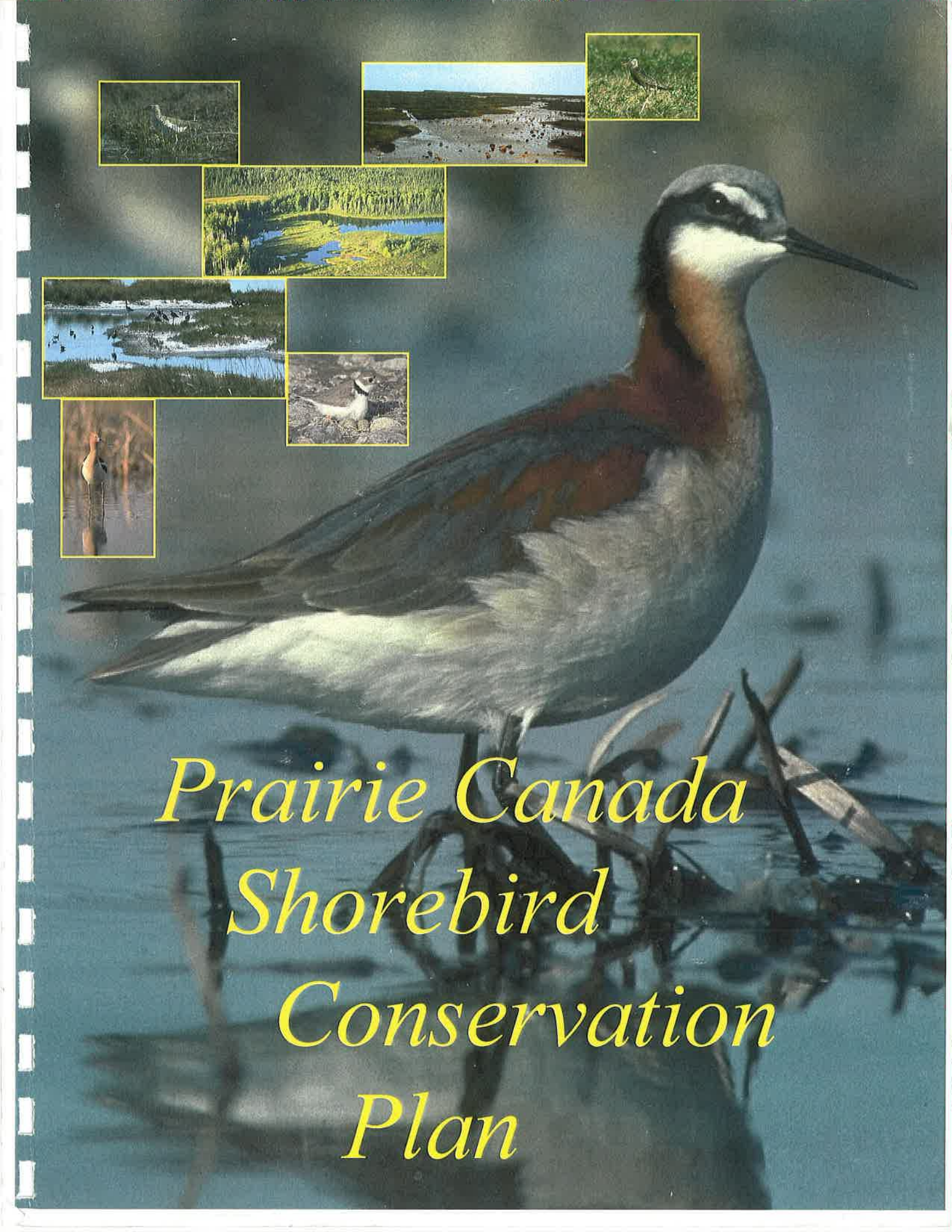

Prairie Canada Shorebird Conservation Plan

PRAIRIE CANADA

SHOREBIRD

CONSERVATION PLAN

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PRAIRIE CANADA SHOREBIRD CONSERVATION PLAN

EXECUTIVE SUMMARY

The significance of the three prairie provinces of Canada to shorebirds and other migratory birds cannot be overstated. Crucially important breeding and staging habitat for a large number of shorebird species is found here. Of the 40 species of shorebirds that breed regularly in Canada, 25 breed in Prairie Canada (the prairie, boreal and Coastal Hudson Bay regions of Alberta, Saskatchewan and Manitoba), including eight species whose breeding range in Canada is primarily or entirely in the prairies. The region also provides important staging sites for thirty-one species of both spring and fall migrating shorebirds.

Many shorebird populations have been declining across Canada, including Prairie Canada, over the past decades. Recent analyses of population trends for 35 species of shorebirds indicated that 80% were in decline (Morrison et al in prep). There is a need for a conservation plan that focusses on shorebirds in Prairie Canada.

Conservation initiatives have been applied for over a decade to waterfowl under the North American Waterfowl Management Plan. This provided a successful model that benefits bird populations and landowners. The same general approach is being applied under a new initiative, the North American Bird Conservation Initiative (NABCI), to develop a more inclusive approach to bird conservation in Canada. NABCI seeks to facilitate the integration and coordination of the major bird initiatives, which include Partners in Flight (PIF), the North American Waterfowl Management Plan (NAWMP), Wings Over Water (Canada's conservation plan for seabirds and colonial waterbirds) and the regional components of the Canadian Shorebird Conservation Plan.

The Prairie Canada Shorebird Conservation Plan (the Plan) is a regional component of the Canadian Shorebird Conservation Plan. It is a complementary effort to the other initiatives to broaden bird conservation efforts to all bird species and to sustain healthy bird populations in North America. At the regional level, the Plan provides an overview of the status and knowledge of shorebirds in Prairie Canada (the prairie, boreal and Coastal Hudson Bay regions of Alberta, Saskatchewan and Manitoba). It also outlines priority needs for conservation efforts through cooperative shorebird monitoring, research and habitat management activities. The biology of Prairie Canada shorebird species, their distribution, habitat needs and threats to their populations are also described. A communication strategy outlines the initial key messages and shows how partners and stakeholders will be involved in the advancement and implementation of the Plan.

The overall goals of the Plan are to sustain and enhance the distribution, diversity, and abundance of breeding and migrating populations of shorebirds throughout the Prairie Provinces by:

- acquiring sufficient information about the population dynamics, population trends, breeding, migration and staging strategies, and habitat preferences of Prairie Canada shorebirds to make knowledgeable management recommendations,
- sustaining and enhancing sufficient high-quality habitat to support healthy populations in Prairie Canada,
- informing the public, decision-makers, and all those involved in land management in Prairie Canada about the importance of Prairie Canada to shorebirds, and about the biology, trends and management of shorebird species, and
- ensuring that coordinated conservation efforts (regionally, nationally, and internationally) are in place to address the key conservation priorities for shorebirds in Prairie Canada.

The specific objectives of this document are to:

- assess the importance of Prairie Canada (Manitoba, Saskatchewan, Alberta) to migrating and breeding shorebirds,
- describe what is currently known about population sizes and trends, habitat needs and important sites, for each species in the region at these stages of the annual cycle,
- consider the threats to which shorebirds are exposed at various times of the year in Prairie Canada,
- set conservation priorities for each species that reflect the rankings in the Canadian and U.S. plans, the biological vulnerability, and very importantly, Prairie Canada's responsibility for the species nationally and internationally, and
- provide a full reference list of published shorebird studies in Prairie Canada.

A number of monitoring, research and habitat management needs have been identified in the Plan as priorities towards achieving the goals and objectives of the Prairie Canada Shorebird Conservation Plan. These include:

Monitoring and research needs

- Assess accuracy of Breeding Bird Survey and random quarter-section system and other appropriate methods.
- Information on factors that affect shorebird species survival and productivity.
- Broad Scale Monitoring - International Shorebird Survey (ISS) type.
- Special surveys for single species.
- Continue periodic International Piping Plover Census for numbers and trends and collect survivorship and dispersal data.
- Research on effects of anthropogenic changes on shorebird populations.
- Information on the effects of botulism on shorebirds.

Key habitat management needs:

- Identification of critical habitat.
- Completion of species and site action sheets.
- Identification and mapping of key shorebird staging/breeding sites and habitat areas.
- Maps to integrate staging/breeding sites with other priority sites of landbirds, colonial waterbirds and waterfowl.
- Wetland management and Water Level Manipulation.
- Wetland creation.
- Habitat protection.
- Grazing management.
- Reduction of disturbances.
- Develop and apply forest management practices that are compatible with habitat needs of shorebirds.

Implementation of the Plan will involve the cooperative and coordinated efforts of partner organisations working through a Steering Committee. The responsibilities of the Committee are to facilitate and expand the implementation of the shorebird initiative priorities with partners and link these activities to the National Shorebird Working Group and NABCI Canada. The partners will identify priorities, common areas of interest among the various other initiatives, and immediate opportunities for integrating and linking issues. Clear goals, objectives and time bound deliverables that are measurable, must be established. A communications strategy will be developed that will assist in the consultation process with potential partners. Strong partnerships working in a coordinated and cooperative manner will ensure that the Prairie Canada Shorebird Conservation Plan moves forward as an integral part of an integrated, ecologically based, biologically driven, landscape-oriented bird conservation effort.

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ACKNOWLEDGEMENTS

We would like to express our appreciation to R. Bazin, J. Jehl and E. Nol for commenting on portions of the draft and supplying references and to P. Goossen for providing text, data and reviews of Mountain and Piping plovers. S. Skagen and B. Waltermire, USGS-Midcontinent Ecological Sciences Centre and J. Fallon and J. Sauer, USGS-Biological Resources Division provided data for breeding and range distribution maps. Steve VanWilgenburg prepared the full references for the Prairie Provinces Shorebird Reference List. M. Schmoll developed and prepared all maps and figures for the document in GIS format. B. McBride and P. Blancher provided information on numbers of BBS routes. Ian Richards, Bird Studies Canada, kindly provided the data on Important Bird Area sites. We gratefully acknowledge permission to reproduce the photographs from Don Baccus, Gerry Beyersbergen, Cheri Gratto-Trevor, Marcus Martin, Nebraska Wildlife, The Provincial Museum of Alberta, Don Roberson and Monte M. Taylor. G. Beyersbergen also provided photos and design layout of the front cover. We also thank all those who provided review comments of the various versions of the Plan and Environment Canada's Canadian Wildlife Service and Alberta NAWMP for covering printing costs of the document. Finally, we acknowledge the PHJV members for their support and review comments.

PRAIRIE CANADA SHOREBIRD CONSERVATION PLAN

1.0 INTRODUCTION

1.1 GOALS AND OBJECTIVES

The Canadian Shorebird Conservation Plan (Hyslop et al. 2000) has been developed nationally to provide an overview of the status of shorebirds in Canada and outlines procedures for cooperative national and international shorebird conservation. Regional plans to address specific regional issues are now being developed across Canada. The Prairie Canada Shorebird Conservation Plan describes in more detail our current state of knowledge about shorebird species, biology, and conservation in Prairie Canada, which includes the prairie, boreal and coastal Hudson Bay regions of Alberta, Saskatchewan and Manitoba. It includes notable gaps in knowledge, and makes recommendations for priorities in shorebird monitoring, research and management in these provinces. Breeding birds are separated from migrants in the text, since priorities, timing of habitat use, and habitat requirements often differ between the two groups. Under those sections, the three main ecological areas of the region are discussed separately: prairie, boreal, and Hudson Bay coastline. More detail is given for the prairies, since they are unique to this part of Canada and have been more accessible to human interactions.

The overall goals of this conservation initiative are to sustain and enhance the distribution, diversity, and abundance of breeding and migrating populations of shorebirds throughout the Prairie Provinces by:

- acquiring sufficient information about the population dynamics, population trends, breeding, migration and staging strategies, and habitat preferences of Prairie Canada shorebirds to make knowledgeable management recommendations,
- sustaining and enhancing sufficient high-quality habitat to support healthy populations in Prairie Canada,
- informing the public, decision-makers, and all those involved in land management in Prairie Canada about the importance of Prairie Canada to shorebirds, and about the biology, trends and management of shorebird species, and
- ensuring that coordinated conservation efforts (regionally, nationally, and internationally) are in place to address the key conservation priorities for shorebirds in Prairie Canada.

The specific objectives of this document are to:

- assess the importance of Prairie Canada to migrating and breeding shorebirds,
- describe what is currently known about population sizes and trends, habitat needs, distribution and important sites, for each species of migrating and breeding shorebird in the region,

- consider the threats to which shorebirds are exposed at various times of the year in Prairie Canada,
- set conservation priorities for each species that reflect the rankings in the Canadian and U.S. plans, the biological vulnerability, and very importantly, Prairie Canada's responsibility for the species nationally and internationally, and
- provide a full reference list of published shorebird studies in Prairie Canada.

1.2 PRAIRIE CANADA IN THE NATIONAL PERSPECTIVE

Prairie Canada provides breeding or staging habitat for a large number of shorebird species (Jehl and Smith 1970, Godfrey 1986, Semenchuk 1992, Smith 1996) (Table 1). Of the 40 species of shorebirds that breed regularly in Canada, 25 breed in Prairie Canada, (which includes the prairie, boreal and coastal Hudson Bay regions of Alberta, Saskatchewan and Manitoba). These include eight species whose breeding range in Canada is primarily or entirely in the prairies (American Avocet, Marbled Godwit, Piping Plover, Wilson's Phalarope, Black-necked Stilt, Willet, Long-billed Curlew and Upland Sandpiper). In addition, the only reported (but rare) breeding occurrences of Mountain Plover and Snowy Plover in Canada have been in the prairies. Thirty-one species of shorebirds regularly migrate through the prairies, which provide important staging sites during both spring and fall. The prairies, from a national perspective, are most important in the spring to passage migrants (species not breeding in the prairies), including Sanderling, Red-necked Phalarope and White-rumped Sandpiper, in the fall to Baird's Sandpiper, Pectoral Sandpiper, Buff-breasted Sandpiper, Hudsonian Godwit, and in both seasons to Stilt Sandpiper, Lesser Yellowlegs, and Semipalmated Sandpiper.

While specific wetlands of the prairies sometimes support huge numbers of migrants, water conditions are exceedingly variable and unpredictable (primarily depending on spring runoff) both among and within years, so sites important in one year may be dry or too deep the next year. This provides challenges to monitoring populations, habitat conservation, and management in this region, both for local breeders and passage migrants. Habitat loss, degradation and water management are important factors for prairie breeders, both historically and at present. Much less is known about shorebirds and their habitat in the large boreal region of Prairie Canada, but general habitat loss due to forestry is extensive. In the Hudson Bay coastline Churchill area, which is one of the most accessible regions in North America for subarctic habitat, human disturbance is a potential threat to shorebird breeding.

The significance of the three prairie provinces of Canada to shorebirds and other migratory birds cannot be overstated. Accordingly, conservation efforts for shorebirds, waterfowl, landbirds and colonial water birds often overlap with mutual benefits. This integration of bird conservation at an international scale is now being developed under the North American Bird Conservation Initiative (NABCI).

Table 1. Shorebird Species in Prairie Canada

Species	*Scientific name*
1. Prairie/Parkland Breeding Birds	
Piping Plover	*Charadrius melodus*
Mountain Plover	*Charadrius montanus*
Black-necked Stilt	*Himantopus mexicanus*
American Avocet	*Recurvirostra americana*
Willet	*Catoptrophorus semipalmatus*
Upland Sandpiper	*Bartramia longicauda*
Long-billed Curlew	*Numenius americanus*
Marbled Godwit	*Limosa fedoa*
Wilson's Phalarope	*Phalaropus tricolor*
American Woodcock	*Scolapax minor*
2. Boreal Breeding Birds (also Migrants through the Prairies/Parkland)	
Greater Yellowlegs	*Tringa melanoleuca*
Lesser Yellowlegs	*Tringa flavipes*
Solitary Sandpiper	*Tringa solitaria*
Short-billed Dowitcher	*Limnodromus griseus*
3. Hudson Bay Breeders	
American Golden-Plover	*Pluvialis dominica*
Semipalmated Plover	*Charadrius semipalmatus*
Whimbrel	*Numenius phaeopus*
Hudsonian Godwit	*Limosa haemastica*
Least Sandpiper	*Calidris minutilla*
Semipalmated Sandpiper	*Calidris pusilla*
Dunlin	*Calidris alpina*
Stilt Sandpiper	*Calidris himantopus*
Red-necked Phalarope	*Phalaropus lobatus*
4. Generalist Breeding Birds	
Killdeer	*Charadrius vociferus*
Spotted Sandpiper	*Actitis macularia*
Common Snipe	*Gallinago gallinago*
5. Passage Migrants	
Black-bellied Plover	*Pluvialis squatarola*
Snowy Plover	*Charadrius alexandrinus*
Ruddy Turnstone	*Arenaria interpres*
Red Knot	*Calidris canutus*
Sanderling	*Calidris alba*
Western Sandpiper	*Calidris mauri*
White-rumped Sandpiper	*Calidris fuscicollis*
Baird's Sandpiper	*Calidris bairdii*
Pectoral Sandpiper	*Calidris melanotos*
Buff-breasted Sandpiper	*Tryngites subruficollis*
Long-billed Dowitcher	*Limnodromus scolopaceus*

Conservation initiatives have been applied for over a decade to waterfowl under the North American Waterfowl Management Plan. This plan has provided a successful model that benefits both bird populations and landowners. The same general approach is now being applied under a new initiative, the North American Bird Conservation Initiative (NABCI), to develop an integrated approach to bird conservation in Canada. The goal of NABCI is to deliver the full spectrum of bird conservation through regionally based, biologically driven landscape-oriented partnerships. This new initiative seeks to facilitate the integration and coordination of four bird conservation initiatives - the North American Waterfowl Management Plan, Partners in Flight Landbird Conservation (PIF), the Canadian Colonial Waterbird and Seabird Conservation Plan and the Canadian Shorebird Conservation Plan. The basic units within which these four bird components will be integrated are Bird Conservation Regions that have been delineated ecologically across Canada. The Prairie Canada Shorebird Conservation Plan (The Plan) forms part of the Canadian Shorebird Conservation Plan (Hyslop et al. 2000), and will be an integral part of the NABCI. This Plan, through the identification of shorebird species priorities and actions, will form a basis for the development and implementation of cooperative programs in the Bird Conservation Regions of Prairie Canada.

Some of Prairie Canada's critical wetlands for shorebirds are also internationally recognised through other complimentary programs of the Western Hemisphere Shorebird Reserve Network (WHSRN), the RAMSAR Convention and Important Bird Areas (IBA) Program. On-going monitoring and management of Prairie Canada's shorebird populations, through participation in the Breeding Bird Survey and the Pan-American Shorebird Program, further reflect an international linkage. For listed species like the Piping Plover and Mountain Plover, the Plan is also linked with various provincial and federal Species at Risk legislation and COSEWIC.

1.3 SHOREBIRD CONSERVATION IN PRAIRIE CANADA

1.3.i History

Uncontrolled market hunting in the late 1800s to early 1900s in North America, particularly in the United States, is thought to have decimated populations of many shorebird species. This was particularly significant for larger birds such as Eskimo Curlews, and Hudsonian and Marbled godwits. The 1916 *Migratory Birds Convention Act* was designed to restrict shorebird hunting, and although all shorebirds are classed as migratory game birds, open seasons exist only for Common Snipe and American Woodcock. In practice, shorebirds (except snipe and woodcock) are now treated as non-game birds and it is illegal to hunt them in Canada and the United States. Immigration of settlers to the western interior occurred later in Canada than the United States. In Canada, therefore, habitat loss due to agriculture, including wetland drainage, probably affected populations of prairie breeding shorebirds more severely than hunting. In addition, the extensive grid road system allowed easier access to unbroken grassland by new and increased populations of predators (primarily mammalian). Fragmentation of habitat has also enabled predators to search small

remnant patches of habitat more efficiently. After hunting was prohibited, and until about 15 years ago, little interest was shown to non-hunted prairie species such as shorebirds, or to boreal nesting species, other than the area around Churchill, which has long been a favourite location for examining subarctic avifauna, including shorebirds. More recently, interest has increased in non-game species, including shorebirds, for bird-watching in the prairies.

1.3.ii Existing Monitoring and Research

A Prairie Provinces Shorebird Reference List (Appendix A) provides historical information, general references, research results and discussions on breeders and migrants throughout the Prairie, Boreal, and Coastal Hudson Bay region. More detailed discussions follow.

Prairie Breeders

The North American Breeding Bird Survey (BBS) started in Manitoba in 1967 and 1968 in Saskatchewan and Alberta (Sauer et al. 1977). A total of 349 routes currently exist although only 237 routes have been run for two or more years by the same volunteer and used in the trend analyses. Most of these routes are in the prairies, rather than boreal or subarctic areas. All breeding birds seen or heard during 50 three-minute stops on 40 km routes by volunteers are recorded and later entered into a continental database. Most prairie breeding shorebird species are monitored in this fashion. However, it is not known how accurate this method is for monitoring shorebirds that are seldom seen or heard during the incubation period, or that are either tied to wetlands or large expanses of native grassland.

Populations of shorebirds breeding in the prairies have not been monitored on a broad scale, other than the BBS, dedicated surveys for Piping Plovers and woodcock, and specific surveys of potential WHSRN sites carried out in cooperation with the Canadian Wildlife Service (CWS), provincial wildlife agencies and Ducks Unlimited Canada. Breeding density estimates exist for a few species, but the accuracy of these estimates is not known. Total population numbers are known only for Piping Plovers (Flemming 1994), although estimates of unknown accuracy exist for all shorebird species (Morrison et al. 1994, Morrison et al. *in press*).

There is a great lack of information on population dynamics of almost all shorebird species breeding in the prairies, although some research (through universities and federal and provincial agencies) has been carried out on the breeding biology of Piping Plovers, Wilson's Phalaropes, Willets and Marbled Godwits (e.g. Haig 1992, De Smet 1992, Colwell and Jehl 1994, Gratto-Trevor 2000). The effects of anthropogenic changes (including cattle grazing, oil and gas development, powerlines, changes in predator regime, water control, global warming) of the prairie landscape for most species is also virtually unknown. Genetic differentiation of shorebirds breeding in the Canadian prairies (or anywhere in North America) is poorly known, nor are specific migration routes and wintering areas for most species well known.

Boreal and Coastal Hudson Bay Breeders

No intensive research has been carried out on breeding shorebirds in the boreal region of the Canadian Prairie Provinces (and very little in any boreal area of North America). In the Hudson Bay coastline area, several authors have examined changes in the abundance of shorebirds near Churchill (Allen 1945, Lin and Jehl 1998.). Numerous studies, primarily through Canadian and U.S. universities and research institutes, have examined shorebird biology in the Churchill area (mostly breeding biology but some feeding ecology), including Semipalmated Plover, Dunlin, Stilt Sandpiper, Least Sandpiper, Semipalmated Sandpiper, Hudsonian Godwit, Red-necked Phalarope, Short-billed Dowitcher and Whimbrel (e.g. Jehl 1970, Baker 1977, Miller 1983, Ricklefs 1984, Reynolds 1987, Gratto-Trevor 1992, Skeel and Mallory 1996, Klima and Jehl 1998, Nol and Blanken 1999). Again, specific migration routes and wintering areas of these species are poorly known.

Migrants

Historical records of migrant shorebirds in Prairie Canada are the result of select scientific studies or observations of naturalists and bird-watchers at high profile shorebird sites. Initial systematic monitoring of the prairies began with Canadian Wildlife Service (CWS) aerial surveys in 1987 (Smith and Dickson 1989), during the spring and fall migration periods, to identify sites with shorebirds (Morrison et al. 1995). Subsequent ground surveys were conducted during the following 11 years at the sites with the highest levels of shorebird use. Sites of one or a complex of lakes were surveyed over one to four years to identify peak shorebird numbers, species, migration chronology and important habitats used. The CWS undertook an intensive study of length-of-stay, migration routes, and feeding ecology at Quill Lakes, Saskatchewan for four years from 1989 to 1993 (Alexander and Gratto-Trevor 1997). Even during these various short-term studies it became evident that there was a high degree of variability in shorebird use and habitat availability within sites and years. Further studies are required to identify additional important prairie and prospective boreal sites, to determine the importance of the Churchill area and Hudson Bay coastline of Manitoba to staging shorebirds, to determine the breeding origin, migration routes and wintering areas of Prairie Canada migrants, and to better determine habitat needs at these areas.

1.3.iii Conservation Initiatives

As the federal agency with primary responsibility for conservation of migratory birds, CWS has been a leader or partner in many conservation actions focused on shorebirds in Prairie Canada, especially in identification and dedication of Western Hemisphere Shorebird Reserve Network (WHSRN) sites. While Provincial agencies have primarily concentrated on the survey and management of the endangered Piping Plover, they have also, in conjunction with other organizations, been active participants in shorebird site conservation and monitoring activities. The Saskatchewan Wetland Conservation Corporation (SWCC), Manitoba Habitat Heritage Corporation (MHHC), NAWMP Alberta and Ducks Unlimited Canada have contributed to surveys and migration staging site

identification as well as undertaken NAWMP habitat initiatives to protect and enhance shorebird breeding and staging sites across the Canadian prairies. In addition, they work closely with local WHSRN site communities, the public and land managers to educate and support community economic development through ecotourism, such as its initiatives around Quill Lakes, Chaplin/Old Wives/Reed Lakes and Beaverhill Lake.

Surveys have identified a number of areas of importance to migrating shorebirds in the prairies of Canada (Figure 1). Four of these wetland areas have been designated as WHSRN sites. WHSRN is a program for shorebird conservation under the auspices of Wetlands International (Appendix B). WHSRN sites are categorized as either of Hemispheric, International, or Regional importance to shorebirds, or critical to the survival of Endangered Species. Hence, all designated sites reflect the importance of the area to shorebirds within the broader context. WHSRN dedication does not confer legal protection of these sites, but considerable protection results from increased local interest and demonstration of their international role in shorebird conservation. In Prairie Canada, WHSRN sites currently designated include:

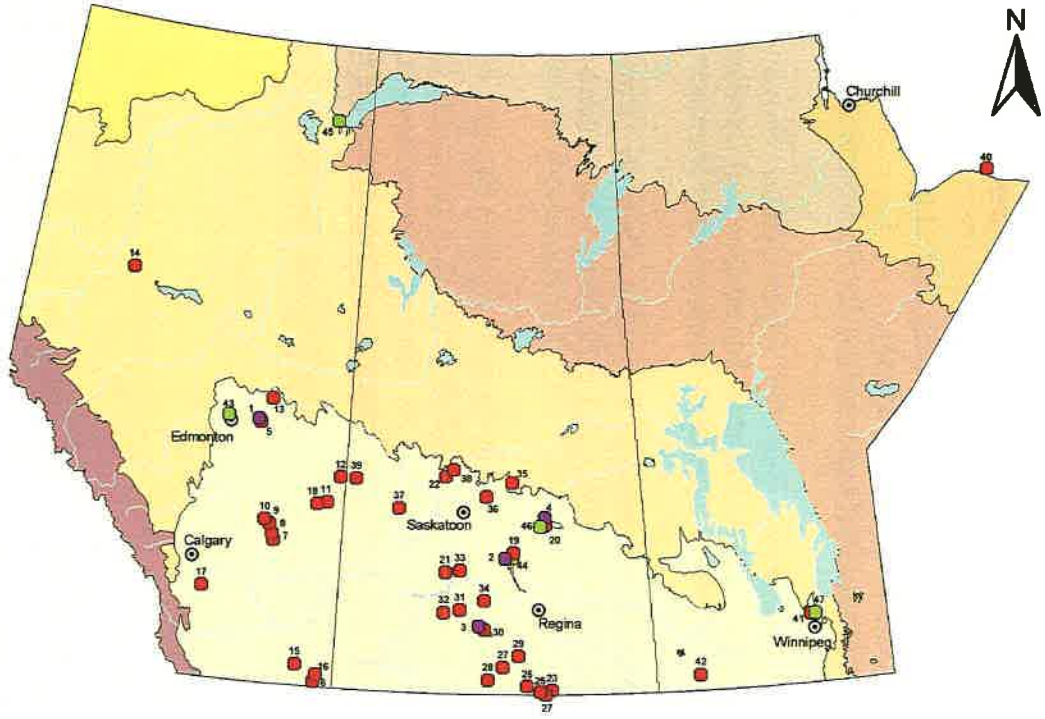
- Chaplin/Old Wives/Reed Lakes, Saskatchewan (Hemispheric Site for Sanderling, Stilt Sandpiper, and Red-necked Phalarope),
- Quill Lakes, Saskatchewan (International Site for Hudsonian Godwit, Stilt Sandpiper, Piping Plover, Red-necked Phalarope),
- Last Mountain Lake, Saskatchewan (Regional Site for Red-necked Phalarope and a variety of other species) and
- Beaverhill Lake, Alberta (Regional Site for Black-bellied Plover, Red-necked Phalarope, Semipalmated Sandpiper, Pectoral Sandpiper and Dowitcher spp.).

Other potential WHSRN sites in Prairie Canada are described in Morrison et al. (1995).

Ramsar Wetlands of International Importance in Prairie Canada often are important shorebird staging sites, including Beaverhill Lake and Peace-Athabasca Delta, Alberta, Last Mountain and Quill Lakes, Saskatchewan, and Oak Hammock Marsh in Manitoba.

The Important Bird Areas (IBA) initiative, led in Canada by Bird Studies Canada and the Canadian Nature Federation, have also identified sites of importance to shorebirds in Prairie Canada. To date, 14 sites in Alberta, 21 sites in Saskatchewan and 3 sites in Manitoba have been approved under the IBA initiative. Other sites are still undergoing review.

FIGURE 1. IBA, WHSRN, AND RAMSAR SITES IN THE PRAIRIE PROVINCES



Data sources:
(1) Ecozones: A National Ecological Framework for Canada, Agriculture and Agri-Food Canada & Environment Canada
(2) IBA locations: Bird Studies Canada
(3) RAMSAR Sites: compiled by Canadian Wildlife Service
(4) WHSRN Sites: compiled by Canadian Wildlife Service

Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

October 2000

ECOZONES

- Boreal Plain
- Boreal Shield
- Hudson Plain
- Montane Cordillera
- Prairie
- Southern Arctic
- Taiga Plain
- Taiga Shield

RAMSAR SITES

- 43 - Beaverhill Lake
- 44 - Last Mountain Lake
- 45 - Peace-Athabasca Delta
- 46 - Quill Lakes
- 47 - Oak Hammock Marsh

WESTERN HEMISPHERE SHOREBIRD RESERVE NETWORK (WHSRN) SITES

- 1 - Beaverhill Lake
- 2 - Last Mountain Lake SK
- 3 - Old Wives Lake/Chaplin Lake
- 4 - Quill Lakes

IMPORTANT BIRD AREAS (IBA)

ALBERTA IBAs

- 5 - Beaverhill
- 6 - Milk River Canyon
- 7 - Little Fish Lake
- 8 - Handhills Lake
- 9 - Dowling Lake
- 10 - Chain Lakes
- 11 - Sounding Lake
- 12 - Killarney Lake
- 13 - Whitford & Rush Lakes
- 14 - Kimiwan Lake
- 15 - Pakowki Lake
- 16 - Sage Creek Natural Area
- 17 - Frank Lake (south)
- 18 - Gooseberry Lake

SASKATCHEWAN IBAs

- 19 - Last Mountain Lake
- 20 - Quill Lakes
- 21 - Luck Lake
- 22 - Redberry Lake
- 23 - Sandoff Lake
- 24 - Alkali Lake
- 25 - Coteau Lakes
- 26 - Big Muddy Lake
- 27 - Willow Bunch Lake
- 28 - Fife Lake
- 29 - Dryboro/Burn Lake
- 30 - Old Wives-Frederick Lakes
- 31 - Chaplin Lake
- 32 - Reed Lake
- 33 - East Lake Diefenbaker
- 34 - Pelican Lake
- 35 - Basin and Middle Lake
- 36 - Buffer Lake
- 37 - Landis Lake
- 38 - Blaine Lakes
- 39 - Manitou Lake Area

MANITOBA IBAs

- 40 - Kaskattama River Mouth
- 41 - Oak Hammock Marsh WMA
- 42 - Whitewater Lake

2.0 BREEDING SHOREBIRDS IN PRAIRIE CANADA

2.1 INTRODUCTION

A wide variety of shorebirds breed in Prairie Canada, including subarctic species such as Semipalmated Sandpipers and American Golden-Plovers, boreal species such as Lesser Yellowlegs and Solitary Sandpipers, and prairie breeders such as American Avocets and Marbled Godwits. While most North American shorebirds breed in the arctic, the next highest number breed in interior grasslands, and the breeding distribution of several species in Canada is restricted entirely to the prairies (Table 2).

From a world population perspective, Prairie Canada supports a large proportion of all breeding Marbled Godwits (up to 60% of the global population), Piping Plovers (28% of total population), and a significant number of American Avocets, Western Willets, Long-billed Curlews, Wilson's Phalaropes and Upland Sandpipers. While all known Canadian breeding records for Black-necked Stilts, Mountain Plovers and Snowy Plovers have been in the prairies, numbers for these species are totally insignificant for either North American or global populations (and for maintaining breeding populations for at least the latter two species).

Numbers of shorebirds breeding in boreal Prairie Canada are almost totally unknown, but the distributions of Greater Yellowlegs and Short-billed Dowitchers in particular suggest the boreal forest region supports significant portions of the Canadian and global populations of these species.

The Hudson Bay coast of Manitoba supports virtually all the eastern (genetically distinct) breeding population of Hudsonian Godwits (Haig et al. 1997), as well as small percentages (for Canadian or global populations) of many other sub or low arctic breeding shorebirds.

The importance of Prairie Canada to the regional, national and global population of many shorebirds is thus clear. More detailed examination follows of the biology of species nesting in Prairie Canada, their habitat needs, key sites used and threats to their populations. In addition, Shorebird Species Action Sheets for priority shorebirds are profiled in Appendix C, delineating status summary, regional and global distribution and conservation issues. Summaries of species distributions and habitat needs for individual species are found in Appendix D.

2.2 BIOLOGY, DISTRIBUTION AND THREATS TO BREEDING SHOREBIRDS

2.2.i Nesting Species

2.2.i.a Prairies

Shorebirds breeding in the prairies are generally present from mid April to late August, with some variation among species (e.g., Killdeer and Long-billed Curlews usually arrive first in the spring, Willets and Wilson's Phalaropes later). Most shorebirds nesting in

the prairies are monogamous, with both parents sharing in incubation. Exceptions are polygynous Common Snipe, where only females incubate, and polyandrous Wilson's Phalaropes, where males provide all incubation and brood care. Normally, four eggs are laid in a simple scrape in the ground (the nest is sometimes built up more in species nesting at wetland edges such as Black-necked Stilts and American Avocets). Incubation is normally 18-25 days after laying of the last egg, depending on the species. Young are highly precocial; downy chicks can walk and feed themselves within a day of hatching. One or both parents brood and guard the chicks, which fledge in 16-30 days. In monogamous sandpipers, females often desert the brood earlier than their mates; the remaining parent deserts the young shortly before or after fledging. Adults and young feed primarily on larval and adult invertebrates such as mosquitoes, midges, and grasshoppers. Godwits often eat pondweed tubers when they are available.

Fourteen species of shorebirds nest in the Canadian prairies.

Mountain Plovers and Snowy Plovers

Nesting Mountain and Snowy plovers have been recorded rarely: Snowy Plovers five times, all in the 1980s in Saskatchewan (Old Wives, Chaplin, Big Quill Lakes; Smith 1996), and Mountain Plovers confirmed breeding (flightless young) once in Saskatchewan (near Val Marie; Smith 1996), and about a dozen nests altogether in Alberta (mostly Lost River area of south-eastern Alberta; Wershler 1987; Semenchuk 1992; S. Brechtel, unpubl. data).

Piping Plover

Approximately 80% of the Canadian and 28% of the global population of Piping Plovers nest in Prairie Canada (1684 individuals, 1996 data). This species is listed as endangered in Canada, with a high profile and high priority in the prairies. The International Piping Plover Census Data for 1991 and 1996 indicated that numbers have declined in Manitoba, but increased in Alberta and Saskatchewan where, in the latter province, the bulk of the prairie population breeds (Appendix E). Low productivity is of concern as it may threaten population stability. In the region, predation appears to be a major factor affecting survival of eggs and young. Although weather conditions and water management practices (e.g., flooding Lake Diefenbaker) can negatively impact nesting efforts by reducing nesting and chick-rearing habitat, they can also positively influence habitat availability by creating favourable habitat conditions. Careful management is required.

Black-necked Stilt

Black-necked Stilts, with nests or young, have been recorded in Saskatchewan: once at Qu'Appelle in 1894 and 4 times since 1987 at Blackstrap, Bradwell, Unity and Chaplin Lake (Smith 1996, A. R. Smith pers. comm.; J. Bilyk, pers. comm). Numbers breeding in Alberta have been increasing in the past 20 years, and Black-necked Stilts now breed consistently in southern Alberta, with perhaps 100 or more pairs annually.

Table 2. The status and seasonal timing of occurrence, and known Canadian population trends and conservation priority of shorebirds commonly occurring or known to have bred in the prairie region of Manitoba, Saskatchewan and Alberta.

Species name[1] Priority species in highlight [8]	Status and Occurrence in The prairies[2]	Population trend in Canada[3]	Conservation Priority in the U.S. and Canada[4]	Canadian Conservation Priority[5]	Prairie Responsibility (Canada)[6]	Prairie Responsibility (Hemispheric)[7]
American Avocet	**B**	D	3b	M	**H**	M
Black-necked Stilt	b	I	2a	L	(H)	VL
Black-bellied Plover	S,f	D	3a	H	m	M
American Golden-Plover	S,f	s?/d	4a,b	H	m	M
Semipalmated Plover	S,F	s?/d	2a	M	l	L
Piping Plover	**B**	d	5a	H	**H**	**H**
Mountain Plover	(b)	d?	5a	VH	(H)	VL
Snowy Plover	(b)	?	5a	L	(H)	VL
Killdeer	**B**	D	3a	L	M	L
Greater Yellowlegs	F	s?/d	3b	M	m	M
Lesser Yellowlegs	S,F	D	2a	M	m	M
Solitary Sandpiper	s,f	s?/d	3b	M	l	L
Willet	**B**	D	3c	L	**H**	M
Spotted Sandpiper	B	D	3b	L	L	L
Upland Sandpiper	**B**	I?	2a	L	**H**	L
Eskimo Curlew	(s)	s?	5a	H	l	L
Long-billed Curlew	**B**	D	5a	H	**H**	M
Whimbrel	S	d/s?	4b	H	l	L
Hudsonian Godwit	F	?	4,b	H	**h**	**H**
Marbled Godwit	**B**	D	4a,b	H	**H**	**H**
Ruddy Turnstone	S	s?	4a,b	H	l	L
Red Knot	S	d/s?	4a	H	l	L
Sanderling	S	D	4a	H	**h**	**H**
Semipalmated Sandpiper	S,F	D	3a	H	m	M
Western Sandpiper	(f)	?	3b	L	(l)	VI
Least Sandpiper	S,F	D	3e	M	l	L
Baird's Sandpiper	S,F	s?	2a	M	**h**	M
White-rumped Sandpiper	S	s?/D	2a	H	**h**	M
Pectoral Sandpiper	S,F	s?/d	2a	H	**h**	M
Dunlin	S	s?	3a	M	l	L
Stilt Sandpiper	S,F	?	3b	M	**h**	**H**
Buff-breasted Sandpiper	S,F	D	4a,b	H	**h**	M
Long-billed Dowitcher	S,F	?	2b	M	m	M
Short-billed Dowitcher	S,F	D	3a	H	m	M
Common Snipe	**B**	D	3e	L	L	L
American Woodcock	B	D	4a	L	L	VL
Wilson's Phalarope	**B**	D	4a	H	**H**	M
Red-necked Phalarope	S,F	D	3a	H	**h**	**H**

1. current species name from AOU 1998

2. summarized from literature and expertise of drafting team: UPPERCASE = regionally important, lower case=regular occurrence; in parentheses=uncommon to rare; B=breeding, S=spring migration, F=fall migration

3. Canadian population trend from Hyslop et al. 2000: D=declines $p<0.5$, d=declines not significant, s=stable, I=increase $p<0.5$, ?=uncertain

4. prioritized on basis of population trend, relative abundance, threats during breeding and non-breeding seasons, and breeding and non-breeding distribution; as 1= not at risk, 2= low concern, 3= moderate concern, 4= high concern, 5= highly imperiled; see Hyslop et al. 2000 for further details of prioritization and categories

5. ranked High, Medium or Low on basis of Canadian responsibility and Canadian concern (Dunn 1997), biological vulnerability (Morrison, CWS-NWRC) and Partners In Flight watchlist scores (PIF)

6. responsibility of the prairies to the total Canadian population, ranked High, Medium, or Low (Prairie Canada Shorebird Conservation Plan Committee). Uppercase letters refer to breeders, lowercase to passage migrants. Letters in parentheses denote extremely low numbers in the prairies of Canada.

7. responsibility of the prairies to the total Hemispheric population, ranked High, Medium, or Low (Prairie Canada Shorebird Conservation Plan Committee). Uppercase letters refer to breeders, lowercase to passage migrants.

8. priority species identified, by the Canadian Wildlife Service Technical Committee, as prairie region's responsibility because a large, or entire, portion of the Canadian, hemispheric or global population occurs in the region at some point in the annual cycle.

American Woodcock
American Woodcock breed only in south-eastern Manitoba, and represent a small fraction of the Canadian population. The range may apparently be extending west as far as Portage La Prairie and Spruce Woods Provincial Park. Actual numbers are not yet known. The Manitoba population of woodcock is the only population in its entire range that is not hunted.

Marbled Godwit
Virtually all Marbled Godwits in Canada (about 100,000) breed in the prairies (with the exception of 1000-2000 in southern James Bay), and the Prairie Canada population may amount to 60% of the global population. The only information available on population trends is the BBS database, which reports no significant declines in Canada or survey-wide.

American Avocet
American Avocets, which do not breed elsewhere in Canada, are common breeding birds in the Canadian prairies (about 63,000), representing about 14% of the global population. BBS trend analysis reports no significant declines in Canada since 1966.

Long-billed Curlew
Most Canadian Long-billed Curlews nest in the prairies (except a small population in British Columbia), and this population represents about 20% of the global population, which is estimated to be 20,000. The species is listed as vulnerable in Canada, and BBS trends note a significant decline in Saskatchewan (but not Alberta) since 1966.

Willet
The entire Canadian population of the western subspecies of Willet (about 23,000) nests in the prairies: about 15% of the subspecies, 92% of the Canadian population, and 10% of the global population. According to BBS data, declines were significant since 1966 in Canada and Saskatchewan.

Wilson's Phalarope
By far, the majority of Canadian Wilson's Phalaropes (680,000) breed in the prairies, about 43% of the global population (small populations exist in northern and southern Ontario, Quebec, and New Brunswick). BBS trends were not significant.

Upland Sandpiper
Most Canadian Upland Sandpipers nest in the prairies, about 2% of global populations (they also nest in southern Ontario, Quebec, and New Brunswick). Although apparently increasing in numbers in the United States, and no significant declines reported in Canada from BBS data, the perception of long-time bird watchers in western Canada is that their numbers have decreased greatly in the past 40 to 50 years.

Killdeer, Common Snipe, and Spotted Sandpiper
These species nest in the prairies, but are common breeders throughout much of Canada and North America. BBS trend analyses show no significant changes since 1966, except for Killdeer, which declined in all Prairie Provinces.

2.2.i.b Boreal

At least six species of shorebirds commonly nest in boreal regions of the Prairie Provinces, including Greater Yellowlegs, Short-billed Dowitcher, Solitary Sandpiper, Common Snipe, Lesser Yellowlegs, and Spotted Sandpiper (Table 3). Virtually no information exists on densities and distribution, so it is difficult to gauge the importance of Prairie Canada to these species. However, judging from overall distributions (Godfrey 1986), it is possible that boreal Prairie Canada supports a large percentage of the global populations of Short-billed Dowitcher and Greater Yellowlegs.

2.2.i.c Coastal Hudson Bay, Manitoba

Fourteen species of boreal and sub/low arctic shorebirds breed regularly in this region (Table 4). Arrival of breeding birds is from late May to early June, with peak nest initiation in mid June, and peak hatch in early to mid July. The usual four eggs are laid in a scrape in the ground, and normally both parents share in incubation, except for the polygynous Common Snipe (only females incubate), and polyandrous Red-necked Phalaropes (only males incubate). Incubation from day of last egg laid is 19-25 days, depending on the species. The highly precocial young are not fed by their parent(s), and fledge in 15-30 days. Most adults depart the area by the end of July, most juveniles by the end of August. Adults primarily feed on insect larvae, and chicks on adult dipteran insects.

Lesser Yellowlegs, Solitary Sandpiper, Spotted Sandpiper, Short-billed Dowitcher and Common Snipe are boreal species (see above).

American Golden Plover, Semipalmated Plover, Whimbrel, Hudsonian Godwit, Semipalmated Sandpiper, Least Sandpiper, Dunlin, Stilt Sandpiper, and Red-necked Phalarope are common sub/low arctic breeders. Most of these species have a wide breeding distribution (Whimbrel, Dunlin, and Red-necked Phalarope are Holarctic; Semipalmated Sandpiper, Semipalmated Plover and American Golden-Plover nest throughout most of low arctic Canada). Therefore, only a small portion of their total populations breed in the Manitoba Hudson Bay coast area. However, virtually all the eastern Canadian breeding population of Hudsonian Godwit (36,000) nests in this region. Recent studies have demonstrated that this population is genetically distinct from the Mackenzie Delta (NWT) and Alaskan populations (Haig et al. 1997). Populations of Short-billed Dowitchers also may be of hemispheric importance (J. Jehl, pers. comm.).

Table 3. The status, known Canadian population trends and conservation priority of shorebirds commonly breeding in the boreal regions of Manitoba, Saskatchewan and Alberta.

Species name[1] Priority species in highlight[8]	Status and Occurrence in The boreal[2]	Population Trend in Canada[3]	Conservation Priority in the U.S. and Canada[4]	Canadian Conservation Priority[5]	Boreal Responsibility (Canada)[6]	Boreal Responsibility (Hemispheric)[7]
Greater Yellowlegs	**B**	s?/d	3b	M	**H**	**H**
Lesser Yellowlegs	**B**	d	2a	M	M	M
Solitary Sandpiper	**B**	s?/d	3b	M	M	M
Spotted Sandpiper	**B**	d	3b	L	L	L
Short-billed Dowitcher	**B**	d	2b	H	**H**	**H**
Common Snipe	**B**	d	3e	L	L	L

1. current species name from AOU 1998

2. summarized from literature and expertise of drafting team: UPPERCASE = regionally important, lower case=regular occurrence; B=breeding

3. Canadian population trend from Hyslop et al. 2000: D=declines p<0.5, d=declines not significant, s=stable, I=increase p<0.5, ?=uncertain

4. prioritized on basis of population trend, relative abundance, threats during breeding and non-breeding seasons, and breeding and non-breeding distribution; as 1= not at risk, 2= low concern, 3= moderate concern, 4= high concern, 5= highly imperiled; see Hyslop et al. 2000 for further details of prioritization and categories

5. ranked High, Medium or Low on basis of Canadian responsibility and Canadian concern (Dunn 1997), biological vulnerability (Morrison, CWS-NWRC) and Partners In Flight watchlist scores (PIF)

6. responsibility of the prairies to the total Canadian population, ranked High, Medium, or Low (Prairie Canada Shorebird Conservation Plan Committee). Uppercase letters refer to breeders, lowercase to passage migrants. Letters in parentheses denote extremely low numbers in the prairies of Canada.

7. responsibility of the prairies to the total Hemispheric population, ranked High, Medium, or Low (Prairie Canada Shorebird Conservation Plan Committee). Uppercase letters refer to breeders, lowercase to passage migrants.

8. priority species identified, by the Canadian Wildlife Service Technical Committee, as prairie region's responsibility because a large, or entire, portion of the Canadian, hemispheric or global population occurs in the region at some point in the annual cycle.

Table 4. The status and seasonal timing of occurrence, and known Canadian population trends and conservation priority of shorebirds commonly occurring in the Hudson Bay coast area of Manitoba, Saskatchewan and Alberta.

Species name[1] Priority species in highlight[8]	Status and Occurrence in Hudson Bay[2]	Population trend in Canada[3]	Conservation Priority in the U.S. and Canada[4]	Canadian Conservation Priority[5]	Hudson Bay Responsibility (Canada)[6]	Hudson Bay Responsibility (Hemispheric)[7]
Black-bellied Plover	s,f	d	3a	H	I	I
American Golden-Plover	**B**	s?/d	4a,b	H	L	L
Semipalmated Plover	**B**	s?/d	2a	M	M	M
Killdeer	(b)	d	3a	L	VL	VL
Lesser Yellowlegs	**B**	d	2a	M	L	L
Solitary Sandpiper	(b)	s?/d	3b	M	VL	VL
Spotted Sandpiper	(b)	d	3b	L	VL	VL
Whimbrel	**B**	d/s?	4a	H	M	M
Hudsonian Godwit	B	?	4b	H	**H**	**H**
Ruddy Turnstone	S,F	s?	4a,b	H	m	m
Sanderling	S,F	d	4a	H	I	I
Semipalmated Sandpiper	**B**	d	3a	H	L	L
Least Sandpiper	**B**	d	3e	M	L	L
Baird's Sandpiper	S,f	s?	2a	M	I	I
White-rumped Sandpiper	S,f	s?/D	2a	H	I	I
Pectoral Sandpiper	s,F	s?/d	2a	H	I	I
Dunlin	**B**	s?	3a	M	L	L
Stilt Sandpiper	**B**	?	3b	M	M	M
Buff-breasted Sandpiper	F	d	4a,b	H	I	I
Short-billed Dowitcher	**B**	d	2b	H	L	L
Common Snipe	**B**	d	3e	L	L	L
Red-necked Phalarope	**B**	d	3a	H	L	L

1. current species name from AOU 1998

2. summarized from literature and expertise of drafting team: UPPERCASE = regionally important, lower case=regular occurrence; in parentheses=uncommon to rare; B=breeding, S=spring migration, F=fall migration

3. Canadian population trend from Hyslop et al. 2000: D=declines $p<0.5$, d=declines not significant, s=stable, I=increase $p<0.5$, ?=uncertain

4. prioritized on basis of population trend, relative abundance, threats during breeding and non-breeding seasons, and breeding and non-breeding distribution; as 1= not at risk, 2= low concern, 3= moderate concern, 4= high concern, 5= highly imperiled; see Hyslop et al. 2000 for further details of prioritization and categories

5. ranked High, Medium or Low on basis of Canadian responsibility and Canadian concern (Dunn 1997), biological vulnerability (Morrison, CWS-NWRC) and Partners In Flight watchlist scores (PIF)

6. responsibility of the prairies to the total Canadian population, ranked High, Medium, or Low (Prairie Canada Shorebird Conservation Plan Committee). Uppercase letters refer to breeders, lowercase to passage migrants. Letters in parentheses denote extremely low numbers in the prairies of Canada.

7. responsibility of the prairies to the total Hemispheric population, ranked High, Medium, or Low (Prairie Canada Shorebird Conservation Plan Committee). Uppercase letters refer to breeders, lowercase to passage migrants.

8. priority species identified, by the Canadian Wildlife Service Technical Committee, as prairie region's responsibility because a large, or entire, portion of the Canadian, hemispheric or global population occurs in the region at some point in the annual cycle.

2.2.ii Habitat Needs of Breeding Shorebirds

2.2.ii.a Prairies

The prairie and parkland regions of Prairie Canada (here collectively referred to as "prairies") do not present a uniform landscape. The region varies from semi-arid native grassland habitats in south-western Saskatchewan and south-eastern Alberta to relatively moist tall grass areas in southern Manitoba (Figure 2). To the north, the landscape changes into the wooded areas of the aspen parkland and boreal forest fringe.

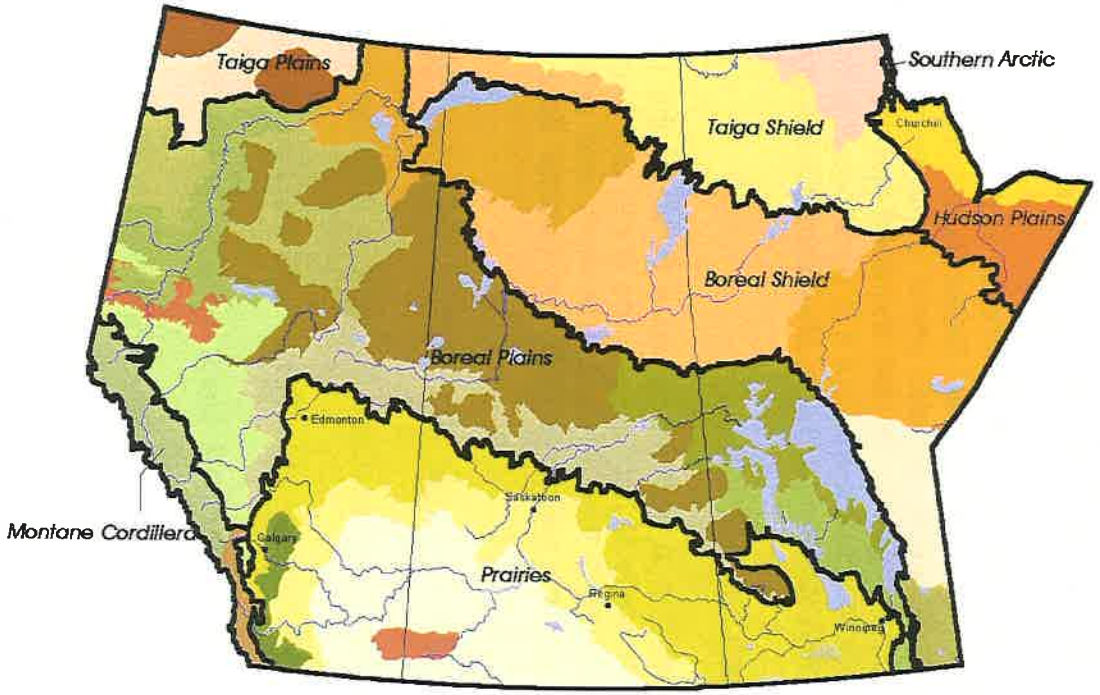
While portions of the prairies, formerly occupied by glacial melt water lakes, offer very little topographical relief, much of the area consists of gently rolling or knob and kettle terrain dotted with the wetlands of the prairie pothole region. These wetland depressions range from shallow temporal basins to deep permanent basins. Short-term climate fluctuations result in a wide range of wetland conditions, often ensuring that wetlands are maintained at varying degrees of succession and offering a variety of habitats to shorebird species. Primary land use throughout the region is agricultural. Ranching lands dominate the semi-arid native grasslands of the southwest, while higher rainfall areas are almost entirely given over to cultivation.

Prairie breeding shorebirds occupy a wide variety of breeding habitats. Most, but not all, of these habitats include a wetland component. Important habitats for breeding shorebirds in the prairie region normally include one or more of the following elements:

- semipermanent wetlands with extensive shallows (Black-necked Stilt)
- open shorelines with sand/gravel or muddy substrates (Piping Plover, Spotted Sandpiper, Killdeer, American Avocet)
- wet meadows (Wilson's Phalarope, Common Snipe)
- grasslands with wetlands (Upland Sandpiper, Marbled Godwit, Willet)
- dry grasslands (Mountain Plover, Long-billed Curlew).

Management plans for the prairies should take into consideration all of these component areas, with specific programs designed to address the needs of the habitat specialists such as Piping and Mountain plovers, Long-billed Curlews, and Upland Sandpipers.

FIGURE 2. ECOREGIONS AND ECOZONES IN THE PRAIRIE PROVINCES



ECOREGIONS GROUPED BY ECOZONE

Prairies
- Aspen Parkland
- Cypress Upland
- Fescue Grassland
- Lake Manitoba Plain
- Mixed Grassland
- Moist Mixed Grassland
- Southwest Manitoba Uplands

Boreal Plains
- Boreal Transition
- Clear Hills Upland
- Interlake Plain
- Mid-Boreal Lowland
- Mid-Boreal Uplands
- Peace Lowland
- Slave River Lowland
- Wabasca Lowland
- Western Alberta Upland
- Western Boreal

Boreal Shield
- Athabasca Plain
- Churchill River Upland
- Hayes River Upland
- Lac Seul Upland
- Lake of the Woods

Hudson Plains
- Coastal Hudson Bay Lowland
- Hudson Bay Lowland

Taiga Plains
- Hay River Lowland
- Northern Alberta Uplands

Taiga Shield
- Kazan River Upland
- Selwyn Lake Upland
- Tazin Lake Upland

Montane Cordillera
- Eastern Continental Ranges
- Northern Continental Divide

Southern Arctic
- Maguse River Upland

200 0 200
km

N

Data Source: A National Ecological Framework For Canada, Agriculture and Agri-Food Canada & Environment Canada

Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

2.2.ii.b Boreal

The boreal region of Prairie Canada is generally characterised by low topographical relief and a much greater permanency of the wetland areas. While the area is generally wooded with stands of jack pine, white spruce, white birch, balsam poplar and aspen, there are also broad open areas of muskeg and bog with only a scattered covering of black spruce and tamarack. The area is dotted with larger lakes and river systems, and there are two extensive inland deltas, the Peace-Athabasca and the Saskatchewan River deltas. Both of these areas contain extensive wetland complexes. In the boreal region the most important shorebird habitats include:

- open bog or muskeg areas with clumps of trees (Solitary Sandpiper, Short-billed Dowitcher)
- wooded bogs and open boreal woodlands (Greater Yellowlegs)
- burned over areas with aspen regrowth (Lesser Yellowlegs)
- wetland complexes of the extensive inland deltas (many species).

Much of the land in the boreal region is used for forestry and oil and gas activities. The maintenance of shorebird populations in boreal forest regions will require not only the preservation of the lowland wet areas, but also some of the surrounding uplands and woodlands that provide the nesting sites for the shorebird species. More research is required to determine specific habitat needs, but it is quite possible that not all forestry practices are incompatible with, or detrimental to, shorebird populations in the regions.

2.2.ii.c Coastal Hudson Bay, Manitoba

Churchill, Manitoba is located in a transitional zone between the boreal and tundra ecozones and has a high diversity of habitats. To the south and west of Churchill, the boreal forest reaches its northerly limit while to the north and east, tundra prevails. Along the Hudson Bay coast are extensive mud and boulder flats. Other important habitats include:

- extensive sedge bogs and muskegs (Short-billed Dowitcher, Solitary Sandpiper, Common Snipe)
- sedge meadows (Hudsonian Godwit, Least Sandpiper, Stilt Sandpiper, Red-necked Phalarope)
- lichen heath with dwarf forests of willows and birches (Lesser Yellowlegs, Semipalmated Sandpiper)
- tundra with outlying clumps of dwarf black spruces (American Golden Plover, Dunlin)
- gravel ridges, old beach lines that were the former coast of Hudson Bay, eskers and lowlands (Semipalmated Plover)
- wet tundra (Whimbrel)
- coastal mud and boulder flats (these are important feeding areas for a variety of species).

Each of these habitat types has its own assemblage of shorebirds. Some sites, such as the gravel ridges and old beach lines where the Semipalmated Plover breed, would be particularly susceptible to pedestrian disturbances such as ecotourism during the nesting period, while tundra areas are very susceptible to any kind of surface disturbance and development. Planning for the Churchill region will require that all habitat types be considered if the unique species diversity is to be preserved.

2.2.iii Key Sites Used by Breeding Shorebirds

Most species breed in fairly low densities, so it is difficult to define specific important breeding areas, except for populations with very low numbers, such as Piping and Mountain plovers. While some species nest at fairly consistent sites and densities from year to year (e.g., Long-billed Curlews, Marbled Godwits), others move to areas with appropriate water conditions (e.g., American Avocet, Wilson's Phalarope and Black-necked Stilt). Broad breeding areas and densities for the 24 species breeding in Prairie Canada, as well as their summer and winter ranges, are depicted in Appendix F.

2.2.iv Threats to Breeding Shorebirds

Prior to the European settlement of Prairie Canada, there was little disturbance of prairie breeding shorebirds. Some species were later subjected to unregulated hunting during migration and in wintering areas, but hunting ceased to be a threat to shorebird species with the signing of the Migratory Birds Convention Act in 1916. This treaty ended the hunting of all but two species in North America (American Woodcock and Common Snipe), and the hunting of those is closely regulated. Since that time, however, the numbers of some species have remained low. With increased agricultural activities and urbanization of the prairies, the habitats of many breeding shorebirds have been subjected to continued long-term degradation. Perhaps the greatest threat to breeding shorebirds in Prairie Canada comes from the unpredictable cumulative effects of many on-going activities, some of which are listed below.

2.2.iv.a Prairies

1. Loss of Wetlands

Wetland drainage and the historic conversion of many shallow marshlands to agricultural land have reduced the amount of wetland habitat available for brood rearing by summer resident shorebirds, some of which also require adjacent flat areas of low vegetation in which to nest. Land use patterns have affected run-off frequencies and quantities and this, along with low level drainage, have affected the degree of permanency of many wetlands.

2. Changing Agricultural Practices

Over the long term, agricultural practices have drastically changed the landscape and resulted in a major reduction of grassland habitats. Various estimates on the amount of

decline have been made (AEP 1997); approximately 75% of the historic area of Canadian prairie grasslands has been lost, primarily through agricultural practices. In Alberta, about 61% of the prairies, primarily mixed grass, have been lost, while Saskatchewan has lost about 83% and Manitoba almost 100% of their mixed grass and tall grass prairie (Samson and Knopf 1994; AEP 1997).

Large areas of native grassland now remain only in the more arid mixed-grass portions of Southeastern Alberta and Southwestern Saskatchewan. Of the approximately 25% of native grassland in Prairie Canada that remain, losses continue; between 1991 and 1996, about 6% (570,000 ha) of what remained were lost (Statistics Canada 1997). Grazing pressure has generally increased on remaining native grasslands (Gayton 1991). Fire frequency has also been reduced, resulting in changing species composition. The aspen parkland has been extended and wetlands have been drained.

The intensification of agriculture in recent years and increases in continuous cropping practices (and subsequent decrease in fallowing) in some areas has meant that small grain stubble is no longer available as a breeding habitat for upland-nesting shorebirds such as the Long-billed Curlew. Reduced stubble availability due to fallow reduction may be ameliorated by a shift towards the practice of direct seeding of small grains into standing stubble. Earlier mowing of haylands has been related to declines of nesting Upland Sandpiper in other parts of the range by destroying the nest site or causing mortality of incubating adults.

3. Fluctuating Climate Conditions/Long Term Drought

The prairie landscape is typified by continual changes in the landscape's water regime. Short-term effects can be amplified by long periods of drought resulting in the loss of the majority of the smaller wetlands and detrimental effects to larger water bodies. Continued drought may allow for the cultivation of smaller basins by local landowners. Over the longer term, drought frequency and severity could become amplified by the impact of climate changes such as global warming.

4. Avian Disease Outbreaks

The shallow waters of the prairie and boreal fringe wetlands, heated during the late summer months, are susceptible to the growth and development of botulism. This disease is responsible for the death of large numbers of water birds. Water level fluctuation, a feature of prairie wetlands, will influence the degree and occurrence of particular disease outbreaks. Most important shorebird staging sites in the prairies have had botulism outbreaks, and in some areas, thousands of shorebirds have died.

5. Shoreline Use

Any shoreline use, whether for agricultural, industrial or recreational purposes, can pose a threat to shoreline breeding species. To date, the cultivation of shorelines

during low water periods and the heavy trampling of shorelines by livestock have posed the greatest threat to breeding shorebirds in Prairie Canada.

The increasing use of shorelines in the three Prairie Provinces by cattle, and by cottagers and other recreational users, especially the impact of foot and all-terrain vehicle traffic, has also reduced both the quantity and quality of key stretches of nesting habitat available for shoreline breeders, especially for Piping Plover.

6. Introduction of Non-Native Plant Species

The introduction of non-native plant species, both accidental and deliberate by such activities as land reclamation and the regrassing of areas for agricultural or other purposes, can result in long-term changes to native habitats. Such changes can be detrimental to shorebird habitats, particularly where tall vegetation, which is not suitable as shorebird nesting habitat, replaces naturally shorter or non-vegetated areas.

7. Wetland Reservoir Management

The management of artificially constructed reservoirs, such as at Lake Diefenbaker, can pose a threat to breeding shorebird species. During the low water cycle at Lake Diefenbaker, the shoreline attracts numbers of breeding pairs of Piping Plovers, an endangered species. The filling of this reservoir, during peak mountain run-off from river headwaters in late spring/early summer, usually results in the destruction of the nests and the loss of any potential reproduction from those breeding pairs for the year. At other sites, the addition of irrigation water to regulated wetlands during the critical breeding period can also result in nest loss for other species (particularly American Avocets, Black-necked Stilts, Wilson's Phalaropes)

8. Power Lines

Power lines that cross both wet and dry wetland basins are known to cause mortality to breeding shorebirds and other birds. Their importance to shorebird population dynamics is unknown.

2.2.iv.b Boreal

1. Boreal Forest Reduction

The growth of the logging and pulp and paper industries in the boreal region and resultant cutting could represent a threat to breeding habitats for shorebirds such as yellowlegs and dowitcher species. The clearing of forested lands also results in surface drying that can directly result in wetland loss.

2. Agricultural Expansion

The expansion of agriculture into cleared lands is often accompanied by direct drainage of bogs, muskeg, and other wetland areas.

3. Oil and Gas Activities

The expansion of oil and gas activities and exploration leads to the fragmentation of habitat as new roads and gas pads are developed. Oil Sands extraction disturbs the landscape to a greater degree and for a much longer period of time than traditional forest activities. With extensive landscape removal, hydrological regimes, complete soil profiles and associated habitats are permanently removed, disrupted or altered. Permanent as well as semi-permanent wetland areas, with the resultant loss of the hydrological component, are replaced by reclaimed soils and re-vegetated to allow for the development of dry upland and parkland habitats.

4. Climate Change

Long-term climate change has the potential to significantly affect the extent and distribution of boreal forests and wetlands, and allow for the further expansion of agricultural activities into the region.

2.2.iv.c Coastal Hudson Bay, Manitoba

1. Eco-tourism

The Churchill area tundra and coastline is an important eco-tourism destination in the Prairie provinces. The potential exists for the serious disturbance of breeding shorebirds in the area.

2. Effects of Expanding Lesser Snow Goose Population

The increase of the Lesser Snow Goose population has been identified as having a detrimental effect on Hudson Bay coastal wetland habitat. This particular habitat may be important for certain species of shorebirds.

3.0 PASSAGE MIGRANT SHOREBIRDS IN PRAIRIE CANADA

3.1 INTRODUCTION

Passage migrants refer to species not breeding in the three prairie provinces. Many species of local breeders flock in spring and/or fall, but are covered under previous sections. Generally, the habitat preferences of passage migrants are similar to those of breeding species. Shorebirds are abundant during both spring and fall migration in shallow wetlands of the prairies. Much less is known about staging sites in the boreal, and some observations exist on concentrations of shorebirds in the Coastal Hudson Bay region.

For hemispheric populations, the prairies are most important to migrating Hudsonian Godwits in fall (western arctic breeders), Sanderlings and Stilt Sandpipers (both seasons) and Red-necked Phalaropes and White-rumped Sandpipers in spring. Numbers of staging Buff-breasted and Baird's sandpipers may be of global importance as well.

3.2 BIOLOGY, DISTRIBUTION AND THREATS TO PASSAGE MIGRANT SHOREBIRDS

3.2.i Passage Migrants

3.2.i.a Prairies

About 33 species of shorebirds are observed regularly during migration in the prairie region of Canada, of which 22 do not breed here. Passage migrants use the prairies as a migration corridor between breeding areas in northern Canada and Alaska and wintering areas in Central and South America. Some migrate 21,000 km annually and rely on the mid-continental interior wetlands to provide areas to rest and replenish energy reserves for migration. Spring migration is from late April through mid June with timing of peak numbers varying among species. Fall migration is more drawn out, occurring from mid July through the end of September. The timing and pattern of migration vary with species as well as age and sex cohorts. Species that are much more common in spring than fall include Sanderling, White-rumped Sandpiper, Red Knot, Ruddy Turnstone, Dunlin, American Golden-Plover, and Black-bellied Plover. Species more often seen in fall are Hudsonian Godwit, Lesser Yellowleg, Greater Yellowleg, Short-billed Dowitcher, and Long-billed Dowitcher, and those abundant in both seasons include Red-necked Phalarope, Semipalmated Sandpiper, Stilt Sandpiper, Least Sandpiper, Baird's Sandpiper, Pectoral Sandpiper, and Semipalmated Plover (Colwell et al. 1988, Alexander and Gratto-Trevor 1997).

Prairie wetlands are extremely dynamic, with fluctuating water levels within the annual seasonal cycles and between years. This directly affects the availability and quality of suitable habitat (mudflats and shallow water areas) for migrant shorebirds during roosting and feeding. Shorebird migrants are therefore opportunistic in using available

suitable wetland habitat. During years of favourable water conditions, they will tend to disperse across the prairie landscape rather than becoming highly concentrated at predictable staging areas, such as occurs along the coastal regions of the continent. However, large shorebird concentrations will stage on key wetlands with optimal habitat and food resources during drought years when the smaller, shallower wetlands are dry. The suitability of prairie sites is unpredictable over the long term; thus the evolution of opportunistic behaviour by shorebirds migrating through the continental corridor.

No comprehensive surveys for prairie migrants have been carried out throughout the prairie region in any one season. As noted, numbers vary dramatically among years at specific sites (and probably regionally) depending on local water conditions and on conditions farther south. For example, spring drought in the U.S. interior is thought to force more birds to stage in the Canadian prairies. Length-of-stay is variable, at least among species and between seasons, and likely among sites, years and age groups, (although in general fall migrants appear to stage for longer periods of time than spring migrants). Therefore, there are no good estimates for numbers of shorebirds, of any species, migrating through the Canadian prairies. However, there is information on species chronology, and peak numbers of each species at various sites and seasons.

As noted, for hemispheric or Canadian populations, the prairies are apparently most important in providing spring staging sites to Sanderling and White-rumped Sandpiper. Five of the top ten sites in interior North America recognized for peak spring numbers of Stilt Sandpipers are in Saskatchewan and Alberta (Skagen et al 1998). In fall, significant numbers of Stilt Sandpipers and Hudsonian Godwits (possibly most of the western arctic breeding populations), are present in the prairies.

A considerable number of Red-necked Phalaropes and Semipalmated Sandpipers, apparently primarily western arctic breeders, stage in the prairies. However, in spring, many of the Semipalmated Sandpipers moving through the prairies appear to nest in the central Canadian arctic and migrate south in the fall through the east coast of Canada (Bay of Fundy) and the northern United States (Gratto-Trevor and Dickson 1994).

Short-billed and Long-billed Dowitchers stage in large numbers in the prairies in fall. A significant and unusual feature for shorebirds is that dowitchers moult flight feathers during this period, while almost all other North American species replace wing and tail feathers upon arrival on the wintering grounds.

Historically, Eskimo Curlews may have migrated north through Saskatchewan in significant numbers (Gollop et al. 1986). No verified nests of young have been found for well over 100 years, despite considerable searches being carried out in historic arctic breeding areas in the 1970s to 1990s. Nevertheless, occasional, unconfirmed, sightings of nonbreeding birds, some by very experienced birders, still occur, including three recent possible sightings in the Canadian Prairies (Pollock 1996, Walden 1996, Gollop 1997, Gill et al. 1998). Eskimo Curlews may persist in very small numbers, but populations have not recovered in a measurable amount from the population crash of

the 1870s to 1890s. Eskimo Curlews are easily confused with Little Curlew (*Numenius minutus*), Whimbrel, Long-billed Curlew (especially fledged young since bills of juveniles continue to grow for months), Upland Sandpiper, Pectoral Sandpiper, and Stilt Sandpiper (Gratto-Trevor 1999).

3.2.i.b Boreal

Migrant shorebird information in this ecoregion is limited because of the expense and difficulty of access. Current data are limited to incidental observations by researchers on other surveys (e.g., waterfowl surveys), and an aerial shorebird survey of the Peace Athabasca Delta in 1999. Results of the 1999 survey showed limited shorebird use by arctic migrants, even with large expanses of potentially suitable habitat available (maximum daily count 23,000 individuals) (G. Beyersbergen, unpubl. data). Shorebird use is likely opportunistic, depending primarily on habitat availability in boreal wetlands and perhaps on energy reserves of migrants or severe weather conditions, forcing birds to land and wait for favourable conditions before continuing their migration.

3.2.i.c Coastal Hudson Bay, Manitoba

Migrant shorebird information is limited and derived mainly from observations by naturalists in the Churchill area, anecdotal information from researchers working on other species (e.g. goose banding operations along the coastal region), and a few surveys or research studies on shorebirds. Several areas of importance that have been identified to date include the delta regions of the Nelson/Hayes Rivers (1974), the coastal region around Churchill (6,000 Ruddy Turnstone in 1982), and Cape Merry near Churchill (1500 Whimbrel - early July 1999, W. Koonz pers. comm.).

3.2.ii Habitat Needs of Passage Migrant Shorebirds

Frequent short-term climate fluctuations and a broad diversity of wetland permanency and depth have historically assured that Prairie Canada wetlands remain at varying stages of succession. Changes in water depth from year to year significantly alter the availability of individual wetlands as suitable feeding areas for shorebirds. Migrant shorebirds frequently shift from one feeding area to another depending on local wetland conditions. Topographical variation and climate fluctuation across the broad prairie region virtually assures that the wetlands in some portion of the region will meet the feeding requirements of most migrant shorebirds in any one season.

Passage migrant shorebirds can generally be classified by feeding guild into four groups: mud, wading, upland and seiche (wind tide) shoreline (Harrington 1995). Wading shorebirds can be further classified by their feeding depth requirements. Many, particularly upland breeding species, use different feeding habitats during migration than during breeding or winter.

The four shorebird guilds, during the migration period, would include the following migrant species:

Mud: Black-bellied Plover, Semipalmated Plover, Spotted Sandpiper, Whimbrel, Semipalmated Sandpiper, White-rumped Sandpiper and Least Sandpiper

Wading: Greater Yellowlegs, Lesser Yellowlegs, Solitary Sandpiper, Hudsonian Godwit, Western Sandpiper, Dunlin, Stilt Sandpiper, Pectoral Sandpiper, Short-billed Dowitcher, Long-billed Dowitcher, Red-necked Phalarope (swimming).

Upland: American Golden Plover, Baird's Sandpiper, Buff-breasted Sandpiper.

Seiche shoreline: (Simulated wind tide effect on larger interior wetlands, e.g., Beaverhill Lake): Ruddy Turnstone, Red Knot, Sanderling.

Some seiche shoreline species, such as the Ruddy Turnstone, occur where they can use habitats along the shorelines of large shallow freshwater bodies affected by wind tides and/or wave action, during migration through interior regions. Others, such as Red Knot and Black-bellied Plover, will roost along shorelines, but feed in more diversified habitats including uplands (e.g., cultivated fields) in interior regions. A diversity of habitats should provide feeding regimes for a variety of shorebird species and should include the four components of uplands, mudflats, shallow wetlands less than 20 centimetres in depth, and the seiche shoreline or intertidal interface between land and water. Generally, the priority habitats for migrant shorebirds include the following:

- large shallow open water bodies (Red-necked Phalarope),
- shallow wetlands less than 20 centimetres in depth (all wading species),
- mudflats and shorelines; these habitats are especially notable in wind tide/wave action affected zones of some larger wetlands. They are also important roosting sites for shorebirds: (some plovers, Ruddy Turnstone, Sanderling, "peeps", including White-rumped, Semipalmated, Least and Baird's Sandpiper),
- wet meadows and closely cropped pastures (Baird's, Pectoral and Buff-breasted Sandpiper),
- cultivated fields (American Golden-Plover).

3.2.iii Key Areas Used by Migrant Shorebirds

As noted earlier, natural water conditions vary dramatically from year to year and between seasons in the prairies. Since most shorebirds are dependent on shallow wetlands for foraging (migrants usually require mudflats with little or no vegetation), sites suitable one year may be inappropriate the next (or even the next day). Therefore, numbers of shorebirds using major prairie wetlands vary enormously from one year to the next. A number of wetlands have been identified, as a result of systematic surveys and observations by researchers and naturalists, as being important to shorebirds as significant migration staging sites (Appendix G). Priority sites are those

with high bird numbers, especially of specific species, and include all designated prairie WHSRN sites. The priority shorebird sites are further profiled in a "Shorebird Site Action Sheet" delineating site description, importance, threats, protected status, action required and regional contacts (Appendix H). Potentially important sites with historical information of high numbers, but no recent data, are listed in Appendix I. More information is needed on these sites and other potentially important areas. Key migration staging sites for each species of shorebird migrating through the prairie region are plotted for both the spring and fall migration periods in Appendix J. General breeding areas for these species are shown in Appendix K.

Priority migration sites are typically larger than average, and are relatively permanent during periods of drought when smaller wetlands are dry. Use is restricted or eliminated during wet periods when excessive water levels flood the available habitat there, forcing birds to seek alternative sites. During these wet periods, complexes of smaller wetlands may provide the habitat necessary to sustain migrant shorebirds in the region. This change of use, and the extent to which these smaller wetland complexes are used during wetter conditions, must be addressed in future assessments of habitat use and requirements by migrant shorebirds.

3.2.iv Threats to Passage Migrant Shorebirds

With the exception of southern Manitoba, most of Prairie Canada remained primarily unsettled until the 20th Century, and the unregulated hunting of shorebirds in the area was relatively insignificant. However, this was not the case in southern portions of the United States through which the majority of our shorebirds pass during spring migration.

Many of our migrant populations also exhibit a bimodal pattern of migration and pass through eastern Canada and along the East Coast of the United States during fall migration. There they were heavily hunted. Even after the signing of the Migratory Birds Convention Act, many species continue to be hunted on their wintering grounds in South America. As a result, some migrant populations have shown poor or relatively limited recovery in numbers. Factors limiting those populations still exist beyond the bounds of Prairie Canada. Any conservation plans for these migrant species must include cooperative efforts with other parts of Canada, the United States, Mexico and Caribbean, Central, and South American nations. The conservation of migrant shorebirds will require the development of partnerships throughout the Western Hemisphere for plans to succeed.

In Prairie Canada, modern-day threats to migrating shorebirds include those that result in direct mortality, those that cause disturbance to migrants, particularly at roosts and during foraging, and those that affect habitat quality and quantity of both roosting and foraging areas. Perhaps the greatest threat comes from the unpredictable cumulative effects of many of the threats listed below.

3.2.iv.a Prairie

1. Habitat Loss

Since the agricultural settlement of the prairies, many wetlands have been ditched and drained. Others have been stabilised with the result that vegetation has grown up on what were formerly open shorelines. Changes in upland use have often affected local run-off patterns resulting in apparently permanent declines in many wetland areas. These areas would have provided significant habitat for migrant shorebirds. While often negatively affecting the degree of permanency of breeding shorebird habitats, low level drainage and changes in run-off patterns have, in some cases, actually improved the quality of spring-time feeding habitats for migrant shorebirds. For example, a project near Beaverhill Lake, Alberta, resulted in the creation of a number of shallow grassed wetlands that provide excellent backflood habitat for yellowlegs and godwits each spring.

The conversion of native grasslands into cultivation has severely limited the availability of upland grassland habitats over large portions of the prairie. Almost all of the former grasslands in the tall and mid-grass prairie and the aspen parkland are now under cultivation, with significant amounts of native grassland remaining only in the drier portions of Prairie Canada.

2. Climate Changes

Climate warming in inland Prairie Canada is expected to increase the frequency and severity of prairie droughts. The long-term drying of shallow wetland habitats could severely affect the availability of suitable habitats for migrant shorebirds.

3. Shoreline Use

As noted for breeding shorebird species, disturbance due to shoreline use for agriculture, industry or recreation can significantly affect the availability of shoreline areas to migrant shorebirds. Cultivation of shorelines during low water periods and heavy trampling of shorelines by livestock can result in long-term vegetational changes in the riparian zone, often severely impacting the suitability of these areas for migrant shorebirds.

Because many "fall" shorebird migrants arrive in Prairie Canada from mid-July through August, there is a broad period of overlap with cottage use and other more transient recreational uses of beaches. Most of the resulting disturbance occurs on sand beaches. However, gravel beaches and other shoreline areas, used by roosting shorebirds, are increasingly subject to disturbance by summer beach-users, with the potential impact increased by all-terrain vehicles or the presence of dogs. In Atlantic Canada, for example, a shift has been noted in the roosting pattern of Semipalmated Sandpipers into fewer large aggregations. Although this clumping may also be a response to increased risk of predation by peregrines over the same period, these

observations suggest that human recreational activity may now be limiting the availability of undisturbed roost sites at key areas. Birds may be forced to shift from ideal foraging and roosting habitats to those of lesser value. The presence of people and dogs appears to pose an increasing threat to roosting shorebirds in Prairie Canada, although to a lesser extent at the present time.

4. Avian Disease Outbreaks

The shallow waters of the prairie and boreal fringe wetlands are susceptible to the growth and development of botulism. This disease is responsible for the death of large numbers of wetland birds. Water level fluctuation, a feature of prairie wetlands, will influence the degree and occurrence of particular disease outbreaks and in some areas thousands of shorebirds have died. The highest risk period for botulism outbreaks in Prairie Canada coincides directly with the fall migration period for shorebirds.

5. Eco-tourism

In addition to other activities that incidentally affect shorebirds, an increasing number of people visit roosts specifically to view these concentrations of shorebirds. This can become an increasing source of disturbance at major concentration points. Pressures due to eco-tourism will continue to increase. Eco-tourism is probably most easily regulated through the provision of viewing and staffed interpretation facilities.

6. Resource Harvesting

Harvesting of resources in saline wetland areas frequented by foraging shorebirds can result in both direct competition for food species and degradation of these habitats. The harvesting of brine shrimp (*Artemia* spp.) and the mining of salt deposits both have the potential to influence habitat quality for migrant shorebirds at saline lakes. There can, however, also be some positive benefits. For example, at Chaplin Lake, a Hemispheric reserve under the WHSRN program, there is a solution mining operation for sodium sulphate that incidentally increases the amount of shallow water habitat for migrant shorebirds. In some cases during drought periods, this industrial activity has provided the only source of stable water, rich in invertebrate populations, in southern Saskatchewan.

3.2.iv.b Boreal

1. Boreal Forest Reduction

Deforestation of the boreal region through logging for lumber and pulp and paper production has the potential to significantly influence wetland drainage patterns and water quality in the north. The effect this would have on migrating shorebirds is unknown at this time.

2. Agricultural Expansion

Agricultural expansion into boreal regions usually results in the drying of the land and in the drainage of wetlands. The effect this would have on migrating shorebirds is unknown at this time.

3. Climate Change

Long-term climate change through global warming could significantly affect the extent and distribution of the boreal forest and wetlands, and allow for the further expansion of agricultural activities into the region.

4. Oil and Gas Activities

The development of oil sands results in extensive landscape removal in which hydrological regimes, complete soil profiles and associated habitats are permanently removed, disrupted or altered, resulting in the permanent drainage of wetlands. Oil and gas exploration further fragments the habitat.

5. Reservoir/Hydroelectric Development

The construction of hydroelectric and flood reduction dams on the major north-flowing rivers, such as the Bennett Dam on the Peace, affects the annual run-off peaks and flood frequencies through water storage. This in turn reduces flood frequencies in the northern deltas, such as the Peace-Athabasca, and can significantly alter habitats available to migrant shorebirds.

3.2.iv.c Coastal Hudson Bay, Manitoba

1. Climate Change

The impacts of long-term climate change will be felt in both coastal and inland environments. Shorebird habitats in the Churchill/Hudson Bay coastline area could be severely affected. Current climate change scenarios indicate that sea level will continue to rise. This will likely have a substantial influence on the availability and distribution of high-tide roosts. Changes in characteristics of tidal currents and amplitudes may affect the distribution, density and species composition of tidal invertebrates.

2. Effects of the Expanding Lesser Snow Goose Population

The increase of the Lesser Snow Goose population has been identified as having a detrimental effect on Hudson Bay coastal wetland habitat. This particular habitat may be important for certain species of shorebirds that use it for roosting and feeding sites during migration.

4.0 PRIORITY NEEDS FOR SHOREBIRD CONSERVATION

4.1 INTRODUCTION

In this section we outline the priority needs or actions for conserving shorebirds in Prairie Canada. This is an attempt to guide strategic thinking, to encourage a coordinated approach in delivery mechanisms directed at shorebird conservation issues and to ensure that duplicative programs are minimized and program capacity is maximized. We present these needs in three key sections: Population Monitoring, Research Needs and Habitat Management. As programs are developed for implementation of this plan's priorities, efforts must be taken to ensure that clear goals are in place upon which to measure success and/or failure. The North American Waterfowl Management Plan has taken the approach of using specific population targets for each waterfowl species as the measure for success. Similarly, the U.S. Shorebird Conservation Plan proposes to set population targets as measures. Given the total lack of reasonable population estimates for shorebirds hemispherically and globally, and the impossible challenge of monitoring populations on a prairie scale, we have not accepted population targets as a viable tool in a prairie shorebird context. We do, however, strongly recommend that population trends for specific species, gathered at various levels (see monitoring section), and habitat availability trends be used as the key measures of success. Although priorities have been identified as high or medium, all are very important. Further refinement has not been done at this stage as other factors may dictate priorities. As the Plan moves into the next phase of implementation, consultation with a broader range of partners will further define and establish priorities for research and monitoring activities.

4.2 POPULATION MONITORING

The highest monitoring priorities include assessing the accuracy of general prairie breeding surveys, International Shorebird Survey ISS-type (site specific, multispecies) surveys of prairie migrants, and species-specific surveys of prairie migrants and the International Piping Plover Surveys. Priorities of slightly lesser importance include increasing Breeding Bird Surveys, special Mountain Plover surveys, prairie-wide random quarter-section prairie breeder surveys, determining the distribution and relative abundance of boreal breeders, repeat of Churchill area breeder surveys, and Hudson Bay coast migration and habitat surveys. Further details of priority needs for population monitoring for both breeders and migrants are provided below.

4.2.i Breeding Shorebirds

4.2.i.a Prairie Breeders

1. **Assess accuracy of BBS and random quarter-section system.**
   The random quarter section method involves selection of survey areas in randomly chosen quarter sections in each ecozone. Surveys for breeding

birds are carried out in the randomly chosen areas (Stewart and Kantrud 1972; Igl and Johnson 1997). This provides relative breeding density information over a large area, and if carried out at periodic intervals, changes in population numbers over time also can be measured over a broad area. There is a need to examine the BBS for its value in determining trends in shorebirds, and, if useful, for what species.

If useful, conduct and compare the random quarter section method to BBS routes in the same area with similar habitat. Look for relative differences in numbers of species and do correction of BBS or quarter-section numbers if relative differences prove consistent (can be combined with breeding biology research studies noted later). Investigate and evaluate other techniques or methods for assessing populations of prairie breeding shorebirds. (HIGH priority)

2. **Continue periodic International Piping Plover Census** (every 5 years) for numbers and trends. (HIGH priority)

3. **Conduct Special surveys** in extreme south Alberta and Saskatchewan for **breeding Mountain Plover** to determine numbers and year-to-year consistency over 5 years. (Medium priority)

4. **Increase numbers of Breeding Bird Surveys** and continue them each year, for trend analysis if findings on the accuracy and usefulness of BBS prove positive (see above). (Medium priority)

5. **Assess total population numbers of breeding shorebirds in prairies by random quarter-section system** as used in North Dakota if the findings discussed above are found to be positive for this technique. Repeat the surveys two years in a row during a 20 year time span and repeat 20 years later, which will help determine key breeding locations for each species as well. (Medium priority)

4.2.i.b Boreal Breeders

1. **Assess populations of boreal breeding shorebirds** in cooperation with forest songbird studies. Initially this will consist of rough estimates of distribution and relative abundance of each species. (Medium priority)

4.2.i.c Coastal Hudson Bay Breeders

1. **Repeat Jehl Churchill surveys. Repeat the surveys** 2 years in a row during a 10 year time span and repeat 10 years later to determine trends of breeding shorebirds. (Medium priority)

4.2.ii Passage Migrants

4.2.ii.a Prairie Migrants

Long term monitoring in the interior region to detect population trends of migrants will be extremely difficult because of the dispersion of shorebirds across a broad landscape and the lack of dependability of wetland habitats and shorebird occurrence. Monitoring long term population trends would be best suited at coastal and wintering areas where birds are concentrated and expected on an annual basis. Many of the Broad-scale and Special Species monitoring protocols proposed for the U.S. Shorebird Conservation Plan (described at the following website: http://www.manomet.org/USSCP/files.htm), would cover Prairie Canada shorebirds. However, it would be difficult or impossible to separate specific trends of Prairie Canada birds. Despite this, efforts to examine this capacity and to integrate shorebird plan objectives between the U.S. and Canada in this area should be pursued. Two important monitoring needs for migrants include:

1. **Broad Scale Monitoring - International Shorebird Survey (ISS) type.** This survey would monitor habitat availability and shorebird use of specific sites over time for migrants. Volunteers and professionals would count all shorebirds at specific sites, at intervals over spring and fall migration. If emphasis is placed on continuous coverage over decades at key census locations (WHSRN sites), the potential for population trend monitoring is increased. If the number of sites with unpredictable habitat (smaller, prairie wetlands) is increased, it will assure that large numbers of birds are not missed. In addition to censusing birds every two weeks (or more often) during migration periods each year, simple habitat information is requested: wetland condition (whether water levels are suitable for shorebirds, and wetland vegetation absent or sparse), use of surrounding land, and disturbance. A combination of aerial and ground surveys across a large area may be required to develop a better understanding of shorebird use in the region. (HIGH priority)

2. **Special surveys for single species.** This survey would provide information about the proportion of the hemispheric population of certain species using prairie staging areas. It is most applicable to species identified for potential monitoring in the prairie region that do not occur elsewhere in Canada or North America, or for which high numbers are observed during migration. These surveys would contribute towards a hemispheric monitoring scheme. They should cover all suitable habitat for the species within the region. Coordination of timing of the census is critical to ensure simultaneous counts and the peak period for migration must be well known to facilitate optimal monitoring. Peak migration periods have been documented by researchers in prairie Canada and for a number of locations and species in the mid-continental interior (Skagen et al. 1998). For example, Sanderlings were surveyed by this method in spring 1994, with coordination of efforts by SWCC and Nature Saskatchewan. Species identified for monitoring on the

Canadian prairies because of high numbers or concentrations during migration include Sanderling (late spring), Stilt Sandpiper (spring and/or fall), Red-necked Phalarope (spring) and Hudsonian Godwit (fall).

A well-planned series of spring surveys (2-3 survey days over a 2-3 week period) could cover Sanderling, Stilt Sandpiper, White-rumped Sandpiper, and potentially Red-necked Phalarope.

In fall, since birds stage for longer periods, two surveys two weeks apart in late July/early August could census Hudsonian Godwits and Stilt Sandpipers. Since the surveys cover a large geographical area they would be carried out once every five years. (HIGH priority)

4.2.ii.b Boreal Migrants

1. **Specific aerial surveys to determine the shorebird use of certain areas** followed by ground surveys (to determine numbers of each species) if large numbers of migrants are seen in aerial surveys. (Medium priority)

4.2.ii.c Coastal Hudson Bay Migrants

1. **Aerial and/or ground surveys** are needed to assess numbers of migrants and habitat changes due to natural effects and white goose overgrazing. (Medium priority)

4.3. RESEARCH NEEDS

In Prairie Canada, most research activities on shorebirds have focussed on the prairie region and the Coastal Hudson Bay region. Basic research on breeders in the boreal region and on passage migrants in both the boreal and Coastal Hudson Bay region is lacking. Initial priority research needs include studies on survival and productivity in Piping Plovers, factors affecting productivity and survival of other breeders, and effects of anthropogenic changes and avian disease outbreaks, such as botulism, on shorebird populations. Slightly lesser priorities include determining genetic diversity, migration and wintering routes of species of concern, and examining shorebird use of specific prairie staging sites (length-of-stay, weight gain, movements, site tenacity). Further details are found below.

4.3.i Breeding Shorebirds

4.3.i.a Prairie Breeders

1. **Endangered species:**
   Piping Plover. Survivorship and dispersal data are needed to improve population modelling efforts aimed at assessing population viability and to

determine whether recovery goals and conservation efforts are sufficient, appropriate (e.g. improve adult survival versus improve productivity) and adequate. More data are needed on productivity of Piping Plovers in different regions of the range (e.g., Missouri Coteau), and predators must be identified, as well as the means to reduce their influence. (HIGH priority)

Mountain Plover. Distribution and abundance need to be clarified in Saskatchewan and Alberta through extensive and intensive surveys. Habitat preferences and threats should be documented on these surveys. Information on population dynamics and dispersal are needed if sufficient Mountain Plovers are found to consistently breed in Canada (e.g. >50 pairs). (Medium priority)

2. **Factors affecting productivity and survival.** Studies would involve measures of nest success (causes of failure, re-nest potential) and survival of chicks from hatch to fledging, juvenile and adult survival, age of first breeding, site fidelity, natal philopatry, sex differences in care of eggs and young, and modelling of population dynamics to determine if populations are being maintained. This could be combined with studies examining specific perceived threats (or benefits) to shorebird populations in the prairies. Upland breeding species would include Long-billed Curlews, Upland Sandpipers, Marbled Godwits and Willets. Wetland edge breeders are American Avocets, Wilson's Phalaropes, and Black-necked Stilts. These species studies would involve finding and monitoring nests and broods, capturing and resighting adults, and surveys. Due to extremely high variability among years in prairie habitats (particularly wetland conditions), and the need for returns of marked birds to measure survival, studies of specific species would continue for a minimum of five years (in some cases, several species could be studied simultaneously). (HIGH priority)

3. **Research on effects of anthropogenic changes on shorebird populations.** This would include studies of the effects of various anthropogenic factors on shorebird numbers, productivity, survival, and habitat. Potential threats could include the effects of agricultural practices (such as wetland drainage and cultivation, winter cereals, zero tillage), fragmentation of habitat and grassland loss, changes in landscape composition, changes in vegetation cover and species from planting dense nesting cover for waterfowl, planting other alien species to recover disturbed habitats (e.g. pipelines, oil wells), changes in grazing regimes, powerlines through wetlands, drought and climate change, changes in predator regimes and toxics. (HIGH priority)

4. **Genetics. Identification of conservation units, genetic diversity migration routes and wintering sites for species of concern** are important in gaining an understanding of inter-relatedness among sites. Recovery objectives can be more accurately designed. Description of genetic diversity

and population structure in these shorebirds will allow scientists to understand the relative status of various populations within species. Determination of population-specific genetic markers will allow us to identify species migration pathways and wintering grounds. Initially, blood (or other tissue) samples would be collected from shorebirds in various breeding areas, in cooperation with other jurisdictions, and later, from various staging and wintering areas for the species. Species of concern and those with disjunct breeding populations include Piping Plover, Marbled Godwit, Willet, and Black-necked Stilt. Other important species are Long-billed Curlew, American Avocet, Wilson's Phalarope, and Upland Sandpiper. (Medium priority)

5. **Identifying sex and age differences in wintering sites and migration routes**. This could involve cooperative ground surveys of suspected wintering areas for species where birds have been individually marked in the prairies (e.g., search coasts of Mexico for marked Marbled Godwits and Willets), and/or use radio or satellite transmitters. (Medium priority)

4.3.i.b Boreal Breeders

1. **Research on effects of anthropogenic changes on shorebird populations.** This would include studies of the effects of various anthropogenic factors on shorebird numbers, productivity, survival, and habitat. Potential threats could include: changes in habitat, including loss of wetlands and changes in vegetation cover and species from forestry practices, oil sands development, oil wells, pipelines and powerlines through wetlands, climate change and changes in predator regimes. (HIGH priority)

2. **Factors affecting productivity and survival.** Studies would involve measures of nest success (causes of failure, re-nest potential), survival of chicks from hatch to fledging, juvenile and adult survival, age of first breeding, site fidelity, natal philopatry, sex differences in care of eggs and young, and modelling of population dynamics to determine if populations are being maintained. This could be combined with studies examining specific perceived threats (or benefits) to shorebird populations in the boreal region. Boreal breeding species would include Greater Yellowlegs, Short-billed Dowitchers, Lesser Yellowlegs and Solitary Sandpipers. These species studies would involve finding and monitoring nests and broods, capturing and resighting adults, and surveys. (Medium priority)

4.3.i.c Coastal Hudson Bay Breeders

Research on Hudson Bay Coastal breeders in a variety of areas, as discussed below, is required in order to be able to address management concerns for species breeding in this area. Of particular concern is the Hudsonian Godwit, given that this coastline is only one of two, quite small, disjunct breeding areas for this species in the western

hemisphere. In addition, virtually all the eastern Canadian breeding population of Hudsonian Godwits (36,000 individuals) nest in this region.

1. **Factors affecting productivity and survival.** As above. Some information exists for several species, but data are lacking for most and information is needed for all species. The Hudsonian Godwit would be a primary species of concern, given the small size of its population, its disjunct breeding nature in North America and the potential threats that may face the species in the future, such as Snow Goose habitat degradation and climatic changes (see also section 4.3.i.b-2). (HIGH priority)

2. **Research on effects of anthropogenic changes on shorebird populations**. This would include studies of the effects of various anthropogenic factors on shorebird numbers, productivity, and survival. Potential threats could include climate change, human disturbance, overgrazing by geese and toxics (see also section 4.3.i.a-4). (HIGH priority)

3. **Identification of conservation units, genetic diversity, migration routes and wintering sites for species of concern**. As above. The most important species in this area is the Hudsonian Godwit, but similar studies should be carried out for other arctic shorebirds. (Medium priority)

4. **Identifying wintering sites and migration routes of Hudsonian Godwits** by radio or satellite transmitters. (Medium priority)

4.3.ii Passage Migrants

4.3.ii. a <u>Prairie Migrants</u>

1. **Effect of botulism on shorebird populations**. Almost all of the important shorebird staging sites in the Canadian prairies have had botulism outbreaks. Large kills of shorebirds have been recorded, but it is not known what effects, if any, botulism has on shorebird population dynamics. Studies would examine the numbers and ages (adult versus juvenile) of each species at risk (numbers present during an outbreak), and the numbers of each species and age group dying of botulism during the outbreak at specific wetlands. This would determine the susceptibility of different species, foraging types, and age groups to mortality, and provide better estimates of mortality. (Historically, shorebird carcasses have not been identified to species, and deteriorate faster due to their smaller size.) If mortality occurs late in fall migration, few adults may die, so effects on population maintenance may be minimal. (HIGH priority)

2. **Impacts of potential anthropogenic changes**, including climate change and toxics (selenium, mercury and pesticides). (HIGH priority)

3. **Identification of conservation units, genetic diversity, migration routes and wintering sites for species of concern**. As above. Primary species of concern would be Hudsonian Godwits, Stilt Sandpipers, Semipalmated Sandpipers and Red-necked Phalaropes (see also section 4.3.i.a-4). (Medium priority)

4. **Use of prairie staging sites by shorebirds.** This would include determination of regional movements, site fidelity, length-of-stay and weight gain information in spring and fall for selected species and areas (e.g., Sanderling at Chaplin Lake/Missouri Coteau). Dyed and/or radio marked birds would be used to examine regional movements of shorebirds migrating through prairies, turn-over rates, and to some extent, movement between spring and fall. Colour banded birds would be used to determine inter-year movements. This would enable the design of more efficient monitoring programs and provide for a more accurate estimate of maximum population sizes of some species using specific sites. (Medium priority)

5. **Identifying sex and age differences in wintering sites and migration routes** using individually marked birds, radio or satellite transmitters. This would involve considerable co-ordination with other researchers (and the public to look for marked birds). Species of interest would include Semipalmated Sandpiper, Hudsonian Godwit, and Sanderling. (Medium priority)

4.3.ii. b Boreal Migrants

1. **Research of effects of anthropogenic changes on shorebird populations.** Potential threats could include forestry practices, oil sands development, linear disturbances such as powerlines and pipelines and oil wells. (Medium priority)

2. **Effect of botulism on shorebird populations**. Potentially important shorebird staging habitats in the boreal region have had botulism outbreaks. Large kills of shorebirds have been recorded, but it is not known what effects, if any, botulism has on shorebird population dynamics. (Medium priority)

4.3.ii.c Coastal Hudson Bay Migrants

1. **Research on effects of anthropogenic changes on shorebird populations**. Potential threats could include climate change, human disturbance, overgrazing by white geese, toxics. (HIGH priority)

4.4 HABITAT MANAGEMENT

The purpose of the Prairie Canada Shorebird Conservation Plan is to ensure that we acquire the necessary knowledge to establish and carry out programs to sustain and enhance sufficient high quality habitat to support healthy populations of breeding and migrant shorebirds. Scientifically based shorebird management plans, with realistic goals for Prairie Canada need to be developed. With few exceptions to date, there has not been a great deal of research conducted on shorebirds in the region, and little long-term monitoring has been carried out. The importance of some sites to migrant shorebirds, during years of high habitat suitability, has been assessed. Little is known, however, of alternate habitats that are used when conditions at these known sites are not suitable, due to high water levels or drought conditions. Reliability of the Breeding Bird Survey data (the only wide range data available) for assessing the numbers of breeding shorebirds has not been tested. Almost nothing is known about the distribution and abundance of breeding shorebirds in the boreal forest or of the migrant use of sites in the area. Because of this lack of scientific knowledge on habitat use and species numbers, it is not possible to set realistic habitat goals at this time. There are, however, a number of habitat management practices that are being or can be implemented to maintain, or enhance existing habitat or develop new shorebird habitats. In addition to the discussion below, a synthesis of information on, effects of management practices on grassland birds, including Mountain Plover, Marbled Godwit, Long-billed Curlew, Willet, Wilson's Phalarope, and Upland Sandpiper is available on the World Wide Web at: www.npwrc.usgs.gov/resource/literatr/grasbird/grasbird.htm. Much of this information is from U.S. sites (since there are very few, if any, studies in Canada for most species), so it may not always be pertinent to Canadian prairie habitats. However, this is an excellent synthesis of current knowledge on this topic.

4.4.i Prairies

4.4.i.a Prairie Breeding Shorebirds

1. Wetland Management and Water Level Manipulation

Habitat management plans for breeding shorebirds in the prairies will need to incorporate a number of goals. Some goals include the maintenance and management of the existing wetland base through the wetland preservation and restoration programs of Ducks Unlimited Canada and the North American Waterfowl Management Plan.

There are a number of techniques and procedures used in the management of waterfowl habitat by wetland managers, which would be of immediate application in addressing the known threats to shorebird populations. Shorebird planners need to work with the North American Waterfowl Management Plan managers and others to incorporate wetland management and water level manipulation into management plans in keeping with the maintenance of suitable water levels for breeding shorebirds. Some of these techniques have been applied at sites such as Beaverhill Lake, Alberta and

the Quill Lakes, Saskatchewan to provide additional shorebird habitat, but the actual benefits to shorebirds need to be assessed and the scale of application across the prairies may be quite small. Water level manipulations also need to be better planned to prevent the flooding of dry wetland basins or the flooding of wetland margins where shorebirds are nesting. Traditionally, restoration programs have tended to focus on increasing wetland permanency, but this could have negative landscape effects on shorebirds. Incorporating restoration of a number of wetland types under NAWMP could provide broader shorebird benefits over a much larger geographic area. A shift by managers towards minimal ecological management under which wetlands are allowed to follow a more natural wet/dry cycle would be of benefit to shorebirds. Adaptive resource management needs to be applied to assess and fine-tune these applications to ensure that the greatest benefits for shorebirds in conjunction with other wetland species is realised. This will, in part, be achieved through improved communication and education.

2. Piping Plover Management

Piping Plover populations in the region have been closely monitored for a number of years, and management plans have been put into place at a number of sites by Ducks Unlimited Canada, the Alberta NAWMP and by the Saskatchewan Wetland Conservation Corporation. Techniques proposed or tested have included shoreline vegetation control through burning or water level manipulations and moving of nests (Lake Diefenbaker). Nest enclosures to exclude predators are also being tested to determine their efficacy and applicability to Piping Plover populations on the prairies. Shoreline protection plans are in place and alternate watering sites for livestock have been created to exclude cattle from the nesting sites at some locations such as at Reflex and Killarney Lakes on the Alberta/Saskatchewan border and the Quill Lakes of Saskatchewan. At other sites where problems are known to exist, plans need to be developed to adjust wetland flooding regimes to prevent nest loss. This is true not only for Piping Plover at Lake Diefenbaker, but for sites where wetlands have been recharged with irrigation water during the nesting season for both shorebirds and waterfowl.

3. Mountain Plover Habitat Protection

The few known breeding habitats of the Mountain Plover in Canada need to be protected from agricultural alteration. This species benefits from livestock grazing and any attempt at cover improvement would have a strong negative effect on the Mountain Plover. Close communication with landowners is required and any changes to land use in the area need to be closely regulated and monitored.

4. **Wetland Creation**
   Wetland creation has been demonstrated to benefit shorebird populations of some of the breeding species (e.g., Willet and Marbled Godwit). Small earthen islands in wetlands can be beneficial in providing nesting sites for American Avocets, while larger islands can be detrimental when they result in establishment of gull colonies and an increase in predation upon other breeding birds in the area.

5. **Grazing Management**
   The importance of native grasslands for some species such as Upland Sandpipers and Long-billed Curlews is known, but the impact of grazing system management on these species has not been assessed. While nest cover improvements for waterfowl could benefit Upland Sandpipers, they are likely to negatively affect habitat use by Long-billed Curlews.

6. **Habitat Protection**
   The native prairie land base needs to be preserved and prairie upland nesting habitats need to be managed as defined by research studies. To accomplish this, habitat managers will need to work closely with landowners, grazing associations, irrigation districts, local authorities and other land managers, the oil and gas industry, policy makers, and regulators. Habitat managers also need to work with these groups to reduce the disturbance of important shorebird nesting sites such as at the Piping Plover lakes.

7. **Conservation easements** may prove to be a useful tool for the conservation of both wetland and native prairie habitats.

8. **Development Restrictions**
   Overhead wires and power lines should be excluded from crossing wetland habitats. Timing restrictions on development should be adhered to.

4.4.i.b Prairie Migrants

Habitat management techniques for passage migrants in the prairies are essentially the same as those employed for breeding shorebirds, e.g., wetland preservation, restoration and creation.

1. **Identification of Critical Habitats**
   Additional work is required to identify and protect important migrant shorebird habitats. Efforts to date have been focused on high concentration areas, but complexes of small wetlands may also be critical as alternate sources of habitat, given the cumulative importance of small numbers of shorebirds on large numbers of small wetlands. This may be particularly important when the major sites lack suitable habitat due to water level fluctuations.

2. **Water Level Management**
   Greater attention needs to be paid to water level management and manipulation to ensure that a variety of wetland habitat types continue to be maintained in a complex such as the Quill or Chaplin/Old Wives Lakes. Sites need to be provided for roosting (sheltered areas, small wetlands) and feeding (shallow water basins or open beach/mudflats on larger wetlands) during both the spring and autumn migration periods. Water depths should be fine-tuned to accommodate not only a variety of species, but also to meet the needs of the priority species at each site (e.g., Sanderling at Chaplin Lake).

   Shorebird planners need to work with water managers to incorporate shallow flooding regimes, where possible and practical, into new and existing projects, to provide suitable feeding depths and increase food availability for shorebirds during the migration periods. Flooding would also be a beneficial tool in management of encroaching vegetation on shoreline habitat.

3. **Reduction of Disturbances**
   Managers need to work with local landowners and authorities to reduce disturbances due to human activities such as agriculture, industry, or eco-tourism to shorebirds at feeding and roosting sites.

4.4.ii Boreal

4.4.ii.a Boreal Breeding Shorebirds

As noted, research on the numbers and distribution of boreal breeding shorebirds is needed before any scientifically based management plans can be developed.

1. **Habitat Protection**
   Wetland preservation as well as forest preservation and management practices will be important elements of any planning initiatives. Ducks Unlimited Canada has recently embarked on a boreal forest initiative in conjunction with several forestry management companies and other agencies. Management for shorebirds will entail working with the forestry management companies, oil and gas industry, and wildlife agencies to identify and protect important shorebird habitats in the boreal forest.

2. **Habitat Needs**
   Research is needed to determine the habitat needs of boreal breeding shorebirds, and the impacts of various types of forest management on them.

3. **Forest Management**
   Techniques in keeping with common forest management practices may need to be developed to optimise shorebird habitat in forestry management areas.

Managed burns may prove to be beneficial to some breeding species, such as Lesser Yellowlegs.

4.4.ii.b Boreal Migrants

1. **Monitoring**
   Very little is known of the use of boreal habitats by migrant shorebirds, but most apparently pass over the area to and from their summer taiga and tundra habitats and their wintering areas. Northern river deltas such as the Peace-Athabasca may provide important stopover habitats, especially in some years. Monitoring is required to determine the extent of use of habitats such as the inland deltas, and the distribution of migrant shorebirds within habitats of the boreal region.

4.4.iii Coastal Hudson Bay, Manitoba

4.4.iii.a Coastal Hudson Bay Breeding Shorebirds

1. **Habitat and Key Breeding Site Identification**
   Shorebirds occupy a variety of habitats in the Churchill region of Manitoba. Important habitats need to be delineated if we are to minimize human encroachment and impacts upon them. Key breeding sites for species of concern need to be identified and protected. The cooperation of local authorities and government agencies will be essential to any management plans for the area.

4.4.iii.b Coastal Hudson Bay Migrants

As for the breeding shorebirds, the most important habitats for migrant shorebirds along Hudson Bay need to be identified and protected from human encroachments and impacts. The impact of burgeoning Lesser Snow Goose populations on the habitats of both migrant and breeding shorebirds needs to be determined.

5.0 COMMUNICATION

The Prairie Conservation Shorebird Plan seeks to inform the public, landowners, environmental managers and decision-makers about shorebird biology and conservation, and, in particular, the continental importance of Prairie Canada to shorebirds. This regional communication effort forms part of a continent-wide implementation goal of the Canadian and United States Shorebird Conservation Plans to achieve a continent-wide approach to shorebird conservation.

5.1 TARGET AUDIENCES

The Plan will target four main audiences:

1. **Environmental Managers** – provincial and federal governments and private organizations involved in shorebird conservation and/or management of water resources and lands with existing and potential shorebird habitat.

2. **Lessees/Landowners** – Lessees of public lands and private landowners whose lands provide shorebird habitat and who typically manage for agricultural, recreational or forestry use.

3. **Public** –The opportunity to influence the future through the education and encouragement of an interest in shorebirds and other wildlife in young people and students, cannot be underestimated. In addition, individuals and groups with a general interest in shorebirds, such as local communities, tourism associations, environmental educators, ecotourists and birdwatchers are important in conservation efforts.

4. **Decision-makers** – Elected local, provincial and federal government representatives responsible for decisions affecting shorebirds and their habitat.

5.2 KEY MESSAGES

Target audiences will receive the following key messages:

1. Shorebirds are beautiful, interesting and often beneficial species that form an important component of Prairie Canada's ecosystem.

2. Many shorebird species are declining in number across Canada, including the prairies.

3. Prairie Canada provides substantial amounts of critical habitat to shorebirds. For some species a large proportion of the global and total population is found here.

4. Degradation and loss of habitat on private and public lands are the most negative impacts on shorebird populations in Prairie Canada.

5. Habitat conservation practices on private and public lands offer potential for improved shorebird breeding and staging habitat.

6. Opportunities exist to expand and to improve conservation protection through public policy and direct habitat initiatives.

7. A similar conservation initiative is presently being applied to waterfowl under the North American Waterfowl Management Plan and is a successful wildlife management model that benefits both landowners and waterfowl populations. The approach is now broadened to include other non-waterfowl birds (shorebirds, landbirds and colonial water birds) under the North American Bird Conservation Initiative (NABCI). Conservation plans for landbirds under Partners in Flight (PIF) and for colonial waterbirds under the Canadian Colonial Water Bird Conservation Plan are also being initiated.

8. Community and landowner support for shorebird conservation is essential. In some locations, the development of ecotourism has resulted in local economic benefits for tourism, such as Chaplin, Quill and Beaverhill Lakes. It is a win – win situation for conservation and landowners/communities.

5.3 COMMUNICATION ACTIVITIES

Each target group will be a focus for communicating the key messages. Beyond informing, the strategy is to gain support and where feasible show how the target group can participate in Plan implementation. Following are six examples that outline potential activities that could further this strategy. Further communication activities would be developed in consultation with partners.

1. Introduce environmental managers in the agricultural, forestry and water resource management sectors to shorebird ecology and conservation. Seek to integrate shorebird needs into existing agricultural, forestry and water resource management activities. The first Prairie Canada Shorebird Ecology and Conservation Workshop was successfully completed in May 1999 at Chaplin, Saskatchewan. Additional training workshops to target the various sectors are proposed across Prairie Canada.

2. Increase shorebird habitat protection and management awareness on private and public lands. With environmental managers and landowners/lessees, implement demonstration projects such as water level management and grazing practices. Undertake projects throughout Prairie Canada. Employ public tours and articles to highlight results.

6.1 POTENTIAL ACTIVITIES

This section is designed to introduce six examples of the kinds of partnerships and activities that could be initiated and/or expanded. It is expected that the Plan review will stimulate action on these and other new possibilities.

1. Stewardship and Shorebird Conservation

Stewardship programs involve the conservation of habitat on private and provincial lands, on a landscape basis, through the joint efforts of landowners, industries, communities and governments and are a large component of many conservation organizations. Many stewardship programs have been developed in Prairie Canada by various organizations with whom Shorebird Plan partners would work cooperatively to further stewardship efforts for shorebird habitat. A few examples of organizations actively involved in stewardship include:

- Wildlife Habitat Canada (WHC), has been a leading advocate of the importance of land stewardship since 1984, and has been involved in almost every major stewardship program in Canada. WHC was the original national agency to promote and initially fund stewardship as a conservation strategy through the North American Waterfowl Management Plan (NAWMP). In partnership with the Canadian Federation of Agriculture, Agriculture and Agri-Food Canada, and a network of provincial partners, WHC has developed the Program, Countryside Canada: Recognizing Stewardship, whose goal is to double the participation of landowners in stewardship activities in the agricultural landscape.

- The Nature Conservancy of Canada (NCC) protects areas of biological diversity for their intrinsic value and for the benefit of future generations and secures ecologically significant natural areas and places of special beauty and educational interest. Migratory bird areas, including shorebird habitats, are a focus for the NCC program delivery. Lands are protected through conservation easements, fee-simple land donation, planned gifts and land purchase.

- A volunteer stewardship program has been implemented by the Saskatchewan Wetland Conservation Corporation to protect native Prairie in Saskatchewan. The goal of the Native Prairie Stewardship Program is to encourage landowners to conserve and manage native prairie grassland. Saskatchewan landowners have embraced the Native Prairie Stewardship Program. Since 1997, 213 voluntary stewardship agreements have been made on about 90,000 acres of remnant native prairie.

- The Land Stewardship Centre of Canada, based in Alberta, provides a centre for developing partnerships with agriculture, industry, government, institutions and community-based organizations, projects and exchanging knowledge. A major

feature is the Land Stewardship Resource Centre, which is an electronic clearinghouse and educational referral service, including a Land Stewards' Network.

- In Manitoba, various organizations are involved in Stewardship and conservation activities, including Ducks Unlimited, Manitoba Naturalist Society, Delta Waterfowl Foundation, Nature Conservancy of Canada, Manitoba Habitat Heritage Corporation and Manitoba Conservation.

- The new federal stewardship initiative, which is tied to the new Species at Risk legislation, is an extensive program directed to protect endangered and threatened species and habitat. The main approach is to encourage landowners to voluntarily protect species. Voluntary landowner participation in conservation agreements and easements to protect species will be encouraged through incentives. Part of the program will also aim to protect rare and sensitive ecosystems to prevent decline of species. Shorebird conservation may benefit by participating in this initiative. Sensitive shorebird habitat may qualify for stewardship activities, particularly if it is shared with species at risk. Species that are already listed, like the Piping Plover, may also benefit from new funding for the recovery of species at risk that will be available through the new bill.

2. Landowner Awareness and Habitat Protection

Landowner awareness and support for shorebird conservation are essential to implement habitat protection. Critical shorebird breeding areas and individual migration wetlands are identified in the Plan. Communities, local governments and individual landowners in these priority habitats would benefit from background information on the Plan, local site importance and options for habitat protection.

Plan partners could introduce shorebirds and describe the local area through a series of Town Hall presentations in the most critical shorebird breeding and staging areas. Background information on the Plan could be compiled in a landowner brochure. Direct landowner contact would be made to negotiate agreements for habitat protection. The Important Bird Areas Program is already in the process of developing conservation plans for some areas.

3. Shorebird Conservation and Geographic Information Systems

Shorebird conservation will benefit from land managers having access to a common database that can be mapped and analyzed through geographic information systems (GIS) that can perform complicated overlays and spatial analyses, investigate geographic relationships in data and define relationships among multiple sets of data. Breeding areas of shorebird species can be superimposed to determine where species breed in a common area. These locations can be overlain on native dominant grasslands, seeded grassland and pasture to produce maps showing where the common breeding sites coincide with, for example, habitat, NAWMP target areas and PFRA pastures (Figure 3).

With knowledge of shorebird distribution, abundance and habitat requirements, planners could identify critical wetland and upland habitat and compare these sites to distribution of private and crown lands as well as to current protected lands such as NAWMP habitat conservation projects plus provincial, federal and community pastures. This is an example of gap analysis where, with limited conservation dollars, land managers could identify new opportunities for joint land protection and management beneficial to shorebirds and other wildlife.

Future partnerships related to the shorebird GIS database could link with on-going NABCI planning and implementation of the North American Waterfowl Management Plan, Partners In Flight and Canadian Colonial Water Bird Conservation Plan. The database for individual shorebird sites directly links to the Western Hemisphere Shorebird Reserve Network program, Breeding Bird Surveys and the Important Bird Areas program.

4. Shorebird Habitat Management

Given the on-going loss of shorebird habitat, opportunities to secure and manage critical habitat should be undertaken. Environmental managers, using an adaptive management approach, could implement a series of demonstration habitat management projects in the prairies, aspen parkland and boreal forest. The projects could develop and demonstrate habitat management practices beneficial to shorebirds and other wildlife.

Demonstrating habitat management is an opportunity for conservation organizations to partner with the agricultural and forestry sectors. A series of demonstration projects could link the North American Waterfowl Management Plan and the Canadian Shorebird Conservation Plan.

Windmill Point, a PHJV habitat conservation project at Quill Lakes, Saskatchewan, is an example of an existing partnership in shorebird and waterfowl conservation. The Quill Lakes are designated as a RAMSAR wetland as well as an international WHSRN site and an IBA site. In 1997-98, Ducks Unlimited Canada and the Saskatchewan Wetland Conservation Corporation secured a wetland and upland complex of 1380 acres. Funding support came from the following partners: Nature Conservancy of Canada, Saskatchewan Wildlife Federation, Canadian Wildlife Service, Saskatchewan Agriculture and Food, States of Arkansas and Kansas, Ducks Unlimited Inc. and the United States Fish and Wildlife Service. Windmill Point's management plan considers the needs for shorebirds, waterfowl and other wildlife. Individual wetlands are managed specifically for breeding waterfowl and fall migrant shorebirds. Saskatchewan Wetland Conservation Corporation monitored biodiversity, including shorebirds present in 1998-1999. Future opportunity exists to monitor shorebird response to specific water level manipulations and upland habitat management.

A second example to protect and maintain shorebird habitat is Beaverhill Lake, a WHSRN and NAWMP wetland located south-east of Edmonton, Alberta. Important habitats for shorebirds include the shoreline and waters of Beaverhill Lake proper as well as a large number of shallow spring-flooded areas located primarily to the south and east of the lake. Large portions of this habitat underwent agricultural drainage and much of this area now is managed as backflood hay meadows. This attractive shorebird and waterfowl habitat is managed through Ducks Unlimited Canada water level controls.

Although Beaverhill Lake was recognized as an important stopover point for migrant shorebirds, no complete ground survey of the lakeshore area during the migration period had ever been completed prior to 1995. In 1995, staff from Ducks Unlimited Canada and volunteers, in consultation with the Canadian Wildlife Service organized several shorebird surveys over the period of the spring migration. Data from these surveys resulted in the nomination by the Canadian Wildlife Service, Alberta Fish and Wildlife Service, and Ducks Unlimited Canada of Beaverhill Lake as a Western Hemisphere Shorebird Reserve Network site of regional importance to shorebirds. The site was designated in 1996.

An example of species specific management is found in relation to Piping Plover habitat. Grazing is excluded from wetland shorelines known to attract Piping Plover. Cattle fences are installed and alternative water sources are created to reduce disturbance to nests. Saskatchewan Wetland Conservation Corporation has led this initiative at the Quill Lakes and other Saskatchewan wetlands. The Alberta Piping Plover Ad Hoc group coordinates research and management activities concerning Piping Plover in Alberta.

5. Training in Shorebird Ecology and Conservation

Implementation of the Plan is dependent upon environmental managers who are informed and motivated about the potential for implementation. A partnership between researchers and environmental managers could develop training workshops for shorebird ecology and conservation.

Field workshops in United States and, more recently, Prairie Canada have proven effective in introducing basic shorebird ecology and conservation. In May 1999, Saskatchewan Wetland Conservation Corporation, Ducks Unlimited Canada and the Canadian Wildlife Service hosted a Prairie Canada Shorebird Ecology and Conservation Workshop at Chaplin, Saskatchewan. The 3-day training session attracted 55 land managers (biologists, water resource planners, agrologists, researchers, environmental managers from oil and gas sectors and tourism planners) from 23 different organizations. Participants were introduced to the topic of shorebirds through classroom presentations and field tours. The local community and school were involved through social events scheduled with the workshop as well as media coverage and school presentations.

There are additional opportunities to hold workshops across the prairie and parkland where more environmental managers can be introduced to shorebirds. Site locations could be linked to the demonstration shorebird habitat projects described under point 4, above.

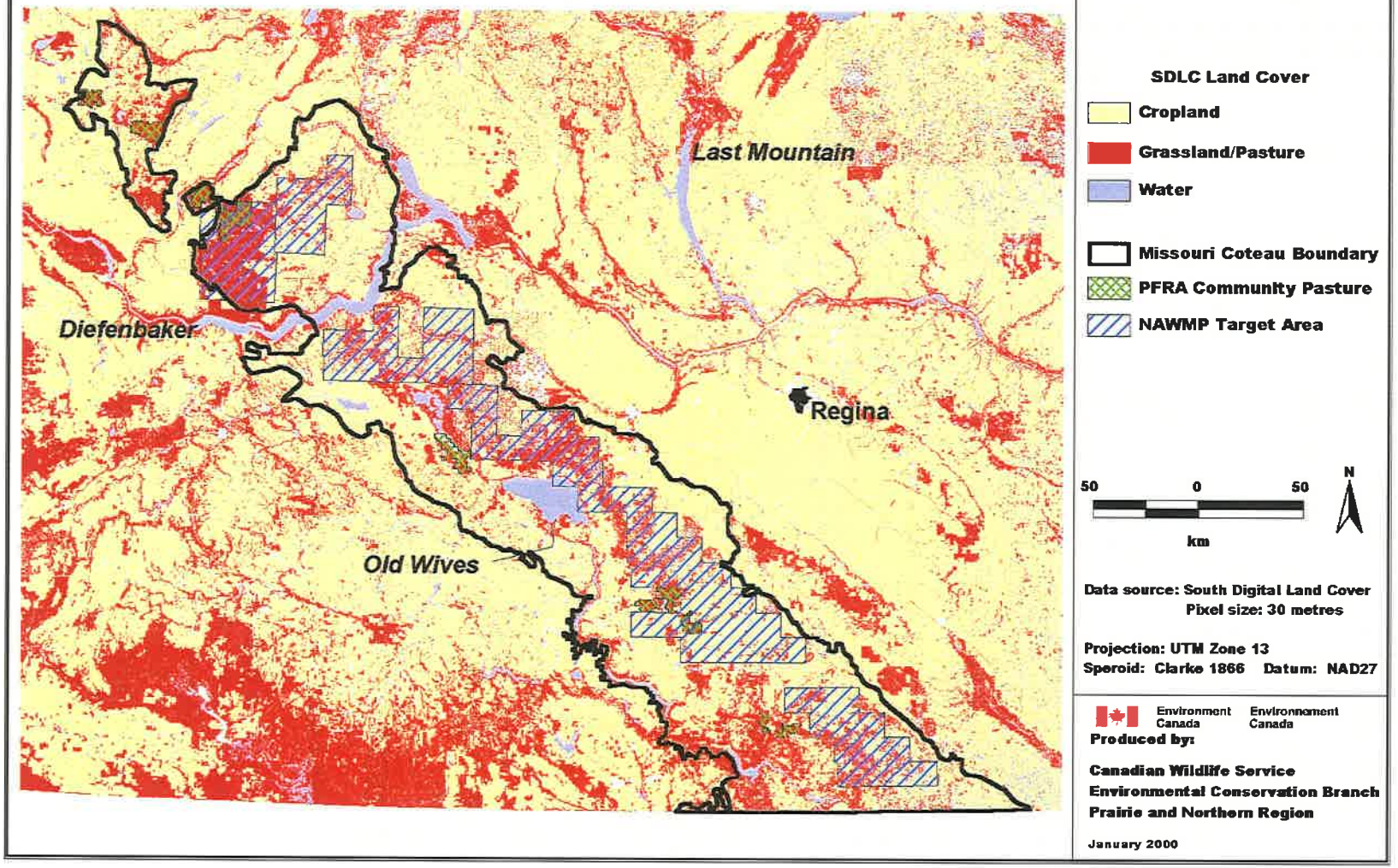
6. Rural Economic Development – A Case for Ecotourism and Shorebirds

Landowners, communities and government will support wetland protection and shorebird conservation where local economic benefits are realized. Ecotourism, specifically bird watching, is a recreational activity that is expanding and will be an important component in Prairie Canada's rural tourism industry. Interpreting and viewing shorebird migration and breeding is one component of this activity. An opportunity exists to partner local communities with tourism and conservation groups to organize "Birding Trails" that link wetland sites of interest to bird watchers. Other activities could include events like birding festivals as well as on-site interpretive signage, tours and the operation of seasonal nature centres.

Success stories of WHSRN community partnerships illustrate the potential for rural economic development. For example, the Community of Wadena, Saskatchewan recognized the significance of the Quill Lakes for shorebirds. Wadena residents have funded and developed a wildlife viewing site, highway interpretive signage and host an annual community shorebird festival. At Beaverhill Lake, Alberta, the town of Tofield supports a nature centre and annually hosts a Snow Goose Festival that profiles bird migration, including shorebirds. The Community of Chaplin, Saskatchewan supports a nature centre and wildlife viewing site on Chaplin Lake. All three communities have partnered with provincial, federal and non-government conservation organizations and their provincial and regional tourism organizations. Each of the community wildlife viewing sites could be an anchor around which a birding trail of other sites would link to surrounding communities and landowners.

The Plan identifies critical shorebird habitat and the status of shorebird use at these locations. With responsible site planning and community partnerships there are opportunities to seek habitat protection and to promote wildlife-viewing sites. Attracting bird watchers and providing services creates opportunities for rural economic development.

FIGURE 3. GRASSLAND/PASTURE AND CROP LAND COVER IN THE MISSOURI COTEAU



7.0 NEXT STEPS OF PRAIRIE SHOREBIRD CONSERVATION PLAN

Conservation efforts for shorebirds, waterfowl, landbirds and colonial water birds often overlap with mutual benefits. To maximize these benefits, an integration of the objectives and priorities of these various bird conservation initiatives is now being initiated under the framework of the North American Bird Conservation Initiative (NABCI). In Canada, NABCI's goal is to facilitate the integration and co-ordination of the major bird conservation initiatives. These initiatives include the regional component of the Canadian Shorebird Conservation Plan, the North American Waterfowl Management Plan (NAWMP) under the Joint Venture implementation plans, Partners In Flight (PIF) Landbird Conservation, and the Wings Over Water Plan, which is Canada's conservation plan for seabirds and colonial waterbirds. The objective is to establish the various conservation initiatives as integral parts of an integrated ecologically-based, landscape-oriented bird conservation approach. The challenge will be to link the monitoring, research and management priorities of the different initiatives together so that individually they can be moved forward in a coordinated, non-duplicative manner.

At the regional level, the Prairie Canada Shorebird Conservation Plan provides an overview of the status and knowledge of shorebirds in Prairie Canada. It also outlines priority needs for conservation efforts through cooperative shorebird monitoring, research and management activities. The Plan is an attempt to guide strategic thinking, to encourage a coordinated approach in delivery mechanisms directed at shorebird conservation issues, to ensure that duplicative programs are minimized and that program capacity is maximized. Strong partnerships need to be developed to cooperatively implement The Plan and a coordinating mechanism is required for delivery of the program. To accomplish this, the PHJV requested that this plan be developed to provide a basis for moving shorebird conservation forward in the prairie provinces.

7.1 IMPLEMENTATION PROCESS

7.1.i Formation of Steering Committee

The immediate challenge facing the implementation of the plan will be the formation and expansion of the Steering Committee. The responsibility of this group would be to facilitate and expand the implementation of the shorebird initiative in the prairies with partners and link this activity to the National Working Group and NABCI Canada in partnership provincial and federal government and private conservation organizations. It must also identify common areas of interest among the various initiatives (PIF, NAWMP, Shorebirds, Colonial waterbirds) and establish time bound deliverables.

Member organizations on the Shorebird Steering Committee include:

Alberta Fish and Wildlife
Alberta NAWMP
Canadian Wildlife Service
Churchill Northern Studies Centre
Ducks Unlimited
Manitoba Natural Resources
Manitoba Habitat Heritage Corporation
Nature Conservancy of Canada
Prairie Farm Rehabilitation Administration
Sask. Env.and Resource Management
Sask. Wetland Conservation Corporation
Wetlands International

7.1.ii Steering Committee Meeting

Formation of the committee will be followed by a meeting, by February 2001, to address the following:

1. Goals and Objectives
Discuss the goals and objectives laid out in the plan, and to consider others they feel may be missing. As programs are developed for implementation of this Plan's priorities, efforts must be taken to ensure that clear goals and objectives are in place upon which to measure success and/or failure of delivery.

2. Communications Strategy
A communications strategy to link in new partners and provide ways for them to contribute and participate will be developed by the steering committee. There is a need to define the approach to include other partners, recognizing the critical importance of agricultural partners, municipalities and non-government organizations. An early key requirement will be presenting and discussing The Plan and opportunities with other key partners and stakeholders, as listed in Section 6, or others that are identified as the plan progresses. The development of a clear prospectus document may be useful in this approach and needs to be considered by the committee.

3. Key Priorities
Identify key priorities and discuss immediate opportunities for integrating and linking the issues and moving plan priorities forward. A number of major monitoring, research and habitat management needs have been identified. Extensive consultation with, and the involvement of, other partners during implementation of The Plan will further define and establish priorities for research, monitoring and habitat management activities. Priorities identified in the Plan include:

<u>Monitoring and Research Needs:</u>

- Assessing the accuracy of Breeding Bird Survey and random quarter-section system and other appropriate methods. Since these techniques have been the primary tools for population monitoring, they have to be validated and possibly improved.
- Information on factors that affect shorebird species survival and productivity.

- Broad Scale Monitoring - International Shorebird Survey (ISS) type.
- Special surveys for single species.
- Continue periodic International Piping Plover Census for numbers and trends and collect survivorship and dispersal data.
- Research on effects of anthropogenic changes on shorebird populations.
- Information on the effects of botulism on shorebirds.

Key habitat management needs:

- Identification of critical habitat.
- Completion of species and site action sheets.
- The identification and mapping of key shorebird staging/breeding sites and habitat areas.
- Maps to integrate staging/breeding sites with other groups, overlapping these sites with other priority sites of landbirds, colonial waterbirds and waterfowl.
- Wetland management and water level manipulation.
- Wetland creation.
- Habitat protection.
- Grazing management.
- Reduction of disturbances.
- Develop and apply forest management practices that are compatible with habitat needs of shorebirds.

Following the establishment of priorities for goals and objectives, identified above, the partners will then need to identify which projects should and could be implemented, time frames, funding opportunities and who would deliver these goals and objectives. It is apparent that the steering committee must also be flexible in adapting or considering new priorities and shifts in direction. In addition, the plan is a living document and will continue to be revised and expanded upon as program priorities are identified, developed and implemented and as new information is gained.

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9.0 APPENDICES

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APPENDIX A

Prairie Provinces Shorebird Reference List

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APPENDIX B

Western Hemisphere Shorebird Reserve Network (WHSRN) Selection Criteria

WHSRN sites are those staging areas that are of highest priority in the hemispheric conservation of shorebirds. Current biological criteria identify 4 categories of use believed to represent sites where shorebirds concentrate. Additionally, as a voluntary, nonregulatory program, WHSRN requires that sites have full support of all stakeholders, including public and private landowners, local communities and organizations.

Hemispheric Sites: support at least 500,000 shorebirds annually, or 30% of a species' flyway population. Hemispheric Sites are intended to include areas supporting major concentrations of shorebirds, with daily totals reaching about 50,000 birds during migration;

International Sites: support at least 100,000 shorebirds annually, or 15% of a species' flyway population;

Regional Sites: support at least 20,000 shorebirds annually, or 5% of a species' flyway population; and

Endangered Species Sites: are critical to the survival of endangered species (minimum number of birds is under review).

APPENDIX C

SHOREBIRD SPECIES ACTION SHEETS

PRAIRIE CANADA

American Avocet

Black-necked Stilt

Black-bellied Plover

American Golden-Plover

Piping Plover

Mountain Plover

Willet

Upland Sandpiper

Long-billed Curlew

Hudsonian Godwit

Marbled Godwit

Sanderling

Semipalmated Sandpiper

Stilt Sandpiper

Buff-breasted Sandpiper

Wilson's Phalarope

Red-necked Phalarope

**More to be added in future*

Shorebird Species Action Sheet - Prairie Canada

American Avocet - Avocette d'Amérique - *Recurvirostra americana*

Status summary:

Continental conservation priority	**3 (Species of moderate concern)**[1]
Global and Canadian populations	450,000[2] 63,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	common[3]
Prairie Canada % of Canadian population	100%
Prairie Canada % of Global population	14%
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Abundant breeder (semi-colonial in suitable habitat) in the prairies, usually at shallow saline wetlands.

Global distribution: Breeds in the western U.S. and prairies of Canada. Winters in the southern U.S. through Mexico (Robinson et al. 1997).

Issues in Prairie Canada: Total numbers breeding in prairie Canada are not well known, nor are migration routes and wintering areas. Accuracy of the BBS in monitoring population trends is unknown. Population dynamics have not been studied in Canada, nor have effects such as contaminants, climate change, grazing, or botulism on productivity and survival.

Action needed:

- Determine total numbers breeding in prairies and accuracy of the BBS in monitoring populations
- Examine movements between and within years in response to habitat availability and nest success
- Examine factors affecting survival and productivity, including contaminants, botulism, grazing, and climate change
- Determine migration routes and wintering areas of prairie breeders
- Ensure adequate food and habitat available each year

Primary regional contact:

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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

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Shorebird Species Action Sheet - Prairie Canada

Black-necked Stilt - Échasse d'Amérique - *Himantopus mexicanus*

Status summary:

Continental conservation priority	**2 (Species of low concern)**[1]
Global and Canadian populations	150,000[2] 400[2]
Population trend in Canada	increasing
Abundance status in Canada	rare[3]
Prairie Canada % of Canadian population	100%
Prairie Canada % of Global population	0.3%
Prairie Canada conservation priority	**LOW**

Occurrence in Prairie Canada: Rare breeder in southern Saskatchewan, rare but locally consistent breeder in some areas of southern Alberta. Increasing in numbers in the prairies over the past 25 years (Gratto-Trevor *in press*).

Global distribution: This species breeds primarily in the western U.S., Mexico, Caribbean, and South America. Black-necked Stilts winter from the southern United States to South America (Robinson et al. 1999).

Issues in Prairie Canada: Breeding birds are increasing in numbers in the Canadian prairies, even though they have been found in botulism kills in Alberta and Saskatchewan. Their increase has had no apparent effect on the breeding success and distribution of other local species, but this has not been examined.

Action needed:

- Monitor continued change in numbers, and determine if related to drought conditions elsewhere
- Determine if genetic differences from more southern populations
- Examine productivity and survival: compare to similar species (avocets) that do not appear to be increasing in numbers
- Determine if increase results in detrimental effects on local species of breeding shorebirds
- Determine migration routes and wintering areas of prairie breeders
- Examine effects of disturbance, contaminants, botulism on survival and breeding success

Primary regional contact:

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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

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Shorebird Species Action Sheet - Prairie Canada

Black-bellied Plover - Pluvier argenté - *Pluvialis squatarola*

Status summary:

Continental conservation priority	**3 (Species of moderate concern)**[1]
Global and Canadian populations	450,000[2] 200,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	common[3]
Prairie Canada % of Canadian population	?
Prairie Canada % of Global population	?
Prairie Canada conservation priority	**MEDIUM-LOW**

Occurrence in Prairie Canada: Fairly common spring and fall migrant in Alberta and Saskatchewan, uncommon in Manitoba.

Global distribution: Widely distributed, known as the Grey Plover in the Old World, this species breeds from northeastern Russia and Siberia across Alaska and northern Canada to Baffin Island. It winters along the coastlines of the southern half of North America, South America, southern Europe and Asia, Africa, and Australasia (Hayman et al 1986). No subspecies are recognized.

Issues in Prairie Canada: Wetlands provide the most important habitats for this species during the migration through Prairie Canada, with nearly 8000 individuals recorded on a single count at Beaverhill Lake in 1995. Overall numbers of the species are apparently stable (Paulson 1995), although large decreases in breeders were noted in the Rasmussen Lowlands (Gratto-Trevor et al. 1998). Greatest threats probably occur on the wintering grounds.

Action needed:

- Monitor numbers
- Identify and protect shorelines of major staging wetlands
- Determine habitat and food preferences

Primary regional contact:

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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Gratto-Trevor, C. L., V. H. Johnston, and S. T. Pepper. 1998. Changes in shorebird and eider abundance in the Rasmussen Lowlands, NWT. Wilson Bull. 110: 316-325.

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Shorebird Species Action Sheet - Prairie Canada

American Golden-Plover - Pluvier doré d'Amérique - *Pluvialis dominica*

Status summary:

Continental conservation priority	**4 (Species of high concern)**[1]
Global and Canadian populations	150,000[2] 150,000[2]
Population trend in Canada	stable or decreasing
Abundance status in Canada	common[3]
Prairie Canada % of Canadian population	?
Prairie Canada % of Global population	?
Prairie Canada conservation priority	**LOW**

Occurrence in Prairie Canada: In Alberta and western Saskatchewan this is a fairly common spring and uncommon fall migrant. Juvenile birds are fairly common fall migrants in eastern Saskatchewan and southern Manitoba. It is a common migrant and a fairly common breeding bird around Churchill, Manitoba.

Global distribution: The American Golden Plover breeds from the Bering Strait eastwards to Baffin Island, Canada. Primary winter range is the grasslands of s. Brazil, Argentina and Uruguay (Johnson and Connors 1996).

Issues in Prairie Canada: It is not known whether populations in general are declining, but large decreases in breeding birds were noted in the Rasmussen Lowlands (Gratto-Trevor et al. 1998). Minimize disturbance on Churchill breeding grounds. Spring migrant golden plovers utilize a wide variety of habitats including cultivated fields and grazed pasturelands. Fall migrants, apparently mostly juveniles, are more closely associated with wetlands.

Action needed:

- Determine population dynamics in Churchill area breeders and monitor population periodically there
- Monitoring of total numbers is most likely best accomplished on the wintering grounds
- Determine food and habitat preferences of spring and fall migrants

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Gratto-Trevor, C. L., V. H. Johnston, and S. T. Pepper. 1998. Changes in shorebird and eider abundance in the Rasmussen Lowlands, NWT. Wilson Bull. 110: 316-325.

Hyslop, C., G. Morrison, G. Donaldson and I. Davidson. 2000. The Canadian Shorebird Conservation Plan. Canadian Wildlife Service National Office, Ottawa 32pp.

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Shorebird Species Action Sheet - Prairie Canada

Piping Plover - Pluvier siffleur - *Charadrius melodus*

Status summary:

Continental conservation priority	**5 (Highly imperiled)**[1]
Global and Canadian populations	5,913[2] 2,104[2]
Population trend in Canada	Slight increase in recent census[2]
Abundance status in Canada	Uncommon
Prairie Canada % of Canadian population	80%
Prairie Canada % of Global population	28%
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Breeds primarily on sandy/gravely beaches of alkali and freshwater lakes in the prairies and parklands. Few breed at boreal lakes and rarely on river sandbar habitat. Most breed in Saskatchewan (80%) followed by Alberta (16%) and Manitoba (4%). One or two pairs breed in northwestern Ontario (Lake of the Woods) and are considered to be part of the Prairie population.

Global distribution: Breeds only in the United States and Canada including the French islands of St-Pierre-et-Miquelon off the coast of Newfoundland. Three breeding populations are known: Atlantic (Newfoundland to South Carolina), Great Lakes (U.S. Lake Michigan) and Northern Great Plains (Oklahoma to northwestern Ontario to Alberta). Two subspecies are recognized by the American Ornithologists' Union, however, recent research has not validated this taxonomic division. Winters in coastal areas of southern U. S. Atlantic, Bahamas, Cuba, Gulf of Mexico and some Caribbean Islands. Limited mixing of populations on the wintering grounds occurs. Most wintering birds censused have been found in Texas. Northern Great Plains (including Prairie Canada) birds are known to winter along Gulf of Mexico.

Issues in Prairie Canada: Need to determine population dynamics, productivity, dispersal, stability rates and effective conservation approaches for a broadly scattered population. Protection of breeding and wintering grounds needs to be secured.

Action needed:

- Protect breeding and wintering habitat from water management, industry and agricultural activities
- Reduce threats (e.g. predation, human disturbance) to productivity
- Determine adult and juvenile survival rates, productivity and model population dynamics
- Monitor population trends through periodic international censuses

- Implement the Revised Canadian Piping Plover Recovery Plan (*In. prep.*)

Primary regional contact:
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[1] Hyslop et al. (2000)

[2] Plissner and Haig (2000). Note regional population decreases have occurred (1991 compared to 1996 international census data) as Atlantic Canada plover numbers decreased by 17% and Northern Great Plains (U.S. and Canada combined) numbers by 5%.

References:

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Hyslop, C., G. Morrison, G. Donaldson and I. Davidson. 2000. The Canadian Shorebird Conservation Plan. Canadian Wildlife Service National Office, Ottawa 32pp.

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Shorebird Species Action Sheet - Prairie Canada

Mountain Plover - Pluvier montagnard - *Charadrius montanus*

Status summary:

Continental conservation priority	**5 (Highly imperiled)**[1]
Global and Canadian populations	8,000 -10,000[2] <50[3]
Population trend in Canada	Unknown
Abundance status in Canada	Rare
Prairie Canada % of Canadian population	100%
Prairie Canada % of Global population	<1%
Prairie Canada conservation priority	**LOW**

Occurrence in Prairie Canada: Rare breeder in grasslands of Alberta and Saskatchewan. Apparently has always been a rare breeder in Canada, at the northern edge of its range.

Global distribution: Breeds in short-grass prairies of western Canada and the central United States. Also breeds in U. S. semi-arid areas. Winters in grasslands and fields of south and southwestern United States (primarily California). Found also in northern Mexico.

Issues in Prairie Canada: Species is not well known in Canada, and is apparently at the extreme northern edge of its range. Information is primarily needed on numbers and consistency of breeding in Canada. If numbers warrant, then information needed on breeding biology and population dynamics, breeding habitat preferences, location and security of wintering grounds used by Prairie Canada birds, threats to productivity and habitats and effective conservation approaches.

Action needed:

- Carry out extensive surveys in Canadian grasslands to determine species distribution, abundance, habitat preferences
- Identify threats to nesting efforts and breeding habitat
- Determine effects of grazing on abundance, distribution, productivity and survival
- Protect breeding and feeding habitats
- Locate wintering areas and encourage their protection
- Complete Canadian recovery plan for the Mountain Plover

Primary regional contact:

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[1] Hyslop et al. (2000)

[2] Knopf (1996)

[3] Population estimate from Edwards et al. (1993)

References:

Edwards, R., S. Brechtel and D. Hjertaas. 1993. National recovery plan for the Mountain Plover. Draft manuscript.

Knopf, F. L. 1996. Mountain Plover (*Charadrius montanus). In* The Birds of North America, No. 211 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington D.C.

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Shorebird Species Action Sheet - Prairie Canada

Willet - Chevalier semipalmé - *Catoptrophorus semipalmatus*

Status summary:

Continental conservation priority	**3 (Species of moderate concern)**[1]
Global and Canadian populations	250,000[2] 25,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	common[3]
Prairie Canada % of Canadian population	92%
Prairie Canada % of Global population	10%
Prairie Canada conservation priority	**MEDIUM-HIGH**

Occurrence in Prairie Canada: Western subspecies (*C. semipalmatus inornatus*) a common breeder in the prairies.

Global distribution: Two subspecies exist. The Western Willet breeds in the southern part of the Prairie Provinces, and the Great Plains of the U.S. The Eastern Willet breeds on the Atlantic and Caribbean coasts from Nova Scotia to the West Indies. Willets winter from the southern U.S. to northern South America (Cramp and Simmons 1983).

Issues in Prairie Canada: BBS surveys show significant declines since 1966 in Saskatchewan and all Canada, and near significant declines in Alberta (Sauer et al. 1998). This species breeds in upland grasslands near suitable wetlands. Wetlands are necessary for foraging and broods. Wintering areas, population dynamics, and genetic differentiation between subspecies are unknown.

Action needed:

- Determine numbers breeding in prairie Canada, and accuracy of BBS in monitoring populations
- Examine factors affecting survival and productivity
- Determine effects of anthropogenic factors such as disturbance, power lines on breeding success and survival
- Determine staging and wintering sites of prairie population
- Examine genetic differentiation among disjunct populations
- Ensure adequate food, upland breeding and shallow wetland foraging/brood habitat available each year

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

Primary regional contact:
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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Dechant, J.A., M.F. Dinkins, D.H. Johnson, L.D. Igl, C.M. Goldade, B.D. Parkin and B.R. Euliss. 1999. Effects of management practices on grassland birds: Upland Sandpiper. Northern Prairie Wildlife Research Center, Jamestown, ND. 34 pp. Northern Prairie Research Center home page: http://www.npwrc.usgs.gov.

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Shorebird Species Action Sheet - Prairie Canada

Long-billed Curlew - Courlis à long bec - *Numenius americanus*

Status summary:

Continental conservation priority	**5 (Imperiled)**[1]
Global and Canadian populations	20,000[2] 5000[2]
Population trend in Canada	decreasing
Abundance status in Canada	uncommon[3]
Prairie Canada % of Canadian population	90%
Prairie Canada % of Global population	22%
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Historically bred in southern portions of all three provinces, now restricted to southwestern Saskatchewan and southern Alberta (DeSmet 1992).

Global distribution: Breed in the U.S. Great Plains and Canadian prairie, including grasslands of southern British Columbia. Evidence for decrease in breeding range since 1900s. Winter from southern U.S. to South America (DeSmet 1992).

Issues in Prairie Canada: Small global population, evidence of recent declines in breeding distribution, and clumping (so vulnerable) on wintering grounds make this a species of great concern, about which little is known (including population size) on the prairies. This species appears to be dependent on large continuous tracts of grazed native prairie. There are some concerns with potential habitat degradation in wintering areas, particularly South America (Hill 1998).

Action needed:

- Determine population size in prairies, accuracy of BBS surveys for monitoring, and population trends
- Determine habitat preferences in Canadian prairies
- Determine factors affecting survival and productivity
- Examine anthropogenic factors affecting success, including disturbance, grazing
- Ensure protection of large tracts of low vegetation native grasslands
- Determine amount of genetic differences among populations

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Allen, J. N. 1980. The ecology and Behavior of the Long-billed Curlew in Southeastern Washington. Wildlife Monographs 73:6-67.

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Shorebird Species Action Sheet - Prairie Canada

Hudsonian Godwit - Barge hudsonienne - *Limosa haemastica*

Status summary:

Continental conservation priority	**4 (Species of high concern)**[1]
Global and Canadian populations	50,000[2] 50,000[2]
Population trend in Canada	unknown
Abundance status in Canada	very locally common[3]
Prairie Canada % of Canadian population	100%?
Prairie Canada % of Global population	80%?
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Disjunct and genetically distinct eastern and western arctic breeding populations: almost all eastern breeders nest in Hudson Bay, Manitoba, area. Several thousand adults (western arctic breeders: Alaskan and probably Mackenzie Delta, NWT birds) stage during fall in Saskatchewan.

Global distribution: Breed entirely in northern Canada and Alaska: populations in Hudson Bay area (eastern breeders) and Mackenzie Delta and Alaska (western breeders). All three areas are genetically separable, especially eastern versus western breeders. Eastern birds stage on western James Bay coast; only commonly known staging areas in fall for western breeders are in Saskatchewan. Winter southern South America - not known if populations mix.

Issues in Prairie Canada: Need to know if populations stable, population dynamics and breeding biology, if eastern breeders affected by habitat destruction of white geese, what percentage of western breeders stage in the Canadian prairies, where populations stage in northern South America, and if populations, sexes and age groups separate on the wintering grounds.

Action needed:

- Encourage monitoring of populations in southern South America
- Promote studies to examine breeding biology and potential effects of geese in Hudson Bay area
- Determine numbers staging in prairies of Canada, and habitat preferences
- Continue genetics work to determine if populations mix in winter
- Determine migration routes of each population
- Manage important staging areas in prairies for availability of Pondweed tubers

Primary regional contact:
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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Godfrey (1986)

References:

Alexander, S. A., and C. L. Gratto-Trevor. 1997. Shorebird migration and staging at a large prairie lake and wetland complex: the Quill Lakes, Saskatchewan. Canadian Wildlife Service Occasional Paper Number 97, Environment Canada, Ottawa.

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Morrison, R. I. G., R. E. Gill, B. A. Harrington, S. Skagen, G.W. Page, C. L. Gratto-Trevor, and S. M. Haig. *In press*. Estimates of shorebird populations in North America. Canadian Wildlife Service Occasional Paper, Environment Canada, Ottawa.

Shorebird Species Action Sheet - Prairie Canada

Marbled Godwit - Barge marbrée - *Limosa fedoa*

Status summary:

Continental conservation priority	**4 (Species of high concern)**[1]
Global and Canadian populations	173,500[2] 103,400[2]
Population trend in Canada	no significant change[3]
Abundance status in Canada	common in prairies[4]
Prairie Canada % of Canadian population	98%
Prairie Canada % of Global population	59%
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Common breeder in grasslands of Alberta and Saskatchewan, less abundant in Manitoba.

Global distribution: Breed entirely in Canada and the United States, primarily in prairie grasslands. Small isolated populations breed in southern James Bay (1000-2000) and the Alaskan Peninsula (1000-3000). Winter primarily on west coast of the United States (primarily California) and Mexico.

Issues in Prairie Canada: Actual breeding population unknown, not known if BBS adequately monitor population trends, unknown if genetic differences among Alaskan, James Bay, and central populations, or between Canadian and U.S. prairie breeders, effects of management practices and anthropogenic changes in habitat (such as powerlines) not known, need to model population dynamics and determine age of first breeding and juvenile survival.

Action needed:

- Determine if BBS adequately monitors population trends
- Obtain breeding population estimates per province
- Determine age of first breeding, adult and juvenile survival, and model population dynamics
- Ensure adequate suitable breeding and foraging habitat is available (including Pondweed tubers)
- Examine effects of grazing, powerlines, etc. on abundance, productivity and survival
- Examine genetics of various populations
- Determine staging and wintering areas, and if sexes and age groups separate in winter

Primary regional contact:
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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Decline not statistically significant (BBS, Sauer et al. 1997)

[4] Godfrey (1986)

References:

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Shorebird Species Action Sheet - Prairie Canada

Sanderling - Bécasseau sanderling - *Calidris alba*

Status summary:

Continental conservation priority	**4 (Species of high concern)**[1]
Global and Canadian populations	600,000[2] 300,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	abundant[3]
Prairie Canada % of Canadian population	? (>20% - probably much higher)
Prairie Canada % of Global population	? (>10% - probably much higher)
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Abundant spring migrant through the prairies (tens of thousands at some locations, e.g. Chaplin Lake, Saskatchewan (Morrison et al. 1995).

Global distribution: Holarctic breeding distribution (New and Old World) across o mid to high arctic. North American breeders winter in western Europe, and from the east coast of the U.S. to southern South America (Cramp and Simmons 1983).

Issues in Prairie Canada: Populations thought to have been declining in 1980s; current trends unknown. Numbers passing through prairies, consistency of use of prairies, breeding origins, and wintering and other staging sites are unknown. Prairie Canada may be one of the best locations for monitoring populations, as a large percentage of North American Sanderling appear to migrate through the prairies.

Action needed:

- Determine breeding origin and wintering sites of migrants
- Estimate total numbers migrating through prairies (via full survey of potential lakes in a single season)
- Monitor populations
- Determine habitat and food preferences, length-of-stay, inter and intra-seasonal movements, fat deposition
- Ensure adequate food and habitat available each year

Primary regional contact:

G. Beyersbergen, CWS, Environment Canada: gerard.beyersbergen@ec.gc.ca

[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

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Cramp, K. E. L., and Simmons, K. E. L., eds. 1983. Handbook of the birds of Europe, the Middle East, and North Africa. Vol. III. Oxford Univ. Press, Oxford.

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Shorebird Species Action Sheet - Prairie Canada

Semipalmated Sandpiper - Bécasseau semipalmé - *Calidris pusilla*

Status summary:

Continental conservation priority	**3 (Species of moderate concern)**[1]
Global and Canadian populations	3,500,000[2] 3,500,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	abundant[3]
Prairie Canada % of Canadian population	? (>1% - probably much higher)
Prairie Canada % of Global population	? (>1% - probably much higher)
Prairie Canada conservation priority	**MEDIUM**

Occurrence in Prairie Canada: Abundant migrant through the prairies, in both spring and fall. Highest numbers (tens of thousands) in spring. Formerly common breeder in Churchill, Manitoba area; recent large declines for unknown reasons (Alexander and Gratto-Trevor 1997; Hitchcock and Gratto-Trevor 1997).

Global distribution: Breeds across low arctic Canada and Alaska. Winters primarily in northern South America (Gratto-Trevor 1992).

Issues in Prairie Canada: Central and western arctic breeders migrate through the prairies in spring; western breeders also through the prairies in fall, while central arctic birds migrate south through the east coast of Canada and the U.S. There is some evidence for declining numbers in birds breeding in the Churchill region (Hitchcock and Gratto-Trevor 1997) and those staging in the Bay of Fundy (Morrison et al. 1994).

Action needed:

- Estimate total numbers migrating through prairies (via full survey of potential lakes in a single spring)
- Examine inter and intra-seasonal movements of migrants in prairies under varying wetland and climate conditions
- Monitor population changes in Churchill area periodically
- Determine genetic differences among breeding and staging populations
- Determine effects of botulism outbreaks on populations in prairies
- Ensure adequate food and habitat available each year

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Alexander, S. A., and C. L. Gratto-Trevor. 1997. Shorebird migration and staging at a large prairie lake and wetland complex: the Quill Lakes, Saskatchewan. Can. Wildl. Service Occasional Paper Number 97. Canadian Wildlife Service, Environment Canada, Ottawa K1A 0H3. 47 pp.

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Shorebird Species Action Sheet - Prairie Canada

Stilt Sandpiper - Bécasseau à échasses - *Calidris himantopus*

Status summary:

Continental conservation priority	**3 (Species of moderate concern)**[1]
Global and Canadian populations	200,000[2] 200,000[2]
Population trend in Canada	unknown
Abundance status in Canada	common[3]
Prairie Canada % of Canadian population	? (>8% - probably much higher)
Prairie Canada % of Global population	? (>8% - probably much higher)
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Abundant migrant in spring and fall in the prairies. Breeds in area around Churchill, Manitoba (Alexander and Gratto-Trevor 1997).

Global distribution: Patchy distribution in low arctic coastal areas from Hudson Bay to Alaska. Winters primarily in the interior of central South America (Klima and Jehl 1998).

Issues in Prairie Canada: The Canadian prairies apparently provide very important staging sites for Stilt Sandpipers, but actual numbers moving through the area, and consistently of use of the region among years, is unknown. Particularly in the fall, considerable amounts of fat may be deposited before major migratory flights. These birds are often picked up in botulism outbreaks, and although many important prairie staging sites have outbreaks, the importance of botulism deaths to population dynamics is unknown. Population dynamics of Churchill breeders has not been examined.

Action needed:

- Determine population dynamics in Churchill area breeders and monitor population periodically there
- Determine effects of habitat degradation by white geese on breeding success and densities
- Estimate total numbers migrating through prairies (via full survey of potential lakes in a single season) and consistency of use
- Examine susceptibility to botulism outbreaks in prairies and potential effects on populations
- Determine breeding origin and wintering areas of migrants
- Ensure adequate food and habitat available each year

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Alexander, S. A., and C. L. Gratto-Trevor. 1997. Shorebird migration and staging at a large prairie lake and wetland complex: the Quill Lakes, Saskatchewan. Can. Wildl. Service Occasional Paper Number 97. Canadian Wildlife Service, Environment Canada, Ottawa K1A 0H3. 47 pp.

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Shorebird Species Action Sheet - Prairie Canada

Buff-breasted Sandpiper - Bécasseau roussâtre-*Tryngites subruficollis*

Status summary:

Continental conservation priority	**4 (Species of high concern)**[1]
Global and Canadian populations	15,000[2] 15,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	regular[3]
Prairie Canada % of Canadian population	? (high?)
Prairie Canada % of Global population	? (high?)
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: The entire world's population of this species passes northwards through Alberta and Saskatchewan each spring. Southbound adults follow the same route, but southbound juveniles disperse across the continent (Lanctot and Laredo, 1994).

Global distribution: The breeding range extends across the high arctic from Western Chukotka, Russia, and Wrangel Island eastwards to the Boothia Peninsula in Arctic Canada. The species winters in the pampas of Argentina, Paraguay and Uruguay.

Issues in Prairie Canada: The population of this species probably numbered in the hundreds of thousands to millions at the turn of the twentieth century, but was almost destroyed by the early 1920's. It has failed to make a significant recovery and may now only number in the tens of thousands. It may still be declining. The largest concentrations noted in recent years have been of around 2,000 birds. (Lanctot and Laredo, 1994; Morrison, 1993/94). Migrant birds frequent short-grass areas such as well-grazed pastures and golf courses.

Action needed:

- This is a species that is potentially at risk. The total world population of the Buff-breasted Sandpiper needs to be assessed
- Examine factors affecting survival and productivity
- Determine the potential role of pesticides and other toxins on this species on the wintering grounds and along the migration routes, and take protective measures at migrant concentration sites where appropriate
- Identify and protect important staging sites along the migration routes
- Evaluate the impact of agricultural land-use changes on the wintering grounds on the availability of habitat for this species

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

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[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Hyslop, C., G. Morrison, G. Donaldson and I. Davidson. 2000. The Canadian Shorebird Conservation Plan. Canadian Wildlife Service National Office, Ottawa 32pp.

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Shorebird Species Action Sheet - Prairie Canada

Wilson's Phalarope - Phalarope de Wilson - *Phalaropus tricolor*

Status summary:

Continental conservation priority	**4 (Species of high concern)**[1]
Global and Canadian populations	1,500,000[2] 680,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	common[3]
Prairie Canada % of Canadian population	95%
Prairie Canada % of Global population	43%
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Abundant breeder at shallow prairie wetlands.

Global distribution: Primarily breeds at prairie wetlands of the western provinces and states. Isolated breeding populations exist in southern and northern Ontario, Alaska, Quebec, New Brunswick, and some southern and eastern states. Most birds stage at a single stop-over, Mono Lake, California, and most winter in western and southern South America, especially in the interior (Colwell and Jehl 1994).

Issues in Prairie Canada: This species is tied to the presence of suitable wetlands, where birds nest in damp grassy areas and margins of ponds. Numbers breeding in prairie Canada are not well known, nor are migration routes or wintering areas. Accuracy of the BBS in monitoring population trends is unknown. Population dynamics (especially survival) have been little studied, and effects of contaminants, climate change, grazing, or botulism on productivity and survival are not known.

Action needed:

- Determine total numbers breeding in prairies, and accuracy of the BBS in monitoring populations
- Examine movements between and within years in response to habitat availability and nest success
- Examine factors affecting survival and productivity, including contaminants, botulism, grazing, and climate change
- Determine migration routes and wintering areas of prairie breeders
- Ensure adequate food and habitat available each year

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Colwell, M. A., and J. R. Jehl, Jr. 1994. Wilson's Phalarope (*Phalaropus tricolor*). *In* The Birds of North America, No. 83 (A. Poole and F. Gill, eds.). Philadelphia: The Academy of Natural Sciences and The American Ornithologists'Union.

Hyslop, C., G. Morrison, G. Donaldson and I. Davidson. 2000. The Canadian Shorebird Conservation Plan. Canadian Wildlife Service National Office, Ottawa 32pp.

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Shorebird Species Action Sheet - Prairie Canada

Red-necked Phalarope - Phalarope hyperboréen - *Phalaropus lobatus*

Status summary:

Continental conservation priority	**3 (Species of moderate concern)**[1]
Global and Canadian populations	4,000,000-5,000,000[2] 2,500,000[2]
Population trend in Canada	decreasing
Abundance status in Canada	abundant[3]
Prairie Canada % of Canadian population	? (>3% - probably much higher)
Prairie Canada % of Global population	? (>2% - probably much higher)
Prairie Canada conservation priority	**HIGH**

Occurrence in Prairie Canada: Abundant migrant in spring and fall, especially through southern Saskatchewan. Highest numbers (tens of thousands) in spring. Formerly common breeder in Churchill, Manitoba area; recent large declines (possibly affected by El Nino and climate change; Gratto-Trevor 1994, Alexander and Gratto-Trevor 1997).

Global distribution: Holarctic breeding distribution (New and Old World) across low to mid arctic. Winter offshore near Equator: locations and numbers very poorly known (Cramp and Simmons 1983).

Issues in Prairie Canada: Origin of fall prairie migrants apparently western arctic: Alaska (DNA study, Haig et al. 1997). Spring migrants not tested. Numerical declines not noted in western arctic, but possibility of enormous declines of eastern arctic breeders (Churchill area: Gratto-Trevor 1994, disappearance of Bay of Fundy migrants: Duncan 1996). Numbers migrating through prairies large, but unknown.

Action needed:

- Determine breeding origin of spring versus fall migrants (east Vs. west)
- Estimate total numbers migrating through prairies (via full survey of potential lakes in a single season)
- Determine habitat and food preferences
- Ensure adequate food and habitat available each year

Primary regional contact:

C.L. Gratto-Trevor, CWS, Environment Canada: cheri.gratto-trevor@ec.gc.ca

[1] from Canadian Shorebird Conservation Plan (Hyslop et al. 2000), with breakdown of contributing factors as follows:

Population trend estimate	5 = significant population decline ($p<0.10$)
Relative abundance estimate	3 = 150,000 - <300,000
Threats during breeding season	2 = threats assumed to be low from all factors
Threats during non-breeding season	2 = threats assumed to be low from all factors
Breeding distribution	2 = 10-20% of North America
Non-breeding distribution	1 = very widespread (10-18,000,000km^2, or on 8-14 500 km of coast)

[2] See Morrison *et al. in press* for derivation of population estimates; global = sum of all populations for which estimates are available

[3] Hyslop et al. (2000)

References:

Alexander, S. A., and C. L. Gratto-Trevor. 1997. Shorebird migration and staging at a large prairie lake and wetland complex: the Quill Lakes, Saskatchewan. Canadian Wildlife Service Occasional Paper Number 97, Environment Canada, Ottawa.

Cramp, K. E. L., and Simmons, K. E. L., eds. 1983. Handbook of the birds of Europe, the Middle East, and North Africa. Vol. III. Oxford Univ. Press, Oxford.

Duncan, C. D. 1995. The migration of Red-necked Phalaropes: ecological mysteries and conservation concerns. Birding 28:482-488.

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APPENDIX D

SUMMARY OF SPECIES DISTRIBUTION AND HABITAT NEEDS

SUMMARY OF SPECIES DISTRIBUTION AND HABITAT NEEDS

A. PRAIRIE CANADA BREEDING SHOREBIRDS

1. Prairies

a. Piping Plover[1]

The Piping Plover occurs primarily in the eastern portion of Alberta, southern Saskatchewan, and in southwestern Manitoba, in prairie/parkland habitats. The zone of greatest abundance is in Saskatchewan. It is a species with very specialised habitat needs and is confined, as a breeding bird, to saline wetlands with bare finely gravelled shorelines. It is currently classified as an endangered species and its needs are addressed in an endangered species recovery plan.

b. Mountain Plover

The Mountain Plover is a species of the high plains of western North America. It occurs in southeastern Alberta in very dry upland habitats that are almost totally devoid of vegetation. Its occurrence in Canada is at the very limit of its range and is essentially extralimital.

c. Black-necked Stilt

The Black-necked Stilt is of only recent occurrence in Prairie Canada. At present, it appears to be established as a breeding bird in southern Alberta with occasional breeding in central Alberta and southwestern Saskatchewan. A tall slim wading bird, it typically breeds along the grassy shoreline of shallow freshwater that have extensive areas of mudflats. It frequents fresh or saline wetlands with short, sparse vegetation, foraging in water depths up to 18 centimetres. It often nests semicolonially with several pairs occurring in a relatively small area.

d. American Avocet[1]

The American Avocet is a common breeding bird of saline wetland areas in southern Alberta and Saskatchewan and reaches its northern limit of distribution in the aspen parkland. This area of Prairie Canada is an extremely important component of its breeding range. Favoured breeding habitat consist of ponds or lakes with exposed, sparsely vegetated shorelines or mud flats that are closely adjacent to areas of shallow water. Such waters include alkaline as well as subsaline semipermanent ponds and lakes. Island habitats, such as constructed earth islands, can be preferred breeding habitats where the birds will nest semicolonially at high densities. Foraging is carried out at water depths up to 20 centimetres.

e. Willet[1]

As a breeding bird the Willet occurs in two disjunct populations, one along the southeastern coast of North America and the other in Prairie Canada and North Dakota. Highest densities of the interior subspecies occur on brackish to subsaline semipermanent ponds and lakes. Nests are usually located in upland grassland, often at substantial distances from the wetland shore. Nesting is solitary. Willets forage in areas ranging from moist grasslands to water depths up to 15 centimetres.

f. Upland Sandpiper[1]

Upland Sandpipers are grassland birds not normally associated with wetlands. They occur in dense grasslands of medium to tall height and may nest semicolonially. Sites chosen are usually more moist than those of the Long-billed Curlew.

g. Long-billed Curlew[1]

The Long-billed Curlew is an upland species that will resort to the margins of wetlands outside of the breeding season. Nesting areas chosen are usually of short vegetation height with only moderate vegetation density. In Canada this species is confined to the dry grasslands region of southern Alberta and southwestern Saskatchewan.

h. Marbled Godwit[1]

The world breeding range of the Marbled Godwit is confined to the prairie/parkland region of Prairie Canada and to the Dakota potholes, except for small numbers in the James Bay region and Alaska, making this a very high priority species in the region. The breeding range of the Marbled Godwit is focused around semipermanent wetlands ranging from fresh to strongly saline. Native grasslands of short to medium height provide the preferred nesting cover. Nests may be located a considerable distance from water. Foraging ranges from upland habitats to wetlands up to 16 centimetres in depth.

I. Wilson's Phalarope[1]

Wilson's Phalarope is the most southerly breeding of the phalarope species and its greatest centre of abundance is in the prairie region. Breeding areas consist of shallow fresh to saline wetlands with wet meadow areas nearby. Nesting occurs in wet-meadow vegetation close to the wetland margins.

2. Boreal

a. Greater Yellowlegs

The Greater Yellowlegs is a common summer resident of the muskegs across the Northern Boreal Region of Prairie Canada. Optimum habitat consists of open and high woodlands with only low and sparse undergrowth near marshy or grassy ponds. In many areas, the birds breed on hills or ridges near swamps that are mostly burned over and grass-covered, or which are still covered with

dense forests of poplar, birch, and spruce. Nests have been recorded up to 1.6 kilometres from the nearest water.

b. Lesser Yellowlegs

Like the Greater Yellowlegs, this species is also a common summer resident of the wooded bogs in the Boreal Region. General habitat requirements appear to be similar, and research is needed to delineate habitat differences between the two. The Lesser Yellowlegs apparently is especially numerous in broken hills covered with burned and fallen timber with a secondary growth of low poplars. The usual nest site is in an area where there is an abundance of tree stumps, charred tree trunks, and similar debris of a forest fire, often where new growth is no more than 2.4 to 3.0 metres high.

c. Solitary Sandpiper

The Solitary Sandpiper seeks out wet muskeg country in the boreal zone, typically open terrain with scattered trees or clumps of trees. The species is unique amongst North American shorebirds in that the nest sites normally consist of the abandoned nests of numerous tree-nesting passerines. These nests can range in height from 1.2 to 12 metres above ground and can be found up to 200 metres from water. Foraging is normally done in wet grassy areas, along the water's edge, or in shallow water.

d. Short-billed Dowitcher

North America supports two dowitcher species only one of which breeds within the prairie region. The Short-billed Dowitcher is a subarctic species associated with muskegs or similar boggy and marshy areas with low vegetation. They do not go much beyond the treeline onto the tundra. Nests are usually located in wet grasses or sedges near the water's edge.

3. Generalists Breeding Throughout Prairie Canada

a. Killdeer

The Killdeer has the widest breeding range of any American plover occurring from the Boreal Region south into coastal South America. It occupies a wide variety of open land habitats and is especially attracted to gravelly substrates such as roadways or gravel pits. It often occurs considerable distances from water. Although it has shown some recent decline in numbers on the breeding bird surveys, overall it is one of our most numerous shorebirds and is not a management concern. The Killdeer is not a wader, preferring instead to forage along the water's edge or in upland habitats.

b. Spotted Sandpiper

The Spotted Sandpiper is a true species of the water's edge occurring throughout North America south of the tundra regions. It is the shorebird species most closely associated with running water and watercourses, although it also

occurs along the edge of standing pools. It both nests and forages close to the water's edge, and is not normally a wader.

c. Common Snipe
The Common Snipe is the most widely distributed shorebird species in the world, breeding in North and South America and across Eurasia. It breeds in wetland habitats throughout Prairie Canada and is especially common in peatlands and organic bog habitats north as far as the low tundra. Nesting is usually in dry locations in tall grasses, rushes or sedges. The birds typically forage in soft water-saturated soils and rarely wade.

4. Coastal Hudson Bay, Manitoba

a. American Golden-Plover
The American Golden Plover is a common migrant at Churchill and a fairly common summer breeder on high dry tundra.

b. Semipalmated Plover
The Semipalmated Plover is a common migrant and summer resident in the Churchill region. It nests commonly along the bay beach or on the shoulders of gravel roads.

c. Killdeer
The Killdeer is uncommon in summer with a few pairs breeding around the town site and in gravel pits.

d. Lesser Yellowlegs
This species is a common to abundant resident south of the treeline, feeding in muskeg areas. It nests on dry lichen-covered or burned over ridges around brush or blow-down trees, rarely in the open.

e. Solitary Sandpiper
The Solitary Sandpiper is uncommon to rare during the summer in muskeg habitat in the area.

f. Whimbrel
The Whimbrel is a common to abundant summer resident in large marshes near the treeline and is uncommon to rare on the tundra. It nests on dry lichen-covered ridges or on hummocks in the marshy tundra. Fall migrants utilize both the dry ridgetops and coastal mudflats.

g. Hudsonian Godwit[1]
The Hudsonian Godwit, eastern population, is common in summer at the treeline, but rare in tundra habitats. It nests in fairly dry sedge meadows dotted with small birch near the treeline. Fall staging occurs along the coastline.

h. Semipalmated Sandpiper
The Semipalmated Sandpiper is an abundant migrant and fairly common summer resident. It is most common in flat fairly dry tundra, often near the bay shore.

I. Least Sandpiper
The Least Sandpiper is common to abundant in marshes near the tree-line. It breeds primarily in sedge meadows and avoids the dry tundra.

j. Dunlin
The Dunlin is a common migrant along the coastal area and a summer resident of the wet tundra, nesting in wet sedge marshes.

k. Stilt Sandpiper[1]
This species is a fairly common migrant. In summer it is common in wet sedge meadows near the treeline, usually nesting on hummocks or on low dry ridges.

l. Short-billed Dowitcher
Breeding Dowitchers in the Churchill region are all of the Short-billed species. They are a fairly common summer resident in sedge marshes near the treeline.

m. Common Snipe
The Snipe is uncommon in tundra situations but common to abundant in muskegs north to the treeline.

n. Red-necked Phalarope[1]
This is a common migrant along the coast and a common summer resident in large marshes with shallow ponds from the treeline north. It is the most abundant breeding shorebird in the tundra in the Churchill region.

B. PRAIRIE CANADA PASSAGE MIGRANTS

1. Prairies/Boreal

a. Black-bellied Plover

Significant numbers of migrant Black-bellied Plovers utilise wetland shores in the prairie region. During spring, the species sometimes numbers in the thousands at Beaverhill Lake near Edmonton. Not as terrestrial as the American Golden Plover, the Black-bellied Plover will forage in cultivation or in mud and along the water's edge. Although widespread during the migration, the species is especially numerous around the larger water bodies.

b. American Golden-Plover

An uncommon autumn migrant, the American Golden Plover is much more abundant in May across Prairie Canada. Numbers are difficult to assess then, however, as the species normally forages in the cultivated fields, often not close to any wetlands.

c. Semipalmated Plover

The Semipalmated Plover is more common in the interior of North America during the spring passage, but does not occur in large numbers anywhere. Semipalmated plovers forage in mud along the water's edge.

d. Greater Yellowlegs[2]

Nesting in the Boreal Region, the Greater Yellowlegs is a wader common in Prairie Canada during both the spring and autumn migrations. It is not as gregarious as the Lesser Yellowlegs and is not as numerous overall. Although occasionally feeding along the shore, the Greater Yellowlegs normally forages in shallow water to a depth of 10 or 12 centimetres.

e. Lesser Yellowlegs[2]

In habits the Lesser Yellowlegs is much like the Greater, although it is more gregarious and usually occurs in flocks. This abundant species especially favours shallow grassy wetlands in which to forage and, in spring, often utilises backflooded hayfields. Lesser Yellowlegs tend to forage in somewhat shallower water than Greater Yellowlegs, but there is a great deal of overlap between the two species.

f. Solitary Sandpiper[2]

As its name implies, the Solitary Sandpiper is not to be found in flocks during the migration. Although widespread, it is nowhere abundant. It normally forages in very shallow water or along the water's edge.

g. Eskimo Curlew
One of the world's rarest birds, if indeed it survives at all, this species was formerly an abundant spring migrant through the Great Plains Region of North America.

h. Whimbrel
The Whimbrel is not an abundant species in the interior of North America, although it sometimes occurs in small flocks around the saline lakes of southern Alberta and Saskatchewan. Whimbrels forage in a variety of situations ranging from dry grasslands to shallow water.

i. Hudsonian Godwit[1]
Although more widely dispersed during the spring migration, the Hudsonian Godwit occurs in quite large numbers at some Saskatchewan lakes during the fall (in excess of 2500 at Luck and Little Quill). Waders, the birds forage in shallow water to a depth of about 12 centimetres.

j. Ruddy Turnstone
The Ruddy Turnstone is an uncommon migrant in the interior and a true oceanfront species. Migrants found in the interior are normally solitary or observed in small numbers in migrant flocks of Black-bellied Plover and Red Knot. They are usually seen along the shorelines of large wetlands and forage along the shore.

k. Red Knot
A rare autumn migrant, the Red Knot, is not uncommon during the spring and sometimes numbers in the thousands. At that time, not normally a wader, they forage in a variety of habitats ranging from mud flats and wet meadows to cultivation.

l. Sanderling[1]
Sanderlings often occur in very large numbers on saline lakes in the interior during the spring migration. Up to 50,000 Sanderling have been recorded in the Chaplin/Old Wives Lakes region of Saskatchewan. This represents nearly one-half of the numbers recorded on their principal wintering grounds (Pacific coast of South America). They are an oceanfront species that normally forages by chasing the waves along the water's edge.

m. Semipalmated Sandpiper
The Semipalmated Sandpiper is the most abundant of the small "peeps" in Prairie Canada and probably the most abundant shorebird migrating through the region. Widespread, the overall population is in the millions. They normally forage along the shore from wet mud to depths of about 4 centimetres.

n. Least Sandpiper[2]
Uncommon as a breeding bird in our Boreal Region, the Least Sandpiper is a common migrant in the prairie region, sometimes numbering in the thousands. Foraging areas range from wet mud to very shallow water.

o. White-rumped Sandpiper[1]
The White-rumped Sandpiper is primarily a spring migrant in Prairie Canada, and is more common to the east than in Alberta. Over 15,000 were recorded at Little Quill Lake, Saskatchewan, on one occasion, and 10,000 at Whitewater Lake in Manitoba. Foraging is on wet mud or in shallow water depths of only 4 to 5 centimetres.

p. Baird's Sandpiper[1]
The Baird's Sandpiper is widespread and common during both the spring and fall migrations. Not a wader, it is more terrestrial than the other small sandpipers and often feeds a considerable distance from the shore in moist heavily grazed pastures.

q. Pectoral Sandpiper[1]
Not normally seen in large flocks, the Pectoral Sandpiper is however common in Prairie Canada during both the spring and autumn migrations, sometimes occurring in quite large numbers overall. Pectorals often forage in the uplands in wet meadow habitats or along the vegetated shorelines of wetlands. Even the large Siberian population of this species migrates through North America to winter in South America.

r. Dunlin
Primarily a coastal species, the Dunlin is not a common migrant in the interior. When seen, it is usually along the shoreline of one of the larger saline waterbodies foraging in shallow water or on mudflats.

s. Stilt Sandpiper[1]
The Stilt Sandpiper is a true wader using its long legs to advantage to forage in water too deep for the smaller calidrid shorebirds. It is a common spring and fall transient, particularly in Saskatchewan where flocks in excess of 10,000 frequently occur. This is strictly a North American species in which the major migration occurs through the continent's interior.

t. Buff-breasted Sandpiper[1]
The Buff-breasted Sandpiper may be one of our rarest shorebirds. Although little is known of its numbers, the total population is not large and virtually all the world's Buff-breasted Sandpipers pass through Alberta and Saskatchewan each spring. No large congregations have been recorded in recent years and the species is one of concern. Migrants normally forage in moist heavily grazed pasturelands or in cultivated fields. They were formally recorded in the hundreds

in pasturelands near Beaverhill Lake, but have become scarce there in recent years.

u. Short-billed Dowitcher[2]
A breeding bird in the boreal forest, the Short-billed Dowitcher is a relatively common migrant in the prairie/parkland region. It is a true wader foraging in water up to about 10 centimetres in depth.

v. Long-billed Dowitcher
Nesting more to the north and west (including into Siberia) than the Short-billed species, the Long-billed Dowitcher is much more numerous in Prairie Canada during the migration. Like the Pectoral Sandpiper, the Siberian birds migrate through North America. Foraging habits are similar to those of the Short-billed Dowitcher. Dowitchers are late migrants with large numbers (10,000 on some counts) occurring at Beaverhill Lake in late September.

w. Red-necked Phalarope[1]
A rare breeding bird in the north of the prairie provinces, the Red-necked Phalarope is a very common migrant often numbering in the thousands on the large prairie wetlands. Although it migrates through the interior, this species is not truly a wader, but is pelagic, often feeding in large flocks a considerable distance from shore. Although still abundant overall, concerns have been recently expressed, most remarkably in the Atlantic coastal areas, about possible major declines in numbers.

2. Coastal Hudson Bay, Manitoba

a. Black-bellied Plover
The Black-bellied Plover does not breed in the area but is an uncommon spring and fall migrant.

b. Greater Yellowlegs
The Greater Yellowlegs is an uncommon transient.

c. Eskimo Curlew
This species was formerly a common transient and possibly a summer resident of the area. There have been no confirmed recent reports of the species.

d. Ruddy Turnstone
The Ruddy Turnstone is a common spring and fall migrant along the Hudson Bay shore. Besides the shore, it apparently also scavenges the garbage dumps and the area around the Churchill grain elevator where it feeds on waste grain.

e. Sanderling[1]
The Sanderling is a common migrant in coastal areas.

f. White-rumped Sandpiper[1]
This species does not breed in the area but is fairly common during the spring migration, less common in fall.

g. Baird's Sandpiper[1]
Like the White-rumped Sandpiper, this species is fairly common during the spring migration, but uncommon in fall.

h. Pectoral Sandpiper[1]
The Pectoral Sandpiper is uncommon during the spring but more common in fall.

i. Buff-breasted Sandpiper[1]
This species occurs in the Churchill region only as a fall migrant in coastal areas and was considered to be fairly common there in the 1960's.

j. Red Phalarope
The Red Phalarope is a rare spring and fall transient. The nearest nesting is about 100 miles north.

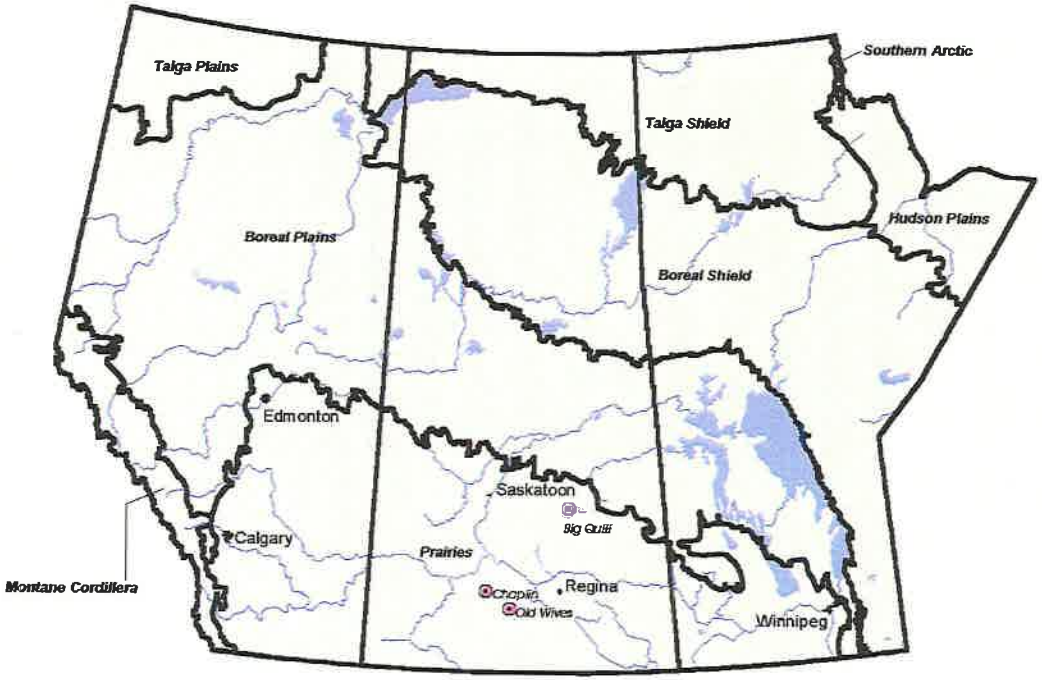
[1] Priority species identified, by the Canadian Wildlife Service Technical Committee, as prairie region's responsibility because a large, or entire, portion of the Canadian, hemispheric or global population occurs in the region at some point in the annual cycle.

[2] Denotes species that breed in the boreal ecoregion but which are passage migrants in the prairie/parkland ecoregions.

BREEDING DISTRIBUTION AND RANGE MAPS OF SOME BREEDING SHOREBIRDS IN THE PRAIRIE PROVINCES

Snowy Plover
Piping Plover
Killdeer
Mountain Plover
Black-necked Stilt
American Avocet
Greater Yellowlegs
Lesser Yellowlegs
Solitary Sandpiper
Willet
Spotted Sandpiper
Upland Sandpiper
Long-billed Curlew
Marbled Godwit
Least Sandpiper
Short-billed Dowitcher
Common Snipe
Wilson's Phalarope

SNOWY PLOVER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES



No Photo Available

Breeding Site

Ecozones

Data source: Al Smith, Canadian Wildlife Service, Environment Canada

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

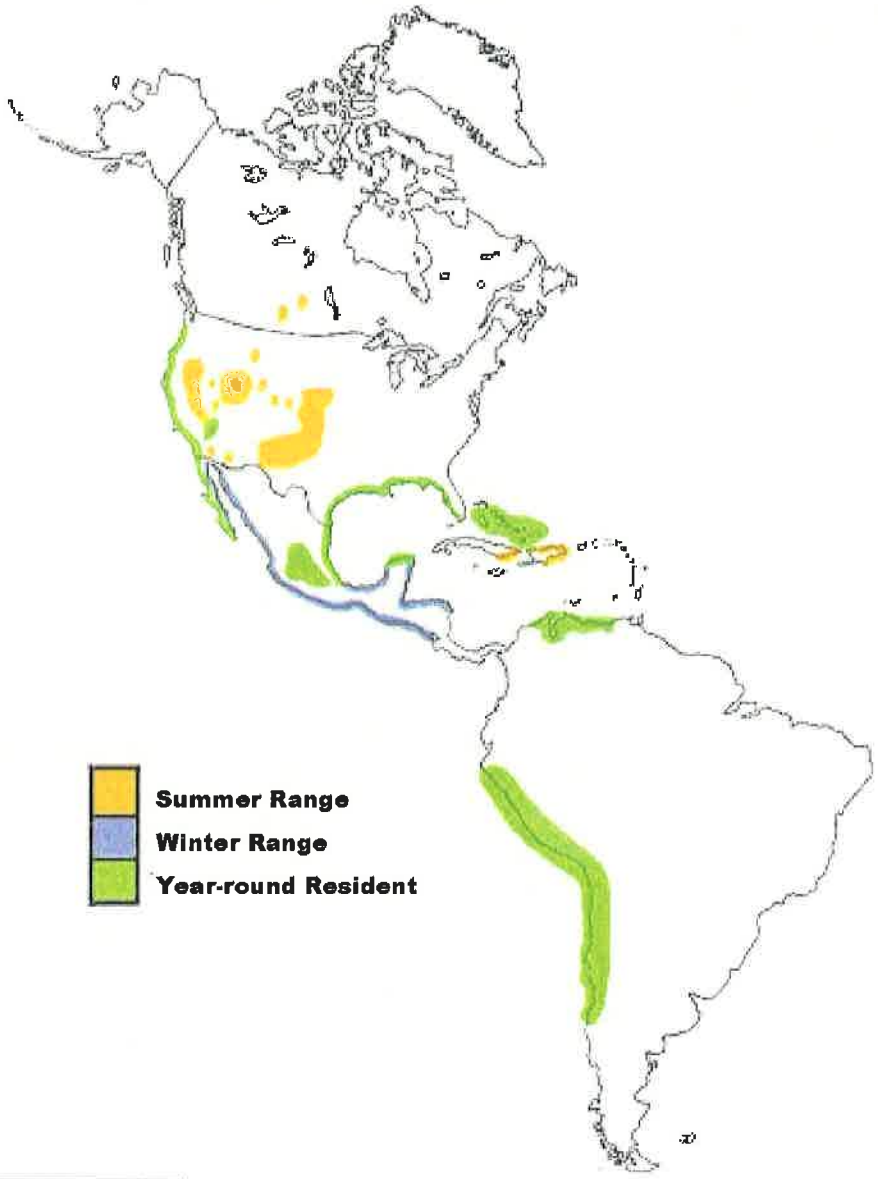
Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SNOWY PLOVER NORTH AMERICAN DISTRIBUTION



No Photo Available

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

PIPING PLOVER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Photo by Gerry Bayersbergen

Breeding Range

Ecozones

Data source: Paul Goossen, Canadian Wildlife Service, Environment Canada

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

PIPING PLOVER NORTH AMERICAN DISTRIBUTION

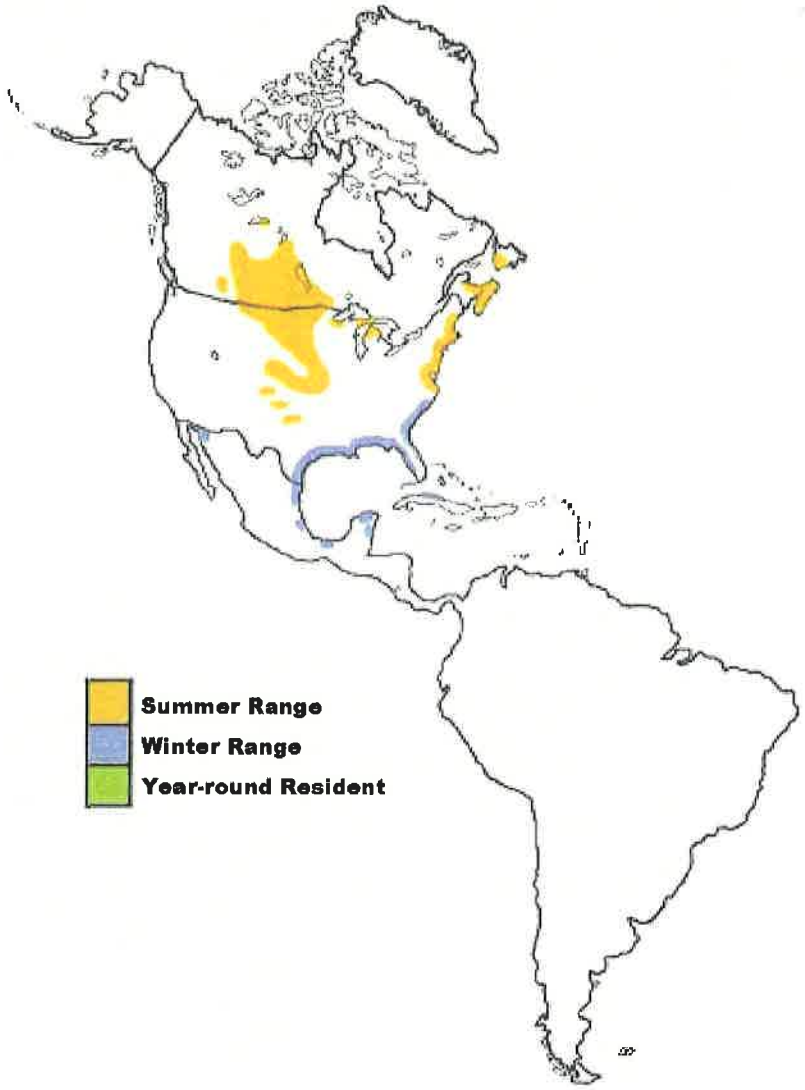


Photo by Gerry Beyersbergen

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

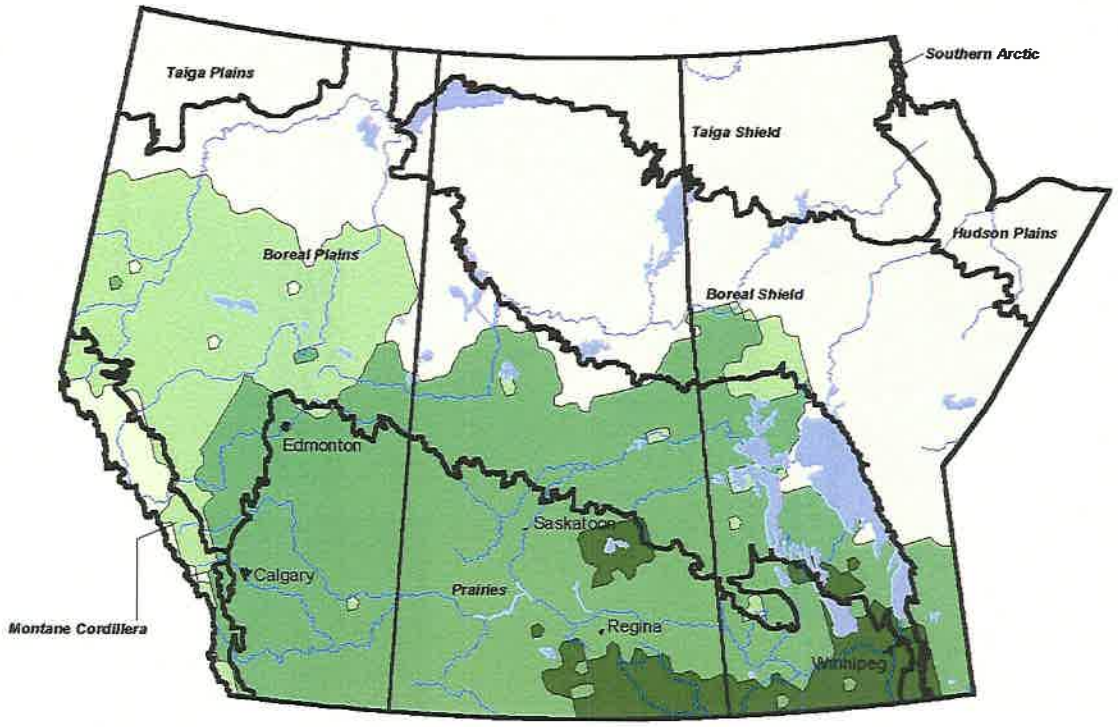
Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

KILLDEER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES


Photo by Gerry Beyersbergen



Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- Ecozones

*** indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

KILLDEER NORTH AMERICAN DISTRIBUTION

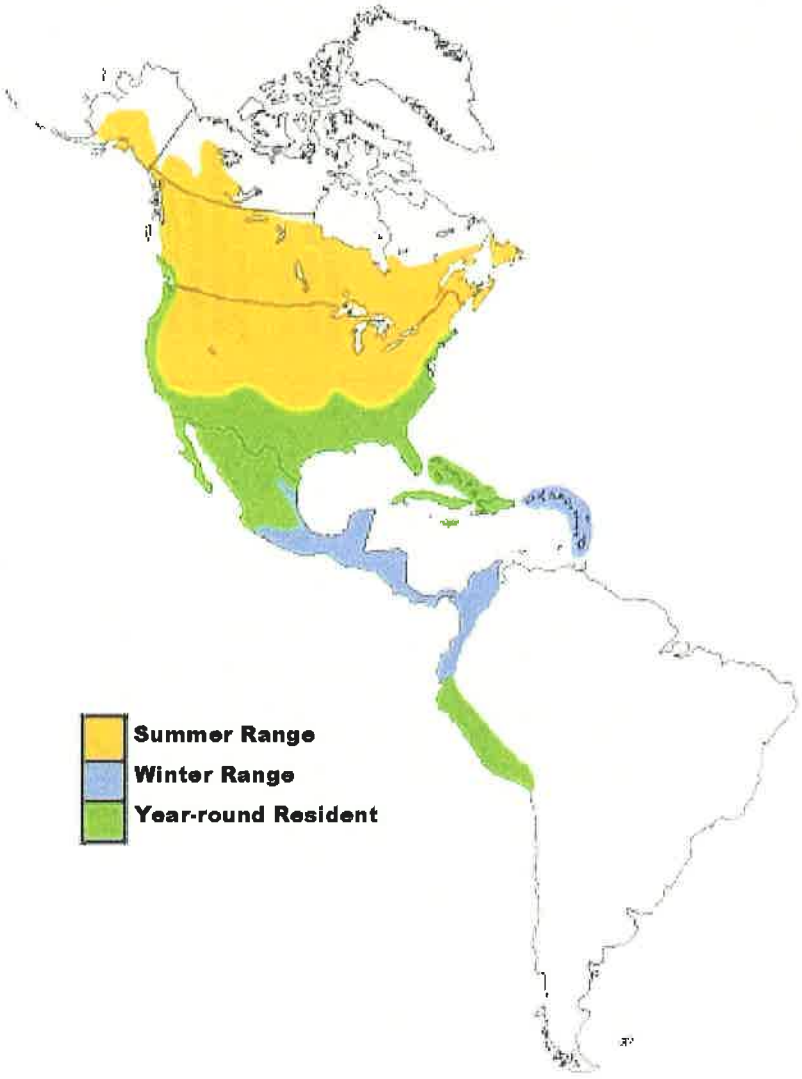


Photo by Gerry Beyersbergen

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

MOUNTAIN PLOVER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Breeding Range

Ecozone

Data Source: Paul Goossen, Canadian Wildlife Service, Environment Canada

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

MOUNTAIN PLOVER NORTH AMERICAN DISTRIBUTION

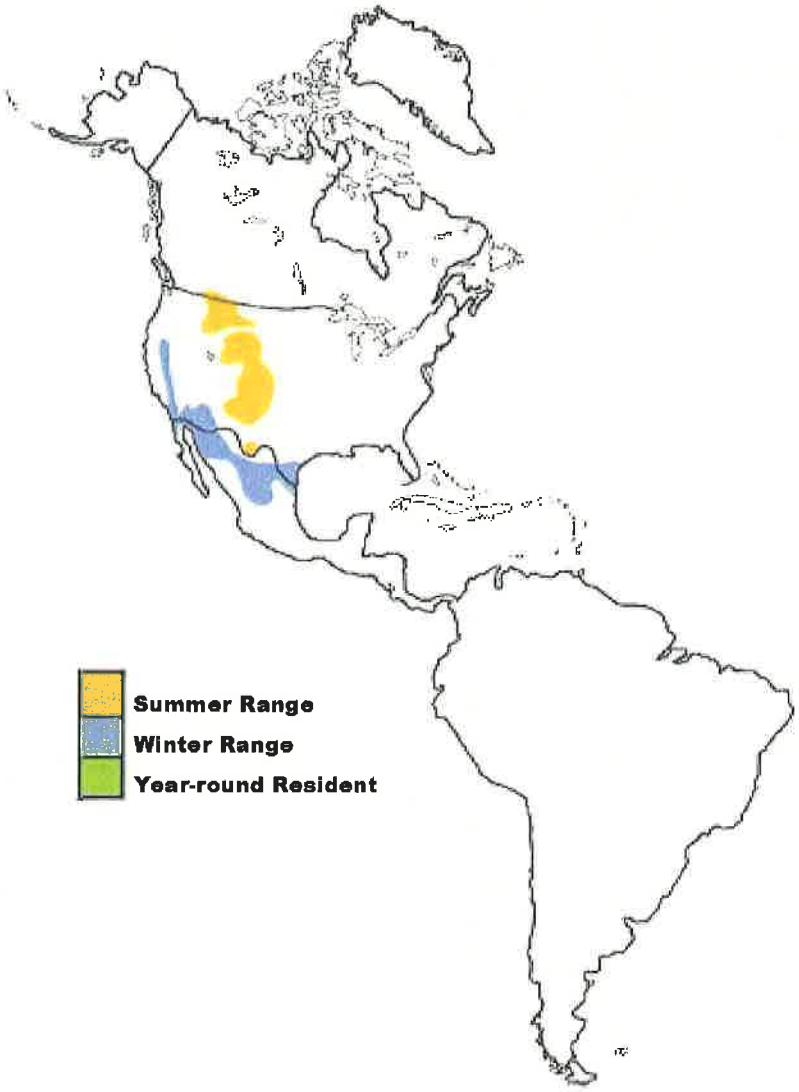


Photo by Nebraska Wildlife

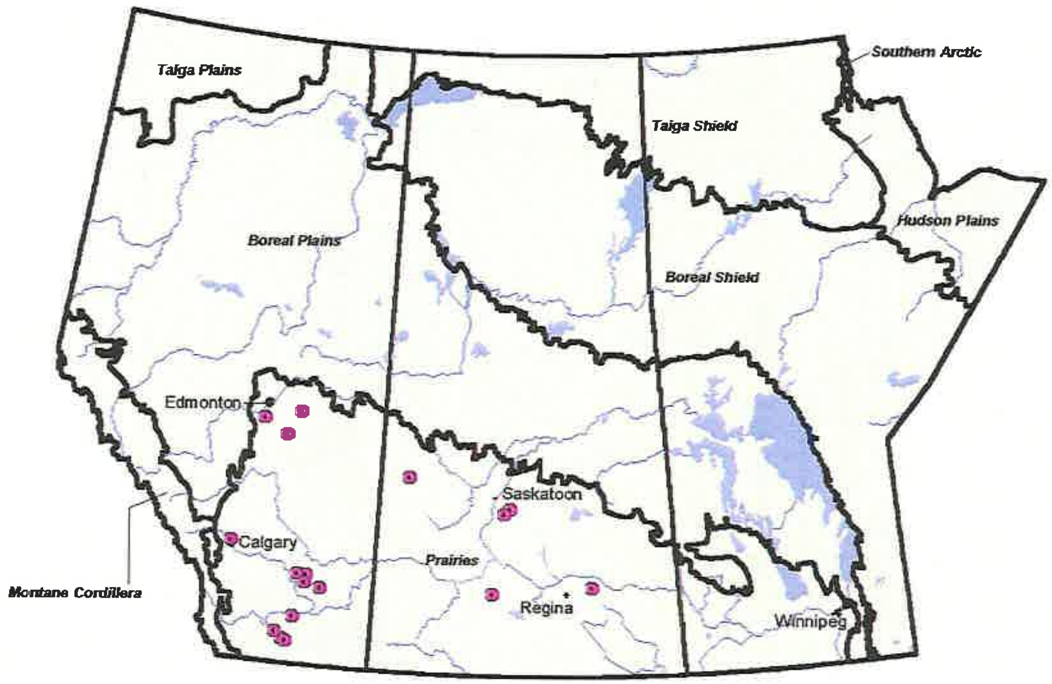
Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

BLACK-NECKED STILT BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES



Documented Breeding Sites

Ecozone

Breeding site data source:
Josh Bilyk, SWCC
Dr. C. L. Gratto-Trevor, CWS, Environment Canada

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200 km

N

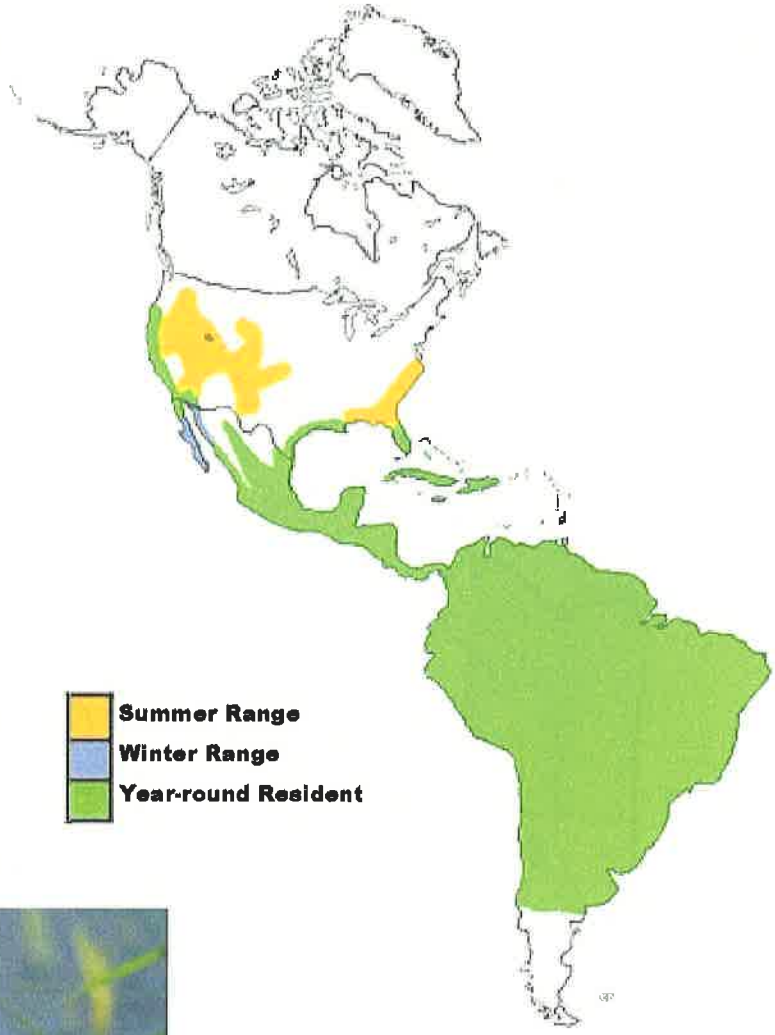
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

BLACK-NECKED STILT NORTH AMERICAN DISTRIBUTION



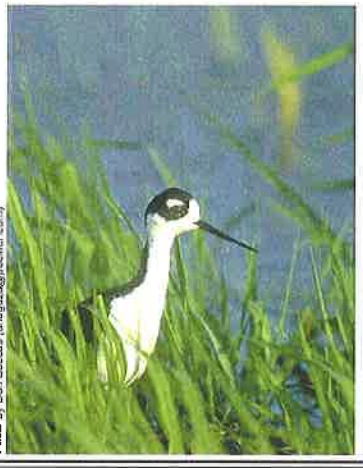


Photo by Don Bacus (dhagaza@pacifier.com)

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

AMERICAN AVOCET BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

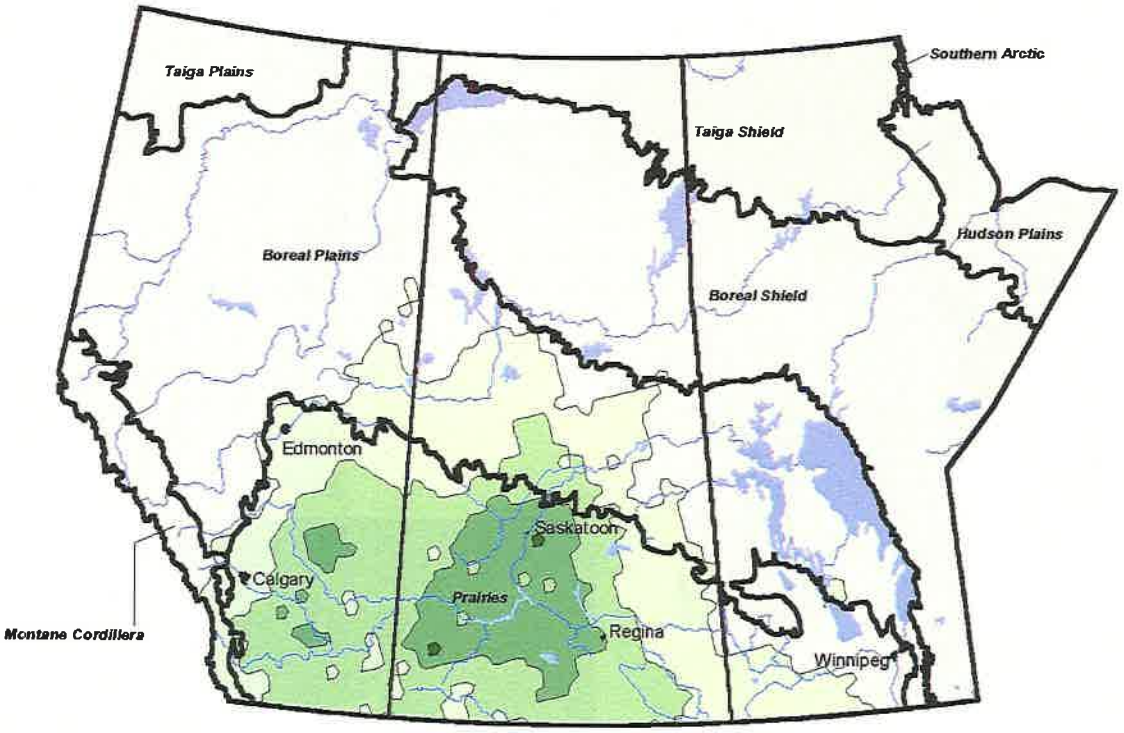


Photo by Gerry Ebyerbergen

Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- Ecozone

*** indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

AMERICAN AVOCET NORTH AMERICAN DISTRIBUTION

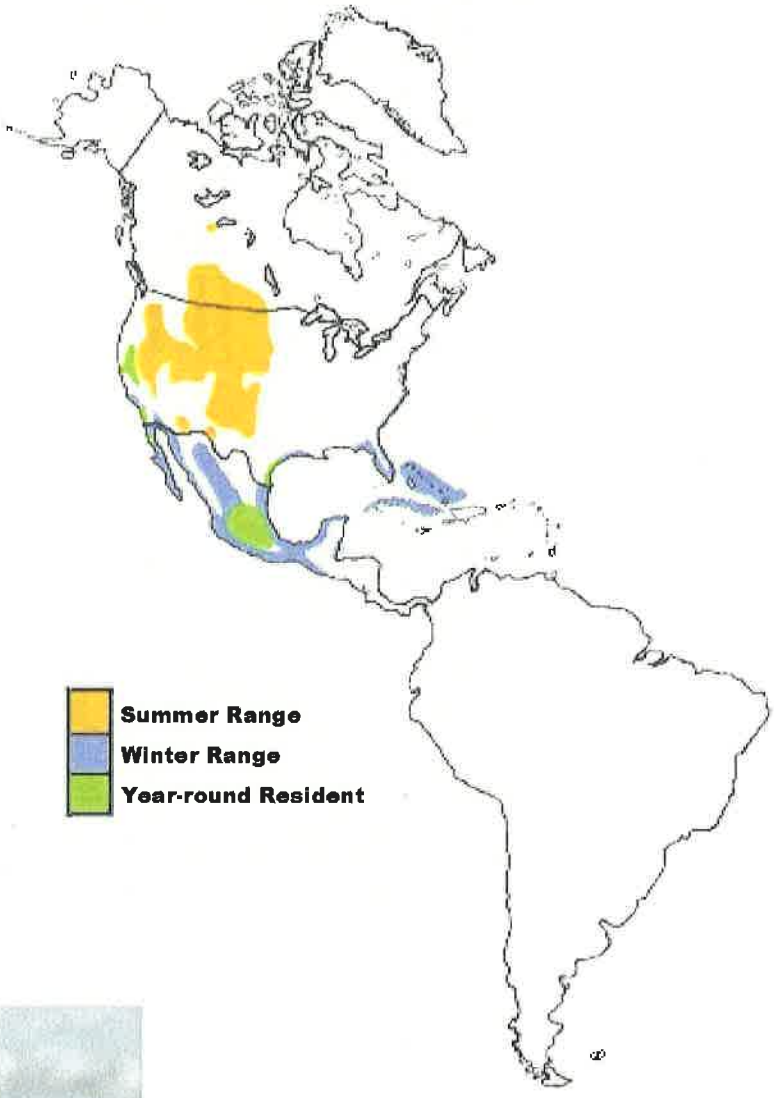


Photo by Gerry Beyersbergen

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

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Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

GREATER YELLOWLEGS BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Photo by The Provincial Museum of Alberta

Breeding Range

Ecozone

Data Source: The Birds of North America, The American Ornithologists' Union and The Academy of Natural Sciences

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

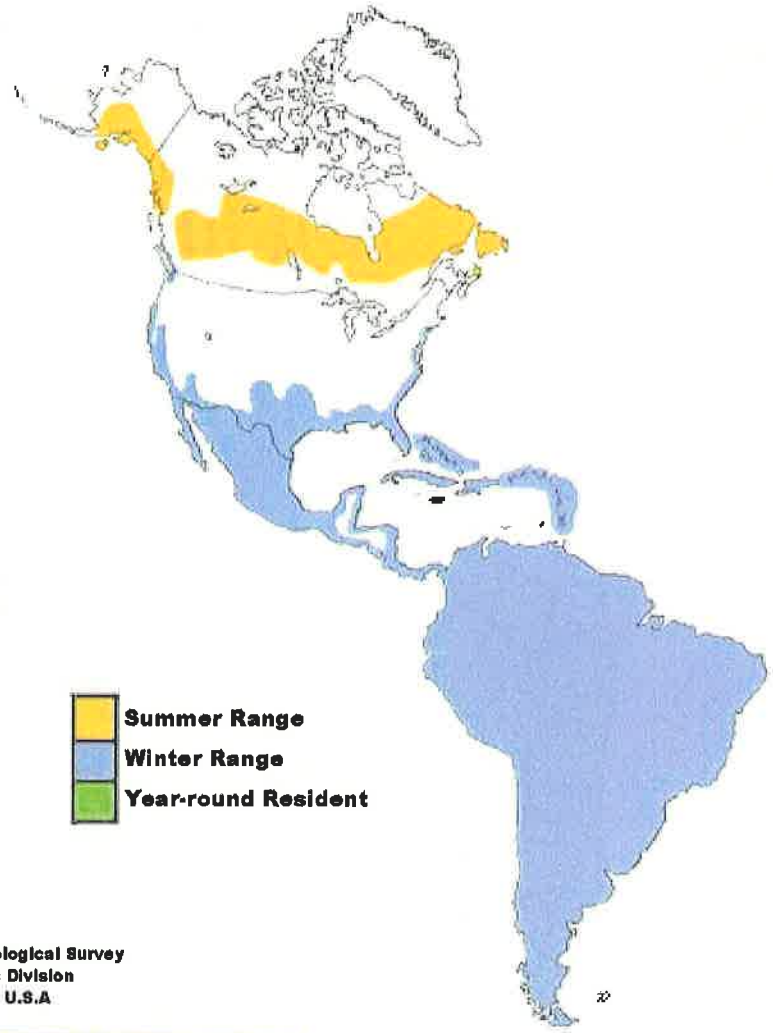
Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

GREATER YELLOWLEGS NORTH AMERICAN DISTRIBUTION



Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Photo by The Provincial Museum of Alberta

Environment Canada | Environnement Canada

Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

February 2000

LESSER YELLOWLEGS BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Breeding Range

Ecozones

Data Source: W. Earl Godfrey, The Birds of Canada

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

LESSER YELLOWLEGS NORTH AMERICAN DISTRIBUTION

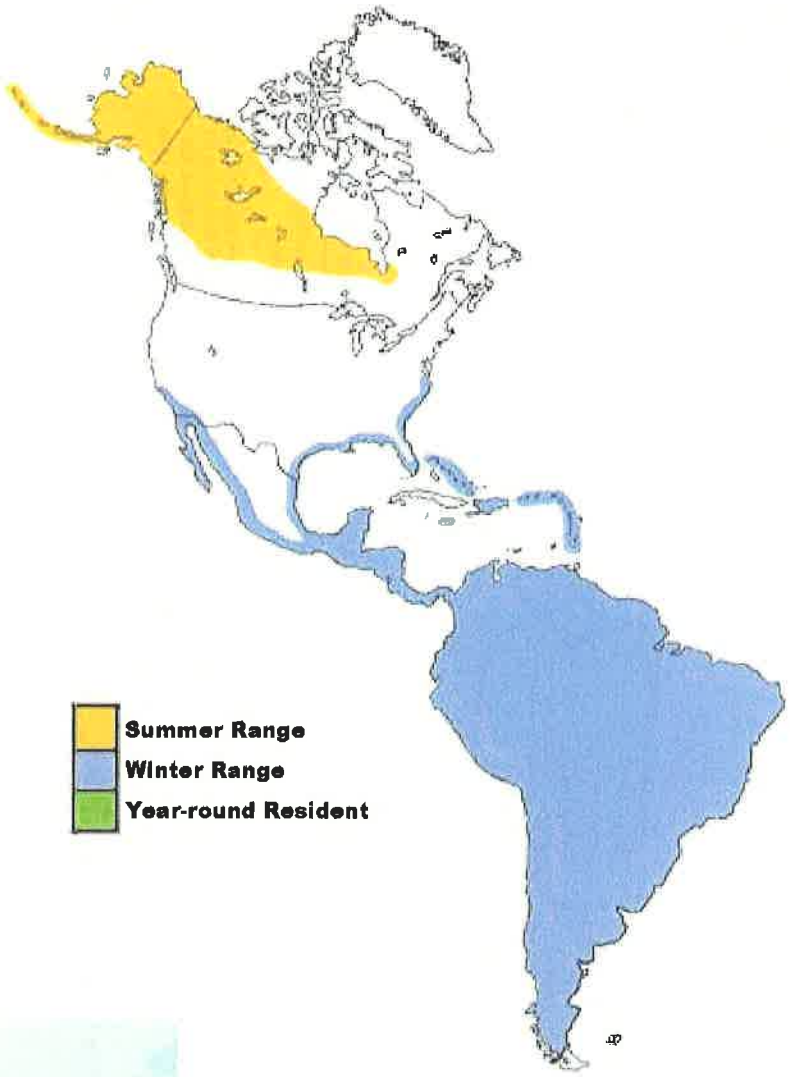


Photo by Cheri Gratto-Trevor

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SOLITARY SANDPIPER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Breeding Range

Ecozones

Data source: The Birds of North American, The American Ornithologists' Union and The Academy of Natural Sciences

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

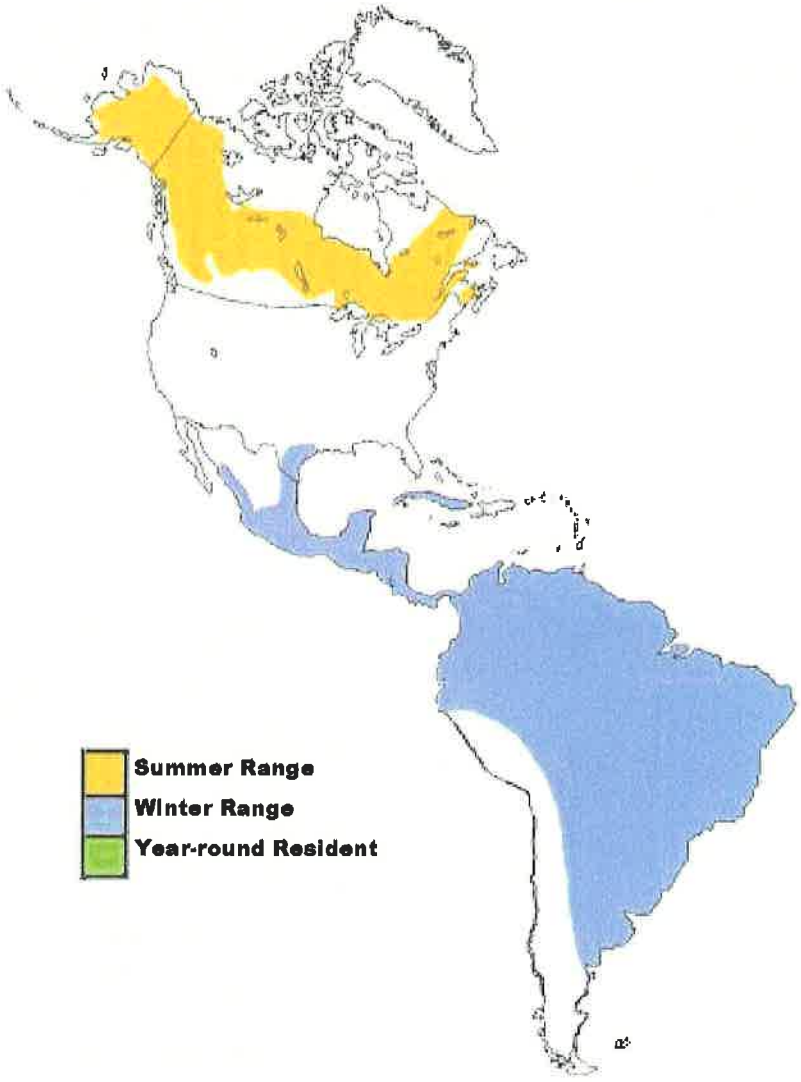
Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SOLITARY SANDPIPER NORTH AMERICAN DISTRIBUTION



Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

February 2000

WILLET BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

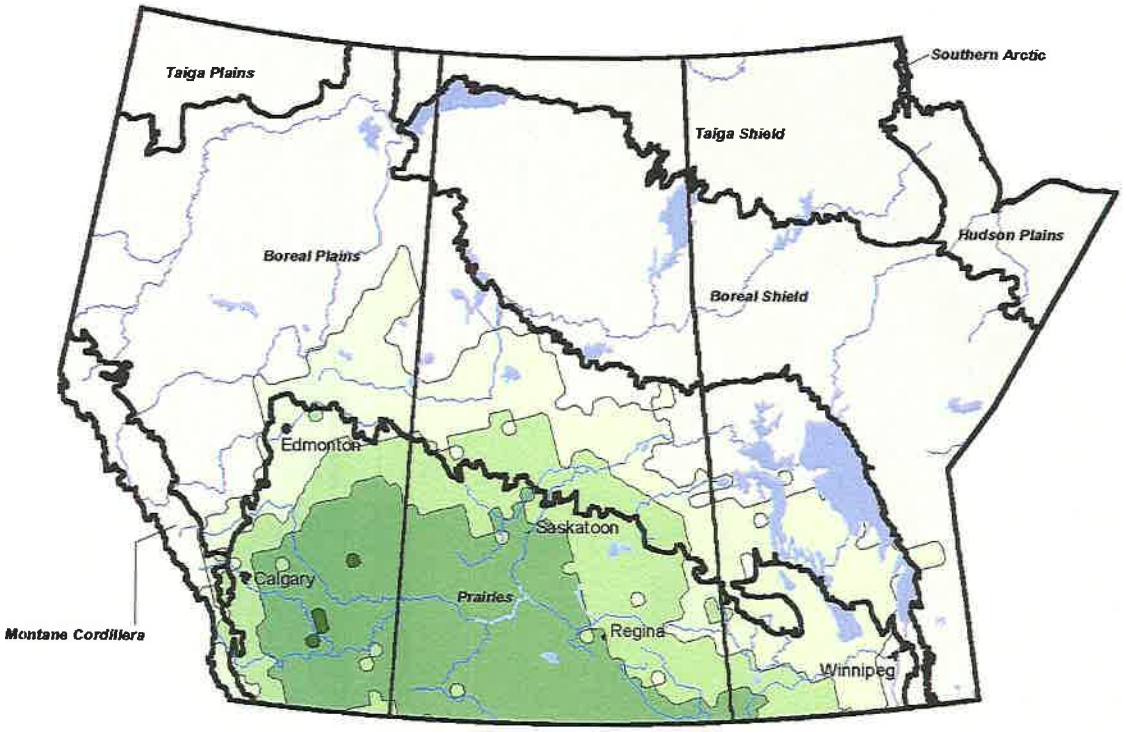


Photo by Don Baccus (dhcgrass@pacifier.com)

Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- *Ecozone*

*** indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

WILLET NORTH AMERICAN DISTRIBUTION

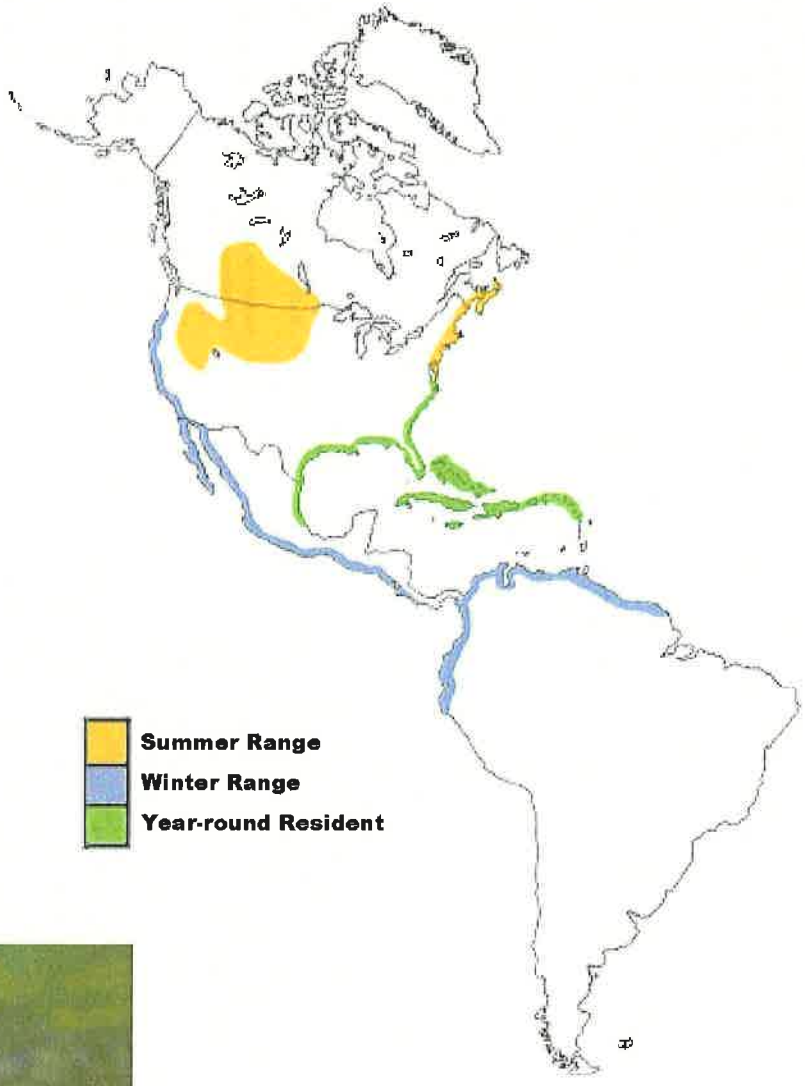


Photo by Don Baccus (dhogaza@pacifier.com)

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SPOTTED SANDPIPER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

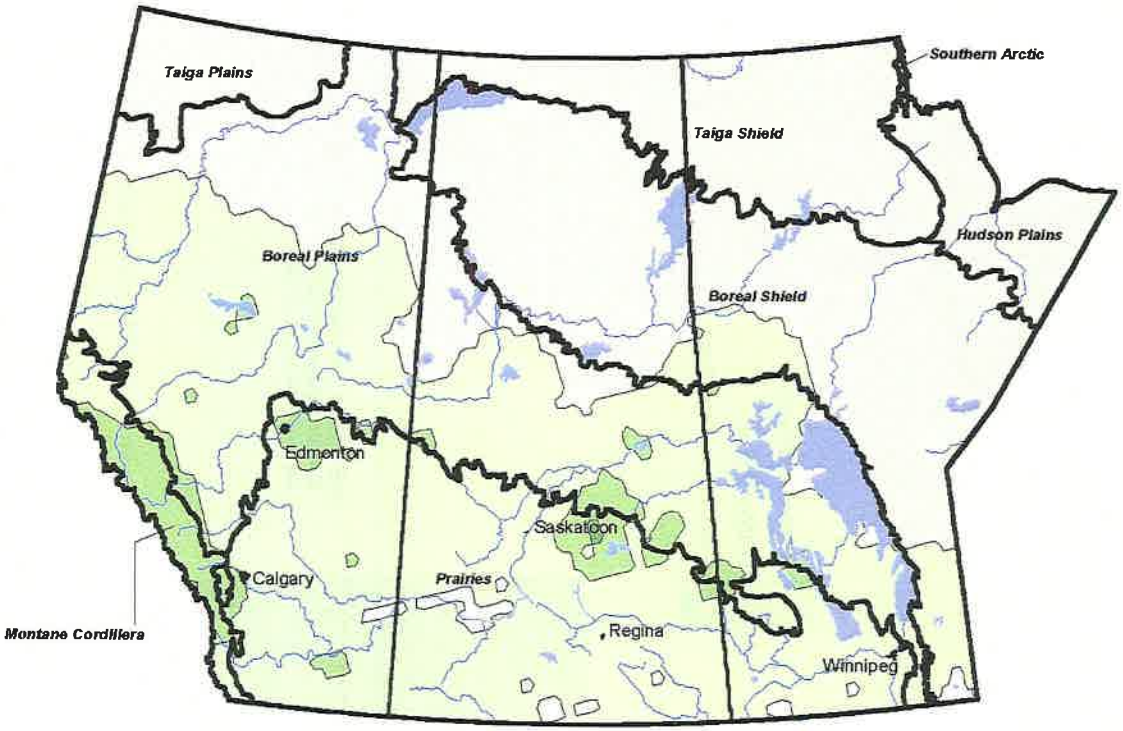


Photo by Gerry Bloemsma

Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- *Ecozone*

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Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

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Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SPOTTED SANDPIPER NORTH AMERICAN DISTRIBUTION

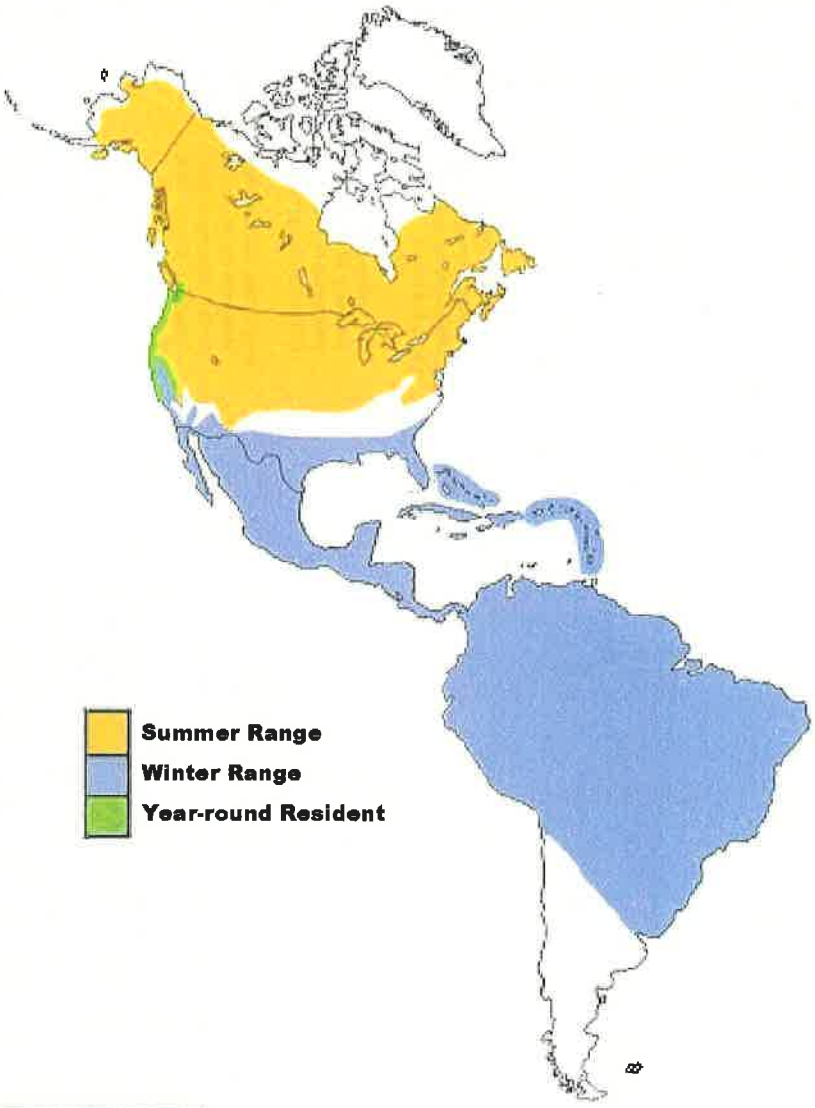

Photo by Gerry Beyersbergen

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

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Produced by: Canadian Wildlife Service
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February 2000

UPLAND SANDPIPER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

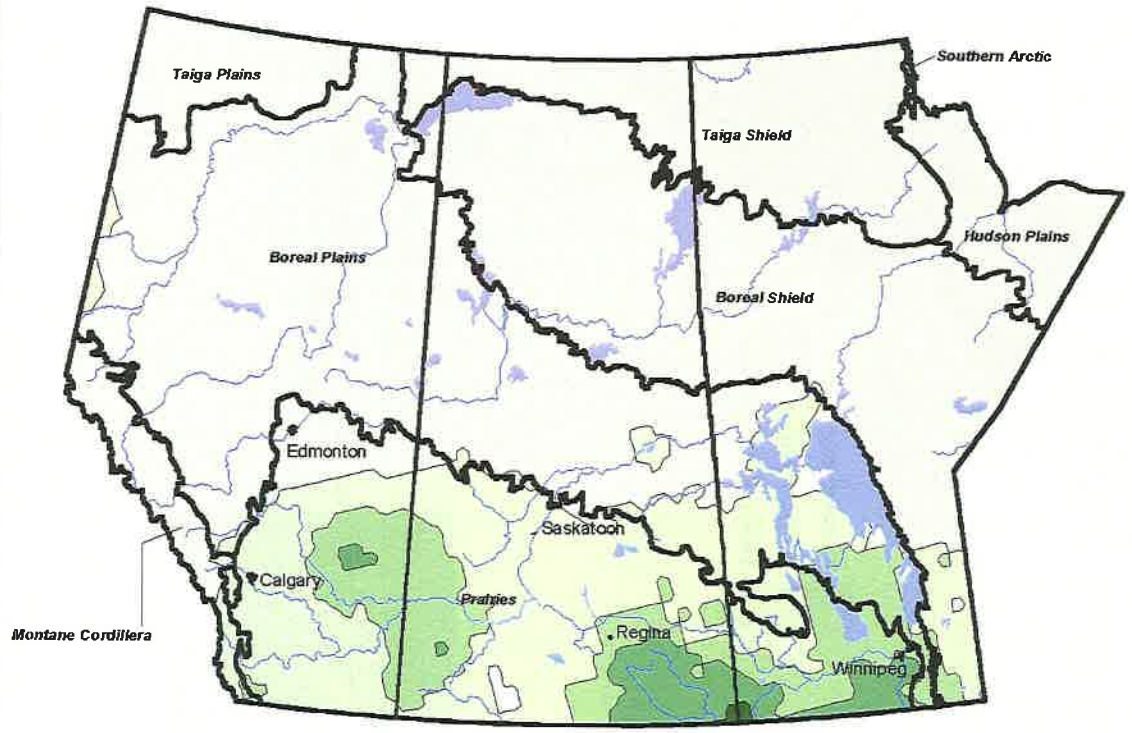

Photo by Cerry Beyersbergen

Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- *Ecozone*

*** indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

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km

N

Environment Canada Environnement Canada

Produced by:

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Environmental Conservation Branch
Prairie and Northern Region

February 2000

UPLAND SANDPIPER NORTH AMERICAN DISTRIBUTION

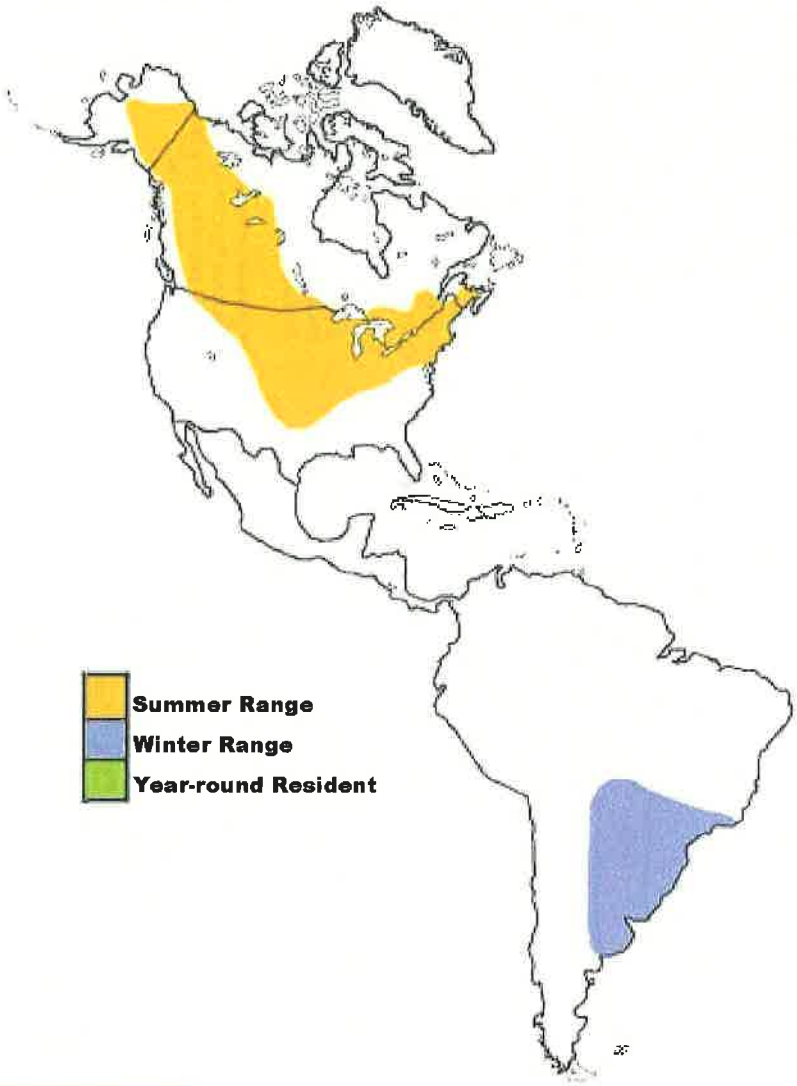

Photo by Gerry Beyersbergen

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

LONG-BILLED CURLEW BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

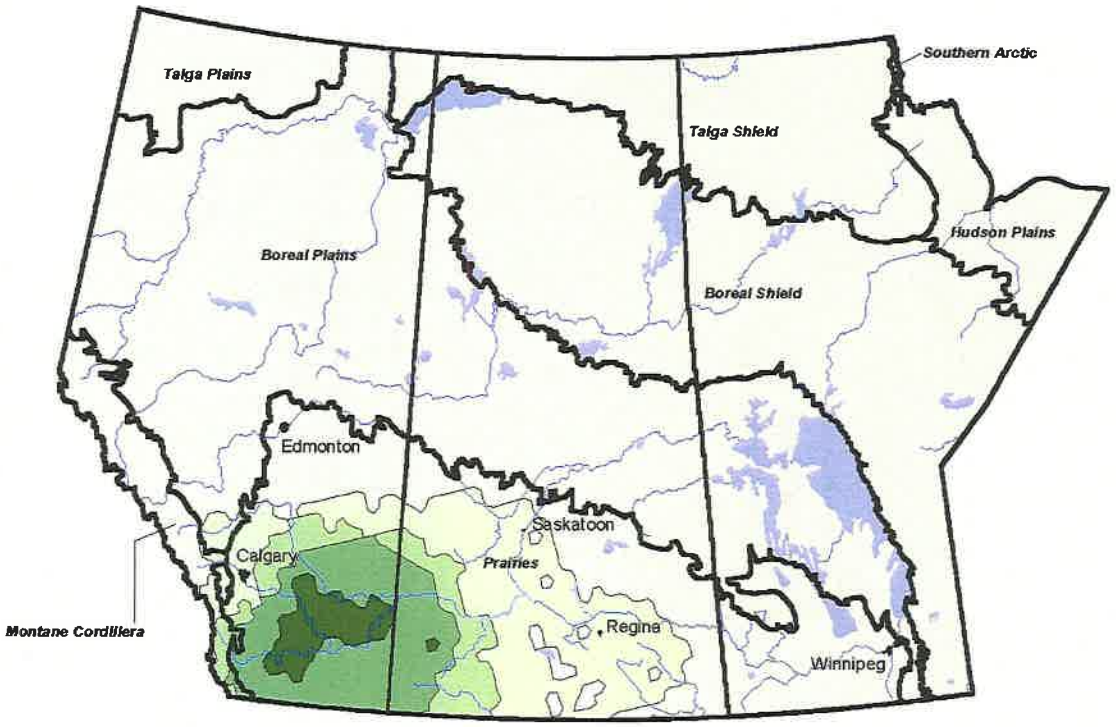

Photo by Don Baccus (dbaccus@pacifier.com)

Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- *Ecozones*

*** Indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

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February 2000

LONG-BILLED CURLEW NORTH AMERICAN DISTRIBUTION

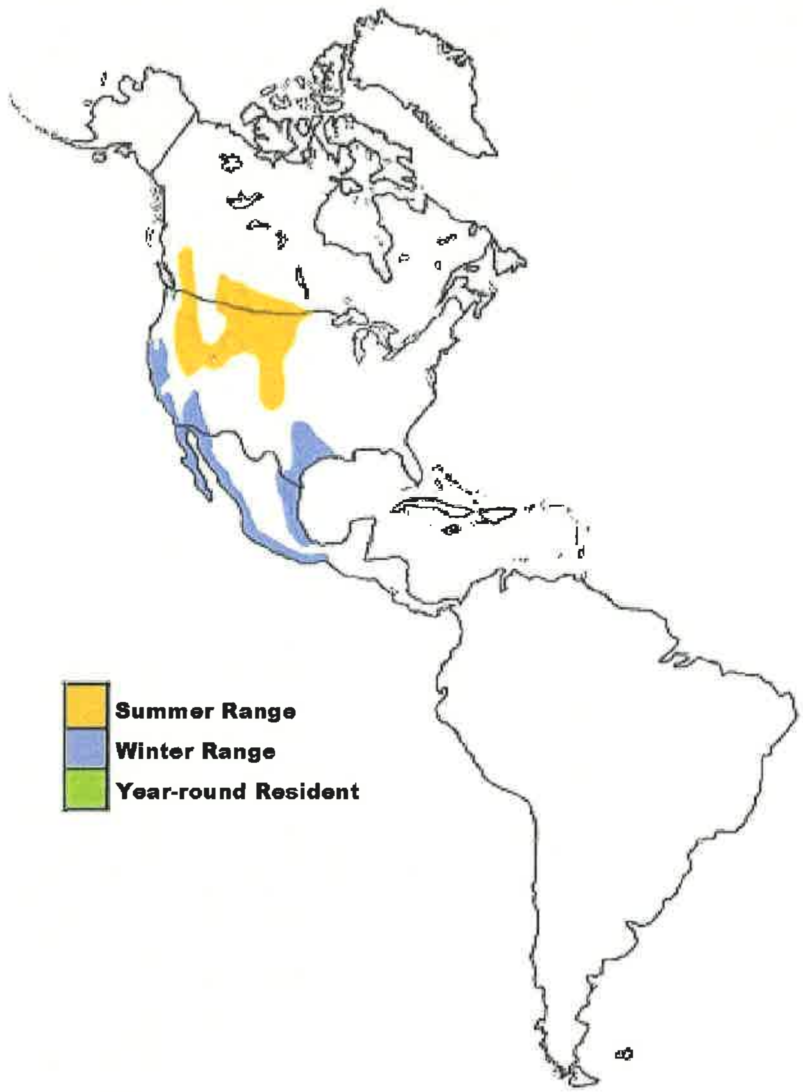

Photo by Don Baccus, dhagoza@pacifier.com

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

MARBLED GODWIT BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

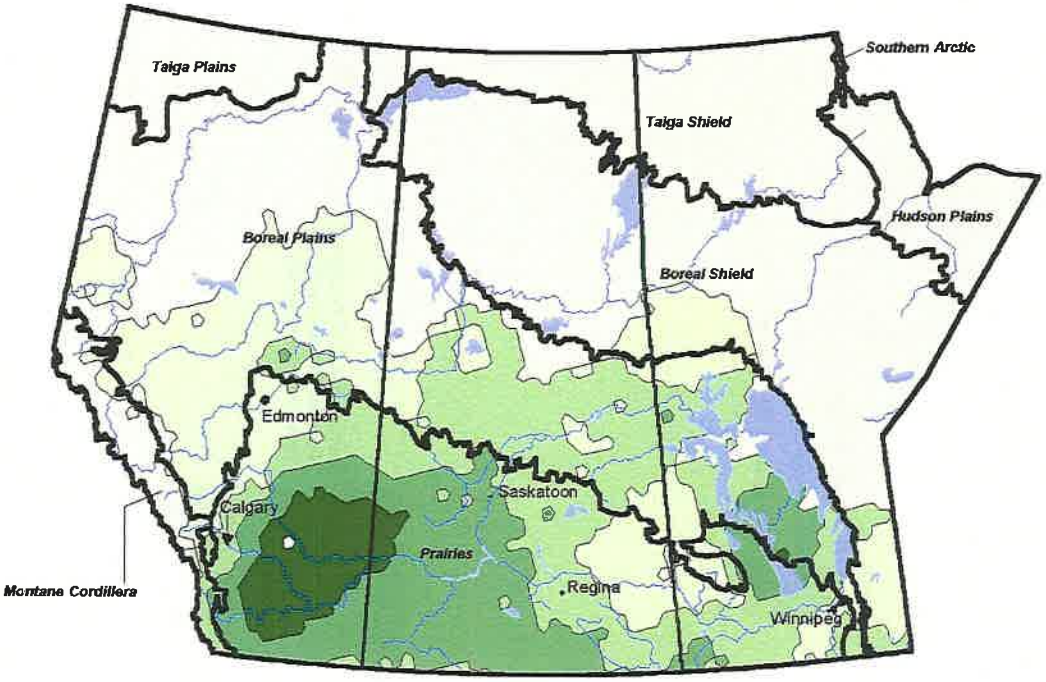

Photo by Gerry Beyersbergen

Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- *Ecozone*

*** indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

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Produced by:

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February 2000

MARBLED GODWIT NORTH AMERICAN DISTRIBUTION

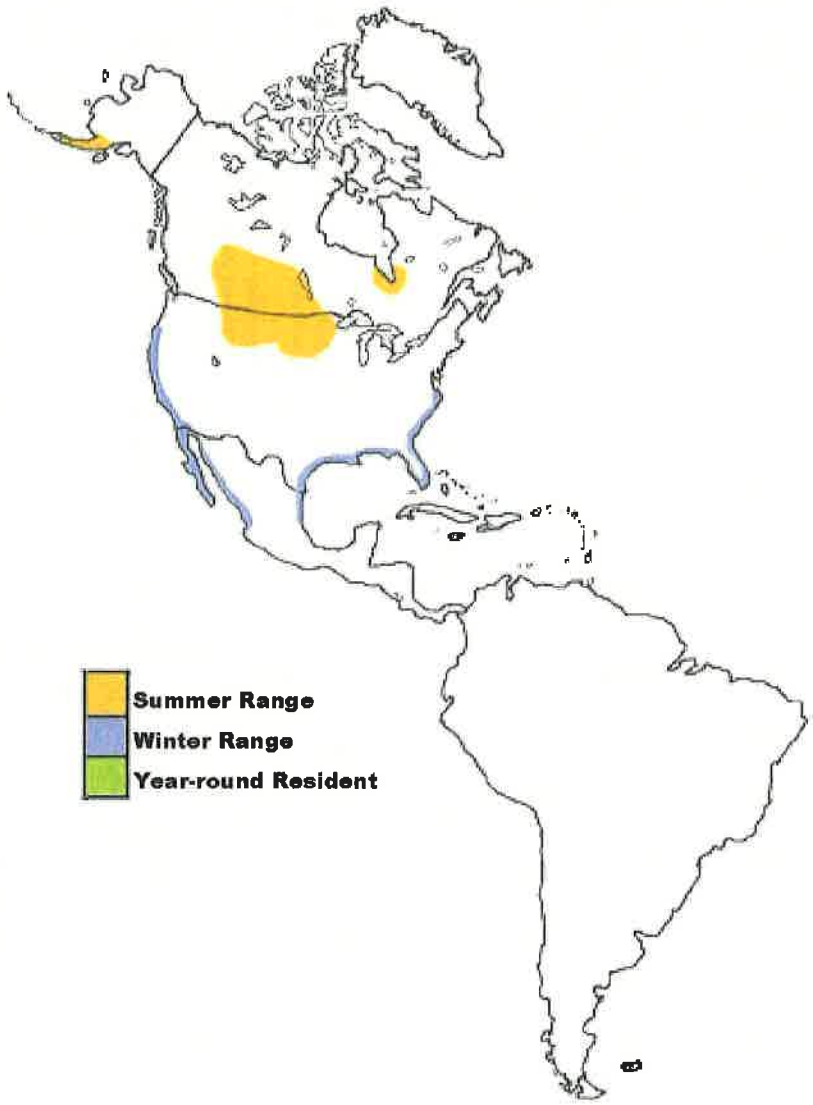

Photo by Gerry Beversdergen

Data source: U.S. Geological Survey
Biological Resources Division
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Produced by: Canadian Wildlife Service
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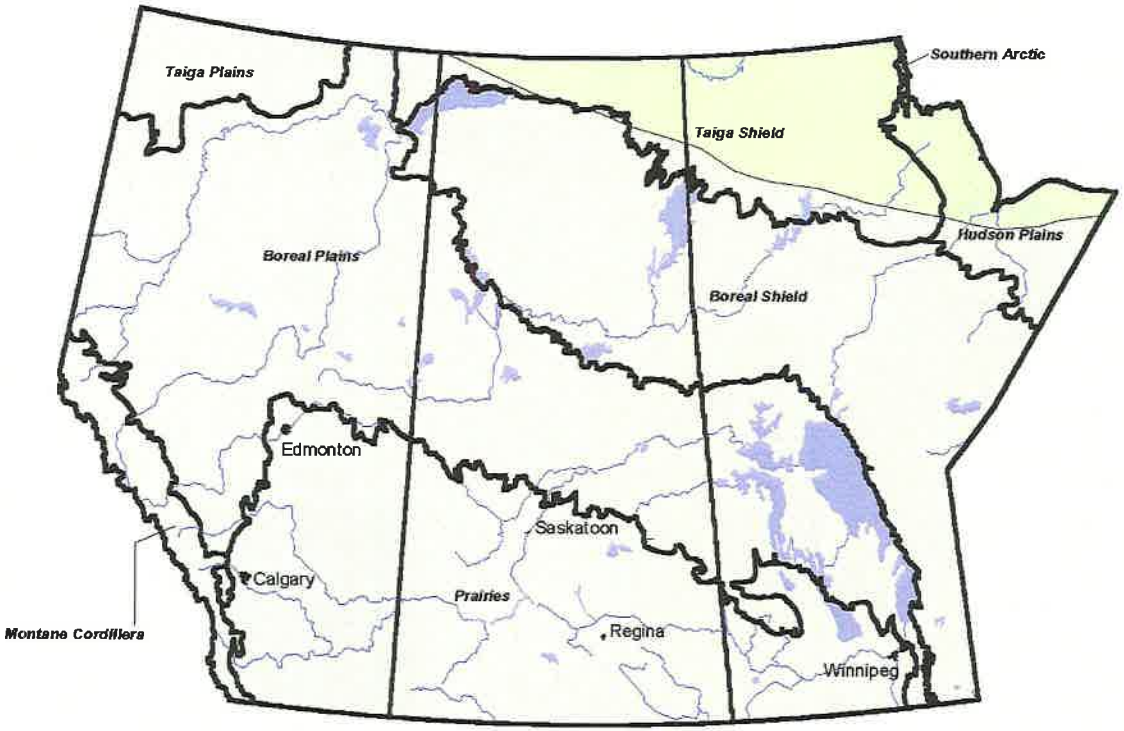
LEAST SANDPIPER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES



Breeding Range

Ecozone

Data Source: The American Ornithologists' Union and The Academy of Natural Sciences

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

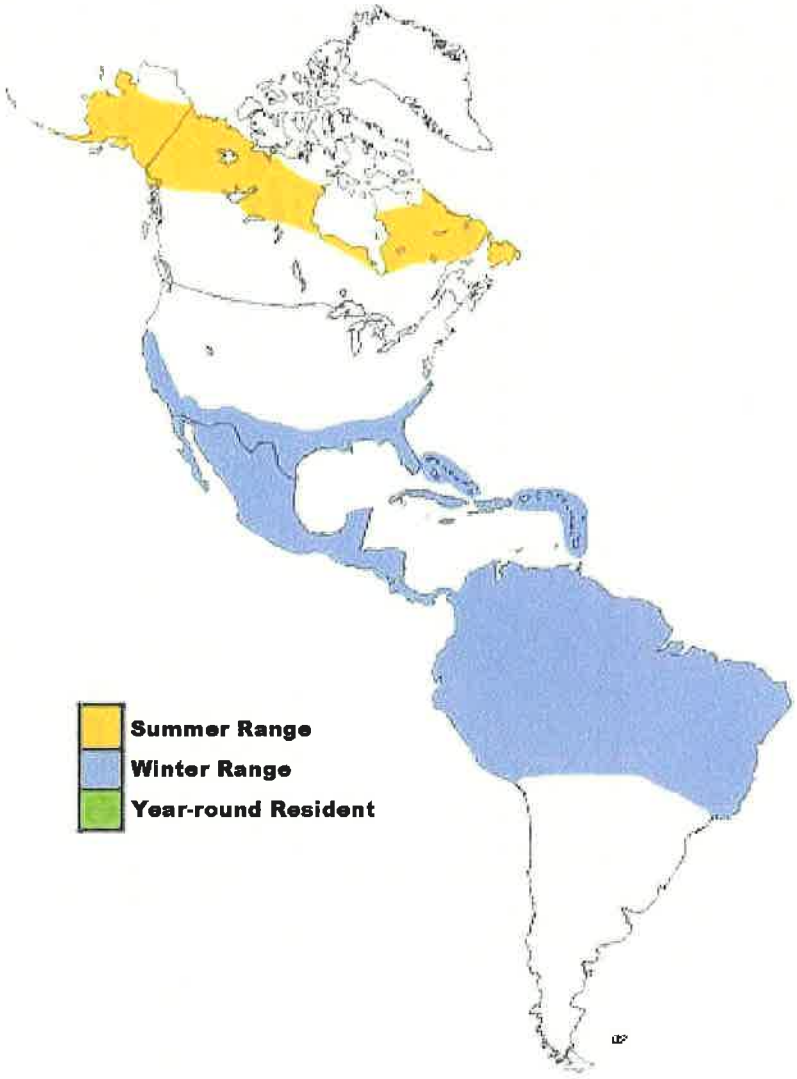
Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

LEAST SANDPIPER NORTH AMERICAN DISTRIBUTION



Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

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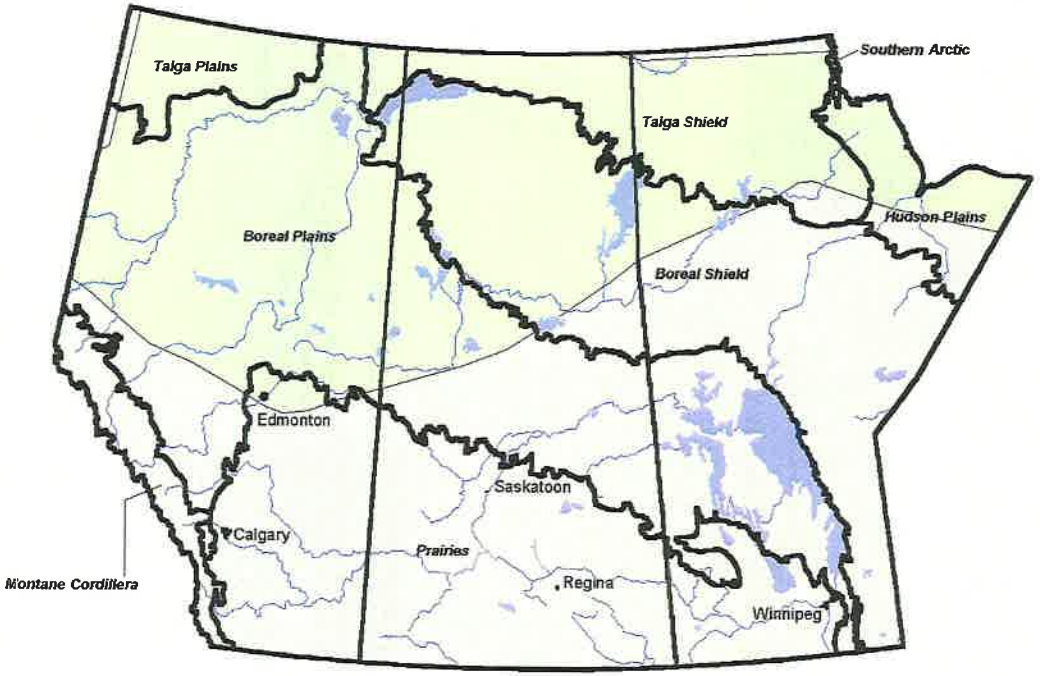
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SHORT-BILLED DOWITCHER BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Photo by Gerry Beyersbergen



Breeding Range *

Ecozones

* Breeding counts unknown

Data Source: W. Earl Godfrey
The Birds of Canada

Projection: Lambert Conformal Conic
Standard Parallels: 53°N and 57°N
Central Meridian: 105°W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

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February 2000

SHORT-BILLED DOWITCHER NORTH AMERICAN DISTRIBUTION

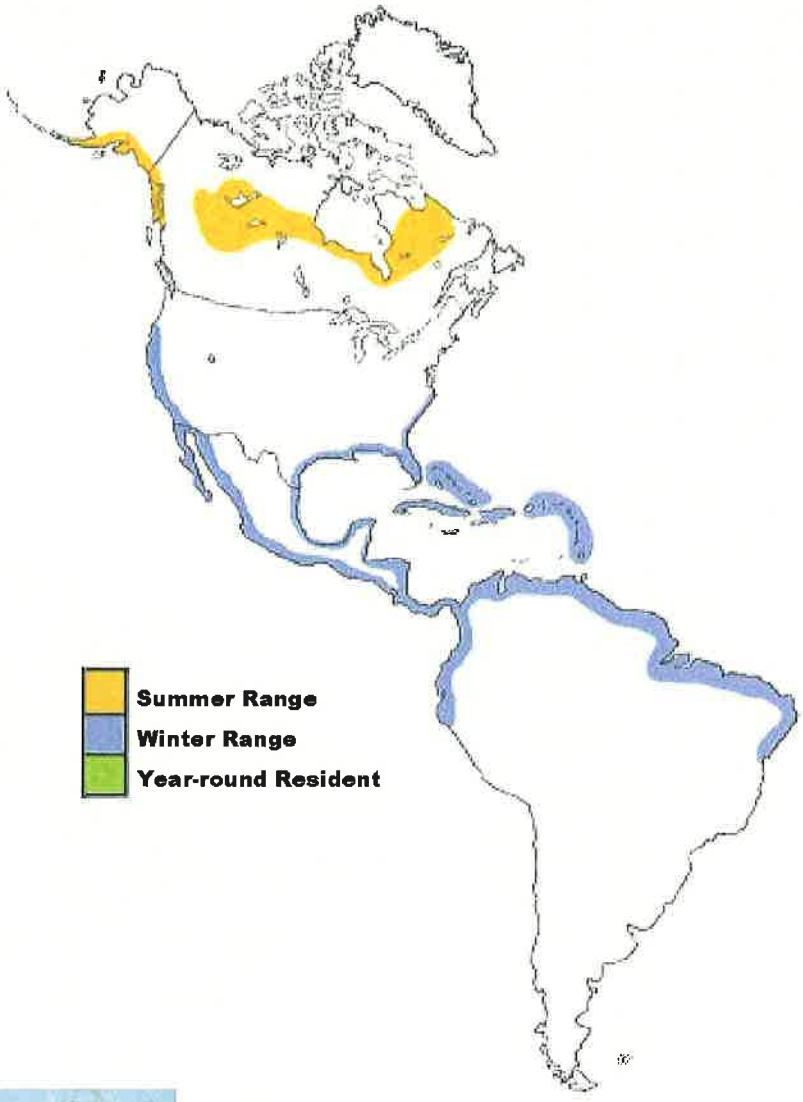

Photo by Gerry Beyersbergen

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

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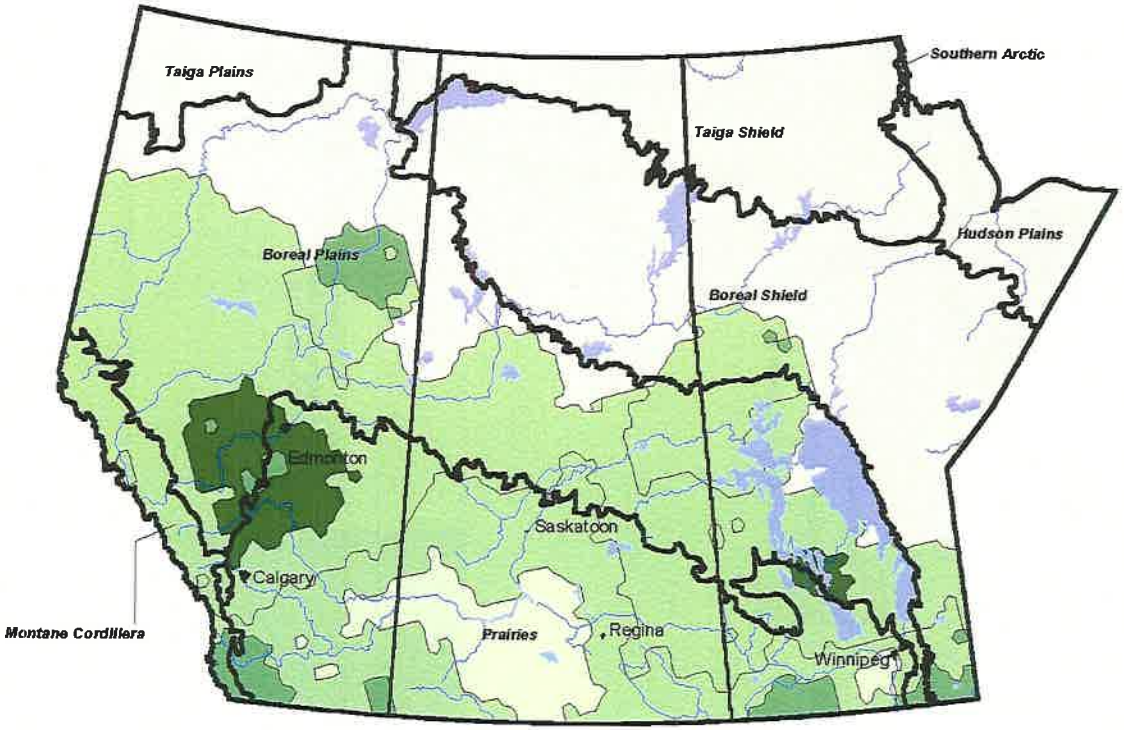
Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

February 2000

COMMON SNIPE BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Photo by Don Bacous, dhspzs@pacifier.com



Breeding Range Count *

- outside range
- none counted
- one and below
- 2 to 3
- 4 to 10
- 11 to 30
- Ecozone

*** indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada / Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

COMMON SNIPE NORTH AMERICAN DISTRIBUTION

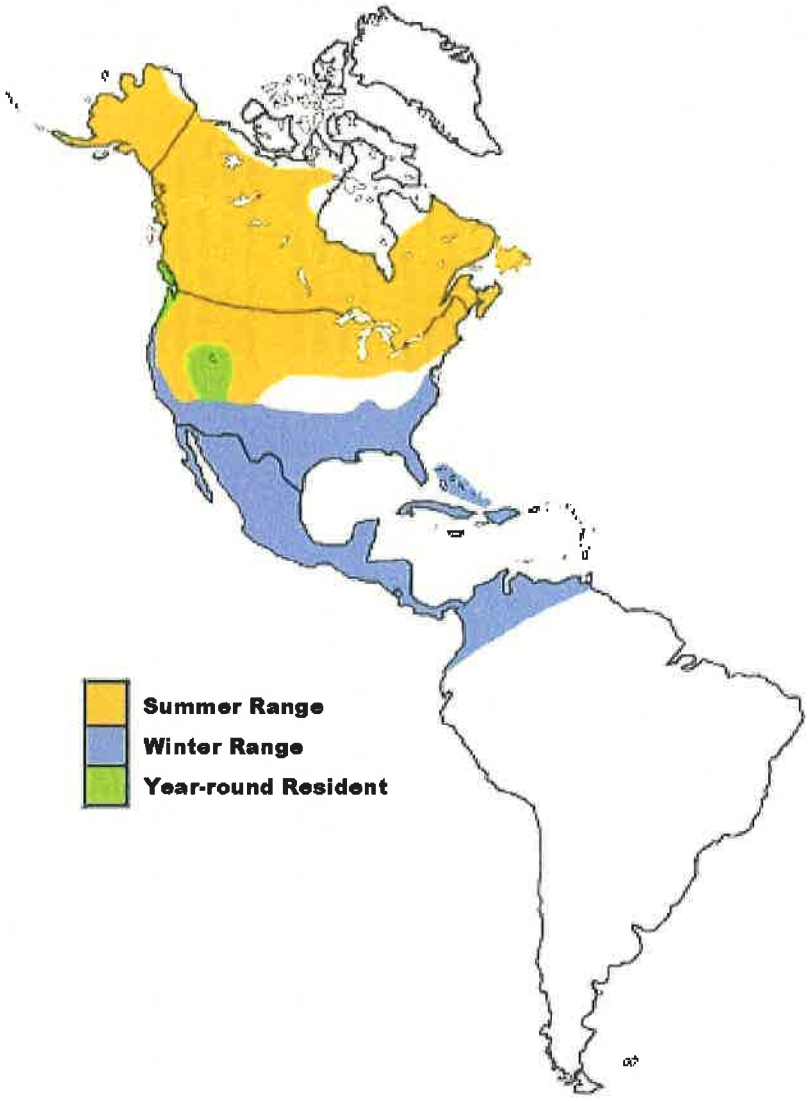


Photo by Don Baccus, dhogaza@pacifier.com

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

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Produced by: Canadian Wildlife Service
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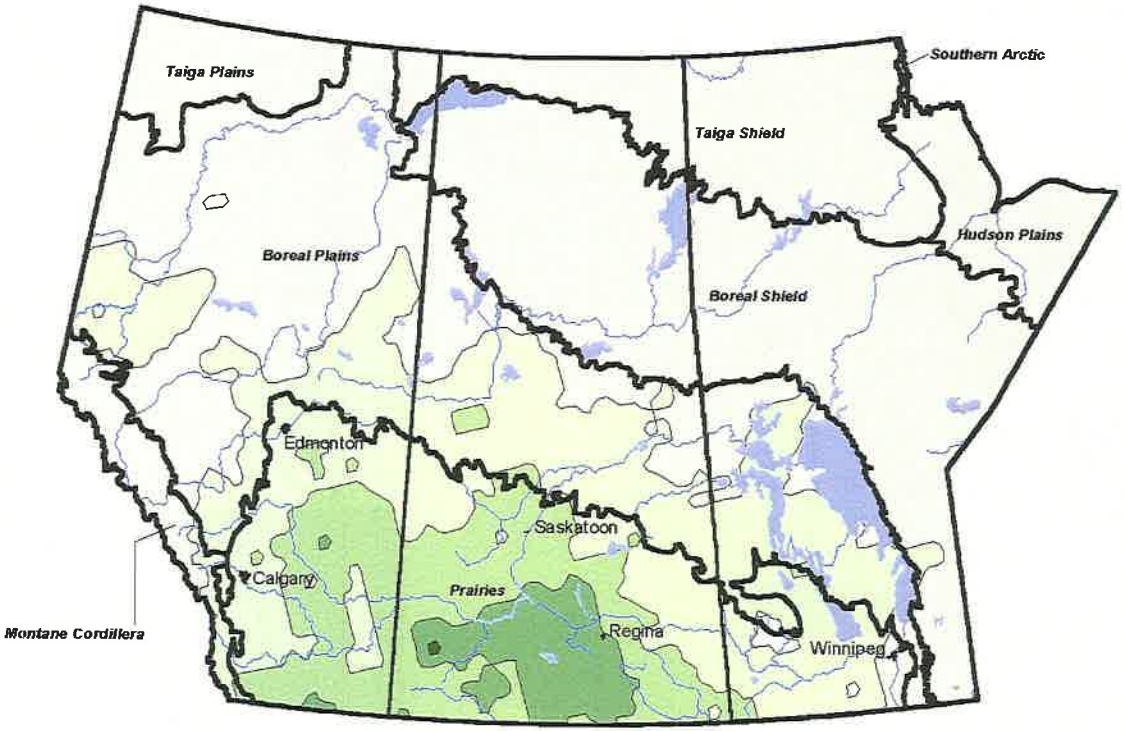
Prairie and Northern Region

February 2000

WILSON'S PHALAROPE BREEDING DISTRIBUTION IN THE PRAIRIE PROVINCES

Photo by Gerry Beyersbergen



Breeding Range Count *

- outside range
- none counted
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- 11 to 30
- Ecozone

*** Indicates the number of birds (grouped into categories of relative abundance) predicted to be seen on BBS routes in about 2.5 hours**

Data source: The North American Breeding Bird Survey, USGS, Biological Resources Division, Baltimore, Maryland, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

200 0 200
km

N

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

WILSON'S PHALAROPE NORTH AMERICAN DISTRIBUTION

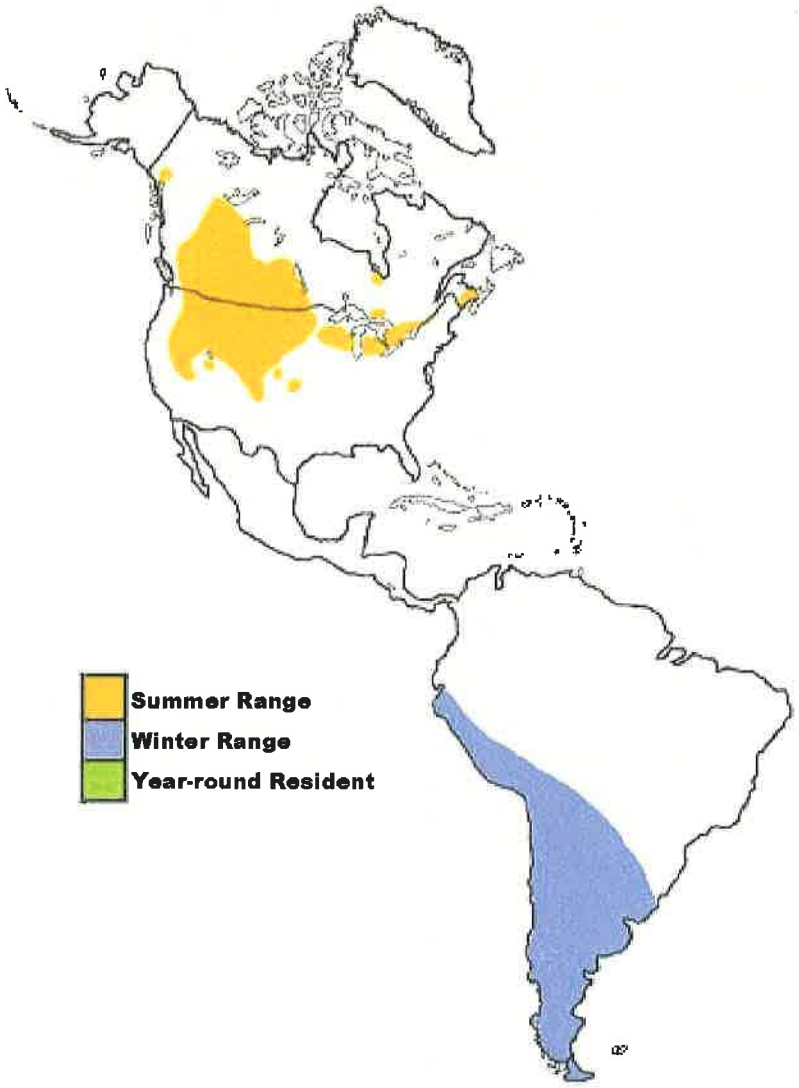

Photo: by Gerry Beyersbergen

Data source: U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

APPENDIX G

SIGNIFICANT SHOREBIRD MIGRATION

STAGING SITES

APPENDIX G:

Significant shorebird migration staging sites in Prairie Canada based on results from the shorebird surveys, and reports and observations of wildlife personnel and naturalists.

Area and site {WHSRN Designation} Latitude/Longitude	Size	Most important shorebird habitats	Season	Primary Species - Spring	Primary Species - Fall	Maximum shorebird count
Manitoba – Prairie						
Whitewater Lake 49 14'N, 100 19'W	6,070 ha	- mudflats - shallow marshes	S	White-rumped Sandpiper (10,000 : 1988)		23,068 (spring 1987)
Saskatchewan - Prairie						
Chaplin / Old Wives / Reed Lakes WHSRN Site {Hemispheric /Endangered}						124,165 - 1987 106,065 - 1993 92,882 - 1994
Old Wives Lake (Frederick Lake) (MBS) 50 07'N, 106 00'W	33,020 ha	- mudflats - sand / gravel islands & beach - shallow saline basins	S/F Endg.	Sanderling Stilt Sandpiper (8,102 : 1994; 9,040 : 1995) Piping Plover (42 : 1991)		64,392 (spring 1987) 32,706 (spring 1993) 37,755 (spring 1994)
Chaplin Lake 50 26'N, 106 40'N	6,360 ha	- mudflats - sand / gravel islands & shoreline - shallow saline basins - shallow marshes	S/F Endg.	Sanderling (51,084 : 1993; 52,984 : 1994) Semipalmated Sandpiper (28,796 : 1994) Red-necked Phalarope (7,755 : 1994) Stilt Sandpiper (4,349 : 1993; 2,927 : 1994) Piping Plover (195 : 1991)	Wilson Phalarope (4,500 : 1993; 6,192 : 1994) Semipalmated Sandpiper (5,666 : 1994) American Avocet (2,685 : 1994)	59,773 (spring 1987) 73,359 (spring 1993) 55,127 (spring 1994)

Reed Lake 50 24'N, 107 04'W	3,300 ha	- mudflats - shallow basin shoreline	S	Stilt Sandpiper (2,265 : 1993) Red-necked Phalarope (1,726 : 1993)		11,328 (spring 1993)
Quill Lakes WHSRN Site {International} 51 55'N, 104 20'W	33,000 ha.	- mudflats - shallow marsh basins - sand / rock beaches	S/F Endg.	Sanderling (23,498 : 1988; 15,640 : 1993) Red Knot (8,967 : 1993) Stilt Sandpiper (14,932 : 1993) Semipalmated Sandpiper (23,637 : 1993) White-rumped Sandpiper (17,126 : 1990) Red-necked Phalarope (45,188 : 1990; 43,488 : 1993) Least Sandpiper (7,150 : 1993) Piping Plover (303 : 1994)	Hudsonian Godwit (2,073 : 1989; 2,934 : 1991) Stilt Sandpiper (13,600 : 1985; 8,125 : 1989) Marbled Godwit (1,200 : 1985) Yellowleg spp (9,000 : 1985)	155,008 (spring 1988) (Big Quill Lake) 98,959 (spring/species 1990) 129,922 (spring/species 1993) 29,452 (fall/species 1990)
Last Mountain Lake WHSRN Site {Regional} 51 21'N, 105 15'W	15,700 ha.	- shallow alkaline basins - sand/gravel beaches - shallow marshes	S/F Endg.	Ruddy Turnstone (2,500 : 1972) Red Knot (2,500 : 1972) Piping Plover (10 : 1985)	Marbled Godwit (1,000 : 1965)	5,078 (spring 1987)
Buffer Lake 52 23'N, 106		- mudflats - shallow saline basin	S/F	Red-necked Phalarope (16,780 : 1997) Semipalmated Sandpiper (16,407 : 1998)	Stilt Sandpiper (8,765 : 1997) Red-necked Phalarope (11,170 : 1997) Baird's Sandpiper (2,780 : 1997) Semipalmated Sandpiper (4,973 : 1997) American Avocet (1,842 : 1997)	38,993 (species 1997)

Porter Lake 52 12'N, 106 17'W		- mudflats - shallow saline basin	F		Hudsonian Godwit (1,978 : 1979; 997 : 1997)	1,735 (species 1997)
Pelican Lake 50 32'N, 106 00'W		- mudflats - shallow marsh areas	S/F	Stilt Sandpiper (5,082 : 1994)	Marbled Godwit (1,000 : 1978)	75,000 (spring 1978)
Luck Lake 51 05'N, 107 05'W		- mudflats - shallow basins	S/F	Stilt Sandpiper (2,524 : 1998)	Hudsonian Godwit (3,420 : 1995) Marbled Godwit (1,521 : 1995) Stilt Sandpiper (2,575 : 1998) Lesser Yellowlegs (3,837 : 1998) Dowitcher spp. (4,951 : 1996; 3,812 : 1998)	12,337 (species fall 1996) 14,447 (species 1998)
Blaine Lakes 52 50'N, 106 59'W		- mudflats	S	Sanderling (10,000 : 1989)		29,861 (1989)
Landis Lake 52 11'N, 108 31'W	335 ha	- mudflats - shallow water zone	S	Red-necked Phalarope (11,890 : 1989) Sanderling (1,661 : 1995)		24,790 (spring 1989)
Muddy Lake 52 19'N, 109 06'W	1,830 ha	- mudflats - shallow basin	S	Red-necked Phalarope (4,652 : 1995) Semipalmated Sandpiper (2,775 : 1995) Sanderling (1,399 : 1995) Stilt Sandpiper (2,322 : 1996)		10,654 (spring 1987) 11,546 (spring 1995)

Alberta/Saskatchewan Border Lakes
Potential WHSRN Site {International /Endangered}

Saskatchewan Lakes

Manitou Lake 52 43'N, 109 43'W	3,830 ha	- sand / gravel beaches - open water - mudflats	S/F Endg.	Red-necked Phalarope (66,860 : 1995; 46,845 : 1996) Semipalmated Sandpiper (2,885 : 1996) Sanderling (3,104 : 1996) Piping Plover (111 : 1991)	Red-necked Phalarope (40,067 : 1995)	73,802 (species 1995)
Wells Lake 52 50'N, 109 51'W	480 ha	- mudflats	S	Red-necked Phalarope (857 : 1995)	Lesser Yellowlegs (1,188 : 1995) Semipalmated Sandpiper (1,956 : 1995)	6,864 (species 1995)
Reflex Lake (East) 52 41'N, 109 56'W	970 ha	- sand / gravel beaches	S	Sanderling (1,894 : 1995; 1,728 : 1996)		2,631 (species 1995)
Freshwater Lake 52 37'N, 109 59'W	575 ha	- mudflats - sand / gravel beaches	S Endg.	Sanderling (2,650 : 1995; 2,877 : 1996) Semipalmated Sandpiper (1,505 : 1995; 1.143 : 1996) Red-necked Phalarope (2,511 : 1996) Piping Plover (15 : 1995)	Semipalmated Sandpiper (1,113 : 1995)	7,252 (species 1995)

Alberta Lakes						
Reflex (Salt) Lake 52 40'N, 110 00'W	555 ha	- mudflats - sand/gravel beach	S Endg.	Sanderling (20,000 : 1989) Red-necked Phalarope (10,000 : 1989) Piping Plover (34 : 1990)		35,948 (1989) 7.001 (species 1995)
Killarney Lake/ Leane Lake 52 35'N, 110 06'W 52 33'N, 110 04'W	1,330 ha	- mudflats - shallow marsh basin	S Endg.	Semipalmated Sandpiper (1.187 : 1995) Red-necked Phalarope (20,000 : 1989) Sanderling (1,467: 1996) Piping Plover (48 : 1994)		17,170 (spring 1984) 27,542 (1989)
Cipher Lake 52 41'N, 110 06'W	70 ha	- shallow alkaline basin - mudflats	S	Baird's Sandpiper (1,500 : 1995) Red-necked Phalarope (648 : 1995)		10,021 (1989)
Metiskow Lake 52 24'N, 110 38'W		- mudflats - sand shoreline - shallow saline basin	S	Baird's Sandpiper (10,000 : 1988) Semipalmated Sandpiper (1,430 : 1995) Sanderling (880 : 1995)		17,703 (1988) 13,487 (1989) 2.336 (1995)
Alberta - Prairie						
Beaverhill Lake WHSRN Site {Regional} (RAMSAR) 53 27'N, 112 31'W	13,900 ha	mudflats - shallow marsh basins - sand / rock beaches	S/F	Red-necked Phalarope (9,692 : 1995) Black-bellied Plover (7,829 : 1995) Semipalmated Sandpiper (7,218 : 1995) Sanderling (2,072 : 1995) Red Knot (905 : 1995)	Dowitchers (10,000:1991; 3,075 : 1995) Yellowleg spp. (1,216 : 1995)	23,442 (1989) 52,334 (Spring 1995)

Baxter Lake 53 24'N, 110 51'W	560 ha	- mudflats - sand / rock beach areas	S	Semipalmated Sandpiper (6,265 : 1995) Red-necked Phalarope (6,972 : 1995) Baird's Sandpiper (2,952 : 1995) Sanderling (1,093 : 1996)		19,808 (Species 1995)
Sounding Lake 52 08'N, 110 29'W		- mudflats - shallow water zones	S/F Endg.	Yellowleg spp. (13,532 : 1987) Sanderling (3,000 : 1983) Piping plover (27 : 1986)	Lesser Yellowlegs (11,480 : 1987) American Avocet (900 : 1987)	55,803 (1987)
Kimiwan Lake 55 45'N, 116 55'W		- mudflats - shallow water zone	S	Dowitchers (12,000 : 1988) Pectoral Sandpipers (7,000 : 1988)		27,067 (1988)
Gillespie Lake 52 25'N, 110 11'W	445 ha	- mudflat - open water	S	Stilt Sandpiper (10,000 : 1988)		16,854 (spring 1988)
Gooseberry Lake 52 07'N, 110 44'W	400 ha	- open water - shoreline - narrow	S	Red-necked phalarope (7,500 : 1987) Sanderling (2,500 : 1989)	Red-necked phalarope (10,000 : 1987)	13,503 (1988) 14,719 (1989)

Note: This is a preliminary table and as such, not a comprehensive listing of important shorebird sites or species listing.
Primary species are those whose peak numbers formed a large component of the peak number of shorebirds observed during surveys of the lake.

WHSRN = Western Hemisphere Shorebird Reserve Network
MBS = Migratory Bird Sanctuary, NWA = National Wildlife Area
S = Spring, F = Fall, S/F = Both spring and fall ; Endg = Endangered Species breeding lake

APPENDIX H

SHOREBIRD SITE ACTION SHEETS

1. Beaverhill Lake, Alberta
2. Chaplin Lake, Saskatchewan
3. Lake Diefenbaker, Saskatchewan
4. Last Mountain Lake, Saskatchewan
5. Luck Lake, Saskatchewan
6. Manitou Lake, Saskatchewan
7. Quill Lakes, Saskatchewan
8. Reflex Lake, Alberta/Saskatchewan

* more sites to be added in future

Shorebird Site Action Sheet - Prairie Canada

Beaverhill Lake, Alberta (53°27'N, 112°32'W)

Site description:
This large, natural, inland lake (13,900 hectares) is strongly saline and quite shallow with a maximum depth of 2 to 3 meters. The shoreline is variable and includes mudflats with shallow water areas, narrow sandy beaches and areas of dense emergent vegetation. The shoreline is affected by wind tides during which expanses of mudflats may appear or disappear, depending on the wind intensity and direction. Several shallow water basins adjacent to the lake provide feeding, roosting and nesting habitat for migrating as well as local breeding shorebirds.

Importance to shorebirds:
Twenty-four species of shorebirds use this site for feeding and roosting, primarily during spring migration. They use the mudflats and shallow waters of the main lake, bays and the adjacent wetland basins and cultivated uplands and pastures. The more numerous species include Black-bellied Plover, Red-necked Phalarope, Semipalmated Sandpiper, Pectoral Sandpiper and Sanderling. Large numbers of Dowitcher species are observed during fall migration. Nine species of shorebirds use the site for nesting including the American Avocet and the Piping Plover.

Current and potential threats:
- growth of eco-tourism and bird watching will result in increased levels of disturbance at critical times in the migration period when the birds are resting or rebuilding energy reserves.
- cattle grazing and trampling can have some effect on nesting shorebirds such as Piping Plovers.
- outbreaks of botulism and other avian disease can result in large die-offs of migratory birds including shorebirds.
- drought and flooding directly influence the availability and condition of shorebird habitat on this site.

Protected status and area designation:
- designated as a Ramsar site as a *Wetland of International Importance* in 1987.
- designated as a *WHSRN Regional Shorebird Reserve* in 1996.
- designated an *Important Bird Area* - Global Category in 1997.
- sites designated as *Natural Areas* on and adjacent to Beaverhill Lake protected under the Wilderness Areas, Ecological Reserves and Natural Areas Act.

- pelican nesting island in Sec. 8/ Twsp. 52/ Rge. 17/ W. of 4th Meridian is a seasonal sanctuary with access prohibited with one-half mile radius from 15 April to 15 September.
- the southern half of the lake and one-half mile of land adjacent to this portion of the lake (water edge) have restricted access from game bird hunting until October 31, each year. Lake and adjacent lands located within Townships 50 and 51, Ranges 17 and 18, west of the Fourth Meridian.

Action needed:

- minimize human disturbance and impacts through shorebird educational viewing opportunities and materials to local landholders and the public (eco-tourists, etc.).
- work with local landholders to maintain and enhance the quality of the lake's shoreline habitat and adjacent wetland basins.
- continue management of back-flood hay wetland projects to benefit shorebirds and waterfowl.

Primary regional contacts:

Michael Barr, Area Biologist, Ducks Unlimited Canada, Camrose, AB; email: m_barr@ducks.ca

Gerard Beyersbergen, Wildlife Biologist, Canadian Wildlife Service, Edmonton, AB; email: gerard.beyersbergen@ec.gc.ca

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References:

Dekker, D. 1993. Prairie Water - Watchable Wildlife at Beaverhills Lake, Alberta. BST Publications, Edmonton, Alberta. 144pp. ISBN 0-9695297-0-8.

Dekker, D. 1998. Prairie Water - Wildlife at Beaverhills Lake, Alberta. The University of Alberta Press, Edmonton, Alberta. 147 pages. ISBN 0-88864-308-X.

Lister, R. 1979. The birds and birders of Beaverhills Lake. Edmonton Bird Club Publication. 264pp. Edmonton, Alberta.

Chaplin Lake, Saskatchewan (50° 24'N, 106° 39'W)

Site description:

This large, intermittent saline lake covers 6,360 hectares and is shallow and broken into a number of sections or cells by a series of roadways and dikes. These structural features are used for control of water levels on a solution mining operation to extract sodium sulphate on the north end, as well as creation of a marsh complex for waterfowl and water bird use on the south end of the lake. The soils around the lake, located in the mixed-grass prairie ecoregion of southern Saskatchewan, are unsuitable for intense agricultural use other than stock grazing and hay lands. The manipulation of water levels by the mining operation results in large expanses of mudflats and shallow water zones. The partitioning of the lake proper has also resulted in presence of several fresh water basins in the north, which are used by shorebirds after feeding/wading in the highly saline basins.

Importance to shorebirds:

Nineteen species of shorebirds use this site for feeding and roosting, primarily during spring migration. They use the mudflats, sandy/rocky beaches and shallow waters of the lake and adjacent wetland basins and pastures. The food resources available encompass a host of invertebrates including brine shrimp. The more numerous shorebirds include Sanderling, Semipalmated Sandpiper, Red-necked Phalarope, Stilt Sandpiper and White-rumped Sandpiper. Ten species of shorebirds nest along the shoreline and in the surrounding pastures including American Avocet and Piping Plover and large staging concentrations of Wilson's Phalarope in the late summer.

Current and potential threats:

- drought and flooding directly influence the availability and condition of shorebird habitat on this site.
- growth of eco-tourism and bird watching will result in increased levels of disturbance at critical times in the migration period when the birds are resting or rebuilding energy reserves.

Protected status and area designation:

- designated as a *WHSRN Hemispheric Shorebird Reserve* in 1997 (Chaplin/ Old Wives/ Reed Lakes).
- colonial nesting birds on the islands in the southern marsh complex are protected under the *Wildlife Refuge* Regulations of the Provincial Wildlife Act.
- southern marsh complex of 1323 hectares under long term agreement by Ducks Unlimited Canada and designated a *Saskatchewan Heritage Marsh*

Site, which is a cooperative wetland conservation initiative which recognizes, manages and protects wetlands important to waterfowl and other wildlife.
- major portions of the lakeshore designated as *Critical Piping Plover Habitat.*
- designated as an *Important Bird Area* site.

Action needed:
- continue cooperative efforts with Saskatchewan Minerals and local landholders including provincial and federal grazing cooperatives, to control access and to encourage suitable management of the habitat for shorebirds.
- in cooperation with waterfowl management, manipulate water levels on the Chaplin Heritage Marsh complex to enhance and maintain suitable shorebird feeding and roosting habitat.
- investigate potential to create an additional cell for shorebirds at Chaplin Heritage Marsh complex.

Primary regional contacts:

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Gerard Beyersbergen, Wildlife Biologist, Canadian Wildlife Service, Edmonton, AB; email: gerard.beyersbergen@ec.gc.ca

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Flemming, S.P. (ed). 1994. The 1991 International Piping Plover census in Canada. Canadian Wildlife Service Occasional Paper No 82. Ottawa, ON.

Shorebird Site Action Sheet - Prairie Canada

Lake Diefenbaker, Saskatchewan (50°43'N, 107°30'W)

Site description:
Lake Diefenbaker is one of Canada's largest freshwater reservoirs. The reservoir, created by damming the South Saskatchewan and Qu'Appelle rivers, is 225 km long and at full supply covers an area of 43,000 ha. The reservoir is managed by the Saskatchewan Water Corporation for a variety of purposes including irrigation, hydro-electricity, flood control and recreation. The annual water level fluctuation at the reservoir is about 8 m. Low water levels in spring result in wide beaches which attract migrant shorebirds and breeding Piping Plovers. Water from the snow melt in the Rocky Mountains is the primary water source for this reservoir. The annual influx of water from these mountains, primarily in June and July, greatly reduces beach widths, often to the detriment of Piping Plover breeding efforts.

Importance to shorebirds:
Lake Diefenbaker has been one of North America's most populated Piping Plover breeding sites. In 1991, the 276 adults counted at this reservoir represented 19% of the Prairie Canada population and 5% of the world population. Numerous shorebirds also use this reservoir enroute to arctic breeding grounds.

Current and potential threats:
- rising waters at Lake Diefenbaker frequently threaten Piping Plover nests, eggs, chicks and/or brood-rearing habitat.
- disturbance to nesting Piping Plovers by recreationalists and vehicles that are also a threat to nests, eggs and chicks.
- cattle on nesting beaches are a potential threat to Piping Plover nests.

Protected status and area designation:
- Miry Bay and Galloway Bay are designated as an *Important Bird Area* of Canada. These bays are important for staging Sandhill Cranes and geese.
- "East Lake Diefenbaker" is designated as an *Important Bird Area* of Canada. This area is one of Saskatchewan's major Piping Plover nesting areas. Also used by migrant shorebirds as well as breeding and migrant waterbirds.
- three provincial parks (Danielson, Douglas and Saskatchewan Landing) border Lake Diefenbaker.
- *Critical Piping Plover Habitat* has been designated for portions of Lake Diefenbaker.

Action needed:

- water management agreement with the Saskatchewan Water Corporation to identify and implement water operations and mitigative conservation measures which will benefit Piping Plover reproductive success.
- public education to inform recreationalists about the value of beaches as habitat for migrant shorebirds and breeding Piping Plovers.
- increased enforcement in provincial parks to eliminate public vehicular beach traffic.

Primary regional contact: Paul Goossen, Wildlife Biologist, Canadian Wildlife Service, Edmonton, Alberta. Email: Paul.Goossen@ec.gc.ca

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Shorebird Site Action Sheet - Prairie Canada

Last Mountain Lake, Saskatchewan (51°21'N, 105°14'W)

Site description:

This long slender lake (85 km in length) is located in the flat to gently undulating topography of the moist mixed grass prairie eco-zone. The Last Mountain Lake National Wildlife Area and Migratory Bird Sanctuary (over 15,700 ha.) is located at the northern end of Last Mountain Lake. The site is comprised of the natural bays, islands, inlets and shorelines of the lake plus a series of six basins separated from the lake by a series of dikes with water control structures enabling water level management. The shoreline is variable including marsh fringes, mudflats and sandy and rock strewn beaches. Numerous springs and shallow, ephemeral, fresh to saline basins are located in the adjacent grasslands and provide additional feeding habitat for staging and local breeding shorebirds; these include several additional managed basins. The adjacent upland is a mixture of native mixed prairie, tame hay lands, pastures and cultivated croplands.

Importance to shorebirds:

Twenty-six species of shorebirds use this site for feeding and roosting, during spring and fall migration. They use the mudflats, sandy/rocky beaches and shallow waters of the diked basins, and on the adjacent wetlands and cultivated uplands and pastures. The more numerous include Golden Plover, Sanderling, Stilt Sandpiper, Long and Short-billed Dowitchers and Red-necked Phalarope. Nine species of shorebirds nest in the area including American Avocet, Marbled Godwit, Wilson's Phalarope and Piping Plover.

The relatively secure water supply from the lake and inflow streams within the Last Mountain Lake National Wildlife Area make the site extremely important as a refuge for shorebirds and other water birds in times of regional drought. Peak numbers of breeding and migrant shorebirds, cranes and waterfowl are reached at the site during and for the few years immediately following droughts.

Current and potential threats:

- drought and flooding influence the availability and condition of shorebird habitat in the district; site management opportunities such as water manipulation by pumping and diking can minimize the impact of regional droughts at the site and make the area a critical refuge for shorebirds in times of low water.
- growth of eco-tourism, bird watching and other recreational activity such as boating could result in increased levels of disturbance at critical times in the migration period when the birds are resting or rebuilding energy reserves if existing regulations are not enforced.

- outbreaks of botulism and other avian diseases can result in large die-off of migratory birds including shorebirds.
- habitat loss in the district continues (wetland drainage, plowing native prairie to grow cereal crops); management activities at the site are aimed at reversing this trend by restoring native prairie and by returning natural processes like prairie fires and rotation grazing to the landscape for the benefit of shorebirds and other native species.

Protected status and area designation:

- reserved from sale and settlement for a *Migratory Bird Sanctuary* in 1887, and gazetted as a *National Wildlife Area* in 1994, and protected under the Migratory Bird Convention Act (1916) regulations.
- designated a Ramsar site as a *Wetland of International Importance* in 1982.
- designated *a National Historic Site* in 1990 (Heritage and Parks Canada)
- designated as *a WHSRN Regional Shorebird Reserve* in 1994.
- portions of the lakeshore designated as *Critical Piping Plover Habitat.*
- Designated as an *Important Bird Area* site.

Action needed:

- water level management and manipulation in northern basins to continue in order to provide shorebird roosting and feeding habitat, and to reduce vegetation encroachment on shoreline habitat. This is achieved through a variety of management and conservation actions such as water level manipulation, prescribed burning and rotation grazing.
- maintain and restore native wetland and upland habitats on the site to benefit shorebirds and other native species.

Primary regional contacts:

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Gerard Beyersbergen, Wildlife Biologist, Canadian Wildlife Service, Edmonton, AB; email: gerard.beyersbergen@ec.gc.ca

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Shorebird Site Action Sheet - Prairie Canada

Luck Lake, Saskatchewan (51°04'N, 107°06'W)

Site description:

The lake is located, north of the town of Lucky Lake, in south-central Saskatchewan and is situated in the flats between Douglas and Archer ridges of the Coteau escarpment. A large, shallow saline lake (1,800 ha), it is divided into three basins by two dikes (8.6 km). The eastern and western (freshwater) wetland basins receive water from natural runoff. The basins are supplemented with water, when available, from the local irrigation system that is supplied from Lake Diefenbaker. The central basin is the largest and at times may be highly saline and almost dry. The shoreline of the main basin is variable depending on water levels and includes large mudflat expanses with shallow water zones and areas of dense bulrush stands. The smaller basins provide a variety of shoreline habitats (mudflats, shallow water zones) depending on the water levels while the long dikes potentially provide roosting and nesting sites. The majority of the uplands are under cultivation although 334 ha of uplands are secured on the west end of the lake as part of the Luck Lake Heritage Marsh.

Importance to shorebirds:

Twenty-four species of shorebird have been observed using the site for feeding and roosting, with the highest numbers occurring during the fall migration period when water levels in the lake were lower. The food resources available encompass a host of invertebrates and likely *Potamogeton* tubers, given the high concentration of Hudsonian Godwits. The more numerous species include Hudsonian Godwit, Marbled Godwit, Lesser Yellowlegs, Stilt Sandpipers and Dowitcher spp. Potentially, six species of shorebirds nest along the shoreline and in the surrounding uplands. Adult Piping Plover have been observed but no record of nesting has been verified.

Current and potential threats:

- drought and flooding directly influence the availability and condition of shorebird habitat on this site.
- growth of eco-tourism and bird watching may result in increased levels of disturbance at critical times in the migration period when the birds are resting or rebuilding energy reserves.
- outbreaks of botulism and other avian disease can result in large die-off of migratory birds including shorebirds.
- cattle trampling of shoreline may have some effect on nesting shorebirds but can be controlled in high use or critical areas by fencing.

Protected status and area designation:

- designated a *Saskatchewan Heritage Marsh Site* which is a cooperative

wetland conservation initiative which recognizes, manages and protects wetlands important to waterfowl and other wildlife.
- designated a globally significant *Important Bird Area*.

Action needed:
- additional ground shorebird surveys to identify species and numbers using the site during both migration periods to identify whether the site warrants WHSRN designation.
- minimize human disturbance and impacts through shorebird educational viewing opportunities and materials to local landholders and the public.
- work with local landowners to maintain and enhance the quality of shoreline and upland habitat.

Primary regional contacts:
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Shorebird Site Action Sheet - Prairie Canada

Manitou Lake, Saskatchewan (52°45'N, 109°41'W)

Site description:
This large, natural, inland lake (3,830 hectares) is strongly alkaline and quite deep in several locations. The shoreline is variable and includes narrow sandy beaches, rocky shoreline zones, alkaline mudflats, and areas of steep banked shoreline. Large tracts of pasture and aspen woods surround the lake to the west and south. On the escarpment to the north and east, the land is mainly under cultivation. Two large bays (one completely separated by lower water levels and a sand ridge) are located on the south portion of the lake that provide shallow water zones and sand/mud flats for shorebirds. A large island (Manitou Island) in the center of the lake provides feeding, roosting and nesting habitat for migrating as well as local breeding shorebirds.

Importance to shorebirds:
Twenty-eight species of shorebirds use this site for feeding and roosting, with the highest use occurring during spring migration, on the sandy/rocky beaches and alkaline mudflats, in the shallow waters of the sheltered bays of the lake, and on the adjacent uplands. The food resources available encompass a host of invertebrates. The more numerous shorebirds include Red-necked Phalarope, Sanderling and Semipalmated Sandpiper. Eight species of shorebirds nest along the shoreline and in the surrounding uplands. Piping Plovers nest in the area and in the 1996 International Census, Manitou Lake had the fifth highest count for the province of Saskatchewan.

Current and potential threats:
- limited recreational activity on the north end of the lake as well as cattle grazing and trampling can have some effect on nesting shorebirds such as Piping Plovers.
- outbreaks of avian diseases can result in large die-off of migratory birds including shorebirds.
- drought and flooding can influence the availability and condition of select areas of shorebird habitat on this site.

Protected status and area designation:
- major portions of Manitou Lake lakeshore designated as *Critical Piping Plover Habitat*.
- development activities in the area are directed / regulated under the Manitou Sandhills Integrated Resource Management Plan. Manitou Island and the shoreline of Manitou Lake are included in the *Prime Conservation Area* under this plan.
- identified as a potential *Western Hemisphere Shorebird Reserve Network* site

and *Important Bird Area* site.

Action needed:

- designation and dedication of the proposed complex of lakes including Manitou Lake as a WHSRN site and follow-up with public awareness and information programs.
- work with local landholders to protect critical areas of shoreline habitat for nesting / brood-rearing Piping Plover.
- Develop cooperative efforts with local landholders, including grazing cooperatives to encourage suitable management of the habitat for shorebirds.

Primary regional contacts:

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Manitou Sand Hills Integrated Resource Management Plan. 1996. Published by Saskatchewan Environment and Resource Management and Saskatchewan Agriculture and Food. 32 pp. plus appendices.

Shorebird Site Action Sheet - Prairie Canada

Quill Lakes, Saskatchewan (51° 55'N, 104° 20'W)

Site description:

The Quill Lakes comprises three saline lakes, Big Quill (18,000 ha), Little Quill (13,000 ha) and Middle Quill (800 ha) in a mixed grassland ecosystem within the Aspen Parkland Biome. Wind action develops a tidal effect on these shallow lakes, creating large expanses of fresh mudflats for staging shorebirds to feed on. It also includes a series of large open marsh complexes (secured under long term agreement and managed by Ducks Unlimited Canada) in adjacent pasture and hay land areas which are utilized by staging and local shorebirds for feeding and roosting.

Importance to shorebirds:

Twenty-three species of shorebirds use this site for feeding and roosting, during spring and fall migration. They use the mudflats, sandy beaches and shallow waters of the main lake, bays and on the adjacent wetland basins and cultivated uplands and pastures. The food resources available include a host of invertebrates including the *Choronomide* larvae as well as plant material in the form of *Potamogeton pectinatus* tubers. The more numerous species include Red-necked Phalarope, Semipalmated Sandpiper, Sanderling, White-rumped Sandpiper, Least Sandpiper, Stilt Sandpiper, Dowitcher spp., Yellowleg spp., and Hudsonian Godwit. Nine species of shorebirds use the site for nesting including the American Avocet, Marbled Godwit and Piping Plover.

Current and potential threats:

- drought and flooding directly influence the availability and condition of shorebird habitat on this site.
- outbreaks of botulism and other avian disease have resulted in die-off of migratory birds including shorebirds.
- cattle trampling of shoreline may have some effect on nesting shorebirds but can be controlled in high use or critical areas by fencing.

Protected status and area designation:

- designated a Ramsar site as a *Wetland of International Importance* in 1987.
- designated a *Saskatchewan Heritage Marsh Site* which is a cooperative wetland conservation initiative which recognizes, manages and protects wetlands important to waterfowl and other wildlife.
- designated as a *WHSRN International Shorebird Reserve* in 1994.
- Big Quill Lake: Entire lake designated as *Critical Piping Plover Habitat*; Little Quill Lake: Portions of the lakeshore designated as *Critical Piping Piping Plover habitat.*
- designated as an *Important Bird Area* site.

- Quill Lakes: 18 NAWMP Projects : 49,209 acres of secured wetlands, 2,612 acres of dense nesting cover, 2,101 acres of grazing systems.

Action needed:

- continued management of water levels in the marsh complexes to provide feeding and roosting habitat for migrating shorebirds, especially during fall migration or during high water years.
- water level manipulation on managed basins to control vegetation encroachment on open shoreline habitat.
- continued control of cattle and human activity access to critical Piping Plover nesting areas through fencing.

Primary regional contacts:

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Gerard Beyersbergen, Wildlife Biologist, Canadian Wildlife Service, Edmonton, AB; email: gerard.beyersbergen@ec.gc.ca

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Shorebird Site Action Sheet - Prairie Canada

Reflex Lake, Alberta / Saskatchewan (52°40'N, 110°01'W)

Site description:
This hyper-saline, permanent, deep lake, 555 hectares in size, has 10-30m wide beaches consisting of sand and gravel substrates. The shoreline consists of sand/alkaline beaches, rocky/gravel outcrops, seepages (vegetated and non-vegetated) on the west and south shores and areas of mud and shallow water along the shores. The upland area around the entire lake is primarily grazed pasture with aspen groves in a sandy soil substrate.

Importance to shorebirds:
Currently, twenty-five species of shorebirds use this site for feeding and roosting, primarily during spring migration, on the sandy beaches, alkaline mudflats and adjacent uplands. The food resources available encompass a host of invertebrates. The more numerous shorebirds include Sanderling and Red-necked Phalarope. Nine species of shorebirds nest along the shoreline and in the surrounding uplands including a large number of Piping Plovers (26 adults in 1996).

Current and potential threats:
- recreational activity from the cottage development on the lake can have some effect on nesting shorebirds such as Piping Plovers and increase levels of disturbance at critical times in the migration period when the birds are resting or rebuilding energy reserves
- drought and flooding directly influence the availability and condition of shorebird habitat on this site.

Protected status and area designation:

- cattle grazing and trampling concerns on the Alberta side of the lake were alleviated by a fencing program in 1997 of select areas of shoreline habitat through the cooperative efforts of numerous government and non-government organizations plus landowners.
- development activities in the area are directed / regulated under the Manitou Sandhills Integrated Resource Management Plan. Reflex Lake and the shoreline are included in the *Prime Conservation Area* under this plan.
- identified as a potential *Western Hemisphere Shorebird Reserve Network* site and *Important Bird Area* site.
- the south shore and a portion of the northeast shore of the Saskatchewan portion of West Reflex (Salt) Lake are designated as *Critical Piping Plover Habitat*.

Action needed:

- designation and dedication of the proposed complex of lakes including Reflex (Salt) Lake as a WHSRN site and follow-up with public awareness and information programs.
- work with local landholders / the recreation public to protect critical areas of shoreline habitat for nesting / brood-rearing Piping Plover.
- develop cooperative efforts with local landholders, including grazing cooperatives to encourage suitable management of the habitat for shorebirds.

Primary regional contacts:

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APPENDIX I

POTENTIALLY IMPORTANT SHOREBIRD MIGRATION STAGING SITES IN PRAIRIE CANADA

Appendix I.

Potentially important shorebird migration staging sites in Prairie Canada based on results from shorebird surveys, and reports and observations of wildlife personnel and naturalists.

Area and site [Latitude/Longitude]	Size	Most important shorebird habitats	Season	Primary Species - Spring	Primary Species - Fall	Maximum shorebird count
Manitoba – Hudson Bay Coast						
Churchill 58 46'N, 94 05'W	km of shoreline	- coastal mudflats - freshwater basins	S/F	Ruddy Turnstone (6,000 : 1982)	Whimbrel (1,500 : 1999)	
Nelson River / Hayes River (deltas) 57 05'N, 92 20'W		- delta & coastal mudflats - shallow water areas?	S/F	Red Knot (3,500+ : 1974) Hudsonian Godwit (100s : 1974)		5,910 (spring 1974) 8,890 (fall 1974)
Manitoba – Prairie						
Oak Hammock Marsh (RAMSAR) 50 10"N, 97 08'W	3,600 ha	- mudflats - shallow marsh	S/F	White-rumped Sandpiper (7,000 : 1981) Short-billed Dowitcher (5,000+ : 1983) Hudsonian Godwit (600+ : 1983)	Pectoral Sandpiper (2,000 : 1976) Yellowleg species (5,400 : 1976) Dunlin (2,200 : 1983)	16,759 (north cell : spring 1981) 12,578 (south and central cell : spring 1983)

Saskatchewan - Prairie						
Opuntia Lake (MBS) 51 49'N, 108 35'W	1,375 ha	- mudflats	S			5,791 (spring 1988)
Lenore Lake (MBS - Raven Island) 52 30'N, 104 58'W	8,830 ha	- mudflats				25,000 (1989)
Basin Lake / Middle Lake (MBS) 52 38'N, 105 17'W 52 34'N, 105 12"W	8,720 ha	- mudflats - shallow basins	S	Red-necked Phalarope (1,445 : 1997)		12,623 (1989)
Killsquaw Lake 52 24'N, 108 06'W	785 ha	- mudflats	S	Sanderling (755 : 1995) Semipalmated Sandpiper (622 : 1995)		7,259 (spring 1989)
Muskiki Lake 52 20'N, 105 43'W		- shallow saline basin	S	Red-necked Phalarope (23,325 : 1997)		23,331 (spring 1997)
Alberta -- Boreal						
Peace Athabasca Delta (RAMSAR) 58 35'N, 111 40'W		- mudflats - shallow marsh basins - river delta zones - shallow water basins	S/F		Lesser Yellowlegs	22,818 (fall 1999)

Alberta – Prairie				
Chappice Lake 50 10'N, 110 22'W		S	Sanderling (4,500 : 1988)	10,992 (1988)
		Endg.	Piping Plover (17 : 1986)	
Sullivan Lake 52 00'N, 112 00'W	- mudflats - shallow water zones			14,130 (1989)
Whitford Lake 53 52'N, 112 15'W	- mudflats			20,000+ (May 1991)

Note:

1. This is a preliminary table and as such, not a comprehensive listing of important shorebird sites or species listing.
Primary species are those whose peak numbers formed a large component of the peak number of shorebirds observed during surveys of the lake.
2. Requires data update to establish shorebird numbers and species using each site.

WHSRN = Western Hemisphere Shorebird Reserve Network
MBS = Migratory Bird Sanctuary; NWA = National Wildlife Area
S = Spring, F = Fall, S/F = Both spring and fall; Endg. = Endangered Species breeding lake

APPENDIX J

SPRING AND FALL MIGRATION DISTRIBUTION

OF

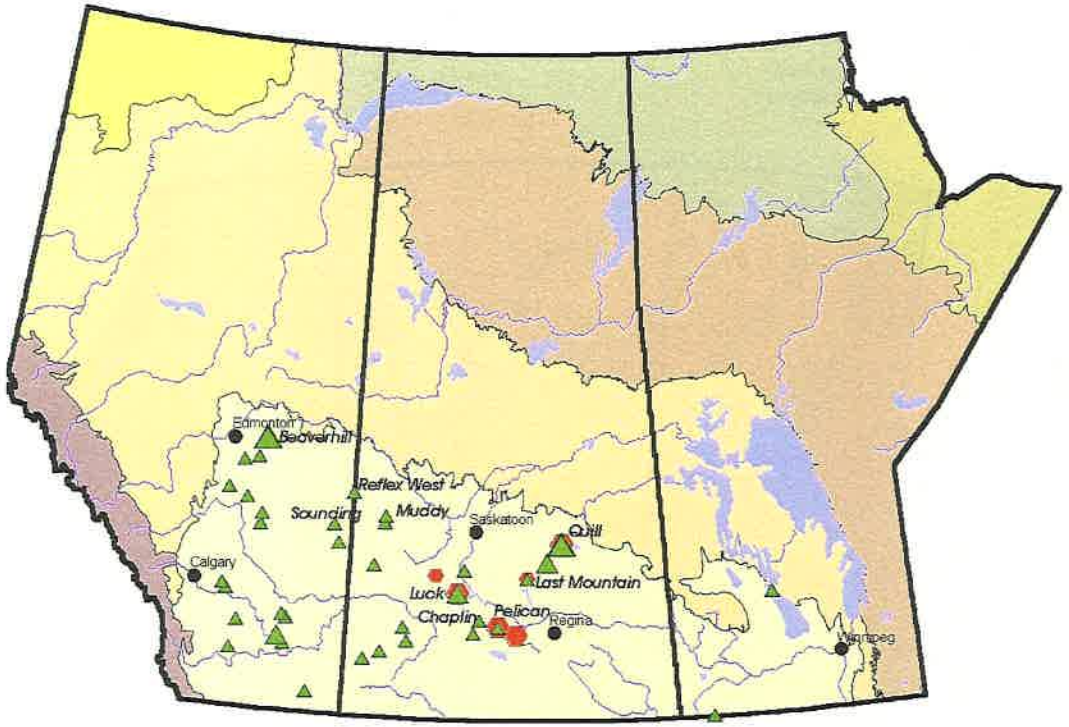
SOME PRAIRIE CANADA SHOREBIRDS

SPRING AND FALL MIGRATION DISTRIBUTION

OF SOME PRAIRIE CANADA SHOREBIRDS

Black-bellied Plover
American Golden Plover
Semipalmated Plover
Greater Yellowlegs
Lesser Yellowlegs
Solitary Sandpiper
Whimbrel
Hudsonian Godwit
Ruddy Turnstone
Red Knot
Sanderling
Semipalmated Sandpiper
Western Sandpiper
Least Sandpiper
White-rumped Sandpiper
Baird's Sandpiper
Pectoral Sandpiper
Dunlin
Stilt Sandpiper
Buff-breasted Sandpiper
Short-billed Dowitcher
Long-billed Dowitcher
Red-necked Phalarope

BLACK-BELLIED PLOVER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

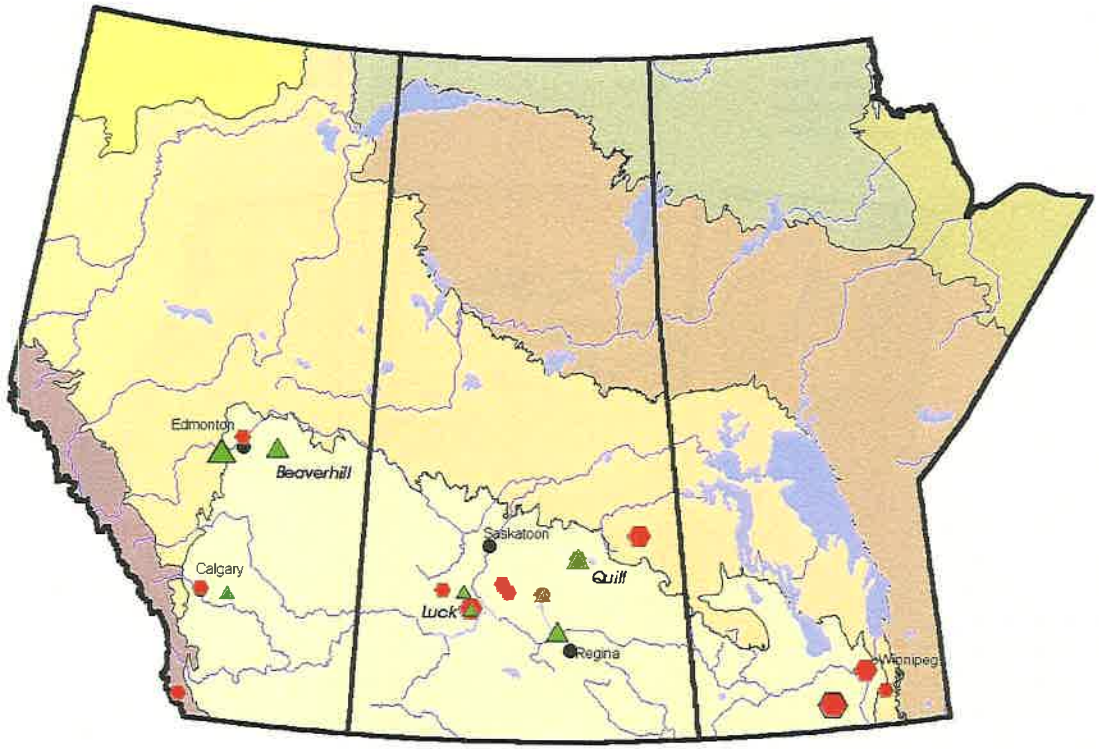
Environment Canada | Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

AMERICAN GOLDEN PLOVER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

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Central Meridian: 105° W
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Datum: NAD27

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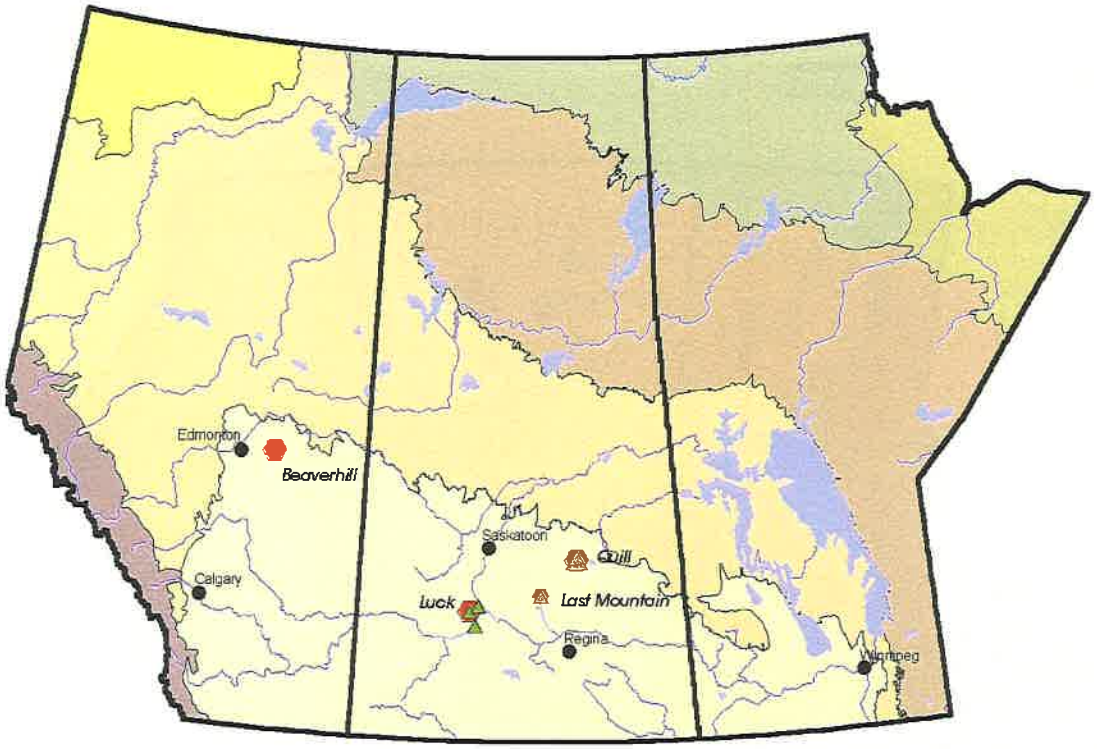
February 2000

SEMIPALMATED PLOVER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
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Datum: NAD27

Environment Canada Environnement Canada

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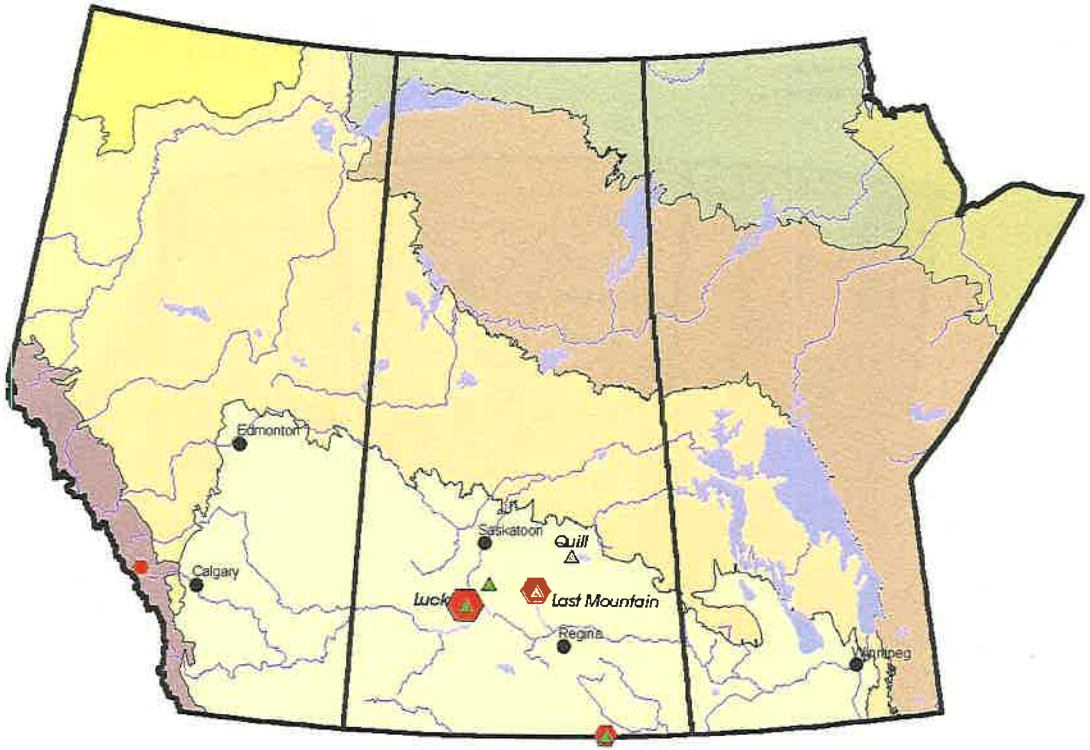
February 2000

GREATER YELLOWLEGS SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by The Provincial Museum of Alberta

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
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Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
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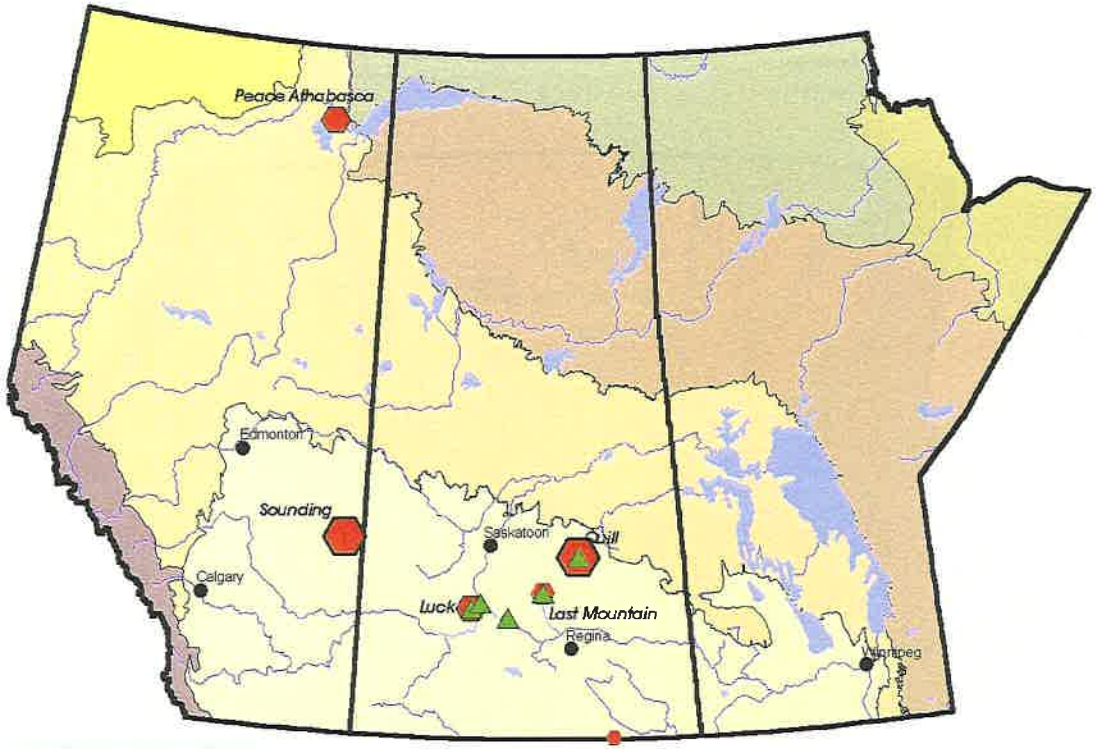
February 2000

LESSER YELLOWLEGS SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Cheri Gratto-Trevor

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
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Spheroid: Clarke 1866
Datum: NAD27

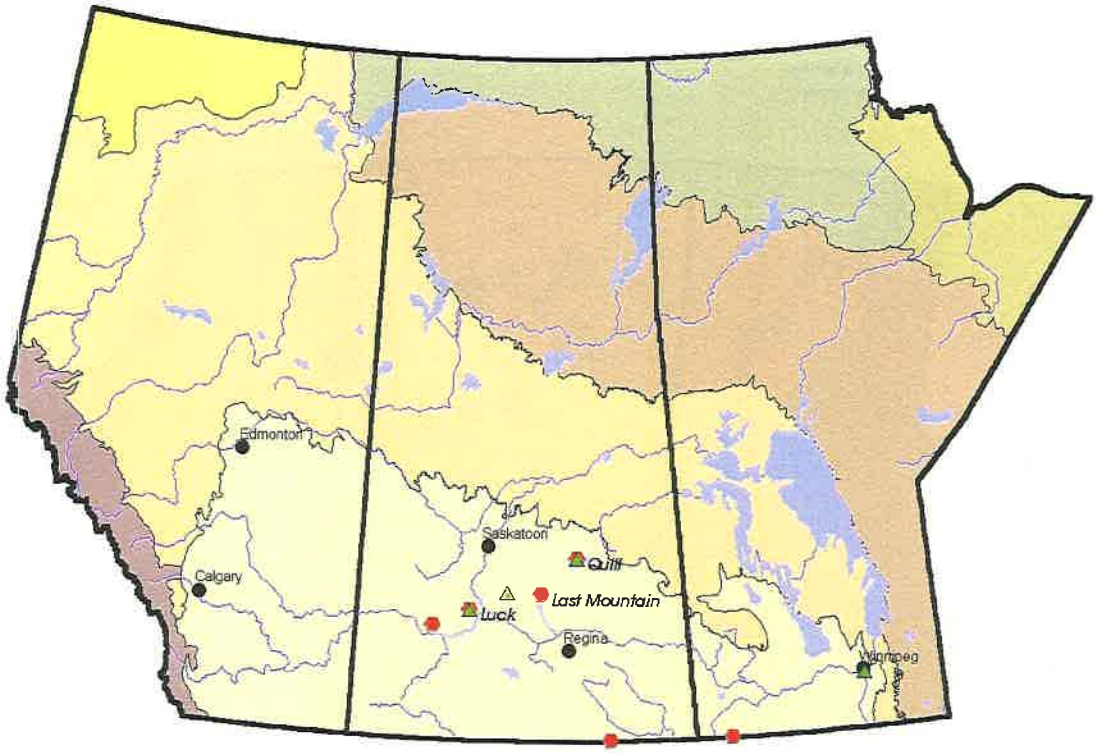
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SOLITARY SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

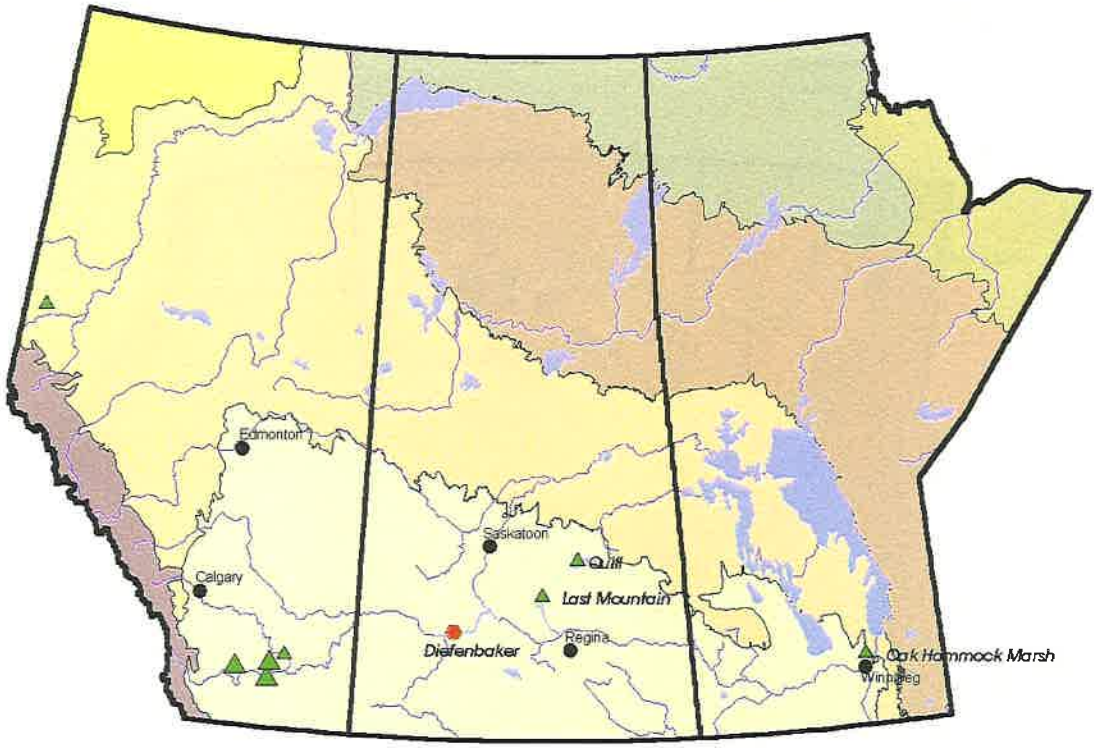
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

WHIMBREL SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Marcus Martin

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

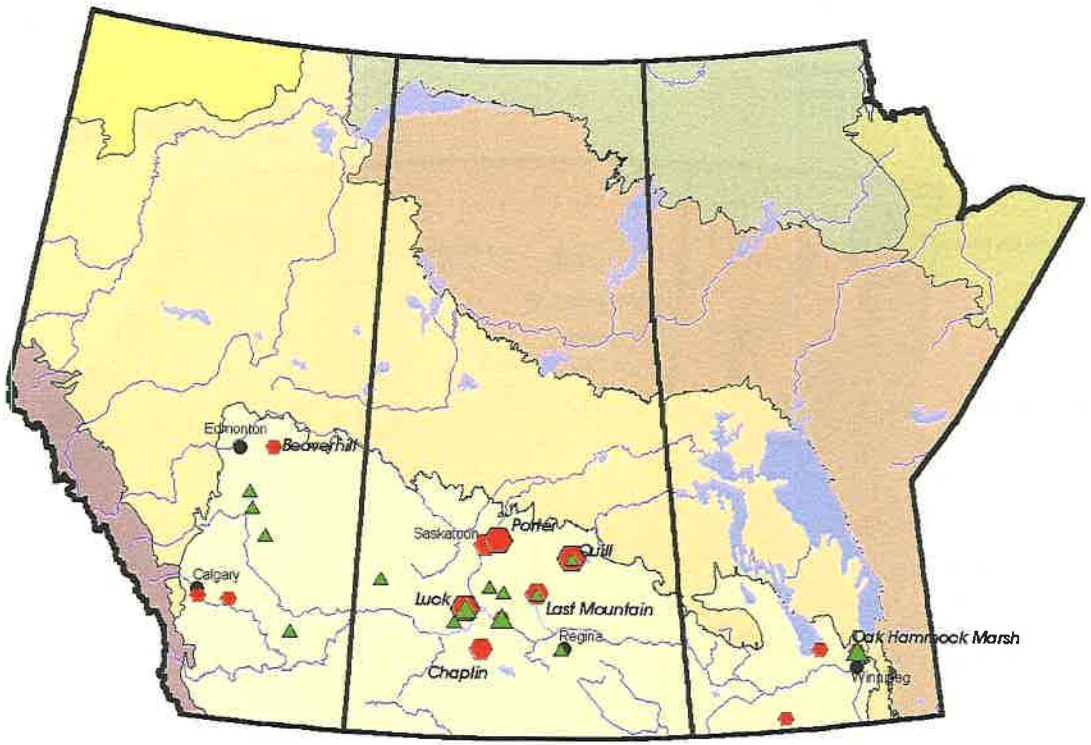
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

HUDSONIAN GODWIT SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

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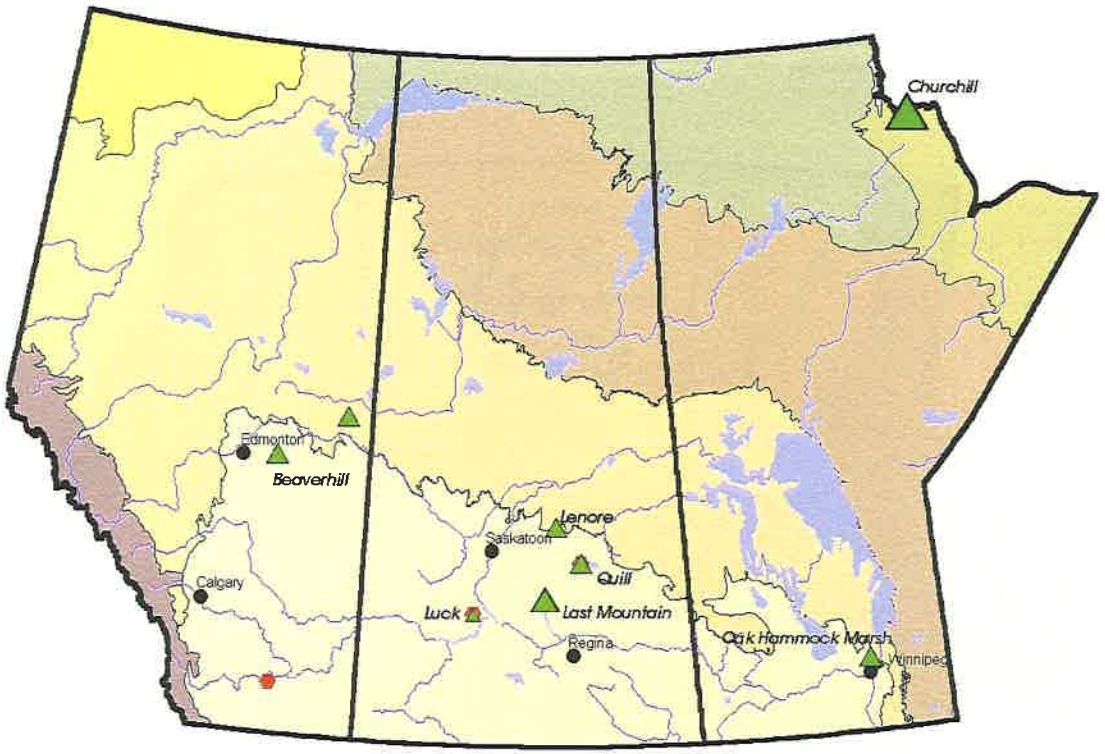
February 2000

RUDDY TURNSTONE SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

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Environmental Conservation Branch
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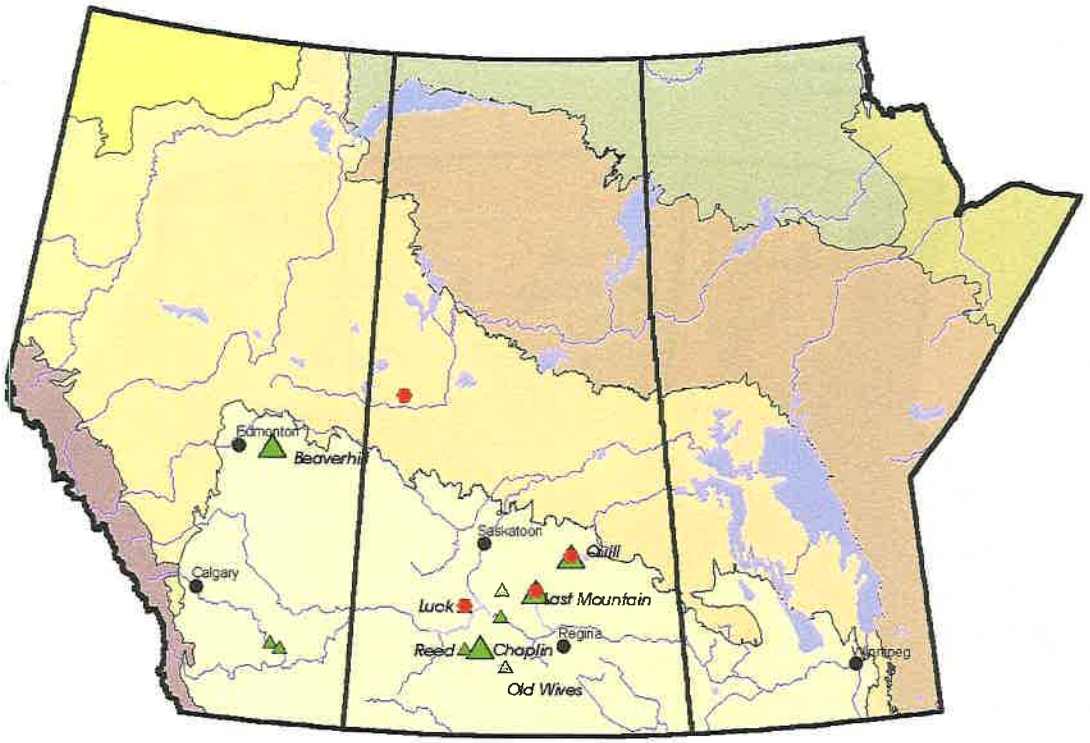
February 2000

RED KNOT SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

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Environmental Conservation Branch
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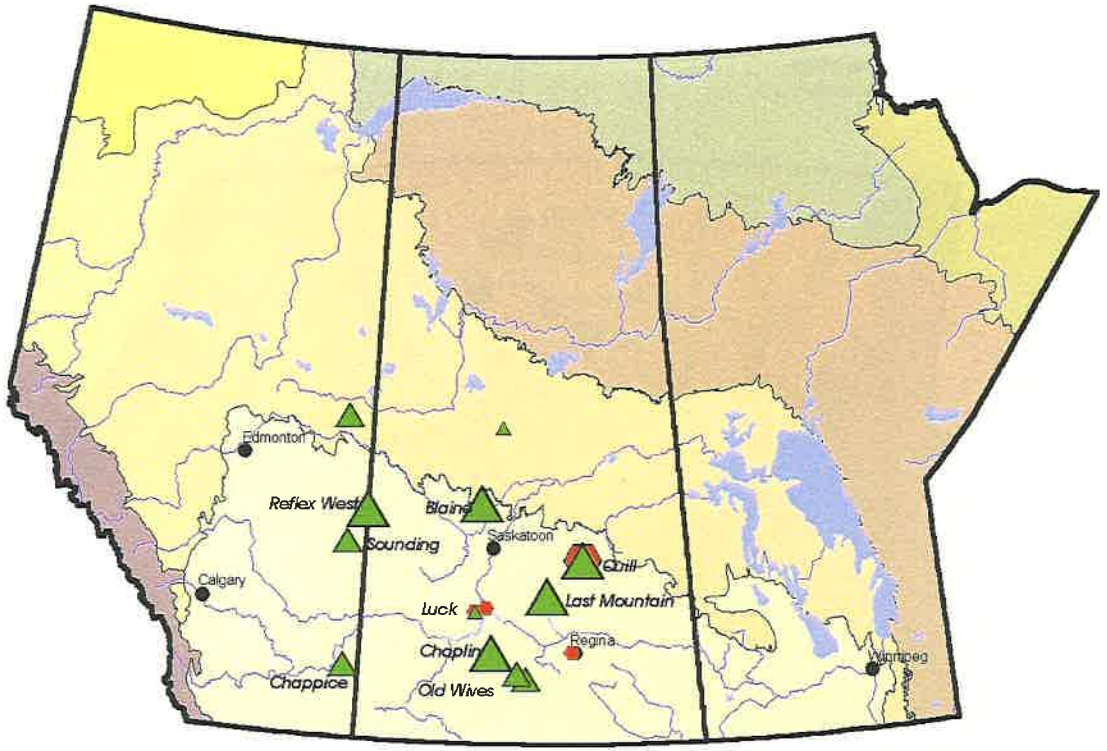
February 2000

SANDERLING SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

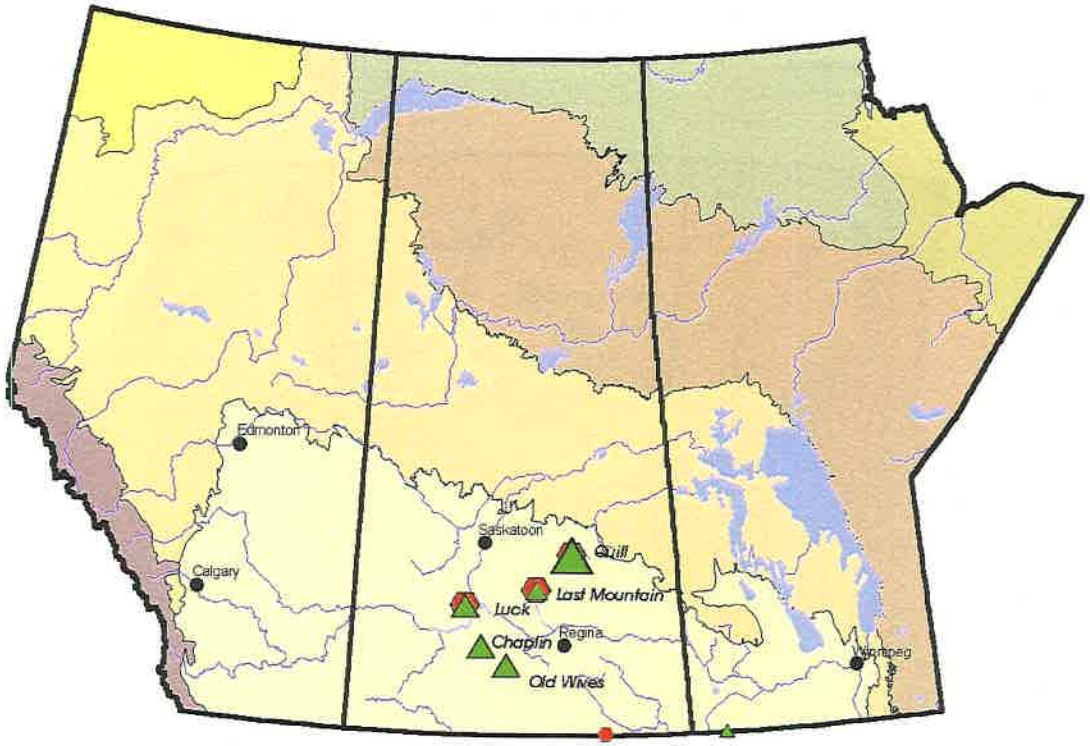
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SEMIPALMATED SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

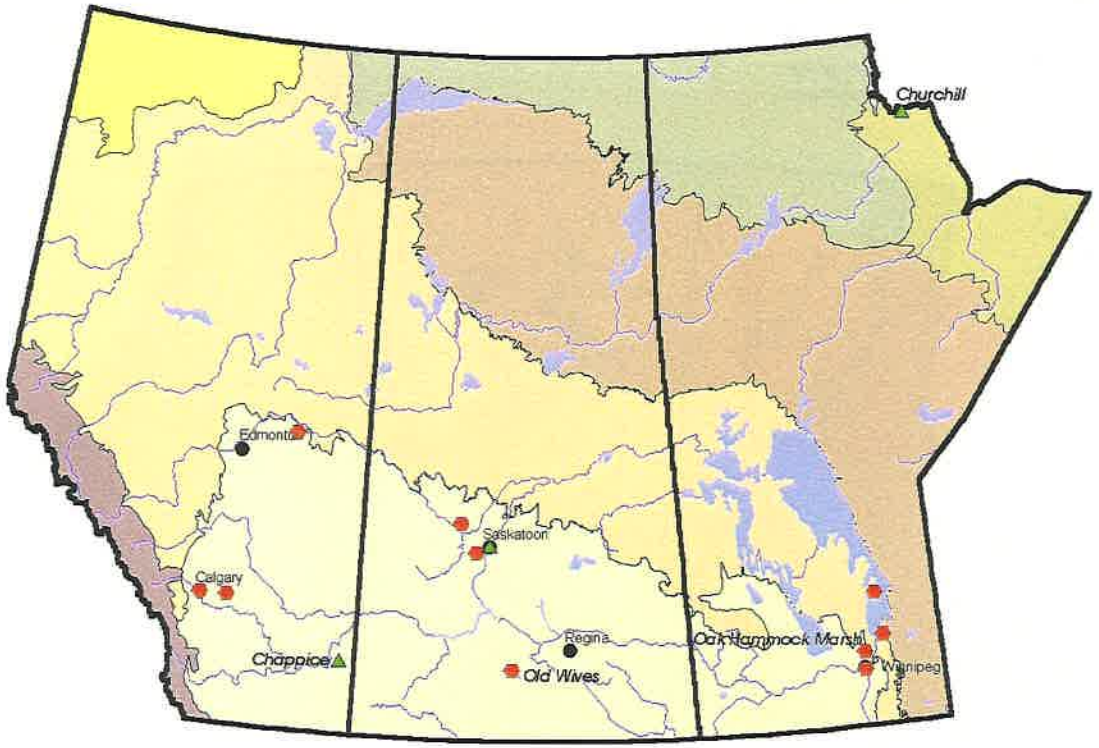
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

WESTERN SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

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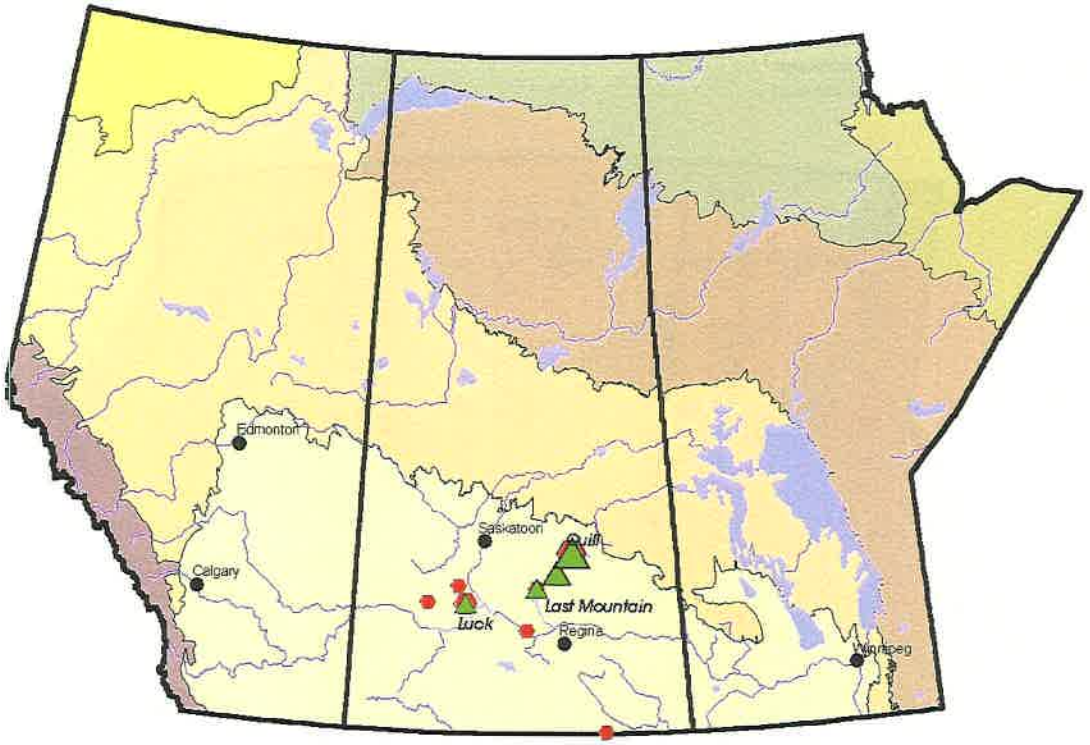
LEAST SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

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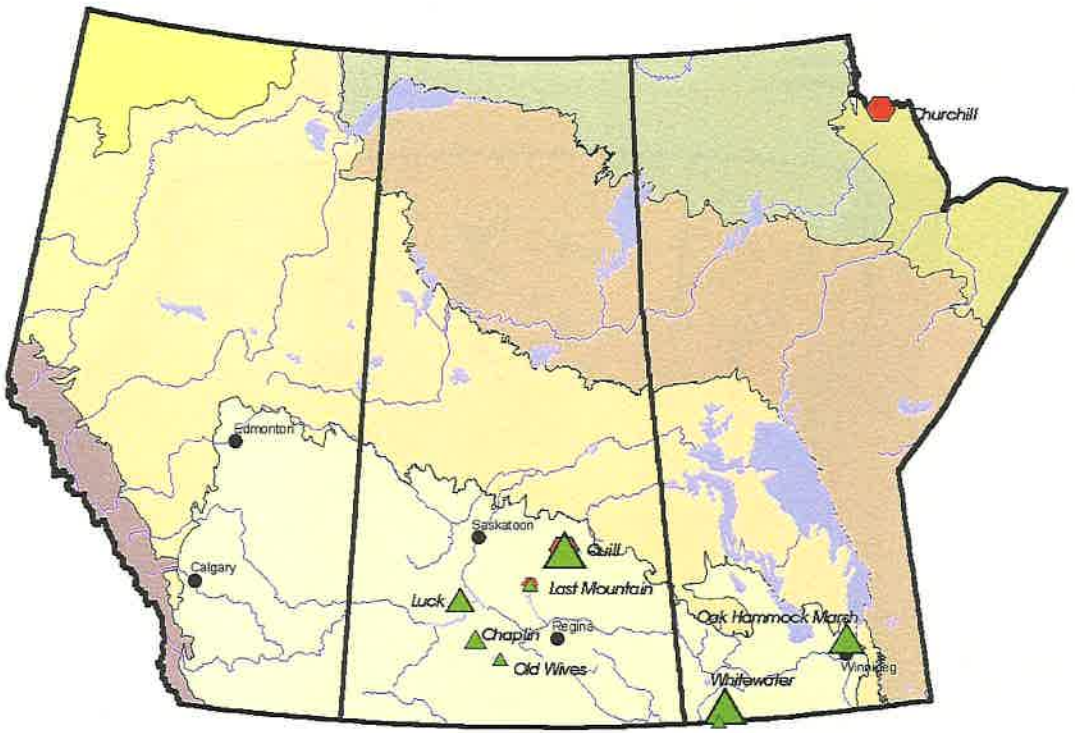
Environmental Conservation Branch
Prairie and Northern Region

February 2000

WHITE-RUMPED SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

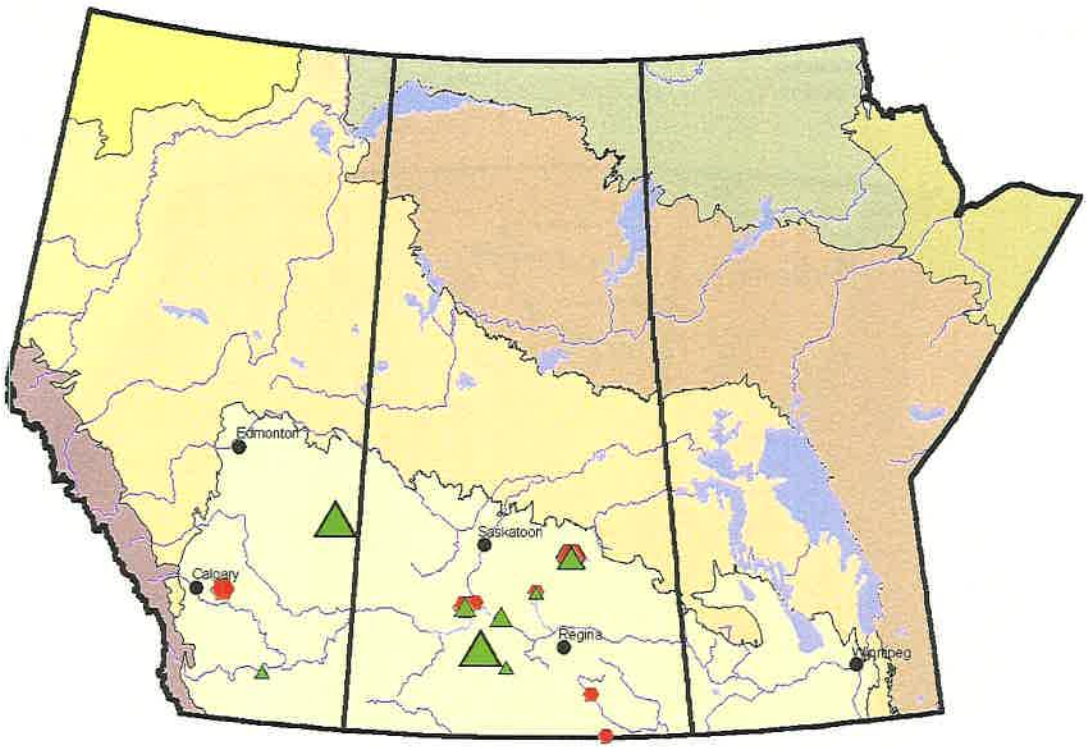
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

BAIRD'S SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Cheri Gratto-Trevor

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
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Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

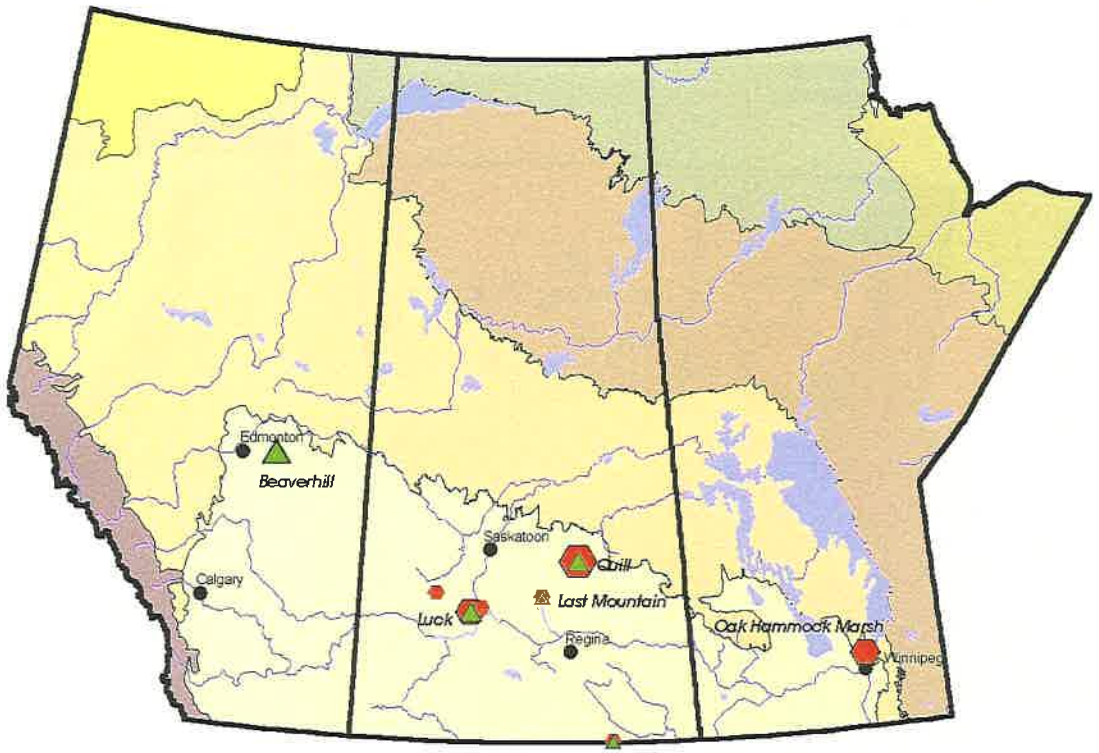
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

PECTORAL SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Gerry Beyersbergen

200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
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Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
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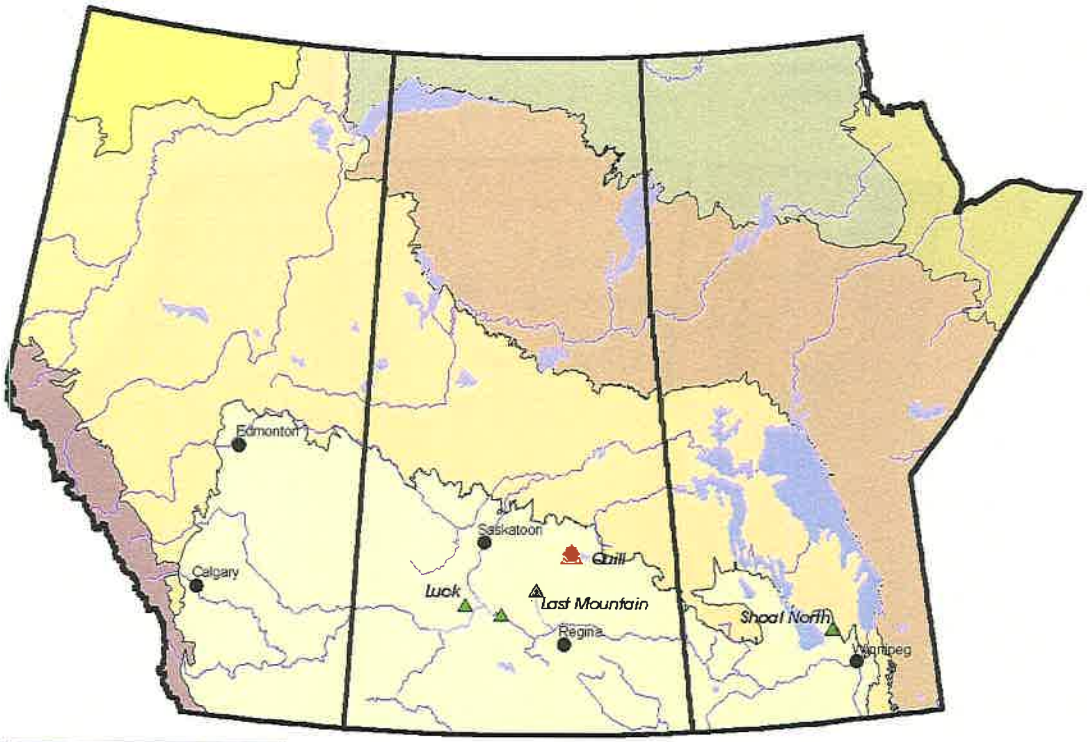
February 2000

DUNLIN SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



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200 0 200
km

N

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Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Environment Canada | Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

STILT SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES

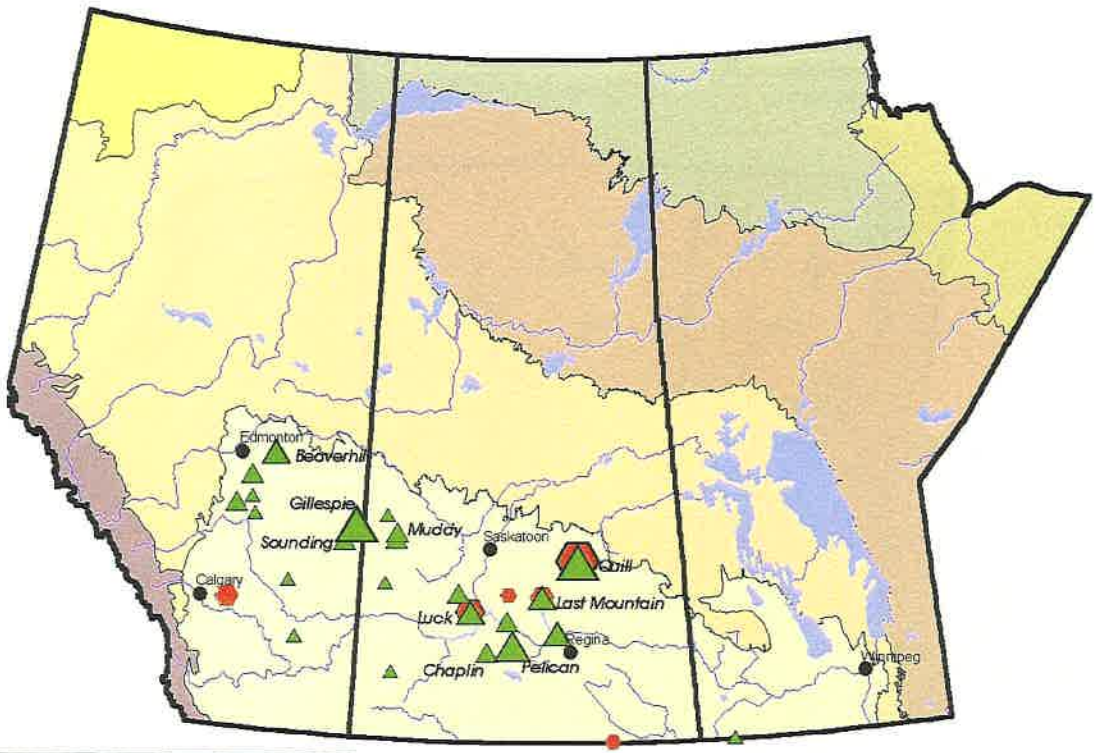


Photo by Gerry Beyersbergen

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

BUFF-BREASTED SANDPIPER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES

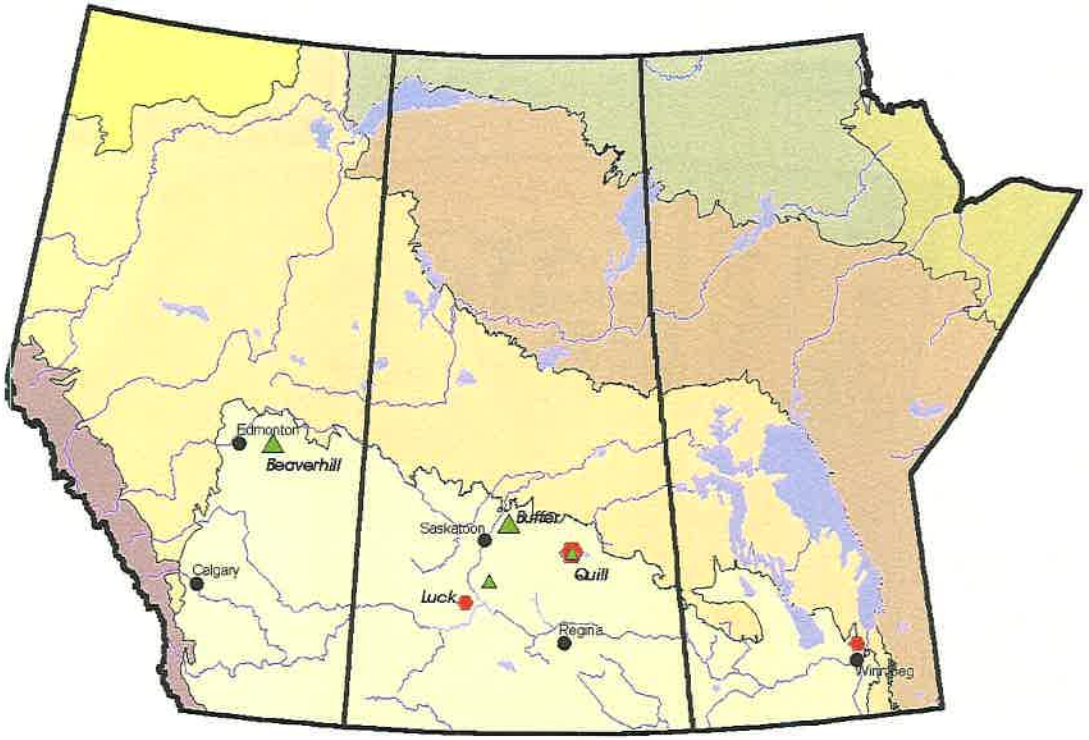


Photo by Gerry Beyersbergen

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

SHORT-BILLED DOWITCHER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES

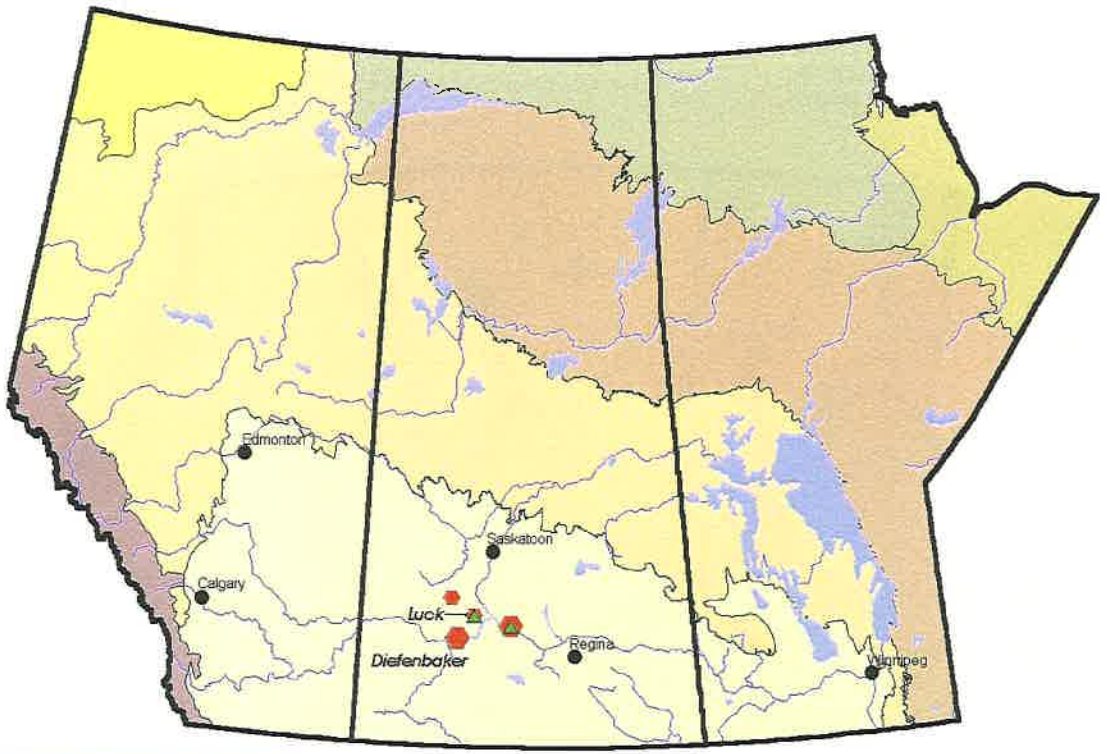


Photo by Gerry Beyersbergen

200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

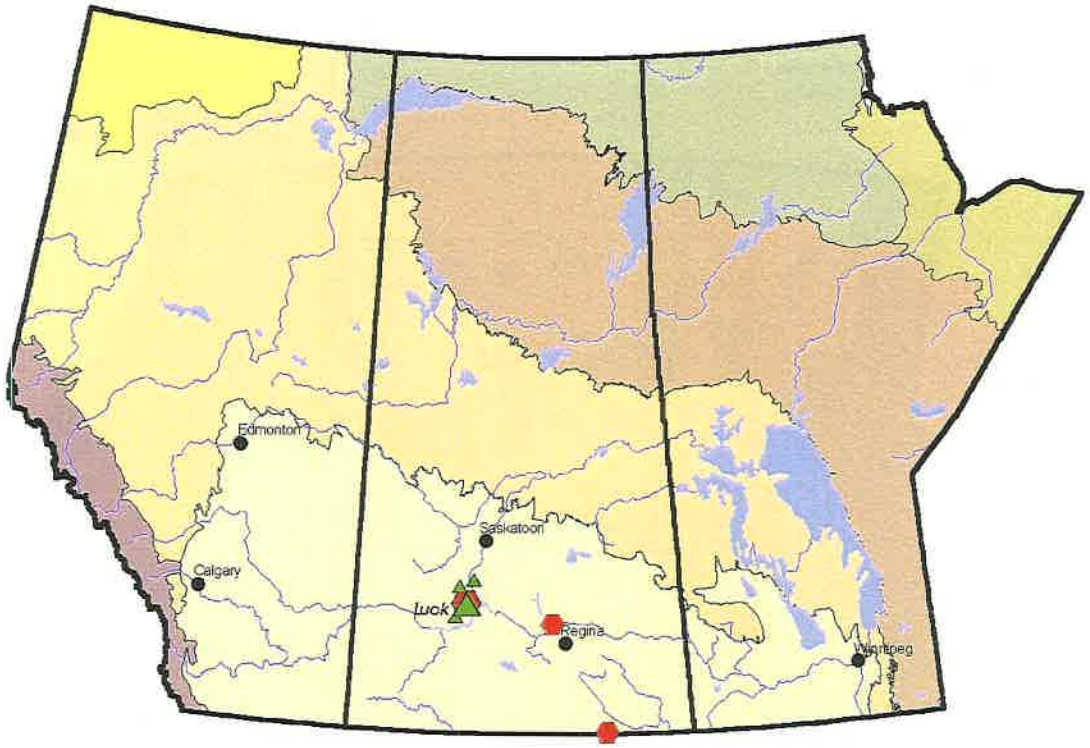
Environment Canada Environnement Canada

Produced by:

Canadian Wildlife Service
Environmental Conservation Branch
Prairie and Northern Region

February 2000

LONG-BILLED DOWITCHER SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

Photo by Cheri Gratto-Trevor

* breeding plumage photo was not available

200 0 200

km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

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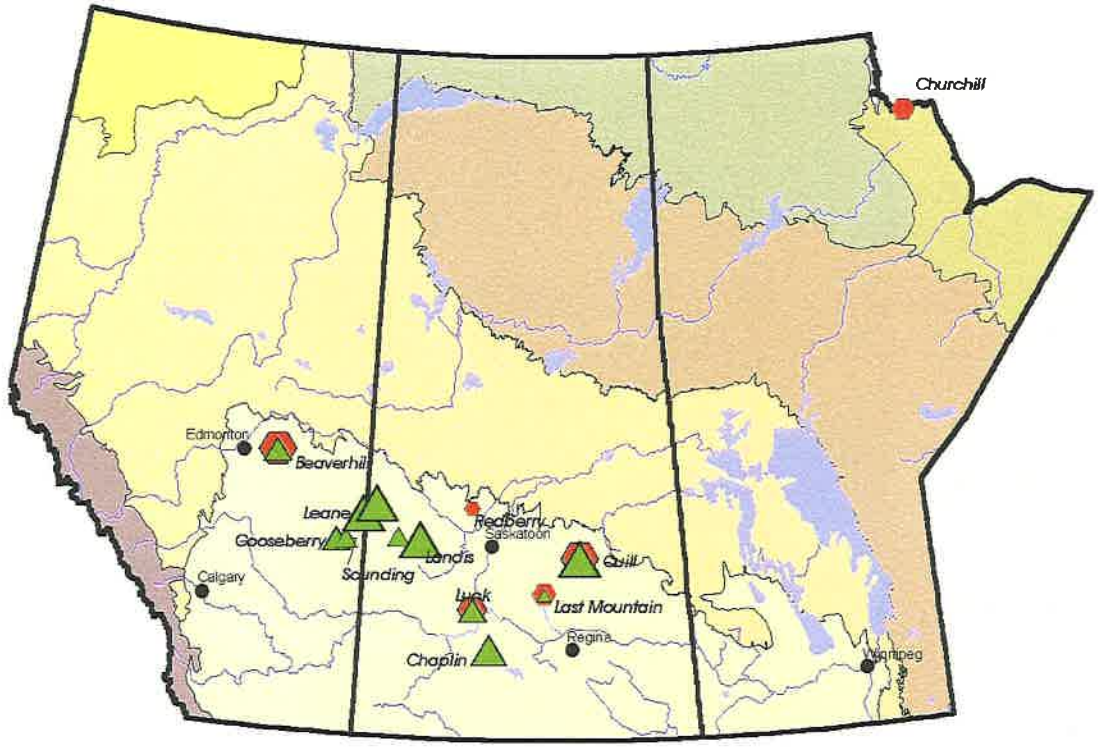
RED-NECKED PHALAROPE SPRING AND FALL MIGRATION DISTRIBUTION IN THE PRAIRIE PROVINCES



200 0 200
km

N

* counts are the result of compiling observation and survey data from many sources; the types of data range from systematic and repeated surveys to non-systematic observations

Data source: USGS Biological Resources Division, Midcontinent Ecological Science Center, Fort Collins, Colorado, U.S.A.

Projection: Lambert Conformal Conic
Standard Parallels: 53° N and 57° N
Central Meridian: 105° W
Spheroid: Clarke 1866
Datum: NAD27

SPRING MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

FALL MIGRATION COUNT *

- < 100
- 100 - 999
- 1000 - 4999
- 5000 - 9999
- > 10000

ECOZONES

- Boreal Plains
- Boreal Shield
- Hudson Plains
- Montane Cordillera
- Prairies
- Southern Arctic
- Taiga Plains
- Taiga Shield

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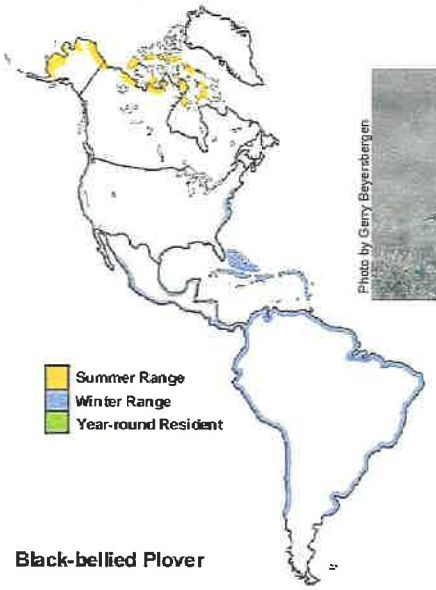
February 2000

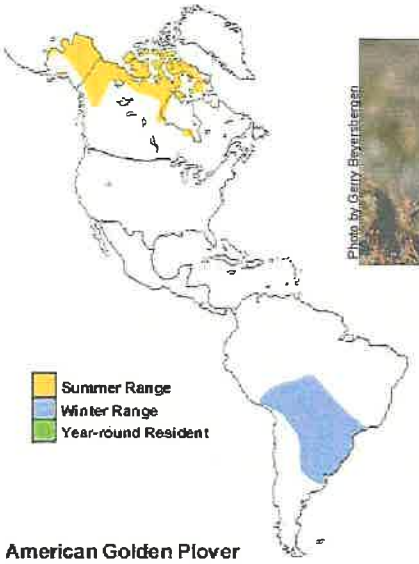
APPENDIX K

NORTH AMERICAN DISTRIBUTION RANGES OF MIGRANTS

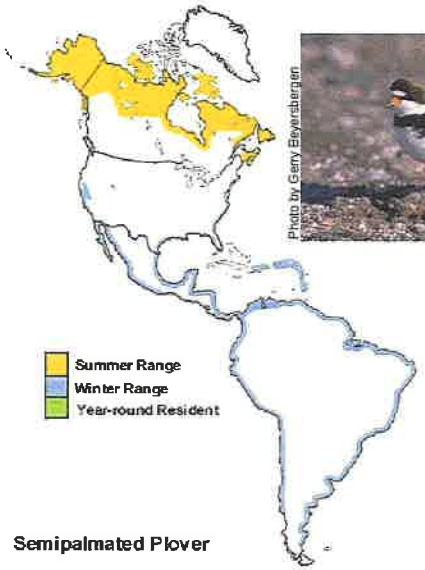
[1] MIGRATORY SHOREBIRD DISTRIBUTION IN NORTH AMERICA



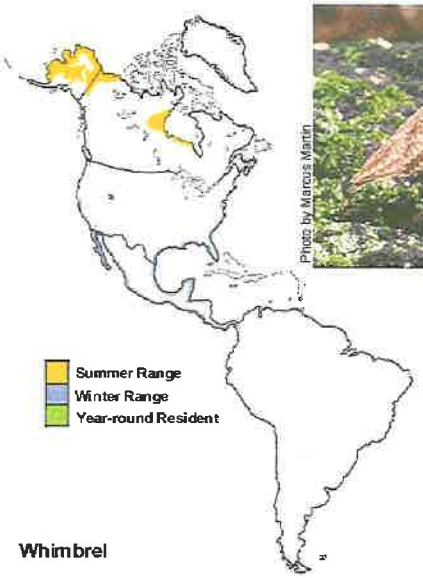
Black-bellied Plover



American Golden Plover



Semipalmated Plover



Whimbrel

Data source:
U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

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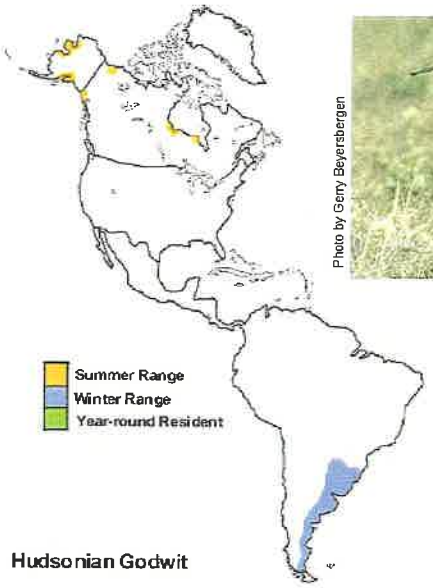
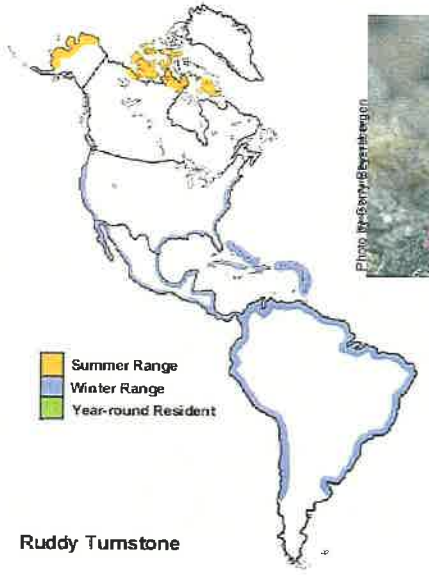
Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

February 2000

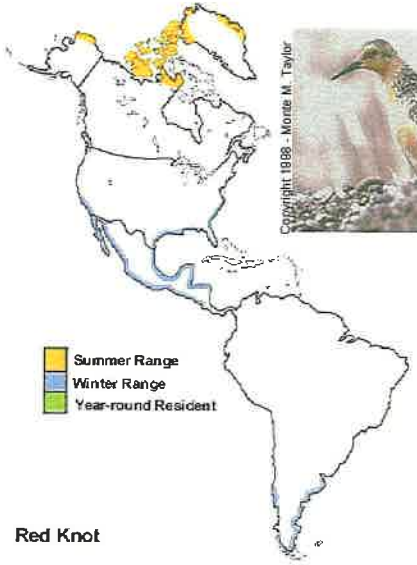
[2] MIGRATORY SHOREBIRD DISTRIBUTION IN NORTH AMERICA



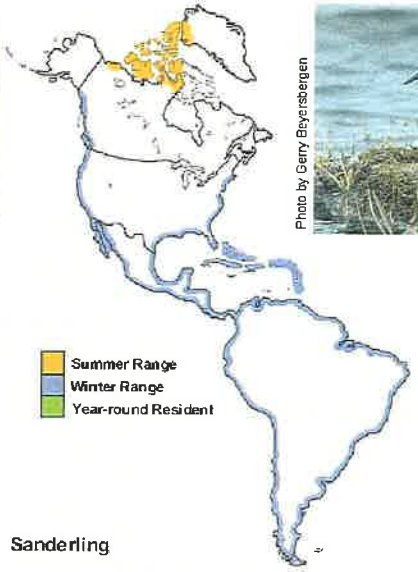
Hudsonian Godwit



Ruddy Turnstone



Red Knot



Sanderling

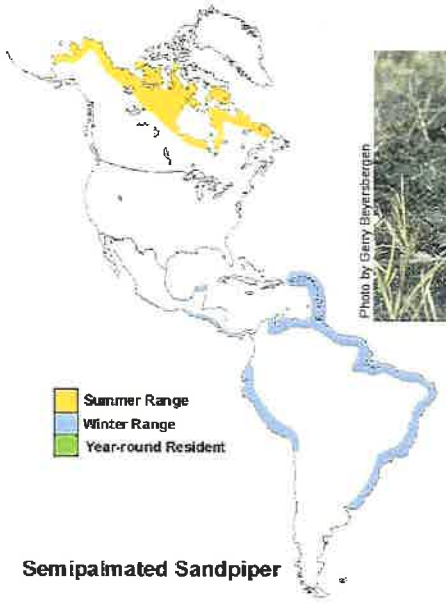
Data source:
U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada Environnement Canada

Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

February 2000

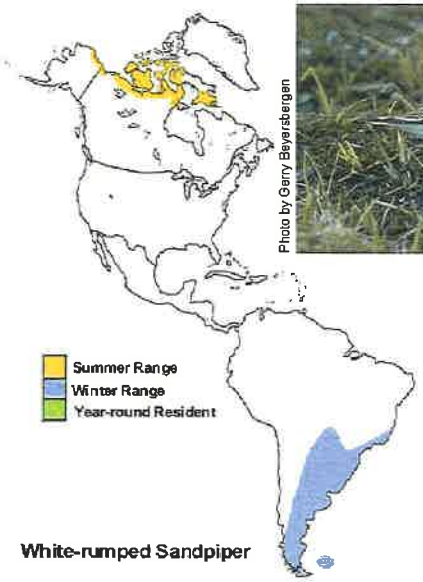
[3] MIGRATORY SHOREBIRD DISTRIBUTION IN NORTH AMERICA



Semipalmated Sandpiper

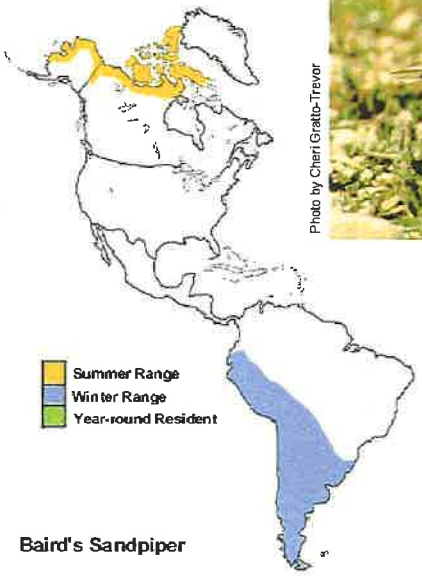
Photo by Gerry Beyersbergen

Western Sandpiper not available



White-rumped Sandpiper

Photo by Gerry Beyersbergen



Baird's Sandpiper

Photo by Cheri Gratto-Trevor

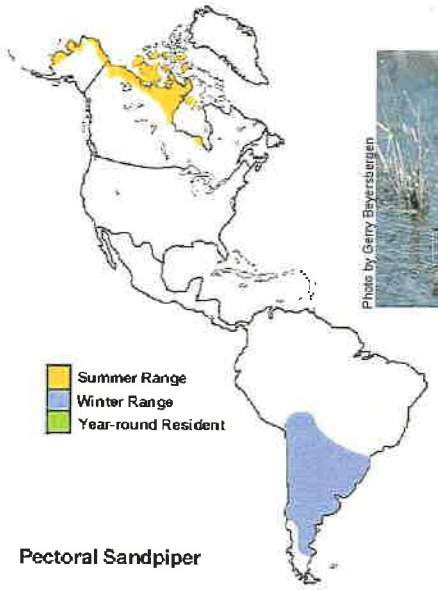
Data source:
U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

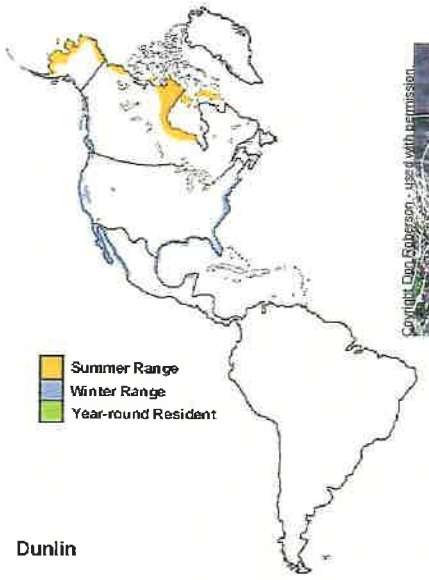
Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

February 2000

[4] MIGRATORY SHOREBIRD DISTRIBUTION IN NORTH AMERICA

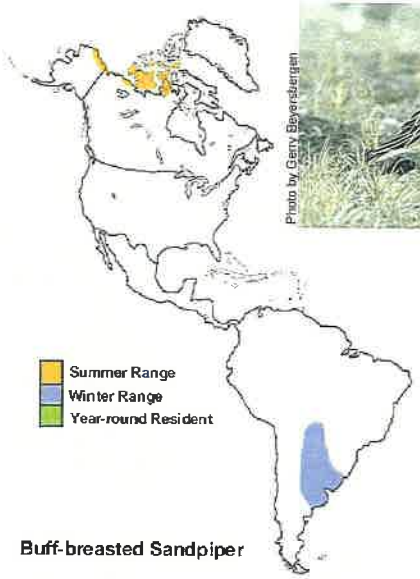


Pectoral Sandpiper



Dunlin

Stilt Sandpiper



Buff-breasted Sandpiper

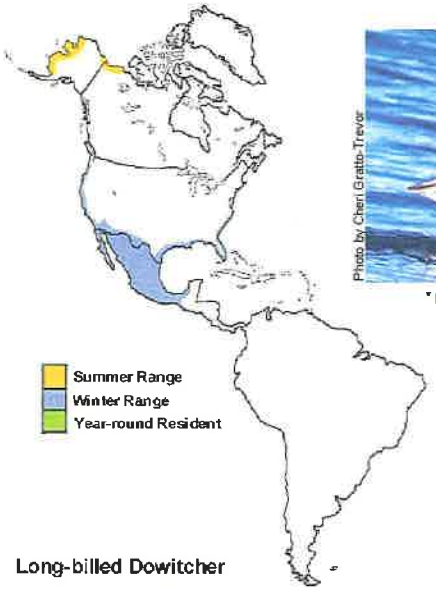
Data source:
U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada Environnement Canada

Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

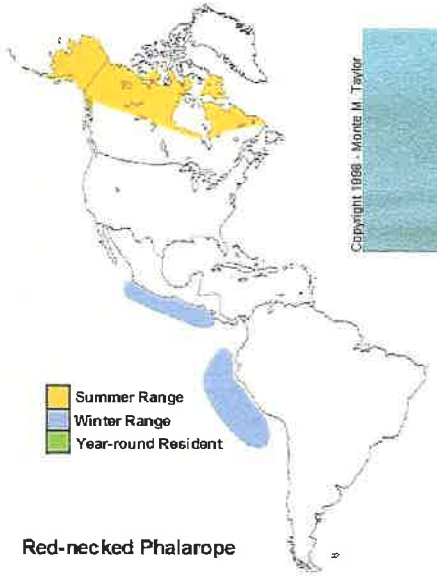
February 2000

[5] MIGRATORY SHOREBIRD DISTRIBUTION IN NORTH AMERICA



Long-billed Dowitcher

* photo with breeding plumage not available



Red-necked Phalarope

Data source:
U.S. Geological Survey
Biological Resources Division
Baltimore, Maryland, U.S.A

Environment Canada | Environnement Canada

Produced by: **Canadian Wildlife Service**
Environmental Conservation Branch
Prairie and Northern Region

February 2000