss due to tourism and recreational housing development in coastal habitats). These threats are categorized as per Salafsky et al. 2008 (see Table A-4 in Appendix 3 for a complete list of threat categories).

Once individually ranked threats to priority species are rolled up for each habitat class, the overall threat magnitude is "high" in the shrub/early successional, wetland, coastal (above high tide) and riparian habitats of BCR 8 NL, as well as the intertidal coasts of both MBU 10 NL and MBU 12 NL and the marine waters of MBU 10 NL. The other habitat classes have an overall threat magnitude of "medium" except for mixed wood forests, herbaceous habitats and inland waterbodies of BCR 8 NL, which have a threat magnitude of "low" (Table 4).

In BCR 8 NL, several high-ranked threats were identified, including gaps in knowledge of the distribution, abundance and population trends of priority bird species (12.1 Information lacking). Climate change created habitat loss or degradation from changes to habitat structures, food webs, shifts in species' ranges and altered timing of seasonal cues (11.1 Habitat shifting & alteration) in shrub/early successional, wetlands, coastal (above high tide) and riparian habitats. Climate change also resulted in habitat degradation or mortality from an increase in frequency and severity of storms (11.4 Storms and flooding) that lead to a loss of productivity and/or reduction in food availability in wetlands, cultivated and managed areas, coniferous, urban, riparian, and coastal (above high tide) habitats (Fig. 10).

Medium-ranked threats to priority species in BCR 8 NL include population reductions in American Black Ducks due to hybridization with Mallards, competition with other species (e.g., grazing geese, Red-winged Blackbirds or Common Grackles) for resources and increased predator populations due to anthropogenic land modifications (8.2 Problematic native species). Habitat loss or degradation from the destruction and manipulation of inland waterbodies, wetlands, coastal (above high tide), and riparian habitats due to changes in hydrologic regimes, water management or river channelization (7.2 Dams & water management/use) was also ranked medium, as was mortality from cold snaps in spring due to climate change (11.3 Temperature extremes) in coniferous, wetland, cultivated and managed areas, urban, riparian, and coastal (above high tide) habitats. Other threats that were frequently identified but ranked as low overall in BCR 8 NL were habitat degradation or mortality due to chemical contamination mainly from the use of pesticides related to forestry activities in coastal habitats (above high tide), coniferous forests, mixed wood forests, inland waterbodies and wetlands (9.3 Agricultural & forestry effluents). Similarly, mortality due to legal hunting or poaching and incidental take by hunters/trappers (5.1 Hunting & collecting of terrestrial animals) was a frequent low-ranked threat in all habitats except mixed wood forests, cultivated and managed areas, and herbaceous (Fig. 10).

In MBU 10 NL and MBU 12 NL, the highest ranked threat categories (all ranked “high” in MBU 10 and all ranked “medium” in MBU 12) were habitat degradation, lethal and/or sub-lethal effects due to chemical or heavy metal contamination, especially from oil spills and discharges by ships or drilling platforms (9.2 Industrial & military effluents), as well as gaps in knowledge of the distribution, abundance and population trends of priority bird species (12.1 Information lacking) in both coastal (intertidal) habitats and marine waters (Figs. 11, 12). There are several medium-ranked threats in MBU 10 NL including mortality from entanglement in fishing gear and habitat degradation from competition with commercial fisheries for prey in marine waters (5.4 Fishing & harvesting aquatic resources). Climate change resulted in habitat degradation from changes to habitat structure and food webs (11.1 Habitat shifting & alteration) as well as temporal, geographic distribution and changes in sea ice thickness (11.3 Temperature extremes). Finally, population reductions due to the hybridization of American Black Ducks with Mallards in both marine habitats, and increases in predator populations due to anthropogenic land modifications (8.2 Problematic native species) in coastal (intertidal) habitats, were also ranked medium in MBU 10 NL (Fig. 11). In MBU 12 NL, additional medium-ranked threats were habitat degradation from climate-change-induced habitat structure alterations (11.1 Habitat shifting & alteration) such as tidal currents and amplitudes in coastal (intertidal) habitats, as well as reductions in survival due to an increase in predator populations as a result of anthropogenic land modifications (8.2 Problematic native species) in marine waters (Fig. 12).

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

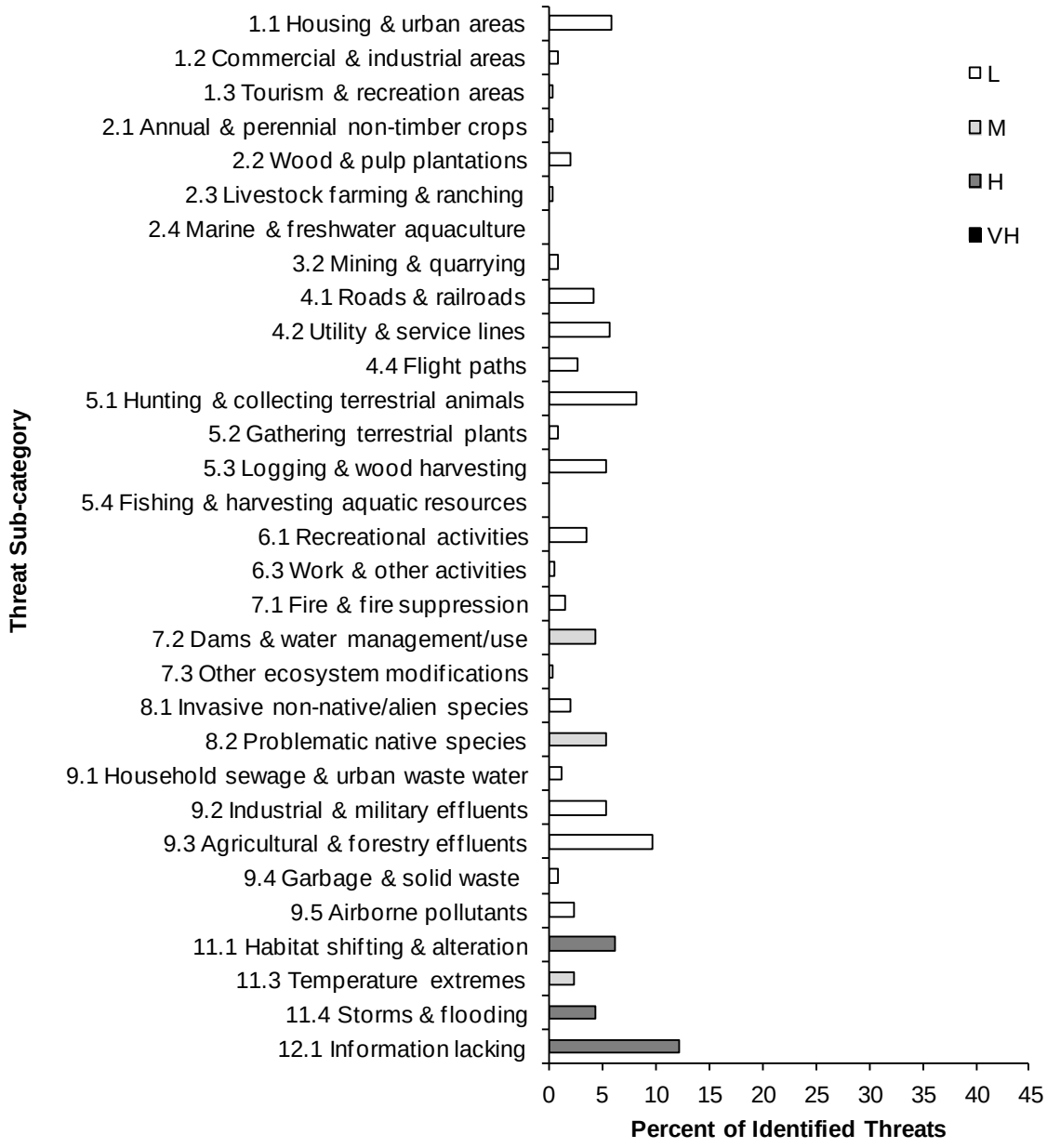

Figure 10. Percent of identified threats to priority species within BCR 8 NL by threat sub-category. Each bar represents the percent of the total number of threats identified for each threat sub-category in BCR 8 NL (for example, if 100 threats were identified in total for all priority species in BCR 8 NL, and 10 of those threats were in the category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). Shading in the bars (VH = very high, H = high, M = medium and L = low) represents the rolled-up magnitude of all threats in each threat subcategory in the BCR (see Appendix 2 for details on the assessment of magnitude).

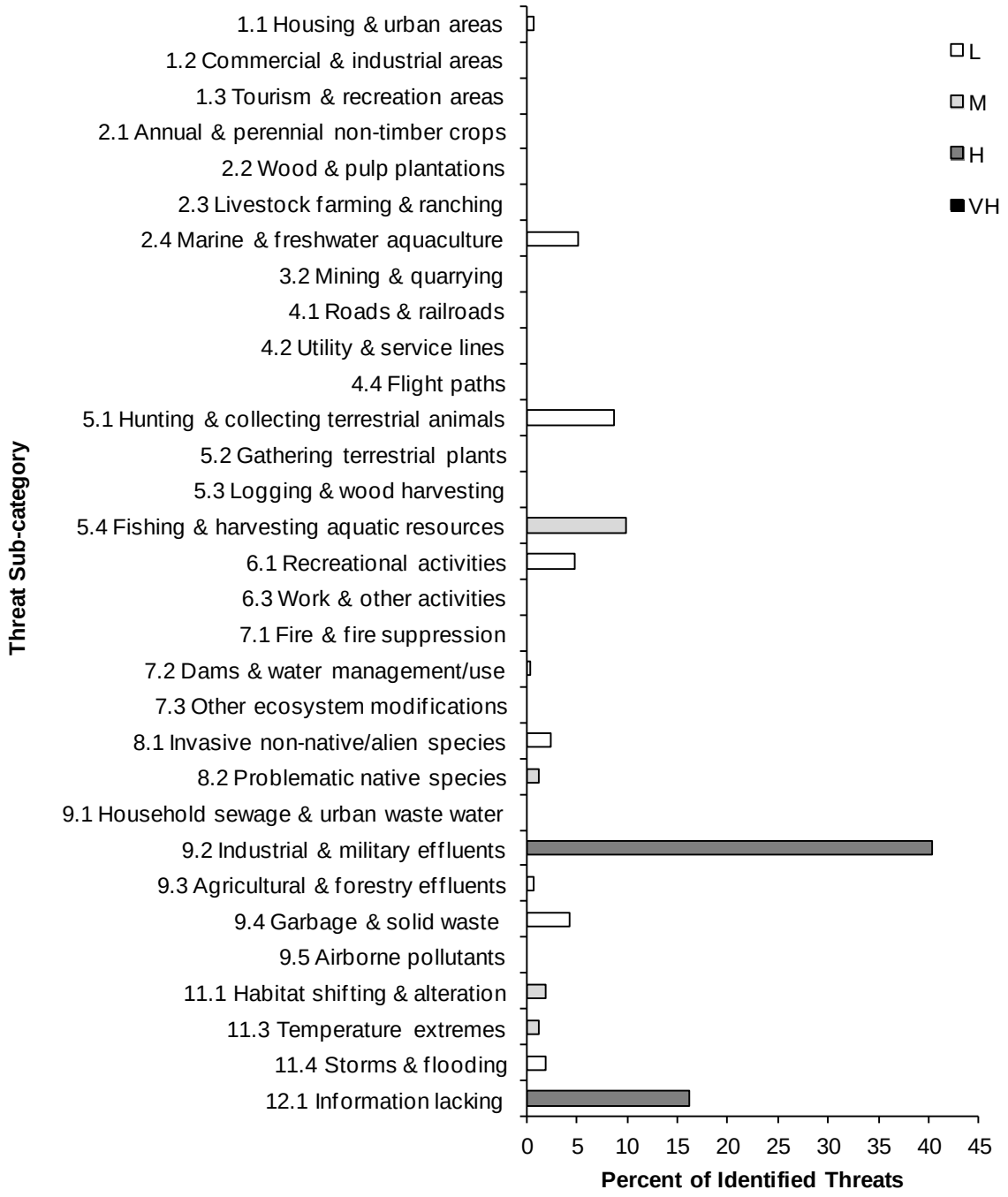

Figure 11. Percent of identified threats to priority species within MBU 10 NL by threat sub-category.
Each bar represents the percent of the total number of threats identified for each threat sub-category in MBU 10 NL (for example, if 100 threats were identified in total for all priority species in MBU 10 NL, and 10 of those threats were in the category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). Shading in the bars (VH = very high, H = high, M = medium and L = low) represents the rolled-up magnitude of all threats in each threat subcategory in the MBU (see Appendix 2 for details on the assessment of magnitude).

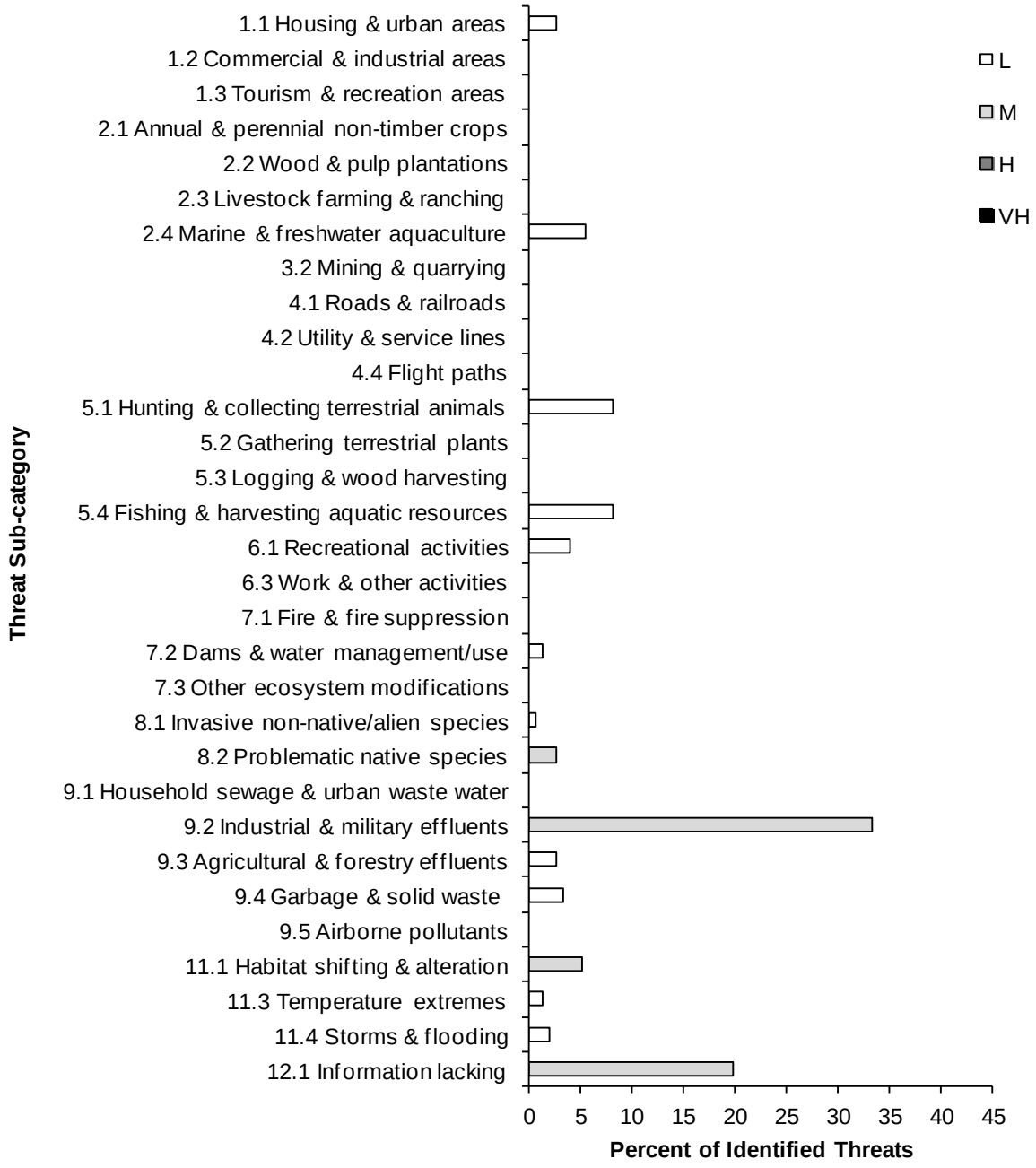

Figure 12. Percent of identified threats to priority species within MBU 12 NL by threat sub-category. Each bar represents the percent of the total number of threats identified for each threat sub-category in MBU 12 NL (for example, if 100 threats were identified in total for all priority species in MBU 12 NL, and 10 of those threats were in the category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). Shading in the bars (VH = very high, H = high, M = medium and L = low) represents the rolled-up magnitude of all threats in each threat subcategory in the MBU (see Appendix 2 for details on the assessment of magnitude).

Table 4. Relative magnitude of identified threats to priority species within BCR 8 NL, MBU 10 NL and MBU 12 NL by threat category and broad habitat class.

Note: Overall ranks were generated through a roll-up procedure described in Kennedy et al. 2012. L represents Low magnitude threats; M = Medium; H = High; VH = Very High. Blank cells indicate that no priority species had threats identified in the threat category/habitat class combination.

	BCR 8 NL											MBU 10 NL			MBU 12 NL		
Threat Category	**Habitat Class**											**Habitat Class**			**Habitat Class**		
	Coniferous	Mixed wood	Shrub/early successional	Herbaceous	Cultivated and managed areas	Urban (artificial surfaces & bare areas)	Wetlands	Inland waterbodies	Coastal (above high tide)	Riparian	**Overall**	Marine waters	Coastal (intertidal)	**Overall**	Marine waters	Coastal (intertidal)	**Overall**
Overall	**M**	**L**	**H**	**L**	**M**	**M**	**H**	**L**	**H**	**H**		**H**	**H**		**M**	**H**	
1. Residential & commercial development	L		L			M	L	L	L	L	**L**		L	**L**		L	**L**
2. Agriculture & aquaculture	L	L			M		L			L	**L**	L	L	**L**	L	L	**L**
3. Energy production & mining			L						L	L	**L**						
4. Transportation & service corridors	L	L	L		L	L	L	L	L	L	**L**						
5. Biological resource use	M	L	L			L	L	L	L	L	**L**	H	M	**M**	M	L	**L**
6. Human intrusions & disturbance			L	L		L	L	L	M	L	**L**	L	M	**L**	L	L	**L**
7. Natural system modifications	M				L		M	M	M	L	**M**		L	**L**		L	**L**
8. Invasive & other problematic species & genes	M	L	L	L	L	L	L	L	H	L	**M**	L	H	**M**	L	H	**M**
9. Pollution	L	L	L	L	L	L	L	L	L	L	**L**	VH	M	**H**	H	M	**M**
11. Climate change & severe weather	M		H		H	M	H	L	H	H	**H**	M	H	**M**	M	H	**M**
12. Other direct threats	M		H	L	M	M	H	L	H	H	**H**	H	H	**H**	M	H	**M**

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 (see Appendix 2).

In BCR 8 NL, most conservation objectives pertained to ensuring the availability of adequate habitat for priority bird species (Fig. 13), while in MBU 10 NL and MBU 12 NL, most conservation objectives related to reducing mortality or increasing productivity of priority bird species (Figs. 14, 15), which was also a conservation objective for 25% of priority bird species in BCR 8 NL (Fig. 13).

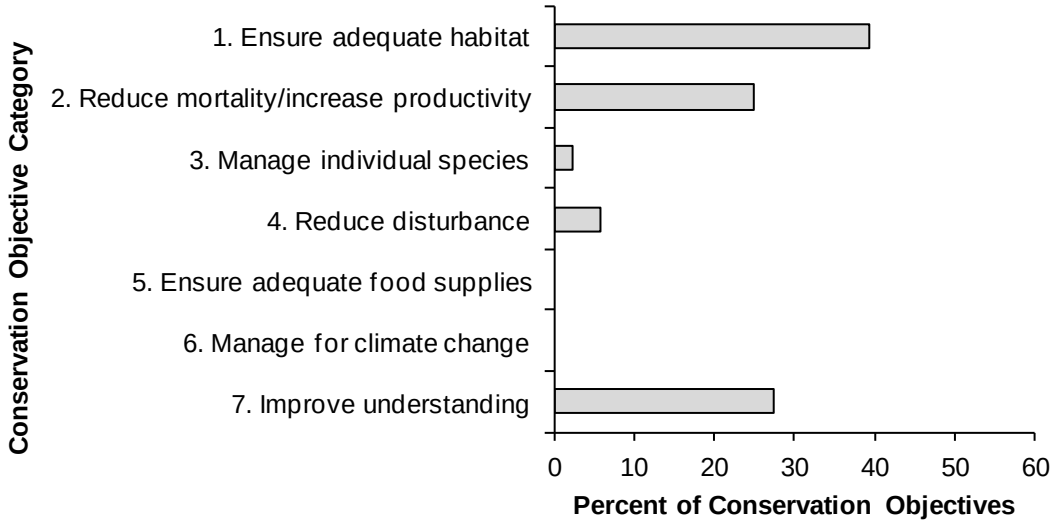

Figure 13. Percent of all conservation objectives assigned to each conservation objective category in BCR 8 NL.
Note: Widespread issues (including climate change) were excluded from this calculation, as these are detailed in Section 3: Additional Issues.

However, in all planning units, improving our understanding of priority bird species was the second-most frequently identified conservation objective (Figs. 13, 14, 15). For the majority of priority bird species in the marine units, we do not have enough information on population trends to set specific population objectives, while for most priority birds in BCR 8 NL, information is required to understand the causes of population decline on the potential effects of climate change.

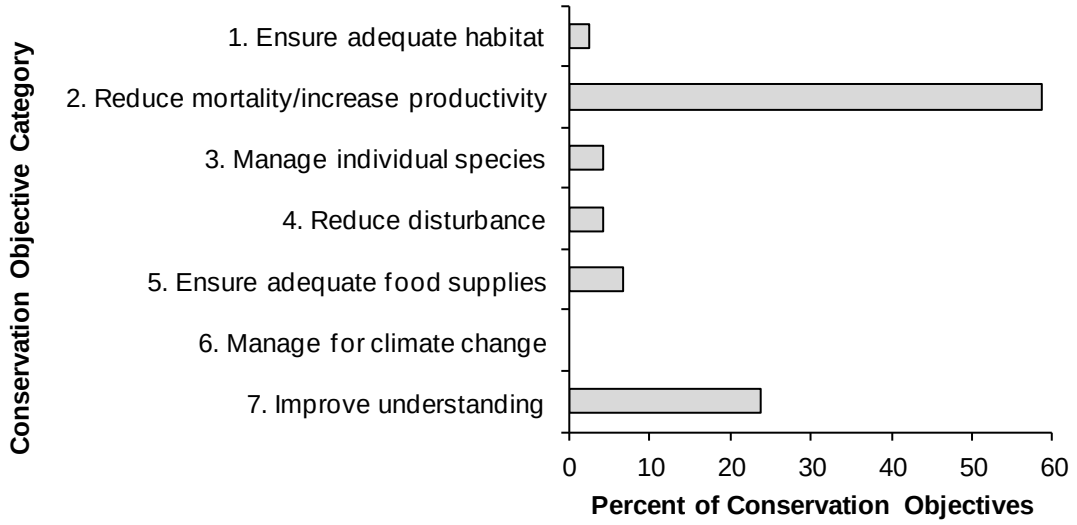

Figure 14. Percent of all conservation objectives assigned to each conservation objective category in MBU 10 NL.

Note: Widespread issues (including climate change) were excluded from this calculation, as these are detailed in Section 3: Additional Issues.

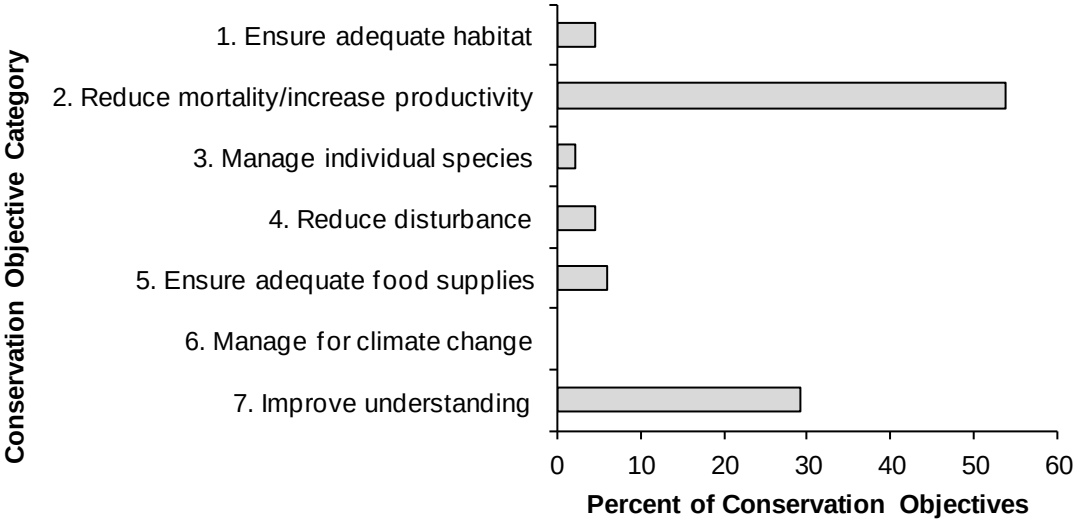

Figure 15. Percent of all conservation objectives assigned to each conservation objective category in MBU 12 NL.

Note: Widespread issues (including climate change) were excluded from this calculation, as these are detailed in Section 3: Additional Issues.

Element 6: Recommended Actions

Recommended actions indicate on-the-ground activities that will help to achieve the conservation objectives (Figs. 16, 17 and 18). Actions are strategic rather than highly detailed and prescriptive (see Appendix 2). 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, but will usually be more general than those developed for individual species.

The recommended conservation actions are classified following the categories developed by the World Conservation Union-Conservation Measures Partnership (IUCN-CMP), with the addition of categories for research and monitoring (see Table A-5 in Appendix 3 for a complete list of conservation action categories). In BCR 8 NL, the most frequently recommended conservation actions were not assigned to a sub-category, as they were related to widespread issues such as climate change and a lack of information (see Section 3: Additional Issues for more information). The most frequently identified conservation actions for direct threats were listed under the sub-categories 2.1 Site/area management and 5.3 Private sector standards and codes (Fig. 16). Examples of actions under site or area management include specific recommendations to establish buffer zones around known breeding, foraging and/or staging areas in and around several habitats and limit industrial activities within these established buffers; limit human recreational activities in important breeding colony and stopover areas during breeding and migration windows; limit sources of loud noise and rapidly moving vehicles in sensitive areas during breeding and migration windows; as well as maintain sufficient patch sizes, configuration and connectivity of habitats to support and, where necessary, enhance populations of priority species (see Section 2 for habitat-specific examples). Examples of private sector standards and codes include the development of beneficial management practices for bridge maintenance crews to benefit priority species; use pesticides and other biocides only where necessary and only as part of an integrated pest management system to minimize exposure of birds to potentially toxic chemicals; as well as manage for tree species and age diversity, structural diversity and important habitat features (see Section 2 for habitat-specific examples).

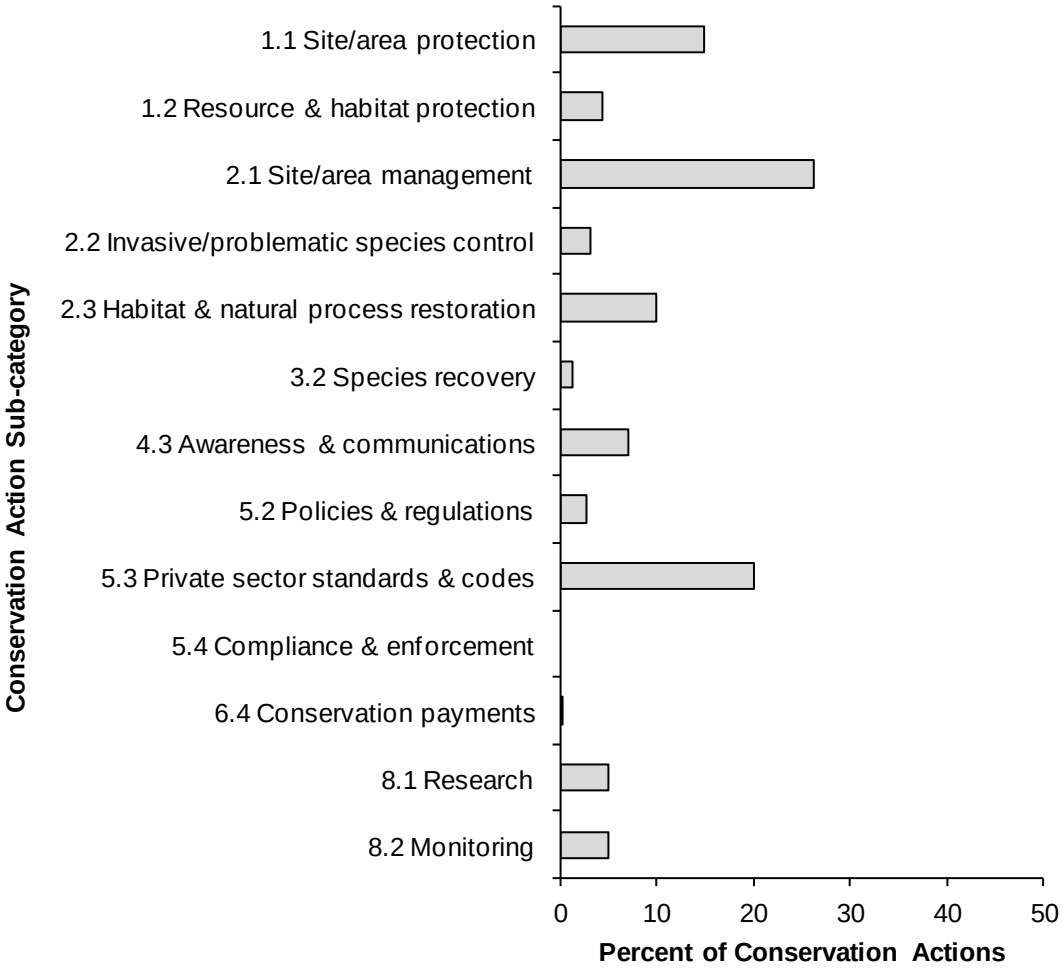

Figure 16. Percent of recommended conservation actions assigned to each sub-category in BCR 8 NL.
Note: 8.1 Research and 8.2 Monitoring sub-categories refer to specific species where additional information is required. For a discussion of broad-scale research and monitoring requirements, see Research and Population Monitoring Needs in Section 3. For information on threats related to widespread issues (e.g., climate change), see Widespread Issues in Section 3.

In MBU 10 NL and MBU 12 NL, the most frequently identified conservation actions were listed under the sub-categories 2.3 Habitat and natural process restoration and 5.2 Policies and regulations. Examples of actions under the former are to maintain/restore or improve water quality in marine waters by reducing the use of pollutants or heavy metals leaching into the environment, maintain/improve effectiveness of emergency intervention programs such as those run by the Regional Environmental Emergencies, maintain/improve Environment Canada's Birds Oiled at Sea (BOAS) program, and to recover and dispose of derelict fishing gear or garbage and solid wastes in marine waters and coastal (intertidal) habitats (see Section 2 for more habitat-specific examples). Examples of policies and regulations include making, implementing, changing, influencing or providing input into policies and regulations affecting the implementation of laws at international, national, state/provincial, local and tribal levels. For example, altering fishing practices to avoid important foraging/staging areas during periods

of peak bird use, regulating the adoption of fishing gear modifications to reduce bycatch as a condition of licensing, and prohibiting disposal of garbage and solid wastes in marine waters or coastal (intertidal) habitats through regulation (see Section 2 for more habitat-specific examples).

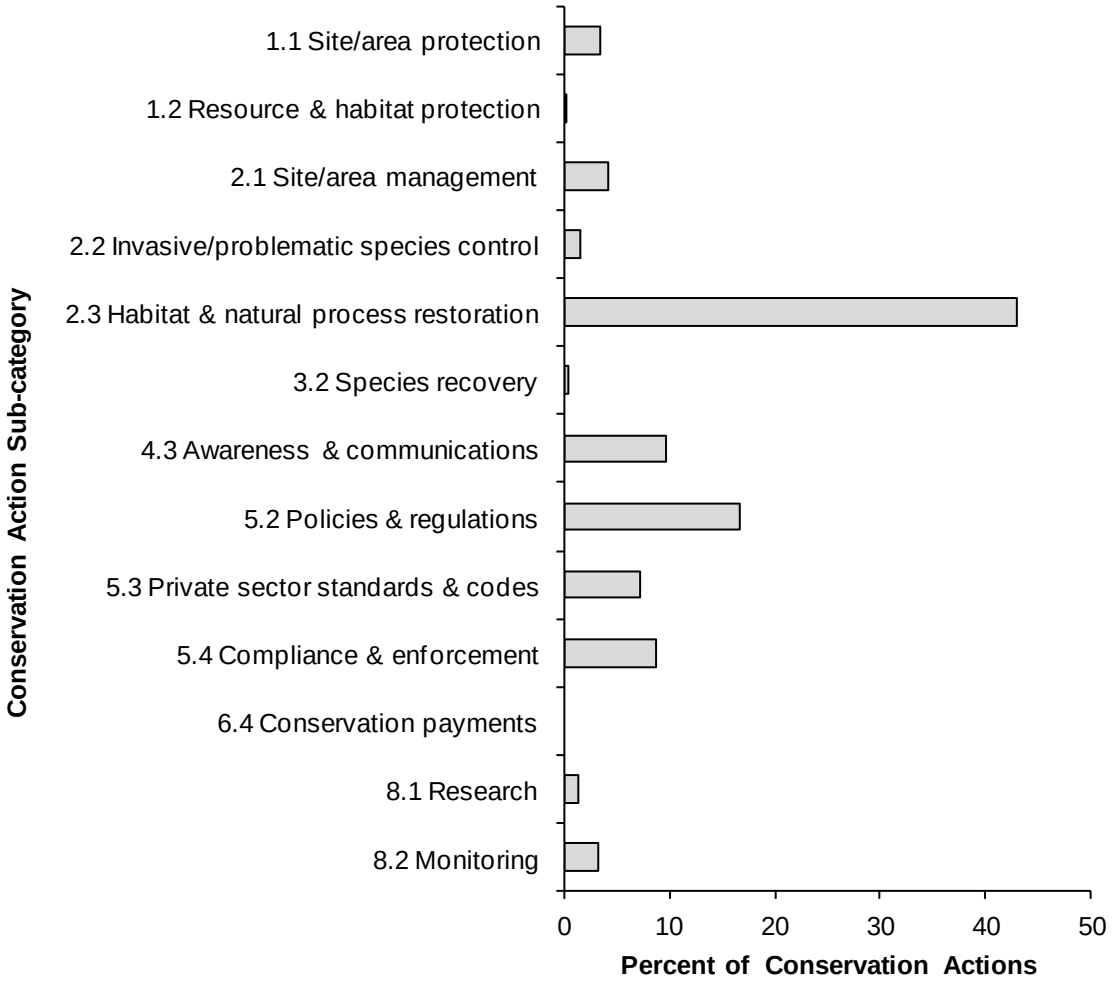

Figure 17. Percent of recommended conservation actions assigned to each sub-category in MBU 10 NL.
Note: 8.1 Research and 8.2 Monitoring sub-categories refer to specific species where additional information is required. For a discussion of broad-scale research and monitoring requirements, see Research and Population Monitoring Needs in Section 3. For information on threats related to widespread issues (e.g., climate change), see Widespread Issues in Section 3.

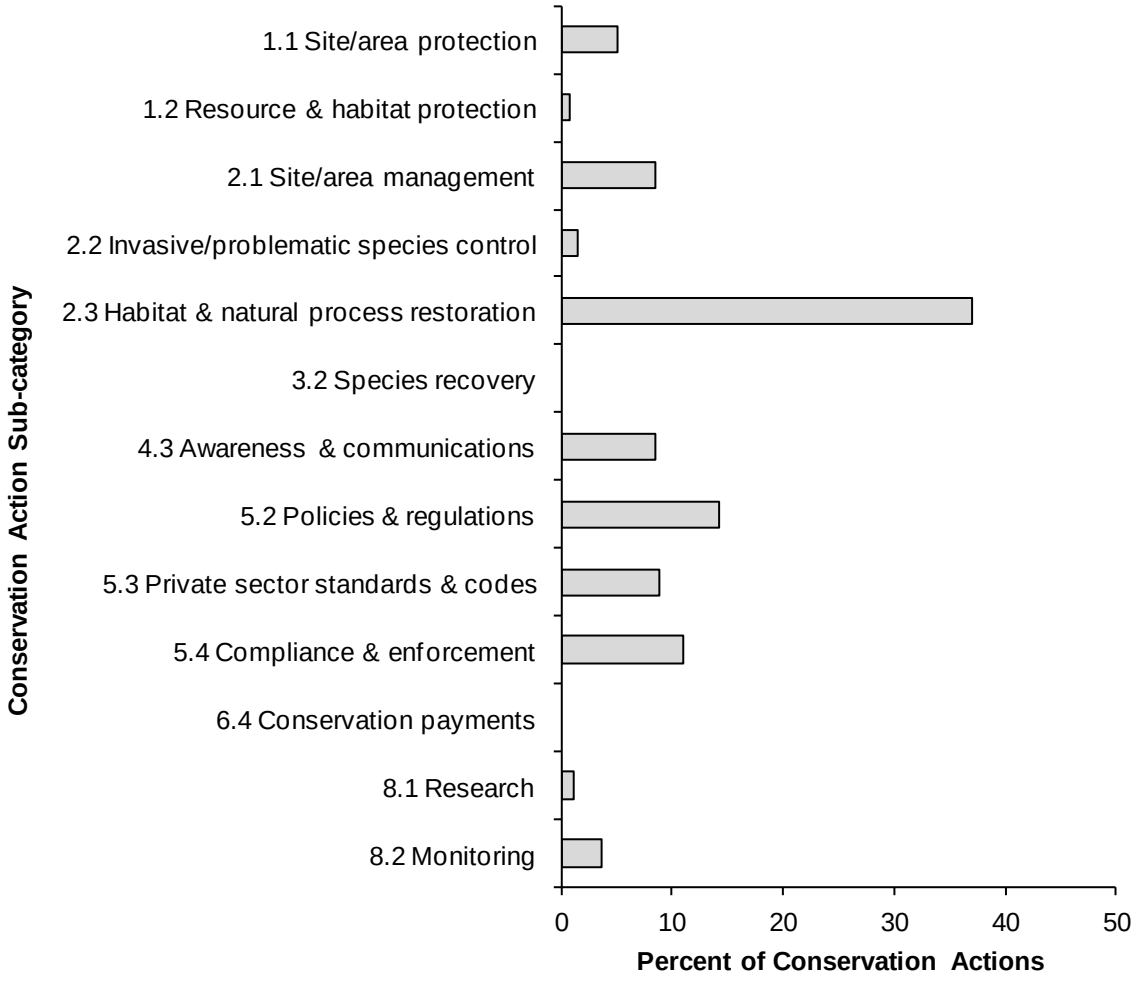

Figure 18. Percent of recommended conservation actions assigned to each sub-category in MBU 12 NL.
Note: 8.1 Research and 8.2 Monitoring sub-categories refer to specific species where additional information is required. For a discussion of broad-scale research and monitoring requirements, see Research and Population Monitoring Needs in Section 3. For information on threats related to widespread issues (e.g., climate change), see Widespread Issues in Section 3.

Section 2: Conservation Needs by Habitat

The following sections provide more detailed information on priority species, their threats and objectives within each of the broad habitat classes that occur in BCR 8 NL, MBU 10 NL and MBU 12 NL. Where appropriate, habitat information is provided at a finer scale than the broad habitat categories in order to coincide with other land management exercises in the region. Some species do not appear in the threats table because their low-level threats have not been assigned objectives or actions and/or identified threats are addressed in the Widespread Issues section of the strategy.

Coniferous

In BCR 8 NL, coniferous habitats cover the majority of the area and are characterized by young and/or mature stands of cone-producing trees (Fig. 19). The variety of species is quite limited in this habitat class due to the cool, moist climate, slow nutrient cycling and poorly drained soils (NL Department of Natural Resources 2012e). The dominant canopy species across many areas of central Newfoundland is black spruce (*Picea mariana*). This species has a very high tolerance for unfavourable conditions and is common on very wet and dry sites subjected to the occurrence of repeated forest fires. Otherwise, the coniferous forests in remaining areas of Newfoundland and Labrador are commonly pure stands of balsam fir (*Abies balsamea*) which prefer moist and well-drained soils (NL Department of Natural Resources 2012e).

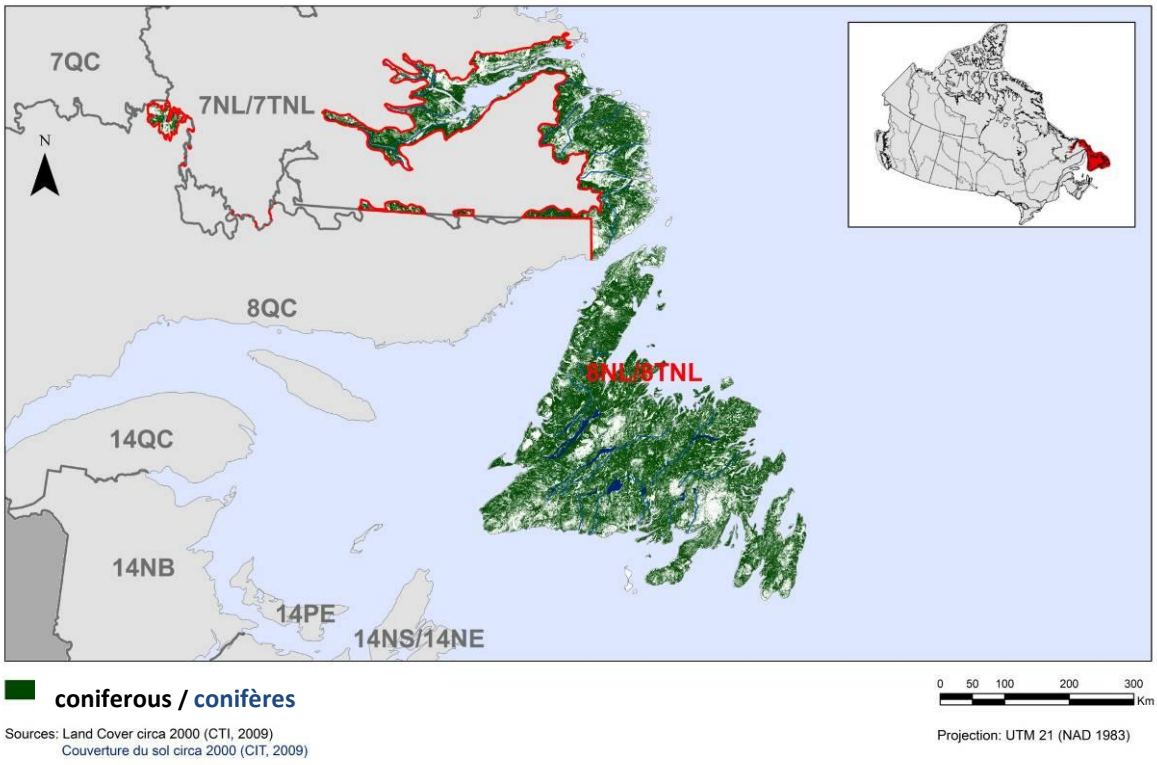

Figure 19. Map of coniferous habitats in BCR 8 NL.

There are 15 priority bird species found in coniferous habitats of BCR 8 NL (Table 5); all are landbirds, and 6 are species at risk. Half of the priority bird species are found in either scrub or spruce/lichen forests (Table 5). Priority species are also found in open, mature or moist forests (Table 5). Thirteen of these priority bird species are associated exclusively with coniferous forest habitats. Only the Purple Finch and Black-throated Green Warbler are associated with both coniferous and mixed wood forests (Tables 5, 7).

Several medium-magnitude threats to priority species in the coniferous habitats of BCR 8 NL were identified. These include habitat loss or degradation from forest harvesting (specifically clear-cutting and fragmentation) leading to the loss of tree age structure, breeding habitats and important habitat features such as cone-producing trees (5.3 Logging & wood harvesting); gaps in knowledge of priority bird species' distribution, abundance and population trends (12.1 Information lacking); habitat loss or degradation from changes in forest age structure and removal of insect-infested trees due to fire suppression (7.1 Fire & fire suppression); reductions in nest success due to predation by red squirrels, competition with other species such as red squirrels or seed-eating finches for cone crops, and habitat degradation from infestation of introduced destructive pests (i.e., woolly adelgids) feeding on tree sap (8.1 Invasive non-native/alien species); habitat degradation due to severe weather (11.4 Storms & flooding); as well as increases in adult and chick mortality due to temperature extremes such as cold snaps in spring (11.3 Temperature extremes; Fig. 20). Other low-magnitude threats that were frequently identified were lethal and/or sub-lethal toxic effects due to pesticide contamination (9.3 Agricultural & forestry effluents, as well as mortality due to collisions with towers or transmission lines (4.2 Utility & service lines; Fig. 20).

Many bird species will benefit from the conservation objectives and actions presented in Table 6. Examples of recommended conservation actions to address medium-ranked threats in coniferous habitats of BCR 8 NL include recommendations to identify, establish or expand protected areas of existing young-growth/early-successional or old-growth/late-successional forest habitats; manage for tree species, age, structural diversity and important habitat features; implement beneficial management practices (i.e., FSC Canada National Boreal Standard 2004); mimic natural fire regimes; assess the impact of increased predation on the survival of priority species; as well as to monitor the spreading of invasive species and evaluate the possibility of developing a program to control these species. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see Research and Population Monitoring Needs section). Recommended conservation actions to address climate change are presented in the Widespread Issues section of this document (see Climate Change). Conservation objectives and actions for low-ranked threats to priority bird species in coniferous habitats are available in the database but are not presented in this document.

Table 5. Priority species in BCR 8 NL that use coniferous habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Black-backed Woodpecker	mature	mature, wet, disturbance (e.g., burns, windthrow, disease, flood), abundant insects (snags and dying trees)	Maintain current			Y		Y		
Black-throated Green Warbler	non-specific coniferous	mature, balsam-fir, interior forests	Maintain current		Y	Y				
Chimney Swift	non-specific coniferous	large hollow dead deciduous or coniferous trees	Assess/Maintain	Y	Y					
Common Nighthawk	spruce/lichen forest	outstanding tall trees, burns, clear-cuts, often riparian	Assess/Maintain	Y	Y					
Gray-cheeked Thrush	mature; scrub forest	mature, thick understory	Assess/Maintain	Y						
Magnolia Warbler	non-specific coniferous; scrub forest	second growth, regenerating stands, sometimes mature with dense understory, edges	Maintain current		Y	Y				
Mourning Warbler	scrub forest		Maintain current		Y	Y		Y		
Northern Hawk Owl	open; scrub forest; spruce/lichen forest	taiga/tundra transition, closed coniferous forests bordering wetlands, other open areas (e.g., burns, clear-cuts, windthrow), burnt or rotted-out cavities, hollow snags	Maintain current					Y		
Olive-sided Flycatcher	scrub forest; spruce/lichen forest	black spruce, openings and edges (e.g., wetlands), early successional (e.g., clear-	Maintain current	Y	Y		Y			

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

Table 5 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
		cuts, burns), riparian, snags and tall perches, high elevations/montane								
Purple Finch	moist	cool, moist, edges of bogs	Maintain current				Y	Y		
Red Crossbill (*percna*)	mature	seed producing trees, black spruce, mature, contiguous	Recovery objective	Y	Y		Y	Y		
Rusty Blackbird	spruce/lichen forest	edges, wet, disturbance (e.g., burns, windthrow, beaver-modified wetlands)	Assess/Maintain	Y	Y					
Sharp-shinned Hawk	non-specific coniferous		Maintain current					Y		
White-throated Sparrow	scrub forest	forest openings and edges, disturbance (e.g., fire, clear-cuts, beaver ponds, insect damage), regenerating areas	Maintain current		Y	Y				
Yellow-bellied Flycatcher	non-specific coniferous	cool, moist, stratified vegetation structure/varying age-classes, open canopy, dense low undergrowth, mossy	Maintain current			Y		Y		

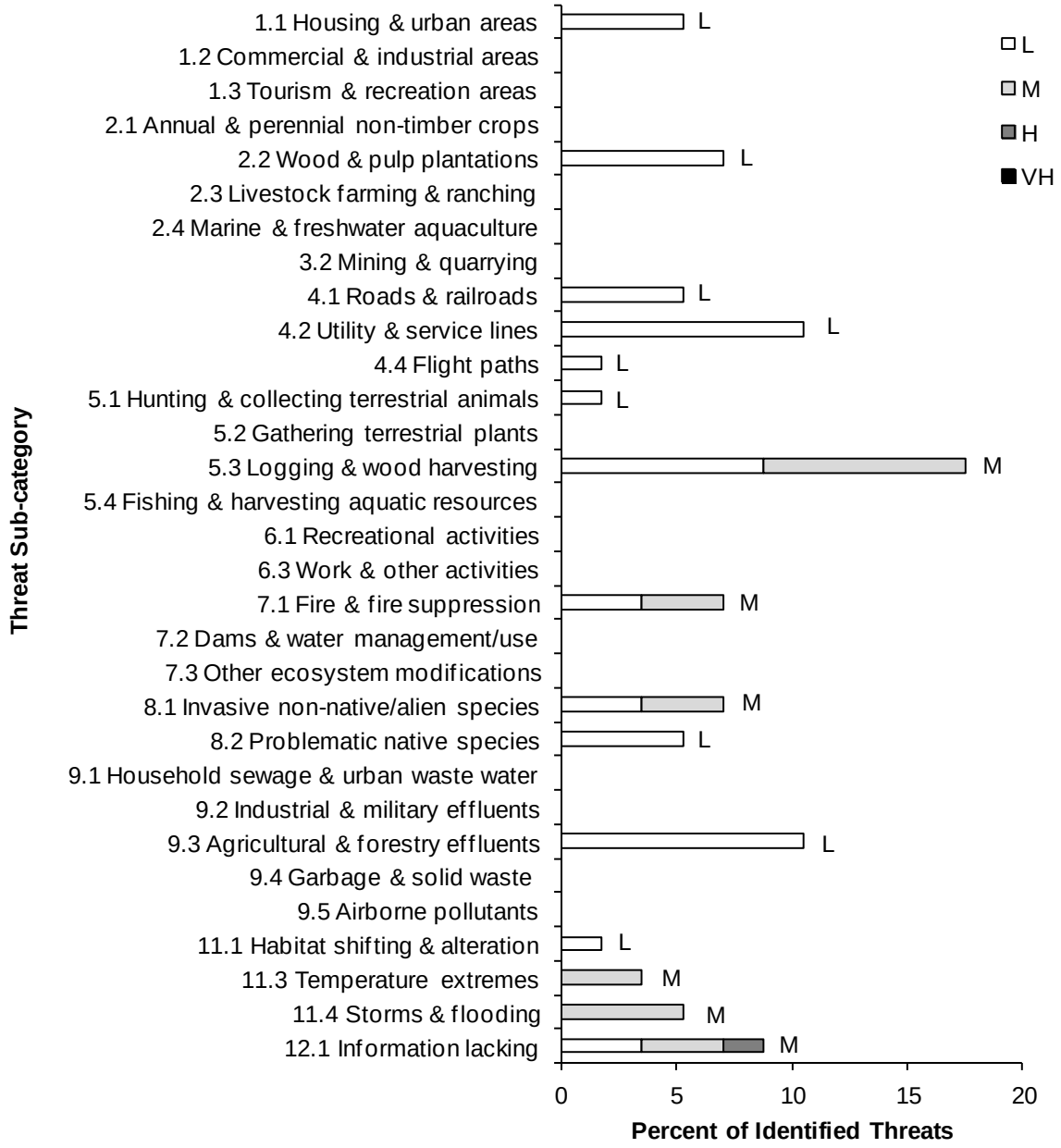

Figure 20. Percent of identified threats to priority species in coniferous habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in coniferous habitats (for example, if 100 threats were identified in total for all priority species in coniferous habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in coniferous habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 6. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected in coniferous habitats of BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Habitat loss or degradation due to clear-cutting, fragmentation and forest harvesting.	5.3 Logging & wood harvesting	Maintain/restore the diversity and quality of coniferous forest habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Identify, establish, or expand protected areas of existing old-growth/late-successional forest habitats.	1.1 Site/area protection	Medium: Black-backed Woodpecker Black-throated Green Warbler Gray-cheeked Thrush Yellow-bellied Flycatcher
				Maintain sufficient patch sizes, configuration, and connectivity of coniferous habitats to support and, where necessary, enhance populations of priority species.	2.1 Site/area management	
				Manage for tree species, age diversity, structural diversity, and important habitat features.	5.3 Private sector standards and codes	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
				Identify, establish, or expand protected areas of existing young-growth/early-successional habitats.	1.1 Site/area protection	
Loss of breeding habitat and important habitat features due to forest harvesting.	5.3 Logging & wood harvesting	Maintain/restore the diversity and quality of coniferous forest habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Identify, establish, or expand protected areas of existing old-growth/late-successional forest habitats.	1.1 Site/area protection	Medium: Red Crossbill (*percna*)
				Maintain sufficient patch sizes, configuration, and connectivity of coniferous habitats to support and, where necessary, enhance populations of priority species.	2.1 Site/area management	
				Manage for tree species, age diversity, structural diversity, and important habitat features.	5.3 Private sector standards and codes	

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 6 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
				Implement beneficial management practices.	5.3 Private sector standards and codes	
Habitat loss or degradation from forest age structure changes and removal of insect-infested trees due to fire suppression.	7.1 Fire & fire suppression	Maintain/restore the diversity and quality of coniferous forest habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Manage for large trees, large snags, and closed canopy.	2.1 Site/area management	Medium: Black-backed Woodpecker Olive-sided Flycatcher
				Mimic natural fire regimes.	2.3 Habitat and natural process restoration	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
Habitat degradation due to competition with red squirrels and seed eating finches for cone crops.	8.1 Invasive non-native/alien species	Study impact of competition between priority species and other similar species	7.4 Improve understanding of population decline causes	Compare habitats used by the priority species to those used by similar species in order to better target actions on habitats that will favour the priority species, but not similar species as well.	8.1 Research	Medium: Red Crossbill (*percna*)
Habitat degradation from infestation of introduced woolly adelgids.	8.1 Invasive non-native/alien species	Reduce or eliminate problematic invasive species	3.5 Prevent and control the spread of invasive and exotic species	Monitor the spreading of invasive species and evaluate the possibility to develop a program to control these species.	8.2 Monitoring	Medium: Black-throated Green Warbler

Mixed Wood

In BCR 8 NL, mixed wood habitats are characterized by areas of transitional and discontinuous tree cover between coniferous and deciduous forests (Fig. 21). It is the least commonly used habitat class by priority bird species in BCR 8 NL (Figs. 4, 21). The dominant canopy species are conifers such as black spruce (*Picea mariana*) and balsam fir (*Abies balsamea*), as well as deciduous trees such as white birch (*Betula papyrifera*) and trembling aspen (*Populus tremuloides*). Other mixed wood stands such as white spruce (*Picea glauca*) and larch (*Larix laricina*) can also be sporadically encountered (NL Department of Natural Resources 2012e).

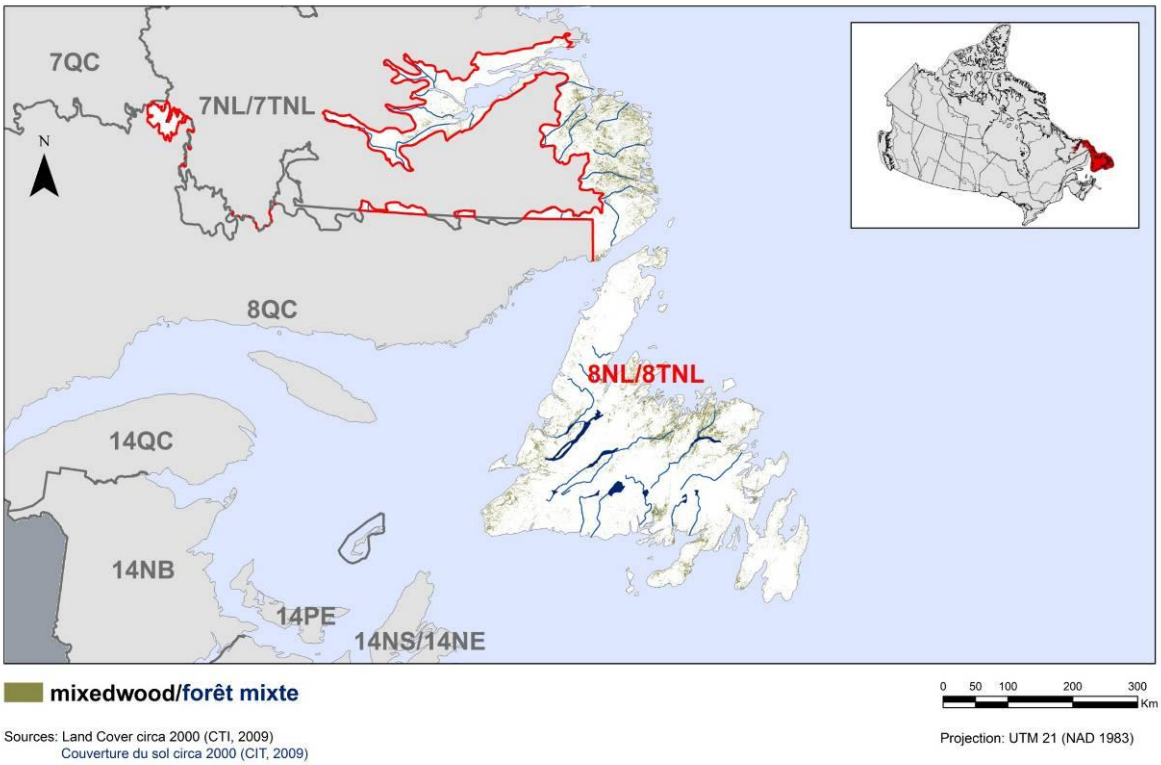

Figure 21. Map of mixed wood habitats in BCR 8 NL.

There are two priority bird species found in mixed wood habitats of BCR 8 NL (Table 7): the Black-throated Green Warbler and Purple Finch, both landbirds and not species at risk. These birds are found in the non-specific mixed or moist forests sub-habitats (Table 7).

All threats identified for priority bird species in the mixed wood habitats of BCR 8 NL were ranked as "low" overall (Fig. 22); however, medium-magnitude threats were identified for the Black-throated Green Warbler in this habitat. The most frequently identified threat was habitat loss and subsequently a loss of age structure in forest stands due to forest harvesting and logging activities mostly for domestic fuel wood (5.3 Logging & wood harvesting; Fig. 22). This threat was identified for both priority bird species but ranked as "medium" only for the Black-throated Green Warbler. Habitat degradation from infestation of introduced woolly adelgids

(8.1 Invasive non-native/alien species; Fig. 22) was the other medium-ranked threat identified only for this species.

Many bird species will benefit from the conservation objectives and actions presented in Table 8. While the threats were all ranked “low” overall, certain threats were of medium magnitude, as mentioned above, and so are discussed in Table 8. Examples of the recommended conservation actions to address these threats in mixed wood habitats of BCR 8 NL include efforts to implement beneficial management practices (i.e., FSC Canada National Boreal Standard 2004); maintain sufficient patch sizes, configuration and connectivity of mixed wood habitats to support and, where necessary, enhance populations of priority species; identify, establish or expand protected areas of existing old-growth/late-successional forest habitats; as well as to monitor the spread of invasive species and evaluate the possibility of developing a program to control these species. According to methods outlined in Kennedy et al. (2012), conservation objectives and actions for low-ranked threats to priority bird species in mixed wood habitats are not presented in this document but are available in the database.

Table 7. Priority species in BCR 8 NL that use mixed wood habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Black-throated Green Warbler	non-specific mixed	mature, transitional area between coniferous and deciduous forests, interiors	Maintain current		Y	Y				
Purple Finch	moist	hedgerows	Maintain current				Y	Y		

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
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[4] R/SC: species of Regional or Subregional Concern.
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[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

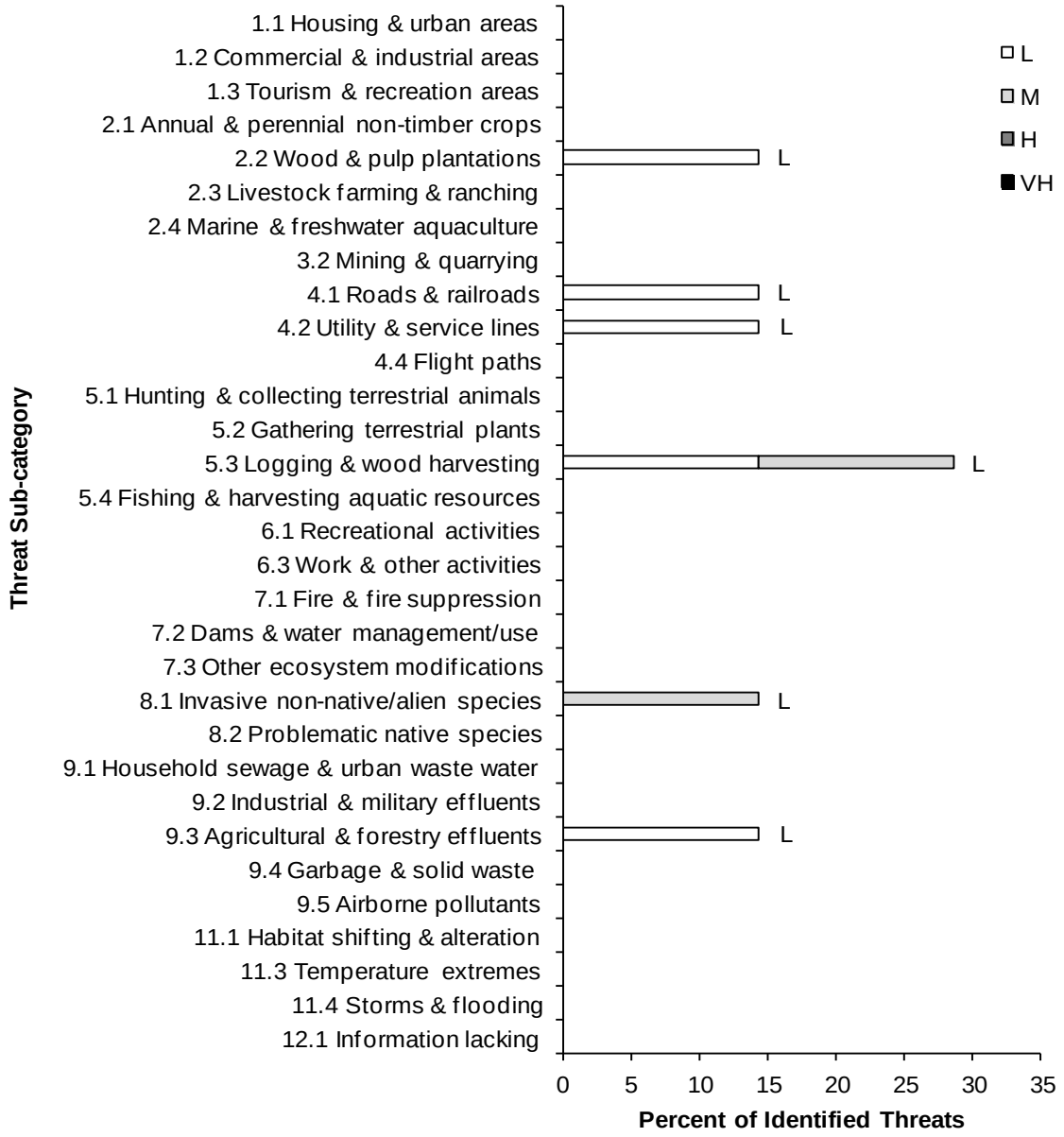

Figure 22. Percent of identified threats to priority bird species in mixed wood habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in the mixed wood habitats (for example, if 100 threats were identified in total for all priority bird species in mixed wood habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in mixed wood habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 8. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for mixed wood habitats in BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Habitat loss or degradation due to clear-cutting, fragmentation and forest harvesting.	5.3 Logging & wood harvesting	Maintain/restore the diversity and quality of mixed wood forests habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Identify, establish, or expand protected areas of existing old-growth/late-successional forest habitats.	1.1 Site/area protection	Medium: Black-throated Green Warbler
				Maintain sufficient patch sizes, configuration, and connectivity of mixed wood forests habitats to support and, where necessary, enhance populations of priority species.	2.1 Site/area management	
				Manage for tree species, age diversity, structural diversity, and important habitat features.	5.3 Private sector standards and codes	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
Habitat degradation from infestation of introduced woolly adelgids.	8.1 Invasive non-native/alien species	Reduce or eliminate problematic invasive species	3.5 Prevent and control the spread of invasive and exotic species	Monitor the spread of invasive species and evaluate the possibility of developing a program to control these species	8.2 Monitoring	Medium: Black-throated Green Warbler

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Shrub/Early Successional

In BCR 8 NL, shrub habitat is characterized by low vegetation on dry rocky slopes, barrens, upland heaths and flooded fields (Fig. 23). Early successional habitats are generally transient, occurring where disturbances such as forest fires have removed the tree cover. The dominant species in this habitat class are immature balsam fir (*Abies balsamea*) and black spruce (*Picea mariana*) along with varying amounts of white spruce (*Picea glauca*), larch (*Larix laricina*), blueberry (*Vaccinium angustifolium*), raspberry (*Rubus spp.*), labrador tea (*Rhododendron groenlandicum*), sweetgale (*Myrica gale*), mountain alder (*Alnus crispa*) and rhodora (*Rhododendron canadense*; NL Department of Natural Resources 2012a).

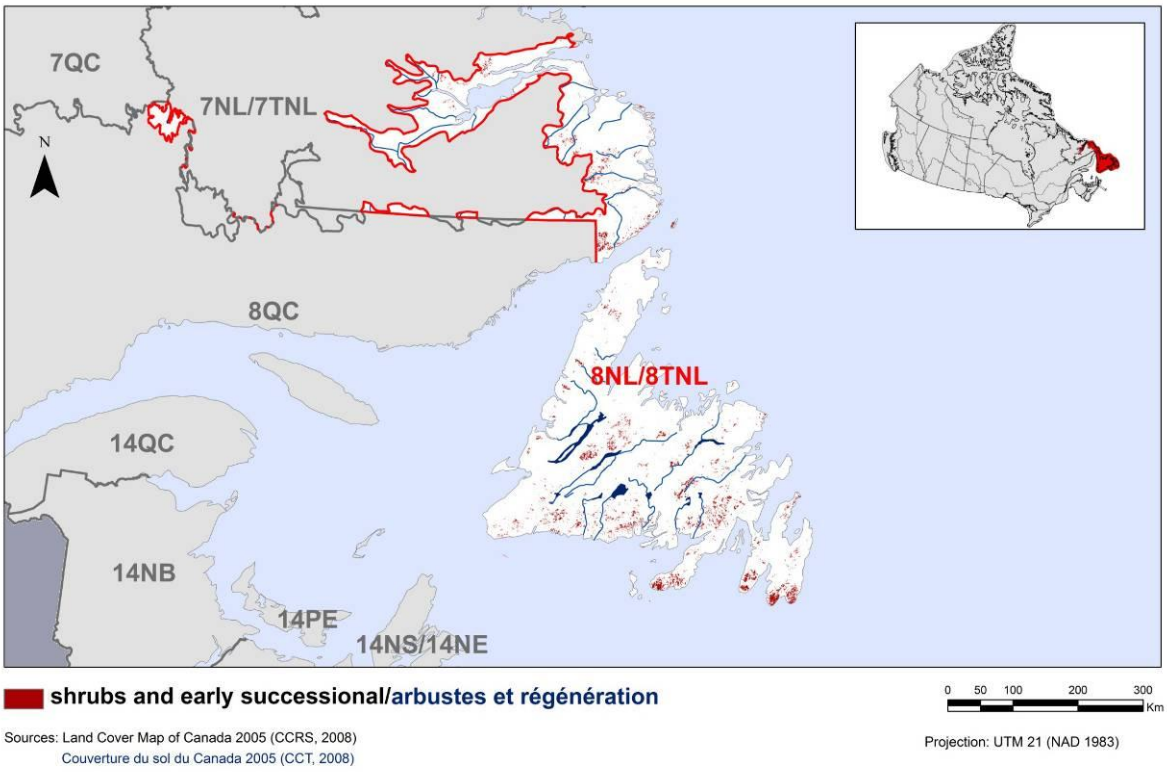

Figure 23. Map of shrubs and early successional habitats in BCR 8 NL.

There are seven priority bird species found in shrub/early successional habitats of BCR 8 NL (Table 9): three landbirds, three shorebirds and one waterfowl species. Of these, only the Peregrine Falcon (*anatum/tundrius*) is a species at risk. All of the priority bird species are found in barrens with the exception of the Mourning Warbler, which is found in the non-specific shrub sub-habitat class (Table 9).

High-magnitude threats identified in shrub/early successional habitats of BCR 8 NL include a lack of understanding of priority bird species' distribution, abundance and population trends (12.1 Information lacking), and habitat degradation from changes to habitat structure (e.g., drying), food webs (e.g., prey distribution, abundance and species), shifts in the range of species and altered timing of seasonal cues (e.g., migration) due to climate change (11.1

Habitat shifting & alteration; Fig. 24). Other frequently identified low-ranked threats to priority species include mortality from collisions with tall structures or utility lines (4.2 Utility & service lines), as well as mortality from legal hunting, in addition to the Aboriginal harvest of eggs and nestlings (5.1 Hunting & collecting of terrestrial animals; Fig. 24).

The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Recommended conservation actions to address climate change, are presented in the Widespread Issues section of this document (see Climate Change). Conservation objectives and actions for low-ranked threats to priority bird species in shrub/early successional habitats are available in the database but are not presented in this document.

Table 9. Priority species in BCR 8 NL that use shrub/early successional habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Golden-Plover	barrens	low vegetation on dry rocky slopes, snow free	Assess/Maintain		Y					
Canada Goose (North Atlantic)	barrens	dwarf willow, barrens	Increase 50%		Y				Y	
Mourning Warbler	non-specific shrubs	regenerating or disturbed second-growth forest	Maintain current		Y	Y		Y		
Peregrine Falcon (*anatum/tundrius*)	barrens	steep cliffs, crevices, coastal	Assess/Maintain	Y		Y				
Semipalmated Sandpiper	barrens	dry ridges, shrubs, sedges, graminoids, rocky areas, grassy hummocks, peat bogs, berry bearing plants	Assess/Maintain		Y					
Swamp Sparrow	barrens		Maintain current		Y	Y		Y		
Whimbrel	barrens	upland heaths, flooded fields	Assess/Maintain		Y					

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[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

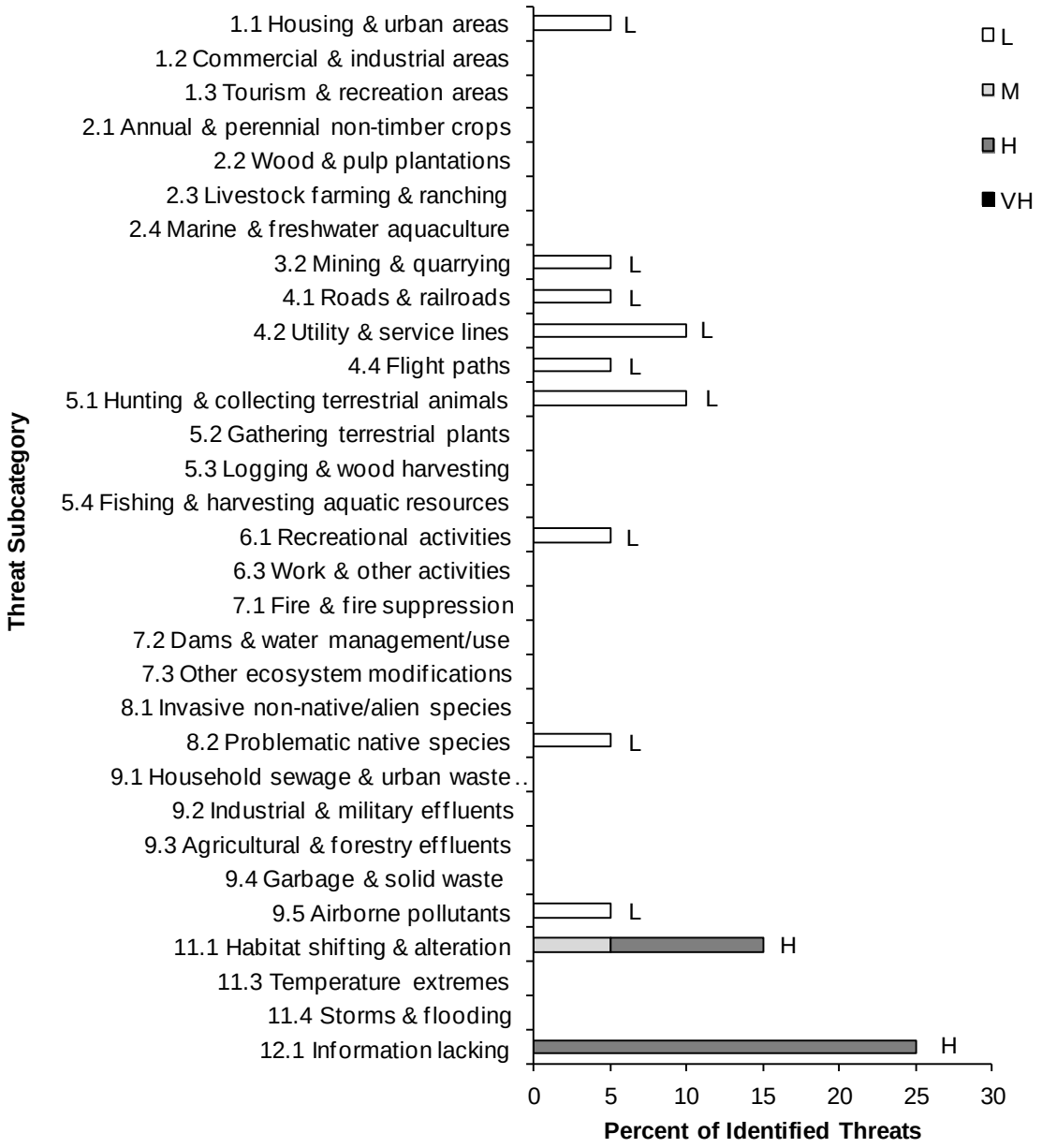

Figure 24. Percent of identified threats to priority bird species in shrub/early successional habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in the shrub/early successional habitats (for example, if 100 threats were identified in total for all priority bird species in shrub/early successional habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in shrub/early successional habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Herbaceous

In BCR 8 NL, herbaceous habitats include grassy freshwater islands and are natural assemblages of forbs and graminoids that are often associated with “open” areas (Fig. 25).

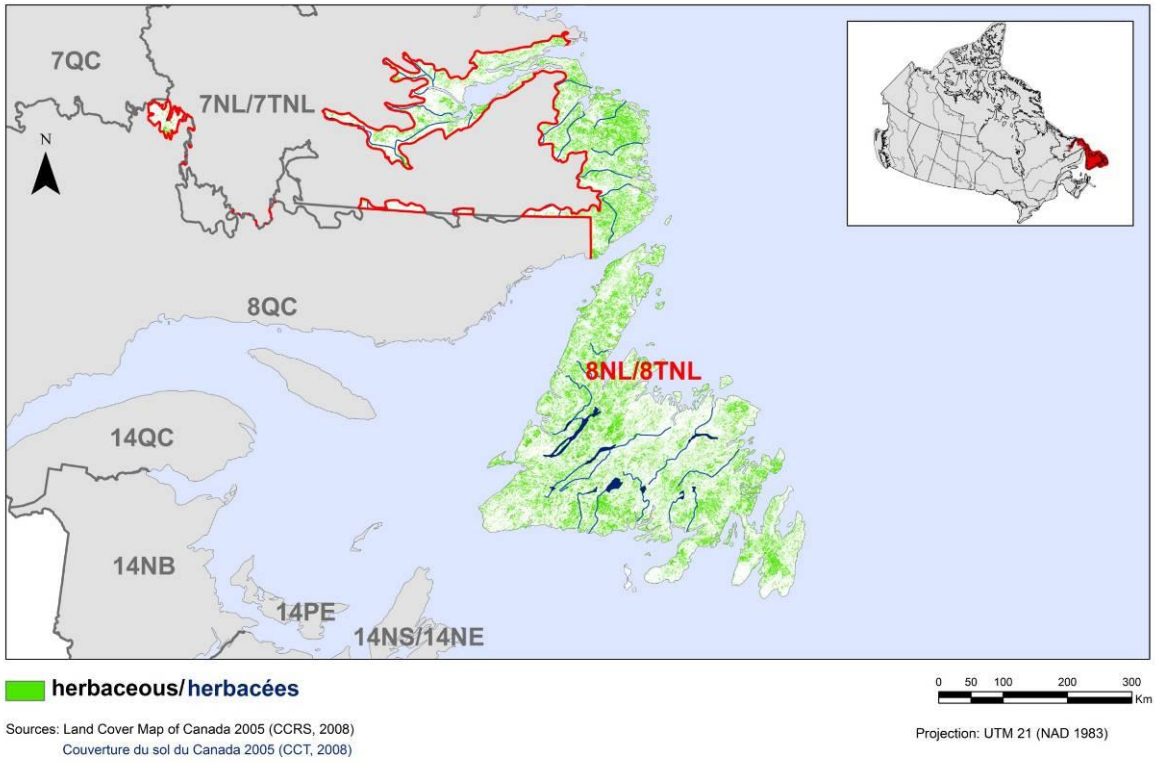

Figure 25. Map of herbaceous habitats in BCR 8 NL.

There are three priority bird species found in herbaceous habitats of BCR 8 NL (Table 10) two landbirds that are species at risk (Bobolink and Short-eared Owl) and one waterbird (Common Tern). The two landbirds are found in natural herbaceous sub-habitats while the Common Tern is associated with islands (Table 10).

All threats identified in herbaceous habitats of BCR 8 NL were ranked as “low” overall (Fig. 26) and were distributed between four sub-categories: reductions in fecundity due to disturbance from motor boats and activities near breeding colonies (6.1 Recreational activities); mortality from increasing predation rates on breeding islands (8.1 Invasive non-native/alien species); mortality from ingestion of/and entanglement in garbage or solid waste (9.4 Garbage & solid waste); as well as a lack of understanding of priority bird species’ distribution, abundance and population trends (12.1 Information lacking; Fig. 26). According to the methods outlined in Kennedy et al. (2012), no recommended conservation objectives and actions are presented here, as the magnitude of the threats to priority species in this habitat type are all “low”.

Table 10. Priority species in BCR 8 NL that use herbaceous habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Bobolink	natural herbaceous	high grasses	Assess/Maintain	Y	Y					
Common Tern	islands	grassy islands	Maintain current		Y			Y		
Short-eared Owl	natural herbaceous	well-drained, dense, near wetlands, coastal, open, small mammal abundance	Assess/Maintain	Y	Y					

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[4] R/SC: species of Regional or Subregional Concern.

[5] R/SS: species of Regional or Subregional Stewardship.

[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).

[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

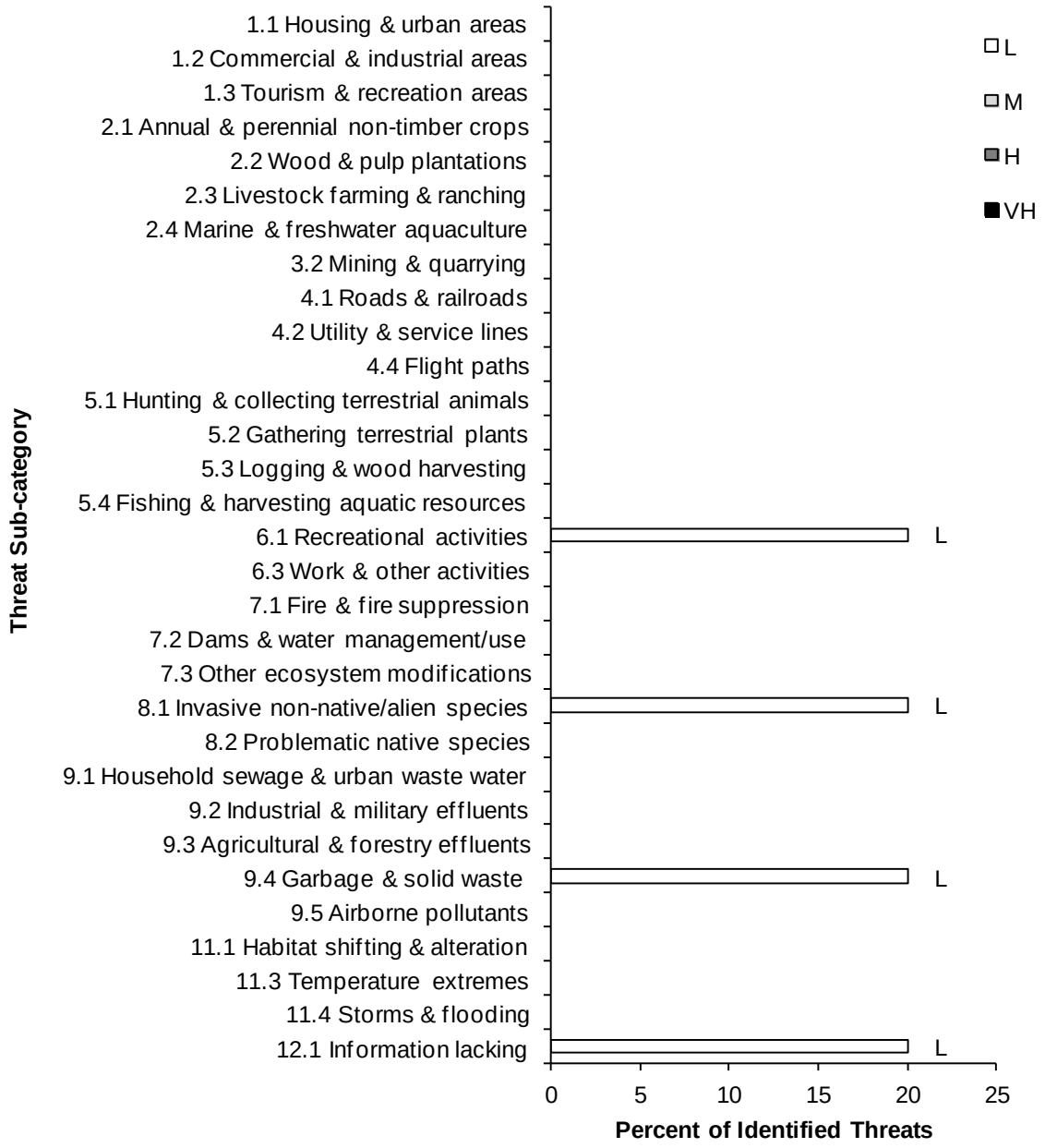

Figure 26. Percent of identified threats to priority bird species in herbaceous habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in the herbaceous habitats (for example, if 100 threats were identified in total for all priority bird species in herbaceous habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in herbaceous habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Cultivated and Managed Areas

In BCR 8 NL, cultivated and managed areas are characterized by open or agricultural fields as well as urban parks (Fig. 27).

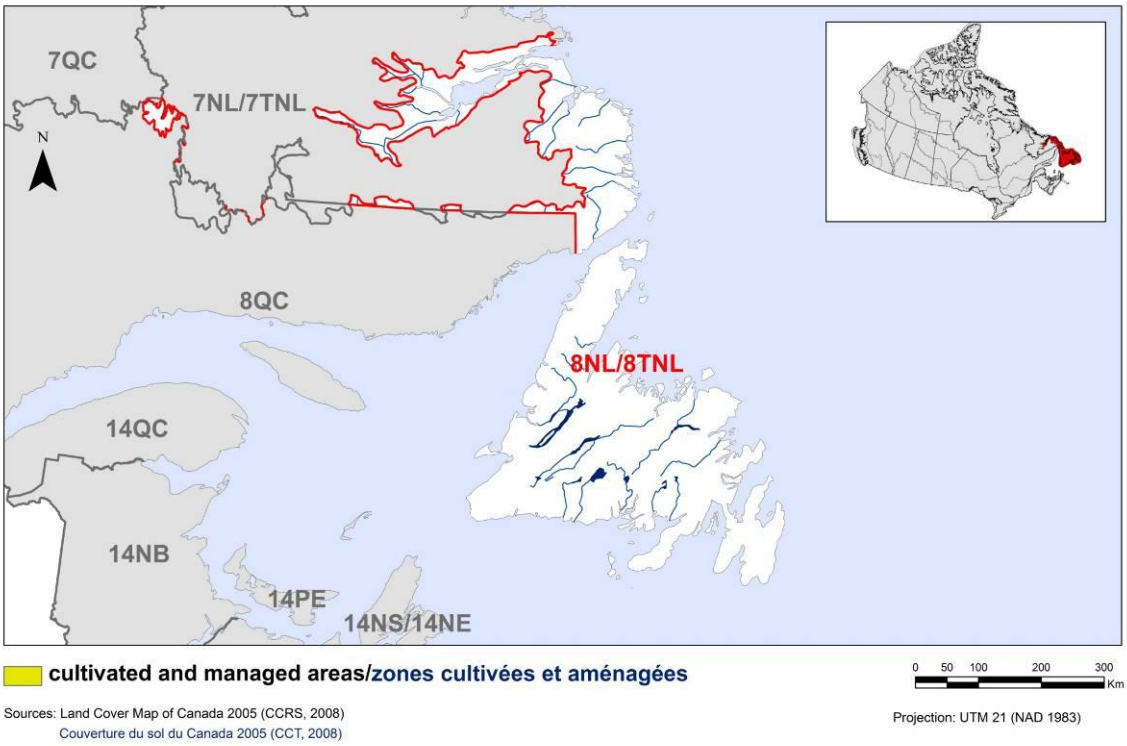

Figure 27. Map of cultivated and managed areas in BCR 8 NL.

There are three priority bird species found in cultivated and managed areas in BCR 8 NL (Table 11); all are landbirds and species at risk. The Bobolink can be found in agricultural (cultivated) lands, the Common Nighthawk in urban vegetation, while the Barn Swallow is associated with both of these sub-habitats (Table 11).

A high-magnitude threat to priority species identified in cultivated and managed areas of BCR 8 NL is habitat degradation, reductions in fecundity and mortality from severe weather or increased frequency of storms due to climate change (11.4 Storms and flooding; Fig. 28). Medium-magnitude threats include reductions in fecundity from early haying and intensive agriculture specifically for the Bobolink (2.1 Annual & perennial non-timber crops), as well as a lack of understanding of priority bird species' distribution, abundance and population trends (12.1 Information lacking; Fig. 28). A low-magnitude threat that was frequently identified was habitat degradation and lethal or sublethal effects due to chemical contamination, predominantly from pesticide use in the forestry sector (9.3 Agricultural & forestry effluents; Fig. 28).

Many bird species will benefit from the conservation objectives and actions presented in

Table 12. The recommended conservation actions to address high- and medium-ranked threats in cultivated and managed areas of BCR 8 NL are to develop and implement incentives to encourage beneficial management practices in agriculture; encourage the maintenance of herbaceous and early successional habitats on agricultural lands; create a system of protected areas representing important breeding, foraging and staging habitats; research predation and assess the impact of increased predation on the survival of priority species; control problematic species; use pesticides and other biocides only where necessary and only as part of an integrated pest management system to minimize exposure of birds to potentially toxic chemicals. The development and implementation of monitoring programs is recommended to address knowledge gaps regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Recommended conservation actions to address climate change, are presented in the Widespread Issues section of this document (see Climate Change). Conservation objectives and actions for low-ranked threats to priority bird species in cultivated and managed areas are available in the database but are not presented in this document.

Table 11. Priority species in BCR 8 NL that use cultivated and managed areas, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Barn Swallow	agriculture; urban vegetation	structure with horizontal surface and shelter for nesting, nearby source of mud for nest construction	Assess/Maintain	Y						
Bobolink	agriculture	high grasses	Assess/Maintain	Y	Y					
Common Nighthawk	urban vegetation	golf course, clear-cuts, burns	Assess/Maintain	Y	Y					

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
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[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

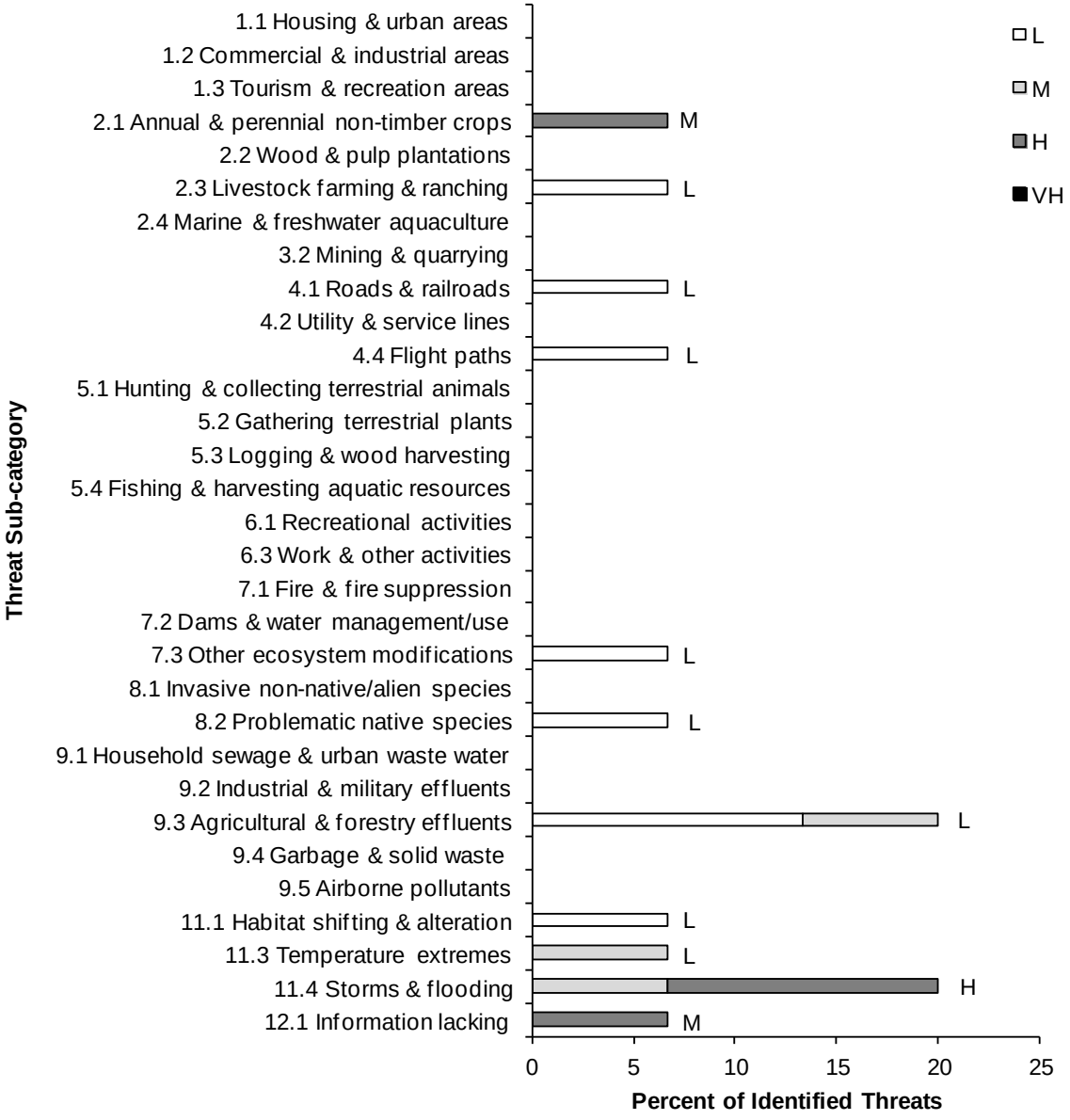

Figure 28. Percent of identified threats to priority bird species in cultivated and managed areas for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in the cultivated and managed areas (for example, if 100 threats were identified in total for all priority bird species in cultivated and managed areas, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in cultivated and managed areas is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 12. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for cultivated and managed areas in BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Nest destruction or chick mortality due to early haying and intensive agriculture.	2.1 Annual & perennial non-timber crops	Maintain/restore the diversity and quality of cultivated and managed areas across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Implement beneficial management practices.	5.3 Private sector standards and codes	High: Bobolink
				Develop incentives to delay mowing in certain crop fields.	6.4 Conservation payments	
Lethal and/or sublethal effects due to chemical contamination from the use of pesticides.	9.3 Agricultural & forestry effluents	Reduce mortality of birds and effects on their prey caused by pesticides	2.1 Reduce mortality and/or sub-lethal effects from pesticide use	Use pesticides and other biocides only where necessary and only as part of an integrated pest management system to minimize exposure of birds to potentially toxic chemicals.	5.3 Private sector standards and codes	Medium: Common Nighthawk

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Urban

In BCR 8 NL, urban habitats consist of areas where developments such as buildings, roads, parking lots and other impervious surfaces dominate (Food and Agriculture Organization 2000). Specific habitat characteristics used by birds include old chimneys, gravel roads, quarries, buildings, bridges, towers and other human-made structures (Fig. 29). There are two main urban areas in BCR 8 NL: Corner Brook on the western portion of the island of Newfoundland, as well as the St. John's-Mount Pearl-Paradise region on the Avalon Peninsula (Fig. 29).

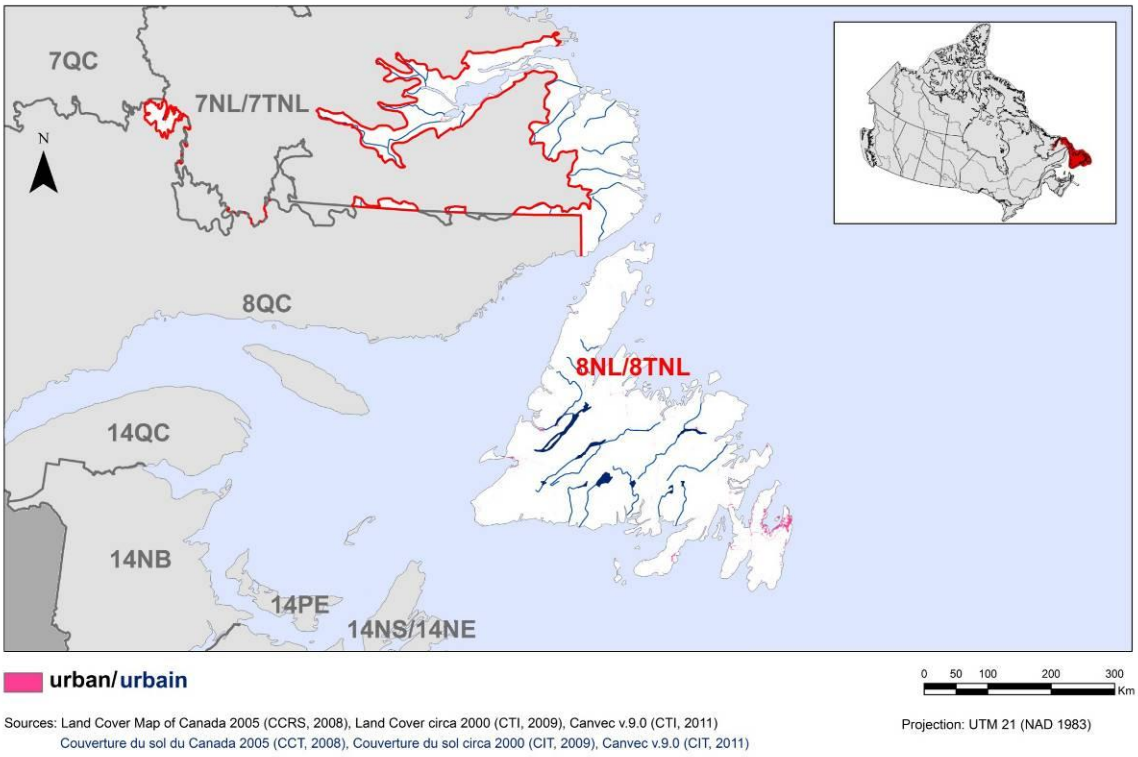

Figure 29. Map of urban habitats in BCR 8 NL.

There are four priority bird species found in urban habitats of BCR 8 NL (Table 13); all are landbirds and species at risk. The Barn Swallow and Peregrine Falcon (*anatum/tundrius*) use buildings and bridges, while the Common Nighthawk can be found in gravel areas and the Chimney Swift is associated with chimneys for roosting and nesting (Table 13).

Several medium-magnitude threats to priority species were identified in urban habitats of BCR 8 NL and include habitat loss due to the replacement of flat gravel rooftops used by the Common Nighthawk with smooth surfaces and the loss of nesting habitat from the renovation or replacement of old wooden barns used by the Barn Swallow (1.2 Commercial & industrial areas), as well as a lack of understanding of the distribution, abundance and population trends of priority bird species (12.1 Information lacking; Fig. 30). Frequently identified low-magnitude threats were habitat loss from urban development and mortality from collisions with buildings (1.1 Housing & urban areas); collisions with moving vehicles (4.1 Roads & railroads); as well as

disturbance at nest sites due to building and bridge maintenance activities and the removal of nests by chimney sweeping (6.3 Work & other activities; Fig. 30).

Many bird species will benefit from the conservation objectives and actions presented in Table 14. The recommended conservation actions to address medium-ranked threats in urban habitats are to install nesting structures to replace lost nesting habitat; raise awareness of the importance of old buildings to Barn Swallows and their value in the ecosystem; as well as to develop and implement mitigation measures (e.g., enhancements to new or existing buildings, creation of alternative nesting sites). The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Conservation actions for low-ranked threats to priority bird species in urban habitats are available in the database but are not presented in this document.

Table 13. Priority species in BCR 8 NL that use urban habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Barn Swallow	buildings and bridges	open habitats for foraging, nearby source of mud for nest construction	Assess/Maintain	Y						
Chimney Swift	chimneys	old chimneys	Assess/Maintain	Y	Y					
Common Nighthawk	gravel	gravel roads, airports, urban parks, quarries, mines	Assess/Maintain	Y	Y					
Peregrine Falcon (*anatum/tundrius*)	buildings and bridges	buildings, bridges, towers	Assess/Maintain	Y		Y				

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

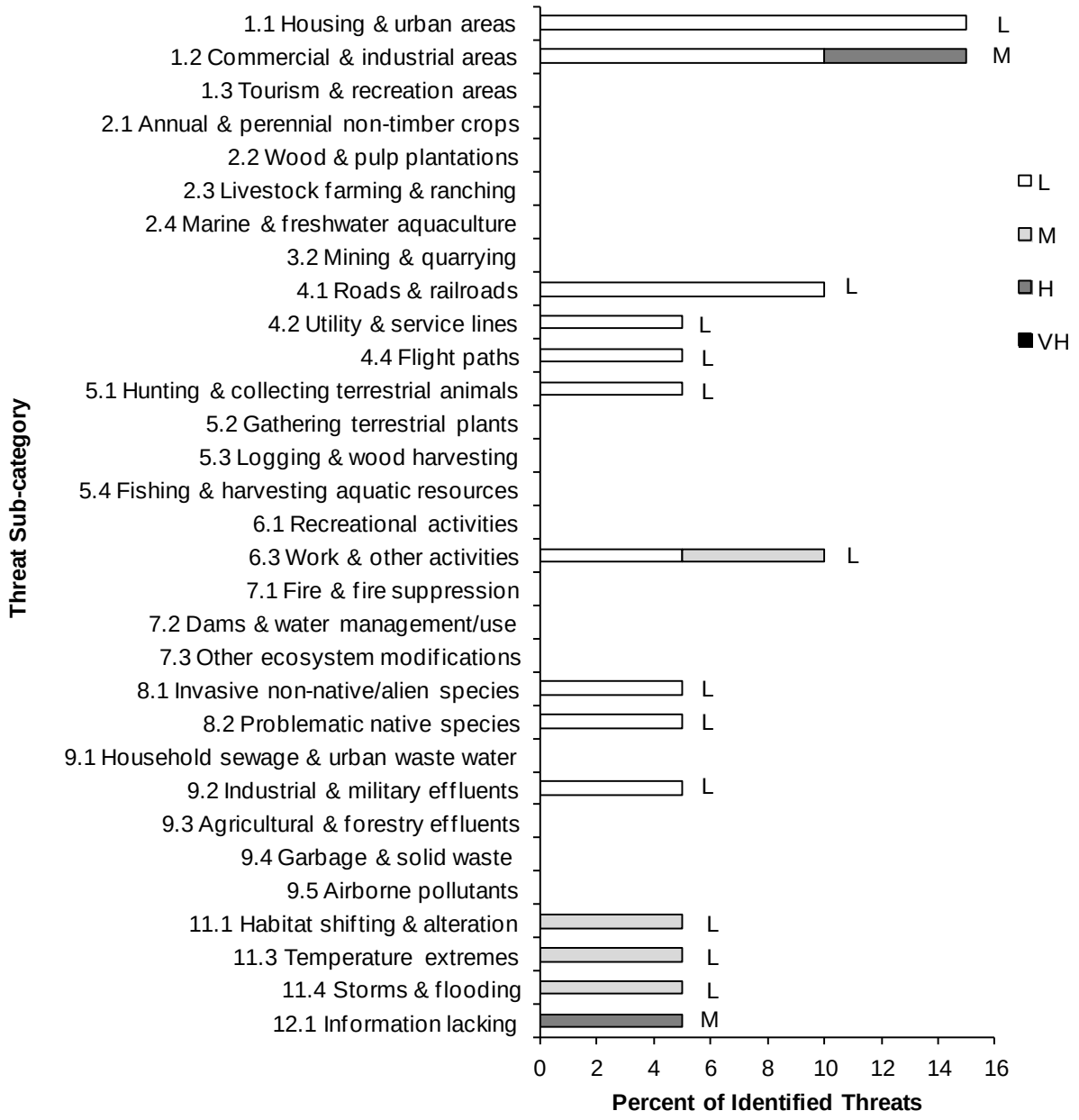

Figure 30. Percent of identified threats to priority bird species in urban habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in urban habitats (for example, if 100 threats were identified in total for all priority bird species in urban habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in urban habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 14. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for urban habitats in BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Loss of nesting habitat in old buildings from the renovation or replacement of old wooden barns.	1.2 Commercial & industrial areas	Maintain/restore old buildings	1.4 Maintain important habitat features on the landscape	Develop and implement mitigation measures (e.g., enhancements to new or existing buildings, creation of alternative nesting structures) when loss of nesting structures cannot be avoided.	3.2 Species recovery	High: Barn Swallow
				Raise awareness of the importance of old buildings to Barn Swallows and the value of this species in the ecosystem.	4.3 Awareness and communications	
Reduction in fecundity from the disturbance or destruction of nest sites due to building and bridge maintenance activities.	6.3 Work & other activities	Reduce/eliminate disturbance by building and bridge maintenance activities	4.2 Reduce disturbance from industrial or work activity	Develop and implement beneficial management practices for bridge maintenance crews to benefit priority species	5.3 Private sector standards and codes	Medium: Barn Swallow

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Wetlands

In BCR 8 NL, wetland habitats are found at both low and high elevations and are characterized by emergent vegetation and standing water (Fig. 31). This habitat class is represented by plant species tolerant of saturated soils and includes both bogs and fens. Bogs are especially common throughout the area and can form wetland complexes in conjunction with fens. Tree cover is generally absent, but a variety of graminoids, shrubs and forbs are common (Stantec 2010).

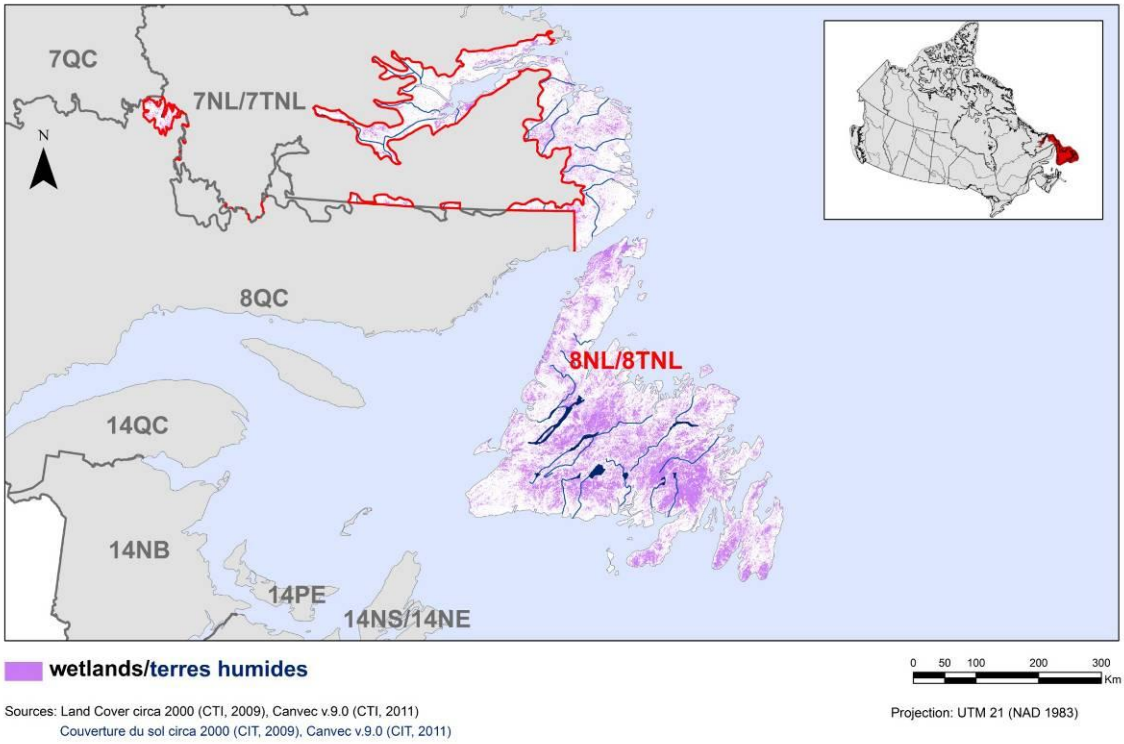

Figure 31. Map of wetland habitats in BCR 8 NL.

There are 18 priority bird species found in wetland habitats of BCR 8 NL (Table 15): 5 waterfowl, 1 waterbird, 3 shorebirds and 9 landbirds. Of these, 6 are species at risk. Over half of the priority bird species are found in either fens or bogs, but also in non-specific freshwater wetlands and marshes (Table 15). All of the priority bird species are exclusively associated with one of these sub-habitats (Tables 15).

Several high-magnitude threats to priority bird species were identified in wetland habitats of BCR 8 NL and include a lack of knowledge of the distribution, abundance and population trends of priority bird species (12.1 Information lacking), as well as habitat loss or degradation due to climate change altering habitat structures (e.g., drying), the distribution and abundance of food sources, range shifts, and the timing of egg laying or insect emergence (11.1 Habitat shifting & alteration; Fig. 32). Medium-magnitude threats include habitat degradation or mortality due to severe weather and increased frequency of storms (11.4 Storms & flooding); mortality due to temperature extremes such as cold snaps in spring (11.3 Temperature extremes); as well as

habitat loss or degradation due to destruction and manipulation of wetlands through changes to hydrology and water management such as draining or flooding (7.2 Dam & water management/use; Fig. 32). Other threats that were frequently identified but ranked as “low” overall were habitat degradation and/or lethal and sublethal effects due to chemical contamination from the use of pesticides either by direct exposure or consumption of contaminated prey such as spruce budworm (9.3 Industrial & military effluents), as well as hunting, poaching and incidental take (5.1 Hunting & collecting terrestrial animals; Fig. 32).

Many bird species will benefit from the conservation objectives and actions presented in Table 16. The recommended conservation actions to address high- or medium-ranked threats in wetland habitats of BCR 8 NL are to establish buffer zones around known breeding, foraging or staging areas in wetland habitats and limit industrial activities within the established buffers; ensure protection of wetlands of a variety of sizes, configuration and habitat conditions in order to ensure diversity of sub-habitat classes; protect and secure wetlands for priority birds through various methods such as creation of protected areas, conservation easements, community conservation plans and stewardship agreements. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Recommended conservation actions to address climate change are presented in the Widespread Issues section of this document (see Climate Change). Conservation objectives and actions for low-ranked threats to priority bird species in wetland habitats are available in the database but are not presented in this document.

Table 15. Priority species in BCR 8 NL that use wetland habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Bittern	bog; fen	tall emergent vegetation, large areas, freshwater, beaver-created or glacially originated wetlands	Maintain current		Y			Y		
American Black Duck	bog; fen	marshes and estuaries with emergent vegetation, beaver-modified or flooded, salt or freshwater	Maintain current		Y				Y	
Barn Swallow	non-specific freshwater wetlands	structure with horizontal surface and shelter for nesting, nearby source of mud for nest construction	Assess/Maintain	Y						
Canada Goose (North Atlantic)	bog; fen	muddy bottom, emergent vegetation, lowland sedge/grass meadows, small islands	Increase 50%		Y				Y	
Chimney Swift	non-specific freshwater wetlands		Assess/Maintain	Y	Y					
Common Nighthawk	non-specific freshwater wetlands	insect abundance	Assess/Maintain	Y	Y					
Green-winged Teal	bog; fen	muddy bottoms, dense vegetation, shrub-swamps	Increase 50%						Y	
Least Sandpiper	bog; fen	marine and freshwater, flooded grassy fields, bogs (often along treeline)	Assess/Maintain		Y					

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

Table 15 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Northern Hawk Owl	bog	tamarack bog, muskeg, near forest edges	Maintain current					Y		
Olive-sided Flycatcher	bog	muskeg bogs and swamps, spruce, tamarack, snags and tall perches	Maintain current	Y	Y		Y			
Ring-necked Duck	bog; fen	beaver-modified, dense emergent sedges and floating vegetation, shallow, stable water level	Increase 100%					Y	Y	
Rusty Blackbird	bog	peat bogs with coniferous trees, associated with recent burns or beaver-created wetlands	Assess/Maintain	Y	Y					
Semipalmated Sandpiper	bog	sedge/grass or heath, rocky areas, grassy hummocks, peat bogs, berry bearing plants	Assess/Maintain		Y					
Short-eared Owl	bog	near open forests, small mammal abundance	Assess/Maintain	Y	Y					
Surf Scoter	non-specific freshwater wetlands		Assess/Maintain		Y				Y	
Swamp Sparrow	non-specific freshwater wetlands	open water, dense low vegetation (grasses and shrubs), available perches for singing	Maintain current		Y	Y		Y		
Wilson's Snipe	bog; fen	treeless, including riparian areas, flooded grassy fields, short grasses, sedges, and nutrient-rich depressions	Maintain current		Y					
Yellow-bellied Flycatcher	non-specific freshwater wetlands	spruce and fir trees	Maintain current			Y		Y		

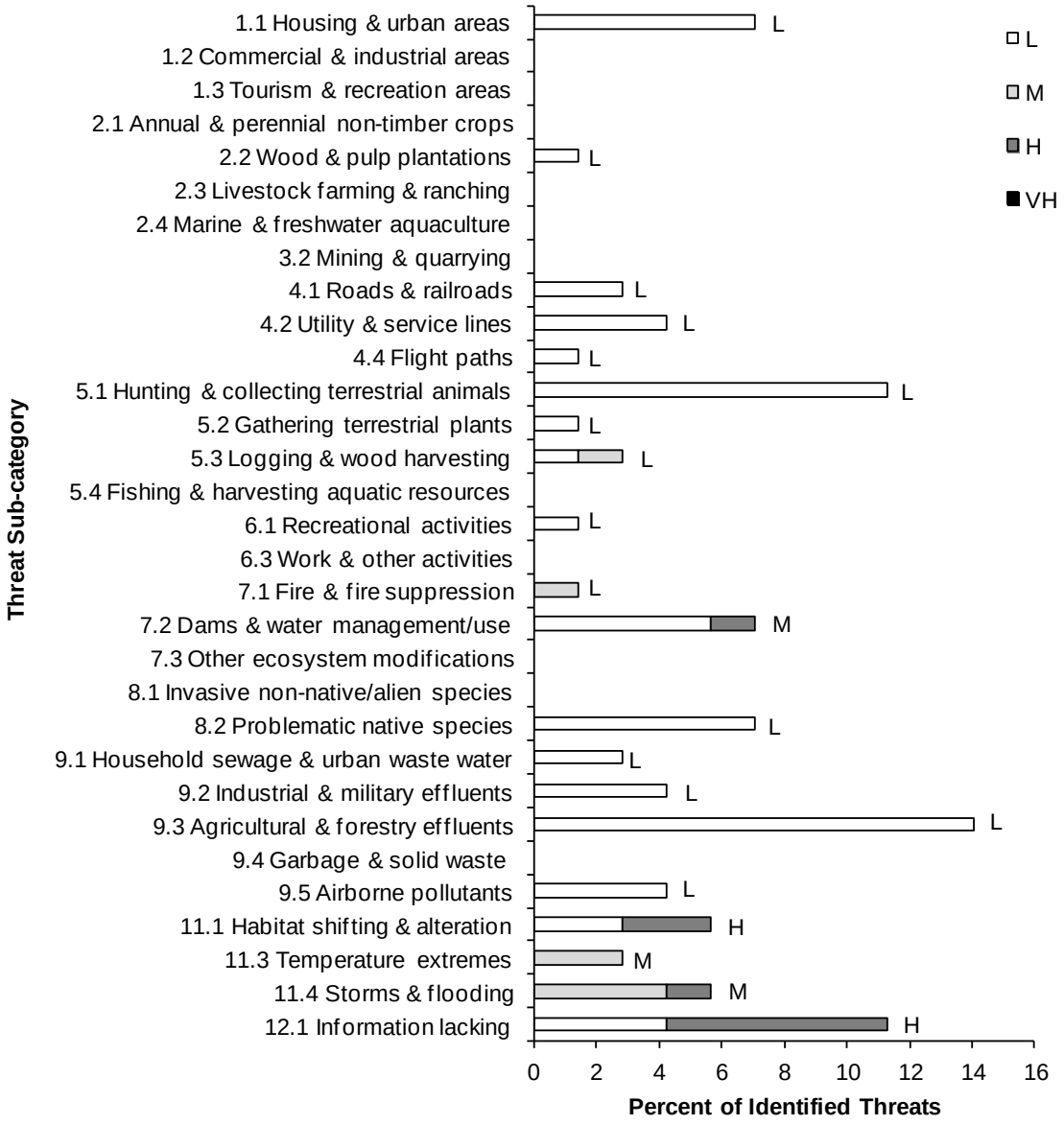

Figure 32. Percent of identified threats to priority bird species in wetland habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in wetland habitats (for example, if 100 threats were identified in total for all priority bird species in wetland habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in wetland habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 16. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for wetland habitats in BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Habitat loss or degradation due to clear-cutting, fragmentation, and forest harvesting.	5.3 Logging & wood harvesting	Maintain/restore the diversity and quality of forested areas in wetland habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Identify, establish, or expand protected areas of existing wetland habitats.	1.1 Site/area protection	Medium: Yellow-bellied Flycatcher
				Maintain sufficient patch sizes, configuration, and connectivity of wetland habitats to support and, where necessary, enhance populations of priority species.	2.1 Site/area management	
				Manage for tree species, age diversity, structural diversity, and important habitat features.	5.3 Private sector standards and codes	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
Habitat loss or degradation from forest age structure changes and removal of insect-infested trees due to fire suppression.	7.1 Fire & fire suppression	Maintain/restore the diversity and quality of forested areas in wetland habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Manage for large trees, large snags, and closed canopy.	2.1 Site/area management	Medium: Olive-sided Flycatcher
				Mimic natural fire regimes.	2.3 Habitat and natural process restoration	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
Habitat loss or degradation from the destruction and manipulation of wetlands due to changes in hydrology,	7.2 Dams & water management/ use	Maintain/restore the diversity and quality of wetland habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird	Protect and secure wetlands for priority birds through various methods such as creation of protected areas, private land acquisitions, conservation easements, community conservation	1.1 Site/area protection	High: Canada Goose (North Atlantic)

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 16 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
water management and river channelization.			habitat	plans and stewardship agreements.		
				Ensure protection of wetlands of a variety of sizes, configuration and habitat conditions in order to ensure diversity of sub-habitat types and species across the landscape.	1.2 Resource and habitat protection	
				Establish buffer zones around known breeding, foraging, and/or staging areas in wetland habitats and limit industrial activities within the established buffers	2.1 Site/area management	

Riparian

Riparian areas are the transition zone where land meets water along rivers, streams, lakes, ponds and estuaries, and they may be treed, shrubby or herbaceous, depending on site conditions (Fig. 33). In BCR 8 NL, riparian habitats are characterized by forested river valleys, sandy margins of lakes and ponds, upland tundra areas that drain into standing water, and other areas close to bodies of water.

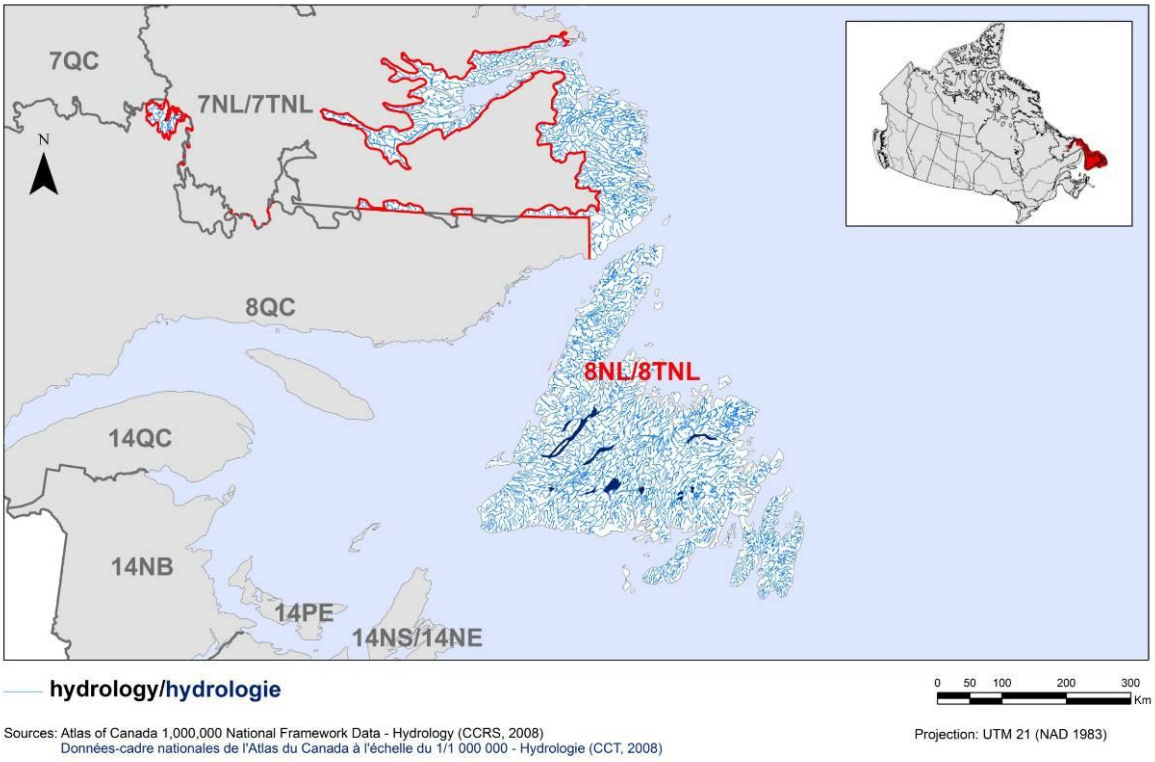

Figure 33. Map of riparian habitats in BCR 8 NL.

There are 13 priority bird species found in riparian habitats of BCR 8 NL (Table 17): 4 waterfowl, 2 shorebirds and 7 landbirds. Of these, 3 are species at risk. The priority bird species are found in bare areas, coniferous forests, scrubs and non-specific shrubs (Table 17). Twelve priority bird species are associated exclusively with one of these sub-habitats, while the Common Goldeneye can be found in both bare areas and coniferous forests (Table 17).

High-ranked threats to priority bird species in riparian habitats of BCR 8 NL were a lack of understanding of the distribution, abundance and population trends of priority bird species (12.1 Information lacking), as well as habitat degradation or loss from changes to habitat structure (e.g., drying), changes to food webs (e.g., distribution and abundance of prey species), shifts in species' ranges and altered timing of laying due to climate change (11.1 Habitat shifting & alteration; Fig. 34). Other threats that were frequently identified but ranked as "low" overall were collisions with tall structures (4.2 Utility & service lines), as well as loss of age structure,

snags (e.g., cavities), breeding habitat and important habitat features due to forest harvesting, clear-cutting and fragmentation (5.3 Logging & wood harvesting; Fig. 34).

Many bird species will benefit from the conservation objectives and actions presented in Table 18. The threat related to logging and wood harvesting (sub-category 5.3) was ranked as "medium" for the Yellow-bellied Flycatcher. The threat related to recreational activities (sub-category 6.1) was ranked as "medium" for the Least Sandpiper. The recommended conservation actions to address these threats in riparian habitats of BCR 8 NL are to identify, establish or expand protected areas of existing riparian habitats; manage tree species for age diversity, structural diversity and important habitat features; limit human activities in riparian habitats important to priority species; and educate the public about the negative effects of disturbances from certain activities on priority species. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Recommended conservation actions to address climate change are presented in the Widespread Issues section of this document (see Climate Change). Conservation actions for low-ranked threats to priority bird species in riparian habitats are available in the database but are not presented in this document.

Table 17. Priority species in BCR 8 NL that use riparian habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Common Goldeneye	bare areas; coniferous forest	tree cavities, rock cavities	Maintain current		Y			Y	Y	
Common Merganser	coniferous forest	coniferous and deciduous forests, cavities, near wetlands, lakes and rivers	Assess/Maintain					Y	Y	
Common Nighthawk	bare areas	beaches, sand dunes, lakeshores, river banks, riparian, clear-cuts	Assess/Maintain	Y	Y					
Green-winged Teal	coniferous forest		Increase 50%						Y	
Least Sandpiper	bare areas	margins of lakes, ponds and rivers	Assess/Maintain		Y					
Peregrine Falcon (*anatum/tundrius*)	bare areas	steep cliffs, crevices, river valleys	Assess/Maintain	Y		Y				
Purple Finch	coniferous forest	coniferous, cool, moist	Maintain current				Y	Y		
Rusty Blackbird	scrub forest	wet, edges, disturbance (e.g., burns, windthrow, beaver-modified wetlands)	Assess/Maintain	Y	Y					
Semipalmated Sandpiper	bare areas	sandy areas along rivers	Assess/Maintain		Y					
Surf Scoter	coniferous forest	small lakes/ponds	Assess/Maintain		Y				Y	
Swamp Sparrow	non-specific shrubs	bushy growth, hedgerows, thickets, dense	Maintain current		Y	Y		Y		
White-throated Sparrow	non-specific shrubs	stratified vegetation structure, nearby trees	Maintain current		Y	Y				
Yellow-bellied Flycatcher	non-specific shrubs	dense	Maintain current			Y		Y		

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.

[2] N/CC: species considered of National or Continental Concern.

[3] N/CS: species considered of National or Continental Stewardship.

[4] R/SC: species of Regional or Subregional Concern.

[5] R/SS: species of Regional or Subregional Stewardship.

[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).

[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

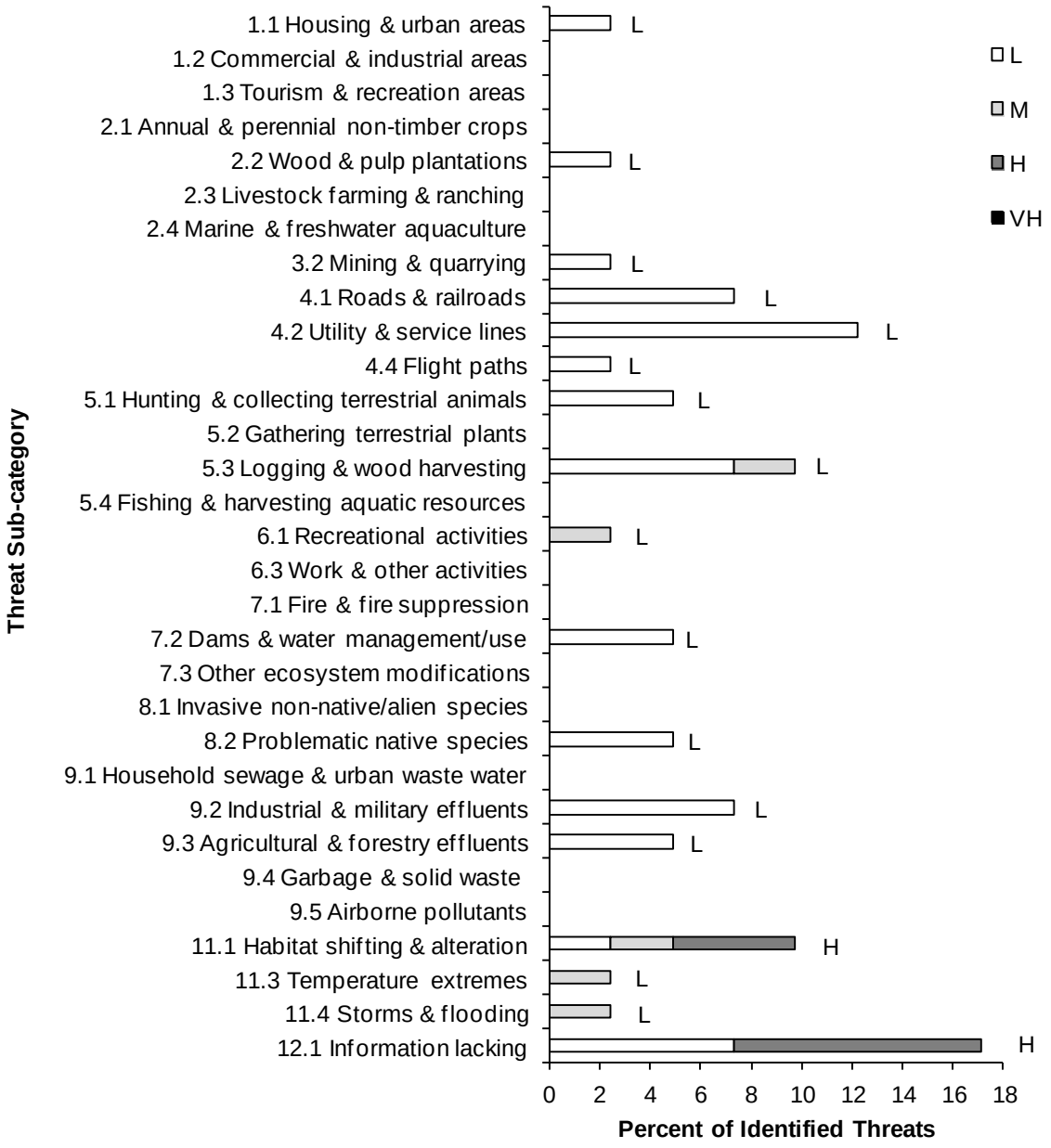

Figure 34. Percent of identified threats to priority bird species in riparian habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in riparian habitats (for example, if 100 threats were identified in total for all priority bird species in riparian habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in riparian habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 18. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for riparian habitats in BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Habitat loss or degradation due to clear-cutting, fragmentation and forest harvesting.	5.3 Logging & wood harvesting	Maintain/restore the diversity and quality of forest areas in riparian habitats across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Identify, establish, or expand protected areas of existing old-growth/late-successional forest habitats.	1.1 Site/area protection	Medium: Yellow-bellied Flycatcher
				Maintain sufficient patch sizes, configuration, and connectivity of riparian habitats to support and, where necessary, enhance populations of priority species.	2.1 Site/area management	
				Manage for tree species, age diversity, structural diversity, and important habitat features.	5.3 Private sector standards and codes	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
Habitat degradation from disturbance at migration sites or staging beaches due to recreational activities.	6.1 Recreational activities	Reduce disturbance caused by human development and recreation in riparian habitats	4.1 Reduce disturbance from human recreation	Establish buffer zones around known breeding, foraging, and/or staging areas in riparian habitats.	2.1 Site/area management	Medium: Least Sandpiper
				Limit human recreational activities in important breeding colony and stopover riparian habitats during breeding and migration windows.	2.1 Site/area management	
				Limit sources of loud noise and rapidly moving vehicles in sensitive riparian habitats during breeding and migration windows.	2.1 Site/area management	
				Raise public awareness of the vulnerability of these species to human disturbance at breeding, foraging, and/or staging sites.	4.3 Awareness and communications	

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Inland Waterbodies

In BCR 8 NL, inland waterbodies include lakes, ponds, rivers and streams. Shallow soil and bedrock deeply scored by glaciers are responsible for the numerous lakes, ponds and rivers scattered across this region. The area of freshwater in Newfoundland and Labrador is 31 340 km^2, covering approximately 4.1% of the province (Statistics Canada 2005).

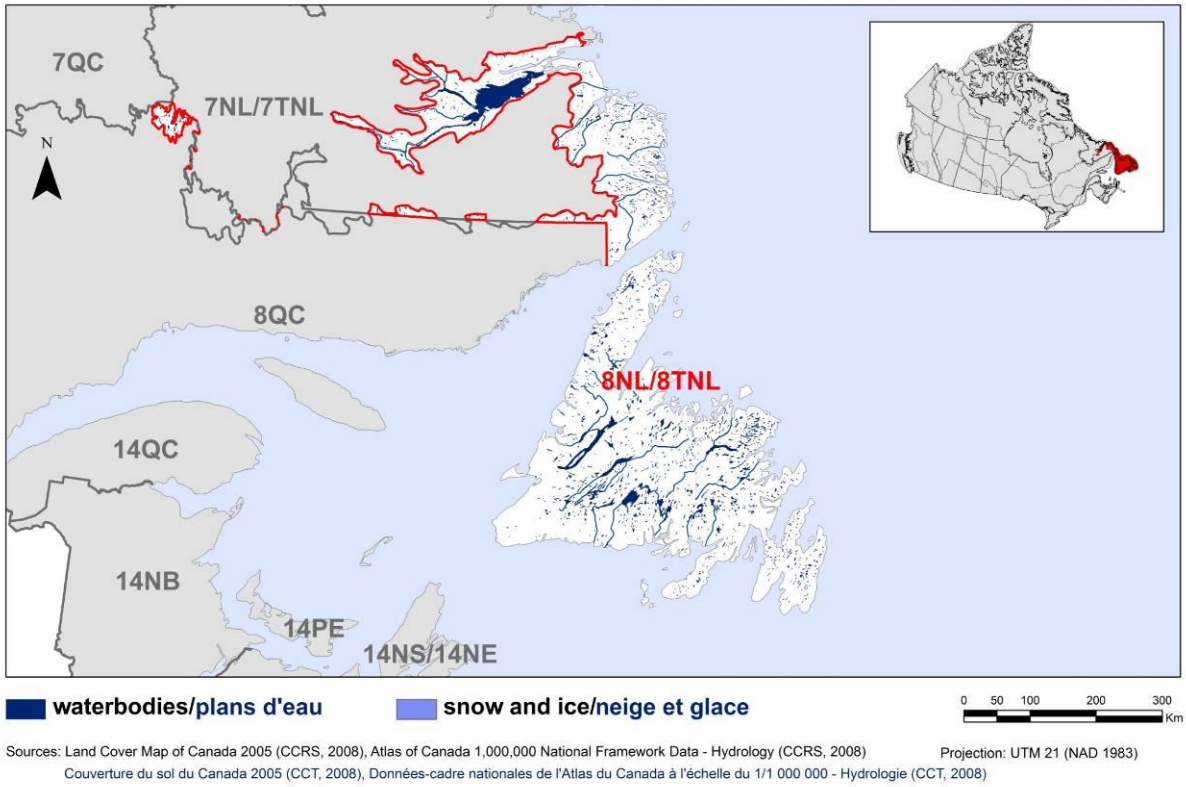

Figure 35. Map of inland waterbodies in BCR 8 NL.
Note: There is no area covered by snow or ice for the majority of the year, and the boundaries of BCR 8 NL (terrestrial unit) do not extend into marine waters.

There are 10 priority bird species found in inland waterbodies of BCR 8 NL (Table 19): 8 waterfowl and 2 waterbirds. Only the Harlequin Duck (Eastern) is a species at risk. Priority bird species are found in lakes or ponds, rivers or streams, or non-specific freshwater (Table 19). Seven of these priority bird species are associated exclusively with one of these sub-habitats, while the Common Goldeneye, Common Loon and Common Merganser can be found in both lakes and ponds in addition to rivers and streams (Table 19).

The only medium-magnitude threat to priority species in inland waterbodies of BCR 8 NL identified is habitat degradation due to the destruction and manipulation of areas in and around waterbodies from river channelization and changes to hydrological regimes or water management (7.2 Dams & water management/use; Fig. 36). Low-magnitude threats that were frequently identified are legal hunting, poaching and incidental take (5.1 Hunting & collecting terrestrial animals); habitat degradation, lethal and/or sublethal effects due to chemical

contamination from the use of pesticides or exposure to dioxins and furans from pulp/paper mills (9.3 Industrial & military effluents), as well as habitat degradation due to chemical contamination (e.g., mining effluents, acidification of lakes, changes to water chemistry), lethal and/or sublethal effects due to pollutant exposure at industrial discharge sites or bioaccumulation of contaminated water and sediments, and heavy metal contamination of inland lakes from mining and industrial activity (9.2 Industrial & military effluents; Fig. 36).

Many bird species will benefit from the conservation objectives and actions presented in Table 20. Examples of recommended conservation actions to address medium-ranked threats to priority species in inland waterbodies of BCR 8 NL are to establish buffer zones around known breeding, foraging or staging areas and limit industrial activities within the established buffers; ensure protection of areas in and around waterbodies of a variety of sizes, configuration and habitat conditions in order to ensure diversity of sub-habitat types and species across the landscape; as well as to protect and secure areas in and around waterbodies for priority birds through various methods such as creation of protected areas, private land acquisitions, conservation easements, community conservation plans and stewardship agreements. Conservation actions for low-ranked threats to priority bird species in inland waterbodies are available in the database but are not presented in this document.

Table 19. Priority species in BCR 8 NL that use inland waterbodies, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Black Duck	non-specific freshwater	lakes and ponds, rivers and impoundments	Maintain current		Y				Y	
Canada Goose (North Atlantic)	lakes/ponds	moss covered islets within lakes for nesting, string bogs	Increase 50%		Y				Y	
Common Goldeneye	lakes/ponds; rivers/streams	wide, deep and slow flowing water, fishless	Maintain current		Y			Y	Y	
Common Loon	lakes/ponds; rivers/streams	large lakes with rocky and convoluted shorelines, oligotrophic, tundra lakes, floating bogs	Maintain current		Y			Y		
Common Merganser	lakes/ponds; rivers/streams	open and wooded areas, abundant fish	Assess/Maintain					Y	Y	
Common Tern	lakes/ponds	shallow areas, clear water for foraging, rocky islands	Maintain current		Y			Y		
Green-winged Teal	rivers/streams	rivers, oxbows off meandering rivers	Increase 50%						Y	
Harlequin Duck (Eastern)	rivers/streams	fast flowing water, abundant invertebrates	Assess/Maintain	Y	Y				Y	
Ring-necked Duck	lakes/ponds	dense emergent vegetation, margins of shallow ponds	Increase 100%					Y	Y	
Surf Scoter	lakes/ponds	fishless lakes, shallow, vegetation free, rocky shores	Assess/Maintain		Y				Y	

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

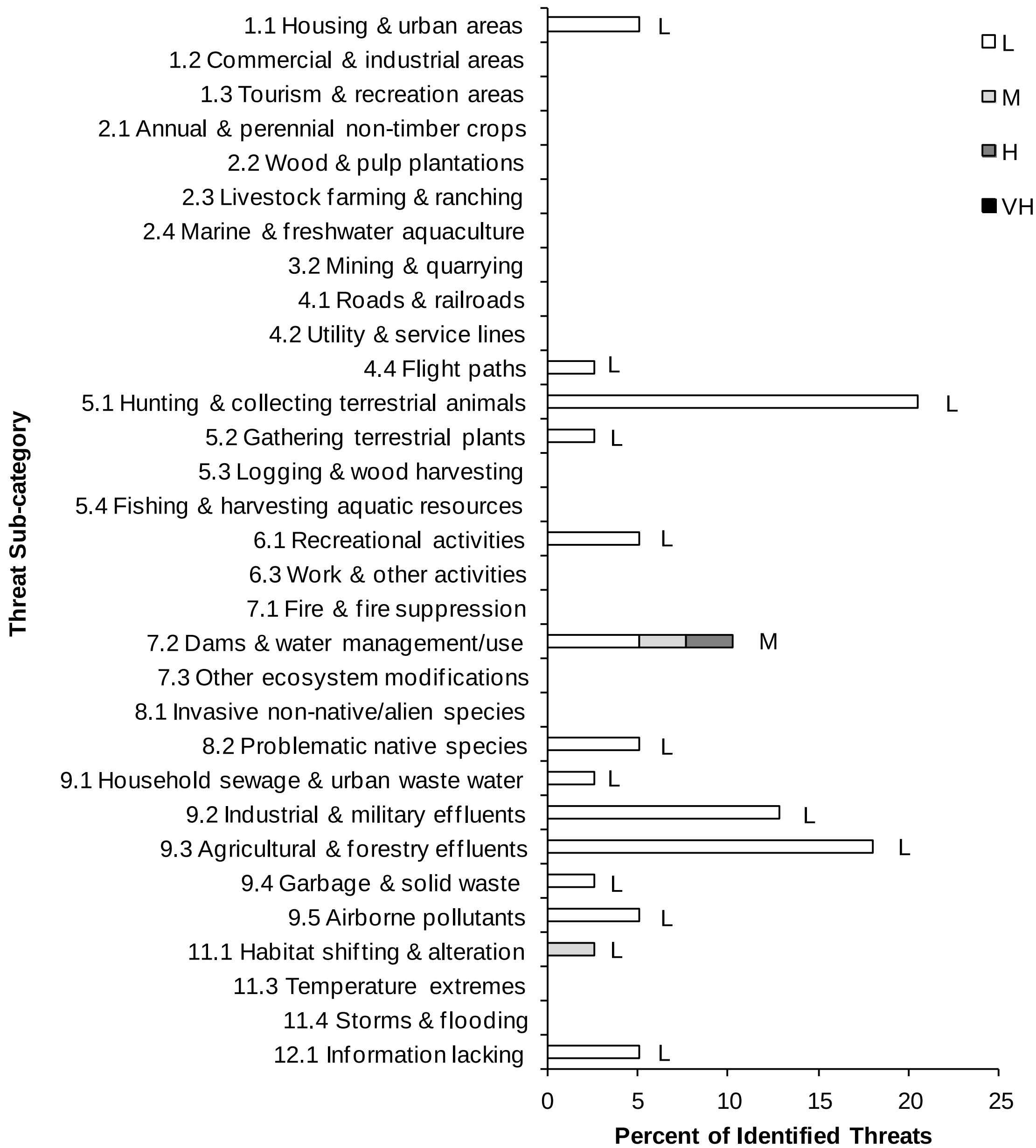

Figure 36. Percent of identified threats to priority bird species in inland waterbodies for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in inland waterbodies (for example, if 100 threats were identified in total for all priority bird species in inland waterbodies, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in inland waterbodies is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 20. Threats addressed (medium-ranked of higher), conservation objectives, recommended actions and priority species affected for inland waterbodies in BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Habitat loss or degradation from the destruction and manipulation of inland waterbodies due to changes in hydrology, water management, and river channelization.	7.2 Dams & water management/ use	Maintain/restore the diversity and quality of areas in and around waterbodies across the landscape	1.1 Ensure land and resource-use policies and practices; maintain or improve bird habitat	Protect and secure areas in and around waterbodies for priority birds through various methods such as creation of protected areas, private land acquisitions, conservation easements, community conservation plans and stewardship agreements.	1.1 Site/area protection	High: Canada Goose (North Atlantic) Medium: Harlequin Duck (Eastern)
				Ensure protection of areas in and around waterbodies of a variety of sizes, configuration and habitat conditions in order to ensure diversity of sub-habitat types and species across the landscape.	1.2 Resource and habitat protection	
				Establish buffer zones around known breeding, foraging, and/or staging areas in and around waterbodies and limit industrial activities within the established buffers.	2.1 Site/area management	

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Marine Waters – Newfoundland-Labrador Shelves

In MBU 10 NL, marine waters include nearshore waters, the continental shelf and oceanic waters. This region covers a total area greater than 2.5 million km^2 and is represented by extensive coastal forms, offshore banks, slopes and canyons. Depending on the season, small parts of this region may be covered in ice (Fig. 37).

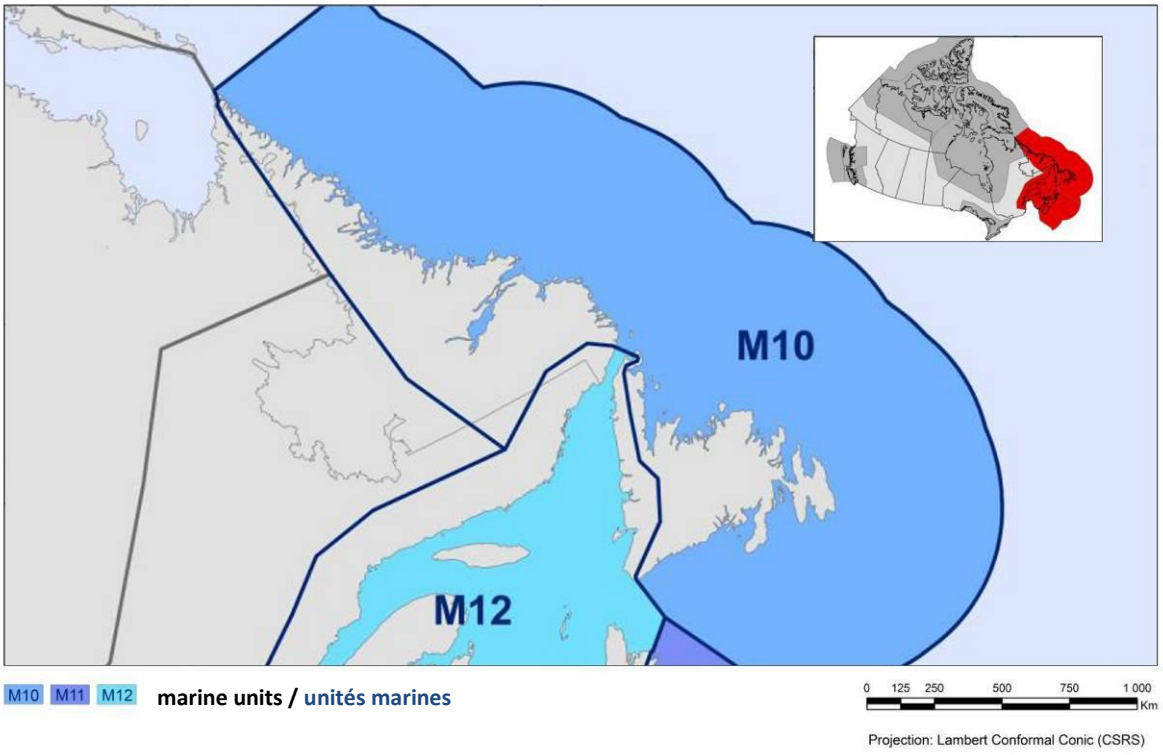

Figure 37. Map of the marine waters in MBU 10 NL.

There are 30 priority bird species found in the marine waters of MBU 10 NL (Table 21): 11 waterfowl, 18 waterbirds and 1 landbird. Of these, 3 are species at risk. Priority bird species are found in nearshore waters, continental shelf, ocean waters and non-specific marine waters (Table 21). There are 18 species that are associated specifically with the Newfoundland-Labrador Shelves marine waters: Atlantic Puffin, Black Scoter, Common Loon, Common Merganser, Common Murre, Cory's Shearwater, Great Skua, King Eider, Leach's Storm-petrel, Long-tailed Duck, Manx Shearwater, Razorbill, Red-throated Loon, Snowy Owl, Solitary Sandpiper, Surf Scoter, Thick-billed Murre and the White-winged Scoter.

Contamination and habitat degradation from industrial and military effluents (threat sub-category 9.2) was identified as a very-high-magnitude threat to priority bird species in the marine waters of MBU 10 NL (Fig. 38). This threat includes habitat degradation, lethal and/or sublethal effects due to oil spills and discharges from drilling platforms or ships, heavy metal contamination (e.g., cadmium from feeding on contaminated mussels, mercury contamination from fish, bioaccumulation of heavy metals from consumption of accumulated prey), and

chemical contamination (e.g., bioaccumulation of contaminated water and sediments, biomagnification of toxins from contaminated prey). High-magnitude threats were identified as reductions in survival or habitat degradation from competition with commercial fisheries for prey, reductions in prey abundance or a collapse of fishing stocks near colonies and mortality due to entanglement in fishing gear (5.4 Fishing & harvesting aquatic resources), as well as a lack of understanding of priority bird species' distribution, abundance and population trends (12.1 Information lacking; Fig. 38).

Many bird species will benefit from the conservation objectives and actions presented in Table 22. The recommended conservation actions to address very-high-, high- or medium-ranked threats in marine waters of MBU 10 NL include: maintaining and improving effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and Environment Canada; maintaining and improving Environment Canada's BOAS program; deterring the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation; improve water quality in marine areas by reducing the use of heavy metals and other pollutants leaching into the environment; prevention, recovery and disposal of derelict fishing gear through increased public awareness and education; regulating the adoption of fishing gear modifications to reduce bycatch as a condition of licensing; and implementing beneficial management practices (e.g., National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries; Department of Fisheries and Oceans 2007). The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Conservation actions for low-ranked threats to priority bird species in marine waters are available in the database but are not presented in this document.

Table 21. Priority species MBU 10 NL that use marine waters, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Black Duck	nearshore waters		Maintain current		Y				Y	
Atlantic Puffin	continental shelf; nearshore waters; oceanic waters		Maintain current							Y
Barrow's Goldeneye (Eastern)	nearshore waters	ice free, protected rocky shorelines	Assess/Maintain	Y	Y				Y	
Black Scoter	nearshore waters	shallow, cobbles, coastal islands, eel grass, mud/sand flats, mollusc beds	Assess/Maintain		Y				Y	
Black-legged Kittiwake	continental shelf; nearshore waters; oceanic waters	upwellings, ice edges	Maintain current			Y		Y		
Common Eider	continental shelf; nearshore waters	polynyas, ice edges and open leads, small coastal islands, rocky coastlines, reefs and shallow waters, mollusc beds	Increase 100%		Y				Y	
Common Goldeneye	nearshore waters	coastal bays, sandy, gravel, rocky or boulder substrates	Assess/Maintain		Y			Y	Y	
Common Loon	nearshore waters	bays and inlets, abundant fish	Assess/Maintain		Y			Y		

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

Table 21 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Common Merganser	nearshore waters	bays, eel grass, mud/sand flats	Assess/Maintain					Y	Y	
Common Murre	continental shelf; oceanic waters	along shelf, fronts, large coastal bays, islands	Assess/Maintain		Y					
Common Tern	continental shelf; nearshore waters	shallow areas, clear waters for foraging	Assess/Maintain		Y			Y		
Cory's Shearwater	continental shelf; oceanic waters	warmer waters	Assess/Maintain		Y					
Dovekie	continental shelf; oceanic waters	upwellings/fronts, continental shelf edges, offshore pack ice, cold waters, large coastal bays	Assess/Maintain		Y					
Great Shearwater	continental shelf; oceanic waters	upwellings/fronts	Assess/Maintain		Y	Y		Y		
Great Skua	oceanic waters	lack of information, ocean habitat usage tied to food source	Assess/Maintain		Y					
Harlequin Duck (Eastern)	nearshore waters	shallow, rocky coastlines and reefs, estuaries	Assess/Maintain	Y	Y				Y	
Ivory Gull	continental shelf; oceanic waters	pack ice and polynyas	Recovery objective	Y	Y					
King Eider	continental shelf; nearshore waters	pack ice and polynyas, deep fjoids and bays, soft bottom, mollusc beds	Assess/Maintain		Y				Y	
Leach's Storm-Petrel	oceanic waters	upwellings/fronts	Assess/Maintain		Y					
Long-tailed Duck	continental shelf; nearshore waters	ice edges, coastal lagoons and bays, deep waters	Assess/Maintain		Y				Y	
Manx Shearwater	continental shelf; oceanic waters	upwellings and productive mixing zones	Assess/Maintain		Y					
Northern Gannet	continental shelf; nearshore waters	continental shelf and slope, shoaling fish	Maintain current			Y		Y		
Razorbill	continental shelf; nearshore waters	sea ice free, estuaries, rocky coastlines, upwellings/fronts	Assess/Maintain		Y					
Red-necked Grebe	nearshore waters	shallow bays and inlets	Assess/Maintain		Y		Y			
Red-throated Loon	nearshore waters	sheltered, shallow, sandy	Assess/Maintain		Y					

Table 21 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
		substrates								
Snowy Owl	non-specific marine waters	sea ice, snow covered landscapes	Maintain current			Y				
Sooty Shearwater	continental shelf; oceanic waters	upwellings/fronts	Assess/Maintain		Y					
Surf Scoter	nearshore waters	shallow eel grass, mud/sand flats, mollusc beds, reefs	Assess/Maintain		Y				Y	
Thick-billed Murre	continental shelf; oceanic waters	ice, upwellings/fronts, large coastal bays	Assess/Maintain		Y					
White-winged Scoter	nearshore waters	shellfish beds, sand or gravel bottoms, shallow	Assess/Maintain		Y				Y	

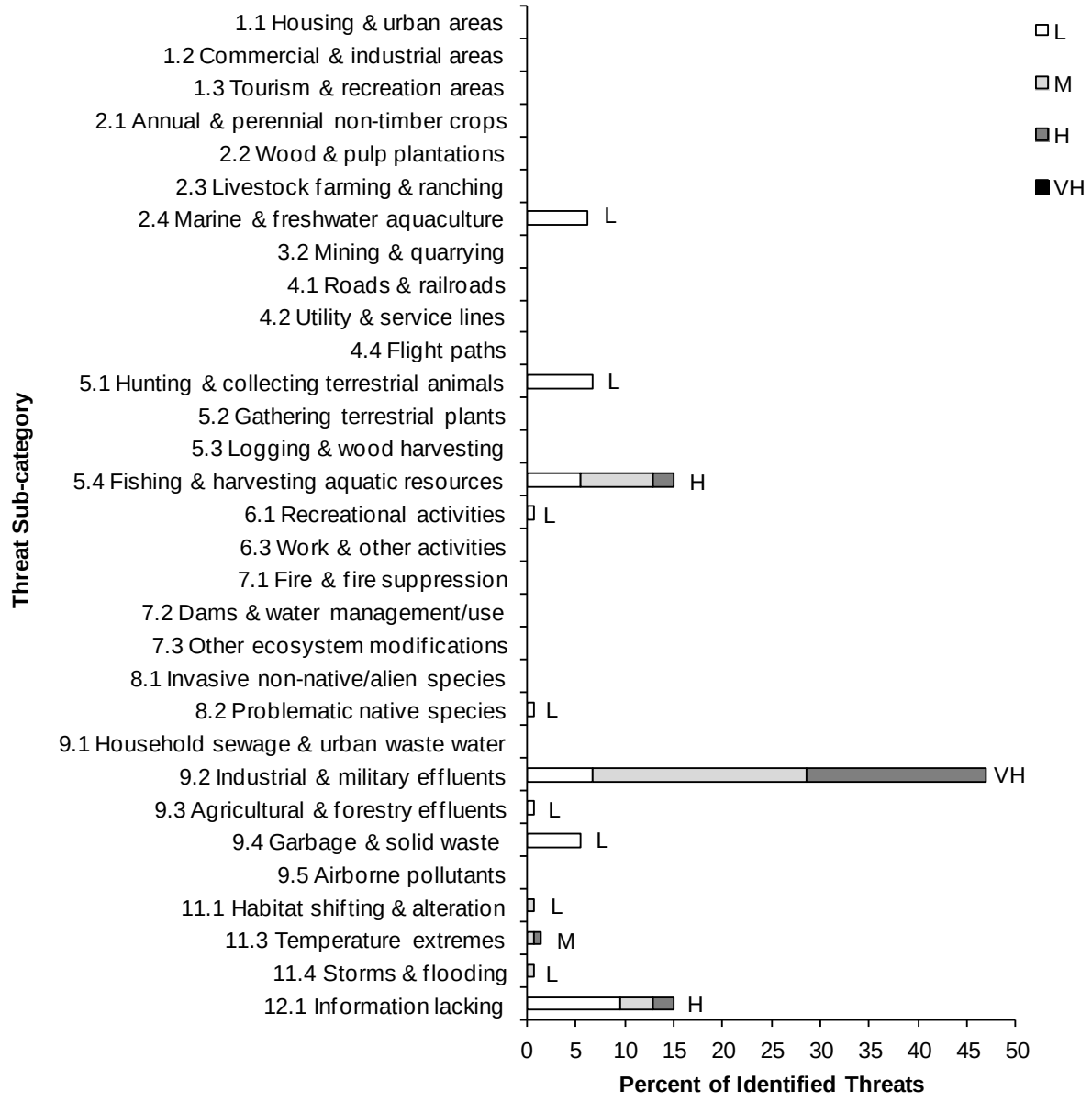

Figure 38. Percent of identified threats to priority bird species in marine waters for each threat sub-category in MBU 10 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in marine waters (for example, if 100 threats were identified in total for all priority species in marine waters, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in marine waters is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within MBU 10 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 22. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for marine waters in MBU 10 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to entanglement in fishing gear.	5.4 Fishing & harvesting aquatic resources	Reduce the number of birds killed directly or indirectly from fishing	2.4 Reduce incidental mortality	Recover and dispose of derelict fishing gear.	2.3 Habitat and natural process restoration	High: Common Murre Razorbill Thick-billed Murre Medium: Atlantic Puffin Common Eider Cory's Shearwater Great Shearwater Great Skua Long-tailed Duck Northern Gannet Sooty Shearwater Surf Scoter
				Prevent disposal of derelict fishing gear in the ocean through increased public awareness and education.	4.3 Awareness and communications	
				Alter fishing practices to avoid important areas and peak bird foraging periods.	5.2 Policies and regulations	
				Regulate the adoption of fishing gear modifications to reduce bycatch as a condition of licensing.	5.2 Policies and regulations	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
				Prevent disposal of derelict fishing gear through regulation.	5.2 Policies and regulations	
Habitat degradation due to competition with commercial fisheries for prey.	5.4 Fishing & harvesting aquatic resources	Reduce competition for resources between priority species and human commercial operations in marine waters	5.3 Reduce human competition for food sources or foraging sites	Alter fishing practices to avoid important areas and peak bird foraging periods.	5.2 Policies and regulations	Medium: Atlantic Puffin Black-legged Kittiwake
Mortality due to oil discharges from ships.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by reducing	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and	2.3 Habitat and natural process restoration	High: American Black Duck Atlantic Puffin Barrow's Goldeneye

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 22 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
		deliberate dumping of oily ship wastes into the ocean		Environment Canada.		(Eastern) Black Scoter Common Loon Common Merganser Common Murre Common Tern Cory's Shearwater Dovekie Great Shearwater Great Skua Harlequin Duck (Eastern) King Eider Northern Gannet Razorbill Red-necked Grebe Red-throated Loon Surf Scoter White-winged Scoter Medium: Black-legged Kittiwake Common Goldeneye Ivory Gull Leach's Storm-Petrel Long-tailed Duck Manx Shearwater Sooty Shearwater Thick-billed Murre
				Maintain/improve the Environment Canada BOAS program	2.3 Habitat and natural process restoration	
				Deter the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation.	5.4 Compliance and enforcement	
Mortality due to oil spills from drilling platforms.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and	2.3 Habitat and natural process restoration	High: Atlantic Puffin Barrow's Goldeneye (Eastern)

Table 22 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
		maintaining/improving emergency intervention programs		Environment Canada.		Black Scoter Common Merganser Cory's Shearwater Dovekie Great Shearwater Harlequin Duck (Eastern) King Eider Surf Scoter White-winged Scoter Medium: Black-legged Kittiwake Common Goldeneye Common Loon Common Murre Common Tern Ivory Gull Leach's Storm-Petrel Long-tailed Duck Manx Shearwater Northern Gannet Red-necked Grebe Red-throated Loon Sooty Shearwater Thick-billed Murre
				Maintain/improve the Environment Canada BOAS program	2.3 Habitat and natural process restoration	
Habitat degradation due to chemical contamination.	9.2 Industrial & military effluents	Reduce the impact of chemical contaminants in marine waters	1.5 Reduce habitat degradation from contaminants	Maintain/restore marine waters by reducing the use of pollutants leaching into the environment	2.3 Habitat and natural process restoration	Medium: Leach's Storm-Petrel

Table 22 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Lethal/sublethal effects due to chemical or heavy metal contamination.	9.2 Industrial & military effluents	Reduce mortality of birds caused by chemical contaminants	2.2 Reduce mortality and/or sub-lethal effects from exposure to contaminants	Maintain/restore marine waters by reducing the use of pollutants leaching into the environment	2.3 Habitat and natural process restoration	High: Ivory Gull Medium: Barrow's Goldeneye Black Scoter Common Eider White-winged Scoter

Marine Waters – Gulf of St. Lawrence

In MBU 12 NL, marine waters include nearshore and offshore waters (Fig. 39). There are no areas within MBU 12 NL that are covered in snow and/or sea ice for the majority of the year. The following discussion focuses on marine waters. The Newfoundland and Labrador portion of MBU 12 encompasses an area of approximately 21 400 km^2 off the western coast of the island of Newfoundland (Fig. 39).

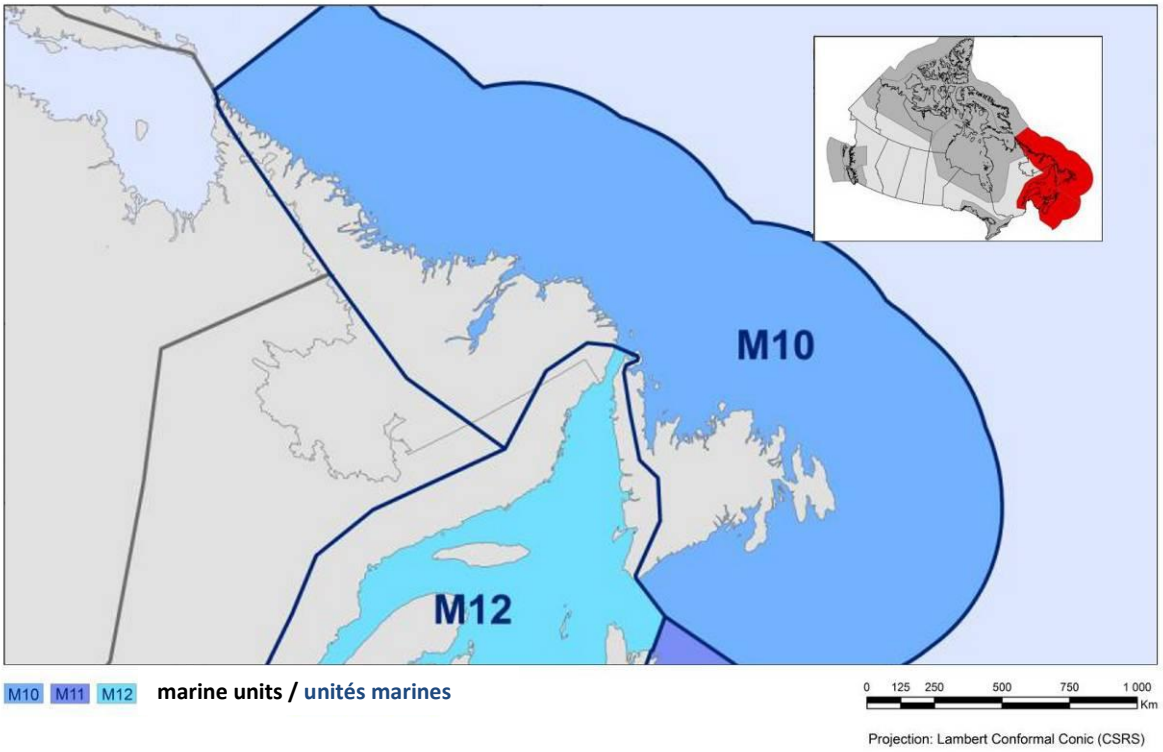

Figure 39. Map of the marine waters in MBU 12 NL.

There are 16 priority bird species found in marine waters of MBU 12 NL (Table 23): 7 waterfowl and 9 waterbirds. Of these, 4 are species at risk. Priority bird species are found in nearshore waters or the continental shelf (Table 23). Eleven priority bird species are associated exclusively to one of these sub-habitats, while the remaining species use both (Table 23). There are 7 species that are associated specifically to the Gulf of St. Lawrence marine waters: Black-bellied Plover, Black-headed Gull, Dunlin, Horned Grebe, Least Sandpiper, Semipalmated Sandpiper and the Willet.

High-magnitude threats to priority bird species in marine waters of MBU 12 NL are lethal and/or sublethal effects due to oil spill or discharges from ships and drilling platforms, chemical or heavy metal contamination due to bioaccumulation/biomagnification of toxins from the consumption of contaminated prey, water and/or sediments (9.2 Industrial & military effluents). Medium-magnitude threats identified were a lack of understanding of priority bird species' distribution, abundance and population trends (12.1 Information lacking), as well as

competition with commercial fisheries for prey or mortality due to entanglement in fishing gear (5.4 Fishing & harvesting aquatic resources; Fig. 40).

Many bird species will benefit from the conservation objectives and actions presented in Table 24. The recommended conservation actions to address medium- or high-ranked threats in marine waters of MBU 12 NL are very similar to those of MBU 10 NL as the highest ranked threat categories are the same in both planning units. Recommended conservation actions are to maintain and improve the effectiveness of environmental emergency intervention programs such as those run by the Regional Environmental Emergencies Team and Environment Canada; maintain and improve Environment Canada's BOAS program; deter the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation; improve water quality in marine areas by reducing the use of pollutants leaching into the environment; implement beneficial management practices (e.g., National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries; Department of Fisheries and Oceans 2007); regulate the adoption of fishing gear modifications to reduce bycatch as a condition of licensing; and prevent dumping of and recover and dispose of derelict fishing gear through increased public awareness, education and regulation. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Conservation actions for low-ranked threats to priority bird species in marine waters are available in the database but are not presented in this document.

Table 23. Priority species in MBU 12 NL that use marine waters, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Black Duck	nearshore waters	bays and estuaries	Maintain current		Y				Y	
Barrow's Goldeneye (Eastern)	nearshore waters	ice free, protected rocky shorelines	Assess/Maintain	Y	Y				Y	
Black Scoter	nearshore waters	shallow, cobbles, coastal islands, eel grass, mud/sand flats, mollusc beds	Assess/Maintain		Y				Y	
Black-headed Gull	nearshore waters	inshore waters including estuaries	Maintain current							Y
Common Eider	continental shelf; nearshore waters	ice edges and open leads, small coastal islands, rocky coastlines, reefs and shallow waters, mollusc beds	Assess/Maintain		Y				Y	
Common Goldeneye	nearshore waters	coastal bays, sandy, gravel, rocky or boulder substrates	Assess/Maintain		Y			Y	Y	
Common Tern	continental shelf; nearshore waters	shallow areas, clear waters for foraging	Assess/Maintain		Y			Y		
Dovekie	continental shelf	upwellings/fronts, continental shelf edges, offshore pack ice, cold waters, large coastal bays	Assess/Maintain		Y					
Great Shearwater	continental shelf		Assess/Maintain		Y	Y		Y		
Harlequin Duck (Eastern)	nearshore waters	shallow, rocky coastlines and reefs,	Assess/Maintain	Y	Y				Y	

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
		estuaries								
Horned Grebe	nearshore waters	sheltered bays	Assess/Maintain	Y	Y					
Ivory Gull	continental shelf	pack ice and polynyas	Recovery objective	Y	Y					
Long-tailed Duck	continental shelf; nearshore waters	ice edges, coastal lagoons and bays	Assess/Maintain		Y				Y	
Northern Gannet	continental shelf; nearshore waters	continental shelf and slopes, shoaling fish	Maintain current			Y		Y		
Red-necked Grebe	nearshore waters	shallow bays and inlets	Assess/Maintain		Y		Y			
Sooty Shearwater	continental shelf	upwellings/fronts	Assess/Maintain		Y					

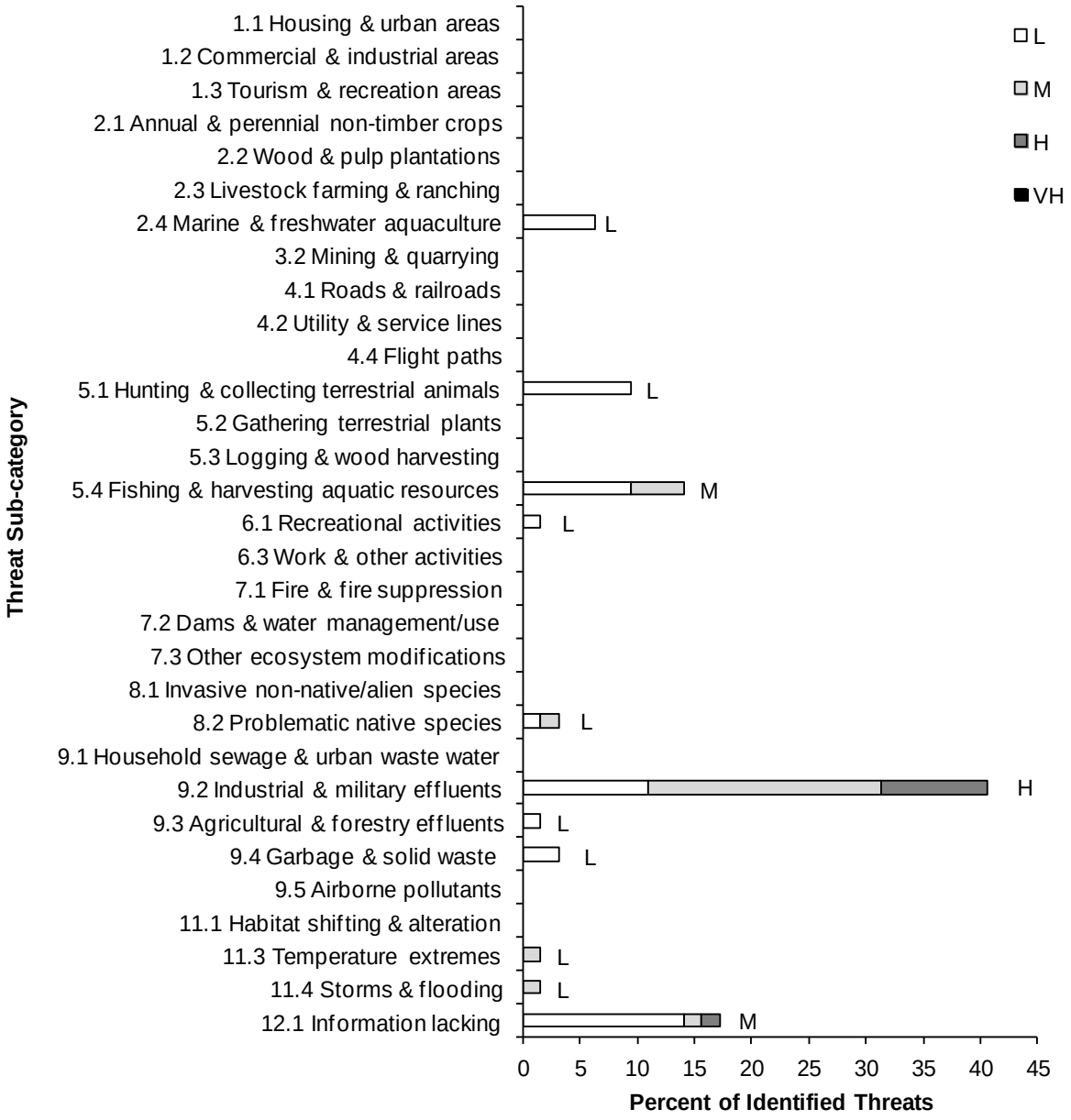

Figure 40. Percent of identified threats to priority bird species in marine waters for each threat sub-category in MBU 12 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in marine waters (for example, if 100 threats were identified in total for all priority species in marine waters, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in marine waters is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within MBU 12 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 24. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for marine waters in MBU 12 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected1[1]
Mortality due to entanglement in fishing gear.	5.4 Fishing & harvesting aquatic resources	Reduce the number of birds killed directly or indirectly from fishing	2.4 Reduce incidental mortality	Recover and dispose of derelict fishing gear.	2.3 Habitat and natural process restoration	Medium: Common Eider Long-tailed Duck Northern Gannet
				Prevent disposal of derelict fishing gear in the ocean through increased public awareness and education.	4.3 Awareness and communications	
				Alter fishing practices to avoid important areas and peak bird foraging periods.	5.2 Policies and regulations	
				Regulate the adoption of fishing gear modifications to reduce bycatch as a condition of licensing.	5.2 Policies and regulations	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
				Prevent disposal of derelict fishing gear in the ocean through regulation.	5.2 Policies and regulations	
Mortality due to introduced mammalian predators.	8.2 Problematic native species	Reduce mortality of priority species due to predation	2.5 Reduce parasitism/predation	Assess the impact of predation by introduced predators on the survival of priority species.	8.1 Research	Medium: Northern Gannet
Mortality due to oil discharges from ships.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by	2.3 Reduce mortality and/or sub-lethal effects from oil	Maintain/improve effectiveness of environmental emergencies intervention programs run by the	2.3 Habitat and natural process restoration	High: American Black Duck Black Scoter

[1]Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 24 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected1[1]
		reducing deliberate dumping of oily ship wastes into the ocean	pollution	Regional Environmental Emergencies Team and Environment Canada.		Dovekie Ivory Gull Medium: Barrow's Goldeneye (Eastern) Black-headed Gull Common Goldeneye Common Tern Great Shearwater Harlequin Duck (Eastern) Horned Grebe Long-tailed Duck Northern Gannet Red-necked Grebe Sooty Shearwater
				Maintain/improve the Environment Canada BOAS program.	2.3 Habitat and natural process restoration	
				Deter the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation.	5.4 Compliance and enforcement	
Mortality due to oil spills from drilling platforms.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by maintaining/improving emergency intervention programs	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and Environment Canada.	2.3 Habitat and natural process restoration	High: Black Scoter Medium: Black-headed Gull Long-tailed Duck
				Maintain/improve the Environment Canada BOAS program.	2.3 Habitat and natural process restoration	
Lethal/sublethal effects due to chemical or heavy metal contamination.	9.2 Industrial & military effluents	Reduce mortality of birds caused by chemical contaminants	2.2 Reduce mortality and/or sub-lethal effects from exposure to contaminants	Maintain/restore marine waters by reducing the use of pollutants leaching into the environment	2.3 Habitat and natural process restoration	High: Ivory Gull

Coastal (Above High Tide)

In BCR 8 NL, coastal habitats, defined here as occurring above the high-tide line, include beaches, estuaries, saltmarshes and bare areas found along the ocean shore (Fig. 41). Coastal habitats occurring below the high-tide line are discussed separately in the next two sections: Coastal (Intertidal) – Newfoundland-Labrador Shelves and Coastal (Intertidal) – Gulf of St. Lawrence.

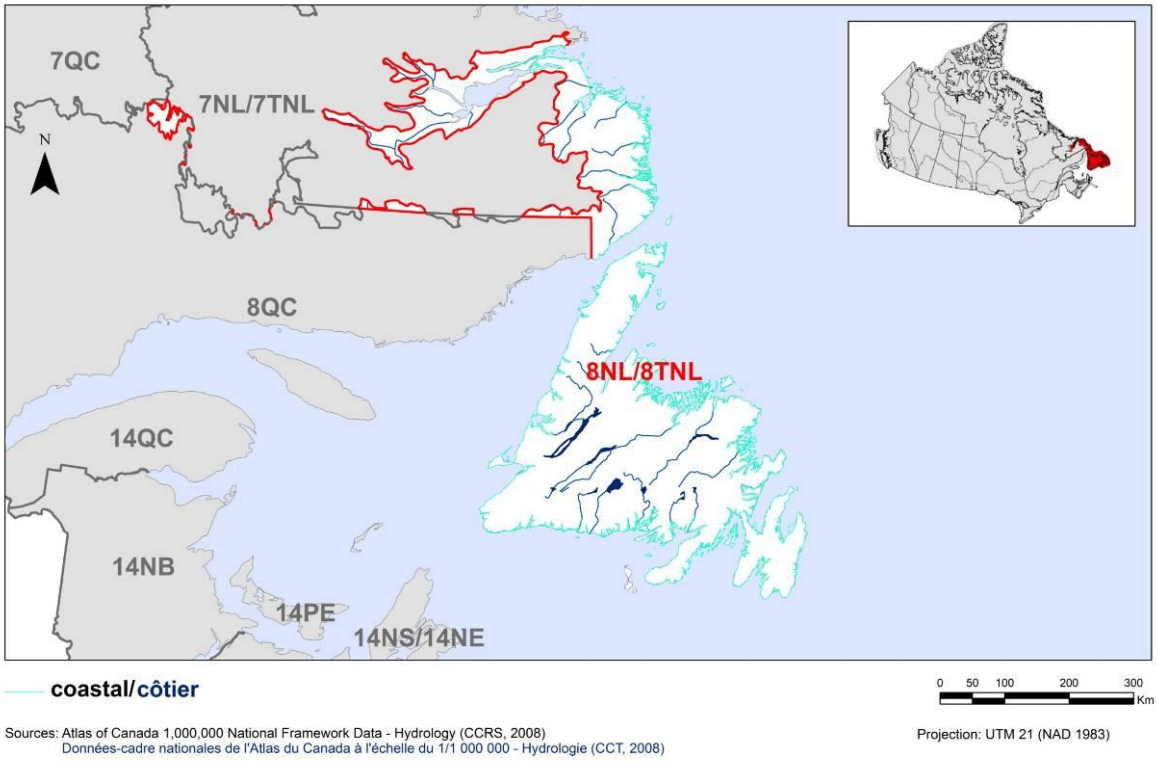

Figure 41. Map of coastal (above high tide) habitats in BCR 8 NL.
Note: The red line delineates the geographic boundaries established by the North American Bird Conservation Initiative for the BCRs. In this document, the boundaries of the terrestrial unit (BCR 8 NL) do not extend below the high-tide line.

There are 14 priority bird species found in coastal (above high tide) habitats of BCR 8 NL (Table 25): 5 waterfowl, 2 waterbirds, 5 shorebirds and 2 landbirds. Of these, 4 are species at risk. Priority bird species are found in estuaries, saltmarshes, beaches, and bare areas (Table 25). Eleven priority bird species are associated exclusively to one sub-habitat class, while the American Black Duck uses both estuaries/saltmarshes, and both the American Golden-Plover and Whimbrel use beaches/estuaries (Table 25). Thirteen species are associated specifically to the coastal (above high tide) habitat and are not found in either marine biogeographic unit: American Bittern, Barn Swallow, Chimney Swift, Common Nighthawk, Green-winged Teal, Northern Hawk Owl, Olive-sided Flycatcher, Ring-necked Duck, Rusty Blackbird, Short-eared Owl, Swamp Sparrow, Wilson's Snipe and the Yellow-bellied Flycatcher.

Several high-magnitude threats to priority bird species in coastal (above high tide) habitats of BCR 8 NL were identified and include a lack of understanding of priority bird species' distribution, abundance and population trends (12.1 Information lacking); habitat degradation due to climate change altering habitat structures, species' ranges, food webs and timing for migration and egg laying (11.1 Habitat shifting & alteration); habitat degradation from increased frequency and severity of storms leading to erosion and nest flooding due to climate change (11.4 Storms & flooding); as well as reductions in fecundity from hybridization with Mallards, competition with grazing goose populations and mortality from increased predator populations due to anthropogenic land use modifications (8.2 Problematic native species; Fig. 42). Medium-magnitude threats identified were habitat degradation or reductions in fecundity from disturbance due to recreational activities (e.g., motor boats) and development (e.g., new roads) near migration or breeding sites (6.1 Recreational activities); habitat loss or degradation from the destruction and manipulation of coastal habitats due to changes in hydrologic regimes, water management and river channelization (7.2 Dams & water management/use); as well as a reduction in chick and adult survival caused by temperature extremes such as cold snaps in spring (11.3 Temperature extremes; Fig. 42).

Many bird species will benefit from the conservation objectives and actions presented in Table 26. Examples of recommended conservation actions to address medium- and high-ranked threats in coastal (above high tide) habitats of BCR 8 NL are to establish buffer zones around known breeding, foraging or staging areas and limit recreational activities including loud noises and moving vehicles within the established buffer during breeding and migration windows; raise public awareness of the vulnerability of priority bird species to human disturbance; ensure protection of coastal areas of a variety of sizes, configuration and habitat conditions in order to ensure diversity of sub-habitat types and species across the landscape; protect and secure coastal areas for priority birds through various methods such as creation of protected areas, private land acquisitions, conservation easements, community conservation plans and stewardship agreements; prevent and prohibit disposal of garbage and solid wastes through education, public awareness and regulation; maintain existing predator control programs and evaluate the possibility of starting new ones. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Recommended conservation actions to address climate change are presented in the Widespread Issues section of this document (see Climate change). Conservation actions for low-ranked threats to priority bird species in coastal (above high tide) habitats are available in the database but are not presented in this document.

Table 25. Priority species in BCR 8 NL that use coastal (above high tide) habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Black Duck	estuaries; saltmarshes		Maintain current		Y				Y	
American Golden-Plover	beaches; estuaries	beaches and mudflats	Assess/Maintain		Y					
Canada Goose (North Atlantic)	estuaries; saltmarshes		Increase 50%		Y				Y	
Common Goldeneye	estuaries		Maintain current		Y			Y	Y	
Common Loon	estuaries	abundant fish	Maintain current		Y			Y		
Common Tern	beaches	sand and gravel, scattered vegetation (cover for chicks)	Maintain current		Y			Y		
Green-winged Teal	saltmarshes	shallow	Increase 50%						Y	
Harlequin Duck (Eastern)	estuaries		Assess/Maintain	Y	Y				Y	
Least Sandpiper	estuaries	short grasses	Assess/Maintain		Y					
Peregrine Falcon (*anatum/tundrius*)	bare areas	steep cliffs, crevices, islands	Assess/Maintain	Y		Y				
Piping Plover (*melodus*)	beaches	beaches, dunes, sparse vegetation, lakes and rivers, pebbles, driftwood, shells or wrack	Recovery objective	Y	Y					

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

Table 25 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Semipalmated Sandpiper	beaches	sand dunes, scattered waterbodies	Assess/Maintain		Y					
Short-eared Owl	bare areas	above treeline, open, small mammal abundance	Assess/Maintain	Y	Y					
Whimbrel	beaches; estuaries		Assess/Maintain		Y					

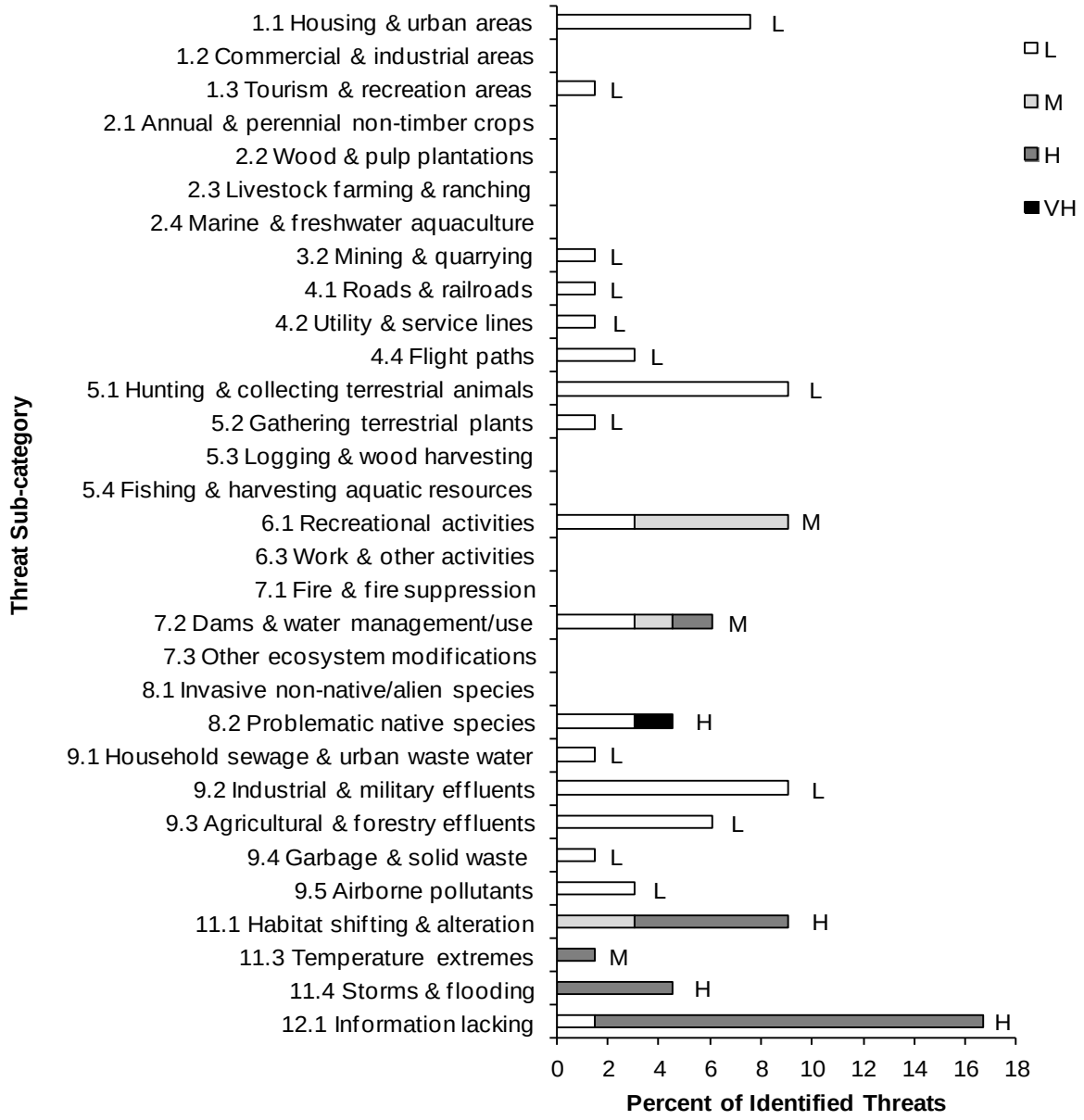

Figure 42. Percent of identified threats to priority bird species in coastal (above high tide) habitats for each threat sub-category in BCR 8 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in the coastal (above high tide) habitats (for example, if 100 threats were identified in total for all priority bird species in coastal (above high tide) habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in coastal (above high tide) habitats is shown at the end of each bar (also presented in Table-4 Relative magnitude of identified threats to priority bird species within BCR 8 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 26. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for coastal (above high tide) habitats in BCR 8 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Habitat degradation or a reduction in fecundity due to disturbance from recreation and development activities near migration or nesting sites.	6.1 Recreational activities	Reduce disturbance caused by human development and recreation in coastal habitats	4.1 Reduce disturbance from human recreation	Establish buffer zones around known breeding, foraging, and/or staging areas in coastal habitats.	2.1 Site/area management	Medium: Least Sandpiper Piping Plover (*melodus*) Semipalmated Sandpiper Whimbrel
				Limit human recreational activities in important breeding colony and stopover coastal habitats during breeding and migration windows.	2.1 Site/area management	
				Limit sources of loud noise and rapidly moving vehicles in sensitive coastal habitats during breeding and migration windows.	2.1 Site/area management	
				Raise public awareness of the vulnerability of these species to human disturbance at breeding, foraging, and/or staging sites.	4.3 Awareness and communications	
Habitat loss or degradation from the destruction and manipulation of coastal (above high tide) habitats due to changes in hydrology, water management and river channelization.	7.2 Dams & water management/use	Maintain/restore the diversity and quality of coastal habitats across the landscape	1.1 Ensure land and resource-use policies and practices maintain or improve bird habitat	Protect and secure coastal areas for priority birds through various methods such as creation of protected areas, private land acquisitions, conservation easements, community conservation plans and stewardship agreements.	1.1 Site/area protection	High: Canada Goose (North Atlantic) Medium: Harlequin Duck (Eastern)
				Ensure protection of coastal areas of a variety of sizes, configuration and habitat conditions in order to ensure diversity of sub-habitat types and species across the landscape.	1.2 Resource and habitat protection	
				Establish buffer zones around known breeding, foraging, and/or staging areas in coastal habitats and limit industrial activities within the established buffers.	2.1 Site/area management	

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 26 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to an increase in predator populations as a result of land use changes.	8.2 Problematic native species	Reduce mortality of priority species due to predation	2.5 Reduce parasitism/predation	Assess the impact of predation by introduced predators on the survival of priority species.	8.1 Research	Very High: Piping Plover (*melodus*)
				Maintain existing predator control programs and evaluate the possibility of starting new ones.	2.2 Invasive/problematic species control	
				Prevent disposal of garbage and solid wastes in coastal habitats through education and public awareness	4.3 Awareness and communications	
				Prohibit disposal of garbage and solid wastes in coastal habitats through regulation	5.2 Policies and regulations	

Coastal (Intertidal) – Newfoundland-Labrador Shelves

In MBU 10 NL, coastal habitats include estuaries, islands, bare areas, mudflats, rocky shoreline, saltmarshes and sandflats (Fig. 43). The coastal (intertidal) habitats of MBU 10 NL include all marine habitats along ocean shorelines, but do not include terrestrial shoreline habitats (Fig. 43). Priority bird species using primarily coastal (above high tide) habitats are included in the previous section: Coastal (Above High Tide).

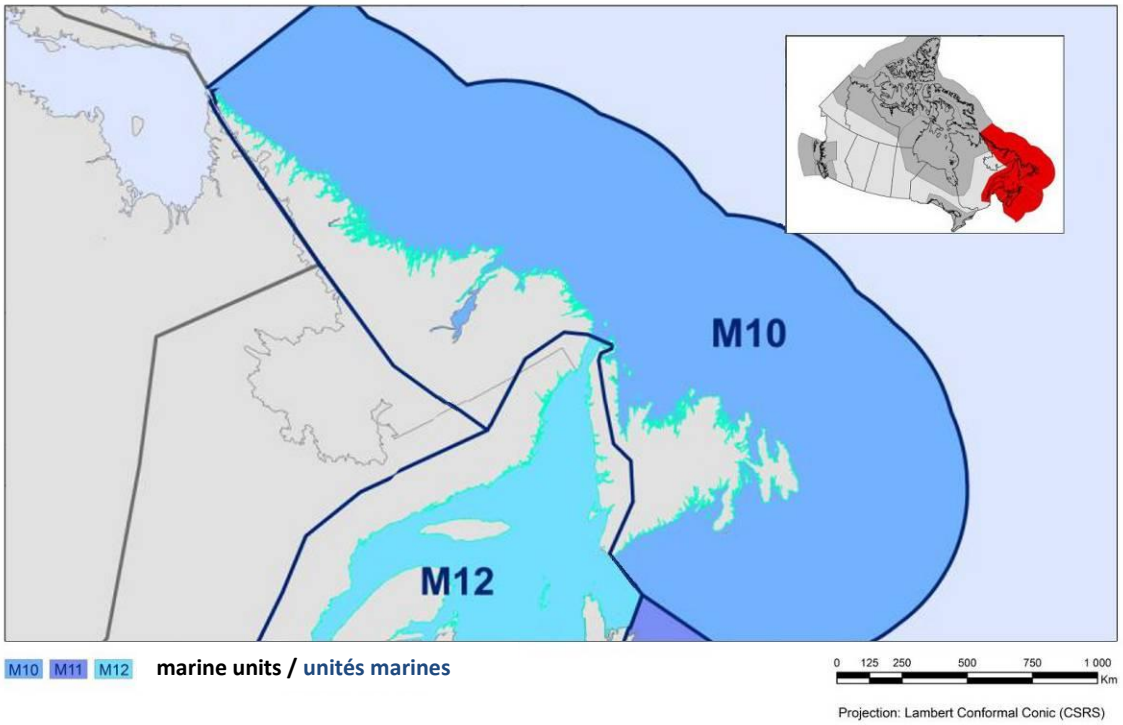

Figure 43. Map of coastal (intertidal) habitats in MBU 10 NL.

There are 28 priority bird species found in coastal (intertidal) habitats of MBU 10 NL (Table 27): 9 waterfowl, 11 waterbirds and 8 shorebirds. Of these, 4 are species at risk. Priority bird species are found in multiple sub-habitats such as estuaries, saltmarshes, islands, mudflats, rocky shorelines, sandflats and non-specific bare areas (Table 27). Eighteen priority bird species are associated exclusively with one sub-habitat, while the remaining species use a combination of sub-habitats (Table 27). Ten species are associated specifically with the Newfoundland-Labrador Shelves coastal (intertidal) habitat, which are not found in coastal habitats of BCR 8 NL or MBU 12 NL: Atlantic Puffin, Common Loon, Common Merganser, Common Murre, Long-tailed Duck, Manx Shearwater, Northern Gannet, Razorbill, Solitary Sandpiper and Thick-billed Murre.

Several high-magnitude threats to priority bird species in coastal (intertidal) habitats of MBU 10 NL were identified and include a lack of understanding of priority bird species' distribution, abundance and population trends (12.1 Information lacking); habitat degradation due to climate change altering habitat structures such as beaches, dunes, tidal currents and

amplitudes (11.1 Habitat shifting & alteration); as well as population reductions due to hybridization with Mallards and mortality from introduced and increased predator populations due to anthropogenic land use modifications (8.2 Problematic native species; Fig. 44). Medium-magnitude threats identified were habitat degradation, lethal and/or sub-lethal effects due to chemical or heavy metal contamination in addition to oil spills and discharges from ships and drilling platforms (9.2 Industrial & military effluents); reductions in survival from introduced predators such as mink, hares and voles on breeding colony islands (8.1 Invasive non-native/alien species); habitat loss and degradation from increased frequency and severity of storms leading to erosion, rock slides and flooding (11.4 Storms & flooding); as well as a reductions chick and adult survival of piping plovers (*melodus*) from cold snaps during breeding season (11.3 Temperature extremes; Fig. 44). The remaining threats were ranked "low" overall; however, the threat related to mortality due to entanglement in fishing gear (5.4 Fishing & harvesting aquatic resources) was ranked as "medium" for the Long-tailed Duck, while the threat related to the reduction in fecundity due to disturbance (e.g., motor boats, human activities near colonies) around nesting sites (6.1 recreational activities) was ranked "medium" for the Common Eider, Common Loon, Common Tern and Piping Plover (*melodus*). Another threat that was frequently identified but ranked as "low" overall was legal hunting, poaching and incidental take (5.1 Hunting & collecting terrestrial animals; Fig. 44).

Many bird species will benefit from the conservation objectives and actions presented in Table 28. Examples of recommended conservation actions to address medium- and high-ranked threats in coastal (intertidal) habitats are to assess the impact of predation by introduced predators on the survival of priority species and maintain existing predator control programs or evaluate the possibility of starting new ones; maintain/improve Environment Canada's BOAS program; maintain/improve effectiveness of environmental emergency intervention programs run by the Regional Environmental Emergencies Team and Environment Canada; deter the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation; and maintain/restore coastal areas by reducing the use of pollutants or heavy metals leaching into the environment. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Recommended conservation actions to address climate change are presented in the Widespread Issues section of this document (see Climate Change). Conservation actions for low-ranked threats to priority bird species in coastal (intertidal) habitats are available in the database but are not presented in this document.

Table 27. Priority species in MBU 10 NL that use coastal (intertidal) habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Black Duck	estuaries; saltmarshes		Maintain current		Y				Y	
Atlantic Puffin	islands	predator free, tunnels in turf or rock piles	Maintain current							Y
Barrow's Goldeneye (Eastern)	estuaries		Assess/Maintain	Y	Y				Y	
Black-legged Kittiwake	islands	coastal and island cliffs	Maintain current			Y		Y		
Canada Goose (North Atlantic)	islands; mudflats; saltmarshes	ponds	Increase 50%		Y				Y	
Common Eider	islands; rocky shorelines	dense shrubby forest, well drained, standing fresh water, predator free, exposed	Increase 100%		Y				Y	
Common Goldeneye	estuaries		Assess/Maintain		Y			Y	Y	
Common Loon	estuaries	abundant fish	Assess/Maintain		Y			Y		
Common Merganser	estuaries		Assess/Maintain					Y	Y	
Common Murre	islands	cliffs and flat ground for nesting, mainland coasts and islands	Assess/Maintain		Y					
Common Tern	islands	sand and gravel, scattered vegetation (cover for chicks)	Assess/Maintain		Y			Y		

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

Table 27 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Harlequin Duck (Eastern)	estuaries; islands; rocky shorelines	rocky shorelines and sub-tidal ledges	Assess/Maintain	Y	Y				Y	
Leach's Storm-Petrel	islands	small, remote, soft substrate, vegetated	Assess/Maintain		Y					
Lesser Yellowlegs	mudflats; saltmarshes		Assess/Maintain		Y					
Long-tailed Duck	rocky shorelines	cobble and bedrock ledges; surf along beaches	Assess/Maintain		Y				Y	
Manx Shearwater	islands	soft substrate, open terrain, grasses and/or shrubs	Assess/Maintain		Y					
Northern Gannet	islands	offshore islands, cliffs or flat/sloping bare rock	Maintain current			Y		Y		
Piping Plover (*melodus*)	sandflats	sand, gravel, cobble, ephemeral pools	Recovery objective	Y	Y					
Purple Sandpiper	rocky shorelines	rocky shoreline exposed to wave action	Assess/Maintain		Y					
Razorbill	islands	offshore islands, rock crevices, boulders and steep cliffs	Assess/Maintain		Y					
Red Knot (*rufa*)	non-specific bare areas; saltmarshes	especially sandy bottom estuaries	Assess/Maintain	Y	Y					
Red-necked Grebe	estuaries		Assess/Maintain		Y		Y			
Sanderling	estuaries; sandflats		Assess/Maintain		Y					
Solitary Sandpiper	mudflats; saltmarshes		Assess/Maintain		Y					
Surf Scoter	estuaries; rocky shorelines	mollusc beds, rocky	Assess/Maintain		Y				Y	
Thick-billed Murre	islands	cliffs	Assess/Maintain		Y					
Whimbrel	estuaries; mudflats		Assess/Maintain		Y					
White-rumped Sandpiper	mudflats		Maintain current							Y

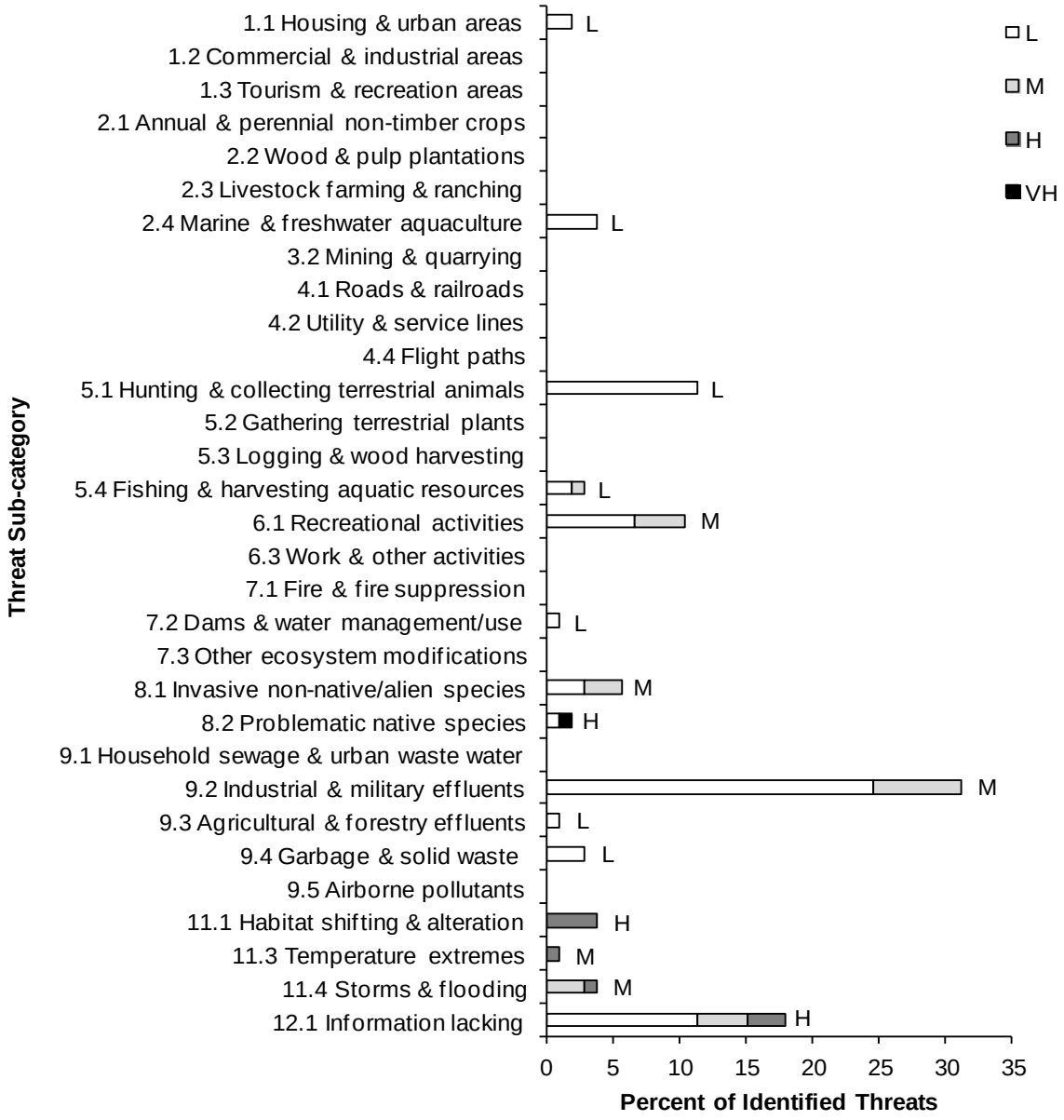

Figure 44. Percent of identified threats to priority bird species in coastal (intertidal) habitats in each threat sub-category of MBU 10 NL.

Each bar represents the percent of the total number of threats identified for each threat sub-category in coastal (intertidal) habitats (for example, if 100 threats were identified in total for all priority species in coastal (intertidal) habitats, and 10 of those threats were in the category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category). The overall magnitude of the sub-threat in coastal (intertidal) habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within MBU 10 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 28. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for coastal (intertidal) habitats in MBU 10 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to entanglement in fishing gear.	5.4 Fishing & harvesting aquatic resources	Reduce the number of birds killed directly or indirectly from fishing	2.4 Reduce incidental mortality	Recover and dispose of derelict fishing gear.	2.3 Habitat and natural process restoration	Medium: Long-tailed Duck
				Prevent disposal of derelict fishing gear in the ocean through increased public awareness and education.	4.3 Awareness and communications	
				Alter fishing practices to avoid important areas and peak bird foraging periods.	5.2 Policies and regulations	
				Regulate the adoption of fishing gear modifications to reduce bycatch as a condition of licensing.	5.2 Policies and regulations	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
				Prevent disposal of derelict fishing gear through regulation.	5.2 Policies and regulations	
Reduction in fecundity due to disturbance around nesting sites (e.g., motor boats, human activities near colonies).	6.1 Recreational activities	Reduce disturbance caused by human development and recreation in coastal habitats	4.1 Reduce disturbance from human recreation	Establish buffer zones around known breeding, foraging, and/or staging areas in coastal habitats.	2.1 Site/area management	Medium: Common Eider Common Murre Common Tern Piping Plover (*melodus*)
				Limit human recreational activities in important breeding colony and stopover coastal habitats during breeding and migration windows.	2.1 Site/area management	
				Limit sources of loud noise and rapidly moving vehicles in sensitive coastal habitats during breeding and migration windows.	2.1 Site/area management	

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 28 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
				Raise public awareness of the vulnerability of these species to human disturbance at breeding, foraging, and/or staging sites.	4.3 Awareness and communications	
Mortality from introduced mammalian and avian predators (e.g., red squirrels).	8.1 Invasive non-native/alien species	Reduce or eliminate introduced predators	3.5 Prevent and control the spread of invasive and exotic species	Assess the impact of predation by introduced predators on priority species' survival.	8.1 Research	Medium: Leach's Storm-Petrel Northern Gannet Razorbill
				Maintain existing predator control programs and evaluate the possibility of starting new ones.	2.2 Invasive/problematic species control	
Mortality due to an increase in predator populations as a result of land use changes.	8.2 Problematic native species	Reduce mortality of priority species due to predation	2.5 Reduce parasitism/predation	Assess the impact of predation by introduced predators on priority species' survival.	8.1 Research	Very High: Piping Plover (*melodus*)
				Maintain existing predator control programs and evaluate the possibility of starting new ones.	2.2 Invasive/problematic species control	
Mortality due to oil discharges from ships.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by reducing deliberate dumping of oily ship wastes into the ocean	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and Environment Canada	2.3 Habitat and natural process restoration	Medium: Barrow's Goldeneye (Eastern) Common Loon Red-necked Grebe
				Maintain/improve the Environment Canada BOAS Program.	2.3 Habitat and natural process restoration	
				Deter the dumping of oily ship wastes into the ocean by enforcing federal legislation.	5.4 Compliance and enforcement	

Table 28 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to oil spills from drilling platforms.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by maintaining/improving emergency intervention programs	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of emergency intervention programs such as those run by the Regional Environmental Emergencies Team and Environment Canada. Maintain/improve the Environment Canada BOAS Program.	2.3 Habitat and natural process restoration 2.3 Habitat and natural process restoration	Medium: Barrow's Goldeneye (Eastern) Common Loon Harlequin Duck (Eastern) Red-necked Grebe

Coastal (Intertidal) – Gulf of St. Lawrence

In MBU 12 NL, coastal habitats include estuaries, islands, bare areas, mudflats, rocky shoreline, saltmarshes and sandflats (Fig. 45). The coastal (intertidal) habitats of MBU 12 NL include all marine habitats along ocean shorelines, but do not include terrestrial shoreline habitats (Fig. 45). Priority bird species using primarily coastal (above high tide) habitats are included in the previous section: Coastal (Above High Tide).

There are 23 priority bird species found in coastal (intertidal) habitats of MBU 12 NL (Table 29); 7 waterfowl, 4 waterbirds, and 12 shorebirds. Of these, 5 are species at risk. Priority bird species are found in estuaries, saltmarshes, mudflats, sandflats, rocky shorelines, islands and bare areas (Table 29). Eleven priority bird species are associated exclusively with one sub-habitat, while the remaining species use a combination of sub-habitats (Table 29). Four species are associated specifically to the Gulf of St. Lawrence coastal (intertidal) habitat, which are not found in coastal habitats of BCR 8 NL or MBU 10 NL: Black-bellied Plover, Dunlin, Horned Grebe and White-winged Scoter.

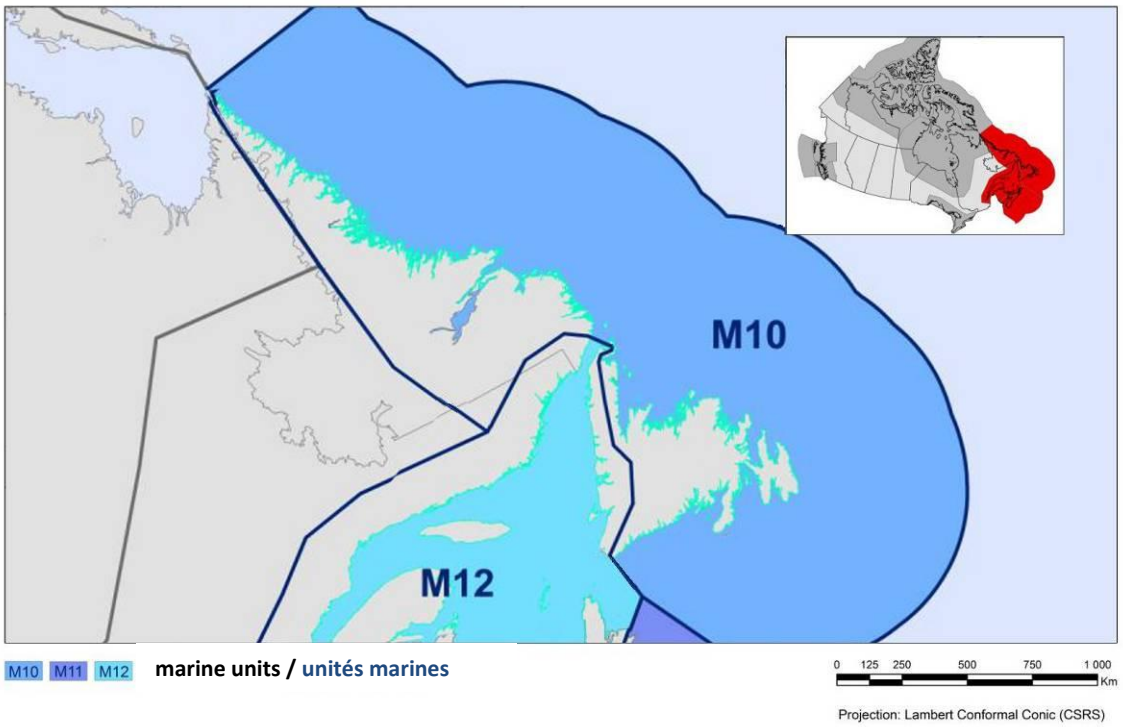

Figure 45. Map of coastal (intertidal) habitats in MBU 12 NL.

Several high-magnitude threats to priority bird species in coastal (intertidal) habitats of MBU 12 NL were identified and include a lack of understanding of priority bird species' distribution, abundance and population trends (12.1 Information lacking); habitat degradation due to climate change altering habitat structures (e.g., beaches, dunes, tidal currents and amplitudes) and food webs (11.1 Habitat shifting and alteration); as well as mortality from

increased predator populations due to anthropogenic land use modifications (8.2 Problematic native species; Fig. 46). Medium-magnitude threats identified were habitat degradation, lethal and/or sub-lethal effects due to chemical or heavy metal contamination in addition to oil spills or discharges from ships and drilling platforms (9.2 Industrial & military effluents); habitat loss and degradation from increased frequency and severity of storms leading to erosion, rock slides and flooding (11.4 Storms & flooding); and reductions in adult or chick survival from cold snaps during breeding season (11.3 Temperature extremes; Fig. 46). The remaining threats were ranked "low" overall; however, the threat related to mortality due to entanglement in fishing gear (5.4 Fishing & harvesting aquatic resources) was ranked as "medium" for the Long-tailed Duck, while the threat related to the reduction in fecundity due to disturbance (e.g., motor boats, human activities near colonies) around nesting sites (6.1 recreational activities) was ranked "medium" for the Piping Plover (*melodus*).

Many bird species will benefit from the conservation objectives and actions presented in Table 29. The recommended conservation actions to address medium- or high-ranked threats in coastal (intertidal) habitats of MBU 12 NL are very similar to those of MBU 10 NL, as the highest ranked threat categories are the same in both planning units. Examples of recommended conservation actions are to assess the impact of predation by introduced predators on the survival of priority species and maintain existing predator control programs or evaluate the possibility of starting new ones; maintain/improve Environment Canada's BOAS program; maintain/improve effectiveness of environmental emergency intervention programs run by the Regional Environmental Emergencies Team and Environment Canada; deter the dumping of oily ship wastes into the ocean by continuing to enforce federal legislation; and maintain/restore coastal areas by reducing the use of pollutants or heavy metals leaching into the environment. The development and implementation of monitoring programs is recommended to address the knowledge gap regarding the distribution, abundance and population trends of priority bird species (see the Research and Population Monitoring Needs section). Recommended conservation actions to address climate change are presented in the "Widespread Issues" section of this document (see Climate Change). Conservation actions for low-ranked threats to priority bird species in coastal (intertidal) habitats are available in the database but are not presented in this document.

Table 29. Priority species in MBU 12 NL that use coastal (intertidal) habitats, regional habitat sub-class, important habitat features, population objectives and reason for priority status.

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Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
American Black Duck	estuaries; saltmarshes		Maintain current		Y				Y	
Barrow's Goldeneye (Eastern)	estuaries		Assess/Maintain	Y	Y				Y	
Black-bellied Plover	estuaries; mudflats; sandflats	mudflats, sandflats, margins of lakes, tidal creeks	Assess/Maintain		Y					
Black-headed Gull	estuaries; islands; saltmarshes	inshore waters, coastal wetlands (saltmarshes, estuaries, river margins) with lush vegetation, associated with tern colonies	Maintain current							Y
Canada Goose (North Atlantic)	islands; mudflats; saltmarshes	ponds	Increase 50%		Y				Y	
Common Eider	rocky shorelines	exposed rocks	Assess/Maintain		Y				Y	
Common Goldeneye	estuaries		Assess/Maintain		Y			Y	Y	
Common Tern	islands	sand and gravel, scattered vegetation (cover for chicks)	Assess/Maintain		Y			Y		
Dunlin	estuaries; mudflats	sandy beaches, shores of lakes and reservoirs	Assess/Maintain		Y					
Harlequin Duck (Eastern)	estuaries; islands; rocky shorelines	rocky shorelines and sub-tidal ledges	Assess/Maintain	Y	Y				Y	

[1] "SAR" (species at risk) includes species considered Endangered, Threatened or of Special Concern pursuant to an assessment by COSEWIC; listed on Schedule 1 of SARA as Endangered, Threatened or of Special Concern; or listed as Endangered, Threatened or Vulnerable under Newfoundland and Labrador's *Endangered Species Act*.
[2] N/CC: species considered of National or Continental Concern.
[3] N/CS: species considered of National or Continental Stewardship.
[4] R/SC: species of Regional or Subregional Concern.
[5] R/SS: species of Regional or Subregional Stewardship.
[6] NAWMP/EHJV: waterfowl that are priority under the regional EHJV Implementation Plan 2007 – 2012, or scored "Moderately-High", "High" or "Highest" in WCR 8 or 8.2 of the North American Waterfowl Management Plan (NAWMP Plan Committee 2004).
[7] Review: added by the Newfoundland and Labrador Technical Working Group. For further details on reasons for priority status and the species prioritization process, see Table 1 and Element 1: Priority Species Assessment in Appendix 2.

Table 29 continued

Priority Species	Regional Habitat Sub-class	Important Habitat Features	Population Objective	Reason for Priority Status						
				SAR[1]	N/CC[2]	N/CS[3]	R/SC[4]	R/SS[5]	NAWMP/ EHJV[6]	Review[7]
Horned Grebe	estuaries	brackish waters, shallow coastlines, emergent vegetation	Assess/Maintain	Y	Y					
Least Sandpiper	estuaries; mudflats; saltmarshes	short grasses	Assess/Maintain		Y					
Lesser Yellowlegs	mudflats; saltmarshes		Assess/Maintain		Y					
Long-tailed Duck	rocky shorelines	cobble and bedrock ledges	Assess/Maintain		Y				Y	
Piping Plover (*melodus*)	sandflats	sand, gravel, cobble, ephemeral pools	Recovery objective	Y	Y					
Purple Sandpiper	rocky shorelines	rocky shorelines exposed to wave action	Assess/Maintain		Y					
Red Knot (*rufa*)	bare areas; saltmarshes	sandy bottom estuaries	Assess/Maintain	Y	Y					
Red-necked Grebe	estuaries		Assess/Maintain		Y		Y			
Sanderling	estuaries; sandflats		Assess/Maintain		Y					
Semipalmated Sandpiper	mudflats	mudflats, margins of lakes	Assess/Maintain		Y					
Whimbrel	estuaries; mudflats		Assess/Maintain		Y					
White-rumped Sandpiper	mudflats		Maintain current							Y
Willet	estuaries; islands; rocky shorelines; saltmarshes	pebble, gravel or sand beaches, predator-free	Assess/Maintain		Y					

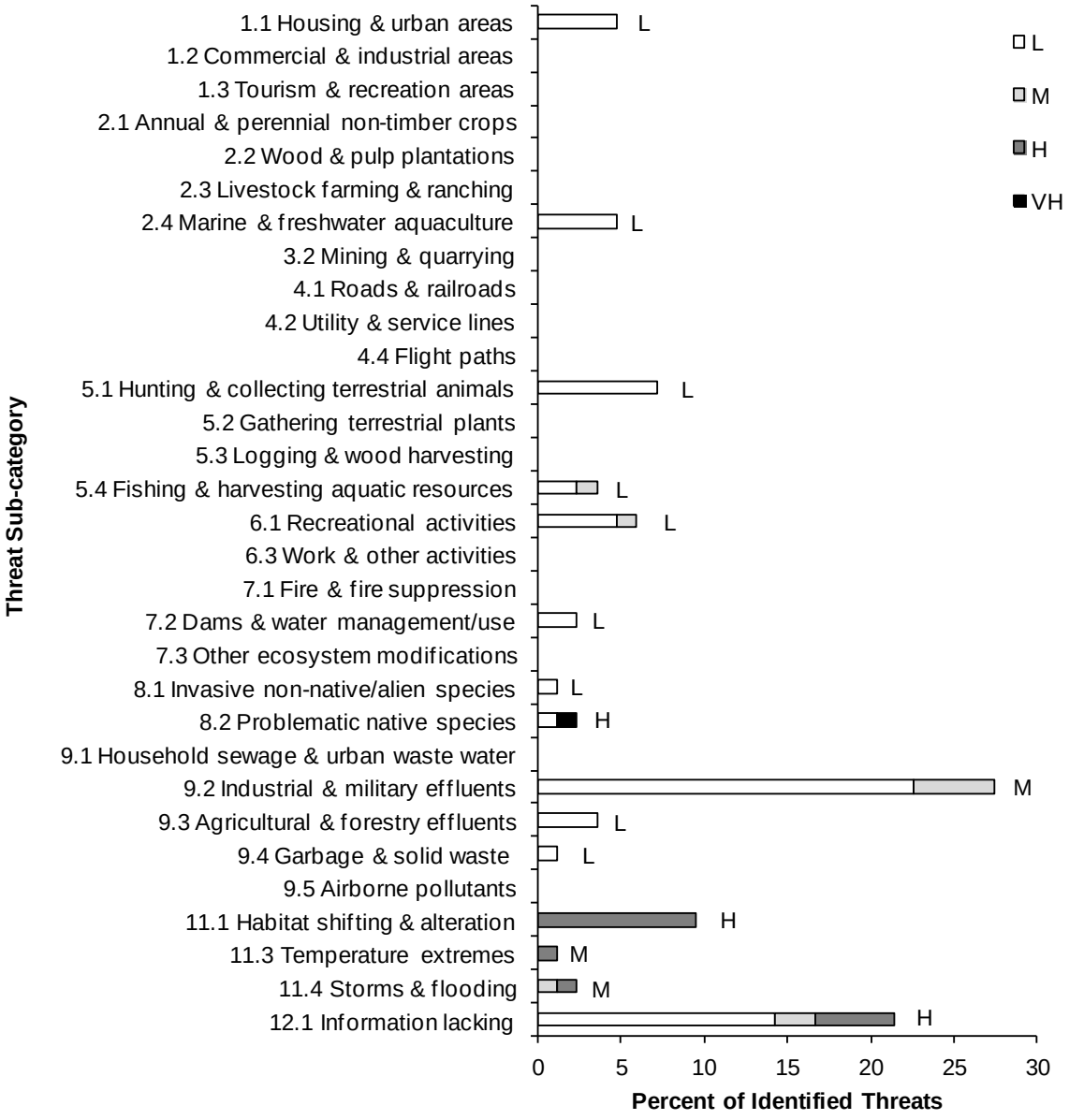

Figure 46. Percent of identified threats to priority bird species in coastal (intertidal) habitats for each threat sub-category in MBU 12 NL.

Each bar represents the percent of the total number of threats identified for each sub-category in coastal (intertidal) habitats (for example, if 100 threats were identified in total for all priority species in coastal (intertidal) habitats, and 10 of those threats were in the sub-category 1.1 Housing & urban areas, the bar on the graph would represent this as 10%). The bars are divided to show the distribution of Low (L), Medium (M), High (H) and Very High (VH) 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, H and VH rankings in the sub-category. The overall magnitude of the sub-threat in coastal (intertidal) habitats is shown at the end of each bar (also presented in Table 4, Relative magnitude of identified threats to priority species within MBU 12 NL by threat category and broad habitat class).

Note: Threats of all magnitudes are included, although low-ranked threats affecting only a single species were not assigned conservation objectives or recommended actions.

Table 30. Threats addressed (medium-ranked or higher), conservation objectives, recommended actions and priority species affected for coastal (intertidal) habitats in MBU 12 NL.

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
Mortality due to entanglement in fishing gear.	5.4 Fishing & harvesting aquatic resources	Reduce the number of birds killed directly or indirectly from fishing	2.4 Reduce incidental mortality	Recover and dispose of derelict fishing gear.	2.3 Habitat and natural process restoration	Medium: Long-tailed Duck
				Prevent disposal of derelict fishing gear in the ocean through increased public awareness and education.	4.3 Awareness and communications	
				Alter fishing practices to avoid important areas and peak bird foraging periods.	5.2 Policies and regulations	
				Regulate the adoption of fishing gear modifications to reduce bycatch as a condition of licensing.	5.2 Policies and regulations	
				Implement beneficial management practices.	5.3 Private sector standards and codes	
				Prevent disposal of derelict fishing gear through regulation.	5.2 Policies and regulations	
Reduction in fecundity due to disturbance from recreational activities on nesting beaches.	6.1 Recreational activities	Reduce disturbance caused by human development and recreation in coastal habitats	4.1 Reduce disturbance from human recreation	Establish buffer zones around known breeding, foraging, and/or staging areas in coastal habitats.	2.1 Site/area management	Medium: Piping Plover (*melodus*)
				Limit human recreational activities in important breeding colony and stopover coastal habitats during breeding and migration windows.	2.1 Site/area management	
				Limit sources of loud noise and rapidly moving vehicles in sensitive coastal habitats during breeding and migration windows.	2.1 Site/area management	
				Raise public awareness of the vulnerability of these species to human disturbance at	4.3 Awareness and communications	

[1] Priority species not mentioned in this table have threats only of low magnitude and/or threats that are presented in the Widespread Issues section.

Table 30 continued

Threat Addressed	Threat Category	Conservation Objective	Objective Category	Conservation Action	Action Category	Rank of Threat: Priority Species Affected[1]
				breeding, foraging, and/or staging sites.		
Mortality due to an increase of predator populations as a result of land use changes.	8.2 Problematic native species	Reduce mortality of priority species due to predation	2.5 Reduce parasitism/predation	Assess the impact of predation by introduced predators on the survival or priority species.	8.1 Research	Very High: Piping Plover (*melodus*)
				Maintain existing predator control programs and evaluate the possibility of starting new ones.	2.2 Invasive/problematic species control	
Mortality due to oil discharges from ships.	9.2 Industrial & military effluents	Reduce the number of birds killed directly or indirectly by oil by reducing deliberate dumping of oily ship wastes into the ocean	2.3 Reduce mortality and/or sub-lethal effects from oil pollution	Maintain/improve effectiveness of environmental emergencies intervention programs run by the Regional Environmental Emergencies Team and Environment Canada.	2.3 Habitat and natural process restoration	Medium: Barrow's Goldeneye (Eastern) Harlequin Duck (Eastern) Horned Grebe Red-necked Grebe

Section 3: Additional Issues

Widespread Issues

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, these issues, while they may or may not be limiting factors for any individual species or population, contribute to avian mortality or decreases in fecundity across many species and thus warrant conservation attention. Usually these issues transcend habitat types and are considered "widespread". Examples of these issues include:

- Collisions with human-made structures (buildings, cars, utility/telecommunication towers and lines, etc.)
- Predation by domestic cats
- Pollution/pesticides/oil spills
- Climate change

Because the widespread issues do not fit into the standard presentation format used in the BCR strategies, they are presented separately here. The mortality estimates included here are largely based on draft reports that were available within Environment Canada when this strategy was produced; the numbers may change as the final scientific papers are peer-reviewed and published. Human-related avian mortality across all sectors was standardized and compared in Calvert et al. 2013.

These widespread issues are not presented in any particular order, as the relative importance of these issues in Newfoundland and Labrador or within BCR 8 NL, MBU 10 NL and MBU 12 NL is not yet determined.

Collisions

Buildings

Collisions with glass windows or reflective panels on buildings are believed to be a significant source of bird mortality in Canada. Estimates of mortality from collisions with houses in Canada (including birds using feeders) range from approximately 15.8 – 30.5 million birds per year (Machtans et al. 2013). Mortality from collisions with buildings of fewer than 12 storeys is estimated at approximately 0.3 – 11.4 million birds/year, and for all cities in Canada with tall buildings in an urban core the estimate is 13 000 – 256 000 birds/year (Machtans et al. 2013). The total estimate of mortality from collisions with buildings in Canada is therefore between 16.1 and 42.2 million birds/year (Machtans et al. 2013).

Data from Canada and the northeastern United States reveal that 163 species of birds of 32 families are known to have been killed by buildings. Some families and species of birds are disproportionately affected by collisions with buildings. Parulidae (warblers), Fringillidae (sparrows and allies) and Regulidae (kinglets) account for 70% of all bird deaths; the species most frequently killed are White-throated Sparrows (13.5% of all reported deaths), Golden-crowned Kinglets (10.2%), Dark-eyed Juncos (6.1%), Ovenbirds (5.3%) and Ruby-crowned

Kinglets (5.3%). The population-level effects of bird mortality from building strikes are unknown. In all planning units, there were only two priority birds species identified with threats related to building collisions, the Peregrine Falcon (*anatum/tundrius*) and Sharp-shinned Hawk in coniferous forests and urban habitats of BCR 8 NL, therefore this is considered a very limited threat in the region. See Table 31 for conservation objectives and actions.

Wind Turbines

The 2 955 wind turbines in Canada in 2011 have drawn considerable attention for their potential to cause mortality to birds and other species (notably bats). Two sources of mortality are typically associated with wind turbines: collisions with the turbines themselves, and the destruction of nests by turbine construction activities during the breeding season. On average, approximately 3 birds are killed per turbine per year. Scaling up to a national level, an estimated 16 700 birds (range 13 300 – 21 600) die from collisions with wind turbines each year (Zimmerling et al. 2013).

Some species are particularly vulnerable to collisions with wind turbines, for example, raptors flying along a land/water interface. For smaller, more common passerine species (warblers, thrushes, kinglets, etc.), the relatively small number of birds affected does not appear to pose a population-level threat. However, the anticipated proliferation of wind turbines means that we should continue to ensure that turbines are sited to avoid important bird habitats and migration corridors.

At the 43 wind farms in Canada for which data are available, total habitat loss per turbine is 1.23 ha on average. Based on this average, the predicted total habitat loss for wind farms nationwide is 3 635 ha. Using published estimates of nest densities, the total number of affected nests, not accounting for construction that might occur outside the breeding season, is approximately 5 700 (Zimmerling et al. 2013).

There are four wind farms on the island of Newfoundland: Ramea (six wind turbines), St. Lawrence Wind Farm (nine wind turbines), Fermeuse Wind Power Project (nine wind turbines) and Ramea Wind Diesel Project (three wind turbines; Canadian Wind Energy Association 2008). While threats from wind farms were not identified for any individual priority bird species in BCR 8 NL, MBU 10 NL or MBU 12 NL, the threats posed to birds from collisions with wind turbines and habitat loss may increase with increased development of this energy sector in Newfoundland and Labrador. However, collision with wind turbines is generally considered a very low risk compared to other mortality sources for birds. Therefore no conservation objectives or actions are mentioned in Table 31 as this threat was considered too low in the region.

Communication Towers

There are currently almost 8 000 communication towers in Canada > 60 m high (Longcore et al. 2012), each of which can pose a hazard to birds during migration. Birds are attracted to the lights of communication towers and are killed when they collide with the structures and guy wires. Mortality increases exponentially with tower height, in part because the use of guy wires

also increases with tower height. Poor weather also plays a significant role in increasing migrant fatality; foggy and cloudy conditions increase the lit area around towers and block celestial clues used by migrating birds. The result is that birds circle to exhaustion in the halo of artificial light, or collide with each other, the tower or its guy wires (American Bird Conservancy 2012).

Avian mortality at towers is unequally distributed among species and regions, but estimates suggest that over 220 000 birds are killed in Canada each year (Table 31; Longcore et al. 2012). In all of BCR 8, collisions with towers are estimated to kill approximately 20 650 birds every year (Longcore et al. 2012).

Neotropical migrants in the families Parulidae (wood-warblers) and Vireonidae (vireos) are the species most commonly killed by communication towers. These families include threatened species and many that are of conservation concern in Canada and/or the United States. When considered in concert with mortality at towers in the United States (which is 20 times higher due to the larger number and greater height of towers in the United States), and the mortality from other stationary structures, mortality from collisions with communication towers may negatively affect the population trends of some birds. See Table 31 for conservation objectives and actions.

Power Lines

Birds may be killed by colliding with power lines, or they may be electrocuted. Species with high wing-loading and thus low maneuverability, such as waterfowl, appear particularly at risk for collisions (Bevanger 1998). Electrocutions are most likely for large birds such as raptors and herons, whose bodies are large enough to span the distances between wires and create a short circuit. Raptors' habit of using power poles as perches further increases their risk. However, estimates of total mortality due to collisions and electrocutions can vary widely (Manville 2005) and population-level impacts are difficult to determine. In Newfoundland and Labrador, the generation and distribution of electricity is provided by two utilities: Newfoundland Power (NP) and Newfoundland & Labrador Hydro (Hydro). NP is the primary distributor of electricity on the island portion of the province and distributes power to nearly 240 000 customers. Hydro is the primary generator of electricity on the Northern Peninsula of Newfoundland and the Labrador portion of the province and distributes power to nearly 40 000 customers. Between both of these utilities, there are more than 20 000 km of power lines, including 13 400 km of distribution lines and 6 756 km of transmission lines (Newfoundland Power 2013; Newfoundland and Labrador Hydro 2013). Canadian estimates are that 161 000 – 802 000 birds are killed annually by electrocution, and another 5.3 – 20.6 million birds are killed each year by colliding with electrical transmission lines (Calvert et al. 2013). See Table 31 for conservation objectives and actions.

Vehicles

There are over 1.4 million km of roads and hundreds of airports in Canada (World Bank Indicators 2012) that are often bordered by fences and vegetation that provide convenient places for birds to perch, forage and nest. The paved surfaces can attract birds through the heat they emit, the puddles that form beside roads, and the salt and grit used for de-icing**.** In

Newfoundland and Labrador, the department of transportation manages more than 9 500 km of primary and secondary highways, of which over 900 km are part of the Trans-Canada Highway, in addition to community access roads that connect rural areas with larger urban centres (NL Department of Transportation and Works 2013). There is also a network of access roads covering over 3 100 km throughout the province, which provide access for natural resource management, play an increasing role in the development of eco-tourism and are utilized by the general public for recreation, hunting and firewood collection (NL Department of Natural Resources 2012d). Current estimates for one- and two-lane paved roads outside of major urban centres in Canada are that between 4.65 and 13.8 million birds are killed annually (Bishop and Brogan 2013).

Bird collisions with cars are influenced by the location of the road, proximity of vegetation and vehicle speed. Raptors and owls that hunt and forage near roads are particularly vulnerable, but many species that forage for grit and road salt or are otherwise attracted to roads have a high likelihood of being hit by vehicles. The population-level effects of this source of mortality are not known. See Table 31 for conservation objectives and actions.

Predation by Domestic Cats

Based on the number of pet cats in Canada and published kill rates by cats elsewhere, roughly 204 million birds (range 105 – 348 million) are killed by domestic and feral cats in Canada each year (Blancher 2013). The broad range on this estimate reflects imprecise information on the average number of bird kills per cat, especially for rural and feral cats, and a lack of information on the number of feral cats (versus owned or pet cats) in Canada.

The birds most susceptible to cat predation are those that nest or forage on or near the ground, or spend substantial time in human-dominated landscapes (both rural and urban) where cats are abundant. The proportion of Canada's birds killed by cats would be higher if additional cat predation when migrating through, or wintering in, the U.S. is factored in.

Without detailed study of the individual species affected, it is difficult to assess whether mortality caused by cat predation impacts population trends of birds in Canada. Nevertheless, it is likely that many species of birds are potentially vulnerable to population effects at the local scale in southern Canada.

Predation by domestic cats was not identified as a threat for any individual priority species in any planning unit; this may be because the vast majority of landbirds listed as priority species for BCR 8 NL are found in regions far away from developed areas where domestic and/or feral cats are at minimum density. However, there are some possible exceptions such as the Barn Swallow, Bobolink and Chimney Swift, which tend to breed near anthropogenically disturbed habitat or farms mostly within cultivated and managed areas or urban habitats and could therefore be more susceptible to predation by cats. No conservation objectives or actions are mentioned in Table 31, as this threat was considered too low in the region.

Pollution

Pollution caused by industrial chemicals, pesticides and heavy metals can have both direct and indirect effects on survival and reproduction in birds. Sometimes the effects of exposure to pollutants are unexpected and do not result in immediate, measurable impacts on bird populations (Eeva and Lehikoinen 2000, Franceschini et al. 2008, North American Bird Conservation Initiative, U.S. Committee 2009, Mineau 2010). However, persistent exposure can result in sharp declines in bird populations, as happened with Peregrine Falcons in eastern Canada prior to the ban of DDT. See Table 31 for conservation objectives and actions.

Pesticides

The most recent estimate suggests that 0.96 – 4.4 million birds are killed by pesticides annually in Canada (Mineau 2010). Provinces such as Saskatchewan, which have a large agricultural land base, account for the majority of the estimated kill, and pesticides are thought to be an important contributor to the decline in grassland bird species in Canada (Mineau 2010). Pesticides can kill birds rapidly following contact or may have sub-lethal impacts such as suppressed immune function and reduced stress response. There may also be indirect effects of pesticides such as reduction in prey and changes in vegetation that reduce habitat quality. While the use of the many toxic pesticides has been eliminated in Canada, migratory birds are still exposed while on wintering grounds in countries where their use is still permitted (Mineau 2010).

In Newfoundland and Labrador, most of the chemical pesticides for forest management have been replaced with biological control agents such as *Bacillus thuringiensis var. kurstaki* (BTK), which are quite specific to certain insect groups and have not shown any mortality effects on vertebrates. However, pesticides are still used in other sectors to control weeds in industrial areas (e.g., roadsides, power lines, pipelines, rights-of-way, railways, well sites, equipment yards, dams, dykes and non-crop land), to promote optimal production of fruits and vegetables and to control livestock and poultry pests in the agricultural sector, as well as for the maintenance of landscapes such as ornamental trees, shrubs, flowers and turf on outdoor residential, commercial and public land, including golf courses and cemeteries. In 2006, commercial fertilizer was applied on more than 61 km^2 of land; herbicides were applied on 16 km^2; insecticides on 5 km^2; and fungicides on 2 km^2 (Statistics Canada 2009). However, Statistics Canada notes that the area of land treated with herbicides, insecticides and fungicides was under-reported due to confusion in its questionnaire. It is also reported that 97% of households in Newfoundland and Labrador have a lawn or garden. Of these, 21% applied either a chemical (e.g., herbicide, insecticide, fungicide) or organic pesticide on a regular basis (44%) or to address a specific problem (57%; Statistics Canada 2009). See Table 31 for conservation objectives and actions.

Toxic Chemicals and Heavy Metals

Toxic organic chemicals and heavy metals released into the environment can also negatively impact bird populations. While some industrial chemicals such as PCBs are regulated, there is concern about new chemicals such as flame retardants (PBDE) that are used in computers, car

parts and upholstery, and whose effects on wildlife are largely unknown (Environment Canada 2003). Scavengers experience toxic effects when they ingest lead shotgun pellets or bullet fragments embedded in carcasses of game animals, and loons and other waterbirds are exposed to lead from shotgun pellets, sinkers and jigs that they ingest either while collecting grit for their gizzards or by eating bait fish with line and sinker still attached (Scheuhammer and Norris 1996, Scheuhammer et al. 2003). In some areas, lead poisoning from sinkers and jigs can account for approximately half of the mortality of adult Common Loons on their breeding grounds (Scheuhammer and Norris 1996). Birds are also susceptible to bioaccumulation of other toxic metals such as methylmercury, selenium and others when they consume prey that has been exposed to these substances.

Lethal/sublethal effects due to chemical or heavy metal contamination (e.g., consumption and bioaccumulation of contaminated water and sediments, exposure to pollutants at industrial discharge sites such as mining effluents, mercury, PCBs), as well as habitat degradation leading to acidification or alterations in water chemistry, were identified as threats to nine priority species in BCR 8 NL; eight priority species in MBU 10 NL; and eight priority species in MBU 12 NL in the following habitat classes: waterbodies (inland and marine), riparian, wetlands, coastal (above high tide and intertidal) and urban habitats (Table A-3). See Table 31 for conservation objectives and actions.

Oil Pollution

Oil may enter the environment either accidentally, through deliberate dumping or in contained tailings ponds. It may be a single large event, as occurred in the Gulf of Mexico in 2010, or numerous smaller events. Off the south coast of Newfoundland, it has been estimated that over 300 000 birds are killed by oil spills annually (Wiese and Robertson 2004), largely as a result of deliberate dumping of oily waste by ships. Typically, diving birds are most at risk of oiling; however, any birds that come into contact with oil are vulnerable. Oil can impact birds through direct effects such as hypothermia (resulting from lost waterproofing of feathers following oil contamination), toxicity (from ingesting oil as they preen or by inhaling volatile organic compounds) and indirect effects, such as reduced prey availability and decreased quality of habitat. While techniques exist to clean and rehabilitate oiled birds, many birds die before, during and after rescue attempts (Brown and Lock 2003). See Table 31 for summary and objectives.

The Gulf of St. Lawrence is the gateway for shipping traffic to New Brunswick, Quebec and Ontario, while the Grand Banks off the coast of the island of Newfoundland contains the major oil fields and also supports international shipping via marine transport. Given the extensive offshore oil and gas exploration/extraction as well as traffic through or near the MBU 10 NL and MBU 12 NL regions, the area is susceptible to oil spills, both accidental and intentional, and not surprisingly, mortality caused by oil spills and discharges was identified as a threat to 35 priority bird species in MBU 10 NL and 22 priority bird species in MBU 12 NL in both the coastal (intertidal) habitats and marine waters (Table A-3). See Table 31 for conservation objectives and actions.

Table 31. Conservation objectives and actions associated with bird mortality from collisions and contaminants in BCR 8 NL, MBU 10 NL and MBU 12 NL.

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
Collision Mortality						
Collisions with buildings cause bird mortality.	1.1 Housing & urban areas 1.2 Commercial & industrial areas	Reduce incidental mortality from collisions with windows/buildings	2.7 Reduce incidental mortality from collisions	Follow beneficial management practices for bird-friendly buildings including using bird-friendly glass, reducing reflection from windows, providing visual markers to enable birds to perceive windows, and reducing light pollution.	2.1 Site/area management 5.3 Private sector standards and codes	All species But specifically noted in the threat assessment process for: Peregrine Falcon (*anatum/tundrius*) Sharp-shinned Hawk
Collisions with communications towers cause bird mortality, particularly during migration.	1.2 Commercial & industrial areas	Reduce incidental mortality from collisions with human-made structures	2.7 Reduce incidental mortality from collisions.	Follow beneficial management practices for reducing mortality to birds when constructing new communications towers. Switch off solid lights on existing towers and ensure that remaining lights have a synchronized, complete dark phase. Take steps to ensure that new towers avoid guy wires and minimize height, and avoid topographic locations where migrating birds are likely to be found in abundance. Retrofit existing towers to adhere to as many guidelines as possible.	2.1 Site/area management 5.3 Private sector standards and codes	All species But specifically noted in the threat assessment process for: Gray-cheeked Thrush Magnolia Warbler Purple Finch Swamp Sparrow Yellow-bellied Flycatcher White-throated Sparrow
Collisions with power lines and accidental electrocution cause bird mortality.	4.2 Utility & service lines	Reduce mortality from collisions with utility lines/ transmission towers	2.7 Reduce incidental mortality from collisions.	In high-risk areas, retrofit power lines so that the risk of electrocution of raptors is minimized. In new developments, locate transmission lines underground. Use markers or paint to increase visibility of power lines in high-strike	2.1 Site/area management	Waterfowl But specifically noted in the threat assessment process for: Northern Hawk Owl Peregrine Falcon (*anatum/tundrius*)

Table 31 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
				areas. Avoid siting lines over or near wetlands.		
Collisions with vehicles cause bird mortality.	4.1 Roads & railroads	Reduce mortality from collisions with vehicles	2.7 Reduce incidental mortality from collisions.	Erect road signs or speed bumps to lower vehicle speeds where bird activity is frequent. Remove plants that attract birds from roadsides and medians. Landscape along roads using taller trees and bushes to cause birds to fly higher. Encourage the use of salt management plans to avoid unnecessary use of particulate salt (a bird attractant) on roads. Avoid locating roads in valuable bird habitat.	2.1 Site/area management 1.1 Site/area protection	All species But specifically noted in the threat assessment process for: Common Nighthawk Peregrine Falcon (*anatum/tundrius*) Purple Finch Sharp-shinned Hawk Wilson's Snipe
Population effects of collisions are unknown.	12.1 Information lacking	Improve understanding of population effects of mortality from collisions	7.4 Improve understanding of causes of population declines.	Assess the biological importance of bird kills from all sources of collisions.	8.1 Research	All species
Environmental Contaminants						
Mortality, sub-lethal effects, reductions in prey populations and habitat alteration caused by exposure to/use of pesticides.	9.3 Agricultural & forestry effluents	Reduce mortality and sub-lethal effects of pesticides on birds Reduce the effects of pesticides on	2.1 Reduce mortality and/or sub-lethal effects from pesticide use. 5.1 Maintain natural food	Substantially reduce the use of pesticides/rodenticides/herbicides in Canada. Where elimination is not possible, they should be used as part of an integrated pest management system. Improve regulation of pesticides/rodenticides/herbicides in	5.2 Policies and regulations 5.3 Private sector standards and codes	All species But specifically noted in the threat assessment process for: Barn Swallow American Bittern American Black Duck Black-throated Green Warbler Bobolink

Table 31 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
		prey species	webs and prey sources.	Canada to reduce bird mortality.		Canada Goose (North Atlantic) Chimney Swift Common Merganser Common Nighthawk Dunlin Green-winged Teal Harlequin Duck (Eastern) Least Sandpiper Lesser Yellowlegs Magnolia Warbler Northern Gannet Olive-sided Flycatcher Ring-necked Duck Sharp-shinned Hawk Surf Scoter
Mortality from heavy metals and other contaminants (including acid precipitation).	9.2 Industrial & military effluents	Reduce mortality from heavy metals and other contaminants	2.2 Reduce mortality and/or sub-lethal effects from exposure to contaminants.	Work with industry and policy makers to reduce the quantity of heavy metals and other contaminants released into the environment.	5.3 Private sector standards and codes 5.2 Policies and regulations	All species But specifically noted in the threat assessment process for: American Bittern Barrow's Goldeneye (Eastern) Black Scoter Canada Goose (North Atlantic) Common Eider Common Goldeneye Common Loon Common Merganser Harlequin Duck (Eastern) Horned Grebe Ivory Gull Leach's Storm-Petrel Northern Gannet Peregrine Falcon (*anatum/tundrius*) Razorbill Red-necked Grebe Red-throated Loon Rusty Blackbird

Table 31 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
						Thick-billed Murre Whimbrel White-winged Scoter
Mortality of waterbirds from oil pollution.	9. Pollution	Reduce mortality from oil pollution	2.3 Reduce mortality and/or sublethal effects of oil pollution. 5.1 Maintain natural food webs and prey sources.	Improve monitoring and enforcement capacity to reduce chronic oil pollution from illegal dumping of bilge waste and cleaning of oil tanks. Improve education/outreach to make sure that the oil industry and its regulators are aware of the potential impacts on birds and take measures to prevent exposure of birds to oil.	5.4 Compliance and enforcement 4.3 Awareness and communications	All species But specifically noted in the threat assessment process for: American Black Duck Atlantic Puffin Barrow's Goldeneye (Eastern) Black-headed Gull Black-legged Kittiwake Black Scoter Canada Goose (North Atlantic) Common Eider Common Goldeneye Common Merganser Common Murre Common Tern Cory's Shearwater Dovekie Great Shearwater Great Skua Harlequin Duck (Eastern) Horned Grebe Ivory Gull King Eider Leach's Storm-Petrel Lesser Yellowlegs Long-tailed Duck Manx Shearwater Northern Gannet Purple Sandpiper Razorbill Red-necked Grebe Red-throated Loon Sanderling Sooty Shearwater

Table 31 continued

Threats Addressed	Threat Category	Objective	Objective Category	Recommended Actions	Action Category	Priority Species Affected
						Surf Scoter Thick-billed Murre Whimbrel White-rumped Sandpiper White-winged Scoter
Population effects of pollution are unknown.	12.1 information lacking	Improve understanding of population effects of pollution	7.4 Improve understanding of causes of population declines.	Evaluate the affects of PBDEs and other chemicals on vital rates in birds. Evaluate the extent to which pesticides are reducing prey availability for aerial insectivores. Improve the ability to monitor and understand the effects of contaminant concentrations in birds. Continue to acquire information on oiling of waterbirds through programs like BOAS.	8.1 Research 8.2 Monitoring	All species

Climate Change

The effects of climate change are already measurable in many bird habitats and have resulted in range shifts and changes in the timing of migration and breeding in some species (National Audubon Society 2009, North American Bird Conservation Initiative, U.S. Committee 2009). Birds in all habitats will be affected by climate change. The most vulnerable are predicted to be those that are dependent on oceanic ecosystems and those found in coastal, island, grassland, arctic and alpine habitats (North American Bird Conservation Initiative, U.S. Committee 2010). Changing climate may also facilitate the spread of disease, the introduction of new predators and the invasion of non-native species that alter habitat structure and community composition (North American Bird Conservation Initiative, U.S. Committee 2009, Faaborg et al. 2010). See Tables 32 and 33 for a summary of impacts of climate change and conservation objectives.

A recent exercise used bioclimatic modelling to predict changes in bird species ranges based on anticipated climate change for different time periods and under different emissions scenarios (Lawler et al. unpublished; Lawler et al. 2009). Bioclimatic models use statistical associations between the current range of a species and a suite of climate variables to predict future ranges under new climate conditions. The study focused on priority bird species currently found within BCRs in Canada. The results suggest that bird species turnover in Canada will be highest in northern BCRs as species ranges continue to shift northward in the coming decades. In BCR 8 NL, the model predicts a gain of 19 species and a loss of 48 species for a total turnover (species gains + species losses) of 52%.

In the Atlantic region, winds, precipitation, storm activity and sea ice are all important in determining local conditions and are influenced by global climate changes. Newfoundland and Labrador is a large coastal province whose climate is strongly influenced by sea conditions that are likely to be affected by climate change. The BCR 8 NL region is experiencing many long-term impacts of climate change such as changes in forest fire frequency, volatile changes in seasonal weather patterns resulting in warmer weather with an increase in total precipitation falling in western-most Newfoundland but a decrease in summer precipitation in most interior areas. Climate change is also predicted to lead to fewer but more intense extreme weather events such as hurricanes, storms and flooding in the region (NL Department of Environment and Conservation 2012). At the same time, changes in winter snow conditions or periods without rain may impact run-off and overall water quality (NL Department of Environment and Conservation 2012).

In the Newfoundland and Labrador Shelves (MBU 10) some of the major impacts of climate change are expected to be enhanced coastal erosion, rising sea level in all areas except Lake Melville, and enhanced frost wedging in coastal locations (Catto, 2005). The rate of sea-level rise around Newfoundland and Labrador has increased over the last 300 years and is greatest on the Avalon Peninsula (3 – 5 mm/year) of the island of Newfoundland and decreases further northward (NL Department of Environment and Conservation 2012). The warming and expansion of oceans and the melting of glaciers has led to this rise in sea level, which in turn increases wave action along the coastline leading to increased erosion. Sea ice and ice foot

developments serve to protect these coastlines from wave erosion thus, a decline in sea ice due to climate change increases the vulnerability of these coasts. There are areas in this province such as the coastlines between Stephenville and the Port au Port Peninsula and Conception Bay South or Greenspond where erosion has already been observed. Arctic ice is also melting, causing increased freshwater export to the North Atlantic. The increase in freshwater will have an impact on ocean circulation and marine ecosystems reaching south to sub-Arctic regions of the northern Labrador Sea (NL Department of Environment and Conservation 2012b).

In the Gulf of St. Lawrence (MBU 12), some of the impacts of climate change are expected to be changes in surface and intermediate waters and ice cover (Galbraith et al. 2010), changes in storm climatology and sea-level rise (Shaw et al. 1996), as well as a decrease in freshwater from the St. Lawrence River that could affect the water circulation and stratification in the Gulf (Saucier et al. 2009). Some impacts could include a decrease in salinity due to an increase in Arctic-derived fresher water (Greene et al. 2008). In addition, the naturally low oxygen levels in the mouth of the Gulf of St. Lawrence are expected to decrease further as the water warms; this is a concern along the Gulf's coastal areas and harbours (Gilbert et al. 2005).

In BCR 8 NL, 13 priority bird species are affected by climate change through changes in habitat structure, ranges, food webs, timing of seasonal cues, as well as increased frequency and severity of storms, sea-level rise, and reduced productivity due to extreme weather (Tables 31 and 32), compared to 10 species in MBU 10 NL and 11 species in MBU 12 NL.

To maintain healthy bird populations in the face of a changing climate, conservation must be carefully planned and must be implemented so as to buffer birds from the negative impacts of climate change wherever possible (Faaborg et al. 2010).

Table 32. Examples of the current and anticipated effects of climate change on bird populations in Canada and some affected bird species.

Note: The species shown here do not represent an exhaustive list; rather, they provide examples of species for which the effects of climate change have been suggested or documented.

Potential and Realized Effects of Climate Change	Examples of Species Affected in BCR 8 NL, MBU 10 NL or MBU 12 NL
Mismatch between peak hatch and peak food abundance	Barn Swallow, Sanderling
Extended breeding season	Least Sandpiper
Habitat loss as a result of ecosystem changes (e.g., advances in treeline, forest fires)	Common Loon, Common Nighthawk, Piping-Plover (*melodus*), Semipalmated Sandpiper
Increase in severe weather events	Bobolink, Leach's Storm-Petrel, Olive-sided Flycatcher
Introduction of new predators and competitors	Black-throated Green Warbler, Common Tern, Gray-cheeked Thrush, Northern Gannet
Range shifts to the north and from coastal to inland sites	American Golden-Plover, Least Sandpiper
Changes in ocean temperature and currents impact marine productivity and food webs	Peregrine Falcon, Dovekie
Thawing of permafrost and increased evaporation will result in vegetation shifts and loss of wetlands in arctic habitat	Rusty Blackbird

Table 33. Proposed conservation objectives and actions to address climate change.

Threats Addressed	Threat Sub-category	Objective	Objective Category	Recommended Actions	Action Category	Planning Unit: Priority Bird Species Affected (Rank of Threat)
Climate change impacts habitat and negatively affects survival and productivity of birds	11.1 Habitat shifting and alteration	Reduce greenhouse gas emissions Mitigate the effects of climate change on bird habitat	6.1 Support efforts to reduce greenhouse gas emissions 6.2 Manage for habitat resilience as climate changes	Support efforts to reduce greenhouse gas emissions. Manage for habitat resilience to allow ecosystems to adapt despite disturbances and changing conditions. Minimize anthropogenic stressors (such as development or pollution) to help maintain resilience. Manage buffer areas and the matrix between protected areas to enhance movement of species across the landscape. Manage ecosystems to maximize carbon storage and sequestration while simultaneously enhancing bird habitat. Incorporate predicted shifts in habitat into landscape level plans (e.g., when establishing protected areas ensure the maintenance of north-south corridors to facilitate northward range shifts of bird species).	5.2 Policies and regulations 1.1 Site/area protection 2.1 Site/area management 5.2 Policies and regulations	BCR 8 NL: American Golden-Plover (H) Barn Swallow (L) Common Loon (M) Least Sandpiper (H) Peregrine Falcon (*anatum/tundrius*) (M) Piping-Plover (*melodus*) (H) Rusty Blackbird (L) Semipalmated Sandpiper (H) MBU 10 NL: Dovekie (M) Lesser Yellowlegs (H) Piping Plover (*melodus*) (H) Sanderling (H) White-rumped Sandpiper (H) MBU 12 NL: Black-bellied Plover (H) Dunlin (H) Least Sandpiper (H) Lesser Yellowlegs (H) Piping Plover (*melodus*) (H) Sanderling (H) Semipalmated Sandpiper (H) Whimbrel (H)

Table 33 continued

Threats Addressed	Threat Sub-category	Objective	Objective Category	Recommended Actions	Action Category	Planning Unit: Priority Bird Species Affected (Rank of Threat)
Population-level effects of climate change are unknown	12.1 Information lacking	Improve understanding of climate change on birds and their habitats	7.5 Improve understanding of potential effects of climate change	Evaluate which species are most vulnerable to climate change. Investigate the cumulative effects of climate change. Investigate behavioural responses to climate change (such as range shifts, changes in demographic rates, and changes in timing of breeding and migration) through long-term studies. Continue to monitor bird populations so changes in numbers and distributions can be identified. Undertake monitoring to evaluate the effectiveness of mitigation activities.	8.1 Research 8.2 Monitoring	BCR 8 NL: American Golden-Plover (H) Least Sandpiper (H) Piping Plover (*melodus*) (H) Semipalmated Sandpiper (H) Whimbrel (H) MBU 10 NL and MBU 12 NL: Red Knot (*rufa*) (H)

Research and Population Monitoring Needs

Population Monitoring

An estimate of population trend for each species is necessary for the development of elements 1 and 3 (Species Assessment and Population Objectives). However, there are many species for which we are currently unable to estimate a population trend (PT) score. These species were typically assigned a population objective of "assess/maintain." The inability to estimate a PT score may be the result of a lack of monitoring data for the BCR as a whole or may be because certain species are not well captured by common monitoring techniques. To be able to effectively evaluate species believed to be of conservation concern, and to track those not yet of concern for future changes in status, we require more comprehensive monitoring that enables us to generate population trends for all species of birds in Canada. However, it is important to note that for some species, population trends are better understood at scales larger or smaller than the BCR unit, and lack of BCR-scale population trend data should not preclude acting to conserve these species.

A lack of information of population status was determined to be a significant conservation concern for 9 of the 37 priority bird species in BCR 8 NL; 26 of the 39 priority bird species in MBU 10 NL; and 22 of the 29 priority bird species in MBU 12 NL. Table 34 provides a list of recommendations to improve knowledge gaps to allow for reliable estimates of population trends for these species and/or to investigate factors causing population declines.

A recent Environment Canada review (Avian Monitoring Review Steering Committee 2012) of avian monitoring programs in Canada made the following recommendations for each of the four main species groups:

Landbirds

- develop options for on-the-ground monitoring across boreal Canada;
- evaluate the ability of migration monitoring and checklist surveys to contribute to Environment Canada's monitoring needs; and
- evaluate the feasibility and cost-effectiveness of improving demographic monitoring to help understand causes of population change.

Shorebirds

- develop more reliable sampling methods for counting shorebirds in migration to address concerns about bias; and
- increase Latin American involvement in monitoring shorebirds on the wintering grounds, including Red Knot.

Waterbirds

- evaluate alternative strategies for filling gaps in coverage for both colonial waterbirds and marsh birds;
- consider both costs and potential reduction in risks; and
- carry out any necessary pilot work to evaluate options.

Waterfowl

- develop strategies to reduce expenditures on the prairie and eastern waterfowl breeding surveys, while retaining acceptable precision in population estimates;
- review the information needs and expenditures for duck banding programs; and
- realign resources for eider and scoter monitoring to a more efficient suite of surveys.

Environment Canada intends to hold further discussions with other government officials and key bird and habitat conservation players about bird population monitoring needs and priorities not only for BCR 8 NL and its associated marine units but also for all priority birds within the Atlantic region.

Table 34. Possible monitoring objectives for priority bird species for which there are currently insufficient data to reliably estimate population trend at the BCR 8 NL, MBU 10 NL and MBU 12 NL scales.

Objective	Priority Species Affected
1. Increase and improve monitoring through appropriate surveys in order to determine population trends for priority species	**BCR 8 NL:** American Golden-Plover, Barn Swallow, Bobolink, Chimney Swift, Common Merganser, Common Nighthawk, Gray-cheeked Thrush, Least Sandpiper, Peregrine Falcon (*anatum/tundrius*), Rusty Blackbird, Semipalmated Sandpiper, Short-eared Owl, Surf Scoter, Whimbrel **MBU 10 NL:** Barrow's Goldeneye, Black Scoter, Common Goldeneye, Common Loon, Common Merganser, Common Murre, Common Tern, Cory's Shearwater, Dovekie, Great Skua, Greater Shearwater, Ivory Gull, King Eider, Leach's Storm-Petrel, Lesser Yellowlegs, Long-tailed Duck, Manx Shearwater, Purple Sandpiper, Razorbill, Red Knot (*rufa*), Red-necked Grebe, Red-throated Loon, Sanderling, Solitary Sandpiper, Sooty Shearwater, Thick-billed Murre, Whimbrel, White-winged Scoter **MBU 12 NL:** Barrow's Goldeneye, Black Scoter, Black-bellied Plover, Common Eider, Common Goldeneye, Common Tern, Dovekie, Dunlin, Great Shearwater, Horned Grebe, Ivory Gull, Least Sandpiper, Lesser Yellowlegs, Long-tailed Duck, Purple Sandpiper, Red Knot (*rufa*), Red-necked Grebe, Sanderling, Semipalmated Sandpiper, Sooty Shearwater, Whimbrel, Willet

Research

The focus of this section is to outline the main areas where a lack of information hindered the ability to understand conservation needs and make conservation recommendations. Research objectives presented here are bigger picture questions, and not necessarily a schedule of studies, that are needed to determine the needs of individual species (Table 35). Undertaking research will allow us to improve future iterations of BCR strategies and to focus future implementation, and will also enable the development of new tools for conservation.

Table 35 provides a preliminary list of research needs for BCR 8 NL, MBU 10 NL and MBU 12 NL and will be used as a starting point for further discussions with other government officials and key bird and habitat conservation players as well as scientists about research needs and priorities for not only the BCR 8 NL and its associated marine units but for all priority birds within the Atlantic region.

Table 35. General research objectives in BCR 8 NL, MBU 10 NL and MBU 12 NL.

Objective	Priority Species Affected
1. Map land cover changes that have occurred between the baseline time periods established in BCR strategies and current day in order to assess habitat transitions that may be due to climate change and how these transitions affect priority species.	**BCR 8 NL:** American Golden-Plover, Least Sandpiper, Piping Plover (*melodus*), Semipalmated Sandpiper, Whimbrel
2. Implement research programs to determine all possible threats to species and their effects on species populations.	**BCR 8 NL:** Piping Plover (*melodus*), Red Crossbill (*percna*)
	MBU 10 NL, MBU 12 NL: Piping Plover (*melodus*)

Threats Outside Canada

Many bird species found in Canada spend a large portion of their life cycle outside of the country (Fig. 47). These species face threats while they are outside Canada; in fact, threats to some migratory species may be most severe outside of the breeding season (Calvert et al. 2009). Of the 37 priority species in BCR 8 NL, 11 (30%) are migratory and spend part of their annual cycle—up to half the year or more—outside Canada.

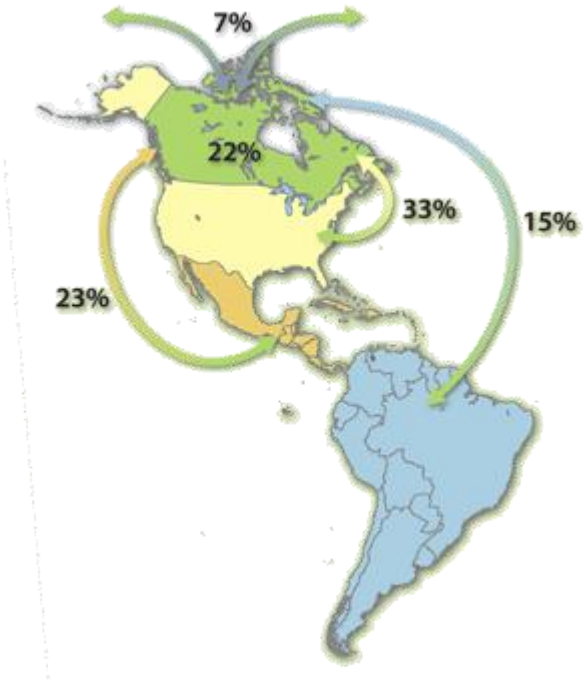

Figure 47. Percent of Canadian breeding birds that migrate to regions outside of Canada for part of their life cycle (North American Bird Conservation Initiative 2012).

Similar to the assessment of threats facing priority species within Canada, we conducted a literature review to identify threats facing priority species while they are outside Canada. A lack of data was a pervasive issue for this exercise. For many species, little is known about threats they face during migration or while on their wintering grounds. Indeed, for some species, their wintering ranges and habitat use are only poorly known, if at all. There is also little information linking specific wintering areas to particular breeding populations, making it difficult to connect declines in breeding populations to potential problems on the wintering grounds. In addition, what data exist on wintering migrant species are heavily biased towards work done in the United States and little research is available from Mexico, Central and South America. While many of the threats identified in the United States likely affect species throughout their range, unique issues outside of the United States may have been missed. An absence of threats in a region may reflect that the necessary research has not yet been conducted (or may not be published in English). Because information on bird distributions during the non-breeding season is limited, we were unable to assess the scope and severity of threats to priority species while they are outside of Canada.

Despite this, some information is available to inform conservation work outside Canada (Fig. 48). Priority birds from BCR 8, MBU 10 and MBU 12 in Newfoundland and Labrador face the loss or degradation of key migration and wintering habitats. The primary sources of habitat loss and degradation are conversion of grasslands and wetlands to agriculture (2.1 Annual and perennial non-timber crops) and residential development (1.1 Housing & urban areas). The threat of loss and degradation of stopover or overwinter habitat is greater for species that have relatively small and concentrated wintering ranges. Others, such as the Semipalmated Sandpiper, are particularly vulnerable, as large numbers of the species concentrate at just a handful of key migratory stopover sites; degradation or loss of these sites could have devastating impacts on the species.

In addition to habitat loss, priority birds from BCR 8 in Newfoundland and Labrador are affected by increased mortality from human sources during migration and over-wintering. Collisions with human-made structures such as buildings, towers and power lines are a significant threat during migration (1.1 Housing & urban areas, 1.2 Commercial & industrial areas, and 4.2 Utility & service lines), especially for landbirds. Mortality from legal and illegal hunting activities (5.1 Hunting & collecting terrestrial animals), including the ingestion of lead shot, is a significant source of mortality for priority birds from BCR 8 in Newfoundland and Labrador as well.

Though the above-mentioned threats are significant for priority birds from all three Newfoundland and Labrador units, some threats more particularly affect the MBUs in this case (Figs. 49 and 50). The most important threat to species from MBU 10 and 12 NL is mortality from exposure to contaminants on the migration routes and on the wintering grounds (9.2 Industrial & military effluents). Though this is also a threat to BCR 8 NL species, it is by far the most significant threat when considering marine species.

Another international threat of particular concern to marine species comes from fishing activities (5.4 Fishing & harvesting aquatic resources). Bycatch, as well as some aquaculture activities, causes mortality of priority species on migration routes and on the wintering grounds.

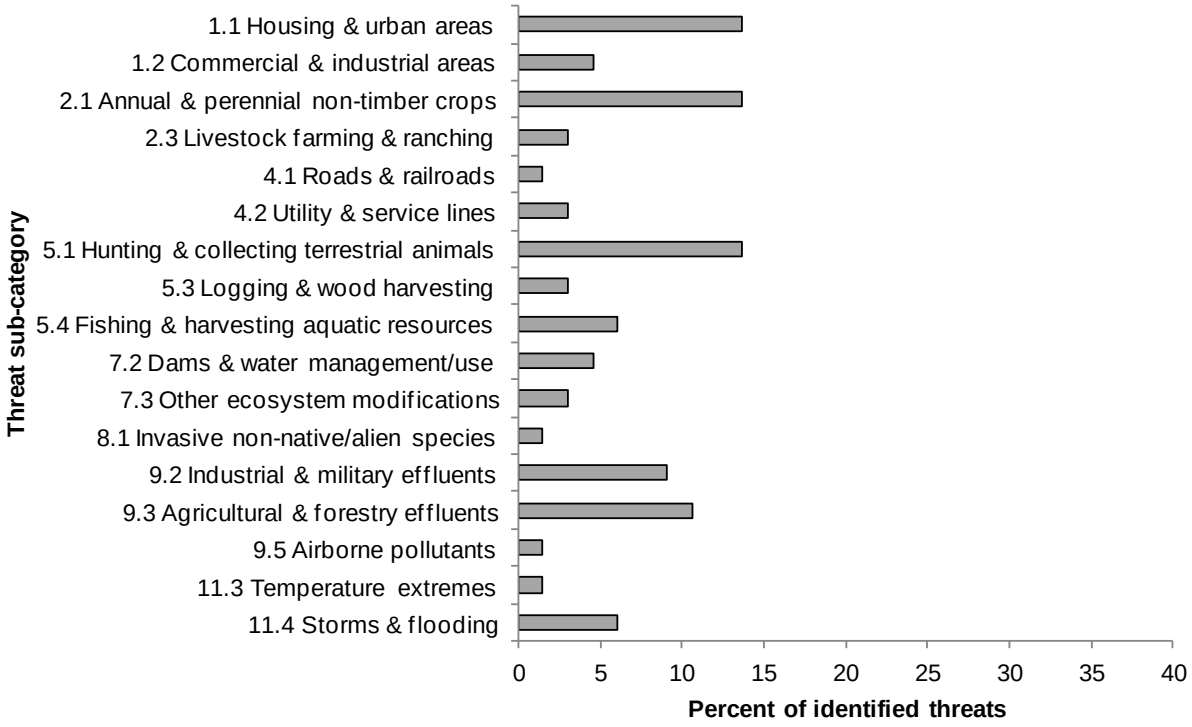

Figure 48. Percent of identified threats to priority species (by threat sub-category) in BCR 8 NL when they are outside Canada.

Note: Magnitudes could not be assigned for threats outside Canada due to lack of information on scope and severity.

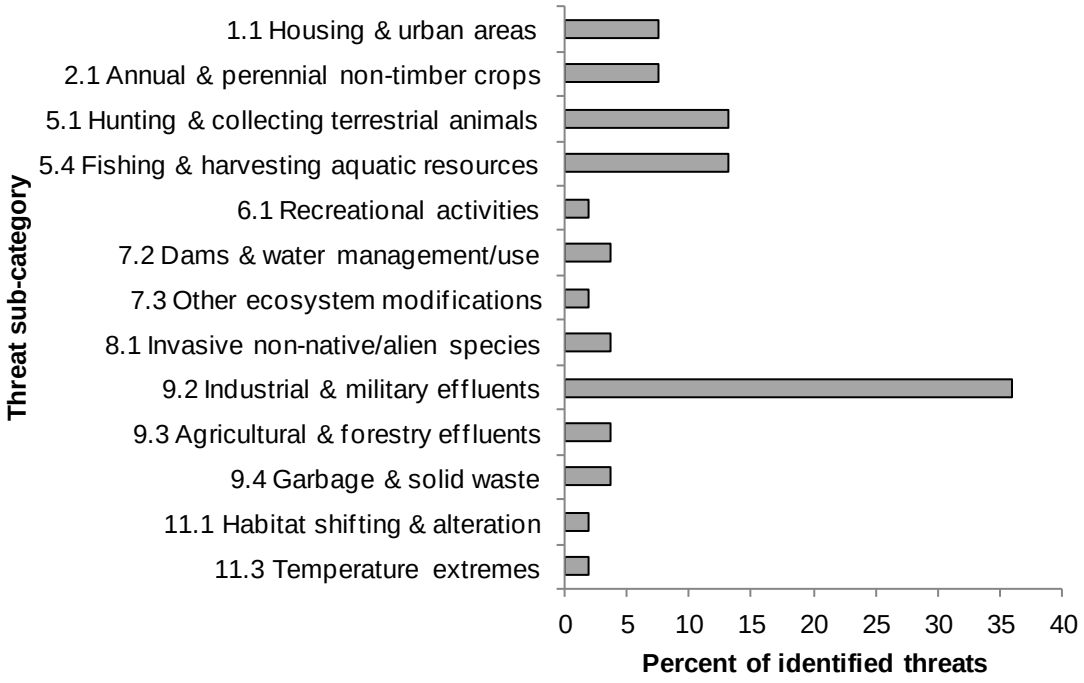

Figure 49. Percent of identified threats to priority species (by threat sub-category) in MBU 10 NL when they are outside Canada.

Note: Magnitudes could not be assigned for threats outside Canada due to lack of information on scope and severity.

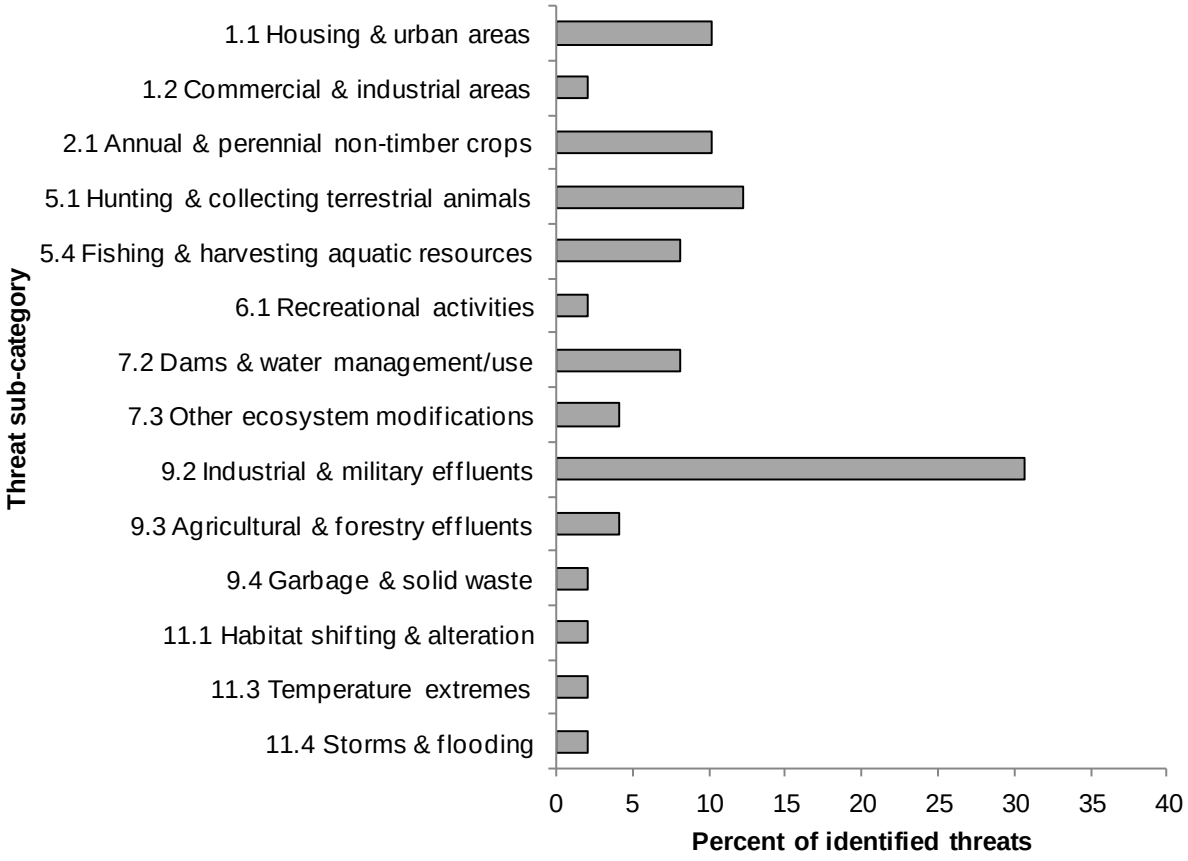

Figure 50. Percent of identified threats to priority species (by threat sub-category) in MBU 12 NL when they are outside Canada.

Note: Magnitudes could not be assigned for threats outside Canada due to lack of information on scope and severity.

Next Steps

The primary aims of BCR strategies are to present Environment Canada's priorities with respect to migratory bird conservation, and to provide a comprehensive overview of the conservation needs of bird populations to practitioners who may then undertake activities that promote bird conservation in Canada and internationally. Users from all levels of government, Aboriginal communities, the private sector, academia, NGOs and citizens will benefit from the information. BCR strategies can be used in many different ways depending on the needs of the user, who may focus on one or more of the elements of the strategy to guide their conservation projects.

BCR strategies will be updated periodically. Errors, omissions, and additional sources of information may be provided to Environment Canada at any time for inclusion in subsequent versions.

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Appendix 1

List of All Bird Species in BCR 8 NL, MBU 10 NL and MBU 12 NL

Table A-1. Complete list of species in BCR 8 NL, MBU 10 NL and MBU 12 NL when they are in the BCR (breeding, migrant, winter, seasonal), and their priority status.

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Empidonax alnorum	Alder Flycatcher	Moucherolle des aulnes	Landbirds	BCR 8 NL				
Corvus brachyrhynchos	American Crow	Corneille d'Amérique	Landbirds	BCR 8 NL		BCR 8 NL		
Spinus tristis	American Goldfinch	Chardonneret jaune	Landbirds	BCR 8 NL		BCR 8 NL		
Falco sparverius	American Kestrel	Crécerelle d'Amérique	Landbirds	BCR 8 NL				
Anthus rubescens	American Pipit	Pipit d'Amérique	Landbirds	BCR 8 NL	BCR 8 NL			
Setophaga ruticilla	American Redstart	Paruline flamboyante	Landbirds	BCR 8 NL				
Turdus migratorius	American Robin	Merle d'Amérique	Landbirds	BCR 8 NL		BCR 8 NL		
Picoides dorsalis	American Three-toed Woodpecker	Pic à dos rayé	Landbirds	BCR 8 NL		BCR 8 NL		
Spizella arborea	American Tree Sparrow	Bruant hudsonien	Landbirds	BCR 8 NL	BCR 8 NL			
Haliaeetus leucocephalus	Bald Eagle	Pygargue à tête blanche	Landbirds	BCR 8 NL MBU 10 NL MBU 12 NL		BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	
Riparia riparia	Bank Swallow	Hirondelle de rivage	Landbirds	BCR 8 NL				
Hirundo rustica	Barn Swallow	Hirondelle rustique	Landbirds	BCR 8 NL				BCR 8 NL
Setophaga castanea	Bay-breasted Warbler	Paruline à poitrine baie	Landbirds	BCR 8 NL				
Megaceryle alcyon	Belted Kingfisher	Martin-pêcheur d'Amérique	Landbirds	BCR 8 NL			MBU 10 NL MBU 12 NL	
Mniotilta varia	Black-and-white Warbler	Paruline noir et blanc	Landbirds	BCR 8 NL				
Picoides arcticus	Black-backed Woodpecker	Pic à dos noir	Landbirds	BCR 8 NL		BCR 8 NL		BCR 8 NL
Setophaga fusca	Blackburnian Warbler	Paruline à gorge orangée	Landbirds	BCR 8 NL				

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Poecile atricapillus	Black-capped Chickadee	Mésange à tête noire	Landbirds	BCR 8 NL		BCR 8 NL		
Setophaga striata	Blackpoll Warbler	Paruline rayée	Landbirds	BCR 8 NL				
Setophaga virens	Black-throated Green Warbler	Paruline à gorge noire	Landbirds	BCR 8 NL				BCR 8 NL
Cyanocitta cristata	Blue Jay	Geai bleu	Landbirds	BCR 8 NL		BCR 8 NL		
Vireo solitarius	Blue-headed Vireo	Viréo à tête bleue	Landbirds	BCR 8 NL				
Dolichonyx oryzivorus	Bobolink	Goglu des prés	Landbirds	BCR 8 NL				BCR 8 NL
Bombycilla garrulus	Bohemian Waxwing	Jaseur boréal	Landbirds	BCR 8 NL		BCR 8 NL		
Poecile hudsonicus	Boreal Chickadee	Mésange à tête brune	Landbirds	BCR 8 NL		BCR 8 NL		
Aegolius funereus	Boreal Owl	Nyctale de Tengmalm	Landbirds	BCR 8 NL		BCR 8 NL		
Certhia americana	Brown Creeper	Grimpereau brun	Landbirds	BCR 8 NL		BCR 8 NL		
Molothrus ater	Brown-headed Cowbird	Vacher à tête brune	Landbirds	BCR 8 NL				
Setophaga tigrina	Cape May Warbler	Paruline tigrée	Landbirds	BCR 8 NL				
Bombycilla cedrorum	Cedar Waxwing	Jaseur d'Amérique	Landbirds	BCR 8 NL		BCR 8 NL		
Chaetura pelagica	Chimney Swift	Martinet ramoneur	Landbirds	BCR 8 NL				BCR 8 NL
Spizella passerina	Chipping Sparrow	Bruant familier	Landbirds	BCR 8 NL				
Quiscalus quiscula	Common Grackle	Quiscale bronzé	Landbirds	BCR 8 NL				
Chordeiles minor	Common Nighthawk	Engoulevent d'Amérique	Landbirds	BCR 8 NL				BCR 8 NL
Corvus corax	Common Raven	Grand corbeau	Landbirds	BCR 8 NL		BCR 8 NL		
Acanthis flammea	Common Redpoll	Sizerin flammé	Landbirds	BCR 8 NL		BCR 8 NL		
Geothlypis trichas	Common Yellowthroat	Paruline masquée	Landbirds	BCR 8 NL				
Junco hyemalis	Dark-eyed Junco	Junco ardoisé	Landbirds	BCR 8 NL		BCR 8 NL		
Picoides pubescens	Downy Woodpecker	Pic mineur	Landbirds	BCR 8 NL		BCR 8 NL		
Tyrannus tyrannus	Eastern Kingbird	Tyran tritri	Landbirds	BCR 8 NL				
Coccothraustes vespertinus	Evening Grosbeak	Gros-bec errant	Landbirds	BCR 8 NL		BCR 8 NL		
Passerella iliaca	Fox Sparrow	Bruant fauve	Landbirds	BCR 8 NL				
Regulus satrapa	Golden-crowned Kinglet	Roitelet à couronne dorée	Landbirds	BCR 8 NL		BCR 8 NL		

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Perisoreus canadensis	Gray Jay	Mésangeai du Canada	Landbirds	BCR 8 NL		BCR 8 NL		
Catharus minimus	Gray-cheeked Thrush	Grive à joues grises	Landbirds	BCR 8 NL				BCR 8 NL
Bubo virginianus	Great Horned Owl	Grand-duc d'Amérique	Landbirds	BCR 8 NL		BCR 8 NL		
Falco rusticolus	Gyrfalcon	Faucon gerfaut	Landbirds			BCR 8 NL		
Picoides villosus	Hairy Woodpecker	Pic chevelu	Landbirds	BCR 8 NL		BCR 8 NL		
Catharus guttatus	Hermit Thrush	Grive solitaire	Landbirds	BCR 8 NL				
Eremophila alpestris	Horned Lark	Alouette hausse-col	Landbirds	BCR 8 NL		BCR 8 NL		
Calcarius lapponicus	Lapland Longspur	Plectrophane lapon	Landbirds		BCR 8 NL			
Empidonax minimus	Least Flycatcher	Moucherolle tchébec	Landbirds	BCR 8 NL				
Melospiza lincolnii	Lincoln's Sparrow	Bruant de Lincoln	Landbirds	BCR 8 NL				
Setophaga magnolia	Magnolia Warbler	Paruline à tête cendrée	Landbirds	BCR 8 NL				BCR 8 NL
Falco columbarius	Merlin	Faucon émerillon	Landbirds	BCR 8 NL				
Zenaida macroura	Mourning Dove	Tourterelle triste	Landbirds	BCR 8 NL		BCR 8 NL		
Geothlypis philadelphia	Mourning Warbler	Paruline triste	Landbirds	BCR 8 NL				BCR 8 NL
Colaptes auratus	Northern Flicker	Pic flamboyant	Landbirds	BCR 8 NL		BCR 8 NL		
Accipiter gentilis	Northern Goshawk	Autour des palombes	Landbirds	BCR 8 NL		BCR 8 NL		
Circus cyaneus	Northern Harrier	Busard Saint-Martin	Landbirds	BCR 8 NL				
Surnia ulula	Northern Hawk Owl	Chouette épervière	Landbirds	BCR 8 NL		BCR 8 NL		BCR 8 NL
Mimus polyglottos	Northern Mockingbird	Moqueur polyglotte	Landbirds	BCR 8 NL				
Setophaga americana	Northern Parula	Paruline à collier	Landbirds	BCR 8 NL				
Lanius excubitor	Northern Shrike	Pie-grièche grise	Landbirds	BCR 8 NL	BCR 8 NL	BCR 8 NL		
Parkesia noveboracensis	Northern Waterthrush	Paruline des ruisseaux	Landbirds	BCR 8 NL				
Contopus cooperi	Olive-sided Flycatcher	Moucherolle à côtés olive	Landbirds	BCR 8 NL				BCR 8 NL
Oreothlypis celata	Orange-crowned Warbler	Paruline verdâtre	Landbirds	BCR 8 NL				
Pandion haliaetus	Osprey	Balbuzard pêcheur	Landbirds	BCR 8 NL			MBU 10 NL MBU 12 NL	
Seiurus aurocapilla	Ovenbird	Paruline couronnée	Landbirds	BCR 8 NL				
Setophaga palmarum	Palm Warbler	Paruline à couronne rousse	Landbirds	BCR 8 NL				

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Falco peregrinus	Peregrine Falcon (*anatum/tundrius*)	Faucon pèlerin	Landbirds	BCR 8 NL				BCR 8 NL
Vireo philadelphicus	Philadelphia Vireo	Viréo de Philadelphie	Landbirds	BCR 8 NL				
Pinicola enucleator	Pine Grosbeak	Durbec des sapins	Landbirds	BCR 8 NL		BCR 8 NL		
Spinus pinus	Pine Siskin	Tarin des pins	Landbirds	BCR 8 NL		BCR 8 NL		
Haemorhous purpureus	Purple Finch	Roselin pourpré	Landbirds	BCR 8 NL		BCR 8 NL		BCR 8 NL
Loxia curvirostra	Red Crossbill	Bec-croisé des sapins	Landbirds	BCR 8 NL		BCR 8 NL		
Loxia curvirostra percna	Red Crossbill (*percna*)	Bec-croisé des sapins (*percna*)	Landbirds	BCR 8 NL		BCR 8 NL		BCR 8 NL
Sitta canadensis	Red-breasted Nuthatch	Sittelle à poitrine rousse	Landbirds	BCR 8 NL		BCR 8 NL		
Vireo olivaceus	Red-eyed Vireo	Viréo aux yeux rouges	Landbirds	BCR 8 NL				
Agelaius phoeniceus	Red-winged Blackbird	Carouge à épaulettes	Landbirds	BCR 8 NL				
Lagopus muta	Rock Ptarmigan	Lagopède alpin	Landbirds	BCR 8 NL		BCR 8 NL		
Pheucticus ludovicianus	Rose-breasted Grosbeak	Cardinal à poitrine rose	Landbirds	BCR 8 NL	BCR 8 NL			
Buteo lagopus	Rough-legged Hawk	Buse pattue	Landbirds	BCR 8 NL				
Regulus calendula	Ruby-crowned Kinglet	Roitelet à couronne rubis	Landbirds	BCR 8 NL				
Archilochus colubris	Ruby-throated Hummingbird	Colibri à gorge rubis	Landbirds	BCR 8 NL				
Bonasa umbellus	Ruffed Grouse	Gélinotte huppée	Landbirds	BCR 8 NL		BCR 8 NL		
Euphagus carolinus	Rusty Blackbird	Quiscale rouilleux	Landbirds	BCR 8 NL				BCR 8 NL
Passerculus sandwichensis	Savannah Sparrow	Bruant des prés	Landbirds	BCR 8 NL				
Accipiter striatus	Sharp-shinned Hawk	Épervier brun	Landbirds	BCR 8 NL		BCR 8 NL		BCR 8 NL
Asio flammeus	Short-eared Owl	Hibou des marais	Landbirds	BCR 8 NL				BCR 8 NL
Plectrophenax nivalis	Snow Bunting	Plectrophane des neiges	Landbirds		BCR 8 NL	BCR 8 NL		
Bubo scandiacus	Snowy Owl	Harfang des neiges	Landbirds			BCR 8 NL MBU 10 NL		MBU 10 NL
Melospiza melodia	Song Sparrow	Bruant chanteur	Landbirds	BCR 8 NL				
Falcipennis canadensis	Spruce Grouse	Tétras du Canada	Landbirds	BCR 8 NL		BCR 8 NL		
Catharus ustulatus	Swainson's Thrush	Grive à dos olive	Landbirds	BCR 8 NL				
Melospiza georgiana	Swamp Sparrow	Bruant des marais	Landbirds	BCR 8 NL				BCR 8 NL

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Oreothlypis peregrina	Tennessee Warbler	Paruline obscure	Landbirds	BCR 8 NL				
Tachycineta bicolor	Tree Swallow	Hirondelle bicolore	Landbirds	BCR 8 NL				
Catharus fuscescens	Veery	Grive fauve	Landbirds	BCR 8 NL				
Zonotrichia leucophrys	White-crowned Sparrow	Bruant à couronne blanche	Landbirds	BCR 8 NL				
Zonotrichia albicollis	White-throated Sparrow	Bruant à gorge blanche	Landbirds	BCR 8 NL		BCR 8 NL		BCR 8 NL
Loxia leucoptera	White-winged Crossbill	Bec-croisé bifascié	Landbirds	BCR 8 NL		BCR 8 NL		
Lagopus lagopus	Willow Ptarmigan	Lagopède des saules	Landbirds	BCR 8 NL		BCR 8 NL		
Cardellina pusilla	Wilson's Warbler	Paruline à calotte noire	Landbirds	BCR 8 NL				
Troglodytes hiemalis	Winter Wren	Troglodyte des forêts	Landbirds	BCR 8 NL				
Setophaga petechia	Yellow Warbler	Paruline jaune	Landbirds	BCR 8 NL				
Empidonax flaviventris	Yellow-bellied Flycatcher	Moucherolle à ventre jaune	Landbirds	BCR 8 NL				BCR 8 NL
Sphyrapicus varius	Yellow-bellied Sapsucker	Pic maculé	Landbirds	BCR 8 NL				
Setophaga coronata	Yellow-rumped Warbler	Paruline à croupion jaune	Landbirds	BCR 8 NL				
Pluvialis dominica	American Golden-Plover	Pluvier bronzé	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL		BCR 8 NL
Calidris bairdii	Baird's Sandpiper	Bécasseau de Baird	Shorebirds		MBU 10 NL MBU 12 NL			
Pluvialis squatarola	Black-bellied Plover	Pluvier argenté	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL		MBU 12 NL
Calidris alpina	Dunlin	Bécasseau variable	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL			MBU 12 NL
Tringa melanoleuca	Greater Yellowlegs	Grand chevalier	Shorebirds	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL			
Limosa haemastica	Hudsonian Godwit	Barge hudsonienne	Shorebirds		MBU 10 NL MBU 12 NL			

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Charadrius vociferus	Killdeer	Pluvier kildir	Shorebirds	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL			
Calidris minutilla	Least Sandpiper	Bécasseau minuscule	Shorebirds	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL			BCR 8 NL MBU 12 NL
Tringa flavipes	Lesser Yellowlegs	Petit chevalier	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL			MBU 10 NL MBU 12 NL
Calidris melanotos	Pectoral Sandpiper	Bécasseau à poitrine cendrée	Shorebirds					
Charadrius melodus melodus	Piping Plover (*melodus*)	Pluvier siffleur (*melodus*)	Shorebirds	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL			BCR 8 NL MBU 10 NL MBU 12 NL
Calidris maritima	Purple Sandpiper	Bécasseau violet	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL
Calidris canutus rufa	Red Knot (*rufa*)	Bécasseau maubèche (*rufa*)	Shorebirds		MBU 10 NL MBU 12 NL			MBU 10 NL MBU 12 NL
Phalaropus fulicarius	Red Phalarope	Phalarope à bec large	Shorebirds		MBU 10 NL MBU 12 NL			
Phalaropus lobatus	Red-necked Phalarope	Phalarope à bec étroit	Shorebirds	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL			
Arenaria interpres	Ruddy Turnstone	Tournepierre à collier	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL		
Calidris alba	Sanderling	Bécasseau sanderling	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL		MBU 10 NL MBU 12 NL
Charadrius semipalmatus	Semipalmated Plover	Pluvier semipalmé	Shorebirds	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL		
Calidris pusilla	Semipalmated Sandpiper	Bécasseau semipalmé	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL			BCR 8 NL MBU 12 NL

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Limnodromus griseus	Short-billed Dowitcher	Bécassin roux	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL			
Tringa solitaria	Solitary Sandpiper	Chevalier solitaire	Shorebirds		BCR 8 NL MBU 10 NL			MBU 10 NL
Actitis macularius	Spotted Sandpiper	Chevalier grivelé	Shorebirds	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL			
Numenius phaeopus	Whimbrel	Courlis corlieu	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL			BCR 8 NL MBU 10 NL MBU 12 NL
Calidris fuscicollis	White-rumped Sandpiper	Bécasseau à croupion blanc	Shorebirds		BCR 8 NL MBU 10 NL MBU 12 NL			MBU 10 NL MBU 12 NL
Tringa semipalmata	Willet	Chevalier semipalmé	Shorebirds	MBU 12 NL	MBU 10 NL			MBU 12 NL
Gallinago delicata	Wilson's Snipe	Bécassine de Wilson	Shorebirds	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL		BCR 8 NL
Botaurus lentiginosus	American Bittern	Butor d'Amérique	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		BCR 8 NL
Fulica americana	American Coot	Foulque d'Amérique	Waterbirds		BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL		
Sterna paradisaea	Arctic Tern	Sterne arctique	Waterbirds	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL			
Fratercula arctica	Atlantic Puffin	Macareux moine	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 12 NL	MBU 10 NL
Cepphus grylle	Black Guillemot	Guillemot à miroir	Waterbirds	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Chroicocephalus ridibundus	Black-headed Gull	Mouette rieuse	Waterbirds	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 12 NL
Rissa tridactyla	Black-legged Kittiwake	Mouette tridactyle	Waterbirds	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Chroicocephalus philadelphia	Bonaparte's Gull	Mouette de Bonaparte	Waterbirds		BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		
Hydroprogne caspia	Caspian Tern	Sterne caspienne	Waterbirds	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Gavia immer	Common Loon	Plongeon huard	Waterbirds	BCR 8 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		BCR 8 NL MBU 10 NL
Uria aalge	Common Murre	Guillemot marmette	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 12 NL	MBU 10 NL
Sterna hirundo	Common Tern	Sterne pierregarin	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL			BCR 8 NL MBU 10 NL MBU 12 NL
Calonectris diomedea	Cory's Shearwater	Puffin cendré	Waterbirds		MBU 10 NL			MBU 10 NL
Phalacrocorax auritus	Double-crested Cormorant	Cormoran à aigrettes	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Alle alle	Dovekie	Mergule nain	Waterbirds		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL
Larus hyperboreus	Glaucous Gull	Goéland bourgmestre	Waterbirds	MBU 10 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		
Larus marinus	Great Black-backed Gull	Goéland marin	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		
Ardea herodias	Great Blue Heron	Grand héron	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 12 NL		
Phalacrocorax carbo	Great Cormorant	Grand cormoran	Waterbirds	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Ardea alba	Great Egret	Grande aigrette	Waterbirds		BCR 8 NL MBU 10 NL MBU 12 NL			
Puffinus gravis	Great Shearwater	Puffin majeur	Waterbirds		MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL
Stercorarius skua	Great Skua	Grand labbe	Waterbirds		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Larus argentatus	Herring Gull	Goéland argenté	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		
Podiceps auritus	Horned Grebe	Grèbe esclavon	Waterbirds		MBU 12 NL	MBU 12 NL		MBU 12 NL
Larus glaucoides	Iceland Gull	Goéland arctique	Waterbirds		BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		
Pagophila eburnea	Ivory Gull	Mouette blanche	Waterbirds			MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL
Leucophaeus atricilla	Laughing Gull	Mouette atricille	Waterbirds		MBU 10 NL MBU 12 NL			
Oceanodroma leucorhoa	Leach's Storm-Petrel	Océanite cul-blanc	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 12 NL	MBU 10 NL
Larus fuscus	Lesser Black-backed Gull	Goéland brun	Waterbirds		BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		
Stercorarius longicaudus	Long-tailed Jaeger	Labbe à longue queue	Waterbirds		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Puffinus puffinus	Manx Shearwater	Puffin des Anglais	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL	MBU 10 NL
Fulmarus glacialis	Northern Fulmar	Fulmar boréal	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Morus bassanus	Northern Gannet	Fou de Bassan	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL
Stercorarius parasiticus	Parasitic Jaeger	Labbe parasite	Waterbirds		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Podilymbus podiceps	Pied-billed Grebe	Grèbe à bec bigarré	Waterbirds		MBU 12 NL			
Stercorarius pomarinus	Pomarine Jaeger	Labbe pomarin	Waterbirds		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Alca torda	Razorbill	Petit pingouin	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 12 NL	MBU 10 NL
Podiceps grisegena	Red-necked Grebe	Grèbe jougris	Waterbirds		BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL		MBU 10 NL MBU 12 NL

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Gavia stellata	Red-throated Loon	Plongeon catmarin	Waterbirds	BCR 8 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL
Larus delawarensis	Ring-billed Gull	Goéland à bec cerclé	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		
Xema sabini	Sabine's Gull	Mouette de Sabine	Waterbirds		BCR 8 NL			
Puffinus griseus	Sooty Shearwater	Puffin fuligineux	Waterbirds		MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL
Porzana carolina	Sora	Marouette de Caroline	Waterbirds	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL			
Stercorarius maccormicki	South Polar Skua	Labbe de McCormick	Waterbirds		MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL	
Uria lomvia	Thick-billed Murre	Guillemot de Brünnich	Waterbirds	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 12 NL	MBU 10 NL
Oceanites oceanicus	Wilson's Storm-Petrel	Océanite de Wilson	Waterbirds		MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL	
Anas rubripes	American Black Duck	Canard noir	Waterfowl	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL		BCR 8 NL MBU 10 NL MBU 12 NL
Anas americana	American Wigeon	Canard d'Amérique	Waterfowl	BCR 8 NL	MBU 10 NL MBU 12 NL			
Bucephala islandica	Barrow's Goldeneye (Eastern)	Garrot d'Islande (de l'Est)	Waterfowl		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL
Melanitta americana	Black Scoter	Macreuse à bec jaune	Waterfowl	BCR 8 NL	MBU 10 NL MBU 12 NL	MBU 10 NL		MBU 10 NL MBU 12 NL
Anas discors	Blue-winged Teal	Sarcelle à ailes bleues	Waterfowl	BCR 8 NL				
Branta bernicla	Brant	Bernache cravant	Waterfowl		MBU 10 NL			
Bucephala albeola	Bufflehead	Petit Garrot	Waterfowl		MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL		
Branta canadensis	Canada Goose	Bernache du Canada	Waterfowl	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL			

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Branta canadensis	Canada Goose (North Atlantic)	Bernache du Canada (Atlantique Nord)	Waterfowl	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		BCR 8 NL MBU 10 NL MBU 12 NL	
Branta canadensis	Canada Goose (Temperate-breeding in Eastern Canada)	Bernache du Canada (qui se reproduit dans des régions tempérées de l'est du Canada)	Waterfowl	BCR 8 NL MBU 10 NL	BCR 8 NL MBU 10 NL			
Somateria mollissima	Common Eider	Eider à duvet	Waterfowl	MBU 10 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL
Bucephala clangula	Common Goldeneye	Garrot à oeil d'or	Waterfowl	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		BCR 8 NL MBU 10 NL MBU 12 NL
Mergus merganser	Common Merganser	Grand harle	Waterfowl	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL		BCR 8 NL MBU 10 NL
Anas penelope	Eurasian Wigeon	Canard siffleur	Waterfowl		BCR 8 NL	BCR 8 NL		
Aythya marila	Greater Scaup	Fuligule milouinan	Waterfowl	BCR 8 NL		BCR 8 NL MBU 10 NL MBU 12 NL		
Anas crecca	Green-winged Teal	Sarcelle d'hiver	Waterfowl	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL			BCR 8 NL
Histrionicus histrionicus	Harlequin Duck (Eastern)	Arlequin plongeur (de l'Est)	Waterfowl	BCR 8 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		BCR 8 NL MBU 10 NL MBU 12 NL
Somateria spectabilis	King Eider	Eider à tête grise	Waterfowl		MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL
Aythya affinis	Lesser Scaup	Petit fuligule	Waterfowl	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Clangula hyemalis	Long-tailed Duck	Harelde kakawi	Waterfowl	BCR 8 NL MBU 10 NL	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		MBU 10 NL MBU 12 NL
Anas platyrhynchos	Mallard	Canard colvert	Waterfowl	BCR 8 NL MBU 10 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL		

Table A-1 continued

Latin Name	English Name	French Name	Bird Group	Breeding	Migrant	Wintering	Seasonal	Priority
Anas acuta	Northern Pintail	Canard pilet	Waterfowl	BCR 8 NL MBU 12 NL	BCR 8 NL MBU 10 NL MBU 12 NL	BCR 8 NL		
Anas clypeata	Northern Shoveler	Canard souchet	Waterfowl	BCR 8 NL	BCR 8 NL			
Mergus serrator	Red-breasted Merganser	Harle huppé	Waterfowl	BCR 8 NL MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL	MBU 10 NL MBU 12 NL		
Aythya collaris	Ring-necked Duck	Fuligule à collier	Waterfowl	BCR 8 NL	BCR 8 NL MBU 10 NL MBU 12 NL			BCR 8 NL
Melanitta perspicillata	Surf Scoter	Macreuse à front blanc	Waterfowl	BCR 8 NL	MBU 10 NL MBU 12 NL			BCR 8 NL MBU 10 NL
Melanitta fusca	White-winged Scoter	Macreuse brune	Waterfowl		MBU 10 NL MBU 12 NL	MBU 10 NL		MBU 10 NL
Aix sponsa	Wood Duck	Canard branchu	Waterfowl		BCR 8 NL			

List of Priority Bird Species Associated with Each Habitat Class in BCR 8 NL, MBU 10 NL and MBU 12 NL

Table A-2: List of priority bird species associated with each habitat class in BCR 8 NL, MBU 10 NL and MBU 12 NL. Some species are priorities in all planning units. A "Y" in one of the first three columns indicates that the species is a priority species in the given region/unit.

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	BCR 8 NL										MBU 10 NL		MBU 12 NL	
					Coniferous	Mixed wood	Shrub/early successional	Herbaceous	Cultivated and managed areas	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)	Marine waters	Coastal (intertidal)
Total number of priority species in each habitat:					15	2	7	3	3	4	18	13	10	14	30	28	16	23
Y			Barn Swallow	Landbirds					Y	Y	Y							
Y			Black-backed Woodpecker	Landbirds	Y													
Y			Black-throated Green Warbler	Landbirds	Y	Y												
Y			Bobolink	Landbirds				Y	Y									
Y			Chimney Swift	Landbirds	Y					Y	Y							
Y			Common Nighthawk	Landbirds	Y				Y	Y	Y	Y						
Y			Gray-cheeked Thrush	Landbirds	Y													
Y			Magnolia Warbler	Landbirds	Y													
Y			Mourning Warbler	Landbirds	Y		Y											

Table A-2 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	BCR 8 NL									MBU 10 NL		MBU 12 NL	
					Coniferous	Mixed wood	Shrub/early successional	Herbaceous	Cultivated and managed areas	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)	Marine waters	Coastal (intertidal)
Y			Northern Hawk Owl	Landbirds	Y						Y							
Y			Olive-sided Flycatcher	Landbirds	Y						Y							
Y			Peregrine Falcon (*anatum/tundrius*)	Landbirds			Y			Y		Y		Y				
Y			Purple Finch	Landbirds	Y	Y						Y						
Y			Red Crossbill (*percna*)	Landbirds	Y													
Y			Rusty Blackbird	Landbirds	Y						Y	Y						
Y			Sharp-shinned Hawk	Landbirds	Y													
Y			Short-eared Owl	Landbirds				Y			Y			Y				
	Y		Snowy Owl	Landbirds											Y			
Y			Swamp Sparrow	Landbirds							Y	Y						
Y			White-throated Sparrow	Landbirds	Y							Y						
Y			Yellow-bellied Flycatcher	Landbirds	Y						Y	Y						
Y			American Golden-Plover	Shorebirds			Y							Y				
		Y	Black-bellied Plover	Shorebirds														Y
		Y	Dunlin	Shorebirds														Y
Y		Y	Least Sandpiper	Shorebirds							Y	Y		Y				Y

Table A-2 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	BCR 8 NL										MBU 10 NL		MBU 12 NL	
					Coniferous	Mixed wood	Shrub/early successional	Herbaceous	Cultivated and managed areas	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)	Marine waters	Coastal (intertidal)
	Y	Y	Lesser Yellowlegs	Shorebirds												Y		Y
Y	Y	Y	Piping Plover (*melodus*)	Shorebirds										Y		Y		Y
	Y	Y	Purple Sandpiper	Shorebirds												Y		Y
	Y	Y	Red Knot (*rufa*)	Shorebirds												Y		Y
	Y	Y	Sanderling	Shorebirds											Y	Y		Y
Y		Y	Semipalmated Sandpiper	Shorebirds			Y				Y	Y		Y				Y
	Y		Solitary Sandpiper	Shorebirds												Y		
Y	Y	Y	Whimbrel	Shorebirds										Y		Y		Y
	Y	Y	White-rumped Sandpiper	Shorebirds												Y		Y
		Y	Willet	Shorebirds														Y
Y			Wilson's Snipe	Shorebirds							Y							
Y			American Bittern	Waterbirds							Y							
	Y		Atlantic Puffin	Waterbirds											Y	Y		
		Y	Black-headed Gull	Waterbirds													Y	Y
	Y		Black-legged Kittiwake	Waterbirds											Y	Y		
Y	Y		Common Loon	Waterbirds									Y	Y	Y	Y		

Table A-2 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	BCR 8 NL										MBU 10 NL		MBU 12 NL	
					Coniferous	Mixed wood	Shrub/early successional	Herbaceous	Cultivated and managed areas	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)	Marine waters	Coastal (intertidal)
	Y		Common Murre	Waterbirds											Y	Y		
Y	Y	Y	Common Tern	Waterbirds				Y					Y	Y	Y	Y	Y	Y
	Y		Cory's Shearwater	Waterbirds											Y			
	Y	Y	Dovekie	Waterbirds											Y		Y	
	Y	Y	Great Shearwater	Waterbirds											Y		Y	
	Y		Great Skua	Waterbirds											Y			
		Y	Horned Grebe	Waterbirds													Y	Y
	Y	Y	Ivory Gull	Waterbirds											Y		Y	
	Y		Leach's Storm-Petrel	Waterbirds											Y	Y		
	Y		Manx Shearwater	Waterbirds											Y	Y		
	Y	Y	Northern Gannet	Waterbirds											Y	Y	Y	
	Y		Razorbill	Waterbirds											Y	Y		
	Y	Y	Red-necked Grebe	Waterbirds											Y	Y	Y	Y
	Y		Red-throated Loon	Waterbirds											Y			
	Y	Y	Sooty Shearwater	Waterbirds											Y		Y	
	Y		Thick-billed Murre	Waterbirds											Y	Y		

Table A-2 continued

BCR 8 NL	MBU 10 NL	MBU 12 NL	Priority Species	Bird Group	BCR 8 NL										MBU 10 NL		MBU 12 NL	
					Coniferous	Mixed wood	Shrub/early successional	Herbaceous	Cultivated and managed areas	Urban	Wetlands	Riparian	Inalnd waterbodies	Coastal (above high tide)	Marine waters	Coastal (intertidal)	Marine waters	Coastal (intertidal)
Y	Y	Y	American Black Duck	Waterfowl							Y		Y		Y	Y	Y	Y
	Y	Y	Barrow's Goldeneye (Eastern)	Waterfowl											Y	Y	Y	Y
	Y	Y	Black Scoter	Waterfowl											Y		Y	
Y	Y	Y	Canada Goose (North Atlantic)	Waterfowl			Y				Y		Y	Y	Y	Y		Y
	Y	Y	Common Eider	Waterfowl											Y	Y	Y	Y
Y	Y	Y	Common Goldeneye	Waterfowl								Y	Y	Y	Y	Y	Y	Y
Y	Y		Common Merganser	Waterfowl								Y	Y		Y	Y		
Y			Green-winged Teal	Waterfowl							Y	Y	Y	Y				
Y	Y	Y	Harlequin Duck (Eastern)	Waterfowl									Y	Y	Y	Y	Y	Y
	Y		King Eider	Waterfowl											Y			
	Y	Y	Long-tailed Duck	Waterfowl											Y	Y	Y	Y
Y			Ring-necked Duck	Waterfowl							Y		Y					
Y	Y		Surf Scoter	Waterfowl							Y	Y	Y		Y	Y		
	Y		White-winged Scoter	Waterfowl											Y			

List of All Regional Threats in BCR 8 NL, MBU 10 NL and MBU 12 NL

Table A-3: List of all the regional threats (with rolled-up rankings at the sub-threat level) sorted by threat sub-category (sub-categories are numbered as per Salafsky et al. 2008) summarized across habitat classes in BCR 8 NL, MBU 10 NL and MBU 12 NL. "Y" means that the threat was associated within the particular habitat class in the planning unit. The rolled-up score for each sub-threat for each habitat is also provided. L: Low, M: Medium, H: High, VH: Very High.

	BCR 8 NL										MBU 10 NL		MBU 12 NL	
Regional Threats	**Coniferous**	**Mixed wood**	**Shrub/early Successional**	**Herbaceous**	**Cultivated and managed areas**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**	**Marine waters**	**Coastal (intertidal)**
1.1 Housing & urban areas	L		L			L	L	L	L	L		L		L
Habitat loss due to urban development	Y		Y				Y	Y	Y	Y				
Habitat degradation due to coastal development												Y		Y
Mortality due to collisions with buildings	Y					Y								
1.2 Commercial & industrial areas						M								
Habitat loss due to commercial or industrial development						Y								
Loss of nesting sites (old chimneys, gravel roofs, old wooden barns, etc.)						Y								
1.3 Tourism & recreation areas										L				
Habitat loss due to tourism and recreational housing development										Y				
2.1 Annual & perennial non-timber crops					M									
Nest destruction or chick mortality due to early haying and intensive					Y									

Table A-3 continued

Regional Threats	BCR 8 NL										MBU 10 NL		MBU 12 NL	
	Coniferous	Mixed wood	Shrub/early Successional	Herbaceous	Cultivated and managed areas	Urban	Inland waterbodies	Wetlands	Riparian	Coastal (above high tide)	Marine waters	Coastal (intertidal)	Marine waters	Coastal (intertidal)
agriculture														
2.2 Wood & pulp plantations	L	L						L	L					
Loss of nesting sites due to forest structure changes from reforestation	Y													
Habitat degradation due to forest structure changes from reforestation	Y							Y						
Nest disturbance or destruction due to tree trimming activities in reforested plantations.	Y	Y							Y					
2.3 Livestock farming & ranching					L									
Habitat degradation due to increased livestock foraging					Y									
2.4 Marine & freshwater aquaculture											L	L	L	L
Competition for resources or foraging areas with aquaculture farms											Y	Y	Y	Y
3.2 Mining & quarrying			L						L	L				
Loss of breeding habitat (e.g., cliffs, ledges) due to mining development			Y						Y	Y				
4.1 Roads & railroads	L	L	L		L	L		L	L	L				
Mortality due to collisions with moving vehicles	Y	Y	Y		Y	Y		Y	Y	Y				
4.2 Utility & service lines	L	L	L			L		L	L	L				
Mortality due to collisions with tall structures (i.e., towers)	Y	Y	Y					Y	Y					
Mortality due to collisions with utility or transmission lines	Y		Y			Y		Y	Y	Y				
4.4 Flight paths	L		L		L	L	L	L	L	L				

Table A-3 continued

Regional Threats	BCR 8 NL										MBU 10 NL		MBU 12 NL	
	Coniferous	Mixed wood	Shrub/early Successional	Herbaceous	Cultivated and managed areas	Urban	Inland waterbodies	Wetlands	Riparian	Coastal (above high tide)	Marine waters	Coastal (intertidal)	Marine waters	Coastal (intertidal)
Reduction in fecundity due to disturbance from aircrafts							Y			Y				
Mortality due to collisions with aircrafts	Y		Y		Y	Y		Y	Y	Y				
5.1 Hunting & collecting terrestrial animals	L		L			L	L	L	L	L	L	L	L	L
Legal hunting			Y				Y	Y	Y	Y	Y	Y	Y	Y
Poaching (e.g., eggs, nestlings) and incidental take by hunters or trappers	Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y
5.2 Gathering terrestrial plants							L	L		L				
Habitat loss due to peat mining							Y	Y		Y				
5.3 Logging & wood harvesting	M	L						L	L					
Habitat loss or degradation due clear cutting, fragmentation and forest harvesting	Y	Y						Y	Y					
Loss of breeding habitat, nesting sites and important habitat features due to forest harvesting	Y								Y					
5.4 Fishing & harvesting aquatic resources											H	L	M	L
Competition with commercial fisheries for prey											Y		Y	
Mortality due to entanglement in fishing gear											Y	Y	Y	Y
6.1 Recreational activities			L	L			L	L	L	M	L	M	L	L
Habitat degradation due to resource development (e.g., new roads) or disturbance at migration sites (e.g., staging beaches, stopover sites)			Y				Y	Y	Y	Y	Y	Y	Y	Y

Table A-3 continued

	BCR 8 NL										MBU 10 NL		MBU 12 NL	
Regional Threats	**Coniferous**	**Mixed wood**	**Shrub/early Successional**	**Herbaceous**	**Cultivated and managed areas**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**	**Marine waters**	**Coastal (intertidal)**
Reduction in fecundity due to disturbance around nesting sites (e.g., motor boats, human activities near colonies)				Y			Y			Y	Y	Y	Y	Y
6.3 Work & other activities						L								
Reduction in fecundity due to disturbance or destruction of nest sites from building and bridge maintenance activities (e.g., chimney sweeping)						Y								
7.1 Fire & fire suppression	M							L						
Habitat loss or degradation from changes in forests age structure and removal of insect-infested trees due to fire suppression	Y							Y						
7.2 Dams & water management/use							M	M	L	M		L		L
Habitat loss or degradation due to changes in hydrology, water management and river channelization							Y	Y	Y	Y				
Habitat loss due to the drainage of saltmarshes												Y		Y
7.3 Other ecosystem modifications					L									
Habitat loss due to reforestation of agricultural land					Y									
8.1 Invasive non-native/alien species	M	L		L		L						M		L
Reduction in survival from introduced mammalian and avian predators (e.g., red squirrels)	Y			Y								Y		Y
Habitat degradation due to competition with red squirrels and seed eating finches for cone crops	Y													
Reduction in fecundity due to competition with European Starlings for nesting sites	Y					Y								

Table A-3 continued

	BCR 8 NL										MBU 10 NL		MBU 12 NL	
Regional Threats	**Coniferous**	**Mixed wood**	**Shrub/early Successional**	**Herbaceous**	**Cultivated and managed areas**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**	**Marine waters**	**Coastal (intertidal)**
Habitat degradation from infestation of introduced woolly adelgids	Y	Y												
8.2 Problematic native species	L		L		L	L	L	L	L	H	L	H	L	H
Population reduction due to hybridization with Mallards							Y	Y		Y	Y	Y	Y	Y
Reduction in fecundity due to competition with Red-winged Blackbirds and Grackles for nesting sites	Y							Y	Y					
Reduction in fecundity due to competition with other grazing geese for nesting sites			Y				Y	Y		Y				
Mortality due to an increase in predator populations as a result of land use changes	Y				Y			Y	Y	Y		Y	Y	Y
9.1 Household sewage & urban waste water							L	L		L				
Mortality due to the chemical contamination of water and sediments by household sewage or urban wastewater operations							Y	Y		Y				
9.2 Industrial & military effluents						L	L	L	L	L	VH	M	H	M
Habitat degradation due to chemical or heavy metal contamination from mining and industrial activities leading to pollutant exposure (e.g., mercury, PCBs, mining effluents etc.)							Y	Y	Y	Y	Y	Y		
Lethal/sublethal effects due to chemical or heavy metal contamination from mining and industrial activities leading to pollutant exposure (e.g., mercury, PCBs, mining effluents etc.)						Y	Y	Y	Y	Y	Y	Y	Y	Y
Mortality due to oil spills and discharges from ships or drilling platforms											Y	Y	Y	Y
9.3 Agricultural & forestry effluents	L	L			L		L	L	L	L	L	L	L	L

Table A-3 continued

	BCR 8 NL										MBU 10 NL		MBU 12 NL	
Regional Threats	**Coniferous**	**Mixed wood**	**Shrub/early Successional**	**Herbaceous**	**Cultivated and managed areas**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**	**Marine waters**	**Coastal (intertidal)**
Habitat degradation due to chemical contamination							Y	Y		Y				
Lethal/sublethal effects due to pesticide contamination by direct exposure or consumption of contaminated prey	Y	Y					Y	Y			Y	Y	Y	Y
Habitat degradation due to pesticide use from the alteration of food webs and abundance of prey species	Y				Y		Y	Y	Y	Y				
9.4 Garbage & solid waste				L			L			L	L	L	L	L
Ingestion of and entanglement in garbage (e.g., plastics) and solid wastes				Y			Y			Y	Y	Y	Y	Y
9.5 Airborne pollutants			L				L	L		L				
Habitat degradation from acid precipitation			Y				Y	Y		Y				
11.1 Habitat shifting & alteration	L		H		L	L	L	H	H	H	L	H		H
Habitat loss or alterations to structures (e.g., drying) due to climate change	Y						Y	Y	Y	Y		Y		Y
Habitat degradation from the alteration of food webs due to changes in weather or sea surface temperatures			Y		Y	Y		Y	Y	Y	Y	Y		
Habitat degradation due to climate change altering species' ranges and timing of seasonal cues (e.g., migration or egg laying)			Y					Y	Y	Y				
11.3 Temperature extremes	M				L	L		M	L	M	M	M	L	M
Mortality due to extreme temperatures (e.g., cold snaps in spring)	Y				Y	Y		Y	Y	Y		Y		Y
Habitat degradation due to climate change altering thickness and temporal or geographic distribution of sea ice											Y		Y	

Table A-3 continued

	BCR 8 NL										MBU 10 NL		MBU 12 NL	
Regional Threats	**Coniferous**	**Mixed wood**	**Shrub/early Successional**	**Herbaceous**	**Cultivated and managed areas**	**Urban**	**Inland waterbodies**	**Wetlands**	**Riparian**	**Coastal (above high tide)**	**Marine waters**	**Coastal (intertidal)**	**Marine waters**	**Coastal (intertidal)**
11.4 Storms & flooding	M				H	L	L	M	L	H	L	M	L	M
Habitat degradation or flooding from an increased frequency and severity of storms due to climate change	Y				Y	Y		Y	Y	Y	Y	Y	Y	Y
Mortality due to heavy rains or storms					Y			Y				Y		
Reduction in fecundity or chick mortality due to extreme weather during nesting					Y						Y	Y		
Reduction in food availability due to extreme weather conditions	Y							Y						
12.1 Information lacking	M		H	L	M	M		H	H	H	H	H	M	H
General lack of information	Y			Y				Y		Y	Y			
Lack of reliable population trend information	Y		Y				Y	Y	Y	Y	Y	Y	Y	Y
Lack of accurate estimates of species abundance	Y													
Lack of knowledge of underlying causes of population declines or possible sources of mortality	Y				Y	Y		Y		Y		Y		Y
Lack of knowledge of effects of climate change on habitat			Y					Y	Y	Y		Y		Y

Appendix 2

General Methodology for Compiling the Six Standard Elements

Each strategy includes six required elements to conform to the national standard. An extensive manual (Kennedy et al. 2012) provides methods and other guidance for completing each element. The six elements provide an objective means of moving towards multi-species conservation efforts that are targeted to species and issues of highest priority. The six elements are:

1) identifying priority species – to focus conservation attention on species of conservation concern and those most representative of the region
2) attributing priority species to habitat classes – a tool for identifying habitats of conservation interest and a means of organizing and presenting information
3) setting population objectives for priority species – an assessment of current population status compared to the desired status, and a means of measuring conservation success
4) assessing and ranking threats – identifies the relative importance of issues affecting populations of priority species within the planning area as well as outside Canada (i.e., throughout their life cycle)
5) setting conservation objectives – outlines the overall conservation goals in response to identified threats and information needs; also a means of measuring accomplishments
6) proposing recommended actions – strategies to begin on-the-ground conservation to help achieve conservation objectives

The first four elements apply to individual priority species and together comprise an assessment of the status of priority species and the threats they face. The last two elements integrate information across species to create a vision for conservation implementation both within Canada and in countries that host priority species during migration and the non-breeding season.

Element 1: Priority Species Assessment

The Bird Conservation Strategies identify "priority species" from all regularly occurring bird species in each subregion. The priority species approach allows management attention and limited resources to focus on those species with particular conservation importance, ecological significance and/or management need. The species assessment processes used are derived from standard assessment protocols developed by the four major bird conservation initiatives[6].

The species assessment process applies quantitative rule sets to biological data for factors such as:

- population size,
- breeding and non-breeding distribution,

[6] Partners in Flight (landbirds), Wings Over Water (waterbirds), Canadian Shorebird Conservation Plan (shorebirds), North American Waterfowl Management Plan (waterfowl).

- population trend,
- breeding and non-breeding threats, and
- regional density and abundance.

The assessment is applied to individual bird species and ranks each species in terms of its biological vulnerability and population status. The assessments can be used to assign subregional (i.e., provincial section of a BCR), regional (BCR) and continental conservation priorities among birds.

Element 2: Habitats Important to Priority Species

Identifying the broad habitat requirements for each priority species in the breeding and non-breeding season allows species with shared habitat-based conservation issues or actions to be grouped. 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. In most cases, all habitat associations identified in the literature are listed for individual species. Habitat associations do not indicate relative use, suitability ratings or rankings, nor selection or avoidance; this could be a useful exercise to undertake in the future.

In order to link with other national and international land classification schemes and to capture the range of habitat types across Canada, habitat classes for all priority species are based, at the coarsest level, on the hierarchical approach of the international Land Cover Classification System (LCCS) developed by the United Nations Food and Agriculture Organization (FAO 2000). Some modifications were made to the LCCS scheme to reflect habitat types that are important to birds that are not included in the classification (e.g., marine habitats). Species often are assigned to more than one of these coarse habitat classes. To retain the link to regional spatial data (e.g., provincial forest inventories), or to group species into regionally relevant habitat classes, individual BCR strategies may identify finer-scale habitat classes. Finer-scale habitat attributes and the surrounding landscape context were also captured when possible to better guide the development of specific conservation objectives and actions.

Element 3: Population Objectives

A central component of effective conservation planning is setting clear objectives that can be measured and evaluated. Bird Conservation Strategies set objectives based upon the conservation philosophies of national and continental bird initiatives, including the North American Bird Conservation Initiative (NABCI), that support conserving the distribution, diversity and abundance of birds throughout their historical ranges. The baselines for population objectives used in this planning exercise (those existing during the late 1960s, 1970s and 1990s for eastern waterfowl) reflect population levels prior to widespread declines. Most of the four bird conservation initiatives under the umbrella of NABCI have adopted the same baselines at the continental and national scale (waterfowl, shorebirds and landbirds; national and continental waterbird plans have not yet set population objectives). Some regions in the current planning effort have adjusted baselines to reflect the start of systematic monitoring. The ultimate measure of conservation success will be the extent to which population objectives

have been reached. Progress towards population objectives will be regularly assessed as part of an adaptive management approach.

Population objectives for all bird groups are based on a quantitative or qualitative assessment of species' population trends. If the population trend for a species is unknown, the objective is usually "assess and maintain", and a monitoring objective is set. Harvested waterfowl and stewardship species that are already at desired population levels are given an objective of "maintain". 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. If recovery documents are not available, objectives are set using the same approach as for other species within that bird group. Once recovery objectives are available, they will replace interim objectives.

Element 4: Threat Assessment for Priority Species

Bird population trends are driven by factors that affect reproduction and/or survival during any point in the annual 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 exercise included three main steps:

1. Conducting a literature review to itemize past, current and future threats for each priority species and classifying the threats following a standardized classification scheme (Salafsky et al. 2008).
2. Ranking the magnitude of threats for priority species following a standardized protocol (Kennedy et al. 2012).
3. Preparing a set of threat profiles for the BCR subregion, for broad habitat categories.

Each threat was categorized following the IUCN-CMP threat classification scheme (Salafsky et al. 2008) with the addition of categories to capture species for which we lack information. Only threats stemming from human activity were included in the threats assessment because they can be mitigated; natural processes that prevent populations from expanding beyond a given level were considered and noted, but no actions beyond research and/or monitoring were developed. Threats were ranked by assessing the scope (the proportion of the species' range within the subregion that is affected by the threat) and severity (the relative impact that the threat poses to the viability of the species' populations) of the threat. The scores for scope and severity were combined to determine an overall magnitude of low, medium, high or very high. These magnitudes were then rolled-up by threat categories and sub-categories across habitat types (see Kennedy et al. 2012 for details on this process). The threats roll-up allows for comparison of the relative magnitude of the threats among threat categories and habitat types. The scoring and ranking of threats not only helps to determine which threats contribute most to population declines in individual species, but also allows us to focus attention on the threats with the greatest effects on suites of species or in broad habitat classes.

In BCR 8 NL, MBU 10 NL and MBU 12 NL, a category was added to the threats classification scheme to address species with inadequate monitoring or research information (category 12 “Other direct threats” and sub-category 12.1 “Information lacking”).

Element 5: Conservation Objectives

Overall, conservation objectives represent the desired conditions within the subregion that will collectively contribute to achieving population objectives. Objectives may also outline the research or monitoring needed to improve the understanding of species declines and how to best take action.

Currently, most conservation objectives are measurable using qualitative categories (e.g., decrease, maintain, increase) that will allow an evaluation of implementation progress, but they are not linked quantitatively to population objectives. Implementation that incorporates an active adaptive management process is an underlying principle of this conservation effort and will allow for future evaluation of whether or not reaching conservation objectives contributed to achieving population objectives.

Whenever possible, conservation objectives benefit multiple species and/or respond to more than one threat. However, where necessary, they focus on the specific requirements of a single species.

Conservation objectives generally fall into one of two broad categories:

- habitat objectives within the BCR subregion (the quantity, quality and configuration of priority habitats)
- non-habitat objectives within the BCR subregion (minimizing mortality by reducing predation, conducting education and outreach to reduce human disturbance, etc.)

Ideally, habitat objectives would reflect the type, amount and location of habitat necessary to support population levels of priority species outlined in the population objectives. Currently, there is a lack of data and tools at the BCR scale to develop these specific quantitative objectives. Threats-based objectives present the direction of change required to move toward the population objectives using the best available information and knowledge of ecosystem management strategies within broad habitat types.

Element 6: Recommended Actions

Recommended conservation actions are the strategies required to achieve conservation objectives. Recommended actions are usually made at the strategic level rather than being highly detailed and prescriptive. Actions were classified following the IUCN-CMP classification of conservation actions (Salafsky et al. 2008; see Appendix 3 IUCN Conservation Actions Categories) with the addition of categories to address research and monitoring needs. When possible, more detailed recommendations can be included, for example if beneficial management practices, ecosystem plans or multiple recovery documents are available for a

subregion. However, actions should be detailed enough to provide initial guidance for implementation.

The objectives for research, monitoring and widespread issues may not have actions associated with them. These issues are often so multi-faceted that actions are best designed in consultation with partners and subject-matter experts. Implementation teams will be better positioned to address these complex issues, drawing input from various stakeholders.

Recommended actions defer to or support those provided in recovery documents for species at risk at the federal, provincial or territorial level, but because these strategies are directed at multiple species, actions are usually more general than those developed for individual species. For more detailed recommendations for species at risk, readers should consult recovery documents.

Appendix 3

Tables adapted from Salafsky et al. (2008).

IUCN Threat Categories

Table A-4: World Conservation Union-Conservation Measures Partnership (IUCN-CMP) classification of threats to biodiversity.

Note that not all threat categories apply to birds or occur in every BCR or MBU.

Threat Category/Sub-category	Definition
1 Residential and commercial development	Human settlements of other nonagricultural land uses with a substantial footprint
1.1 Housing and urban areas	Human cities, towns and settlements including nonhousing development typically integrated with housing
1.2 Commercial and industrial areas	Factories and other commercial centers
1.3 Tourism and recreation areas	Tourism and recreation sites with a substantial footprint
2 Agriculture and aquaculture	Threats from farming and ranching as a result of agricultural expansion and intensification, including siviculture, mariculture and aquaculture
2.1 Annual and perennial non-timber crops	Crops planted for food, fodder, fiber, fuel or other uses
2.2 wood and pulp plantations	Stands of timber planted for timber or fiber outside of natural forests, often with non-native species
2.3 Livestock farming and ranching	Domestic terrestrial animals raised in one location on farmed of nonlocal resources (farming); also domestic or semidomesticated animals allowed to roam in the wild and supported by natural habitats (ranching)
2.4 Marine and freshwater aquaculture	Aquatic animals raised in one location on farmed or nonlocal resources; also hatchery fish allowed to roam in the wild
3 Energy production and mining	Threats from production of nonbiological resources
3.1 Oil and gas drilling	Exploring for, developing, and producing petroleum and other liquid hydrocarbons
3.2 Mining and quarrying	Exploring for, developing, and producing minerals and rocks
3.3 Renewable energy	Exploring, developing and producing renewable energy
4 Transportation and service corridors	Threats from long, narrow transport corridors and the vehicles that use them including associated wildlife mortality
4.1 Roads and railroads	Surface transport on roadways and dedicated tracks
4.2 Utility and service lines	Transport of energy and resources
4.3 Shipping lanes	Transport on and in freshwater and ocean waterways
4.4 Flight paths	Air and space transport
5 Biological resource use	Threats from consumptive use of “wild” biological resources including deliberate and unintentional harvesting effects; also persecution or control of specific species
5.1 Hunting and collecting terrestrial animals	Killing or trapping terrestrial wild animals or animal products for commercial, recreation, subsidence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
5.2 Gathering terrestrial plants	Harvesting plants, fungi, and other nontimber/nonanimal

Table A-4 continued

Threat Category/Sub-category	Definition
	products for commercial, recreation, subsidence, research or cultural purposes, or for control purposes
5.3 Logging and wood harvesting	Harvesting trees and other woody vegetation for timber, fiber, or fuel
5.4 Fishing & harvesting aquatic resources	Harvesting aquatic wild animals or plants for commercial, recreation, subsidence, research or cultural purposes, or for control/persecution reasons; includes accidental mortality/bycatch
6 Human intrusions and disturbance	Threats from human activities that alter, destroy and disturb habitats and species associated with nonconsumptive uses of biological resources
6.1 Recreational activities	People spending time in nature or travelling in vehicles outside established transport corridors, usually for recreation purposes
6.2 War, civil unrest and military exercises	Actions by formal or paramilitary forces without a permanent footprint
6.3 Work and other activities	People spending time in or travelling in natural environments for reasons other than recreation or military activities
7 Natural system modifications	Threats from actions that convert or degrade habitat in service of "managing" natural or seminatural systems, often to improve human welfare
7.1 Fire and fire suppression	Suppression or increase in fire frequency and/or intensity outside of its natural range of variation
7.2 Dams and water management/use	Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities
7.3 Other ecosystem modifications	Other actions that convert or degrade habitat in the service of "managing" natural systems to improve human welfare.
8 Invasive and other problematic species and genes	Threats from non-native and native plants, animals, pathogens/microbes, or genetic material that have or are predicted to have harmful effects on biodiversity following their introduction, spread, and/or increase in abundance
8.1 Invasive non-native/alien species	Harmful plants, animals, pathogens and other microbes not originally found within the ecosystem(s) in question and directly or indirectly introduced and spread into it by human activities
8.2 Problematic native species	Harmful plants, animals, pathogens and other microbes that are originally found within the ecosystem(s) in question, but have become "out of balance" or "released" directly or indirectly due to human activities
8.3 Introduced genetic material	Human-altered or transported organisms or genes
9 Pollution	Threats from introduction of exotic and/or excess materials or energy from point and nonpoint sources
9.1 Household sewage and urban waste water	Water-borne sewage and nonpoint runoff from housing and urban areas that include nutrients, toxic chemicals and/or sediments
9.2 Industrial and military effluents	Water-borne pollutants from industrial and military sources including mining, energy production, and other resource extraction industries that include nutrients, toxic chemicals and/or sediments
9.3 Agricultural and forestry effluents	Water-borne pollutants from agricultural, sivicultural, and aquaculture systems that include nutrients, toxic chemicals and/or sediments including the effects of these pollutants on

Table A-4 continued

Threat Category/Sub-category	Definition
	the site where they are applied
9.4 Garbage and solid waste	Rubbish and other solid materials including those that entangle wildlife
9.5 Air-borne pollutants	Atmospheric pollutants from point and non-point sources
9.6 Excess energy	Inputs of heat, sound or light that disturb wildlife or ecosystems
10 Geological events	Threats from catastrophic geological events
10.1 Volcanoes	Volcanic events
10.2 Earthquakes/tsunamis	Earthquakes and associated events
10.3 Avalanches/landslides	Avalanches or landslides
11 Climate change and severe weather	Long-term climatic changes that may be linked to global warming and other severe climatic or weather events outside of the natural range of variation that could wipe out a vulnerable species or habitat
11.1 Habitat shifting and alteration	Major changes in habitat composition and location
11.2 Droughts	Periods in which rainfall falls below the normal range of variation
11.3 Temperature extremes	Periods in which temperatures exceed or go below the normal range of variation
11.4 Storms and flooding	Extreme precipitation and/or wind events or major shifts in seasonality of storms
*12 Other direct threats**	Other threats
12.1 Information lacking	Lack of clearly documented threats

* Note that this category is not part of the IUCN classification system and was added as part of the BCR planning process to address species of concern for which threats are not clearly documented and/or are unknown.

IUCN Conservation Action Categories

Table A-5: World Conservation Union-Conservation Measures Partnership (IUCN-CMP) classification of conservation actions. Note that not all categories of actions were applicable or were recommended in each BCR or MBU. Encouraging industry compliance with voluntary beneficial management practices was classified under 5.3 Private sector standards and codes.

Action Category/Sub-category	Definition
1 Land/water protection	Actions to identify, establish or expand parks and other legally protected areas, and to protect resource rights
1.1 Site/area protection	Establishing or expanding public or private parks, reserves, and other protected areas roughly equivalent to IUCN categories I-VI
1.2 Resource and habitat protection	Establishing protection or easements of some specific aspect of the resource on public or private lands outside of IUCN categories I-VI
2 Land/water management	Actions directed at conserving or restoring sites, habitats and the wider environment
2.1 Site/area management	Management of protected areas and other resource lands for conservation
2.2 Invasive/problematic species control	Eradication, controlling, and/or preventing invasive and/or other problematic plants, animals and pathogens
2.3 Habitat and natural process restoration	Enhancing degraded or restoring missing habitats and ecosystem functions; dealing with pollution
3 Species management	Actions directed at managing or restoring species, focused on the species of concern itself
3.1 Species management	Managing specific plant and animal populations of concern
3.2 Species recovery	Maintaining, enhancing, or restoring specific plant and animal populations, vaccination programs
3.3 Species reintroduction	Reintroducing species to places where the formally occurred or benign introductions
3.4 *ex situ* conservation	Protecting biodiversity out of its native habitats
4 Education and awareness	Actions directed at people to improve understanding and skills, and influence behavior
4.1 Formal education	Enhancing knowledge and skills of students in a formal degree program
4.2 Training	Enhancing knowledge, skills, and information exchange for practitioners, stakeholders, and other relevant individuals in structured settings outside of degree programs
4.3 Awareness and communications	Raising environmental awareness and providing information through various media or civil disobedience
5 Law and policy	Actions to develop, change, influence, and help implement formal legislation, regulations, and voluntary standards
5.1 Legislation	Making, implementing, changing, influencing, or providing input into formal government sector legislation or policies at all levels: international, national, state/provincial, local, tribal
5.2 Policies and regulations	Making, implementing, changing, influencing, or providing input into policies and regulations affecting the implementation of laws at all levels: international, national, state/provincial, local, tribal
5.3 Private sector standards and	Setting, implementing, changing, influencing, or providing input

Table A-5 continued

Action Category/Sub-category	Definition
codes	into voluntary standards and professional codes that govern private sector practice
5.4 Compliance and enforcement	Monitoring and enforcing compliance with laws, policies and regulations, and standards and codes at all levels
6 Livelihood, economic and other incentives	Actions to use economic and other incentives to influence behavior
6.1 Linked enterprises and livelihood alternatives	Developing enterprises that directly depend on the maintenance of natural resources of provide substitute livelihoods as a means of changing behaviors and attitudes
6.2 Substitution	Promoting alternative products and services that substitute for environmentally damaging ones
6.3 Market forces	Using market mechanisms to change behaviors and attitudes
6.4 Conservation payments	Using direct or indirect payments to change behavior and attitudes
6.5 Non-monetary values	Using intangible values to change behavior and attitudes
7 External capacity building	Actions to build infrastructure to do better conservation
7.1 Institutional and civil society development	Creating or providing nonfinancial support and capacity building for nonprofits, government agencies, communities, and for-profits
7.2 Alliance and partnership development	Forming and facilitating partnerships, alliances, and networks of organizations
7.3 Conservation finance	Raising and providing funds for conservation work
*8 Research and monitoring**	Gathering information about species or habitat of concern
8.1 Monitoring	Establishing new or supporting, continuing, and/or expanding existing monitoring schemes to gather required data about individual or groups of species or habitats
8.2 Research	Undertaking new or supporting, continuing and/or expanding existing research relating to specific species or threats

* Note that this category is not part of the IUCN classification system, and was added as part of the BCR planning process to address certain actions that do not fit elsewhere in the IUCN scheme.

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