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NORTH AMERICAN  
WATERFOWL  
MANAGEMENT PLAN



STRENGTHENING the BIOLOGICAL FOUNDATION

2004  
Strategic  
Guidance



*North American Waterfowl  
Management Plan*  
*Plan nord-américain de  
gestion de la sauvagine*  
*Plan de Manejo de Aves  
Acuáticas de Norteamérica*

The beginning of the 21st Century marks the conclusion of the first 15-year cycle of the 1986 North American Waterfowl Management Plan—a public-private approach to managing waterfowl in Canada, Mexico, and the United States. This approach launched a new era in wildlife conservation as it set out a blueprint for developing partnerships to conserve shared natural resources, one that is still vital today.

With this document, *2004 North American Waterfowl Management Plan-Strengthening the Biological Foundation*, the three countries will set forth another 15-year cycle. They envision sustainable landscapes, consultation and cooperation with partners, and strong biological foundations, to secure the conservation of waterfowl and their habitats for future generations.

This Plan continues to expand on the last 15 years of success to meet the challenges for a new century. The parties recognize that the conservation of North American waterfowl should be pursued through cooperative planning and coordinated management, based on the best scientific knowledge available.

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Le début du 21<sup>e</sup> siècle marque la fin du cycle du premier 15 ans du Plan nord-américain de gestion de la sauvagine de 1986—une approche à la fois publique et privée de gestion de la sauvagine au Canada, au Mexique, et aux États-Unis. Cette approche a amorcé une nouvelle ère dans le domaine de la conservation des espèces sauvages, car elle consiste en un plan directeur visant à mettre sur pied des partenariats qui ont pour objectif de conserver les ressources naturelles partagées. Ce plan directeur est toujours essentiel aujourd’hui.

Grâce au présent document, intitulé *Plan nord-américain de gestion de la sauvagine de 2004 : Renforcer les fondements biologique*, les trois pays peuvent se préparer à un autre cycle de 15 ans. Ils entrevoient des paysages durables, des discussions et une bonne collaboration avec les partenaires ainsi que de solides fondements biologiques afin de garantir la conservation de la sauvagine et de ses habitats pour les générations à venir.

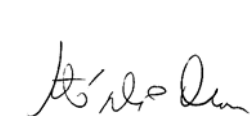
Ce Plan continue de prendre de l’expansion grâce aux 15 dernières années de succès. Il est maintenant possible de relever les défis d’un nouveau siècle. Les parties reconnaissent que la conservation de la sauvagine nord-américaine doit s’effectuer par le truchement d’une planification conjointe et d’une gestion coordonnée fondées sur des connaissances scientifiques de pointe.

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El comienzo del Siglo XXI marca la conclusión del primer ciclo de 15 años del Plan de Manejo de Aves Acuáticas de Norteamérica de 1986—un enfoque público y privado de manejo de las aves acuáticas en Canadá, México, y Estados Unidos. Este enfoque lanzó una nueva era en la conservación de la vida silvestre y también propuso un modelo con el fin de desarrollar asociaciones para la conservación de los recursos naturales compartidos, lo que sigue siendo vital hoy en día.

Con este documento, *El Plan de Manejo de Aves Acuáticas de Norteamérica de 2004 – Fortaleciendo los fundamentos biológicos*, los tres países dispondrán de otro ciclo de 15 años. Su visión es: los paisajes sostenibles, la consulta y cooperación entre los socios, y un sólido fundamento biológico para asegurar la conservación de las aves acuáticas y de sus hábitats para las generaciones futuras.

El Plan ha proseguido expandiéndose, durante los últimos exitosos 15 años, para enfrentarse con los desafíos del nuevo siglo. Las partes reconocen que la conservación de las aves acuáticas de Norteamérica debe proseguir por medio de la planificación cooperativa y del manejo coordinado, basados en el mejor conocimiento científico disponible.



Minister of the Environment  
Canada



Secretary of the Interior  
United States



Secretary of the Environment  
and Natural Resources  
Mexico

NORTH AMERICAN  
WATERFOWL  
MANAGEMENT PLAN

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Environment  
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Environnement  
Canada

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Service

Service canadien  
de la faune



U.S. Department of the Interior,  
Fish and Wildlife Service



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# National Overviews

## Canada

In a prairie slough a mallard sets down at the end of her flight north. For Canadians she represents the return of spring, heralding a natural rebirth across the country. Prairie ducks live and reproduce in an environment that has been greatly modified by people. Nevertheless, when managed under principles of conservation, the land can provide economic benefit through agriculture while it continues to sustain waterfowl.

That is the essential thrust of Canadian environmental policy; sustaining natural values while achieving human well-being and economic progress. For example, the Canadian commitment to the Kyoto Protocol on Climate Change reflects a desire to protect future environments, but to do so in a way that is integrated with sustainable economic activity. The habitat joint ventures established in Canada under the North American Waterfowl Management Plan have become leaders in such approaches. By working to instill waterfowl conservation alongside agriculture, forestry, and other undertakings, the Canadian joint ventures ensure that ducks will continue to fly south. In doing so, they support an environmental agenda in harmony with local economies, and so gain allies for nature. In the modified and managed landscape, healthy, stable populations of waterfowl and other migratory birds are more resistant to the inevitable pressures and upsets caused by human activities than are populations that are at the brink.

When the ducks are old enough to fly and hunting seasons begin along the migratory flyways, the take of birds is coordinated and managed among jurisdictions so that breeding birds survive in sufficient abundance to carry on. Coordination implies a concept of co-management, which applies to habitat stewardship as well as harvest management. In Canada, aboriginal communities are playing a growing role as stewards of the environment. In some areas, notably in northern regions where land claims have been completed, wildlife management boards have been established, including members from government and land claim beneficiaries. These management boards lead development of wildlife and habitat management programs in their areas. Sea ducks and brant are typical high-profile waterfowl species in those parts of Canada where the northern wildlife management boards operate. For some such year-round holarctic bird species, we also need to be including other nations than those included in this update, notably Greenland and Russia, in our waterfowl co-management strategies.

The partnership for waterfowl has been so successful that Canadians are now expanding these concepts for other bird species, and for biodiversity more generally, in a broad vision for habitat joint ventures under the North American Bird Conservation Initiative. With no reduction in the commitment to provide for the requirements of waterfowl that breed in Canada, the joint ventures are now working to attract more partners, widen their coverage, and attract new resources so that they can ensure that the habitat requirements of all bird species are met, in all their habitats. The boreal forest, which covers a vast portion of Canada, will be an important region for this expansion.

While the North American Bird Conservation Initiative takes root, Canadians expect the North American Waterfowl Management Plan to maintain its strength, conserve waterfowl, and continue to lead the way for wildlife conservation. With this update, Canadian, U.S., and Mexican partners are poised to carry out a comprehensive, science-based assessment to help reshape investments and activities so that future habitat conservation efforts through the joint ventures will provide even greater returns for waterfowl and ultimately for all nature.

## United States

The seasonal ebb and flow of waterfowl is one of the most complex and compelling dramas in the natural world. Driven by a genetic memory millions of years in the making, these birds embark twice each year on long-distance journeys between their breeding areas and wintering grounds. Their travels traverse mountains, deserts, prairies, forests, and oceans throughout the northern hemisphere linking the countries, peoples, and ecosystems they visit. The conservation and management of animals capable of such impressive mobility requires strong federal leadership to foster effective partnerships among the many nations, states, provinces, tribes, and organizations that are woven together by the flight paths of these remarkable species.

The U.S. Fish and Wildlife Service (Service) is the principal agency charged with protecting and enhancing the populations and habitats of migratory birds that spend all or part of their lives in the United States. Accordingly, the North American Waterfowl Management Plan will continue to be a major focus for Service efforts. Cooperation and coordination with partners and stakeholders is essential to successfully protect and conserve waterfowl and to ensure their continued enjoyment by hunters, birders, aboriginal groups, and the general public. State wildlife agencies, tribal organizations, and subsistence users play special roles by working with the Service to assume co-management responsibilities for waterfowl harvest and management. These and other partners, including other government agencies, conservation organizations, private industry, landowners, and managers at every scale, must be included in Plan activities to achieve its goals.

For more than a century, conservationists have endeavored to sustain abundant waterfowl populations. These efforts have resulted, for example, in the creation of more than 540 national wildlife refuges and wetland management districts as havens for waterfowl and other birds. Canadian and U.S. partners developed and continue to carry out the longest operating and most comprehensive survey of animal abundance, the Waterfowl Breeding Population and Habitat Survey. The North American Wetlands Conservation Act, now the premier partnership-based habitat conservation effort on the continent, was enacted to support goals of the 1986 Plan. Through these accomplishments, the Service and its partners established a legacy of conservation leadership in the twentieth century. However, despite these and other successes, we now face a host of challenges to the future of waterfowl. Compared to a century ago, society today faces a more complex set of environmental problems that occur across the entire ranges of waterfowl. Reductions in habitat quantity and quality are the primary threats to many species.

To surmount the escalating challenges of the 21<sup>st</sup> century and meet public expectations for waterfowl conservation and management, a clear and well-defined blueprint is needed to guide our collective actions. The Plan is a strategy to engage new and existing partners in a comprehensive approach to waterfowl conservation that coordinates and integrates efforts across North America. We must work with other countries, public and private organizations, and individuals to attain the Plan's vision and secure a bright future for waterfowl. The American people expect and deserve nothing less.



## Mexico

The coastal and interior wetlands of Mexico are important habitats during the winter season for a significant proportion of the migratory waterfowl population in North America, as well as for numerous resident and endemic wildlife and plant species.

For our nation, wetlands and waterfowl are a resource of enormous ecological, cultural, and economical importance. Consequently, during the second part of the 20<sup>th</sup> century Mexico signed several international commitments and cooperation agreements to improve and foster the conservation and management of these birds and their habitats. One of the most relevant and effective programs has been the North American Waterfowl Management Plan. On the basis of these and other legal and policy instruments, the Mexican Government has been supporting and implementing short, medium, and long-term programs and projects throughout the country.

Since the inception of the Plan in 1986, Mexico has been active in its design and implementation. Mexico was initially an “invitee”, but in 1994 signed on as a full partner. Ever since, Mexico has played a dynamic role in the conservation of the wintering grounds of waterfowl populations and resident species, identifying priority habitats, as well as promoting the implementation of sustainable management practices and modern hunting regulations.

In 2000, Mexican Congress passed a law for the conservation and sustainable use of wildlife. This law and its associated policies promote both the habitat and species approach for conservation, giving particular attention to sustainable use and habitat and population management, and to the development of specific recovery programs for priority species or groups of species, particularly waterfowl.

In the past few years the General Directorate of Wildlife of SEMARNAT (DGVS) has established numerous fora, committees, and consultation bodies to improve and promote communications and public participation for the development of specific conservation, management, and recovery programs, and to facilitate technical advice in the decision-making process.

To further develop the national capacity for wetland and waterfowl conservation, the General Directorate of Wildlife in coordination with other federal agencies, nongovernmental agencies, and academic groups is currently working at the local, national, and international levels. These efforts are working toward the integration and long-term planning and implementation of bird and habitat-related conservation initiatives, agreements, and conventions, such as the North American Bird Conservation Initiative, the Ramsar Convention on Wetlands, the Trilateral Committee for the Conservation and Sustainable Use of Wildlife, and the North American Commission for Environmental Cooperation’s Biodiversity Conservation Strategy. These efforts will help guarantee wise and efficient use of the limited resources needed to conserve North American avifauna.

# Foreword

The 1986 North American Waterfowl Management Plan (Plan) transformed cooperative wildlife conservation. The Plan pioneered the shift in waterfowl management from an era dominated by harvest management and site-specific habitat protection into one where waterfowl managers are important participants in making decisions about how to effectively use the working landscapes of North America.

The 1986 Plan was the collective product of a talented team of conservation administrators and biologists who recognized the need to reinvent waterfowl conservation. They began their quest to restore and sustain North America's waterfowl with a commitment to construct a biological foundation capable of supporting a continental program, and they took nothing else in the conservation status quo for granted. They looked beyond what *could* be done, to focus on what *should* be done. International borders were no more a constraint than were current organizational and financial capabilities or national legislation.

The genius of the Plan is in its straightforward framework for action and its shared implementation. The founders established a continental vision and a set of principles grounded in strong waterfowl and habitat science. They recognized that waterfowl habitat conservation had to extend beyond refuges and sanctuaries to include vast areas of privately owned and managed lands. Consequently, the Plan called for the establishment of habitat joint ventures where multi-sector partners could plan and implement locally relevant habitat conservation programs that met this challenge.

It was issues concerning waterfowl that drew Canada, the United States, and later, Mexico, into a continental conservation effort through the Plan, and fostered conservation partnerships encompassing diverse sociological, economic, and environmental interests. Following the Plan model, managers of other bird groups, such as shorebirds, landbirds, and waterbirds, have developed their own geographically based plans with population goals that can be translated into conservation actions on the ground. The Plan community, which is defined as all the agencies, organizations, groups, and individuals involved in Plan activities, must now reaffirm its basic commitment to the science and conservation of waterfowl and their habitats while participating in broader stewardship efforts for other birds and the global environment.



Mallard/Ducks Unlimited Canada

The founders established a continental vision and a set of principles grounded in strong waterfowl and habitat science.

Plan habitat and waterfowl accomplishments have exceeded many expectations from 1986, though much vital work remains.

Plan habitat and waterfowl accomplishments have exceeded many expectations from 1986, though much vital work remains. In the face of globalization and complex environmental issues, the information, challenges, and opportunities for conservation continue to evolve. Thus, it is essential that the Plan builds on its successes, recognizes change, and redefines, recommits, and guides waterfowl conservation into the 21st century.

— *Rollin Sparrowe*  
*Wildlife Management Institute*

*and*

— *Dr. James H. Patterson (deceased)*  
*Canadian Wildlife Service*



Mallards/Ducks Unlimited Canada/Guy C. Fontaine

# Preface

The North American Waterfowl Management Plan was originally written in 1986 and envisioned a 15-year effort to achieve landscape conditions that could sustain waterfowl populations. The Plan Committee (representatives from Canada, the United States, and Mexico) has made two previous modifications to the 1986 Plan to account for biological, sociological, and economic changes that influence the status of waterfowl and the conduct of cooperative habitat conservation. Seventeen years on, as we celebrate the accomplishments of Plan partners, it is also clear that we must renew our commitment to the Plan.

Our intent in preparing the 2004 Plan is to define the needs, priorities, and strategies for the next 15 years, increase stakeholder confidence in the direction of Plan actions, and guide partners in strengthening the biological foundation of North American waterfowl conservation.

To most effectively convey goals, priorities, and strategies, the 2004 Plan is presented in two separate documents. This document, *Strategic Guidance*, is comparable in length and scope to the 1986 Plan and the updates of 1994 and 1998. It is directed to all Plan partners, agency administrators, and policy makers who set the direction and priorities for conservation in our three countries. The companion document, *Implementation Framework*, provides more detailed discussion of the Plan's themes and includes much supporting technical information for use by biologists and land managers. We hope that the thousands of partners involved in the conservation of our natural resources will find these documents useful for continuing their vital work.

Our intent in preparing the 2004 Plan is to define the needs, priorities, and strategies for the next 15 years, increase stakeholder confidence in the direction of Plan actions, and guide partners in strengthening the biological foundation of North American waterfowl conservation.

## Plan Committee Membership

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George Arsenaault  
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Barry Sabeau  
Dennis Sherratt  
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Richard Bishop  
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Julio Alberto Carrera Lopez  
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# Acknowledgements

The composition of the 2004 North American Waterfowl Management Plan began in June 2001. Since then, many individuals and organizations in Canada, the United States, and Mexico have contributed their ideas, time, and support to this effort. The Plan Committee gratefully acknowledges all who have participated in the process, especially those individuals listed below.



Trumpeter Swans/Ducks Unlimited Canada

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**Scott Yaich**

# I. A Conservation Legacy

The 1986 North American Waterfowl Management Plan (Plan) was a landmark event in wildlife conservation. The Plan's antecedents were the species and flyway plans developed by the four flyway councils (partnerships of state and provincial wildlife agencies with responsibilities for population management), and later, the national waterfowl management plans developed by U.S. and Canadian wildlife agencies. These earlier efforts, however, led waterfowl managers to conclude that a comprehensive international plan was needed to adequately address the needs of North American waterfowl.

Put simply, the purpose of the Plan is to sustain abundant waterfowl populations by conserving landscapes, through partnerships that are guided by sound science. Through growth and refinement, documented in Plan updates in 1994 and 1998, the Plan has become an approach to conservation defined by three broad visions:

- Plan partners define and attain the landscape conditions needed to sustain waterfowl populations.
- Plan partners forge broad alliances with other conservation efforts and communities to achieve Plan objectives.
- Plan partners continually improve the biological foundations of waterfowl conservation.

While these visions are being realized across the continent, the scientific foundations, challenges, and opportunities for conservation continue to evolve. The 2004 Plan establishes a new 15-year planning horizon for waterfowl conservation in North America by assessing the needs, priorities, and strategies required to guide waterfowl conservation in the 21st century.

The 1986 Plan recognized that wide-ranging degradations to wetlands and associated uplands required a comprehensive response including landscapes improved through public policies, wildlife friendly agricultural and forestry programs, and traditional habitat conservation projects. Plan successes have hinged on the ability of diverse groups to create novel approaches to conserving waterfowl. Since 1986, the array of Plan partners has expanded beyond traditional wildlife groups to include soil and water conservationists, land and water resource managers, and, most importantly, local communities and private landowners.

The purpose of the Plan is to sustain abundant waterfowl populations by conserving landscapes, through partnerships that are guided by sound science.



Boreal Fen, Barbara Robinson, Canadian Wildlife Service



Growing recognition of the benefits of economic and ecological sustainability in land-management decisions and broad landscape approaches has helped Plan partners integrate waterfowl conservation with broader social needs. A “landscape approach” is a set of conservation strategies, applied at an ecoregional level, that considers the interaction of all relevant sociological, economic, and environmental factors to ensure that conservation investments produce incremental and sustainable accomplishments toward Plan objectives.

## Principles

The following principles, many carried forward since the inception of the Plan, provide structure to the 2004 Plan and should guide all actions undertaken in its support:

1. Waterfowl are among North America’s most highly valued natural resources.
2. Waterfowl populations should be sustained at objective levels across their natural ranges to provide both ecological and socioeconomic benefits.
3. Protection of North American waterfowl populations and their habitats requires long-term planning and close cooperation and coordination of management activities in Canada, the United States, Mexico and other countries important to North American waterfowl.
4. Resident and endemic species are important components of each nation’s waterfowl heritage and deserve significant attention and resources from within the jurisdictions where they occur.
5. Managed harvests of the renewable waterfowl resource are desirable and consistent with its conservation.
6. Habitat joint ventures, which are partnerships among private organizations, individuals, and government agencies, are the primary vehicles for accomplishing Plan objectives. Species joint ventures further scientific understanding that is necessary to effectively manage specific waterfowl species.
7. Long-term protection, restoration, and management of waterfowl habitats requires that Plan partners collaborate with other conservation and community efforts in the development of conservation, economic, and social policies and programs that sustain the ecological health of landscapes.
8. Plan implementation is founded on sound science and guided by biologically based planning, both of which are, in turn, refined with increased knowledge gained through evaluation and research.

## II. Commitment to the Future

Many of the goals in the original 1986 Plan—for some waterfowl populations, for acres of habitat, for dollars raised and expended—have been achieved, but other goals remain unattained. Moreover, we have learned that in many cases the needs defined in 1986 underestimated what is needed to sustain waterfowl populations. So, while the initial 15-year planning horizon has been transcended, the job is far from done. Quite threatening is that conservation gains could be transient if pressures that diminish habitat quantity and quality persist, eroding the accomplishments of the last 17 years.

The challenges are many. Plan partners must deal with significant socioeconomic and environmental changes that will affect waterfowl conservation for years to come. At the same time, a lack of basic knowledge of population dynamics for some waterfowl species hinders the development of conservation strategies. To meet these challenges, aggressive conservation efforts are still needed across the entire range of North America's waterfowl habitats.

To ensure the Plan has a legacy, Plan partners must continue to address the conservation needs outlined in the 1986 Plan as well as the new challenges and opportunities of the 21st century. The subtitle of the 2004 Plan, *Strengthening the Biological Foundation*, reflects the Plan Committee's continuing belief that a strong scientific base underpins everything the Plan does and is vital to its continuing success in conservation.

The basis of all Plan activity is its waterfowl population objectives. These are based on historical abundances of species and consensus among waterfowl stakeholders about waterfowl numbers needed to ensure population viability and to provide for regulated harvest and other forms of public enjoyment.

These objectives can be achieved only through an understanding of the habitat conditions necessary to sustain target population levels. The Plan's biological foundation, therefore, comprises waterfowl population objectives, habitat objectives, and crucially, an understanding of the ecological links between them. These links include factors that affect the distribution and abundance of waterfowl, and especially the relationships between landscape changes (e.g., water abundance, land use, habitat quality, and Plan conservation actions) and waterfowl birth rates, death rates, and population growth. Understanding the ecological factors affecting waterfowl populations directs the development and implementation of conservation actions. Thus, the biological knowledge base must truly be the foundation for the Plan's future success and must be strengthened.



Intertidal emergent vegetation and aquatic bed located along Mexico's Sinaloa coast/Eduardo Carrera/DUMAC

Conservation gains could be transient if pressures that diminish habitat quantity, availability, and quality persist, eroding the accomplishments of the last 17 years.

# III. Emerging Trends

For more than 100 years, waterfowl conservation in North America has adapted to changing environmental, economic, social, and political forces. Continuing fundamental shifts in these forces, especially the trend toward the globalization of human society, demand the constant attention of Plan partners. These external factors can have substantial impacts, both positive and negative, on the landscapes supporting North American waterfowl.

The benefits of healthy waterfowl populations—recreational, economic, cultural, and environmental—were the impetus for the 1986 Plan, and addressing them remains essential for future public support. Hunters have traditionally supported the Plan’s mission and will continue to be the primary stakeholders in Plan activities. Plan partners should find means to encourage participation in waterfowl hunting and secure hunter investment in future Plan activities. In addition, First Nations and other indigenous groups are important stakeholders in waterfowl management and must be increasingly involved in achieving Plan goals. In preparing for the future, however, Plan partners must be cognizant of changing public demands and political support for conservation that could affect the ability of agencies to focus effectively on waterfowl needs. The Plan community needs to monitor and consider the strategic implications of these changes to ensure that the Plan remains vibrant and successful well into the 21st century.

Today’s waterfowl conservation efforts are affected by human population growth; increasing demands for energy, water, food, and fiber; urban expansion; invasive species; and global climate change. Although the specific nature, magnitude, and extent of these forces and their implications for waterfowl conservation remain uncertain, it is clear that some significant changes will occur. Conservation strategies in the future will need to address the effects of these pressures on habitat degradation. Plan partners need to monitor and evaluate all of these emerging global trends to limit negative impacts and to take advantage of potential benefits that dealing with them may have for waterfowl.

Because waterfowl conservation efforts provide society with a broad array of ecological services (clean air and water, food and fiber, carbon storage, wildlife, tourism, etc.) there are mutually beneficial results between waterfowl conservation and meeting human needs. The ecological services concept has been implemented in several countries to achieve environmental, social, and economic goals by creating markets for environmental services. New partnerships and a broadening of the scope of the Plan in this direction would enhance the Plan partnership as a landscape-conservation instrument.



Farming/Ducks Unlimited Canada/  
Darin Langhorst



# IV. North American Waterfowl

## Population Objectives

North America, defined here as the jurisdictional areas of Canada, the United States, and Mexico, has 50 species of ducks, geese, and swans, most of which depend on habitats in two or more countries during their annual cycles. Forty species are shared among two or more North American countries. A few species are shared between one signatory country and other nations. For example, the masked duck and muscovy duck, are found in Mexico and in Latin American and Caribbean nations; the emperor goose lives in both the United States and Russia; and various sea duck species migrate between Alaska, Russia, other Asian nations, or, between arctic Canada and Greenland. Five species are nonmigratory endemics of the Hawaiian archipelago or the West Indies. Population objectives have been established for many species, races, and populations of waterfowl. Because many waterfowl species rely on dynamic habitats, Plan population objectives reflect average population sizes corresponding to a normal range of environmental conditions.

Waterfowl population objectives in the Plan serve three important functions. First, population objectives move the Plan beyond a mere concept for wetland conservation by grounding it in the explicit terms of species conservation. Second, explicit population objectives provide a framework for regional planning and for gauging the success of conservation actions. Third, comparison of monitoring results with population objectives provides an objective assessment of the status of North American waterfowl.

The Plan's population objectives are intended to be simple and easy to communicate. They have been reviewed for consistency with other waterfowl management objectives, such as those developed by the flyway councils. Finally, all Plan population objectives are quantitative and can be compared to the results of operational monitoring programs.

A general objective of the Plan since its inception in 1986 has been to maintain or restore traditional distributions of waterfowl in North America, consistent with long-standing patterns of waterfowl utilization. Waterfowl harvest management and habitat conservation are interrelated pursuits, and their successes are mutually reinforcing. Thus, they should be guided by complementary objectives consistent with long-term population viability and human use of the waterfowl resource.



Researcher/Ducks Unlimited Canada/  
Darin Langhorst

**Population objectives move the Plan beyond a mere concept for wetland conservation by grounding it in the explicit terms of species conservation.**

It is important to define two terms for the purposes of this Plan.

*Population:* a nonspecific term which, depending on the context, refers to a group of birds of one or more species (e.g., the North American scaup population refers to the continental population of both greater and lesser scaup) and/or subspecies distinguished for management purposes. Management does not necessarily imply harvest management and may refer solely to habitat conservation planning and implementation.

*Subspecies:* refers to a taxonomically distinct race.

Consistent with the 1986 Plan, breeding duck population objectives are derived from average breeding population levels of the 1970s or subsequent species-specific management plans (Table 1). During the 1970s wetland conditions in the prairie-parkland region vital to breeding ducks ranged from fair to good. Duck populations during this decade were generally thought to meet the demands of both consumptive and non-consumptive users. Of the 14 species, species groups, or races of ducks for which goals have been established, 11 presently have stable or increasing long-term trends in abundance. Population objectives have not been established for other ducks because of inadequate monitoring programs or a lack of consensus on desired population levels.



Northern Pintails/Rob Simpson/VALAN PHOTOS

**Table 1. Breeding population objectives, recent status, and long-term trends for ducks  
(1,000s of ducks)**

<b>Species/Species Group/Subspecies</b>	<b>Objective<sup>a</sup></b>	<b>Average Population Size (1994-2003)<sup>b</sup></b>	<b>Long-term Trend (1970 – 2003)</b>
Mallard	8,200	8,640	No trend
Northern pintail	5,600	2,815	Decreasing
American black duck	640 <sup>c</sup>	533 <sup>c</sup>	Decreasing <sup>d</sup>
Mottled duck, Florida subspecies <sup>e</sup>	9.4 <sup>f</sup>	11 <sup>f</sup>	Increasing <sup>g</sup>
Gadwall	1,500	2,963	Increasing
American wigeon	3,000	2,628	No trend
Green-winged teal	1,900	2,485	Increasing
Blue-winged and cinnamon teal	4,700	5,875	No trend
Northern shoveler	2,000	3,318	Increasing
Hawaiian duck <sup>e</sup>	5	2.5 <sup>h</sup>	No trend
Laysan duck <sup>e</sup>	10.5	0.3 <sup>h</sup>	No trend
Redhead	640	811	No trend
Canvasback	540	657	No trend
Lesser and greater scaup	6,300	4,017	Decreasing

a Duck objectives are based on the Waterfowl Breeding Population and Habitat Survey, Traditional Survey Area (WBPHS-TSA) strata 1-18,20-50,75-77 and represent average population estimates from 1970-1979, unless otherwise noted.

b Average population size estimates are for the WBPHS-TSA unless otherwise noted.

c The American black duck population objective was developed from the predictions of a model relating mid-winter Waterfowl Survey counts to population estimates derived from the Breeding Waterfowl Plot Survey (BWPS) of Eastern Canada. The objective, and average population size, corresponds to that portion of the black duck breeding range sampled during the BWPS. For management purposes, the black duck objective has been partitioned for three portions of the breeding range: eastern, central, and western. In the future, combined estimates from fixed-wing and helicopter surveys may be evaluated for monitoring and objective-setting for this species.

d Based on mid-winter Survey data.

e Not shared between two or more signatory nations. Management is the responsibility of that nation whose boundary coincides with the range of the species, population, or subspecies.

f The mottled duck Florida subspecies objective corresponds to that portion of the breeding range of this subspecies sampled by the Florida Mottled Duck Survey. The objective for the Florida subspecies of mottled duck is based on average population size estimates from 1985 to 1989. Reported average population size is for the time period 1994-2000.

g 1994-2000.

h Hawaiian species are monitored by the Annual Hawaiian Waterbird Survey. Mean population estimates correspond to the years 2001-2002.



**Table 2. Breeding duck population estimates and trends in North America  
(1,000s of ducks)**

Species/ Subspecies/Population <sup>b</sup>	1994 – 2003 Mean Population Estimates <sup>a</sup>			Long-Term Trend (1970 – 2003)
	Continental	Traditional Survey Area <sup>c</sup>	Other Survey Areas <sup>c</sup>	
Mallard	13,000	8,640	3,380	No trend
Mexican subspecies <sup>d</sup>	56	Not Applicable	Not Applicable	Increasing <sup>e</sup>
Northern pintail	3,600	2,815	169	Decreasing
American black duck	910	31	625	Decreasing <sup>e</sup>
Mottled duck	660	Not Applicable	11	No trend <sup>e</sup>
Florida subspecies <sup>d</sup>	30	Not Applicable	11 <sup>f</sup>	Increasing <sup>f</sup>
Western Gulf Coast subspecies	630 <sup>g</sup>	Not Applicable	Not Applicable	No trend <sup>e</sup>
Gadwall	3,900	2,963	456	Increasing
American wigeon	3,100	2,628	382	No trend
Green-winged teal	3,900	2,485	633	Increasing
Blue-winged and cinnamon teal	7,500	5,875	798	No trend
Blue-winged teal	7,240	Not Differentiated	543	No trend
Cinnamon teal	260	Not Differentiated	30	No trend <sup>e</sup>
Northern shoveler	3,800	3,318	284	Increasing
Hawaiian duck <sup>d</sup>	2.5	Not Applicable	2.5	No trend
Laysan duck <sup>d</sup>	0.3	Not Applicable	0.3	No trend
White-cheeked pintail <sup>d</sup>	1.4 <sup>h</sup>	Not Applicable	1.4 <sup>h</sup>	No trend
Wood duck	4,600	Not Applicable	653	Increasing <sup>e</sup>
Eastern population	4,400	Not Applicable	629	Increasing <sup>e</sup>
Western population	200	Not Applicable	24	Increasing <sup>e</sup>
Muscovy duck <sup>d</sup>	30	Not Applicable	Not Applicable	Decreasing <sup>e</sup>
Whistling ducks	215	Not Applicable	Not Applicable	Increasing <sup>e</sup>
Fulvous whistling duck	Unknown	Not Applicable	Not Applicable	Increasing <sup>e</sup>
Black-bellied whistling duck	Unknown	Not Applicable	Not Applicable	Increasing <sup>e</sup>
West Indian whistling duck <sup>d</sup>	0.1 <sup>h</sup>	Not Applicable	0.1 <sup>h</sup>	Unknown
Redhead	1,200	811	216	No trend
Canvasback	740	657	51	No trend
Scaup	5,200	4,017	535	Decreasing
Lesser scaup	4,400	3,502 <sup>i</sup>	535	Decreasing <sup>e</sup>
Greater scaup	800	515 <sup>i</sup>	Not Applicable	No trend <sup>e</sup>
Ring-necked duck	2,000	1,101	683	Increasing
Ruddy duck	1,102	566	192	Increasing
West Indian subspecies <sup>d</sup>	1.5 <sup>h</sup>	Not Applicable	1.5 <sup>h</sup>	Increasing
Continental subspecies	1,100			Increasing
Masked duck <sup>d</sup>	6	Not Applicable	Not Applicable	Unknown
Harlequin duck	254	Not Applicable	25	No trend <sup>e</sup>
Eastern population	4	Not Applicable	Not Applicable	No trend <sup>e</sup>
Western population	250	Not Applicable	25	No trend <sup>e</sup>
Long-tailed duck	1,000	170	112	Decreasing <sup>e</sup>

Eiders	1,643	13	27	Decreasing <sup>e</sup>
King eider	575	Not Differentiated	Not Applicable	Decreasing <sup>e</sup>
Common eider	1,050	Not Differentiated	Not Applicable	Decreasing <sup>e</sup>
American subspecies	300	Not Differentiated	Not Applicable	No trend <sup>e</sup>
Northern subspecies <sup>d</sup>	550	Not Differentiated	Not Applicable	Decreasing <sup>e</sup>
Hudson Bay subspecies <sup>d</sup>	100	Not Differentiated	Not Applicable	Decreasing <sup>e</sup>
Pacific subspecies	100	Not Differentiated	5	Decreasing <sup>e</sup>
Steller's eider <sup>d</sup>	1	Not Differentiated	1	Decreasing <sup>e</sup>
Spectacled eider <sup>d</sup>	17	Not Differentiated	17	Decreasing
Scoters	1,600	911	15	Decreasing
Black scoter	400	Not Differentiated	Not Applicable	Decreasing <sup>e</sup>
Surf scoter	600	Not Differentiated	1	Decreasing <sup>e</sup>
White-wing scoter	600	Not Differentiated	14	Decreasing <sup>e</sup>
Goldeneyes	1,600	766	794	No trend
Common goldeneye	1,345	Not Differentiated	610	No trend
Barrow's goldeneye	255	Not Differentiated	184	No trend <sup>e</sup>
Eastern population	5	Not Differentiated	Not Differentiated	No trend <sup>e</sup>
Western population	250	Not Differentiated	184	No trend <sup>e</sup>
Bufflehead	1,400	953	359	Increasing
Mergansers	1,600	750	844	Increasing
Hooded merganser	350	Not Differentiated	241	Increasing <sup>e</sup>
Red-breasted merganser	250	Not Differentiated	10	Increasing <sup>e</sup>
Common merganser	1,000	Not Differentiated	257	Increasing <sup>e</sup>

- a Traditional Survey Area estimates were derived from the Waterfowl Breeding Population and Habitat Survey (WBPHS), strata 1-18, 20-50, 75-77. Other Surveyed Area estimates were derived from some combination of WBPHS strata (51-57, 62-69), the Breeding Waterfowl Plot Survey also conducted in eastern Canada, and concurrent state, provincial, or regional breeding waterfowl surveys in British Columbia, California, Colorado, Connecticut, Delaware, Florida, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, Nevada, New Hampshire, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming. In cases where a survey was not completed every year between 1993 and 2002, or when data were unavailable, mean estimates were computed by using available estimates for that time period. Continental estimates include the surveyed area estimates as well as rough estimates of populations outside of surveyed areas based on harvest derivation studies, expert opinion, winter survey data, or special purpose research surveys. Continental estimates for species such as the muscovy, whistling duck, masked duck, and many sea ducks are based on few data and are particularly speculative.
- b Subpopulations are identified distinctly when there is significant evidence for allopatry. Subspecies are also distinguished according to current taxonomic classification. The taxonomic delineation presented in this table is intended to aid in development of regional habitat conservation strategies and is not intended to supercede other international agreements regarding the appropriate organizational level for species management.
- c An entry of "Not differentiated" in these fields indicates that the survey protocol does not enable discrimination to a particular taxonomic level. "Not applicable" indicates that the species, subspecies, or subpopulation is not recorded in the WBPHS Traditional Survey Area or in the surveys represented by the "Other Surveyed Area" category.
- d Not shared among two or more signatory nations. Management is the responsibility of that nation whose boundary coincides with the range of the species, subpopulation, or subspecies.
- e Trend assessments are based on data sources (e.g., mid-winter Survey, Breeding Bird Survey, published accounts) other than breeding population estimates from the WBPHS. In general, less confidence is attributed to these values.
- f 1994-2000.
- g Winter population.
- h Data available from Puerto Rico only.
- i Estimate of lesser scaup in the traditional survey area was computed from nontundra WBPHS strata 1-7, 12, 14-18, 20-50, 75-77. Estimate of greater scaup in the traditional survey area was computed from tundra strata 8-11 and 13. These can be considered only crude estimates since some mixing of lesser and greater scaup occurs in tundra and northern boreal strata.

The Plan recognizes 34 populations within 7 species of geese and establishes goals for 28 of them. Goose populations occupy traditional breeding and wintering grounds and move between these areas using traditional migration corridors. These movements subject each population to distinct recruitment and mortality patterns, and thus population-specific management plans are usually warranted. Consequently, the Plan includes objectives for numerous populations of Canada goose, snow goose, white-fronted goose, and brant (Table 3). These populations have been delineated for management purposes and may include members of more than one subspecies. Plan population objectives for geese were drawn from existing goose population management plans developed by the flyway councils. These plans consider factors such as population maintenance, breeding ground carrying capacity, recreational demand, concerns related to crop depredation, and the potential for disease outbreaks.

**Table 3. Status and objectives for North American goose populations**

Species/population	Population Mean (2001-2003) <sup>a</sup>	Population Trend (1994-2003) <sup>b</sup>	Population Objective
<b>CANADA GOOSE</b>			
Atlantic	156,200	Increasing	150,000 <sup>c,d</sup>
Atlantic Flyway Resident	1,022,100	Increasing	650,000 <sup>e,f</sup>
North Atlantic	No estimate	No estimate	Not yet established
Southern James Bay	95,200	No trend	100,000 <sup>e</sup>
Mississippi Valley	325,200	No trend	375,000 <sup>e</sup>
Mississippi Flyway Giants	1,539,600	Increasing	1,000,000 <sup>e</sup>
Eastern Prairie	220,300	No trend	200,000 <sup>e</sup>
Western Prairie and Great Plains	651,300	Increasing	285,000 <sup>g</sup>
Tall Grass Prairie	421,900	No trend	250,000 <sup>g</sup>
Short Grass Prairie	160,600	Decreasing	150,000 <sup>g</sup>
Hi-Line	225,300	Increasing	80,000 <sup>g</sup>
Rocky Mountain	163,600	Increasing	117,000 <sup>e</sup>
Pacific	No estimate <sup>h</sup>	No estimate <sup>h</sup>	Not yet established
Lesser	No estimate	No estimate	Not yet established
Dusky	17,100 <sup>i</sup>	Increasing <sup>j</sup>	Avoid ESA <sup>k</sup> listing
Cackling	166,300	No trend	250,000 <sup>l</sup>
Aleutian	43,000 <sup>i</sup>	Increasing	40,000 <sup>g</sup>
Vancouver	No estimate	No estimate	Not yet established
Taverner's	No estimate	No estimate	Not yet established
<b>SNOW GOOSE</b>			
Greater	702,700	No trend <sup>m</sup>	500,000 <sup>e</sup>
Mid-continent lesser	2,490,800	No trend <sup>m</sup>	1,000,000-1,500,000 <sup>g</sup>
Western Central Flyway lesser	165,400	No trend <sup>m</sup>	110,000 <sup>g</sup>
Wrangel Island lesser	106,300	Increasing	120,000 <sup>e</sup>
Western Arctic lesser	580,000	Increasing	200,000 <sup>e</sup>

ROSS'S GOOSE	619,000	Increasing	100,000 <sup>e</sup>
WHITE-FRONTED GOOSE			
Mid-continent	802,200	No trend <sup>m</sup>	600,000 <sup>l</sup>
Tule	5,500 <sup>i</sup>	No trend	10,000 <sup>g</sup>
Pacific	404,800	Increasing	300,000 <sup>l</sup>
BRANT			
Atlantic	163,800	No trend	124,000 <sup>g</sup>
Pacific	122,700	No trend	150,000 <sup>g</sup>
Western High Arctic	No estimate	No estimate	12,000 <sup>g</sup>
Eastern High Arctic <sup>n</sup>	20,000	No trend	Not yet established
EMPEROR GOOSE <sup>n</sup>	71,400	No trend	150,000 <sup>e</sup>
HAWAIIAN GOOSE <sup>n</sup>	1,175	No trend	2,800 <sup>e</sup>

a Incomplete survey years were excluded from the computation. Where no estimates are available for 2001-2003, the most recent estimate is presented.

b Many goose population surveys, particularly breeding ground surveys, have shorter periods of record than surveys established for ducks. For this reason trend estimates are based on a shorter, 10-year interval, or for the period of record when 10 years of data are not available.

c Breeding pair index.

d Objective partitioned: 125,000 pairs Ungava Peninsula; 25,000 pairs boreal Quebec. The 3-year mean population of 156,200 presented for this population refers to that portion of the population breeding on the Ungava Peninsula.

e Total spring population.

f Reduce to this level by 2005.

g Winter population.

h State and provincial surveys exist but it is not yet possible to develop a population-wide index.

i Population estimates based on neck collar observations during the winter.

j Official estimates of population size from neck collar data show an increasing trend; however, direct counts of breeding population size in Alaska remain depressed with no indication of a positive trend.

k ESA – Endangered Species Act (United States).

l Autumn population.

m Ten-year trends may mask shorter-term trends in this population.

n Not shared among two or more signatory nations. Management is the responsibility of the nation which encompasses the range of the species or population.

No subspecies are recognized for any of the three swan species considered in the Plan. For management purposes, objectives are specified for two populations of tundra swan and three populations of trumpeter swan (Table 4). The mute swan is native to Europe and was introduced to private estates in the United States in the late 1800s and subsequently became established in all four flyways. The increasing population of mute swan is of management concern because of their impacts on native species. Management policies are being considered by the flyway councils and federal governments of the United States and Canada to address the growing population of feral mute swans.

**Table 4. Status and goals for North American swan populations**

<b>Species and Population</b>	<b>3-Year Winter Population Mean (2001-2003)</b>	<b>Recent Trend (1994-2003)<sup>a</sup></b>	<b>Population Objective</b>
<b>TUNDRA SWAN</b>			
Eastern Population	103,400	Increasing	80,000 <sup>b</sup>
Western Population	82,900	No trend	60,000 <sup>b</sup>
<b>TRUMPETER SWAN</b>			
Pacific Coast Population	17,551 <sup>c</sup>	Increasing <sup>d</sup>	13,000 <sup>e</sup>
Rocky Mountain Population	3,666 (9.1%) <sup>c,f</sup>	Increasing <sup>d</sup>	5% annual growth rate <sup>g</sup>
Interior Population	2,430 <sup>c</sup>	Increasing <sup>d</sup>	2,000 <sup>e</sup>
<b>MUTE SWAN</b>	20,000 <sup>h</sup>	Increasing <sup>h</sup>	Not yet established
<p><sup>a</sup> Swan population surveys have shorter periods of record than surveys established for ducks. For this reason trend estimates are based on a shorter (10-year) interval, or for the period of record when 10 years of data are not available.</p> <p><sup>b</sup> Winter population.</p> <p><sup>c</sup> 2000 Index from the North American Trumpeter Swan Survey conducted every 5 years.</p> <p><sup>d</sup> 1990-2000.</p> <p><sup>e</sup> Autumn population.</p> <p><sup>f</sup> Average annual growth rate 1995-2000.</p> <p><sup>g</sup> Interim objective specified until an abundance objective is adopted.</p> <p><sup>h</sup> Based on the Atlantic Flyway Mute Swan Mid-Summer Survey and individual state survey data from the Mississippi, Central, and Pacific Flyways.</p>			

## Relationship of Population Objectives to Habitat Objectives

Plan objectives can be achieved only through a better understanding of the habitat conditions necessary to sustain target population levels. Plan partners should have a strategic approach to meet population objectives through the science-based application of local or regional-scale habitat conservation actions. To accomplish this, Plan partners must quantitatively link regional waterfowl habitat objectives with continental waterfowl population objectives.

Seventeen years after the 1986 Plan, the empirical basis for regional habitat objectives varies widely among joint ventures. The amount of baseline life-history information available varies considerably for individual waterfowl species, and by geographic region, and so does information on resource utilization by waterfowl and environmental influences on bird demography. This uneven availability of baseline data is the result of many historical and logistical factors, such as inconsistency of data collection from area to area. Consequently, the current joint venture habitat conservation objectives (Table 5) reflect geographic variability in scientific information on bird-habitat relationships. While some objectives have been derived and evaluated with the aid of empirical models, others are based more heavily on expert opinion. The ongoing challenge to Plan partners is to develop biological models for habitat conservation and to evaluate and refine these models to improve habitat conservation strategies. Several joint ventures are presently reviewing their habitat objectives based on the results of recent evaluations. A comprehensive review of joint venture habitat objectives and the methods used to derive them will be part of the

Plan objectives can be achieved only through a better understanding of the habitat conditions necessary to sustain target population levels.

**Table 5. Joint Venture Habitat Objectives (acres)**

Joint Venture	Protect/Secure	Restore/Enhance
Atlantic Coast	945,000	209,790
Central Valley Habitat	200,000	734,555
Eastern Habitat	1,435,230	1,221,550
Gulf Coast	1,129,972	921,016
Intermountain West	1,500,000	1,000,000
Lower Mississippi Valley	407,000	2,046,000
Pacific Coast (United States)	249,000	108,000
Pacific Coast (Canada)	390,696	105,155
Playa Lakes	400,000	1,200,000
Prairie Habitat	6,672,240 <sup>a</sup>	–
Prairie Pothole	1,891,315	4,409,398
Rainwater Basin	50,000	38,333
San Francisco Bay	107,000	129,000
Upper Mississippi/Great Lakes	758,572 <sup>a</sup>	–

<sup>a</sup> Habitat objective is to conserve additional acres through a combination of securement, protection, restoration, enhancement, and management.



In the future, Plan success or failure will continue to be linked to long-term trends in waterfowl habitat conditions in the prairie pothole region.

Plan's progress assessment scheduled for 2004-2005 and will be used to refine continental habitat objectives prior to the next scheduled update of the Plan in 2009.

The 1986 Plan identified prairie pothole breeding habitat in Canada and the United States as "the top priority for protection," primarily because of concerns over mallard and northern pintail populations. In the future, Plan success or failure will continue to be linked to long-term trends in habitat conditions in the prairie pothole region. The 1986 Plan also identified other areas with

critical habitat conservation needs for waterfowl. As the biological foundation for waterfowl conservation has grown, and as Plan horizons have expanded to embrace the full spectrum of North American waterfowl, additional priority areas in all three countries have been identified as critical to the continued maintenance of ducks, geese, and swans throughout their annual cycles (Figure 1). While habitat conservation and monitoring are important in every area of the continent, these areas require special attention and resources.



Prairie Pothole Region/Ducks Unlimited Canada

## Areas of Continental Significance to North American Ducks, Geese, and Swans



# V. Increasing Our Scientific Base

Because there is a rich scientific history and extensive practical management experience concerning waterfowl, Plan partners are fortunate to have a broad scientific knowledge base on which to build conservation plans. This knowledge varies greatly, however, among species and regions. For instance, we know a great deal more about mid-continent mallards than we do about king eiders in the central Arctic or masked ducks in Mexico. Managers are challenged to make conservation investments in the face of much uncertainty about the impact of their actions on waterfowl populations. Plan partners are challenged to improve the scientific knowledge on which conservation decisions depend and to continuously improve their work through adaptive management.



Researcher/Ducks Unlimited Canada

For the purposes of the Plan, adaptive management is described simply as the process of using iterative cycles of planning, implementation, and evaluation to improve management performance. Under this concept, Plan managers design conservation activities to impact waterfowl populations, but they also create opportunities for learning to ensure that future management decisions are well informed.

To manage adaptively, managers must be able to articulate clear, quantifiable objectives for each conservation action; predict the biological outcomes of management actions; design and implement monitoring procedures to measure those outcomes; and compare outcomes with the original predictions and objectives. Knowledge gained during one cycle is then used to adjust future planning and implementation. The monitoring and evaluation components may vary from simple monitoring of the results of routine management to rigorous experiments of alternative management options. Specific advice on how to conduct adaptive management is provided in the companion document, *Implementation Framework*.

Significant gaps also remain in scientific information on the ecology, abundance, and trends of many waterfowl populations, especially for sea ducks and resident ducks in Mexico. Programs to track population trends are lacking or inadequate for several species, preventing establishment of meaningful population objectives. Population monitoring capabilities must be increased to detect meaningful changes in waterfowl abundance and gauge those changes against objectives. The species joint ventures have a crucial role to play with this effort, and enhanced communication between species joint ventures and habitat joint ventures should ensure their success. Habitat joint ventures need to develop and maintain monitoring and assessment systems capable of discerning habitat changes (including Plan actions) over time at appropriate spatial scales. This information is essential for developing a better understanding of how specific habitat changes affect waterfowl populations. Some obvious needs include more frequent and comprehensive

monitoring of land-use changes in the prairie pothole region and reliable population monitoring of the major waterfowl migration areas and wintering grounds.

Because the Plan works continentally, regionally, and locally, adaptive management and strategic planning must also occur at multiple spatial scales. The spatial scale determines the relevant questions, challenges, opportunities for learning, and possible inferences. These differences affect our ability to provide information relevant for decision-makers at all levels. For example, the Plan Committee requires analyses of population trends to help prioritize activities at a continental scale, while a habitat joint venture manager would be more concerned with understanding the relationship between regional habitat variables and waterfowl populations. But data gathered at the joint venture level for local decision-making will also help the Plan Committee set priorities at the continental scale. Managers at all levels benefit from efficient information sharing.

The Plan community is committed to expanding scientific information where it is lacking and integrating the best possible science into the Plan's decision-support systems from continental to project scales. Generous commitments will be needed by Plan partners to foster and finance new scientific capability to strengthen the biological foundation of the Plan. The capabilities of joint ventures and other implementing partners need to be improved to provide better understanding of population and landscape trends and the biological effectiveness of Plan actions. Local data gathering, in turn, will help guide continental assessments. Improving the cost-effectiveness of Plan actions, and strengthening the scientific foundations of waterfowl plans, are key to maintaining the Plan's leadership role in conservation.

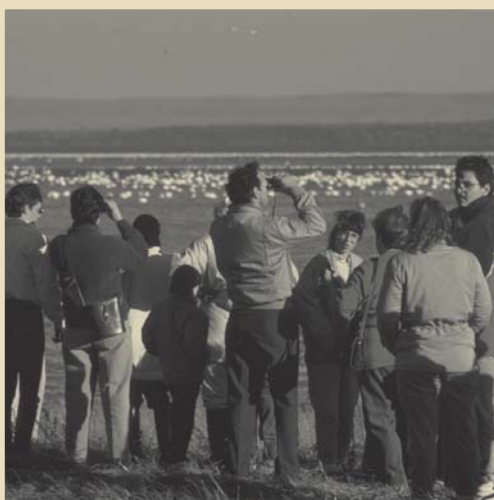
Improving the cost-effectiveness of Plan actions, and strengthening the scientific underpinnings of waterfowl plans, are key to maintaining the Plan's leadership role in conservation.



Lesser Scaup/Ducks Unlimited Canada



# VI. Institutional Organization



Bird Watchers/  
Michel Jutien/VALAN PHOTOS

The Plan is an international cooperative endeavor involving governments at all levels, indigenous groups, nongovernmental organizations, corporations, and thousands of private citizens from all countries involved. Ultimately, success of the Plan depends on effective partnerships among all segments of society that have a role in waterfowl conservation. This voluntary effort requires leadership at different levels, including the international Plan

Committee and its science support team, individual joint venture management boards, flyway councils, the Mexican Advisory Subcommittee on Waterfowl, and a host of regional and local groups. These institutional arrangements transcend a diversity of political structure, culture, and language, and have allowed continuous growth of conservation efforts under the Plan for 17 years.

The lead body for the Plan is the Plan Committee, made up of representatives from Canada, the United States, and Mexico. Plan administration is undertaken through the North American Bird Conservation Initiative Council in Canada, the U.S. Fish and Wildlife Service in the United States, and the General Directorate of Wildlife of the

Secretariat of Environment and Natural Resources in Mexico. The Plan Committee provides leadership by stewarding the Plan, working with Plan partners to assure the quality of Plan activities, advocating for waterfowl conservation policies and programs with appropriate stakeholder groups, and facilitating communication throughout the Plan community.

While federal agencies provide guidance and long-term management of the Plan in each country, it is the network of partnerships that connect the various members of the waterfowl community. Plan partners all have important roles in attaining the vision and goals

of the Plan, and they do so through the habitat and species joint ventures in Canada and the United States and a variety of local partnerships in Mexico. These self-directed regional groups connect diverse programs aimed at migratory bird and habitat conservation on both public and private lands.

Two types of joint ventures have evolved since the inception of the Plan. Species joint ventures were established to further scientific understanding for more effective management of particular waterfowl species. Habitat joint ventures were established as the implementation arms of the Plan and have become the preeminent habitat conservation partnerships in North America. Collectively, they have marshaled more than U.S. \$3 billion for waterfowl habitat and population conservation, including conservation actions on more than 13 million acres of land. Their proven ability to leverage funding from multiple sources is a great asset; less well known is the important role the joint ventures have played in improving the Plan's biological foundations by evaluating conservation planning assumptions and the effectiveness of conservation actions.

Ultimately, the success of the Plan will depend on effective partnerships among all segments of society that have a role in waterfowl conservation.



Organized regional partnerships are still emerging in Mexico. The draft document *National Strategy for the Management of Waterfowl and Their Habitats in Mexico* identifies regions for waterfowl management purposes that could, in the future, become organizations similar to joint ventures.

Most Plan joint ventures have expanded to embrace broader conservation mandates—mainly all migratory birds—indicative of the success of the international Plan model. Joint ventures now serve a broader community and the exclusive relationship between the Plan Committee and the joint ventures has thus changed. Nevertheless, joint ventures and the Plan Committee must uphold a productive relationship in the future. The success of the Plan requires that these crucial waterfowl partnerships be renewed and invigorated.

The North American Waterfowl Management Plan Science Support Team is a working group that comprises national-level federal agency staff, Flyway representatives, and biologists from the individual joint ventures. The group was formed to provide technical advice to the Plan Committee and to facilitate continuous improvement of Plan conservation programs.

Flyway councils, which are partnerships of state and provincial wildlife agencies with responsibilities for population management, are represented in the membership of all Plan institutions to ensure the integration of Plan activities with harvest management strategies.

Vision, leadership, sufficient resources, and continuity are all essential for success. But without sound science, biological monitoring, and adaptive feedback, efforts for waterfowl conservation will not be effective. The Plan's science support team, flyway councils, and the technical committees from joint ventures and other partnerships are all critical to ensuring progress.

Over the next 15 years it is imperative that these different administrative and technical groups work together to achieve what is promised in the Plan's visions and objectives. The Plan community is better organized for success today than ever before; the challenge now is to fulfill that promise.

**The Plan community is better organized for success today than ever before; the challenge now is to fulfill that promise.**



Duck Calling/Ducks Unlimited Canada

# VII. Challenges

Estuarine intertidal mangrove swamp in Mexico's Marismas Nacionales in Nayarit/  
Eduardo Carrera/DUMAC



The cost of conserving all North American waterfowl and their habitats will be many billions of dollars, far beyond the means of traditional waterfowl conservation resources. Funding increases for agencies and nongovernmental organizations are needed but are not the complete remedy. It is essential to use the Plan's broad partnerships to reach out to other interests, integrating the needs of waterfowl with other sociologically desired outcomes like clean water, clean air, and sustainable food, fiber, and energy. In this way, waterfowl conservation funds can be leveraged with the billions of dollars expended annually for these human needs. Plan partners can help shape future policies and programs through the Plan's strong scientific foundation—specifically the ability

to determine the type, amount, and location of conservation actions required to achieve desired population objectives.

The challenge for the Plan community is three-fold: (1) to direct available funds where they can be used most effectively, (2) to capture the potential waterfowl benefits of a host of related federal, state, and provincial programs, and (3) to better inform those making management decisions by improving the scientific knowledge necessary to achieve Plan goals. To address these challenges, Plan community leaders, on the Plan Committee, on joint venture management boards, in federal, state and provincial governments, and in private institutions should:

- Strive to acquire resources to realize the Plan's visions and accomplish the recommendations in the 2004 Plan.
- Foster appropriate links with other governmental and nongovernmental groups that affect waterfowl habitats in priority areas of North America and develop effective liaisons across related sectors of the economy.
- Foster appropriate links with areas outside of North America that are important to some species of North American waterfowl (e.g., Russia, Greenland, Latin America, and the Caribbean).
- Recognize, monitor, and address emerging social, economic, and environmental trends that affect waterfowl and seek new cooperative opportunities for waterfowl conservation.
- Address the persistent deficiencies in breeding habitat in the mid-continent prairie region.

- Address conservation needs in the boreal forest, portions of which have emerged as a high priority area of concern.
- Complete and implement Mexico's *National Strategy for the Management of Waterfowl and their Habitats*.

At the technical level, joint ventures, the science support team, and other Plan partners should:

- Identify significant limiting factors for species or populations of waterfowl exhibiting long-term population declines.
- Develop and use adaptive processes of biologically based planning and evaluation to ensure that habitat work targets priority conservation needs of waterfowl, wherever they occur.
- Improve our knowledge of the links between habitat dynamics and waterfowl population responses to design and deliver more effective waterfowl conservation programs and promote supportive public policies.

The Plan community needs to consider whether the Plan's present organizational "form" matches its desired future "function" as detailed in this document and should:

- Examine Plan Committee roles and responsibilities, followed by Plan Committee structure and membership.
- Strengthen scientific and operational links and coordination among habitat joint ventures, between habitat and species joint ventures, and among the Plan Committee, Flyways, the science support team, and all the joint ventures.

## NAWMP Progress Assessment 2004-2005

To ensure that the Plan is fulfilling its purpose, the Plan Committee, with the support of the science support team, and in cooperation with the species and habitat joint ventures, will undertake a comprehensive assessment of progress toward Plan goals. This assessment will include an update of regional habitat objectives based on evaluation results, identification of additional science support needs, and a refined estimate of the resources needed to accomplish Plan objectives. The assessment will also solidify strategic biological planning, implementation, and evaluation throughout the Plan community, and renew the working relationships between the Plan Committee and the joint ventures.

It is vital that all the major Plan stakeholders participate in some manner in this review. The Plan Committee will provide international leadership in this endeavor with technical support from its science support team. The joint ventures, in particular their technical committees, and associated flyway councils should also be full participants in the work. The scope and process for this assessment was elaborated in meetings of Plan stakeholders. The assessment began in 2004, with a final report presented to the Plan community by the end of 2005.

The results of this comprehensive assessment will help the Plan Committee and its partners set the stage for the 2009 Update, helping to clarify future priority needs. The results should also provide powerful incentive for financial supporters of the Plan to continue their aid.



Manitoba Easement Dedication/  
Manitoba Habitat Heritage Corporation



# VIII. Looking Forward



Lacustrine system at the Laguna Fierro and Redonda in Chihuahua, Mexico/  
Eduardo Carrera/DUMAC

Partners in the North American Waterfowl Management Plan are on a proven path for conservation success. Conservation at landscape scales that is supported by broad partnerships and guided by sound science has achieved more in the past 17 years than the Plan's founders could have imagined.

There is much to celebrate about these unprecedented accomplishments. Yet, old challenges, like improving duck recruitment in the prairie pothole region, persist, and new challenges, like sustaining waterfowl in the boreal forest, and initiating a national waterfowl management program in Mexico, are ahead. Circumstances have changed, but waterfowl today face an array of pressures that are just as imposing as those faced in 1986, at the inception of the Plan.

With this 2004 Plan, the Plan community reinforces its unwavering commitment to waterfowl conservation and particularly to the central role of science in guiding Plan actions. The adaptive processes advocated here offer a clear path to success, even in the face of ecological and sociological uncertainties.

Our continent's spectacular waterfowl have a bright future if we continue to strive on their behalf. We have a solid Plan. We have a history of achievement. A future of waterfowl in abundance is now ours to secure.

## **Recommended Citation:**

North American Waterfowl Management Plan, Plan Committee. 2004. North American Waterfowl Management Plan 2004. Strategic Guidance: Strengthening the Biological Foundation. Canadian Wildlife Service, U.S. Fish and Wildlife Service, Secretaria de Medio Ambiente y Recursos Naturales, 22 pp.

# Dedication

The 2004 North American Waterfowl Management Plan Update: Strengthening the Biological Foundation is dedicated to the memory of Dr. James H. Patterson and Mr. Kenneth W. Cox.

## Dr. James H. Patterson (1942-2002)

Dr. Patterson was one of the architects of the original 1986 Plan. It is largely through his initiative and determination that the Plan has become the legacy that it is today.

## Mr. Kenneth W. Cox (1944-2004)

Mr. Cox led Canada's North American Wetlands Conservation Council Secretariat since its inception in 1990. A superior leader and visionary, Ken was one of Canada's driving forces in building the Plan's international wetland conservation partnerships. His legacy and memory will live on in the thousands of wetlands throughout this continent that he has helped to protect.

Photo above: Canada Geese, Barbara Robinson, Canadian Wildlife Service

Cover photos: Mallard, Ducks Unlimited Canada

Grasslands, Jurgen Hoth, North American Commission for Environmental Cooperation

Ce document est aussi disponible en français sous le titre

*Renforcer les fondements biologiques – 2004 Orientation stratégique*

Este documento esta disponible en español con el título

*Consolidación de los fundamentos biológicos – 2004 Guía estratégica*



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