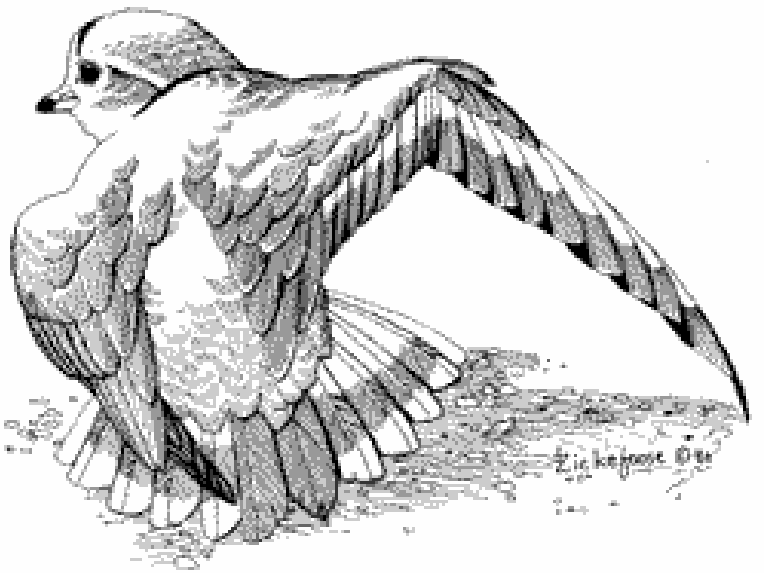
SHOREBIRD CONSERVATION STRATEGY AND ACTION PLAN

NORTHERN CONSERVATION DIVISION



Prairie and Northern Region
November 2006

INTRODUCTION

Environment Canada's Canadian Wildlife Service (CWS), as the federal wildlife agency, has the lead responsibility for the conservation of migratory birds and their habitats in the Northwest Territories and Nunavut (Appendix 1). Traditionally, bird conservation focused on species that were hunted or otherwise of direct use to humans. Increasingly, however, conservation efforts and resources are directed toward non-hunted birds. Shorebirds (plovers, sandpipers, and associated species - see Appendix 2) fall into this category and are addressed by this Strategy, which will guide CWS efforts in maintaining the diversity and abundance of shorebird species in the Northwest Territories and Nunavut. It is a tool to help CWS plan specific monitoring and conservation initiatives called for in the Canadian Shorebird Conservation Plan.

Consultation with interested parties is an integral component of CWS programs. If you have comments or questions concerning this Strategy, or any aspect of CWS activities in the NWT or Nunavut, please contact:

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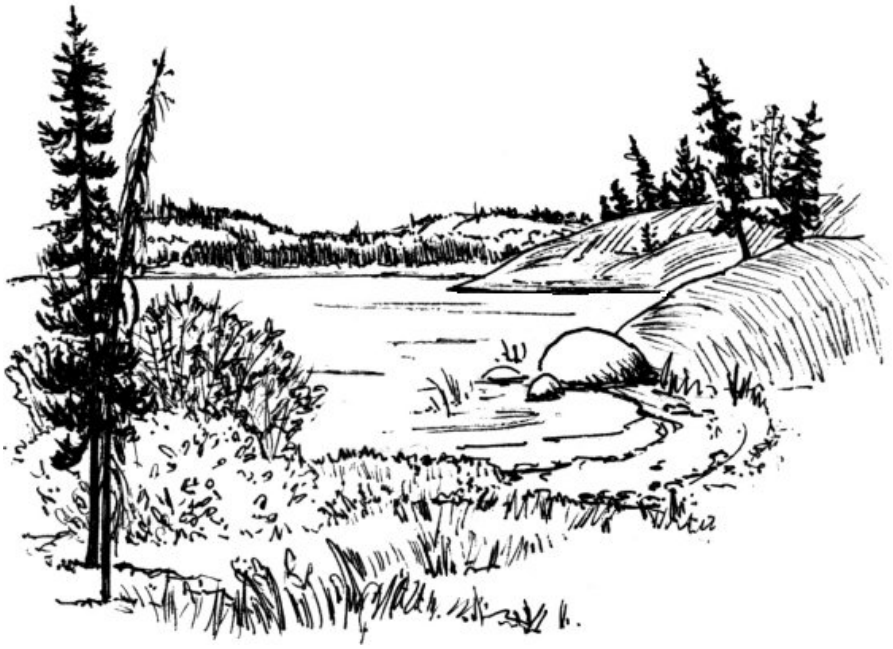


SHOREBIRDS IN NWT AND NUNAVUT

Birds are a conspicuous and vital part of northern ecosystems. Canada's North provides breeding habitat for numerous bird species, and the sheer geographic extent of the Territories means that even those species which breed at low densities can occur in great numbers. Of the 42 shorebird species that breed in Canada, 31 breed regularly in NWT and Nunavut, and these two territories contain most of the Canadian breeding habitat for 21 of those species. The abundant lakes, ponds, and wetlands in the forested portion of the NWT provide ideal breeding habitat for boreal shorebirds. All of the NWT and Nunavut's shorebird species are migratory and spend parts of their life cycle in southern Canada, the United States, and Central and South American countries. A few species also migrate to Europe, Africa and the Pacific Rim.

ISSUES AND INITIATIVES

Recent trends in shorebird populations, pressing environmental issues, political development in the north, and promising conservation initiatives are described below.

DECLINING BIRD POPULATION TRENDS

Population trends for over half of Canadian shorebirds are negative. Out of the 28 NWT/Nunavut-nesting species that were analysed, 26 show persistent, negative trends.

REGIONAL DEVELOPMENT ISSUES

Loss or contamination of breeding or staging habitat, together with increased access by humans to large areas of the North, is the source of the greatest impacts to migratory birds from development. Some developments effects are cross-cutting and cumulative, such as ancillary developments from forestry operations and an oil and gas project in the same area. Generally, the geographic regions where impacts will be greatest over the next ten years are the southwestern NWT, the Slave Geological Province/West Kitikmeot mining clusters, and the Mackenzie Delta and Beaufort Sea region.

1. Oil and Gas

There are significant and increasing oil and gas exploration and development activities in the southwestern NWT. The region currently supports major exploration and/or development projects and pipelines.

A proposal for gas production facilities in the Mackenzie Delta and an oil/gas pipeline down the length of the Mackenzie Valley are currently undergoing environmental assessment. If the proposal goes forward, large parts of the landscape of the NWT will be impacted by this and induced development.

2. Forestry

The southwestern NWT has experienced considerable selective harvest, while further east, the Slave River region and the Cameron Hills have been aggressively logged. Forestry activity is usually not accompanied by onsite production facilities. Forest regeneration (i.e. replanting) has not traditionally been required of logging companies in the NWT.

3. Mining

Mining activity is currently centred in Yellowknife for the NWT, with several smaller mining centres in both the NWT and Nunavut. These include; the NWT's North Slave Region, southwestern NWT, and the west Kitikmeot region of Nunavut. There are also other, smaller projects in various stages of exploration and development scattered across both territories.

4. Transportation

There are numerous proposals for road extensions into communities and mine sites in the NWT and Nunavut, although few of them have advanced beyond the conceptual stage. Most notable is a proposal to develop a seaport at Bathurst Inlet with a combination of all-weather and winter roads to mines in the West Kitikmeot and Slave Geological Province.

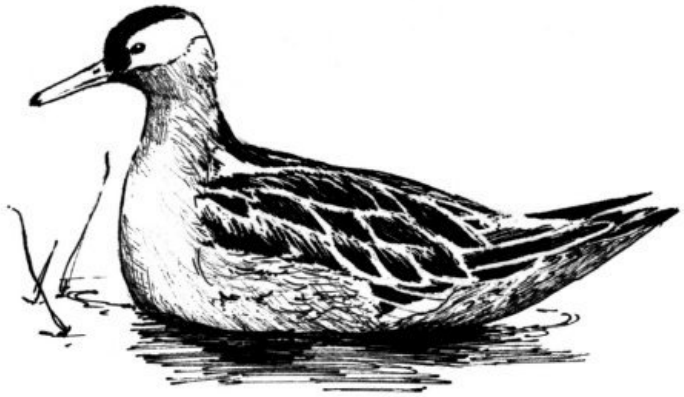
GLOBAL ENVIRONMENTAL ISSUES

Global climate models predict that the western NWT will experience significant warming, while the eastern Canadian Arctic is expected to get cooler. A recent multi-governmental, multi-researcher report[1] documented signs that change is already occurring in Arctic and sub Arctic flora and fauna as a result of climate change. Further and dramatic changes are predicted to occur in the future.

The North is also a sink for airborne pollutants from industrial and agricultural centers around the world. Contaminants are present in some Arctic birds above avian threshold levels for effects. Levels of some contaminants such as mercury continue to rise in some species. Regular, long-term monitoring is essential to determine whether contaminants are having a detrimental effect on overall bird populations.

POLITICAL DEVELOPMENT IN NWT AND NUNAVUT

All of northern Canada is subject to completed or pending land claims. Under a land claim agreement, beneficiaries surrender their claims to various lands in exchange for financial compensation, a variety of socio-economic benefits, a fixed allocation of private collectively-owned lands, certain wildlife harvesting rights, and a meaningful role in the environmental management of their settlement areas. The latter role is conducted through claim-specific co-management boards which are considered to be the “main instrument of wildlife management” within their respective settlement areas. Aboriginal views on and approaches to bird monitoring and conservation will have an impact on the development and implementation of the northern shorebird program.



[1] ACIA 2005

CONTINENTAL AND NATIONAL CONSERVATION INITIATIVES

As bird conservation concerns exceed the geographic scale of most countries, there is a trend for continental-scale conservation initiatives. Canada, the U.S., and Mexico are co-operatively managing migratory birds through the North American Bird Conservation Initiative (NABCI), which acts as a coordinating body for bird conservation initiatives developed for shorebirds, landbirds, colonial waterbirds, and waterfowl. The vision of NABCI is to develop and/or integrate bird conservation plans for all bird species, based on ecological zones (called Bird Conservation Regions - see Appendix 3). The Northern Conservation Division will play a major role in developing bird conservation plans for Bird Conservation Regions three (Arctic plains and mountains), six (boreal taiga plains), and seven (Taiga Shield and Hudson plains).

CIRCUMPOLAR CONSERVATION INITIATIVES

The Conservation of Arctic Flora and Fauna (CAFF) working group of the multilateral Arctic Council is the main body through which CWS is involved in circumpolar bird work. CAFF has produced circumpolar conservation strategies for eiders and murres, and a summary of predicted impacts of climate change on Arctic waterbirds. Recently, a circumpolar network of shorebird researchers was launched, and CAFF affiliates are working toward the establishment of a circumpolar shorebird monitoring program and a circumpolar natural resource monitoring network.

CONSERVATION STRATEGY

STRATEGIC DIRECTIONS

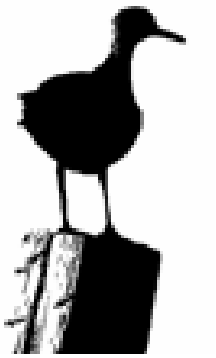
Many of our shorebird species are most effectively monitored during parts of their life cycle when they are outside of the NWT and Nunavut. For others, the northern breeding grounds are the best (and occasionally, the only) place to undertake monitoring or conservation action. CWS will put our efforts into monitoring and conservation actions that are most readily conducted in our jurisdiction. CWS will 'err on the side of caution' in the conservation of shorebirds. Finally, CWS will create opportunities to implement the following strategies in partnership with other interested parties. These parties include other Environment Canada programs, land claim co-management boards, local (Aboriginal and other) wildlife organizations, environmental non-government organizations, and industry.

Strategy 1 – MONITOR: Undertake general population monitoring programs which monitor many or all species over broad geographic areas, as well as more focused programs which monitor priority species or suites of species.

Strategy 2 – RESEARCH: Undertake research to understand or interpret trends identified through population monitoring. CWS needs information about demographic parameters and ecological requirements for most species.

Strategy 3 – CONSERVE: Identify, monitor, and protect habitats that are key to the continued prosperity of shorebird populations.

Strategy 4 – EDUCATE: Increase awareness of these birds and related conservation issues, particularly with wildlife co-management boards, Aboriginal wildlife organizations, industry, and other government agencies.



PROGRESS SINCE 2001

Since the drafting of the original Strategy and Plan, we have made significant progress in addressing the following priorities;

1. Expand the scope and usefulness of the NWT/Nunavut Bird Checklist Survey.

   The NWT/Nunavut Bird Checklist Survey is a volunteer-based survey in which participants record all birds observed in a given location over a set period of time. Its purpose is to produce distribution and trend information for all bird species.

   Since 2001 the checklist survey database has doubled. It now contains over 85,000 records. Several historical datasets were also added. The new records have extended the known ranges of some bird species. Over the next 10 years, the program should amass sufficient records to detect distribution and trend information.

   The Bird Checklist Survey is in the final stages of adaptation for map-based web access. Web access will make volunteer data entry easier, and data will be more accessible through a query- based web-site. Annual mail-outs and communication with other researchers, universities, industry, tourism, and past volunteers have resulted in wider, more consistent participation in the Bird Checklist Survey program.
   The Checklist Survey is becoming a standard baseline and environmental monitoring protocol for development projects in the Northwest Territories and Nunavut.

2. Undertake population monitoring of key Arctic shorebird species.

   Since 2001, we have implemented the Program for Regional and International Shorebird Monitoring (PRISM) in Arctic Canada, the primary goal of which is to develop population estimates for 19 of the 25 shorebird species that regularly breed in the North American Arctic, and then to determine long-term trends in populations.

   After several years of testing in Alaska and Canada, PRISM became operational in Canada in 2004. The CWS Northern Shorebird Program coordinates Arctic PRISM and maintains the database in Canada The first population estimates for the entire Canadian Arctic should be produced by 2012; population estimates for three PRISM ‘regions’ were available in 2006.

3. Undertake population monitoring of key boreal-nesting shorebird species.

   The Northern Shorebird Program is slowly taking steps to develop a boreal PRISM program. The immediate objective of the program is to develop population estimates for shorebird species that commonly breed in the NWT which cannot be effectively monitored outside of the breeding grounds. The long-term objective is to develop a

boreal shorebird PRISM methodology that will work for priority species across the Canadian boreal forest.

In 2004, a US-Canada boreal PRISM committee produced “Boreal Shorebirds: An Assessment of Conservation Status and Potential for Population Monitoring”. This document prioritized boreal-breeding shorebird species for population monitoring, and then assessed current status and potential for various monitoring methods. It also made recommendations for the ‘path forward’ to monitor boreal breeders across the boreal forest BCRs.

A helicopter aerial survey technique was tested in the Sahtu and Deh Cho regions of the Northwest Territories and in the Hudson Bay Lowlands of Ontario. The technique holds promise for adequate surveying of larger boreal species (e.g. Yellowlegs species, Wilson’s Snipe, Solitary Sandpiper). Ground studies near Yellowknife in 2000 provided some phenological information that will help develop a method to compute detection ratios for Lesser Yellowlegs and Wilson’s Snipe.

4. Determine population demographics, habitat requirements and migratory pathways of Arctic shorebirds, particularly those that have exhibited declining population trends.

   A number of CWS sponsored graduate student theses address issues of habitat requirements or demographics among several species of Arctic shorebirds. These include:

   - Ruddy Turnstone breeding ecology on Southampton Island, Nunavut;
   - Habitat requirements of shorebird species on Southampton Island;
   - Demographics of shorebird species with relation to lemming cycles on Southampton and Coats Islands;
   - Nest habitat characteristics of Red-necked Phalaropes in the Mackenzie Delta;
   - Habitat characteristics and predictive models for Whimbrel and Hudsonian Godwits in the Mackenzie Delta;
   - Habitat and population models for shorebird species in the Mackenzie Delta.

5. Develop criteria for the identification of Arctic WHSRN sites

   Draft criteria for Western Hemispheric Shorebird Reserve Network (WHSRN) sites in the Arctic were developed in 2001. The criteria were sent to the WHSRN Council for adoption, but no decision was taken.

   In the interim, CWS has decided to postpone introduction of the WHSRN program into Northern Canada. For the time being, at least, the Northern Shorebird Program considers that legislated protection is a more effective way to conserve Arctic shorebird habitat.

6. Identify key bird habitat sites and recommend areas for protection and/or WHSRN nomination

   Three key shorebird habitat sites in Nunavut are currently being considered for conservation area status through regional land use planning processes. In the draft West Kitikmeot Land Use Plan, CWS is directed to consult local residents about designation of Jenny Lind Island (Nunavut) as a conservation area. CWS is advocating conservation area status for Prince Charles and Air Force Islands (Foxe Basin, Nunavut) through the South Baffin land use planning process.

   The publication *Key Migratory Bird Terrestrial Habitat Sites in the Northwest Territories and Nunavut* has been updated and will be published in 2007. Of 83 sites identified, 18 are specifically considered to be of importance to shorebirds or contain extensive areas of wetland. One new shorebird site (Kagloryuak River Valley, Victoria Island) was added.

7. Determine the effects of lowland habitat destruction by snow geese on nesting shorebirds.

   CWS staff undertook a study in and near the Egg River snow goose colony on Banks Island to determine the relationship between shorebird abundance and proximity to the colony. Habitat at the Egg River colony is showing some impact from Snow Goose grazing (mostly within the main colony, and at pond edges outside the colony), but it is not yet in the severely degraded state of some snow goose colonies in the eastern and central Arctic. The study concluded that shorebird numbers increase up to 10km away from the colony, indicating some avoidance of the colony by shorebirds. Whether this is a natural behavioural avoidance of the colony or is due to habitat degradation is unknown. The study concluded that population-level impacts on shorebirds from habitat degradation in this particular colony are so far negligible.

8. Undertake bird habitat and population inventories in Bird Sanctuaries and National Wildlife Areas.

   Both extensive and intensive shorebird surveys have been undertaken in the Queen Maud Gulf, Kendall Island, and Dewey-Soper Bird Sanctuaries. East Bay and Harry Gibbons Bird Sanctuaries have been surveyed to a lesser extent.

ACTION PLAN

The action plan describes projects needed to fulfill the strategic directions outlined above. Action items are organized by strategic direction, priority (high, medium, or low), and bird conservation region (BCR) using the North American Bird Conservation Initiative BCRs (Appendix 3). When determining the priority of a given action item, the following questions were considered:

- How many bird species will benefit from this activity?
- Is the NWT and/or Nunavut the best possible location to undertake this activity?
- Does the activity address species, or groups of species, which have demonstrated population declines in the recent past?
- Does the activity address bird species or species groups in areas where their habitat is under threat from human activities (including climate change)?

Items in the action plan will be addressed as time, resources, and opportunity permit. Generally, high-priority items will be dealt with before lower-priority items. However, CWS will pursue a lower-priority item first if an opportunity to do so presents itself.

1. MONITOR

a) Evaluate the ability of the current Checklist Survey database to identify trends in shorebird species distribution and abundance.

Priority - HIGH
BCR - 3,4,6,7

The NWT/Nunavut Checklist Survey database will soon contain 100,000 records. CWS needs to know whether the database is able to measure changes in distribution and abundance of NWT/Nunavut shorebird species. After all 2006 data is entered into the database, the data will be analyzed to see whether the following matters can be established:

i) maps showing range of NWT/Nunavut shorebird species;
ii) changes in species distribution over the period 1995-2006;
iii) changes in breeding status at particular locations;
iv) changes in relative abundance at particular locations.

<u>Key result:</u>

- current and historical bird species distribution and abundance are known and compared.

b) Implement PRISM (Program for Regional and International Shorebird Monitoring) in the Canadian Arctic.

Priority - HIGH
BCR - 3

Since 2001, CWS has worked with Canadian and American partners to develop the Arctic component of PRISM. The objective of Arctic PRISM is to generate Arctic-wide population estimates for most North American shorebirds, and then to track trends in population over the long term. A full rationale and description of the Arctic PRISM program can be downloaded at http://amap.wr.usgs.gov/prism/prism.html. CWS's Northern Shorebird Program coordinates the PRISM surveys and holds the PRISM database. The PRISM program has been operational in Arctic Canada since 2004.

A priority for proper implementation of the PRISM program is to obtain or create remote-sensed habitat classifications that reflect breeding habitat conditions in June. The first step in this process is to obtain ground control point data for parts of the Arctic where no or inadequate remote-sensed habitat classifications exist. A significant part of the Northern Shorebird Program effort will be directed to collecting this information over the next few years.

The Arctic PRISM protocol is well suited for use in general area shorebird and songbird monitoring around development sites. The PRISM protocol is being promoted for use in baseline and ongoing general monitoring programs, and CWS would like to see the PRISM protocol become an industry standard for environmental assessment and monitoring in the Canadian Arctic.

Key results:

- population size of Arctic breeding shorebird species are estimated
- changes in population size of Arctic breeding shorebird species are tracked;
- Arctic PRISM becomes a standard protocol for use in baseline and ongoing monitoring of shorebirds and songbirds in the Arctic.

c) Implement recommendations in *Boreal Shorebirds: An Assessment of Conservation Status and Potential for Population Monitoring*.

Priority - MEDIUM
BCR - 4,6,7

The boreal region of the Northwest Territories is on the cusp of change. A large increase in industrial and human activity is expected in the Mackenzie Valley in the next 20 years. Next to nothing is known about shorebird populations in the boreal region of NWT, or how

they will be affected by such change.

The three priority boreal NWT shorebird species (Lesser Yellowlegs, Wilson's Snipe, and Solitary Sandpiper) have breeding, migration and wintering characteristics that make them difficult to survey at all points of their life cycles. The breeding season may well be the best place to monitor their populations.

The Boreal Shorebirds document noted above (download at http://www.bsc-eoc.org/download/Borealshorebirdmonitorpaper.pdf) provides guidance for monitoring populations of priority shorebird species in NWT's boreal forest. CWS will implement recommendations that are relevant to NWT, including the following:

- assessment of the suitability of the North American Breeding Bird Survey, and variations thereof, to monitor boreal NWT breeding shorebirds;
- explore feasibility of using current ground-based waterfowl surveys, and the marsh bird monitoring protocol;
- further develop/test aerial survey methodology for surveying boreal shorebirds;
- investigate current and potential methods of monitoring boreal breeders at temperate and southern boreal stopover sites.

Understanding the impact of impending development in the northern boreal forest on shorebird populations requires a major investment of both human and financial resources. The speed with which the Northern Shorebird Program can develop a good boreal monitoring program will be constrained by both of these factors for the foreseeable future.

Key results:

- long-term estimates of relative abundance of Lesser Yellowlegs, Wilson's Snipe, and Solitary Sandpipers are obtained for NWT's boreal forest;
- baseline conditions for priority shorebird species in the Mackenzie Valley are obtained in advance of major development.

d) Monitor changes in the composition and structure of Arctic shorebird communities that may result from climate change.

Priority - MEDIUM
BCR - 3,4,6,7

There is compelling evidence that climatic changes are occurring in the Canadian Arctic. As climate and vegetation changes, shorebird communities will likely change too, although we do not know specifically how. Concrete evidence for or against recent climate-induced changes in Arctic bird communities is generally absent. Long-term monitoring at several locations across the Arctic is necessary to track changes, assist in prediction of future community status, and target conservation efforts.

Two suitable spots for long-term monitoring stations are in the Mackenzie Delta in the western Arctic and at Southampton and/or Coats Island in the eastern Arctic. Our ability to continue operating these stations into the medium future is currently being assessed.

Key results:

- changes in bird community composition and species abundance are related to changing climate conditions;
- predictions of impacts of future climate change on northern bird communities can be made.

2. RESEARCH

CWS needs information about life cycle phenology, demographics, and habitat requirements of virtually every bird species covered by the Northern Shorebird Program, so it is difficult to articulate every need and to determine priorities. Nonetheless, some of the more urgent priority items are listed below.

e) Determine population demographics, habitat requirements and migratory pathways of Arctic shorebirds, particularly those that have exhibited declining population trends.

Priority - MEDIUM
BCR - 3

CWS needs to be able to delineate discrete breeding populations and identify where their wintering grounds are and the route(s) taken to get there. Basic life history information, such as arrival, departure, and nesting dates, is critical to the ability to accurately assess the impacts of developments and propose suitable mitigation measures. There is a need to know baseline demographic information as well (age at first breeding, nest success rates, adult survival rates, and factors affecting the above, for example) so that when declines occur it will be possible to pinpoint where precisely in the life cycle the problem is. Without this information it is difficult to take conservation action in response to declining population trends.

Similarly, habitat protection for declining species cannot be undertaken without understanding the habitat components that are required for successful breeding.
The Northern Shorebird program has a limited capacity to undertake shorebird research itself; most time and resources are devoted to monitoring functions. However, the Program has made progress on research action items by collaborating with graduate students and their supervisors. The Program will continue collaboration with graduate students to address demographic and habitat research questions.

Key result:

- information regarding migratory routes, wintering areas, breeding season phenology, demographics, and breeding habitat requirements is available for priority species.

f) Determine breeding habitat requirements, breeding parameters and migratory pathways of boreal shorebirds, particularly priority species.

Priority - MEDIUM
BCR - 4,6,7

It is a high priority to develop a population monitoring program for these species, but it is not possible to do so without understanding more about their behaviour and movements during the breeding season. Basic life history information such as arrival, departure, and nesting dates is needed, as is demographic information (such as age at first breeding, nest success rates, adult survival rates, and factors affecting the above). Some of this information could be obtained in partnership with graduate student projects that have logistical support from CWS. Priority species are identified in Appendix 2.

Key result:

- information regarding breeding season phenology and habitat requirements, demographics, and migratory pathways is available for priority species.

3. CONSERVE

g) Identify key bird habitat sites and recommend areas for protection.

Priority - HIGH
BCR - 3,4,6,7

Through Arctic PRISM, it is possible to identify key shorebird habitat sites and get a ‘big picture’ ranking of sites relative to each other. Thus PRISM provides an excellent vehicle for key site identification. As PRISM completes surveys in regions of the Arctic, results will be published and recommendations regarding protection will be communicated to the CWS habitat programs, which are responsible for accomplishing protection of the areas.

Key result:

- key breeding sites are identified and proposed for appropriate designation.

h) Monitor the extent of lowland habitat destruction by snow geese on nesting shorebirds and determine its effect on local shorebird populations.

Priority - LOW
BCR - 3

Burgeoning populations of nesting and brood-rearing Snow Geese are destroying large areas of lowland habitat. These are often the same habitats that shorebirds favour for nesting. With the exception of the effects of climate change, this habitat destruction is likely the largest threat to Arctic shorebird habitat.

Much work is currently in progress at Churchill, La Perouse Bay, Karrak Lake, and Bylot Island to determine changes in vegetation composition at expanding and/or large but stabilized goose colonies. Most of these areas also support(ed) prime shorebird nesting or foraging habitat. In other impacted areas, it would be possible to estimate amounts of shorebird habitat lost, but this has not yet been done. There are still new goose colonies forming in new areas, some of which are known to contain high shorebird numbers (e.g. Coats Island). What is needed is some sort of concentrated effort that a) compiles known estimates of lost shorebird habitat; b) calculates lost habitat in impacted areas; c) chronicles the changes as they occur at a 'new' goose colony; and d) assesses efforts to control goose populations as they translate into on-the-ground improvements in shorebird habitat and numbers. This effort could feed into the snow goose control efforts by targeting certain goose populations or geographic areas where large shorebird numbers and prime habitat still exist.

Key results:

- effects of expanding snow goose populations on shorebird habitat are understood;
- effects of expanding snow goose populations on shorebirds are mitigated.

i) Provide expert input to environmental assessments and follow-up monitoring programs.

Priority - HIGH
BCR - 3,4,6,7

One way to influence the status and use of bird habitats is to provide appropriate recommendations to environmental assessments of developments and undertakings. The Shorebird Conservation Program will provide input regarding shorebirds and their habitats to environmental assessment processes. It is likely that over the next term of this Action Plan, much of the Shorebird Program's effort in this area will focus on developing a follow-up monitoring program for the Mackenzie Oil and Gas project and its ancillary developments. The aim of this program will be to enable adaptive management of the project, and to provide some insight into thresholds for cumulative effects management in the future.

Key results:

- bird populations and habitats are shielded from the worst effects of development through recommendation of appropriate mitigation measures and “no development” zones;
- cumulative effects thresholds for shorebird species are detected as development continues in the Mackenzie Delta and Valley

4. EDUCATE

j) Institute a simple and concise communications process for the Shorebird Conservation Program.

Priority - HIGH
BCR - 3,4,6,7

Although communication and education efforts have occurred sporadically over the past five years, no regular and ongoing communication or education process has been identified. This remains an outstanding action item, and one that must be immediately addressed. Following the lead of other Northern Conservation programs, an annual plain language newsletter will be produced that summarizes Program activities and major findings. This will be made available on Environment Canada's website together with publication of the Strategy and Action Plan, and these will constitute the main communication vehicle of the Program. The Shorebird Sister Schools Program (SSSP) will continue to be the Program’s main education vehicle, although our capacity to undertake SSSP is constrained by staff time. Posters produced by the Shorebird Program in the past have been very popular. CWS will continue to produce posters on an as needed basis, depending on the current focus of the Program.

Key results:

- northern residents and decision-makers are more aware of and appreciative of local shorebirds and of the threats and pressures that these birds face throughout their life cycle;
- northern residents and decision-makers are more supportive of efforts to monitor and conserve bird populations;
- members of the Canadian public are able to easily access information about northern birds, and about the Shorebird Conservation Program.

APPENDIX 1 – The role of the Canadian Wildlife Service

CWS is responsible for the conservation and management of migratory bird populations throughout Canada pursuant to the *Migratory Birds Convention Act*. Under this Act, the CWS administers the Migratory Bird Regulations that regulate hunting and possession of migratory birds, and the Migratory Bird Sanctuary Regulations which provide for establishment and management of Migratory Bird Sanctuaries. Sanctuaries are created to provide long-term protection for migratory bird populations and their habitats.

Pursuant to the *Canada Wildlife Act*, the CWS may establish National Wildlife Areas for the purposes of wildlife research, conservation, or interpretation. National Wildlife Areas are most commonly created to protect wildlife species and their habitat. The Act also gives CWS responsibility, together with the Provinces and Territories, for conservation and protection of endangered wildlife species.

The CWS is the lead federal agency in the implementation of the *Species At Risk Act*. The Act seeks to prevent Canadian wildlife species from becoming extinct, to recover those that are in danger of becoming extinct, and to ensure that common wildlife species stay common. CWS is also the federal lead in implementing the Accord for the Protection of Species at Risk in Canada, and the Canadian Habitat Stewardship Plan. CWS will work closely with the territorial governments and co-management bodies to implement the Accord and the Plan.

The CWS, in co-operation with the provinces and territories, represents Canada on several international Conventions and Agreements that have implications for wildlife conservation. Among these are the Convention on the Conservation of Wetlands of International Importance (Ramsar), which identifies internationally significant wetlands and ensures their protection; the Biodiversity Convention, which seeks to ensure the conservation of the Earth's biodiversity; and the Western Hemispheric Shorebird Reserve Network, which seeks to protect critical shorebird habitat throughout the Americas.

There are a number of ongoing and emerging National and Continental bird conservation initiatives in which CWS is an active participant. These include the North American Bird Conservation Initiative; the North American Waterfowl Management Plan and its related regional Joint Ventures; the Canadian and Continental Partners in Flight and Canadian Landbird Monitoring Strategy; the Canadian Shorebird Conservation Plan; and the Wings Over Water (colonial waterbird/seabird) Conservation Plan. A number of these groups are discussed in this Strategy as they relate directly to Northern Conservation Division's Shorebird/ Landbird/ Inland Waterbird Program.

The CWS also represents Canada on pan-Arctic councils and programs. CWS is an active participant in the program for the Conservation of Arctic Flora and Fauna.

APPENDIX 2 – Bird species addressed by action plan items

a) Evaluate the ability of the current Checklist Survey database to identify trends in shorebird species distribution and abundance.
b) Implement PRISM (Program for Regional and International Shorebird Monitoring) in the Canadian Arctic.
c) Implement recommendations in "Boreal Shorebirds: An Assessment of Conservation Status and Potential for Population Monitoring."
d) Monitor changes in the composition and structure of Arctic shorebird communities that may result from climate change.
e) Determine population demographics, habitat requirements and migratory pathways of Arctic shorebirds, particularly those that have exhibited declining population trends.
f) Determine breeding habitat requirements, breeding parameters and migratory pathways of boreal shorebirds, particularly priority species.
g) Identify key bird habitat sites and recommend areas for protection.
h) Monitor the extent of lowland habitat destruction by snow geese on nesting shorebirds.
i) Provide expert input to environmental assessments and follow-up monitoring programs.
j) Institute a simple and concise communications process for the Shorebird Conservation Program.

		a	***b***	***c***	***d***	***e***	***f***	***g***	***h***	***i***	***j***
All		X						X		X	X
Arctic breeders			X		X	X			X		
Boreal breeders				X			X				
American Golden-Plover	*Pluvialis dominica*	X	X	X	X	X	X	X	X	X	X
Black-bellied Plover	*Pluvialis squatarola*	X	X		X	X		X	X	X	X
Semipalmated Plover	*Charadrius semipalmatus*	X	X	X	X	X	X	X	X	X	X
Common Ringed Plover	*Charadrius hiaticula*	X	X		X	X		X	X	X	X
Killdeer	*Charadrius vociferus*	X		X			X	X		X	X
Hudsonian Godwit	*Limosa haemastica*	X	X		X	X		X	X	X	X
Whimbrel	*Numenius phaeopus*	X	X		X	X		X	X	X	X
Eskimo Curlew	*Numenius borealis*	X						X		X	X
Short-billed Dowitcher	*Limnodromus griseus*	X		X			X	X		X	X
Long-billed Dowitcher	*Limnodromus scolopaceus*	X	X		X	X		X	X	X	X
Wilson's Snipe	*Gallinago delicata*	X	X	X	X	X	X	X	X	X	X
Greater Yellowlegs	*Tringa melanoleuca*	X		X			X	X		X	X
Lesser Yellowlegs	*Tringa flavipes*	X		X			X	X		X	X
Solitary Sandpiper	*Tringa solitaria*	X		X			X	X		X	X
Spotted Sandpiper	*Actitis macularia*	X		X			X	X		X	X
Red-necked Phalarope	*Phalaropus lobatus*	X	X	X	X	X	X	X	X	X	X
Red Phalarope	*Phalaropus fulicarius*	X	X		X	X		X	X	X	X
Wilson's Phalarope	*Phalaropus tricolor*	X		X			X	X		X	X
Ruddy Turnstone	*Arenaria interpres*	X	X		X	X		X	X	X	X
Upland Sandpiper	*Bartramia longicauda*	X		X			X	X		X	X
Buff-breasted Sandpiper	*Tryngites subruficollis*	X	X		X	X		X	X	X	X
Stilt Sandpiper	*Calidris himantopus*	X	X		X	X		X	X	X	X

		a	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*
Purple Sandpiper	*Calidris maritima*	X	X		X	X		X	X	X	X
Semipalmated Sandpiper	*Calidris pusilla*	X	X		X	X		X	X	X	X
Least Sandpiper	*Calidris minutilla*	X	X	X	X	X	X	X	X	X	X
White-rumped Sandpiper	*Calidris fuscicollis*	X	X		X	X		X	X	X	X
Baird's Sandpiper	*Calidris bairdii*	X	X		X	X		X	X	X	X
Pectoral Sandpiper	*Calidris melanotos*	X	X		X	X		X	X	X	X
Red Knot	*Calidris canutus*	X	X		X	X		X	X	X	X
Sanderling	*Calidris alba*	X	X		X	X		X	X	X	X
Dunlin	*Calidris alpina*	X	X		X	X		X	X	X	X

APPENDIX 3 – Canadian NABCI Bird Conservation Regions