

THE STATE OF CANADA'S BIRDS

2012



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5. Mountain Bluebird/H. Loney Dickson

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FOREWORD

Canadians are lucky indeed to live in a country where robins and finches share our backyards, our forests ring with the flute-like songs of thrushes, brilliant warblers add colour to the boreal forests, flocks of ducks dot the prairie potholes and seabirds nest in large coastal colonies. Birds fill our landscapes and are intertwined with the Canadian culture and identity.



Mark Peck

Green Heron



Mark Peck

Bird watching on James Bay

Birds have many values to Canadians. Bird populations are indicators of the ecological integrity of the environment—healthy bird populations imply a healthy planet. Bird watching is one of the most popular outdoor recreational activities in Canada. Millions of Canadians feed birds in their backyards. Waterfowl hunting provides food and supports local economies. Collectively, these activities contribute billions of dollars to the Canadian economy. Birds also provide immeasurable economic and ecological benefits by controlling insect and rodent populations, dispersing seeds and pollinating plants.

Canada's birds have always had to cope with fluctuations in their environment. Droughts, floods, forest fires and insect outbreaks are part of the natural dynamics of ecosystems. Repeated ice ages and warming periods over the past million years caused major shifts in the landscape. In recent decades, however, increasing human populations in Canada and elsewhere are putting pressures on bird populations that may exceed their ability to cope.

Wetlands are being drained, and forests are being cleared and native grasslands converted to cultivated crops. The tundra is threatened by climate change. Urban and industrial developments are replacing natural habitats. Roads, power lines and pipelines dissect the landscape. Invasive species are spreading. Industrial chemicals and pesticides are released into the water

and the air. Historically, excessive commercial harvest led to major declines in many bird populations: Passenger Pigeons, Great Auks and Labrador Ducks all disappeared forever.

Still, there has been significant progress in bird conservation in the past century. The *Migratory Birds Convention* signed between Canada and the United States in 1916 led to better hunting controls, allowing many species to recover. Intensive single-species conservation efforts brought Whooping Cranes and some other species back from the brink of extinction. Controls on pesticide use allowed many raptor populations to recover from DDT poisoning. Ongoing land restoration and conservation activities are helping to restore waterfowl populations.



May Hage

Blue Jay

These successes tell us that conservation can work; with a concerted effort across society, human activities can be compatible with bird conservation.

In this first *State of Canada's Birds* report, we present a picture of the current health of Canada's bird populations.



John Chardline

Common Yellowthroat

The report describes trends in the status of Canada's birds, the major threats they face and conservation solutions that benefit them. It is both a call to action and an acknowledgement of success. Continued progress on bird conservation requires action to conserve habitat and address threats, both within our borders and internationally in cooperation with other countries—three quarters of Canada's bird species spend much of their lives outside Canada. We hope this report will provide a voice for birds as Canada shapes its future.

North American Bird Conservation Initiative, Canada

May 2012





Charles M. Francis

Bald Eagle populations have rebounded following controls on pesticides.

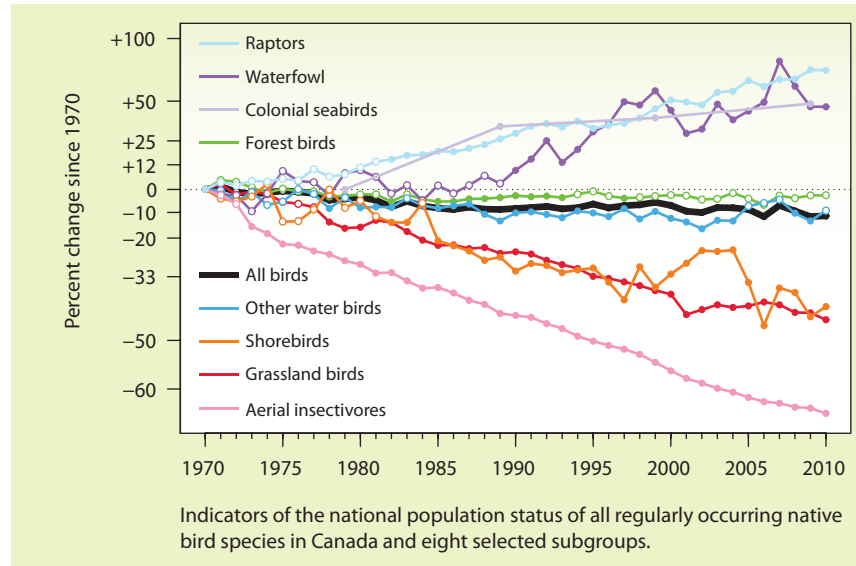
CANADA'S BIRDS: AN OVERVIEW OF NATIONAL STATUS

Canada is home to billions of birds belonging to some 451 regularly occurring native species that raise their young or spend their non-breeding seasons in this vast and varied country. Increasingly, these birds face many threats here and elsewhere. Successful conservation of this biological wealth requires that we manage these threats to maintain or restore healthy populations of all species of birds—including extra measures to ensure recovery of the 66 bird species currently assessed as Endangered, Threatened, or of Special Concern. Careful monitoring of the status of Canada's birds is essential to guide successful conservation and management actions for these and other species. Early response to warning signs in the environment is more cost-effective than critical intervention.

This report summarizes the status of Canada's bird populations, both nationally and individually, for each of eight major regions of the country (see the chapter "Measuring the State of Canada's Birds" for details on methods). The results point to the strong influences of human activity on birds, both positive and negative. This report also identifies threats to birds and offers solutions to keep common birds common and restore threatened species.

Canadian bird populations have changed

On average, Canadian breeding bird populations have decreased 12% since 1970 when effective monitoring



began for most species. For species with sufficient data to monitor their status, 44% have decreased, 33% have increased and 23% have shown little overall change. Some groups, such as grassland birds, aerial insectivores and shorebirds, are showing major declines. Other groups such as waterfowl, raptors and colonial seabirds are increasing, due to careful management, changes in habitat and reductions in environmental contaminants.

Declining grassland birds present challenges and opportunities for conservation within working landscapes. Many declining grassland species can coexist with bird-friendly agricultural practices. Some species actually benefit from appropriate densities of grazing livestock to create their ideal habitat. Other species do not

fare well in disturbed areas. Canada's few remaining native grasslands must be retained, and new ones created, if species like the Greater Sage-Grouse are to survive. Effective management



Geoff Holroyd

Burrowing Owls benefit from well-managed grazing to maintain their habitat.

of grasslands is also needed outside of Canada, in the United States, Mexico and southern South America, where many Canadian birds winter.

Aerial insectivores—birds that catch insects in flight—are declining more steeply than any other group of birds. These declines are likely caused by a combination of factors both in Canada and in their wintering areas in South and Central America, including reductions in insect numbers, habitat loss, pesticide use and climate change. Some formerly very common species like the Barn Swallow and Chimney Swift have declined to less than a quarter of their 1970-level populations. Research is urgently needed to understand and reverse the causes of these declines to ensure these species are not lost.

Shorebirds need urgent action.

As a group, shorebird species have declined by almost half. Most shorebirds migrate very long distances and are being affected by loss and alteration of wetlands, estuaries, deltas and mudflats at all stages of their journey, from their breeding grounds in Canada to stopover sites and wintering grounds throughout the Western Hemisphere. Ongoing international cooperation is vital to identify and conserve the key sites needed by shorebirds throughout their long migrations.

Increasing waterfowl populations reflect successful management of hunting and wetlands. International cooperation among governments and conservation organizations, through the North American Waterfowl Management Plan (NAWMP), has led to more sustainable management of waterfowl hunting and protection or restoration of many wetlands—important habitat for waterfowl (i.e., ducks and geese) as well as other wetland birds. These successes demonstrate that habitat management can work to conserve birds. However, wetlands still face many threats including draining for agriculture and development, pollution, invasive non-native species and increasing droughts due to climate change, so conservation efforts must continue.

Increasing raptor populations point to the success of direct intervention.

Many raptor populations were hard hit by contamination in the mid-1900s. Banning persistent pesticides such as DDT, combined with species-specific recovery programs for species such as the Peregrine Falcon, have enabled dramatic recoveries since 1970. These population rebounds demonstrate that prompt action can reverse environmental damage. Ongoing vigilance and monitoring is needed to ensure that any potential impacts

of new threats, such as endocrine-disrupting chemicals, are promptly identified and addressed.

Successful conservation requires committed action and international cooperation

The biggest threats for many species during their long migrations are loss of habitat at stopover sites and on their wintering grounds. However pollution, pesticides, hunting, collisions with human-built structures and climate change also have effects. Because most species migrate outside Canada, international cooperation is required to address these threats.

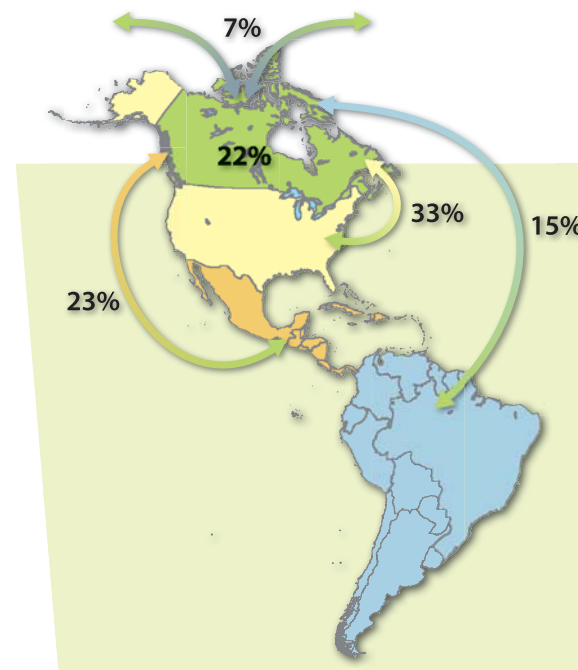
The results in this report point both to past successes in conservation and ongoing challenges for Canada's birds. Although there is much to be done,



Nick Saunders

Barn Swallow and other aerial insectivore populations have drastically declined.

the successes and ongoing research to identify solutions for bird groups in trouble suggest that there are reasons to be hopeful. Solutions can, and must, be implemented at all levels of Canadian society: individuals, organizations, corporations and governments.



Canadians must work internationally to achieve conservation success and be mindful that we share “our” birds with many other countries. Only 22% of Canadian bird species spend the whole year in Canada. Most others migrate to the United States (33%), to Central America, Mexico and the Caribbean (23%) or to South America (15%). Some travel to Europe or Asia or spend long periods of time at sea (7%).

© Ducks Unlimited Canada



Ruddy Ducks benefit from careful wetland and harvest management.

SOUTHERN SHIELD AND MARITIMES

Black and White Warbler/Charles M. Francis



BIRD'S-EYE VIEW

- Characteristic species populations have declined since 1970 due to a combination of factors acting both inside and outside this region. Changes in age and species composition of forests; loss and degradation of wetland, grassland and shrub habitats; acid rain coming from various regions; and habitat loss in southern wintering areas—all affect birds in this large and diverse region.
- Aerial insectivores have declined by 70% in this region. Causes of declines are uncertain, but may include threats on their breeding grounds, wintering grounds or during migration.
- Past forestry practices have reduced the amount of old growth forest on the landscape, leading to declines in some species. Management that more closely emulates patterns and schedules of natural disturbances, such as fire, and allows for periodic pulses in insect populations would benefit many forest dependent bird species.
- Waterfowl populations have increased, due in part to changes on their wintering grounds and to careful management of habitat and hunting in Canada and the United States.

The Southern Shield and Maritimes region is a mosaic of forest stands, wetlands, riverside meadows, rock barrens, lakes and streams, as well as the agricultural and urban centres in the Maritimes and parts of Quebec and Ontario. Most characteristic species are associated with forests and wetlands; others, including some aerial insectivores and shrub and forest-edge species, are closely tied to the open areas created by human activities, such as agriculture and forestry.

Trends

Bird populations in the Southern Shield and Maritimes have decreased by 13% on average across all species groups. One-third of the species characteristic to this region are in rapid decline.

Almost 60% of once-common birds that use shrub and forest-edge habitats



Alan MacKeigan

Bay-breasted Warbler populations fluctuate dramatically in response to changes in abundance of spruce budworm—a key food source.

have declined. This may be due to habitat loss from urban development and maturation of shrub habitats on abandoned agricultural land into forests. In some areas, heavy browsing by over abundant deer has reduced the shrub layer.

Forest birds overall have declined by 10%. Forestry practices that suppress insect outbreaks affect forest species that rely on these insects for food. Many

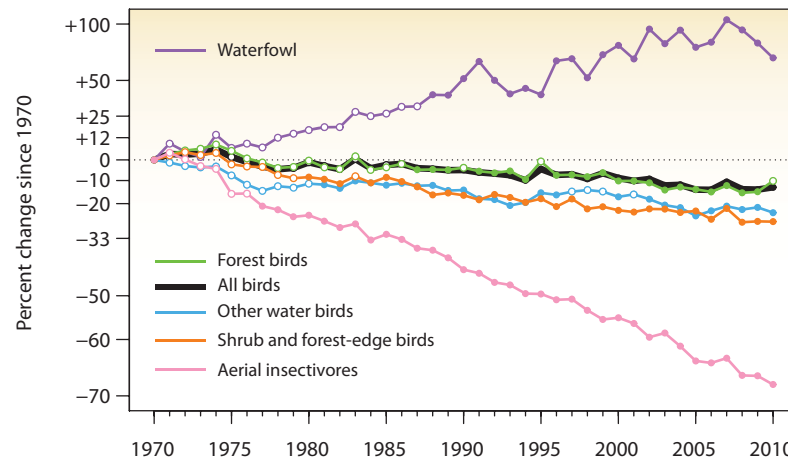
of the declining forest birds, as well as those that use forest-edges and shrub, migrate long distances and may also be affected by loss of forest, shrub and mangrove habitat in their wintering ranges.

Waterfowl have increased as a consequence of plentiful waste-grain

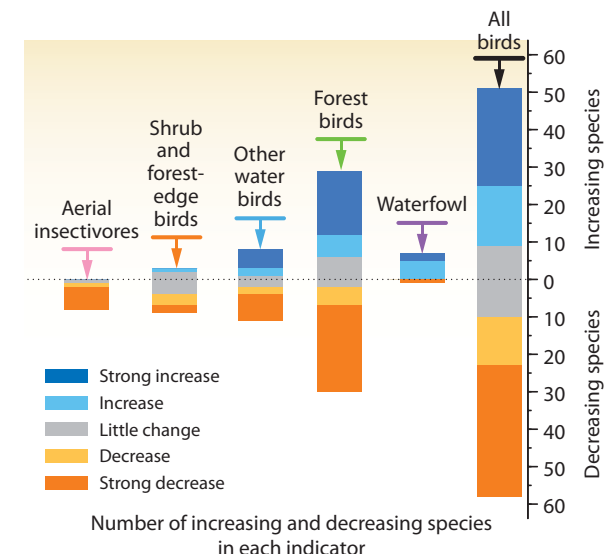


Mark Peck

Improved population monitoring and harvest management for American Black Duck populations have also improved knowledge and management of other waterfowl species.



Indicators of the average population status of characteristic species



in agricultural areas used during winter and migration, careful management of hunting in Canada and the United States, and wetland restoration and protection to slow the rate of wetland loss.

Despite some improvements in wetland restoration and conservation, wetlands are still being lost and degraded in many parts of the region, particularly near urban and agricultural centers. In contrast to waterfowl, other water birds have declined by almost 25% overall—Black-crowned Night-Heron, Wilson's Snipe, and American Bittern populations are all down by more than 50%.

Aerial insectivores, including the Tree Swallow, Olive-sided Flycatcher and Eastern Wood-Pewee, are declining across North America and show the steepest declines in this region—by almost 70% overall. The causes of decline are still under investigation, but may be related to local habitat change, such as re-growth of forests on abandoned agricultural land where many species feed, habitat loss on their wintering grounds, or declines in insect prey due to pesticide use or pollution.

Threats

Some forestry practices alter the species composition and age-structure of forests, changing the habitat of many birds that depend on forest, forest-edge and shrub habitats. Past forestry practices have greatly reduced the amount of mature forests.



Alan MacKeigan

Barred Owls benefit from forestry practices that retain mature forest.

The loss and degradation of wetlands continue to threaten species that depend on these habitats. In many urban and agricultural areas, wetlands have been reduced to a small fraction of their initial area.

Acid precipitation remains a problem despite improvements in treating emissions since the 1980s. High acidity affects birds by reducing food supplies—many insects cannot survive in acid waters—and by reducing the availability of calcium needed for eggshells.

Many forest birds from this region winter in Central America, Mexico, and the Caribbean where forests are being converted to farmland at alarming rates. Reduced wintering habitat may be an important cause of population declines for some forest and forest-edge birds.

Solutions

Support forest management and protection guidelines that recreate the natural age structure of the forest and improve habitat quality for many characteristic forest birds.

Work closely with countries in South and Central America and the Caribbean to support forest conservation and slow the conversion of natural forest-habitat to agricultural use.

Bicknell's Thrush has been declining dramatically. Over 90% of the population winters in the Dominican Republic and Haiti where loss of habitat is a major concern and financial resources for conservation are limited. A fund has been established to encourage developers in the north-eastern United States and Canada to offset effects of development on the breeding grounds by helping to protect or restore winter habitats.



George Peck

The distinctive call of the well-camouflaged Eastern Whip-poor-will was once a common sound on summer evenings, but its population has decreased dramatically for unknown reasons.

Encourage further reductions in acidifying emissions and other contaminants from industrial activities and vehicles to reduce the effects of pollution on ecosystems.



Dan Busby

Bicknell's Thrush

Charles M. Francis

Common Loons are less successful at breeding in highly acidic lakes, possibly due to reduced food for their young.



LOWER GREAT LAKES–ST. LAWRENCE

Rose-breasted Grosbeak/May Haga



BIRD'S-EYE VIEW

- Overall, characteristic species in this highly developed region have increased, including forest birds, water birds and waterfowl, demonstrating that people and birds can live together.
- Substantial reductions in environmental pollution are reflected in increases in populations of colonial waterbirds and many raptors.
- Nevertheless, some species have declined dramatically, including aerial insectivores and grassland birds. The use of bird-friendly agricultural practices could maintain agricultural production while helping to conserve or restore grassland bird populations.
- Urban areas continue to expand in the region. Development needs to be planned carefully to retain key bird habitats and to minimize habitat loss.

This region is dominated by agricultural and urban landscapes, where pastures and fields provide habitat for grassland birds. Except along the northern edge of the region, forest cover is highly fragmented by the surrounding urban and agricultural lands, but forest cover has been increasing due to reforestation and regeneration of trees on marginal farmlands. This region includes the only tracts of Carolinian forest in Canada, which support a distinctive community of animals and plants.

Trends

In recent decades, most bird groups in the Lower Great Lakes–St. Lawrence region have increased. On average, all species are up by 20%.

Waterfowl have benefitted from plentiful food in agricultural areas used during the winter and improved



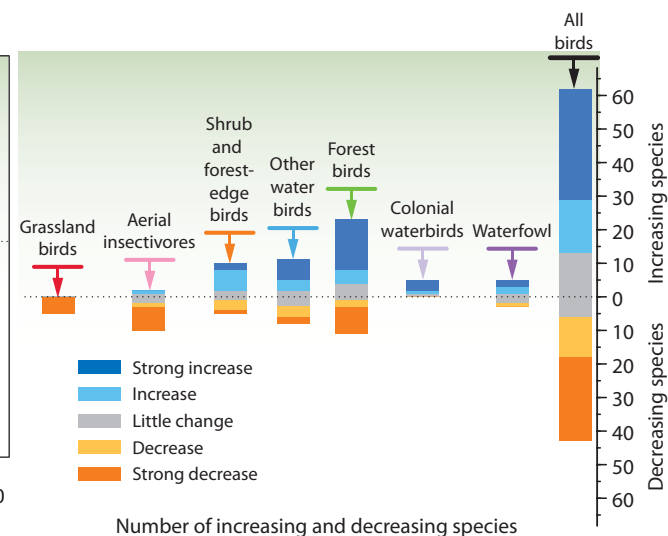
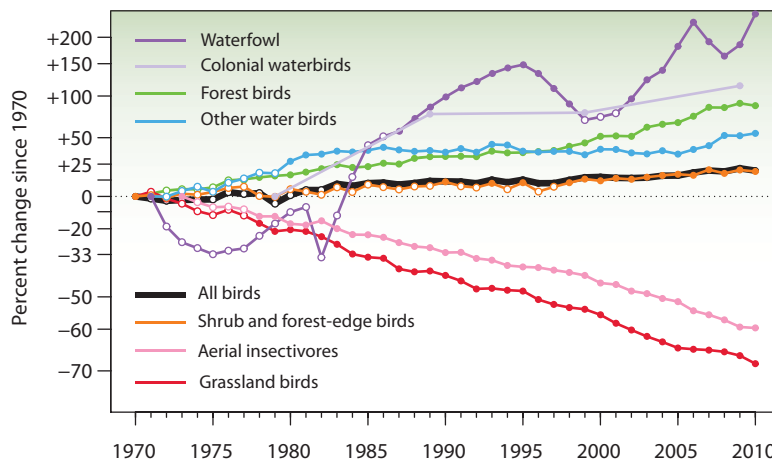
Alan Burger

Pileated Woodpecker populations have increased and expanded into new areas as forests mature.

nesting success in urban areas. Canada Goose populations have exploded, and populations of Mallard, Hooded Merganser and Wood Duck have increased by more than 50%. There has been some recovery, conservation and restoration of wetlands in the region, particularly along the St. Lawrence Seaway, that has slowed the rate of habitat loss for many waterfowl and other water birds.

Aerial insectivores, primarily swallows, have declined here and across the country. The causes of these declines are unknown but may include local factors, such as reduced insect populations or loss of nesting habitat or factors on their wintering grounds. In this region, Chimney Swift, Purple Martin and Bank Swallow populations have all declined by approximately 95% since 1970.

Grassland birds have declined by 70%, with several species at risk of extirpation (local extinction). Changing agricultural practices are making farmlands less suitable as habitat, and forests have re-grown on abandoned agricultural grasslands. Although historically much of this area was forested, in the intervening centuries, the region has become an important refuge for grassland birds in Canada.



The shoreline and islands of the Canadian Great Lakes are home to eight characteristic species of gulls, terns, herons, cormorants and pelicans—waterbirds that breed in colonies. Most colonial waterbirds have increased substantially, due in part to reduced concentrations of DDT, PCBs and other pollutants, although new contaminants, changes in fish populations and disease remain as potential concerns.

Many forest birds, such as the Pine Warbler, Black-capped Chickadee and woodpeckers, have increased as forests in the region have expanded and matured. However, some species are still declining.

Threats

Intensive agricultural practices—wetland draining, increased insecticide and herbicide use, removing hedgerows and field margins, and cutting of hay before chicks leave the nest—affect grassland birds like the Bobolink by reducing habitat and food and even killing birds outright.

Urban expansion—especially along shorelines, in and around forests and wetlands, and on agricultural land—is reducing, fragmenting and degrading bird habitats. In addition, expanding urban areas bring with them house cats, which kill millions of birds every year.

Invasive species, such as purple loosestrife, *Phragmites*, zebra mussels, round gobies and common carp, continue to alter aquatic habitats and associated food webs, with cascading effects on food sources for colonial waterbirds, waterfowl and other water birds.

This economically significant region contains many industrial chemical sources.

Solutions

Practices have been developed for hay and forage production that can benefit grassland birds. Delay of haying until after young birds fledge, well managed grazing, maintenance of hedgerows and other bird-friendly practices should be encouraged.

Urban expansion, housing and industrial developments, and new transportation corridors should respect existing limits to development, be planned to conserve as much of the natural landscape as possible and avoid key areas for birds, especially around shorelines and wetlands.

Increasing existing forest cover, expanding and linking larger forest patches, and ensuring sound forest management practices will all help the forest birds that are most sensitive to nearby development.



May Haga

Bobolink populations, which have decreased by 80%, can thrive in agricultural areas, provided that bird-friendly agricultural practices are followed.



Nick Saunders

The Common Nighthawk has declined dramatically, like most other aerial insectivores, but the causes of the decline are not well understood.

Canadians can help reduce the spread of invasive species by carefully cleaning boats and motors and not moving live fish between water bodies or firewood from region to region.



Gord Belyea

The Least Bittern and other water birds rely on healthy wetland ecosystems, which are threatened by invasive species, contaminants, shoreline development and wetland drainage.

Regulations have successfully reduced concentrations of toxic chemicals such as DDT and PCBs in the eggs and blood of Great Lakes birds, but new controls are needed for emerging chemicals, including those used in flame-retardants.



Ian Parsons

Ring-billed Gulls can thrive in close proximity to humans but are susceptible to pollution. Gulls in the Great Lakes are regularly tested for contaminants as an indicator of environmental health.

EASTERN BOREAL

Max Finkelstein



BIRD'S-EYE VIEW

- The Eastern Boreal region provides a vast expanse of relatively healthy wetland and forest habitats for nesting birds, but knowledge of the status of its birds is limited because most monitoring is restricted to the southern edges.
- Within the monitored area, characteristic species have declined slightly overall, with shrub and forest-edge birds showing the steepest declines, forest birds showing little change and waterfowl and other water birds showing slight increases.
- The boreal landscape has been shaped by natural disturbances (e.g., fires, beavers, insect outbreaks) for millennia. Large-scale industrial activities, such as forestry and mining, as well as climate change, are altering disturbance patterns and are likely to change bird communities. For instance, controls of spruce budworm outbreaks have negatively affected warblers that feed on budworm caterpillars.

The vast Eastern Boreal region supports billions of birds within its patchwork of bogs, spruce forests and countless lakes, rivers and streams. The human footprint from industries such as forestry, mining and tourism is still largely restricted to the south, but some northern areas have been flooded by large reservoirs for hydroelectricity, and planning has started for development in many areas of northern Ontario, Quebec and Labrador.



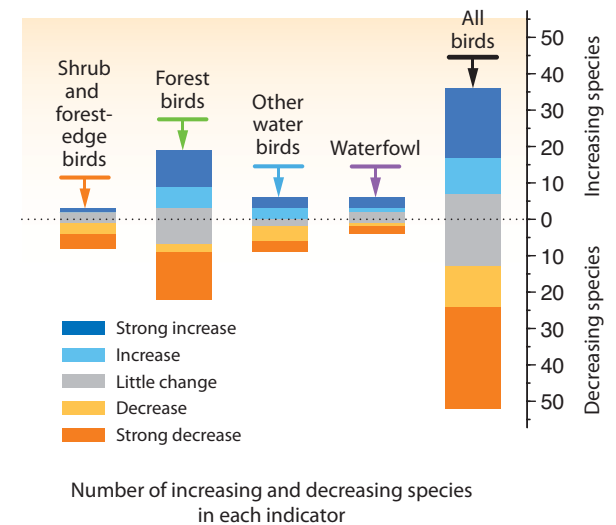
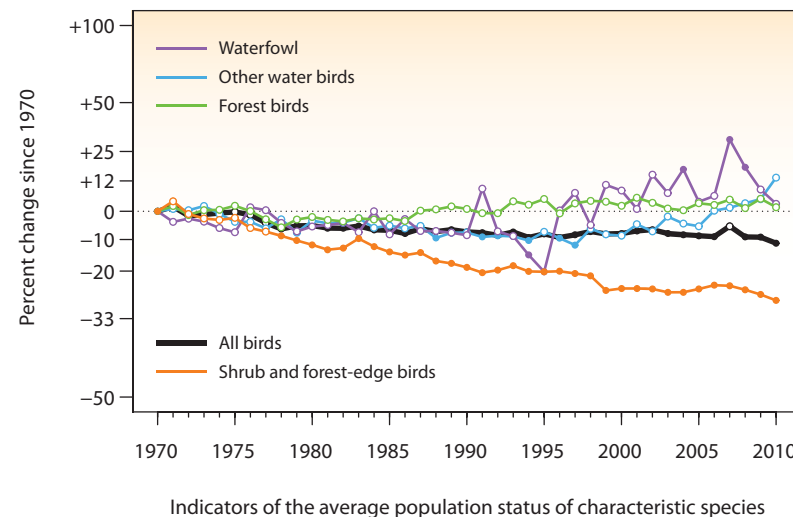
Christine Lepage

Helicopters or airplanes are the only effective way to count ducks and other water birds in many parts of the Boreal.

Trends

Monitoring in the Eastern Boreal is difficult due to the region's large size and relative isolation. Trend data for most species, other than waterfowl which are monitored from the air, come only from the more accessible southern edges of the region.

Overall, species that are characteristic of the Eastern Boreal have decreased by 12%. Shrub and forest-edge birds have shown the largest declines; over the last 40 years, all but one species has declined. All species in this group are migratory, and threats to their wintering habitat may be important.



On average, waterfowl and other water bird populations have increased slightly relative to 1970. Some species have shown substantial increases of more than 100% (Hooded Merganser, Sandhill Crane and Canada Goose), while others have declined strongly, such as the American Bittern and Common Goldeneye.

Almost half of the characteristic species of the Eastern Boreal are forest birds. Overall, forest species show little change. However, some resident species have strongly increased, such as Common Raven, Pileated Woodpecker and Red-breasted Nuthatch while many migrants have decreased, such as Bay-breasted, Blackpoll and Canada Warblers.

Threats

The most serious threats to boreal birds are the cumulative impacts of habitat alteration from industrial development—energy, forestry and mining—and associated infrastructure (e.g., roads, airstrips and transmission corridors). Development is expanding northward to previously inaccessible regions and may affect the quality and quantity of habitat available for birds.

Internationally, the loss of shrub and forest habitats in the Caribbean and Central and South America further threatens the migratory species that breed in the Eastern Boreal region. Forests in these wintering areas are being lost due to forestry and agriculture, supporting increasing human populations and growing international demand for products from these industries. Mangrove habitats—important for wintering shrub and forest edge species—are being lost to coastal development for beach tourism and shrimp aquaculture.

Climate change is an emerging issue with potentially significant effects to ecosystem structure and function. Migratory birds are vulnerable to climate-influenced events, such as the increased frequency or intensity of fires and flooding during the breeding season and storms during migration.

Solutions

Forest management that emulates the pattern and schedules of natural disturbance leads to a mix of habitat types and forest stand ages, thus ensuring healthy bird populations, which in turn help control insect pests.

Recent landmark agreements that aim to protect 50% of the Eastern Boreal forest in Ontario and Quebec are excellent examples of the recognition of the global importance of the Boreal forest and the ability to strike a balance between conservation and economic growth. Detailed comprehensive land-use planning and management are needed to support this balance as development spreads north.

The conservation of remaining native habitats in the Caribbean and Central and South America would provide local ecological benefits such as clean air and clean water, support sustainable industries such as ecotourism while



George Peck

The Boreal provides a vast nursery for millions of warblers, such as these Black-throated Blue Warblers, that migrate through southern Canada and the United States to Central and South America.

providing wintering habitat for boreal birds. Forest plantations and shade-grown coffee support many birds and should be encouraged.

The effects of climate change, such as increased flooding and fires, will be difficult to mitigate in the Boreal forest. Addressing the underlying causes of climate change is essential for long-term conservation.



Nick Saunders

Boreal Chickadees are year-round residents of dense spruce-fir forests in the Boreal.



Laura Gooch

Cape May Warblers breed in the Boreal forest and winter in Cuba and other Caribbean islands. Like many other boreal songbirds, their populations depend on conservation of adequate habitat in their tropical wintering areas.



Mark Peck

Longridge Point, James Bay

The coastlines of James Bay and Hudson Bay provide crucial stopover and staging habitat for many species of migratory waterfowl, other water birds and shorebirds, including Stilt Sandpipers.



May Haga

Stilt Sandpipers

WESTERN BOREAL

Craig Machtans



BIRD'S-EYE VIEW

- Limited monitoring data are available for most parts of the Western Boreal for species other than waterfowl (which are primarily surveyed from the air); only since 1990 have enough areas been surveyed to calculate trends for most groups.
- Within the surveyed region of the Western Boreal, the population of all birds combined has changed little over the past 20 years, but many individual species have shown large increases or decreases.
- The Western Boreal plays a critical role in supporting continental bird populations of many songbirds, water birds and waterfowl. In drought years, many ducks that usually breed in the Prairie Region move to the Western Boreal.
- The permanent loss of forest due to development, including agriculture and energy extraction, is the biggest conservation concern in this ecosystem. The most intense industrial activities occur at the southern edge of the region, overlapping directly with the habitats containing the highest density and diversity of birds.

The Western Boreal is a large and diverse ecosystem, ranging from sparse, open forest along the northern treeline to dense, tall stands of spruce, birch and aspen in the south. Development pressures vary substantially within this huge region. Several billion birds of over 200 species breed every year in the Western Boreal. Almost 30% of Canada's birds are characteristic to this region due to its diversity and size.

Trends

Many individual species in all major bird groups are showing dramatic population changes with either large increases or large decreases, but overall the number of increasing and decreasing species is roughly equal, creating a generally stable indicator since 1990.



May Hago

Spruce Grouse are year-round residents of boreal forests across Canada, found mainly in spruce, regenerating pine and other conifers. Little is known of their population status as they are difficult to survey.

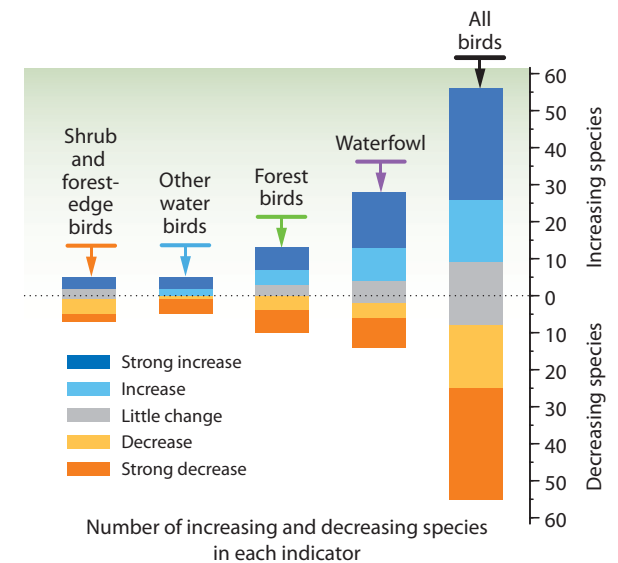
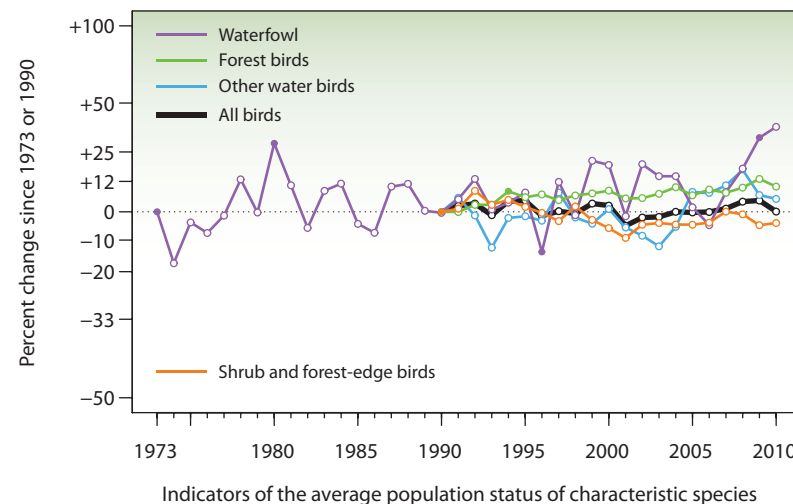
the region's wetlands act as a "safety net" that keeps Prairie populations healthy and is vital for maintaining a sustainable harvest for hunters.



Nick Saunders

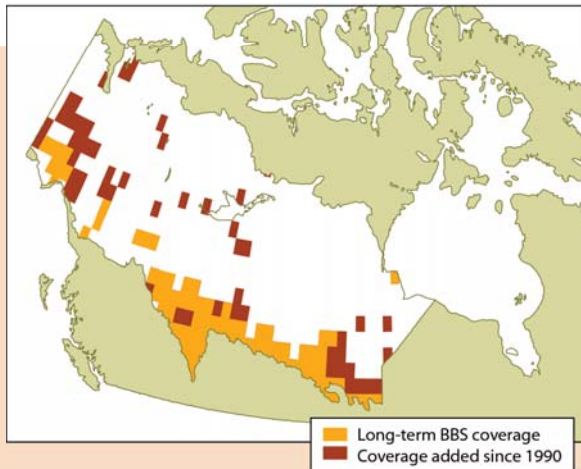
Lesser Scaup populations in the Western Boreal have declined by more than 50% over the last three decades, while other species such as Green-winged Teal have doubled. Shifts in aquatic food webs due to climate change may be favouring generalist species, such as teal, instead of the more specialized diving ducks, such as scaup.

The Western Boreal forest supports 12 to 14 million nesting ducks every summer. When drought affects the Prairie Pothole Region, more ducks fly northward and nest in the extensive wetlands of the Western Boreal. In these drought years,



The Breeding Bird Survey (BBS), the main survey for most species of birds other than waterfowl, has only limited coverage in the region.

In the 1970s, BBS routes were present only around the agriculture/ boreal transition area. Since the 1990s, some additional coverage has been achieved but there are still substantial gaps. This means that large portions of some populations or ranges are not surveyed at all, and caution is warranted in interpreting the indicators for many species. In contrast, waterfowl have been well monitored by aerial surveys since 1955.



Threats

The southern forests in this region include some of the most intensively modified landscapes in North America. Forest is being lost to agriculture, urban expansion, forestry, peat mining, and oil and gas development. Much of this loss is effectively permanent and, although land-use planning is a partial solution, active reclamation would be needed to offset habitat losses.



Alan MacKeigan

Black-throated Green Warblers depend on patches of mature forests. They are expected to decline due to reductions in the amount of mature forest on the landscape as a result of forestry practices.



Approximately 80% of the world population of Bonaparte's Gulls nests in the Western Boreal region, and their populations depend on healthy wetlands.

Older forests support diverse bird communities. Forestry practices are changing the age structure of the forest and several species are expected to decline over the next 50 years as the area of old forest declines.

Changes in water levels and water flow associated with hydroelectric power generation are affecting crucial feeding and nesting areas for waterfowl and other wildlife, such as the Peace-Athabasca Delta, which is one of the largest freshwater deltas in the world and a globally important wetland.

The changing northern climate has already resulted in changes to forests, such as the spread of the Mountain Pine Beetle and increasingly severe forest fire regimes, and more changes are expected.

Solutions

Development, conservation and protection all need to come into balance to ensure healthy populations of birds in the Western Boreal into the future. To prevent complete transformation of regional ecosystems (e.g., agricultural conversion of the southern boreal mixed-wood forest), land-use plans involving all stakeholders are needed to ensure that sufficient areas of key habitats such as old forest and other features significant for birds remain on the landscape.

Water-level management on major river systems with hydro-electric developments must maintain the ecological health and functioning of critical waterfowl habitats such as the Peace-Athabasca Delta.



Charles M. Francis

Blackpoll Warblers follow one of the longest migration routes of any warbler, connecting forests of the Western Boreal with forests of eastern South America. Their conservation depends on maintaining healthy habitats at both ends of this migration route.

Wilderness protection is increasing but progress has been slower in some jurisdictions. Notable agreements that aim to protect 50% of the Boreal forest in Ontario and Quebec provide excellent examples for the Western Boreal.



Kevin Karolyndal

Societal values need to be incorporated into land-use plans so that resource use and conservation are balanced with development.

PRAIRIES

Northern Shoveler and Blue-winged Teal/Bob Clark



BIRD'S-EYE VIEW

- The Prairies are home to many grassland birds not found elsewhere in Canada and support millions of breeding ducks and other water birds in numerous small ponds and wetlands.
- Grassland bird populations are declining rapidly. Native grasslands and pasture lands continue to be lost or degraded through agricultural intensification, such as conversion to grains, oilseed or fibre crops which provide poor habitat for most birds. Oil and gas development, fragmentation by roads and fire suppression also reduce habitat. The conservation and restoration of remaining native prairie and more bird-friendly agricultural practices are needed to restore grassland birds.
- Waterfowl and other water bird populations fluctuate with annual water levels. Habitat protection, through the North American Waterfowl Management Plan, and careful harvest management have helped to maintain waterfowl populations. However, wetlands continue to be drained for agriculture, and climate models predict droughts in the Prairies, which could lead to future declines in birds.

The Canadian Prairies are a mix of cropland and grasslands dotted with millions of small, temporary wetlands and bordered by aspen parklands to the north. It is one of the most intensively used and altered landscapes in Canada—more than 70% of native prairies and wetlands have been lost through conversion to agriculture or other developments.

are able to support viable populations of area-sensitive species, such as Sprague's Pipit, Baird's Sparrow and Chestnut-collared Longspur.

Forest-associated birds have benefited as fire suppression and expanding human settlement have increased the area of woody vegetation. However,

Trends

Grassland birds are in trouble. Since 1970, populations on the Canadian Prairies have declined by almost 40% on average. Historical population declines were likely even larger, as much native grassland habitat was lost prior to the start of bird monitoring in 1970.

The remaining grassland birds are concentrated in well-managed pasturelands and small remnant patches of native prairie. Only the largest patches



May Hoga

The endangered Greater Sage-Grouse, highly susceptible to disturbance, occurs in habitats increasingly subject to oil and gas development. Preservation and restoration of its prairie and sagebrush habitat will benefit many other grassland species.

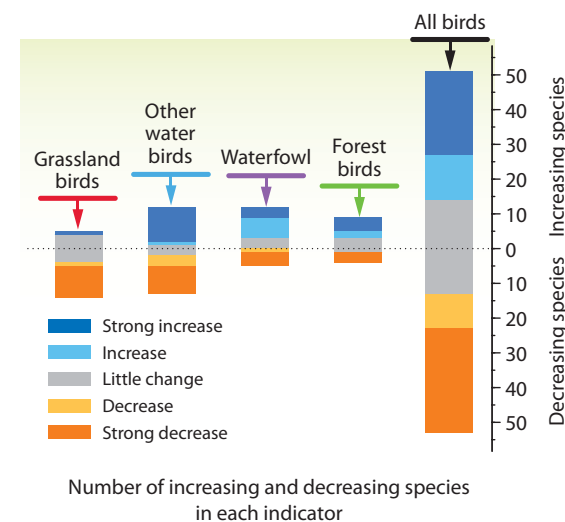
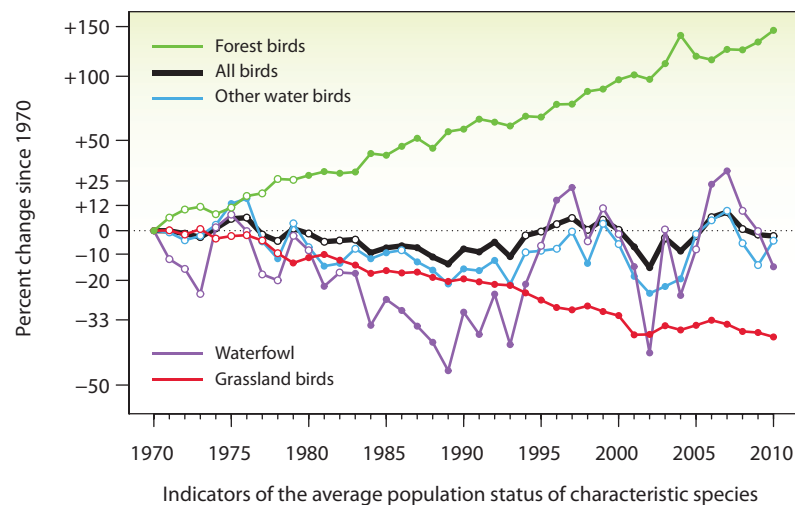


Alan MacKeigan

McCown's Longspurs have declined by 90%. The species is now considered at risk along with more than half of Canada's grassland bird species.

these same changes exacerbate the declines in many grassland bird populations by further removing and degrading native prairie and grasslands.

The Prairies support the highest density of breeding waterfowl in Canada and provide critical stopover sites for migrating waterfowl and shorebirds. Duck populations in this region fluctuate widely from year to year in response to changes in precipitation.



During the droughts of the 1980s and again in 2001–2002, waterfowl populations declined by almost 40%, but then rebounded.

Waterfowl and some other water birds that rely on larger water bodies have increased in population—the Ruddy Duck population has increased by over 50% and the Gadwall population by over 70%. Collaborative partnerships like the Prairie Habitat Joint Venture, have helped preserve some of the wetland habitat these birds require for breeding and survival.

Species that primarily rely on Prairie potholes—small, temporary wetlands that depend on snowmelt and rain—have generally not fared as well. These habitats are more vulnerable to drought and draining for agriculture. Among these species, the Northern Pintail and Horned Grebe populations have declined by over 70%.

Threats

High-intensity farming practices, such as wetland drainage, conversion of pastureland to cropland and over-grazing, remove and degrade grassland and wetland habitat.

Pollutants, including pesticides and heavy metals, reduce the health, reproduction and survival of birds.

Linear development (e.g., roads, power lines, pipelines, seismic lines) fragments the landscape, and introduces noise, predators and invasive plants that are detrimental to bird populations.

Increasing water use by cities, agriculture and industry reduces the amount remaining in wetlands to support waterfowl, shorebirds and other water birds.

Suppressing the natural cycle of fire, particularly near cities and towns, has expanded shrub and forest habitats at the expense of grasslands.

Climate change is an emerging threat. The predicted increase in droughts for the Prairies will have severe consequences for birds and humans.

Solutions

The most important conservation activity in the Canadian Prairies continues to be the preservation of wetlands and native grasslands and the restoration of native prairies.



Nick Saunders

The Western Meadowlark is one of many species of grassland birds that benefit from bird-friendly agricultural practises.

Farming practices that are compatible with birds are especially important in the heartland of Canadian agriculture. Many grassland birds benefit from appropriate livestock grazing to maintain their preferred habitat. Other bird-friendly practices include no-till farming, planting cover crops, such as pasture and hay that prevent soil erosion and provide nesting cover for some grassland birds, reducing pesticide use and preserving wetlands.

Beneficial practices in industrial activities, such as noise abatement and timing restrictions, can reduce disturbance to nearby grassland birds.



Garry C. Troffier

Suffield National Wildlife Area protects some of the most extensive remaining short-grass prairie in Canada.

Healthy grasslands and wetlands can be protected through cooperative tools such as stewardship agreements, community-based urban planning and conservation programs that include landowners.

Canadians' lifestyle choices can help grassland birds. Including bison, beef and other range-fed meat in your diet encourages the retention of pasture land.



Nick Saunders

American Avocets benefit from the conservation of wetlands carried out under the North American Waterfowl Management Plan.



May Hagg

The wetlands of the Prairie Pothole Region—two thirds of which is in Canada—are the waterfowl nursery of North America. About half of the continent's ducks are produced here.

WEST COAST AND MOUNTAINS

Dunlin/Peter Candido



BIRD'S-EYE VIEW

- Characteristic species in this region have declined, especially in the Pacific Coast areas, where forestry, agriculture, and expanding urban and coastal development have reduced suitable habitats for many bird species.
- Many forest birds have declined, especially species associated with mature forest. Forestry activities and the ongoing outbreak of Mountain Pine Beetles are expected to reduce the mature pine forest by more than 70% by 2015. The loss of these trees is altering habitat supply and structure for many declining species, especially birds that depend on cone crops.
- Loss and degradation of grasslands and riparian (adjacent to water) habitats throughout the region are linked to declines in grassland and shrub birds.

The West Coast and Mountains region is ecologically diverse, with habitats ranging from temperate rainforest and oak savannah on the coast to mountain forests, alpine tundra and grasslands in the interior. In a region dominated by high mountains, valley bottoms are important living spaces for birds and people. This variety of ecosystem types is associated with an equally wide range of pressures, from natural resource extraction to urban development to shoreline development.

Trends

Overall, characteristic species in the West Coast and Mountains have decreased by 10%. In the Pacific Coast portion of this region, where human settlement, industry and forestry are most intense, they have declined by 35%—a drastic decline for such a large group of species.

Although this decline is troublesome, most of the monitoring data come from the valleys where human activity is concentrated; populations away from settled areas may have different trends.

Forest birds have declined by approximately 10%. Species associated with mature forest, such as Pine Siskin, Red Crossbill, Cassin's Finch, Purple Finch and Pine Grosbeak have decreased most steeply. They are vulnerable to loss of mature forest due to logging and, more recently, to the outbreak of Mountain Pine Beetle.

Grasslands and other open habitats, such as the Garry Oak ecosystem, are under development pressures from agriculture and human settlement. Grassland birds, such as Western Meadowlark and Vesper Sparrow, are declining as their habitat is lost and degraded.

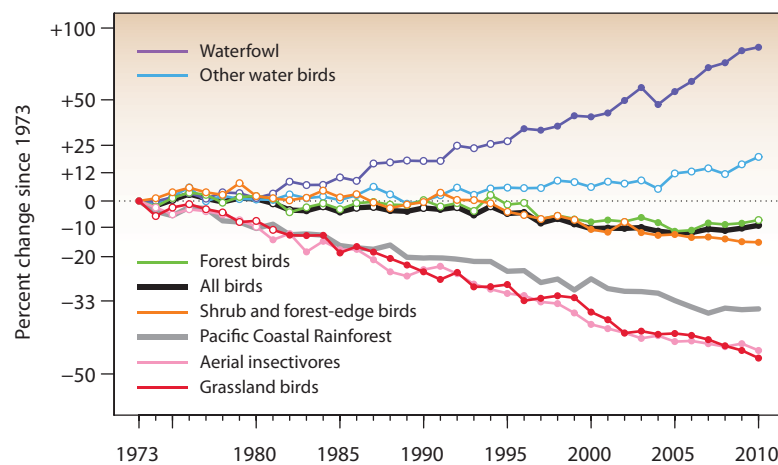


Ralph Hocken

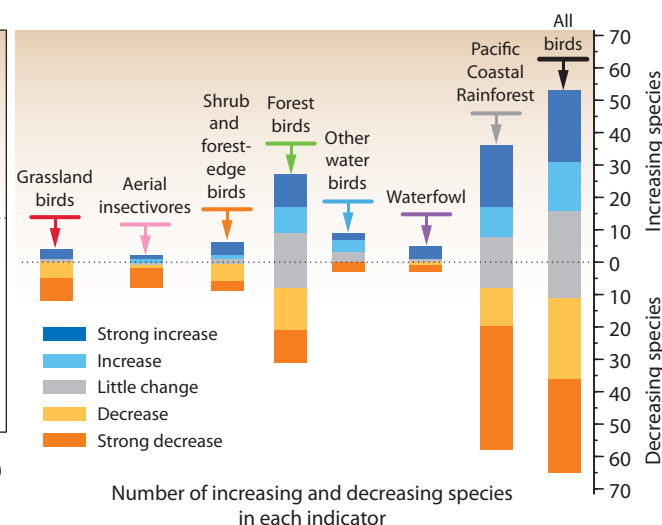
Most Barrow's Goldeneye in Canada breed in this region; their populations have fluctuated without a strong trend.

Aerial insectivores have decreased in this region, although not as steeply as in eastern Canada.

Waterfowl populations overall have increased in the region. Canada Goose, Hooded Merganser and Ring-necked Duck populations have more than doubled. Other water birds appear to have increased slightly, but the trend is uncertain and the group includes both strongly increasing species such as Sandhill Crane and strongly decreasing species such as Great Blue Heron.



Indicators of the average population status of characteristic species



Number of increasing and decreasing species in each indicator

Threats

Forestry continues to reduce the area of mature forests. Coastal old growth forests take hundreds of years to re-grow after logging and are still being logged much faster than they can be replaced. Some of the remaining forest habitat is fragmented into small, isolated patches and degraded by management for forests with uniform age trees of a few species.

Urbanization and industrial agriculture are reducing grassland and riparian habitats in the valleys and degrading what remains through invasive plants, heavy recreational use and poorly managed cattle grazing.

Projected droughts in the interior, due to climate change, will severely reduce habitat for breeding waterfowl and other water birds and alter forest bird habitat through changes to water tables.



Elaine R. Wilson

Red Crossbills, which feed mainly on cones, have declined as a result of the loss of mature pine trees.

Solutions

Preserving remaining old growth forests, particularly in intact watersheds, will benefit birds and other wildlife that depend on this ecosystem.



Richard J. Cummings

Flammulated Owls depend on retention of healthy montane coniferous forests.

Forest management can support healthy bird populations by promoting structural diversity, such as large snags, understory shrubs and successional openings. Forest birds also benefit from management that promotes age and species diversity of trees, such as retaining forest patches within clear-cuts, leaving non-pine trees during salvage logging of beetle-killed trees and replanting the original diversity of tree species.

Conserving and restoring grassland and riparian habitat patches in the working landscape—agricultural and urban environments—will benefit bird conservation and the people who live there. Preventing further fragmentation and degradation of the remaining grassland habitats is vital for maintaining populations of grassland birds in the interior.

Widening riparian zones and fencing them off to exclude cattle grazing benefits endangered species such as the Yellow-breasted Chat. Removal of cattle from riparian habitat in the Okanagan Valley has allowed wild rose thickets to regenerate, providing nesting habitat and allowing the population to increase from 4 to 45 breeding pairs.



Richard J. Cummings

The White-tailed Ptarmigan is one of few species that nest in rocky areas above the treeline. Climate change may affect their habitat, but little is known of their population trends.



Rene McKibbin

Yellow-breasted Chat

The Mountain Pine Beetle epidemic is expected to kill more than 70% of pine forests in the interior of the region. The outbreak has been exacerbated by past forest management and fire suppression that created large, low-diversity pine forests which were highly susceptible to attack by these beetles. Climate change has resulted in warmer winters that allow unusually high overwinter survival of the beetle, speeding the growth and spread of the outbreak.

ARCTIC

Baird's Sandpiper/Kyle Elliot



BIRD'S-EYE VIEW

- Across all characteristic species, the overall indicator has changed little because it combines both dramatic increases in waterfowl, primarily geese, and steep declines in shorebirds. The annual variability in the indicators reflects both true annual fluctuations in bird populations in this highly variable environment, and also uncertainty that comes from challenges in monitoring Arctic species.
- Shorebirds that nest in the Arctic are declining sharply. The biggest threats are habitat loss and degradation along migratory routes and in wintering areas, but climate change may be reducing their breeding success.
- Several goose populations have increased dramatically due largely to abundant winter food sources from agriculture; these populations are now causing serious damage to Arctic wetlands and tundra through over-grazing.
- Climate change is already affecting Arctic ecosystems and is projected to change at rates that will exceed the ability of some Arctic bird species to adapt.

The Arctic is a land of tundra, permafrost, ponds, lakes and wetlands, rocky deserts, deep fiords and looming cliffs. It includes over 25% of Canada's land mass and provides nesting grounds for millions of birds including many of the continent's shorebirds, geese and some landbirds. The Arctic also supports large colonies of several species of seabirds; their trends are described in the Oceans section of this report.

Trends

The population status of many Arctic birds is poorly known because the remoteness, vast area and challenging weather conditions in the Arctic make monitoring difficult. Information for many species depends on counts made during migration or on their wintering grounds, but these counts can be

imprecise and may be affected by shifts in wintering distribution or migration behaviour.

Among species for which data are available, the overall indicator appears to have changed little, but this reflects a combination of large increases in some groups and large declines in others.

Most goose and swan populations have increased dramatically, due partly to extra food sources in agricultural areas on their migration routes and wintering areas.

In contrast, many shorebird species have shown dramatic declines, most likely due to loss or degradation of migration stopover sites and wintering areas. Some seaduck species are also declining, as are several landbirds, though the reasons for these declines are poorly understood.

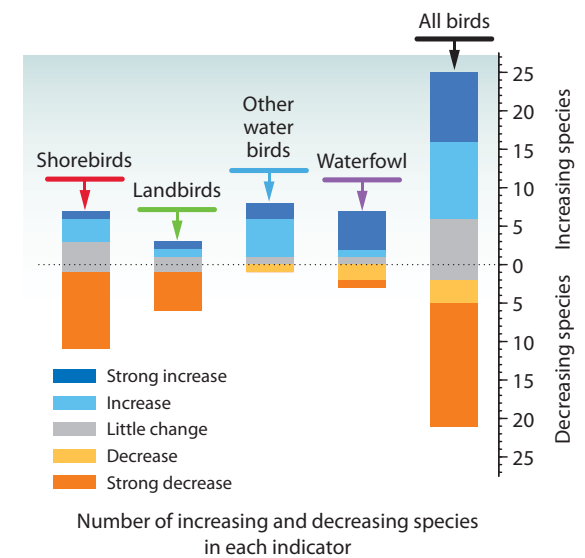
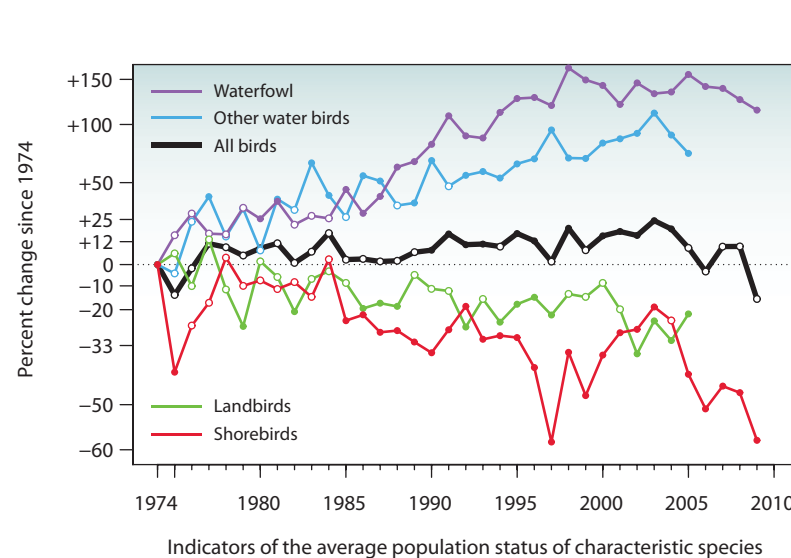
Threats

Climate is changing faster in the Arctic than most of the world. Rapid climate change could affect nesting success and survival for Arctic birds in several ways, including changes in the availability of plentiful, high-protein insects, changes in habitat, increases in predators and more frequent severe weather events.



May Hoga

Too much of a good thing? Snow Goose populations have increased by more than 300% and are degrading coastal salt marshes through intense foraging.



Increased natural resource exploration and extraction—such as expansion of energy and mining activities and associated infrastructure—disturb nesting birds, destroy sensitive habitats and increase the risk of spills or other environmental contamination.

Many Arctic nesting birds migrate long distances and are particularly vulnerable to threats beyond Canada's borders. Hazards include extreme weather, hunting, pesticides, changes in food availability and habitat loss at migration stopover sites and wintering areas.

Solutions

Identifying and protecting areas that are most important for bird survival and most resistant to climate change will help to minimize negative impacts of human activity on bird populations.

Maintaining stringent environmental assessments for development projects in the Arctic and appropriate mitigation measures will reduce risks to birds.



© Government of NWT

Development in the Arctic must be carefully managed to avoid ecosystem damage.

Protection of key stopover habitats and food sources along migration routes, both inside and outside of Canada, and regulation of hunting in Caribbean and South and Central American wintering areas, are necessary to help improve survival for Arctic-nesting shorebirds.

Challenges for long-distance migratory shorebirds

Arctic shorebird populations have declined by 60% overall and 10 species are in severe decline. Similar patterns are evident for shorebirds nesting elsewhere in Canada.

Migrating from one end of the world to the other, shorebirds depend on a complex network of wetland and upland habitats, and are vulnerable to habitat loss at any stage of their journey.



Charles M. Francis

Monitoring shorebirds in the Arctic taiga and tundra provides valuable information on distribution and trends but is logistically challenging and expensive, requiring helicopters to access sampling areas.

Many species of shorebirds concentrate in large numbers at key feeding and resting sites along their migration routes, both in Canada and internationally. Loss or degradation of any one of these sites can lead to dramatic declines in their populations. Shorebirds are also affected by habitat loss and other threats on their wintering areas, such as development that is reducing and degrading coastal habitats in the Caribbean and Central



May Hoga

Endangered Red Knots migrate through Delaware Bay where they feed on the eggs of horseshoe crabs to fuel their spring migration. Overfishing of the crabs has been a major factor leading to declines in this species.

and South America, and agricultural expansion and intensification that is affecting open grassland habitat.

Monitoring shorebird populations presents particular challenges. Most current monitoring data come from migration stopover sites, but may be biased by changes in stopover behaviour. A major international effort, the Program for Regional and International Shorebird Monitoring (PRISM) is now underway to improve understanding of population trends and causes of declines of shorebirds involving surveys in the Arctic, on migration and in southern wintering areas.



May Hoga

Arctic breeding Whimbrel are threatened by hunting in the Caribbean.



© Ducks Unlimited Canada

Snowy Owl populations have declined by more than half, possibly due to changes in lemming populations associated with climate change.

OCEANS

Short-tailed Shearwaters and Black-legged Kittiwakes/Yuri Artukhin



BIRD'S-EYE VIEW

- In the Arctic and Atlantic oceans, nesting seabird populations have generally increased since 1970. Some of these increases reflect a long-term recovery from historical over-hunting.
- In contrast, in the Pacific there has been a slight decline since 1980; introduced predators on nesting islands and other threats to breeding sites have had a negative effect on some species.
- Seabirds are particularly vulnerable to oil spills, mortality from fishing nets or hooks, and predators in their nesting colonies. In addition, their food supply is being affected by complex changes in ocean ecosystems due to climate change and large-scale commercial fisheries both inside and outside of Canadian waters.

Bordered by three oceans, with the longest coastline in the world (244 000 km) and more than 52 000 islands, Canada supports about 15 million breeding seabirds. The most abundant are Leach's Storm-Petrel, Thick-billed Murre and Cassin's Auklet. In addition, there are millions of migrants, mostly shearwaters, which breed in the Southern Hemisphere and visit Canada during our summer. In winter, many birds from the Eastern Atlantic move to Canadian waters, making this region the principle wintering area for seabirds in the North Atlantic.

Trends

Breeding seabird colonies in the Atlantic and Arctic have shown overall increases, partially reflecting a long-term recovery from historical over-hunting. Before the *Migratory Birds Convention* of 1916, harvest of seabirds and their eggs for

food was widespread, decimating many populations and driving the extinction of the Great Auk—a large, flightless relative of murres and puffins. Seabirds live a long time and reproduce slowly, so their populations, once reduced, are slow to recover.

In Atlantic Canada, these long-term recoveries levelled off for many populations in the early 1990s, when changes in food webs, also linked to the crash of the Newfoundland cod population, reduced available prey fish.

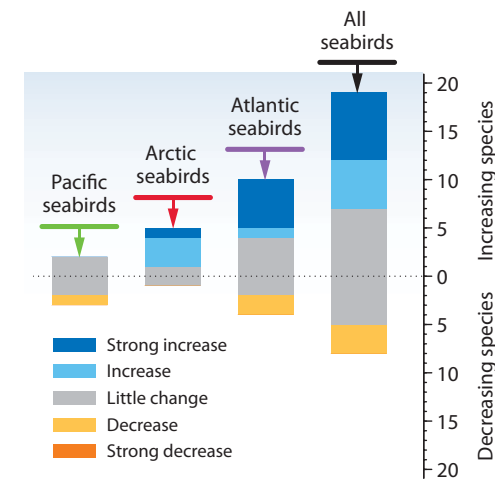
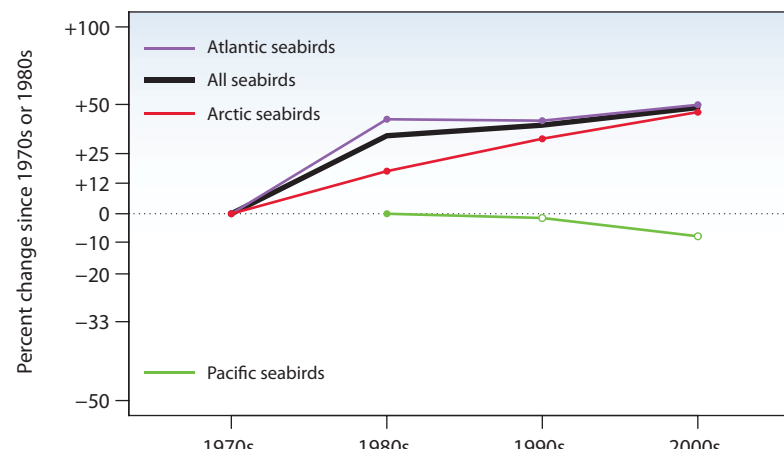
In the high Arctic, climate change may be having short-term benefits for seabirds by reducing the number of years when heavy sea-ice cover limits feeding. Conversely in the low Arctic, earlier ice break-up has adversely affected nest success in some species, including Thick-billed Murres. The long-term consequences of changing food webs are poorly understood.

Richard Corter



The largest colony of Northern Gannets in the world is on Bonaventure Island in the Gulf of St. Lawrence in Quebec. Since 1976, the number of pairs has increased from 16 000 to almost 60 000, partly as a result of reduced exposure to pesticides such as DDT.

In the Pacific Ocean, monitoring of seabird colonies began in the 1980s, and slight declines have been recorded in the most abundant species: Cassin's Auklet and Ancient Murrelet. The declines are primarily the result of introduced predators—rats and raccoons—that have eliminated some local nesting colonies on offshore islands.



No reliable monitoring data are available for the millions of seabirds that visit Canadian waters in their non-breeding season. However, monitoring data elsewhere indicate that some of these species are globally threatened, including the Short-tailed and Black-footed Albatross.

Threats

Oil at sea, both illegal discharges and major spills, poses an increasing threat to Canada's seabirds. Oil and gas developments are concentrated on continental shelves around Canada's coasts, which are also the prime feeding areas for many birds and fish. While breeding, seabirds aggregate in huge colonies—sometimes more than a million birds—and these vast concentrations are extremely vulnerable to marine oil spills.

Introduced predators kill adult birds, their eggs and nestlings in breeding colonies. Some colonies that formerly supported many thousands of birds have been abandoned. This has particularly affected species on the Pacific coast, including the Ancient



© Government of Canada

Aircraft are used to identify polluters after oil slicks are detected by satellite surveillance.

Murrelet, a species for which Canada supports half of the world population.

Changes in climate are having a strong effect on marine ecosystems. For some Arctic species, changes in ice cover are threatening their survival, including the Endangered Ivory Gull, which relies on sea ice for feeding. Rising temperatures in the Pacific Ocean cause plankton populations to peak earlier in the season. Plankton-feeding seabirds, unable to adjust their timing of breeding, have trouble finding enough food to reproduce successfully.

Longline fishing kills seabirds—mostly albatrosses, gulls, fulmars and shearwaters—that attempt to feed on

baited hooks or become tangled in lines. Diving seabirds drown when they are caught in fish nets. Common Murres and Rhinoceros Auklets are regularly killed in salmon gillnets.

Solutions

Illegal oil discharges can be minimized through regular surveillance, including satellite and aircraft monitoring conducted by the federal government.

Techniques for the eradication of introduced predators from islands are well established and progress has been made in securing several colonies on the Pacific Coast.

Unintended mortality from fisheries can be reduced by deploying streamers that scare birds from baited lines, by ensuring that lines and nets sink swiftly and by limiting fishing activities near large concentrations of seabirds.

Establishment of marine protected areas, improved management of fisheries and reduced carbon emissions will benefit marine birds by maintaining healthy food webs.



Tim Lash

Thick-billed Murres at many colonies have to travel farther from their nests to find prey fish, due to ocean warming and reduced sea-ice.



Atlantic Puffin

Paul Regular

Oceans are important wintering habitat

During the winter, many birds move to marine environments, such as loons, seaducks, waterbirds that nest beside inland waters and shorebirds that breed in terrestrial regions. Shorebirds primarily congregate in inter-tidal areas while loons, seaducks, phalaropes and some waterbirds spend the winter in the open ocean. These species are sensitive to some of the same hazards as seabirds, including oiling and changes in sea-ice and food availability. They are also vulnerable to coastal habitat loss both within and outside of Canada.



Charles M. Francis

Red-necked Phalarope

BEYOND OUR BORDERS

Migrating Broad-winged Hawks/David McCauley



More than 75% of Canadian bird species spend at least half of the year outside of Canada. When the plentiful food and warm weather of the Canadian summer ends, migratory birds leave for warmer climates. But migration is risky. Travelling hundreds or thousands of kilometres, birds must find food, shelter and safe passage, both en route and at their destinations. They depend on a chain of stopover sites between their breeding habitats and wintering habitats. If habitat is lost or damaged at any one of these points in their annual journey, it can have drastic consequences.

to their Canadian breeding grounds. Many species over-wintering in the United States, Mexico, Central America and the Caribbean are also declining severely. Only for birds over-wintering in Canada are there more increasing than decreasing species.

Threats

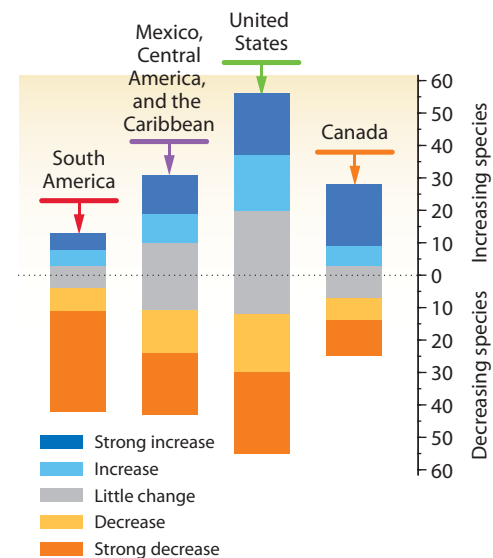
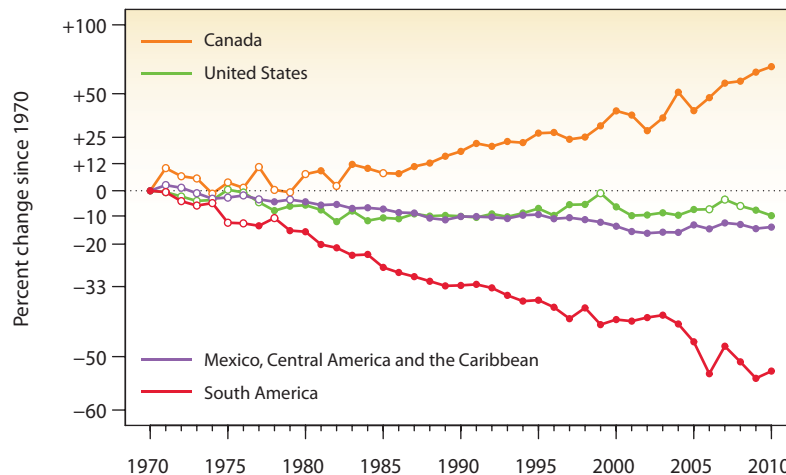
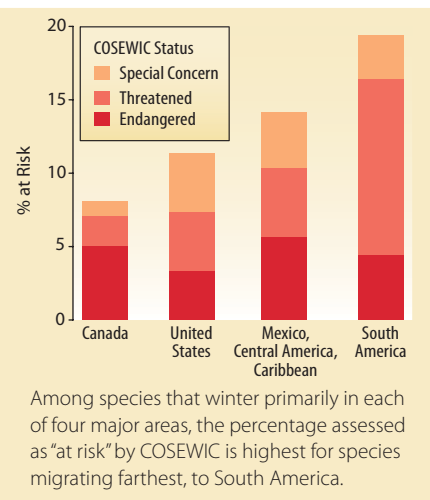
The greatest concern for many migratory species is loss of habitat both inside, and increasingly, outside of Canada. With growing development pressures in many countries in the Caribbean, Central and South America, and global demand for products from these countries, natural habitats are rapidly being converted for human use. Agriculture is replacing both natural forests and grasslands. Logging has significantly reduced the forest habitats of Central America and the Caribbean. Beach-tourism and shrimp aquaculture are replacing coastal habitats, including mangroves and salt marshes.

BIRD'S-EYE VIEW

- Bird species that migrate to South America have decreased much more than species that migrate shorter distances.
- At every stage of their annual journeys, migratory species must find sufficient habitat and food and avoid numerous hazards, such as pollution, collisions with buildings and towers, severe storms and uncontrolled hunting.
- Migratory birds link Canada with other countries. Canadian conservation efforts for migratory birds are most successful when they foster international cooperation and coordination.

Trends

Species that migrate the farthest—between Canada and South America—are declining much more steeply than species that over-winter closer



Pollution—oil spills, pesticides, industrial chemicals and heavy metals—degrade the quality of air, water and terrestrial habitats, and may sicken or kill birds. Many toxic pesticides now banned from Canada and the United States are still in widespread use elsewhere.

Collisions with towers, windows, vehicles and power lines kill millions of birds each year as they migrate between breeding and wintering areas.

Uncontrolled hunting and trapping remains a concern for birds in some countries. Many shorebirds are hunted in the Caribbean, while songbirds are trapped for the caged bird trade in many areas.

Climate change will have particularly strong effects on long-distance migrants because changes anywhere along their migration routes can disrupt their life cycle. Mismatches between migration timing and food availability can lead to reduced nesting success. Changing sea levels will flood coastal stopover habitats. More frequent, stronger storms can lead to major mortality on migration.

Solutions: International cooperation helps migrating birds

International cooperation at the continental and hemispheric levels is needed to ensure that the needs of migratory birds are addressed at all phases of their life cycles. International treaties, such as the *Migratory Birds Convention* between Canada and the United States and environmental components of free trade agreements, provide a foundation for cooperative conservation activities. Shared expertise and funding support are needed to develop joint programs. BirdLife International brings together non-government organizations throughout the world to develop coordinated conservation agendas. Many successful cooperative programs have been developed, a few of which are highlighted here, but many more similar programs are needed to ensure that birds hatched in Canada can survive their migratory journey and return to breed.

Canada Warbler populations have declined dramatically over the last 40 years and the species is now designated by COSEWIC as Threatened. They face threats at all stages of their life cycle, including changes in Canada's boreal forests, mortality risks on migration and loss of habitat in their wintering areas. Restoring their populations will require concerted effort throughout their range.



Nick Saunders

Western Hemisphere Shorebird Reserve Network (WHSRN)

During migration, many shorebird species, such as Semipalmated Sandpipers, concentrate in large numbers at critical stopover sites where they find food to fuel the next stage of their migration. Loss or degradation of any one of these sites can lead to dramatic declines in their populations. The Western Hemisphere Shorebird Reserve Network has, so far, identified and helped conserve over 80 vital stopover, breeding and wintering sites for shorebirds, throughout the Western Hemisphere.



Mark Peck

Semipalmated Sandpiper flock



© Grupo Jaraguá

Birding in the Dominican Republic

Rural Caribbean: Economic management for birds and people

The Caribbean islands of Cuba and Hispaniola are important stopover or wintering grounds for many migratory birds that breed in Canada. Nature Canada and its regional partners in Haiti, the Dominican Republic and Cuba are working with rural communities to develop economic activities that conserve bird habitat such as agro-forestry and ecotourism.

Southern Cone of South America: Alliance for Grasslands

Grassland species, such as the Swainson's Hawk, that spend the northern winter in the pampas and cerrado of the Southern Cone of South America face ongoing habitat loss, where grasslands are being converted to agriculture, plantations or urban settlements. The Alliance for Grasslands is a collaboration led by BirdLife International partners in Argentina, Brazil, Paraguay and Uruguay. The Alliance is establishing conservation priorities for monitoring and research and working with private landowners to support bird-friendly production within local and traditional cultural frameworks.



May Hagg

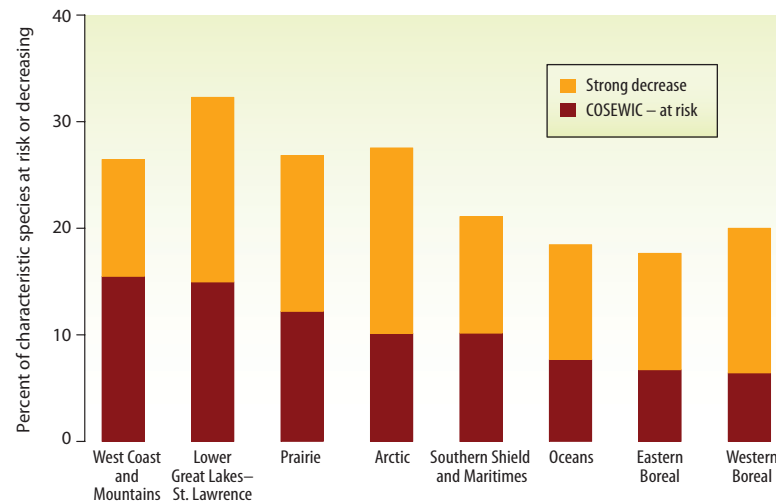
Swainson's Hawk

BIRDS OF CONSERVATION CONCERN

Fifteen percent of species that regularly occur in Canada are designated in some level of risk category by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). These species require extra efforts to restore their populations to healthy levels and to ensure their long-term conservation. Special attention is also needed for species showing marked declines, which may become at risk if prompt action is not taken.

Protecting Species at Risk

The federal *Species at Risk Act* (SARA) and similar provincial and territorial legislation in most parts of Canada provide some extra protection for species at risk and require recovery plans to identify appropriate actions to protect each species. In practice, conserving species at risk and implementing recovery plans present many challenges. Limited funds are available to support recovery. Species may be affected by a broad range of threats both in Canada and elsewhere on their migration routes and wintering grounds. In many cases, the precise causes of declines are unknown, or research is required to determine which threats are most important so that efforts can be directed to the most critical problems. In extreme cases, captive breeding has been necessary to help restore populations that have been reduced to excessively low levels. However, this is very expensive, can only be afforded for some species and can only succeed if the original threats have been addressed.



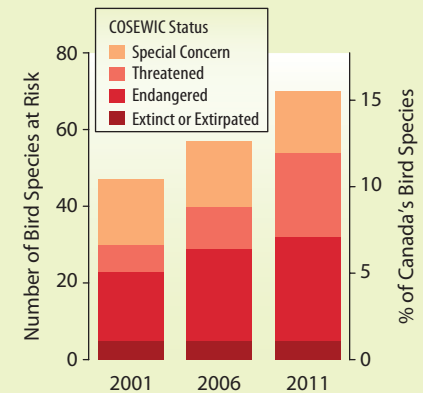
The percentage of bird species that are designated as at risk by COSEWIC or are showing large decreases varies geographically across Canada. The highest proportions of species at risk are in the regions most heavily impacted by human activities: the Lower Great Lakes–St. Lawrence, the West Coast and Mountains and the Prairies. The Arctic also has a high percentage of species of concern, due partly to changes happening outside the Arctic—habitat loss and degradation along their extended migration routes and in southern-hemisphere wintering areas.



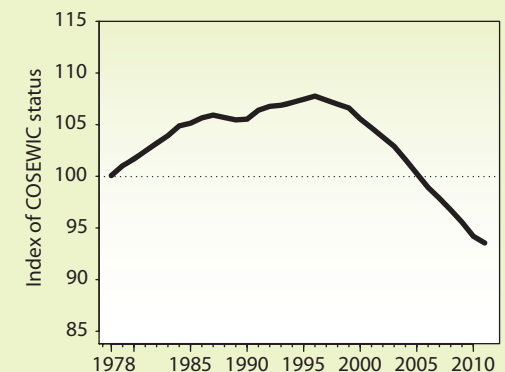
May Hoga

Loggerhead Shrikes have declined throughout their range in Canada and are now considered Endangered. Captive breeding is being undertaken with some success, but releasing individuals into the wild is challenging, as the original threats are still not fully understood and addressed.

Species at Risk: Are we making progress?



Since 2001, when COSEWIC adopted its current criteria for assessments, the number of birds designated as at risk has increased. This partly reflects improvements in our knowledge—better information, more species assessed and greater awareness of imperilled species—but also real declines in the status of some of Canada's bird species.



An index of changes in the status of COSEWIC-designated species over time, after they are designated, indicates that, on average, status improved (values >100) between the late 1970s and the late 1990s. Many species assessed during the earlier time periods had declined as a result of toxic pesticides such as DDT. Banning of DDT, combined with concerted conservation efforts, such as re-introduction programs and artificial nest-boxes and platforms, helped some species recover. Since the 1990s, the average status of species at risk has worsened. Many species are threatened by complex combinations of factors that are poorly understood and that make quick recovery unlikely.

The Whooping Crane: A success story

Although the problems of bird conservation can seem daunting, the dedication and concern of Canadians, in cooperation with partners throughout the Americas, have led to some successes. By 1938, the Whooping Crane population had declined to only 15 individuals due to a combination of hunting and habitat loss. Intensive management in both the United States and Canada has included habitat protection, a captive breeding program, creation of new wild populations and the use of ultra-light planes to teach migration. By 2011, numbers had increased to over 430 in the wild (including introduced populations) and another 160 in captivity. While the Whooping Crane is still considered endangered and remains one of the rarest birds in North America, these efforts are gradually pulling this magnificent bird away from the brink of extinction.



© Parks Canada /Klaus Niggge

Prevention is better than a cure

It is much more cost effective to take action early, to prevent species from becoming at risk, instead of requiring emergency action to recover endangered species. Special attention is needed for bird species showing substantial population declines which have not yet reached critical status. Bird conservation planning (see page 28), focussed on these priority species, can help to identify the most effective ways to manage the landscape to ensure conservation of species before they become threatened or endangered.



Isaac Sanchez

The Wood Thrush, well known for its ethereal, flute-like song, was formerly one of the most common forest birds in eastern North America, but the Canadian population has decreased by almost 70% in the last 40 years. Prompt conservation action, including conserving habitat in its breeding range and its wintering grounds in Central America, is needed to reverse the trend and ensure it is never designated as a species at risk.



Gordon Court

The Piping Plover: Land-use conflicts across its range

In all parts of their range, Piping Plovers depend on habitat that is highly desirable for people: beaches in eastern Canada and their wintering grounds; and lakes, ponds and other water sources in the Prairies. On their breeding grounds, threats include accidental disturbance and nest destruction by beach users and predation by cats and other predators such as crows and gulls. In their wintering areas, many beaches are being developed into tourist resorts to support the local economy. Cooperative international efforts that balance economic development with the habitat requirements of Piping Plovers are needed to help recover this endangered species.



Alan Burger

The Ivory Gull was designated as a species of Special Concern in 2001, but by 2006 due to ongoing declines, the status was reassessed as Endangered. Only 500–700 adults are thought to remain in Canada.



Nick Saunders

Olive-sided Flycatchers breed around wetlands across the Boreal forest. Their populations have declined dramatically and they are now designated as Threatened, though the causes of their decline are not understood.

Where have all the swallows gone?

Aerial insectivores are birds that specialize in a diet of flying insects. Populations of these birds have decreased more than any other group in Canada. Twenty-two of the 26 species that breed in Canada are declining, with swifts, swallows and nightjars—Common Nighthawk and Eastern Whip-poor-will—showing the most alarming changes.

We don't yet know why aerial insectivores are showing such steep declines. These birds depend entirely on flying insects for food and any decrease in flying insects from pesticides or other contaminants—in Canada, along migration routes or in their wintering grounds—could have a large impact on survival. Even a minor shift in the seasonal timing of insect emergence due to climate change, could result in



Charles M. Francis

Cliff Swallows have declined as have many other swallow species. Most colonies are now found on human structures such as buildings and bridges, and need to be protected.

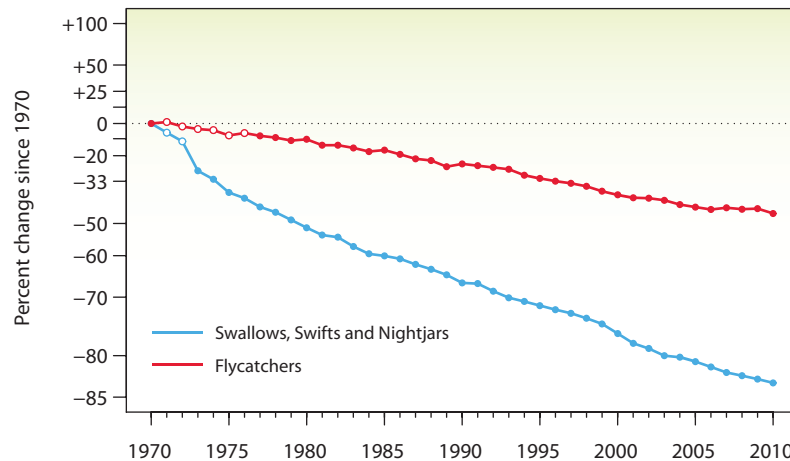
mismatched seasonal cycles of birds and their insect prey that could be disastrous for species with no alternative food source. For some aerial insectivores, such as Chimney Swift and Barn Swallow, human-made nesting sites are no longer as widely available (e.g., open chimneys and wooden barns), and habitat for

some shrub and open-nesting species has also declined. However, for other species there have been no obvious changes in breeding habitat. Further research is urgently needed to identify the causes of these declines so that appropriate conservation action can be taken to reverse them.

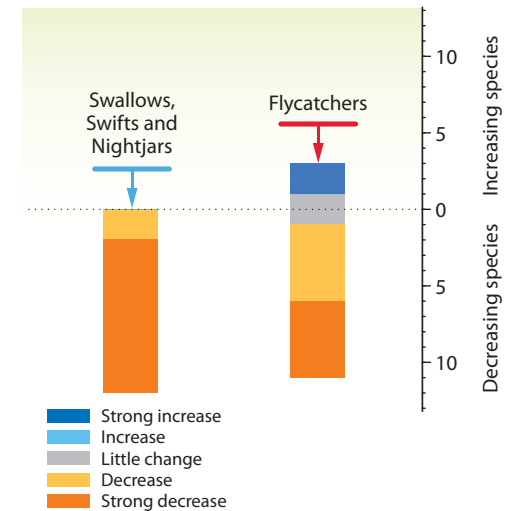


Harvey Schmidt

Changes in flying insect populations are poorly understood but may be partly responsible for declines in aerial insectivores.



Indicators of the average population status of two groups of aerial insectivores



Number of increasing and decreasing species in each indicator

CONSERVING CANADA'S BIRDS

Ensuring healthy populations of all species of Canada's birds requires a concerted effort by all levels of society including government, non-government organizations, the scientific community, the commercial-industrial sector and individuals. It requires working in Canada as well as internationally with countries that share our birds. From developing appropriate policy and legislation, to providing the scientific foundation for conservation through population monitoring and research, to education, to preparing and implementing management plans, to on-the-ground conservation actions, everyone can contribute to bird conservation.

Foundations of bird conservation in Canada

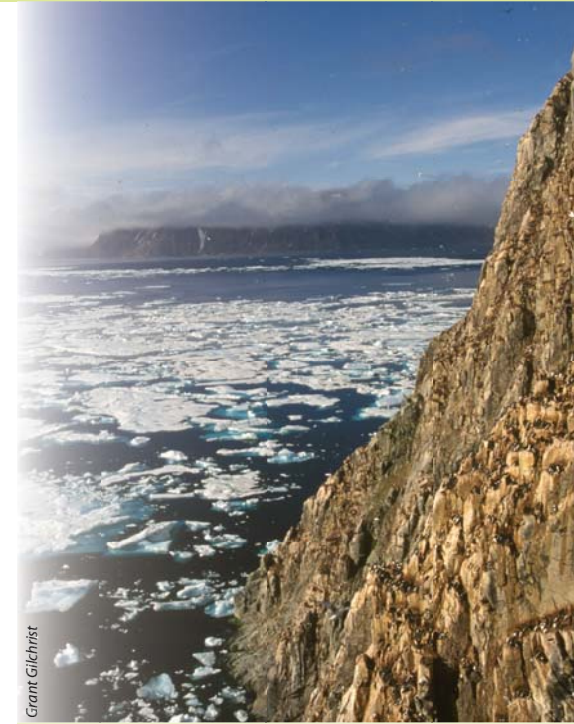
At the end of the 19th century, many species of North American birds had been hunted almost to extinction. Increasing awareness of their plight led to national and international protections, including the *Migratory Birds Convention*, signed by Canada and the United States in 1916. Although too late for some extinct species, such as the Passenger Pigeon, Great Auk and Labrador Duck, this convention has provided the foundation for nearly a century of international cooperation on bird conservation. Commercial harvesting of birds was banned, and careful regulations have helped to

ensure sustainable recreational hunting in both countries. Many species such as herons, egrets and waterfowl recovered dramatically after protection.

Efforts to conserve Canada's birds continue to build on this foundation, including designating protected areas to conserve key habitats, developing monitoring programs to track the status of birds, working to recover species at risk, undertaking research to identify key habitat and other requirements, and determining best practices for managing landscapes to conserve birds while allowing other societal uses. In the rest of this section, we highlight some of the ways that Canadians, in all sectors of society can work together to conserve our birds.

Protected areas in Canada

National, provincial and territorial parks, National Wildlife Areas, Migratory Bird Sanctuaries and other forms of protected areas help to ensure the long-term protection of some of Canada's key natural areas. Many protected areas strive to maintain ecosystem integrity, but in many smaller areas, their integrity depends on the surrounding landscape. Loss or degradation of surrounding natural habitats affects the quality of the air, the water and the habitats within a protected area. Invasive species, such as insect pests, alien plants, aquatic animals and wildlife diseases, alter whole ecosystems. Climate change can affect



Grant Gilchrist

Cobourg Island is one of several National Wildlife Areas in the Arctic established to protect large seabird colonies.



Mark Peck

Egrets were hunted nearly to extinction by the early 1900s to meet demand for their feathers in ladies' hats, but since protection, their populations have recovered.

even the most remote and isolated parks. Active management is required to maintain the values of these areas and counteract the negative impacts of outside factors. Some protected areas allow resource extraction inside their boundaries; for example, forestry is still permitted in some provincial parks. Recreational activities are important in many protected areas but must also be carefully managed to ensure that they do not degrade the area.

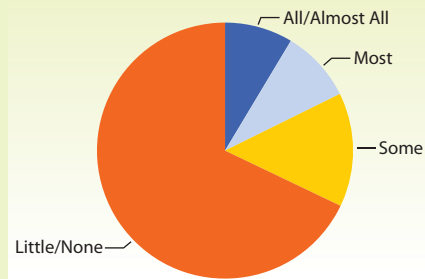
Important Bird Areas: International avian hotspots

BirdLife International has developed a set of global criteria for identifying Important Bird Areas (IBAs)—areas of particular importance to one or more species of birds at some stage of their life cycle. Bird Studies Canada and Nature Canada, have identified nearly 600 IBAs in Canada. The majority are sites where large numbers of birds regularly breed, congregate or pass through on migration; others were identified because they are particularly important to one or more species at risk.

Designation as an IBA provides no official protected status, but instead highlights the area as particularly important to birds and encourages opportunities for conservation. Once identified, IBAs can be considered as candidate sites for formal protection and considered in land and water-use planning. They are also being supported by a Caretaker program, which engages local individuals and organizations to help monitor bird populations, collect information on threats to birds within the IBA, restore habitat as needed, and educate and advocate for the birds that use the IBA.

Protected status of Canadian IBAs

Almost 70% of Canada's IBAs have little or no formal protection—none or a small portion of the IBA overlaps a protected area. Of the IBAs that do overlap, only half are in protected areas where conservation is the primary focus, such as national parks and conservation reserves. The remainder occur in areas that allow a wider range of human activities including development. Many activities are compatible with birds, including hunting, well-managed farming and many types of recreational



Proportion of Canada's IBAs grouped by the amount of their area that is protected.



Carla Ahern

The dedication of volunteer IBA Caretakers helps maintain the value of IBAs.

pursuits. However, some industrial activities may be incompatible with IBAs, particularly if they destroy key habitat features, increase the risk of environmental contamination, or create major risks to birds. Careful land-use planning is needed to ensure the values of each IBA are conserved.

Conservation in the working landscape

Conservation of viable and healthy populations of birds requires not only protected areas, which collectively cover only a small portion of the landscape, but also conservation in the remaining “working” landscape—areas where human activities and nature interact. In general, what is good for birds is good for people. Sustainable resource use, clean air and clean water lead to a healthy environment for birds and people.

Most species of Canada's birds can cope with moderate levels of disturbance and a variety of habitat alterations—within limits. Human activities, ranging from resource extraction to agriculture to urban development, can be done in ways that minimize negative impacts on the environment and help to sustain healthy bird populations.

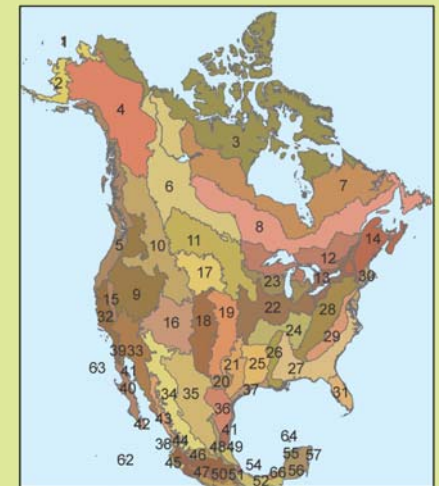
Forestry

Canada's forests are naturally dynamic—wind storms, insect outbreaks, disease and fire continuously change them. Forests are adapted to regenerate and recover from disturbances, and Canada's birds have evolved to live in these dynamic landscapes.

Forestry practices that emulate natural disturbance patterns and schedules continue to provide birds with the habitats they need to live and nest while providing Canadians and the economy with forest products such as wood and paper. Managing the landscape for multiple objectives requires adapting practices to local situations and may involve some compromises. Some forest must be set aside or managed on longer rotation schedules to support species that depend on mature forests. In some forests, such as southern hardwood forests or west coast rainforests, mature

Bird conservation planning

Environment Canada, on behalf of NABCI Canada, is leading development of bird conservation plans for each of Canada's 12 Bird Conservation Regions (BCRs), in collaboration with similar efforts in the United States and Mexico. These plans identify the priority bird species for each region, as well as their key habitat requirements, specific threats and the activities needed to address the threats. The plans will provide a basis for a comprehensive approach to managing Canada's land and resources that benefits birds and the overall environment.



North America is divided into 66 Bird Conservation Regions

trees may be several hundred years old, and only a limited amount of selective harvesting can be considered sustainable and retain the original forest dynamics.



Charles M Francis

Forestry operations that emulate natural disturbances can meet society's need for wood and paper products while supporting diverse bird communities.

Agriculture

Globally, nearly 40% of the earth's surface has been converted to agriculture, including much of southern Canada. Fortunately, many species of birds can thrive in agricultural environments, provided the farming is appropriately managed. Appropriately grazed pastures create habitats similar to native short-grass prairie and can



© Photos.com - 2012

Hayfields provide excellent nesting habitat for many grassland birds, as long as cutting of the hay is delayed until after young birds have left their nests.

support many species of grassland birds; however, excessive grazing can lead to insufficient cover and trampled nests. Hedgerows and remnant vegetation around fields provide nesting sites, food and shelter for many songbirds, in addition to reducing soil erosion in fields. Natural vegetation and fall-seeded crops around small ponds and potholes provide nesting habitat for many species of ducks. Selecting less toxic pesticides and reducing their use minimizes the effects on non-pest insects to help retain healthy food supplies for birds.

Mining, oil and gas

Our society and economy depend on natural resources such as minerals, oil and gas—and we all make use of



Laurie Buckland

Pipelines must be carefully routed to minimize damage to natural habitats and reduce the risk of spills.

them. Mining and extracting these products necessarily leads to some degradation of our environment, but there are many ways the damage can be minimized. Careful planning can ensure that the footprint is as small as possible, access roads are routed to minimize disturbance and that key habitats, such as wetlands, are protected. Seismic lines can be kept as narrow as possible to minimize habitat fragmentation and encourage rapid

regeneration. Disturbed areas should be promptly restored through planting of appropriate native vegetation after mining operations are complete. Improved technologies help to minimize toxic emissions and pollution, providing clean air and water both for humans and wildlife. Effective monitoring of water, air and wildlife ensures that standards are met, and that no unexpected adverse impacts are encountered.

Urban development

Urban environments cannot support all the bird species that occur in the surrounding range of native habitats. However, with careful planning, urban areas can host a wide variety of native species. In-fill development and other strategies that promote higher density of housing have economic benefits and reduce the extent of natural areas that needs to be converted. Effective land-use planning can help to retain key natural habitats during development and create multi-use green spaces within urban environments providing breeding and migration habitat for birds, while increasing the quality of life for people living there.



Joel Campbell

Northern Cardinals have adapted well to city environments and enrich the lives of people living there.

Addressing other threats to birds

Tens of millions of birds die each year across Canada from collisions with windows, tall buildings, transmission towers, power lines, vehicles and other structures. Although this mortality cannot be completely eliminated, the risks can be reduced. Turning off building lights at night during the migration season not only reduces mortality to birds, but also saves energy. Ultraviolet reflective markings on windows help birds to avoid them. Reducing the height of transmission towers, avoiding guy wires and using strobe lights instead of steady burning lights reduces risks to birds. Policies that encourage different companies to share the same towers would reduce the total number of towers needed.



Will Keightley

Feral cats and domestic cats allowed outdoors kill more birds than any other human activity.

Outdoor cats kill more than 100 million birds every year in Canada alone. Reducing or eliminating stray cat populations and keeping domestic cats indoors will protect many birds. Research has shown that cats kill many more birds than their owners realise and that bells on collars do not save birds.

Fisheries kill some seabirds but some relatively simple and effective solutions exist, such as using streamers and

other visual distractions to keep birds away from baited longlines, weighting longlines to ensure they sink quickly beyond the birds' reach and setting nets away from areas where seabirds are known to concentrate.

Chemical pollution—pesticides, oil spills, heavy metals, etc.—kill birds outright and have more chronic effects on bird health, survival and their ability to reproduce. Strategies to reduce

emissions, minimize risks of spills and use fewer, less toxic pesticides will benefit both birds and humans.

Climate change

Climate change is already having measurable effects on bird populations through mortality during severe weather events, mistimed insect emergence, disappearing Arctic ice, changing ocean temperatures and



Tony Beck

In 2005, Hurricane Wilma carried millions of migrating birds off-course, some being blown across the Atlantic to Europe. Many of these birds died, including many Chimney Swifts which declined by 50% in Quebec breeding surveys the next year.

collapsing food-webs, and many more effects are predicted. Reducing these threats requires urgent action to prevent further climate change and to mitigate and adapt to the effects that are inevitable, by implementing land-use and conservation plans that account for the added threat and uncertainty.

Intervention yields results: Raptors in recovery

One of the great success stories for bird conservation is the continuing recovery of many raptors (i.e., hawks, falcons, eagles, osprey and vultures) since the banning of chemical pesticides such as DDT in the early 1970s. Across Canada, Ospreys and Bald Eagles have doubled or tripled in population. Thanks in part to some intense efforts at captive breeding, many major Canadian cities now have Peregrine Falcons nesting on skyscrapers and bridges. These

recoveries are a testament to the power of strong controls on key environmental pollutants and hands-on management of endangered species to improve the plight of birds. These steep recoveries also point to the profound effects that DDT had on these birds.

Many raptors are adapting to urban environments. Peregrine Falcons, Merlins, Cooper's Hawks, and Broad-winged Hawks are becoming more common in urban and suburban environments—partially due to

relatively dense populations of prey species, such as the non-native European Starling.

As a group, raptors are increasing but not all species have fared equally well. American Kestrels and Northern Harriers, for example, have declined by 60%. Both species depend on open grassland and farms and are affected by many of the same threats as other grassland birds. Swainson's Hawks are known to be vulnerable to poisoning from pesticides in South America.



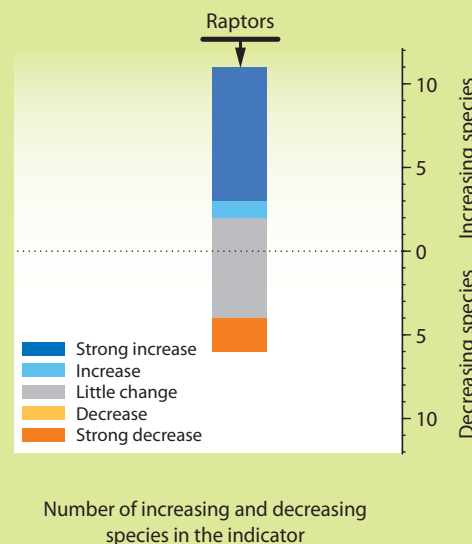
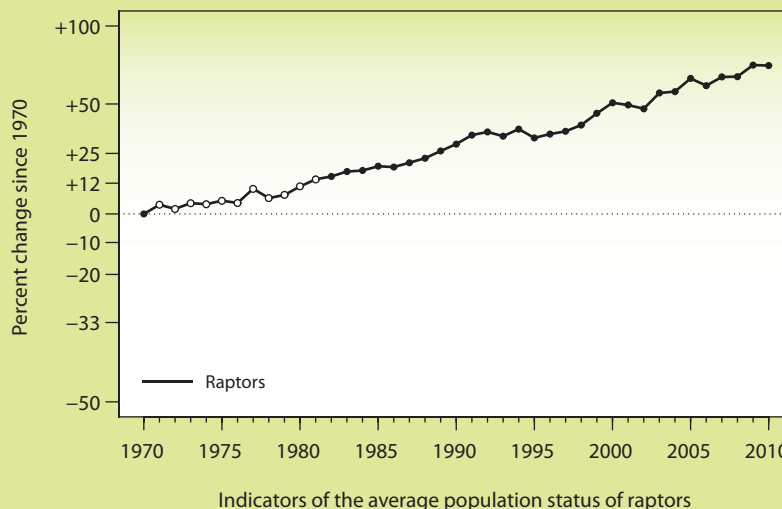
Gordon Court

Peregrine Falcon populations have recovered due to a combination of reduced pesticides and active release of captive-bred individuals in areas where populations had disappeared.



Mark Peck

The Cooper's Hawk is one of several raptor species that are increasingly adapting to urban environments.



What can one person do?

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has." (Margaret Mead)

The actions of society are determined by the actions of individuals. The choices we make and the activities we undertake collectively make a difference to birds. There are many things that we can do as individuals to improve the environment for birds and people.

Some choices benefit bird populations directly, such as keeping cats indoors and choosing products that support bird-friendly agricultural, fisheries and forestry practices—shade-grown



Peter Ward

There are many opportunities for volunteers of all ages and with a variety of skills to help with bird conservation projects, such as repairing nest boxes in a conservation area.

coffee, range-fed meat, sustainable seafood and fish and sustainable forestry products. Reducing our resource consumption, increasing recycling, taking public transport or bicycling to work and driving fuel efficient cars all lead to environmental benefits, including reduced greenhouse gas emissions, that ultimately benefit birds.

We can help birds even more by supporting bird-friendly policies. Learn about the environmental policies of each level of government and how they will affect birds. Share your views with others through letters to newspapers, community meetings and social media.



Charles M. Francis

Scarlet Tanager

You can also contribute to bird conservation by supporting your local naturalist groups and other conservation organizations. You can learn more about birds and other wildlife by participating in their meetings or organizing field trips with other interested people. Working with children is especially rewarding, by teaching them to experience and appreciate the natural world, and support conservation in the future.

Learning more about birds also opens the opportunity to join the rapidly growing numbers of Citizen Scientists who participate in bird surveys. If you enjoy identifying birds, there are opportunities for everybody, from beginners to experts.



© Catherine Jardine

Engaging children in Citizen Science programs, such as eBird, the Christmas Bird Count and Project FeederWatch, provides an opportunity for them to have fun outdoors, contribute to a valuable scientific program and learn to appreciate the environment.

MONITORING CANADA'S BIRDS

Information gathered from monitoring bird populations is essential for tracking the status of bird populations—identifying which species are doing well and which may need conservation action. These data provide the foundation for this report on the state of Canada's birds. Monitoring data are also used to set priorities, evaluate management actions and track the recovery of species at risk. They provide information on changes in distribution and abundance due to climate change, disease, invasive species or other factors, and can help to identify potential causes of population change and appropriate conservation actions.

Current state of bird monitoring

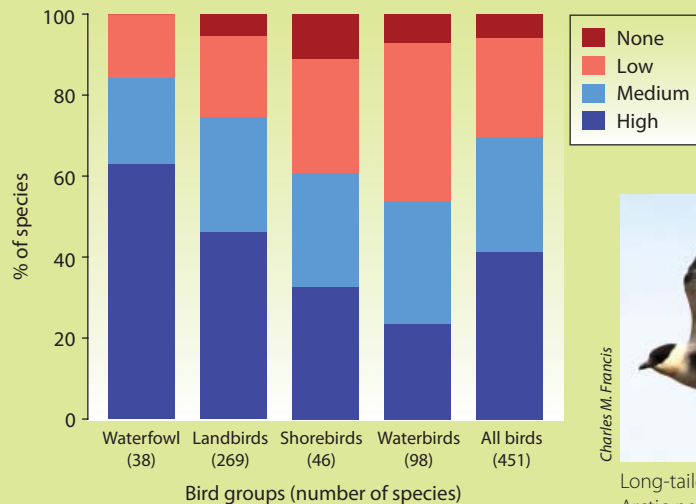
Currently, about 70% of the 451 species that occur regularly in Canada, including both breeders and non-breeders, have medium or high quality monitoring data. The remaining 30% are not yet monitored well enough to determine reliably whether their populations are increasing, decreasing or stable. Managing these poorly monitored species presents particular risks, as we do not know whether they have conservation concerns and, if they do, what needs to be done about them.

Monitoring programs have been improving over time

Despite the gaps, knowledge on the status of birds in Canada has been gradually increasing. New programs have been developed, and the geographic coverage of many existing programs has expanded to fill gaps as they are recognized. A major contribution to increased coverage has been a large jump in volunteer

participation, both in formal programs, such as the North American Breeding Bird Survey, and less formal programs such as checklists. Improved designs and greater effort on professional surveys has also contributed to improvements. Nevertheless, many areas remain difficult to monitor, and substantial new efforts and resources will be needed to fill gaps for all species.

Quality of monitoring data for Canadian birds

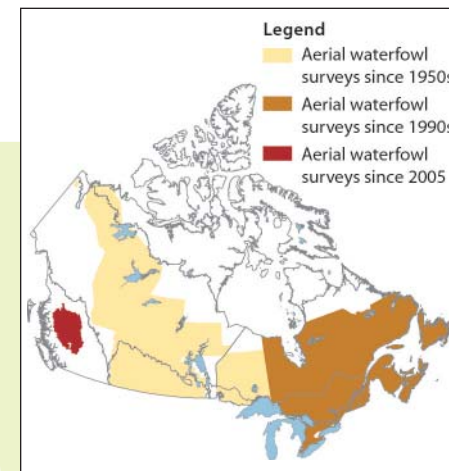
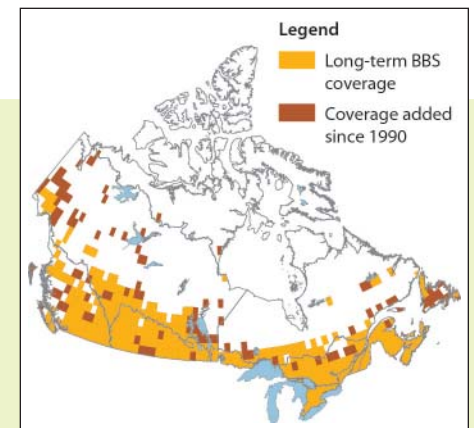


Charles M. Francis

Long-tailed Jaegers, like many other Arctic-nesting birds, are not well surveyed by existing monitoring programs and little is known of their population trends.

Monitoring data for most waterfowl species are medium to high quality, with the exception of some seaducks, but many shorebirds, waterbirds (including marshbirds, inland colonial waterbirds and seabirds) and boreal-nesting landbirds remain poorly monitored. Many of the gaps are for species that nest in remote areas and for secretive species that are hard to monitor.

The North American Breeding Bird Survey, a volunteer-based survey which provides the most reliable trend data for most landbirds in Canada, started in 1966. Geographic coverage has improved over time, but coverage in the Boreal and Arctic remains incomplete due to limited road access and few people living in these regions.



Annual aerial waterfowl surveys now cover much of Canada. They began in central and western Canada where the largest breeding concentrations of ducks are found. They expanded to eastern Canada in 1990 to help manage Black Ducks and to British Columbia in 2005. The Arctic and northern Quebec are also surveyed, but not every year.

How we monitor birds

Knowledge about the state of Canada's birds comes from many different monitoring programs, reflecting the diversity of habitats and behaviours of birds.



Gord Belyea

Changes in numbers of Evening Grosbeaks are monitored mainly by volunteers participating in Christmas Bird Counts and Project FeederWatch.

Many monitoring programs rely on the skill and dedication of tens of thousands of volunteers who contribute their time and expertise. Programs are available for volunteers with various skill levels, from expert birders who can identify every species of breeding bird by sight or sound, to beginners who only know their common backyard birds. Some programs take place in the breeding season, such as the North American Breeding Bird Survey, breeding bird atlases, nocturnal owl surveys and marsh monitoring surveys. Others monitor birds on migration, such as the Canadian Migration Monitoring Network and shorebird migration surveys, or in winter such as the Christmas Bird Count and Project FeederWatch. Checklist programs, such as eBird and Étude des populations d'oiseaux du Québec,

are less formal, year-round programs that encourage birders to record their observations every time they go birding. Many programs combine data collection with education and recreation, thus building public interest in bird conservation.

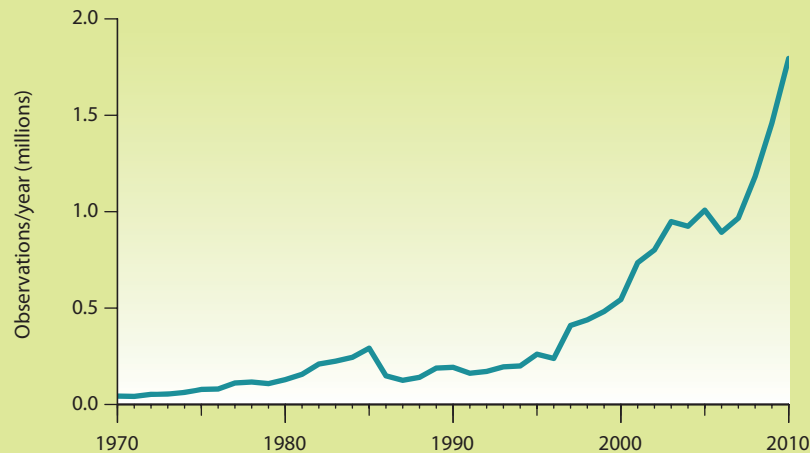
Other monitoring programs rely on professional biologists with logistic support and specialized training. Breeding waterfowl surveys involve counting birds from the air using fixed-wing aircraft and helicopters, usually coordinated with ground crews to estimate the proportion of birds detected from the air. Surveys for colonial seabirds often require boats or aircraft to reach the colonies, and biologists need to deal with many hazards including cliffs and polar bears, while avoiding disturbing the birds.

New technologies are being explored to enhance monitoring programs. Digital photographs and automated computer analyses can be used to count



© Bird Studies Canada

Skilled volunteers participating in breeding season surveys can identify birds by sight or by their songs.



Since 1900, when a handful of birders started the first Christmas Bird Count in Canada, the number of observations contributed by volunteer bird surveyors to Canada's bird monitoring programs has grown exponentially, leading to improved precision and better geographic coverage of bird monitoring programs in Canada.



© U.S. Fish and Wildlife Service

The Canadian Wildlife Service works with the U.S. Fish and Wildlife Service to conduct aerial waterfowl surveys in the Arctic and many other regions of Canada.

nesting seabirds on cliffs or snow goose colonies. Sound recorders can help to monitor singing birds in the breeding season. Migrating birds can be tracked using radar and recordings of their nocturnal flight calls. Such tools may all help improve future monitoring.

MEASURING THE STATE OF CANADA'S BIRDS

This report presents indicators of the status of Canadian bird populations and the ecosystems on which they depend.

The species

Data were included for all native species of birds that regularly occur in Canada and for which there is sufficient information on the status of the Canadian population over the past 20 or more years. Of the 451 native species that occur regularly in Canada, there



Horned Grebe

The regions

The report presents indicators separately for eight major physiographic regions in Canada. These regions reflect major differences across the country in bird habitats, ecosystems and human activities that shape the landscape. For each of the regions, only species that were considered “characteristic” of the region were included, based on the species’ regional-density or the amount of the species’ range in the region, relative to the other regions. For the Oceans region, all seabird species that regularly occur in Canada were considered characteristic.

In each region, indicators for subsets of the characteristic species that reflect the most important bird groups or habitats within the region were calculated. Not all subgroups were displayed in any given region, so some species are only present in the main indicator (i.e., the black line labelled “All birds”).

The graphs

These indicators reflect the average population status of major groups of bird species. They were calculated using regional estimates of each species’ population status that reflect the percent change in the population

since the first-year when population monitoring data existed for most regions—1970. The indicators are plotted based on the percentage change, with the scale adjusted so that negative changes are visually comparable to the corresponding positive change required to return the indicator to its original value; for example, an indicator that has decreased by 50% (i.e., reduced to half its original level) must then increase by 100% (i.e., double) to return to zero.

There is always some uncertainty associated with an indicator. Open circles are used for the indicator in a year if there is more than a 5% chance that the value of the indicator in that year should be on the other side of the zero line.

Averaging across species gives the best overall estimate of the group’s status, but does not necessarily reflect the trends for all species in a group equally well. For example, a stable indicator may reflect a group in which most or all species have stable trends, or it may reflect a group with an equal number of species with large increases and large decreases. For this reason, bar graphs are also presented to show the number of increasing and decreasing species in each indicator, with separate colours for species with population trends in each of five categories from strongly decreasing (>50% decline) through strongly increasing (>100% increase).

For further details on methods, see www.stateofcanadasbirds.org.



were sufficient data for 327 species to be included in at least one of our national indicators. Other species do not yet have adequate monitoring data, although some recently developed monitoring programs, such as nocturnal owl surveys, will provide improved data in the future. Even among the species included, in some cases our best estimate of their population status is highly imprecise and/or based on a small proportion of the Canadian population, particularly for species with their main breeding areas in the Boreal or Arctic.

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NABCI Canada

The North American Bird Conservation Initiative (NABCI) was launched in 1999 in

Canada, the United States and Mexico, to coordinate bird conservation throughout the continent. NABCI's vision is that populations and habitats of North America's birds are protected, restored and enhanced through coordinated efforts at international, national, regional and local levels, guided by sound science and effective management.

NABCI is designed to increase the effectiveness of existing and new programs, foster greater international cooperation and enhance coordination within countries, among governments, environmental non-governmental organizations (ENGOS) and private sector organizations. NABCI functions both through in-country implementation and by tri-national cooperation to deliver comprehensive bird conservation in North America.

NABCI Canada's goal is to deliver the full spectrum of bird conservation in Canada, through regionally-based, biologically-driven, landscape-oriented partnerships. The NABCI Canada Council membership is comprised of federal, territorial and provincial governments, ENGOS (Bird Studies Canada, Ducks Unlimited Canada, Nature Canada, Nature Conservancy Canada and Wildlife Habitat Canada), private sector organizations (Canadian Cattlemen's Association, Canadian Electricity Association, Forest Products Association of Canada and Mining Association of Canada), representatives from Canada's Habitat Joint Ventures (Eastern, Prairie, Canadian Intermountain and Pacific Coast) and Canada's four bird initiatives (Canadian Shorebird Conservation Plan, Partners in Flight, North American Waterfowl Management Plan and Wings Over Water).



Gordon Court

Snowy Owl





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