Waterbird Conservation Planning in the Northern Prairie and Parkland Region: Integration across Borders and with Other Bird Conservation Initiatives[1]

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Abstract

The Northern Prairie and Parkland Region contain millions of wetland basins, which harbor large proportions of the populations of many North American waterbird species, several of which are of high conservation concern. However, knowledge of waterbirds in the region is limited, and there has been little direction for waterbird conservation planning or management. The Northern Prairie and Parkland Waterbird Conservation Plan is being developed to provide an overview of the status and current knowledge of waterbirds in the Region and outline strategies and priorities for monitoring, management, and research. This plan is being developed by Canadian and United States partners under the auspices of the North American Waterbird Conservation Plan and takes a landscape approach to help integrate conservation planning for waterbirds with conservation planning for other species. A working group involving federal, provincial, and state agencies of two countries in conjunction with non-governmental organizations is focusing on plan development with biological rather than political borders. The plan is supported by the Prairie Habitat and Prairie Pothole joint ventures, which largely will coordinate implementation of the plan.

Key words: conservation planning, marshbird, Prairie Pothole Region, waterbird, wetland.

Introduction

Waterbirds, including both colonial and noncolonial species, are an important ecological component of the Northern Prairie and Parkland Region (hereafter Region), which encompasses the Prairie Pothole Region of the United States and the Grassland, Aspen Parkland, and Boreal Transition natural regions of the Canadian prairie provinces. The Region is roughly similar to Bird Conservation Region 11 (U.S. NABCI Committee 2000), with the addition of the Peace Parkland region in east-central British Columbia and northwestern Alberta (part of BCR 6) and other minor differences (*fig. 1*). The Region is characterized by millions of wetland basins and harbors large proportions of the continental ranges and breeding populations of many waterbird species including Pied-billed Grebe, Eared Grebe, American White Pelican, American Bittern, Sora, American Coot, Black Tern, California Gull, and Franklin's Gull (scientific names for all waterbird species in *table 1*). Several waterbirds that breed in the region are of concern because of declining populations or our limited knowledge of them, including Clark's Grebe, Least Bittern, Yellow Rail, Least Tern, and Black Tern. Given the high number of waterbird species and individuals present, the Region is critically important to continental waterbird conservation. However, knowledge of waterbirds in the Region is limited and there has been little direction for waterbird conservation planning or management.

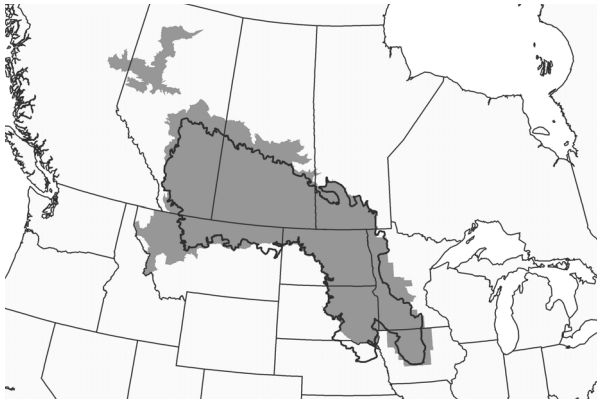

Figure 1— Location of the Northern Prairie and Parkland Waterbird Conservation Region (dark shaded areas) and Bird Conservation Region 11 (black outline) in north-central North America.

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Table 1— *Breeding status, distribution, and preliminary conservation assessment ratings of waterbird species included in the Northern Prairie and Parkland Region Waterbird Conservation Plan.*

Common name	Scientific name	Colonial or non-colonial	Breeding distribution	Conservation assessment
Common Loon	*Gavia immer*	N	Widespread	Low
Pied-billed Grebe	*Podilymbus podiceps*	N	Widespread	Low
Horned Grebe	*Podiceps auritus*	N/C[1]	Widespread	High
Red-necked Grebe	*Podiceps grisegena*	N/C	Widespread	Low
Eared Grebe	*Podiceps nigricollis*	C/N	Widespread	Moderate
Western Grebe	*Aechmophorus occidentalis*	C	Widespread	High
Clark's Grebe	*Aechmophorus clarkii*	C	Local	Low
American White Pelican	*Pelecanus erythrorhynchos*	C	Widespread	Moderate
Double-crested Cormorant	*Phalacrocorax auritus*	C	Widespread	Low[2]
American Bittern	*Botaurus lentiginosus*	N	Widespread	High
Least Bittern	*Ixobrychus exilis*	N/C	Widespread	Moderate
Great Blue Heron	*Ardea herodias*	C	Widespread	Moderate
Great Egret	*Ardea alba*	C	Peripheral	Low
Snowy Egret	*Egretta thula*	C	Peripheral	Low
Cattle Egret	*Bubulcus ibis*	C	Local	Low
Little Blue Heron	*Egretta caerulea*	C	Peripheral	Low
Tricolored Heron	*Egretta tricolor*	C	Peripheral	Low
Green Heron	*Butorides virescens*	N/C	Widespread	Low
Black-crowned Night-Heron	*Nycticorax nycticorax*	C	Widespread	Moderate
Yellow-crowned Night-Heron	*Nyctanassa violacea*	C	Peripheral	Low
White-faced Ibis	*Plegadis chihi*	C	Local	Low
Yellow Rail	*Coturnicops noveboracenis*	N	Widespread	High
Black Rail	*Laterallus jamaicensis*	N	Peripheral	Moderate
King Rail	*Rallus elegans*	N	Widespread	High
Virginia Rail	*Rallus limicola*	N	Widespread	Moderate
Sora	*Porzana carolina*	N	Widespread	Low[3]
Common Moorhen	*Gallinula chloropus*	N	Peripheral	Low[3]
American Coot	*Fulica americana*	N	Widespread	Low[3]
Sandhill Crane	*Grus canadensis*	N	Widespread	Low[3]
Whooping Crane[4]	*Grus americana*	N	-------	Listed
Franklin's Gull	*Larus pipixcan*	C	Widespread	High
Bonaparte's Gull	*Larus philadelphia*	C/N	Peripheral	Low
Ring-billed Gull	*Larus delawarensis*	C	Widespread	Low[2]
California Gull	*Larus californicus*	C	Widespread	Low[2]
Herring Gull	*Larus argentatus*	C	Peripheral	Low
Caspian Tern	*Sterna caspia*	C	Local	Moderate
Common Tern	*Sterna hirundo*	C	Widespread	Moderate
Forster's Tern	*Sterna forsteri*	C	Widespread	Low
Least Tern	*Sterna antillarum*	C/N	Local	Listed
Black Tern	*Chlidonias niger*	C	Widespread	High

[1]N/C: degree of coloniality varies; most typical behavior is listed first.
[2]May be of higher management concern due to problems associated with locally increasing populations.
[3]May be of higher management concern because of harvest in some locations.
[4]Does not breed in Region.

Goals of the Plan

The Northern Prairie and Parkland Waterbird Conservation Plan is being developed to provide an overview of the status and current knowledge of waterbirds in the Region and outline strategies and priorities for waterbird monitoring, management, and research. The Plan is being developed jointly by Canadian and United States partners under the auspices of the North American Waterbird Conservation Plan (Kushlan et al. 2002) to help integrate conservation of waterbirds with local and landscape-level conservation of other species.

A working group involving federal, provincial, and state agencies of two countries in conjunction with non-governmental organizations is focusing on plan development with biological rather than political borders. The overall goal of the working group is "To provide guidelines for conservation that, when implemented, result in maintaining and managing healthy populations, distributions, and habitats of waterbirds throughout the Northern Prairie and Parkland Region of North America." The plan is supported by the Prairie Habitat and Prairie Pothole joint ventures (PHJV and PPJV, respectively), which will coordinate implementation of conservation programs for the benefit of all target bird groups. This paper presents an overview of plan development and preliminary products.

The plan covers 39 breeding species (*table 1*) and the Whooping Crane, which migrates through the Region but breeds farther north. Because waterbird habitat in the Region is often widely dispersed in numerous small wetlands, the plan takes a landscape approach, rather than focusing solely on conservation of few, key sites. Waterbirds largely have been ignored in previous bird conservation efforts in the region, although some large waterbird colonies have been protected and sporadic, non-standardized surveys have taken place on a local level.

An excellent conservation base and partnership network exists in the Region with the PHJV and PPJV, both of which are committed to the conservation of non-game birds as well as waterfowl. For example, the second stated objective of the PPJV is to "Stabilize or increase populations of declining wetland/grassland-associated wildlife species in the Prairie Pothole Region, with special emphasis on non-waterfowl migratory birds."

Assessment of Species Status

Based on available data, we developed conservation assessments for waterbird species in the Region based on 1) population trend, 2) relative abundance, 3) threats to breeding populations, 4) threats to non-breeding populations, 5) geographic size of breeding distributions, and 6) geographic size non-breeding distributions (see Carter et al. 2000, Kushlan et al. 2002). The proportion of the continental breeding population found within the Region was included as a seventh factor to assess the importance of the region to each species. Assessment categories for this Region include Listed, for species that are federally listed as endangered in Canada and/or the U.S and already have significant conservation plans in place; High Concern; Moderate Concern; and Low Concern, which includes species considered not at risk. Preliminary scores (*table 1*) were reviewed and occasionally adjusted according to input from species experts and updated information. Species assessments in this plan are distinct from assessments reflecting policy of plan partner agencies (e.g., U.S. Fish and Wildlife Service 2002) or assessments developed for other plans (e.g., Kushlan et al. 2002).

Assessments were developed using biological criteria that reflect a species' vulnerability and do not necessarily reflect conservation or management priority, which may differ because of a species' harvest status or nuisance potential. For example, Sandhill Crane and Sora are relatively abundant and increasing in the region and are therefore considered to have low biological vulnerability (*table 1*); however, they are of high management interest as they are harvested in some areas. Similarly, Double-crested Cormorant, California Gull, and Ring-billed Gull are considered to have low biological vulnerability because they also are locally abundant and increasing within the Region, but may be of higher management interest due to the potential impact of cormorants on fisheries and concern about gull depredation of bird nests and fledglings, including those of the threatened and endangered Piping Plover (*Charadrius melodus*). Species assessed as being of High Concern are expected to be of high conservation priority.

Threats to waterbirds are being identified and prioritized in the plan. Some are direct, such as loss of wetlands from drainage or cultivation. Others are indirect, such as sedimentation and contamination of wetlands from land use on surrounding uplands. Habitat loss and degradation, primarily from agriculture, are the major threats to waterbirds in the Region, followed by lesser threats such as contaminants, predation, invasive species, and altered disturbance regimes.

Conservation Planning

Conservation planning will differ somewhat for colonial and non-colonial species. Discrete locations somewhat simplify monitoring and management of colonial species, which nest in aggregations of tens to tens of thousands of individuals. Most existing information on waterbirds in the region is limited to colonial species, but is not necessarily current or precise, and is typically limited to higher profile species. We are developing databases of colony locations and size for many species where colony location is known. However, locations of many colonies are unknown or not recorded, and locations of others have shifted recently due to changes in water level of some wetlands. Quality of colony location data differs among species, regions, and surveys. Even where colony locations are known, foraging range and the effects of landscapes surrounding colo-

nies must still be incorporated into conservation planning and management recommendations. The largest gap in our information base is for non-colonial species. Their dispersion and often cryptic nature complicate monitoring and management, and some of them make heavy use of temporary wetlands, which by definition are ephemeral and therefore difficult to incorporate into planning.

One tool for conservation planning for broadly distributed species is development of spatially explicit maps that predict landscape-level habitat suitability based on conceptual or empirical habitat models. For example, relative probability of detecting Black Tern in North Dakota has been modeled using geo-referenced Breeding Bird Survey stop data in conjunction with landcover and wetland information (*fig. 2*). However, good spatial models require accurate digital wetland and landcover data, the availability, timing, and quality of which vary within the region. In addition, so little is known about some marshbird species in the region that we are presently unable to accurately define the limits of their range, distribution within their range, population sizes, or breeding status. This complicates conservation planning, especially landscape-level habitat modeling, which requires large amounts of geo-referenced bird data. These issues are exemplified in our region by Yellow Rail (Bookhout 1995) and Black Rail (Eddleman et al. 1994); even intensive, focused survey efforts for these species can yield relatively few data (Prescott et al. 2002). In addition, monitoring of waterbird population trends is complicated by changes in wetland numbers. The Region is notorious for frequent drought and wet cycles, and numbers of many waterbird species in the region fluctuate markedly in response to changes in water availability, wetland condition, and vegetation (Niemuth and Solberg 2003).

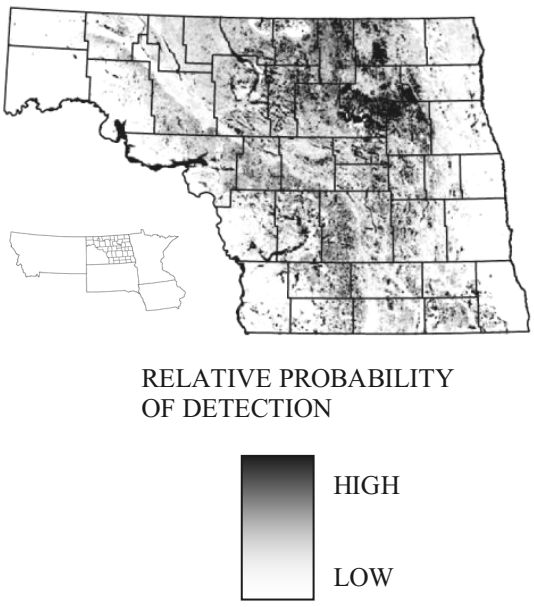

Figure 2— Relative probability of detecting Black Tern in North Dakota as predicted by landscape-level habitat model developed using geo-referenced Breeding Bird Survey stop data and digital landcover and wetland information (preliminary model, USFWS Region 6 HAPET Office, unpublished data).

Integration across Jurisdictions and Species

A key component of the plan will be integration of conservation planning. Integration has many components, one of which is integration across jurisdictions. State and provincial status listings were very similar for many rare species in the Region, and our planning promotes a common approach to conservation of these species. However, integrated waterbird planning across borders is not entirely new in the region. The U.S. Fish and Wildlife Service, Canadian Wildlife Service, and state and provincial governments already cooperate in planning and surveying for migratory bird species that are hunted. The PHJV in Canada and the PPJV in the United States are planning and implementing wetland conservation across landscapes for waterfowl and non-game species. Our planning will not supersede management plans in place for harvested species like Sandhill Crane (Central and Pacific Flyway Councils 1993) or endangered species like Least Tern (U.S. Fish and Wildlife Service 1990). The plan will provide a broader regional context for prioritization and planning of all waterbird species, with an emphasis on priority waterbird species in the region that are not covered by existing initiatives. Development of one waterbird plan under the PPJV and the PHJV will ensure international consistency, but joint ventures will need to tailor implementation according to different political realities in the United States and Canada. Similar habitats along with regional shifts in distribution and numbers emphasize the need for an integrated approach to conservation planning. But integrated conservation within the two joint ventures is only part of the story, as waterbirds breeding in the Region spend only a portion of their annual cycle there, and migration corridors, staging areas, and wintering grounds are also vital to their conservation. Continental planning efforts (e.g., Kushlan et al. 2002) must recognize and support conservation of linkages between different geographic regions.

Conservation planning in the Region will also be integrated with conservation plans for other species. One of the primary planning tools is the development of landscape-level habitat models. Spatially explicit maps predicting presence and density of waterbirds can be combined with maps predicting presence of other spe-

cies of interest such as waterfowl, shorebirds, and grassland birds (Niemuth et al. this volume). Preliminary analyses indicate considerable potential for waterbird conservation efforts to overlap with conservation efforts for waterfowl, shorebirds, and grassland birds in the region, but planning must also consider areas where there is little or no overlap to ensure that all species of conservation concern are adequately covered. Integration among bird conservation plans can be achieved in many ways, such as present efforts in Alberta to determine waterbird habitat relationships by combining waterbird surveys with wetland and habitat information from waterfowl surveys.[1] Even though conservation planning in the region focuses on a landscape approach and broad-scale relationships, local effects and management also must be considered, as fine-grained habitat selection in a given landscape can differ among species. For instance, wetlands with large amounts of emergent vegetation preferred by rails will be avoided by breeding shorebirds such as Marbled Godwit (*Limosa fedoa*), which prefer wetlands with little or no tall emergent vegetation.

Waterbird Conservation Planning in the Region

Much more information will be needed to bring waterbird planning to the level of waterfowl planning in the Region, and we are pursuing that information in an adaptive manner. We have identified numerous information gaps regarding waterbirds in the Northern Prairie and Pothole Region, and the plan will prioritize identified information needs. Accurate population data (waterbird distribution, numbers, and trends) is the top information need, but major gaps exist regarding habitat requirements and factors influencing survival and productivity. Dedicated waterbird surveys along with general and specific research are needed to answer these questions.

However, research is not needed to know that habitat preservation is key to conservation of waterbirds in the Region. Agriculture is the dominant land use and it can dramatically impact habitat quality even when habitat has not been completely converted. Many waterbirds use temporary and seasonal wetlands, and these wetlands have limited protection in both the United States and Canada, particularly during periods of low precipitation, when they are often cultivated. Use of surrounding uplands directly impacts wetland siltation, water quality, vegetation characteristics, and composition of wetland invertebrate communities. Conservation planning for waterbirds in the region must focus on habitat preservation while considering and incorporating use of surrounding uplands.

The Northern Prairie and Parkland Waterbird Conservation Plan will lay the framework for future actions such as monitoring, protection of key sites and landscapes, and identification of priority issues and actions. Many additional public and private partners, including agricultural interests, will be necessary to implement recommendations of the plan given the large amount of private ownership in the region and the landscape approach needed for waterbird conservation.

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