



*Photo by Dennis Malueg*

## **Wisconsin Waterfowl Strategic Plan** **2008–2018**

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This committee includes:

- ◇ Two WDNR wildlife managers with responsibility for waterfowl management from each of the 5 agency regions, the wetland habitat specialist, a research waterfowl biologist, a warden supervisor involved in waterfowl enforcement
- ◇ Representatives from federal and tribal agencies (US Fish and Wildlife Service, US Department of Agriculture – Wildlife Services, Great Lakes Indian Fish and Wildlife Commission)
- ◇ Chair of Conservation Congress Migratory Committee
- ◇ Representatives from waterfowl or conservation organizations (Wisconsin Waterfowl Association, Ducks Unlimited, Wisconsin Wildlife Federation, LaCrosse County Conservation Alliance, Green Bay Duck Hunters, Delta Waterfowl)
- ◇ Several retired waterfowl biologists and wardens with a special interest in waterfowl

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## **Commonly Used Acronyms and Abbreviations**

AHM	Adaptive Harvest Management
CRP	Conservation Reserve Program
CWS	Canadian Wildlife Service
Department, WDNR	Wisconsin Department of Natural Resources
DU	Ducks Unlimited
Flyway	Mississippi Flyway
HIP	Harvest Information Program
MFC	Mississippi Flyway Council
MQS	Mail Questionnaire Survey
MVP	Mississippi Valley Population
NAWMP	North American Waterfowl Management Plan
NWR	National Wildlife Refuge
UMR/GLRJV, JV	Upper Mississippi River/Great Lakes Region Joint Venture
USFWS	United States Fish and Wildlife Service

## **Executive Summary**

Wisconsin has a long history of being an important state for waterfowl populations and waterfowl management. It has been nearly 140 years since the first waterfowl harvest limits were established, ushering in waterfowl management in Wisconsin. Since these beginnings, our human population has grown, we have lost 50% of our original 10 million acres of wetlands, and waterfowl management has evolved while we have continued to maintain a strong waterfowl hunting heritage. A review of our past and present conditions provides this picture of our current status:

- Waterfowl breeding populations in Wisconsin are at their highest levels since estimates were first attempted in the 50's and 60's and systematic surveys began in 1973.
- Over 10 years of 60 day/6 duck daily bag seasons combined with over 100 days of Canada goose hunting in most of these years, representing the highest combined hunting days and bag limits for Wisconsin waterfowl hunting opportunity in 60 years and hunters are generally satisfied with the regulations.
- While threats to waterfowl habitat continue, excellent programs are in place to continue a diligent system of acquisition, restoration and enhancement at the state and regional level. However, reductions in staffing and budgets on state and federal lands limit the ability to maintain quality habitat and conduct restorations, while state level private land policies and potential changes to national programs in the Farm Bill could significantly reduced private land habitat work.
- Waterfowl harvest levels are average to high compared with historical levels.
- Over 60% of the fall duck harvest consists of mallards, wood ducks and blue-winged teal, which are also our top three breeding ducks in Wisconsin.
- Waterfowl hunter numbers are average compared to historical levels in Wisconsin and high compared with other states. Enthusiasm for the sport continues to be high in Wisconsin.
- There is a lack of information in Wisconsin on populations of waterfowl during migration and a lack of current information on waterfowl hunting pressure and activity at the local level.
- Despite long seasons and apparent high waterfowl populations, 30 – 60% of Wisconsin's duck hunters have not had their expectations met during recent hunting experiences.
- The most important variables for improving the waterfowl hunting experience for Wisconsin duck hunters are providing opportunities/locations for duck hunters to see more ducks and experience less hunter crowding.

With this evaluation we present 6 primary objectives and associated strategies for the Wisconsin Department of Natural Resource's waterfowl management program:

**Objective 1:** Continue to provide and expand habitats and management necessary to meet the year round ecological needs of Wisconsin's diverse waterfowl community and

other wetland species with recognition given to the state's role as a waterfowl production state and its waterfowl hunting heritage.

**Objective 2:** Monitor and evaluate waterfowl populations in Wisconsin across seasons and locations. Existing data provides a long term picture of Wisconsin breeding waterfowl populations, however, adequate data is lacking at a statewide and local scale for fall waterfowl numbers and distribution.

**Objective 3:** Improve the overall waterfowl hunting experience and the measures of waterfowl hunter satisfaction at the state level. Public input has consistently identified that the quality of the waterfowl hunting experience is affected by interactions (positive and negative) with other hunters as well as seeing and harvesting birds.

**Objective 4:** Manage resident Canada goose populations at a level that balances conflicting societal perspectives. One segment of society values our resident Canada geese for hunting and wildlife viewing while another segment considers them a nuisance or a source of damage to agricultural interests.

**Objective 5:** Strengthen and maintain Wisconsin's long waterfowl hunting heritage by developing new strategies for waterfowl hunting education and recruitment and by building upon existing Department programs. Waterfowl hunter numbers in Wisconsin appear stable over the last 25 years while other groups of hunters (gun deer, small game etc.) have shown different trends from increasing to decreasing over this period. Education on waterfowl hunting techniques, opportunities and ethics can improve the overall hunting experience.

**Objective 6:** Through continued research, refine and better understand the variables that affect resident breeding and migration populations of waterfowl and apply this knowledge to management strategies.



*Photo by Dennis Malueg*



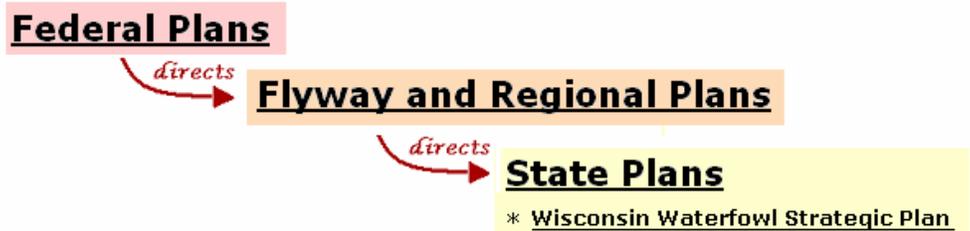
Photos by Dennis Malueg

## Wisconsin Waterfowl Strategic Plan 2007-2017

### Introduction

Waterfowl management and waterfowl related recreation are an important part of Wisconsin’s past, present and future. The Wisconsin Department of Natural Resources (Department) is charged with the primary stewardship responsibility for waterfowl populations and habitats in Wisconsin as well as the management of waterfowl hunting. The Department is fortunate to have strong partners within the state who share in the interest and responsibility for assuring a positive future for waterfowl populations and waterfowl hunting recreation in Wisconsin. The Department has developed this plan with the assistance and input of waterfowl hunters, conservation organizations, tribal interests and federal agencies. This plan has been developed to document the current status of waterfowl populations, habitats and hunting, identify priority needs to assure a positive future for waterfowl management in Wisconsin and set a course for maintaining waterfowl and waterfowl hunting as important parts of Wisconsin’s future. It is a program level plan that implements the overriding guidance provided by continental, flyway, Department and Bureau plans and considers each of these as guidance (Figure 1, Appendix A). This plan is not intended to address all the issues related to policy and protection of wetland habitats nor the needs of other wetland species since those issues are addressed in detail by parallel efforts of the Department and our partners.

Figure 1. Hierarchy of plans related to waterfowl.



*Please see the appendix for a list of plans under each category.*

Beginning in 2005, the Department initiated the planning process to chart the future of its waterfowl management program. Throughout this process we have worked to collect public input from a variety of sources including our Migratory Game Bird Committee (see page 1), the Migratory Committee of the Conservation Congress, a variety of waterfowl hunting and wetland interest groups, special workshops and hunter surveys, annual Department waterfowl public meetings, special sessions at the Wisconsin Waterfowl Hunters Conference as well as letters, phone calls and emails. In addition, a

plan for the management of migratory waterfowl requires communication with partners and other planning efforts at the state, regional, flyway, national and international level. An abundance of available scientific information has been reviewed and serves as a foundation for this plan. The general process and timeline is shown in Table 1, and the sources of input into this plan are found in Table 2.

**Table 1. Waterfowl Strategic Plan timeline.**

<b>Issue Identification and Planning</b>
<b>Winter 2004/2005</b> – Established Migratory Game Bird Committee with representatives from partner agencies and waterfowl groups. Solicited ideas for the planning process.
<b>March 2005</b> – Public Input session as part of the Wisconsin Waterfowl Hunter’s Workshop. This workshop was attended by 170 waterfowl hunters from around the state.
<b>June 2005</b> – Conducted public open houses in 5 locations around the state to seek additional information from waterfowl hunters on issues, desires and strategies for waterfowl management in Wisconsin.
<b>Data Collection and Coordination with Other Flyway and National Efforts</b>
<b>2005 through 2006</b> – Department staff participation in related Flyway planning efforts and National Waterfowl Hunting Strategy Team.
<b>Summer 2005</b> – Assist in development of National and Wisconsin Duck Hunter Mail Survey.
<b>Fall 2005</b> – Survey mailed to a random sample of 1300 duck hunters and results summarized.
<b>February 2006</b> – Results of Duck Hunter Survey released.
<b>Spring 2006</b> – Analysis and presentation of Duck Hunter Survey results, feedback from March Waterfowl Hunters Conference and advisory committee of results for plan development.
<b>Summer/Fall 2006</b> – Department staff work with Upper Mississippi Great Lakes Joint Venture in development and review of regional waterfowl habitat plan that drives Wisconsin’s objectives.
<b>Fall/Winter 2006</b> – Work with U.S. Fish and Wildlife Service and Mississippi Flyway to chart new direction on Management of Canada geese.
<b>Plan Development</b>
<b>Winter 2006/2007</b> – Draft plan development.
<b>Winter 2006/2007</b> – Coordination with U.S. Fish and Wildlife Service waterfowl property plans in Wisconsin.
<b>Draft Plan: Public Presentation and Review</b>
<b>March 2007</b> – Presentation of draft plan objectives at March Waterfowl Hunters Conference.
<b>April 2007</b> – Draft plan for internal and Migratory Game Bird Committee review.
<b>May 2007</b> – Discussion of plan at Migratory Game Bird Committee meeting.
<b>June–August 2007</b> – Public review period.
<b>Fall/Winter 2007</b> – Plan completion and presentation to Natural Resources Board.

**Table 2: Summary of public input for strategic plan.**

- Annual Department meetings/hearings – 100’s of comments each year
- Conservation Congress Spring hearings annually – 1000’s on specific questions
- March Waterfowl Conference – ‘05, ‘06, ‘07 all had input from over 100 hunters
- Waterfowl group and local meetings – several meetings each year
- Statewide random duck hunter survey - 1300
- State and federal duck/goose harvest data
- Annual Horizon zone and youth hunt surveys
- Strategic Plan workshops in ‘05
- Spring/Summer ‘07 input from meetings, groups, email, mail etc. – over 200 people

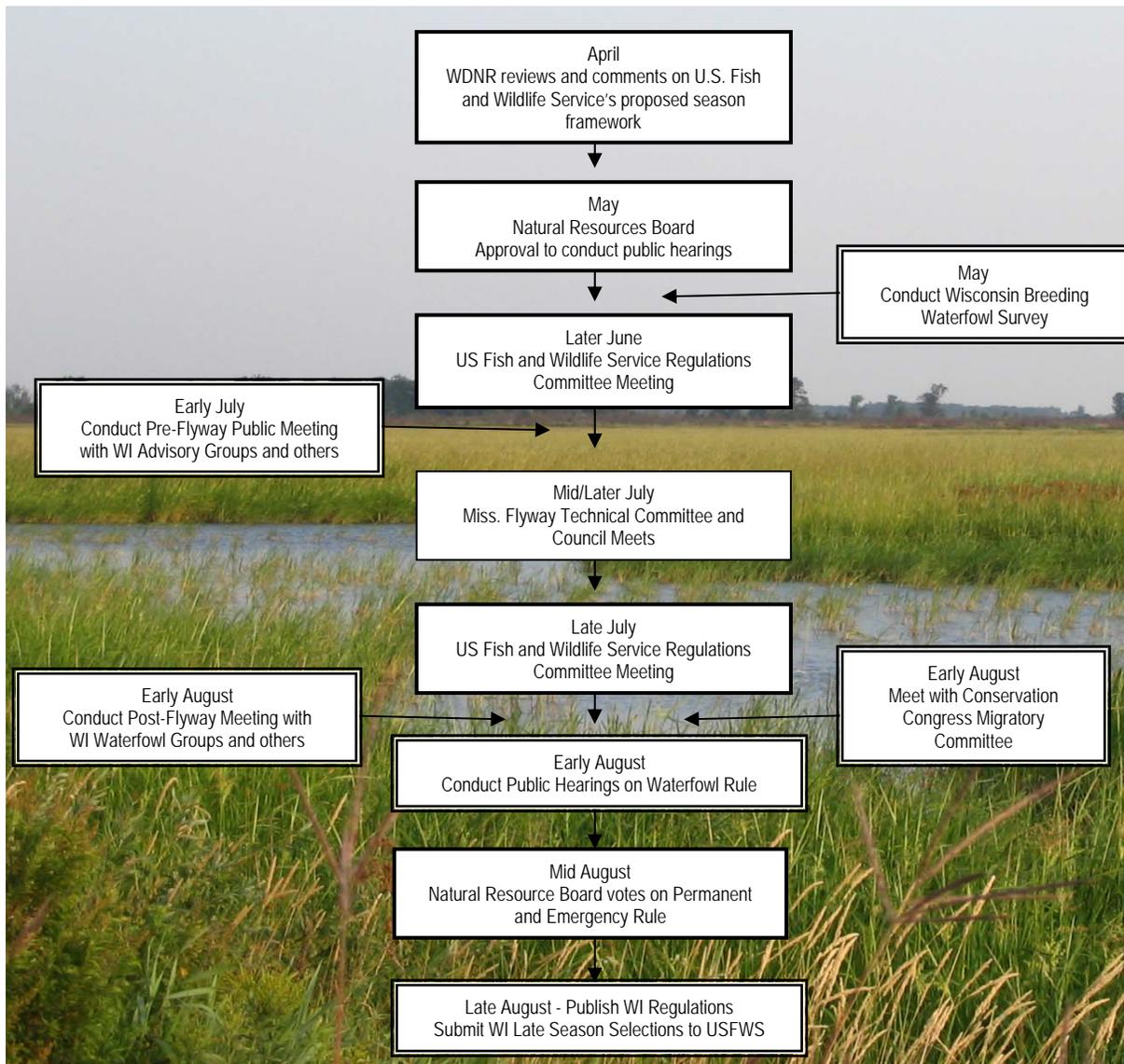


Photo by Andy Paulios

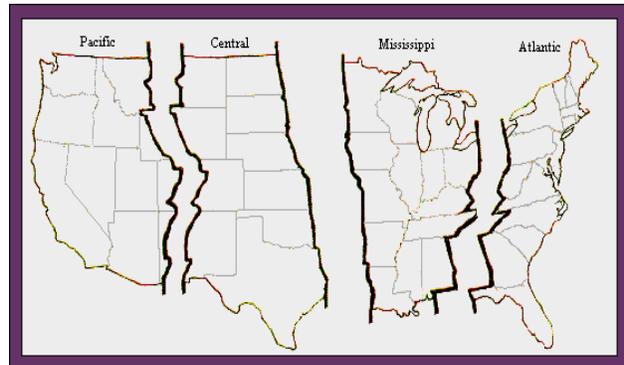
**Figure 2: Wisconsin migratory game bird annual regulatory schedule.**

## Federal management and the flyway system

Waterfowl are migratory birds, which are protected under international treaties and the Migratory Bird Treaty Act. Migratory bird management is under the jurisdiction of the United States government and this authority is administered through the U.S. Fish and Wildlife Service (USFWS). Each state's management of this group of species cannot exist independent of the continental and flyway level management issues and programs. To aid in the cooperative management of North American waterfowl, 4 councils of state and provincial agencies were established based on general migratory flyways encompassing the continent to collectively work with the USFWS and the Canadian Wildlife Service (CWS). Wisconsin is a member of the Mississippi Flyway Council (MFC), which is a group of 17 states and provinces within the migratory pathway from Manitoba/Ontario and the edge of Saskatchewan south to Louisiana/Alabama and further south for some species (Figures 3 and 4).



**Figure 3: Natural flyways.**  
*Courtesy Ducks Unlimited, Inc.*



**Figure 4: Management flyways.**  
*Courtesy USFWS*

Through this structure Wisconsin works with other states, tribes and provinces and the 2 federal governments on the monitoring and management of waterfowl and waterfowl hunting. Wisconsin is an important part of several continental and flyway level waterfowl management programs. Wisconsin Department of Natural Resources staff have been active leaders in flyway, national and continental waterfowl programs and initiatives through this cooperative system.

## Waterfowl and waterfowl hunting

For over 50 years, annual breeding waterfowl and habitat surveys have been conducted across North America through a cooperative effort among the USFWS, CWS, various state and provincial agencies, tribes and private conservation organizations. The USFWS publishes the results in an annual Waterfowl Status Report and these data are used at several levels in making recommendations and decisions on annual waterfowl hunting regulations. Since 1995 these data have been used as part of the Adaptive Harvest Management system (AHM) to make recommendations on duck hunting

season length and daily bag limits. Spring breeding goose estimates have guided goose hunting season structures. These proposals are discussed within each of the 4 flyways during semi-annual meetings and recommendations are made to the USFWS. Subsequently the Secretary of the Interior, based on the recommendation of the USFWS, issues the waterfowl hunting season frameworks for each of the 4 flyways. Each state can then establish state level duck hunting seasons within the sideboards established in these frameworks (Figure 2). Every year, Department staff conduct an extensive public involvement process through meetings and communications to solicit input on the state waterfowl hunting season structure. The population status and harvest potential for some duck species have required more specific hunting restrictions, which have resulted in reduced season lengths or bag limits for those species. As a production state, Wisconsin conducts annual breeding waterfowl surveys, which contribute to the data required to set federal duck and Canada goose hunting season frameworks.



*Photo by Andy Paulios*

### **Wetland habitat**

Management of migratory waterfowl requires the coordinated management of breeding, migration and wintering habitat across North America. Therefore, international, federal



*Photo by Dennis Malueg*

and regional habitat programs were established in order to coordinate management needs, priorities and funding across the annual range of these birds. Wisconsin is a part of this system and must continue to be an effective partner in the continental management programs. While opportunities exist for in-state habitat management to impact fall waterfowl populations in Wisconsin, Wisconsin cannot set goals and conduct habitat management independent of flyway partners when managing for migratory birds (Figures 1 & 2 and Appendix A).

Since 1986 the primary guiding vehicle for the management of continental wetland habitat for migratory waterfowl has been the North American Waterfowl Management Plan (NAWMP) (USFWS 1986). This continental vision and framework for action resulted in the development of regional habitat joint ventures consisting of multi-sector partners that plan and implement locally relevant habitat conservation programs, which contribute to the national plan. Wisconsin is an active member of the Upper Mississippi River/Great Lakes Region Joint Venture (UMR/GLRJV) which developed its first step-down conservation plan in 1992 and has subsequently reviewed and revised this plan

(UMR/GLRJV Management Board 1998). Wisconsin developed a state level waterfowl habitat implementation plan based on the continental and regional goals (WDNR 1992). Wisconsin also benefits from the habitat conservation efforts of joint ventures in other areas of the country, which are protecting and managing waterfowl habitat on breeding, migration and wintering grounds used by waterfowl harvested locally. Examples of other joint ventures that contribute to waterfowl important to Wisconsin would be the Prairie Pothole JV and Lower Mississippi Valley/Gulf Coast Habitat JV. Protection and management of wetlands and associated uplands have many benefits beyond those related to waterfowl and these are represented in a number of other Department/Partner plans such as Reversing the Loss: A Strategy for Protecting and Restoring Wetlands in Wisconsin, Fish, Wildlife and Habitat 6 Year Plan and the Wisconsin Bird Conservation Initiative – All Bird Plan (Appendix A). With regard to habitat, this waterfowl strategic plan will identify habitat needs and priorities related to waterfowl that can then be incorporated in other habitat related plans. Upon completion of the regional UMR/GLRJV plan, the Wisconsin state wetland implementation plan will be revised and will incorporate the regional goals as well as the need and priorities outlined in this plan.



Canada goose, photo by Jack Bartholmai

### **Canada geese and goose hunting**

Wisconsin harvests Canada geese from 2 primary populations; Wisconsin resident giant Canada geese (*Branta canadensis maxima*) and the Mississippi Valley Population (MVP) (*Branta canadensis interior*) of interior Canada geese, which breed in northern Ontario. Wisconsin is a party to the Mississippi Flyway Giant Canada Goose Management Plan and the MVP Canada Goose Management Plan and subject to the decisions of the flyway

committees, which cooperatively manage these populations (Abraham et al. 1998 and Zenner et al. 1996). Most recent data indicate that Wisconsin's Canada goose harvest is 49% giants and 48% MVP with the other 3% coming from two other Canada goose populations. Over the past 50 years, Canada goose populations in the Mississippi Flyway have been managed primarily through committees representing the primary harvest states for each population. In addition, Wisconsin previously managed Canada goose harvest in multiple subunits to recognize these different populations when overall Canada goose numbers were lower. However, over the last 20 years the growing giant population in each state has increased to the level that over 80% of the flyway wide Canada goose harvest consists of giant Canada geese. As a result of this change, Mississippi Flyway states are changing the Canada goose management strategy by moving away from the species committees and toward a holistic harvest management strategy. Wisconsin is somewhat unique in this discussion because of our relatively high proportion of harvest still consisting of an interior Canada goose population. As of 2007, the MVP committee recommended and the MFC approved a strategy to establish a 5-year stable Canada goose season in all participating states. Wisconsin will be selecting a new 5 year season structure in 2007. The 2 options available provide a

Canada goose hunting season on the liberal side compared with the previous few years.

## The Past: Wisconsin Waterfowl Management

### Pre-1930's

Wisconsin's original land cover provided an abundance of habitat for breeding and migrating waterfowl, including approximately 10 million acres of wetland habitat, shorelines of two of the Great Lakes, 15,000 inland lakes, as well as numerous river systems including the Wisconsin River, Fox-Wolf River System, and upper stretches of the Mississippi River. A number of lake complexes such as the Oshkosh and Madison area lakes were also well known for waterfowl concentrations. Waterfowl (ducks, geese and swans) were a part of the Native American diet in Wisconsin prior to settlement by Europeans and as the population of settlers grew, harvest of waterfowl became an important part of the commercial food supply in the Midwest (Havera 1999). The harvest of waterfowl for sporting recreation in addition to food began in the mid 1800's as Wisconsin transitioned from a territory to statehood (WDNR 1979). Hunting clubs managed water levels on large marshes such as Horicon Marsh as early as 1848. The first harvest limits were initiated in 1870 and the first waterfowl hunting licenses were issued in 1899. The historical peak in Wisconsin's nesting Canada goose populations appeared to be in the 1850s, when early settlers found them plentiful on prairie sloughs (Zenner et al. 1996). Canada geese were so abundant that eggs were gathered by the bushel (Schorger 1944). Unlimited hunting and egg collecting along with wetland drainage soon reduced the goose population. As a result, breeding geese disappeared in the 1890's and 1930's from southern and northern Wisconsin, respectively. As early as the late 1800's waterfowl conservationists were bemoaning the loss of waterfowl habitat in southeast Wisconsin to dairy farming practices (Cooke 1906). The early exploitation of waterfowl populations and loss of wetland habitats to other uses such as agriculture, flood control and development resulted in population declines, which in turn drove efforts for government protection and management of the waterfowl populations, habitats and sport harvest.

Over the last 100 years, as the human population has grown, the need for management of waterfowl populations, habitat and harvest has increased and adapted to the changing cultural, biological and physical landscape. The importance of continental wetland habitats to support waterfowl populations, combined with the wet/dry cycle of wetland systems has resulted in an expected ebb and flow of waterfowl populations and waterfowl hunting interest. However, the long term



Hunting in Delevan, WI, 1939. Photo by Dorothy Cassoday

decline in both the quantity and quality of wetland habitat across the continent can limit the potential for waterfowl populations and hunter interest to recover during wet years. In addition to waterfowl habitat and populations, socio-economic factors have long been recognized as having an influence on waterfowl hunting interest (Jahn and Hunt 1964).



Hunting near Little Rice Lake, WI, 1938. Photo by Dorothy Ferguson

### 1930's

During the drought ravaged dust bowl years of the 1930's, waterfowl habitat and waterfowl populations continentally were at a low point. These poor conditions, however, spawned action. The development of the federal duck stamp and passage of the Pittman-Robertson Act in the 1930's provided the funds to begin purchasing and managing federal and state waterfowl refuges across the country. During this early era Wisconsin benefited from the establishment of three national wildlife refuges that are valuable to waterfowl: Trempealeau National Wildlife Refuge in 1936, Necedah National Wildlife Refuge in 1939 and the Horicon National Wildlife Refuge in 1941. Based on duck stamp sales it was estimated that the number of waterfowl hunters in Wisconsin ranged from about 30,000 – 80,000 during the 1930's (Jahn and Hunt 1964). Statewide harvest estimates during the 1930's were obtained from the

first Wisconsin Conservation Department hunter mail surveys and generated a rough average for the decade of 501,000 ducks harvested annually (March and Hunt 1978). This decade marked a significant reduction in duck hunting season length, dropping from a range of 85 – 122 days in the previous 30 years to a range from 30 – 61 days as a result of low continental duck populations. Some species had closed seasons or restricted bag limits; ruddy ducks (*Oxyura jamaicensis*), buffleheads (*Bucephala albeola*), wood ducks (*Aix sponsa*) and canvasback (*Aythya valisineria*) were species of concern during this period. Total daily bag limits dropped from 15 to 12 and then to 10 ducks per day by the end of the decade.

### 1940's and 50's

Considerable management and research on waterfowl was conducted during the 1940's and 50's by the Wisconsin Conservation Department while continental breeding duck surveys were initiated in 1955 by the USFWS (Jahn and Hunt 1964). The need to manage waterfowl populations and waterfowl harvest on a continental scale was also recognized and the MFC was established in 1952 to work cooperatively among the states, provinces and federal governments in the management of migratory birds. The Wisconsin Conservation Department was a strong supporter of the formation of the MFC in these early years. Collection of data to establish breeding waterfowl population trends was first initiated in Wisconsin in 1948 and these data began to suggest that Wisconsin was an important location for breeding waterfowl. Blue-winged teal (*Anas*

*discors*) and mallards (*Anas platyrhynchos*) contributed to most of this breeding population with ring-necked ducks (*Aythya collaris*), wood ducks and American black ducks (*Anas rubripes*) also occurring regularly (Jahn and Hunt 1964). Property based waterfowl counts and hunter bag checks were also developed for a few key waterfowl areas in Wisconsin (unpub data, WDNR). Both pair and brood surveys were conducted in specific areas of the state yielding a crude estimate of 133,500 to 280,500 breeding ducks in 1950. Despite this information, it was concluded that Wisconsin was *not* an important location for waterfowl breeding populations and that local duck production contributed only 9 – 18% of Wisconsin's total duck harvest (March et al. 1973). The Wisconsin Conservation Department initiated both Canada goose and mallard rearing programs during this period which occurred periodically over the years but were ultimately abandoned (March pers comm.) Fall waterfowl use surveys were also conducted and served to identify migration timing, the major duck species using Wisconsin for migration, and waterfowl concentrations. Season length ranged from 30 to 80 days with few restrictions on individual species except for closed seasons on wood ducks from 1954–58 and bag limit reductions for canvasback, redheads (*Aythya americana*) and hooded mergansers (*Lophodytes cucullatus*) in the late 1950's. Beginning in 1946 bag limits were reduced from 10 to 7 and then to 4 in response to increasing harvest pressure on the duck population (Jahn and Hunt 1964). The total duck daily bag limit remained 4 until 1959 when it was reduced to 3 ducks.



Goose hunting at Horicon, WI, 1953. Photo by Dean Tvedt

The interest in waterfowl hunting and the density of hunters increased significantly during the post-World War II period (Jahn and Hunt 1964). During the 1940's the number of federal duck stamps sold in Wisconsin ranged from 66,000 to 102,000 but during the 1950's duck stamp sales increased, ranging from 100,000 to 134,000. Hunter densities were high and crowding problems were as abundant as stamp sales. It was estimated that one hunter per acre of wet marsh hunted the Horicon Marsh on opening day in 1954 while nine hunters reported being hit with shot pellets that imbedded in their skin (Jahn and Hunt 1964). Early studies during this period concluded that fall distribution of ducks in Wisconsin was influenced to a considerable degree by the location of areas offering protection from hunter and other human disturbance. While statewide harvest was not systematically calculated during this period, figures from Jahn and Hunt (1964) allow an estimate during the period 1948–1960 of an annual statewide harvest in an average year of about 560,000 ducks, which would result in an average total seasonal harvest per duck hunter of 4 – 6 ducks (Jahn and Hunt 1964). Hunter bag checks conducted in the early, heavily hunted portions of the duck seasons in this era revealed that 80 – 90% of the harvest was dabbling ducks

with 50 – 75% of that amount consisting of mallards and blue-winged teal. American coots (*Fulicia americana*) made up 30 – 50% of the combined duck/coot kill in the first few days of the season. The primary diving duck harvested was scaup (*Aythya sp.*). Also at this time, increasing flood control and agricultural development took its toll on wetland habitat across the state, with the 14 southeast counties alone experiencing a 2% per year loss in wetlands (Kabat 1972). The Wisconsin Conservation Department began developing and flooding flowages on state wildlife areas in an attempt to partially offset this loss of wetland habitat for ducks and Canada geese (King 1971). Jahn and Hunt (1964) list draining and filling, shoreland development, control of aquatic plants, introduction of carp and pollution/sedimentation as threats to waterfowl habitat during this period.

In the 1940's and 1950's the MVP was the primary fall population of Canada geese in Wisconsin while the giant race was considered nearly extinct in this flyway. The MVP geese breed along the coast of Hudson Bay, Ontario and during this period migrated to specific locations in Wisconsin, Illinois and areas further south during fall and winter. Intense harvest pressure was focused on limited migration (Horicon Marsh) and wintering locations, which raised concerns regarding overharvest. These concerns and a low population led to a closure of Canada goose hunting in the Mississippi Flyway in 1946 (Leafloor et al. 2003). The harvest and management of Canada geese began to emerge as an issue during this period and in 1956 the MFC established a Canada Goose Committee to manage the harvest and distribution of several populations of this species in the flyway. At the same time, the Horicon National Wildlife Refuge (NWR) in Wisconsin began managing specifically to support migrating MVP geese during the fall. Landscape changes, Horicon refuge management and an expanded refuge system in Illinois all contributed to an increase in fall/winter Canada goose populations and harvest levels in both states.



Hunting near LaCrosse, WI, 1960. Photo by Dean Tvedt

### 1960's

The 1960's marked a decade of improved waterfowl data collection at the federal level and greater concentration on habitat programs across the continent. Federal surveys of breeding waterfowl populations across North America and estimates of waterfowl harvest improved in the 1960's. Waterfowl harvest estimates were derived from a combination of hunter logs and wing and tail "parts" collections managed through a mail survey system. During this time the importance of Wisconsin as a production state began to be revealed by a variety of studies. The importance of Wisconsin produced ducks to harvest, particularly the Wisconsin harvest became evident (March et al. 1973). It was

estimated that Wisconsin contributed about 10% of the total duck harvest in the Mississippi Flyway and that 60 – 70% of the Wisconsin mallard harvest might be from locally reared birds (Geis 1971, March et al. 1973). To better document the importance of this idea and to evaluate management within the state, an experimental breeding duck survey was conducted from 1965–70 (except for 1967), in about 75% of the state. The total breeding duck estimate during the late 1960's ranged from 217,000 – 361,000 birds with blue-winged teal and mallards contributing 75 – 90% of that total (March et al. 1973). Wisconsin was also recognized as supporting important migration habitat in large water systems such as the Mississippi River and Lake Winnebago systems. During this same decade the most restrictive duck season was 25 days with a 2 duck bag in 1962 and the most liberal was a 45 day season with a 4 duck bag in 1966. Reduced bag limits for specific species became more frequent. Hunter numbers during the 1960s ranged from 58,600 to 107,100 based on federal estimates, with an average of 85,800 waterfowl hunters for the period. The average number of ducks harvested per Wisconsin duck hunter for the entire season ranged from 3.13 ducks to 5.52 ducks (ave 4.33) while the average total statewide harvest for this period was 410,000 ducks. Federal estimates for this decade indicated that Wisconsin's duck harvest was relatively diverse with mallards (33%), wood ducks (13%), green-winged teal (*Anas crecca*) (8%), blue-winged teal (8%), ring-necked ducks (8%), and American wigeon (*Anas americana*) (7%) making up most of the harvest. While wetland losses and water degradation continued during this period, interest in constructing ponds and flowages may have offset some of the losses (March et al. 1973). The state of Wisconsin officially recognized its continental connection to successful waterfowl management by sending its first payment of \$10,000 to Canada in support of waterfowl habitat projects there. By 1969, 286,000 acres of wetlands were under Department management and most of this was purchased specifically for waterfowl.



Hunting near Kenosha, WI, 1960. Photo by Dean Tvedt

Over a period of several years in the 1960's social, political and biological forces surrounded Canada goose management and resulted in actions such as hazing and a harvest of 30,000 geese in 2 1/2 days of shooting in 1966 in the Horicon area. Low hunter compliance with Canada goose harvest reporting resulted in the federally mandated Horicon zone goose tagging program. During the early 1960's MVP geese steadily increased in numbers at Horicon with fall numbers exceeding 100,000 birds. This growing fall goose population began to cause significant agricultural crop depredation in Wisconsin and complaints by hunters in states to the south that Wisconsin was short-stopping geese (Miller 1998). Efforts were made to create "satellite" properties in an attempt to draw Canada geese away from their concentration on Horicon Marsh. In 1965 agricultural damage payments began as a result of goose

depredation in east central Wisconsin. Also in 1965, the MFC agreed to a winter flyway population objective of 200,000 geese and in 1969 this was increased to 300,000. Meanwhile, a few small remnants of the giant race of Canada geese were discovered in southern Wisconsin and elsewhere in the flyway during the 1950's. Restoration efforts to increase this population began in the 1950's and 1960's involving the release of birds from captive reared populations, translocation of birds within and among states and provinces, and closure of Canada goose hunting in some areas (Zenner et al. 1996). In 1960, Wisconsin and Illinois agreed to establish a quota system to cooperatively manage Canada goose harvest. Wisconsin's program focused on the Horicon area where most of the MVP spent much of the fall. In the early 1960's harvest in the Horicon zone experienced rates near 1,000 geese per day for only a 9 to 11 day season. Later in the decade, harvest was restricted to a season limit of 1 goose/hunter in the Horicon zone and 2 geese outside of this zone. Canada goose hunting seasons were 16 – 37 days in length in the Horicon zone and about 70 days in the remainder of the state.



*Canada geese over Horicon Marsh, WI, 1965. Photo by Dean Tvedt*

### **1970's**

The 1970's were marked by a period of high continental waterfowl populations, good habitat conditions from a wet cycle across North American breeding areas, high hunter numbers and significant changes in waterfowl management. Systematic breeding waterfowl surveys in Wisconsin began in 1973 and have continued through to the present with some changes, documenting the importance of Wisconsin to Mississippi Flyway breeding populations and measuring changes in resident breeders (March et al. 1973, Van Horn et al. 2006b). Consistent annual preseason banding of waterfowl by the Department was also established. Additionally, several more state wildlife areas began waterfowl abundance and waterfowl hunter surveys. Total breeding duck population estimates for the period 1973–79 ranged from 266,000 – 435,000 (average 360,000) with blue-winged teal contributing to about ½ of this total in most years (Van

Horn et al. 2006b). Duck hunting regulations during this period were generally more liberal than the 1960's with longer seasons (45 – 55 days), special species specific seasons (blue-winged teal and scaup) and the point system, introduced in 1973, under which several ducks per day could be harvested. Season closures for canvasbacks and redheads reflected the concern of harvest levels for those species. Waterfowl hunter numbers increased across the country in the early 1970's with an average of 117,000 waterfowlers in Wisconsin during this decade. While the average seasonal bag for hunters during the 1970's (4.71; range of 3.69 – 5.61 ducks/hunter/season) was similar to the 1960's, the increased number of waterfowl hunters pushed the total statewide harvest average up to 595,280. Changing populations, good habitat conditions and regulations in the 1970's all contributed to increases in the percent of Wisconsin harvest of mallards to 36%, wood ducks to 16% and blue-winged teal to 13%. Meanwhile, green-winged teal (7%), ring-necked ducks (6%) and wigeon (6%) all showed a decline in the proportion of the Wisconsin duck harvest. A ground swell of support led by a few determined conservationists to fund habitat work for waterfowl resulted in approval of a state level waterfowl stamp in 1978 at a cost of \$3.25 each. Recognition of Wisconsin produced ducks in the fall harvest helped to establish that 2/3 of the funds were to be used for waterfowl habitat work in Wisconsin and 1/3 was to go to organizations in Canada for duck habitat work that contributed to fall duck numbers in the Mississippi Flyway. That first year a surge of interest and support generated over \$400,000 for waterfowl habitat work. This began a very strong and successful program of waterfowl habitat work in Wisconsin as well as Canada. In 1979 the first contribution from the Wisconsin waterfowl stamp funding was sent to Canada for breeding ground habitat. In addition to state funds, Wisconsin became one of the first non-prairie states where the USFWS used federal duck stamp dollars to purchase waterfowl production areas.

In the 1970's up to 80% (250,000 – 300,000 birds) of the MVP Canada goose winter population stopped at Horicon and surrounding areas (Miller 1998). Agricultural and biological concerns over this concentration of birds lead to the 1976 management strategy to reduce the peak fall population and encourage Canada geese to move south. Altered land management practices in the Horicon NWR and increased harvest and disturbance helped to move geese out of the refuge but not necessarily to locations outside of Wisconsin. However, many hunters and goose watchers in Wisconsin opposed these efforts to redistribute goose concentrations. A number of biological and political concerns complicated management efforts. In 1979, the MFC prepared the first flyway wide management plan for the MVP in an attempt to create a more scientifically based management strategy. Meanwhile, successful restoration efforts for resident giant Canada geese continued. During 1970–79, about 10% of the Canada geese counted during winter surveys in the Mississippi Flyway (an estimated average of 63,000 birds) were allocated to the giant population (Gamble 1995). From 1970–75, Wisconsin had short Horicon Zone Canada goose hunting seasons (17 days) with daily bag limits, hunter number limits and in some years season limits of 1 goose. At the same time, there were long seasons in the remainder of the state (70 days) with daily bag limits of 1 – 2 geese. The later half of the decade began a period of increase in number of zones and split configurations for goose seasons in Wisconsin as well as

more goose hunting days in the Horicon area. Canada goose harvest totals for Wisconsin, based on federal estimates, ranged from less than 30,000 to nearly 90,000 geese annually during the 1970's.

### 1980's

The 1980's were marked by a relative dry cycle on continental duck breeding grounds, increased wetland loss, continentally low duck populations, restrictive regulations and a decrease in waterfowl hunter numbers over the highs of the 1970's. In Wisconsin, statewide management programs initiated in the 1970's continued, research efforts



*Mallard, photo by Dennis Malueg*

were strong, and state property based waterfowl related habitat and inventory work increased. The survey database on Wisconsin breeding waterfowl populations grew, documenting a steady increase in the state wood duck population, the beginning of a mallard population increase and steady decline in the blue-winged teal state breeding population (Van Horn et al. 2006b). Total breeding duck numbers during the 1980's averaged about 300,000 ducks per year with mallards contributing

about 40% of the total. Wisconsin breeding Canada geese were included in the spring waterfowl survey in 1986 in response to the continued growth and increased distribution of this population (Van Horn et al. 2006b). Also during this time, Wisconsin initiated a program to establish a breeding population of trumpeter swans through use of avicultural methods and from swan eggs collected in Alaska (Matteson et al. 1996) North and south duck hunting zones with the option of a season split were introduced to recognize differences in fall weather conditions and hunting opportunity. As directed by federal frameworks, the duck hunting season length began the decade with 50 days, dropped to 45 days and ended the last 2 years of the decade with 30-day seasons. From 1980–84, federal waterfowl regulations were stabilized in an effort to measure their impact. Most of the decade still functioned under the point system for daily bag limits, where several ducks of a low point value could be harvested each day, and it included a special bonus scaup season (7 years). However, in 1988 a daily bag limit of 3 ducks was implemented. Wisconsin selected a one hen mallard bag limit for the entire duck hunting season beginning in 1988 and has maintained that limit until present with 2002 as an exception. Wisconsin also went statewide with a nontoxic shot requirement for waterfowl hunting after several years of testing and implementing special steel shot zones. Waterfowl hunter numbers steadily declined across the U.S. and Canada in the late 1970's and throughout the 1980's and hit the lowest levels around 1990. In contrast, Wisconsin waterfowl hunter numbers mirrored the national decline in the late 1970's but stopped declining by 1982 (Padding et al. 2006, Fronczak 2003). The decade average was 77,500 active waterfowl hunters. The average total statewide duck harvest for this decade was about 380,000 per year, which was much lower than the 1970's, however, the average seasonal bag per hunter ranged from 2.63

– 5.92 with an average of 4.43 ducks/hunter/season. This range had a higher and lower end than previous decades but was similar overall to the 1960's' and 1970's' average seasonal bag for the Wisconsin duck hunter. The composition of Wisconsin's duck harvest again showed shifts from the previous decade. Mallards remained about 36% of the harvest, while wood ducks (19%) and scaup (7%) showed increases, green-winged teal (7%) and ring-necked ducks (7%) remained similar and blue-winged teal (8%) and wigeon (4%) showed declines. With the establishment of the Wisconsin waterfowl stamp in 1978, funding for waterfowl habitat work grew significantly in the 1980's. Over \$3 million in revenue was generated by Wisconsin waterfowl stamp purchasers during this decade. Two thirds of these funds continued to be spent on waterfowl habitat projects in Wisconsin and one third was sent to Canada for habitat work on the prairie/parkland breeding grounds. At a continental level, the United States and Canada signed the North American Waterfowl Management Plan (NAWMP) in 1986 as the mechanism to guide waterfowl habitat management.

Canada goose management in the 1980's was marked by evolving management strategies for the MVP geese and a continuing growth of the resident giant Canada goose population. The status of the MVP was measured by a wintering ground survey each December and based on this survey, the winter population ranged from 251,000 in 1981 to over 1 million in 1989. However, it was recognized that it was difficult to distinguish between the giant and MVP geese by distant observation or aerial surveys and that the growing giant Canada goose population impacted the ability of this winter survey to accurately gauge MVP changes. As a result, in 1989 a breeding ground survey was initiated (Abraham et al.

1998). The average number of giant Canada geese estimated in the winter counts during the 1980's was nearly 3 times the average number estimated in the 1970's, whereas the average total number of Canada geese counted in the winter surveys only increased 40% during the 1980's compared to the 1970's (Zenner et al. 1996). In the early 1970's, a few states in the



*Canada goose, photo by Dennis Malueg*

Mississippi Flyway (Alabama, Arkansas, and Kentucky) reported no giant Canada geese in their winter counts. By the 1980's, giant Canada geese were reported from all flyway states and provinces during the winter surveys. Concerns related to potential over harvest of the MVP resulting in population declines lead to many discussions at the state and flyway level during the 1980's. In the face of these concerns, the MFC's MVP committee faced difficult decisions in developing a new management plan in 1986. As a result of this plan, Wisconsin implemented a new harvest program for Canada geese with a very complex assortment of regulations developed with several zones and multiple hunting periods in a number of zones. Regulations included: 5 zones, hunters restricted to hunting in only one zone and time period and mandatory harvest reporting in the Exterior zone. Hunter numbers were restricted in 4 of the 5 zones. Also, 4 of

the 5 zones had not only daily bag limits, but season limits on Canada geese, including the Horicon Zone. This increase in special management zones was combined with different bag limits and season lengths as a strategy to manage harvest on different populations. Zone season lengths and bag limits varied considerably depending on annual population changes, flyway discussion, hunters' desires, and assumptions of specific population management. Season lengths within these zones during the 1980's ranged from 12 days to as many as 100 days with daily bag limits of 1 or 2 geese except for one zone/period had a daily bag of 3 geese in 1989. Based on state permit sales at the end of the decade about 65,000 hunters were participating in these seasons. Federal harvest estimates indicated that Wisconsin's Canada goose harvest during the 1980's ranged from about 33,000 to 85,000 geese annually.



*Blue-winged teal, photo by Dennis Malueg*

### **1990's**

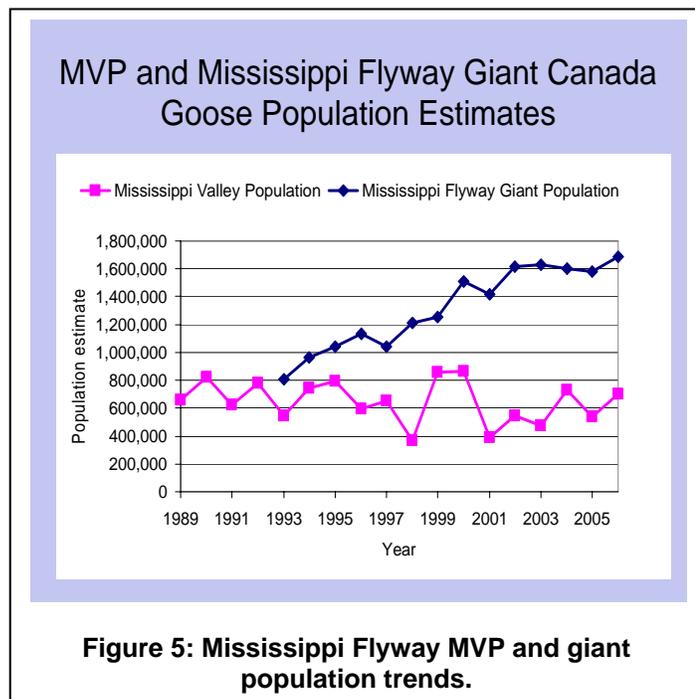
The 1990's were marked by continentally significant changes in waterfowl habitat, duck numbers and waterfowl hunter numbers while in Wisconsin we continued to see an increase in overall breeding duck numbers, habitat advances and stable hunter numbers. During the early 1990's, public involvement in annual hunting regulation decisions increased, which was facilitated by Department staff efforts. Also at

this time, waterfowl and waterfowl hunter surveys on key state properties continued. Further, the statewide breeding survey database for waterfowl continued, expanded in 1997 and began to reveal important trends, which could help guide management decisions (WDNR 1992, Van Horn et al. 2006b). Waterfowl habitat conditions and breeding duck populations in the Canadian prairies/parklands and the U.S. prairies were at some of the lowest recorded levels at the beginning of the decade but the habitat and most species saw a steady improvement, which peaked at the end of the decade (USFWS 2006). Many states experienced a pattern of waterfowl hunter numbers, which followed the conditions on the prairies; very low in the beginning of the decade with higher numbers at the end of the decade. In contrast, Wisconsin showed good habitat conditions during the early 1990's, a continued general upward trend in total duck numbers from the 1980's into the 90's and stable waterfowl hunter numbers. Unfortunately, the Wisconsin blue-winged teal breeding population continued its decline and remained below historic levels. The average annual total breeding duck estimate during the 1990's was over 480,000 ducks with mallards contributing about 50% of the total. By the end of the decade, wood ducks had surpassed blue-winged teal as the second most abundant breeding duck in Wisconsin. After years of successfully captive-rearing and decoy-rearing trumpeter swans raised from Alaskan eggs, this program was ended in 1998 and Wisconsin reached its goal of 20 breeding pairs in 2000.

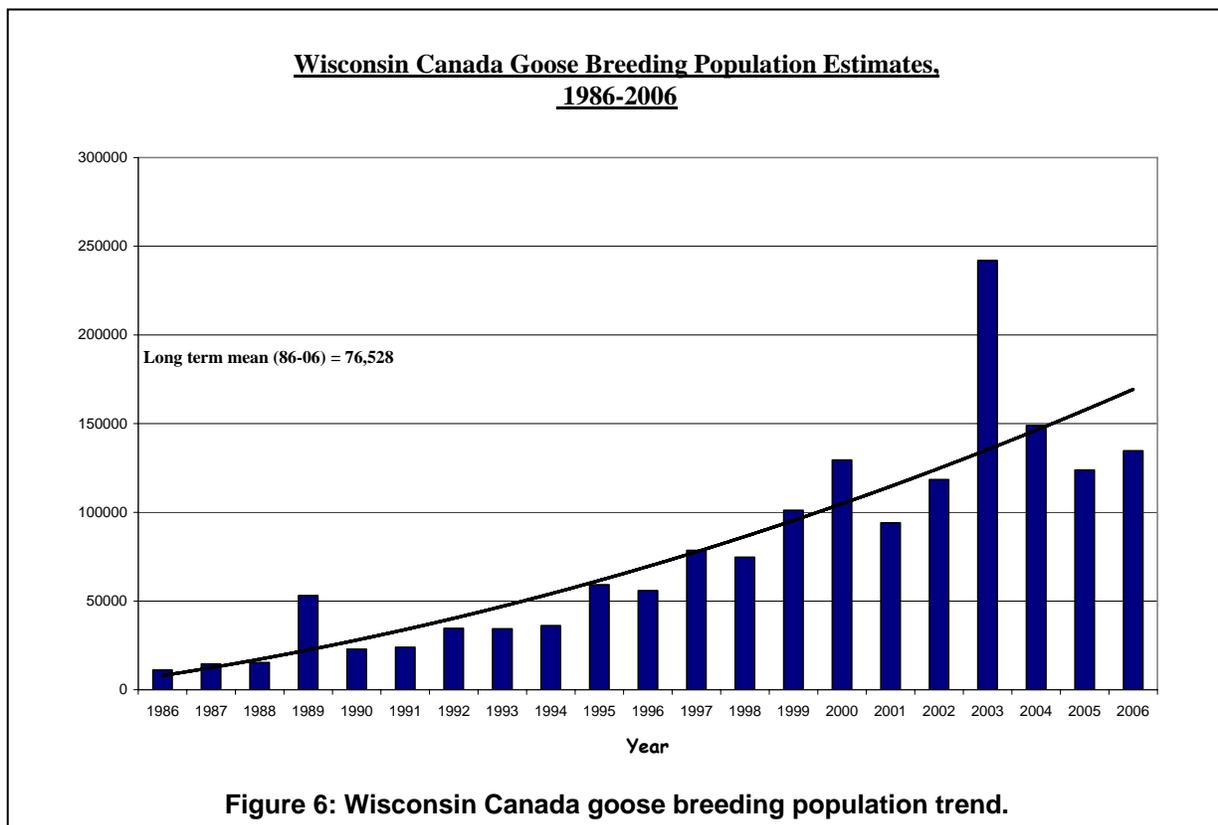
As prescribed by federal regulations, duck hunting season lengths began the decade with 30 days (and a 3 duck daily bag), increased to 40 days, then to 50 days and then in

1997 to 60 days under the current AHM system. AHM provides a harvest model that incorporates available annual survey data (primarily mallard breeding population and wetland numbers) and annually adapts the season recommendation based on past experiences. Since 1997, the mid continent mallard population (U.S./Canadian prairies and parklands plus Wisconsin, Michigan and Minnesota) and wetland counts on Canadian survey routes have been high enough to recommend a 60 day season with a 6 duck daily bag. Wisconsin waterfowl hunter numbers, as estimated by the federal Mail Questionnaire Survey (MQS), showed annual ups and downs but remained fairly stable (68,000 – 85,000) (Fronczak 2003). The average number of waterfowl hunters as estimated by MQS for the 1990's was 75,500. The average total statewide duck harvest for this decade was about 307,000/year, which was lower than previous decades, and the average seasonal bag per hunter ranged from 2.73 – 4.63 with an average of 3.82 ducks/hunter/season. These data are also based on the MQS survey. Mallards (40%) and wood ducks (18%) remained the top 2 ducks in the Wisconsin duck harvest, green-winged teal showed an increase to 10% of the harvest, blue-winged teal remained at 8% while ring-necked ducks (5%), lesser scaup (3%) and wigeon (3%) showed declines in the proportion of the harvest. In 1999 a new federal system for estimating waterfowl hunter numbers was initiated – the Harvest Information Program (HIP).

The 1990's continued with a strong waterfowl habitat program in Wisconsin and was marked by important milestones. In 1990, the first wetland habitat specialist position was approved by the Department to manage the state waterfowl stamp program and our contribution to NAWMP. In 1991, the UMR/GLRJV was created to implement the NAWMP goals in this region. In 1992, the Wisconsin Plan was developed to implement Wisconsin's waterfowl habitat responsibilities under the UMR/GLRJV (WDNR 1992). This plan provided the foundation and framework for waterfowl habitat work among many partners in the state. Waterfowl hunters supported two increases in the cost of the Wisconsin waterfowl stamp to maintain our productive habitat program in the face of increasing costs; in 1991 the stamp price rose to \$5.25 and in 1997 it increased to \$7. In 1998, the UMR/GLRJV plan was updated with revised habitat goals for each state. During this decade, Wisconsin waterfowl hunters provided nearly \$4.6 million for waterfowl habitat work through state waterfowl stamp purchases.



Canada goose management in Wisconsin during the 1990's continued to adapt to the changing landscape of Canada goose populations. Management of the MVP geese was guided by the breeding ground surveys that were initiated in 1989 (Abraham et al. 1998). The MVP breeding population trend during this period was stable with annual changes in response primarily to spring breeding ground conditions. The spring population ranged from 370,000 to 860,000 geese with an average spring population of 679,000 for the decade (Figure 5). Meanwhile, the resident Canada goose population in Wisconsin and across the Mississippi Flyway continued to steadily grow (Figures 5 and 6), increasing in Wisconsin from 22,800 geese in 1990 to 101,200 in 1999 (Van Horn et al. 2006a). Annual changes in the MVP spring population drove annual changes in the season length and bag limit in Wisconsin's regular Canada goose hunting seasons. The multiple zone/time period strategy continued and season lengths during the 1990's ranged from 21 to 102 days in different zones with bag limits generally at 1 – 2 geese. Problems from the growing resident giant population began to be a significant component in Canada goose management (WDNR 1998). This growing population in both Wisconsin and the national triggered the approval of an early September Canada goose season that would target harvest on resident giants prior to the arrival of the interior migrating populations (Van Horn et al. 2006a). The early season in Wisconsin began in 1990 and was restricted to 7 counties in southeast Wisconsin and then grew to 9 counties in the first half of the decade. The second half of the decade brought an expansion of this zone to include all or parts of about 30 counties. This early season varied from 7 – 14 days in length and daily bag limits were

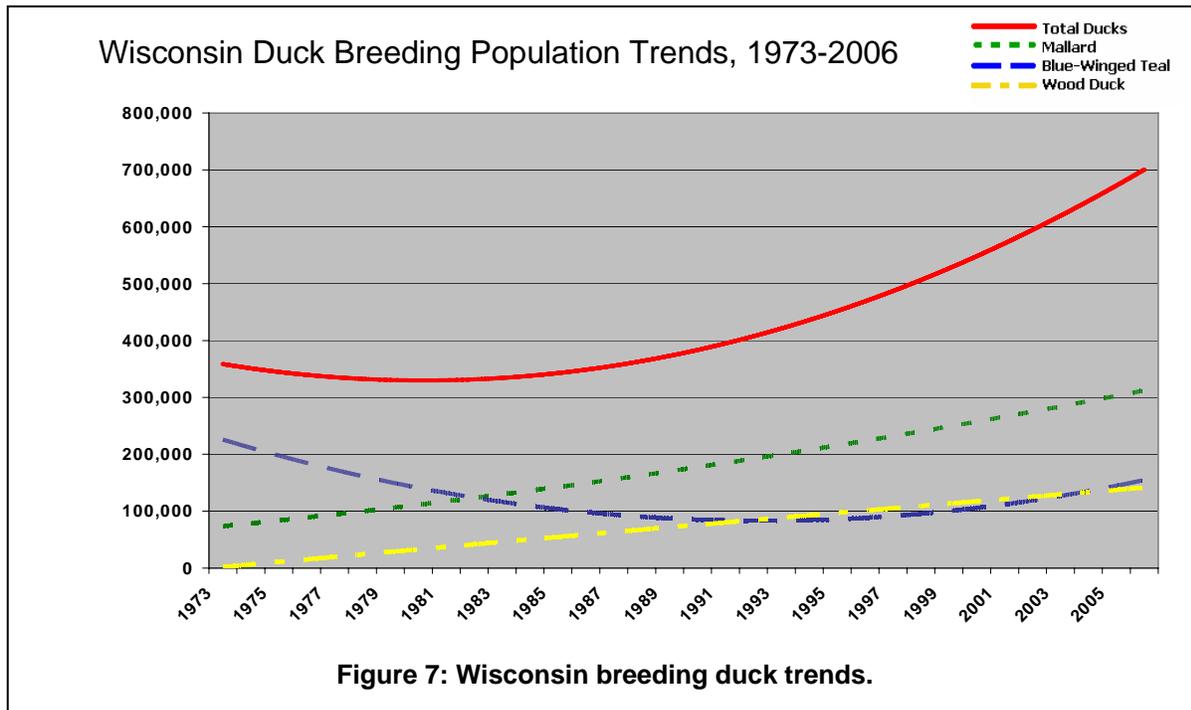


either 3 or 5 geese. In 1995, a 1-800 system to register Canada goose harvests by telephone was first introduced for the Exterior zone and in 1997, the early September harvest registration was also handled by this system. Federal MQS estimates of Wisconsin's regular season Canada goose harvest ranged from 125,300 in 1990 to a low of 26,500 in 1998 with a decade average of 80,610 geese harvested per year. A comparison of the MQS estimates for these years with the state derived harvest estimates from the 1-800 call-in system suggest that the federal estimates were high. Harvest in the early September season, based on state estimates, was 700 – 800 geese in the early years with a small zone but as the zone size and hunter interest grew, annual harvest grew to as high as 10,500 in 1996. As the resident giant Canada goose population grew, the proportion of the harvest from this population also began to grow.

## **The Present**

With this historical backdrop we can evaluate our present condition (2000–2006) of waterfowl management and hunting in Wisconsin to help guide our future. Since the middle 1990's, budget and staffing cuts, increasing work loads and shifting priorities within the Department wildlife program have put a strain on the waterfowl management program. The biggest reductions in effort relate to property level management actions including: maintenance of infrastructure (mowing dikes, repairing water control structures), keeping up with increased habitat work (burning, brushing, exotic plant control), collection of fall waterfowl surveys, waterfowl research and collection of hunter use data. The success of earlier wetland restoration and construction efforts has created a statewide wetland system on public lands with an aging infrastructure that needs to be maintained to assure the continued value of the wetland habitats. On private lands across the state there are increasing barriers to continuing wetland restoration and management including: tax disincentives, insufficient biological support to landowners and continued development pressure. Department partners such as the Wisconsin Waterfowl Association and the USFWS continue to provide technical support on private land wetland restoration while Department resources dedicated to private land assistance have been reduced. Policy issues related to wetland protection have been recognized and are being addressed in a revision of *Reversing the Loss: A Strategy for Protecting and Restoring Wetlands in Wisconsin*. On the positive side, the continuing spring breeding waterfowl survey has been evaluated, improved and is now an important part of the federal regulatory process. Our waterfowl banding program was reduced in 2003 as a result of budget reallocations but since then, our banding efforts have been evaluated, improved and are functioning at a level to meet our commitments. The Department has continued to support continental banding programs by banding 4,000 mallards, 4,000 Canada geese and 1,200 wood ducks each year in Wisconsin while the USFWS staff has had to reduce their efforts for waterfowl banding in Wisconsin. The midwinter waterfowl survey was not conducted in Wisconsin in 2004 and USFWS contributions to this effort have also been reduced, however, since 2005 Wisconsin is again participating annually in this flyway project. Wisconsin's management of the annual regulatory process, our annual waterfowl public involvement process and our contributions to Mississippi Flyway and national efforts are being

maintained at adequate levels. The Department and many partners have also continued to successfully create and enhance new wetland habitats across the state. The areas of need that have been identified in recent years are for the Department to increase efforts with regards to maintenance of existing wetlands, monitoring of fall waterfowl populations and managing/monitoring waterfowl hunting effort/pressure. Addressing these needs will require new resources.



Wisconsin continues to be an important state for waterfowl breeding and migration in the Mississippi Flyway. Wisconsin’s breeding waterfowl populations overall appear to be in good shape. At a continental level, waterfowl populations and breeding ground conditions declined in the early part of this decade. However, in Wisconsin the average total breeding duck population for the period 2000–2006 was 622,444 and the average number of breeding mallards for this period was 291,886 (Van Horn et al. 2006b). Both of these figures represent the highest recorded breeding estimates since data has been collected (Figure 7). While there are always year to year variations in habitat quality and brood production, the increasing trend in the breeding population for mallards and wood ducks suggests that average production has been good. In recent years the total breeding duck population has consisted of 48% mallard, 22% wood duck, 15% blue-winged teal, 6% ring-necked duck, and 9% of 12 other species (Gatti and Van Horn 2006). A variety of other duck species breed in Wisconsin in smaller numbers including redheads, ruddy ducks, green-winged teal, northern shovelers (*Anas clypeata*), gadwall (*Anas strepera*), black ducks, hooded mergansers and common mergansers (*Mergus merganser*). Mallard populations now average 3 times more than those in the 1970’s. The overall trend on the breeding mallard population appears to be leveling off following a 20+ year increase. Wood duck populations have increased 6% per year for 33 years, however, current trend analysis for wood ducks in Wisconsin suggests that the long

term increase in the breeding population may also be leveling off. Between 1973 and 1997 the population estimate for wood ducks exceeded 100,000 only twice, however, since 1998 the population has varied between 110,109 and 141,882. Wood ducks continue to be an encouraging contribution to the state's breeding waterfowl population at a level near 125,000 birds. The lower than historic blue-winged teal breeding population numbers continue to be a concern and additional research on this species in Wisconsin is being conducted. As a result of the successful reintroduction program the number of trumpeter swan nesting pairs continues to increase annually reaching 113 in 19 counties during 2007. A population viability analysis in 2005 showed that there was no threat of extinction to the population. The population is expected to increase at a rate of 6-8% annually. Our management efforts for breeding waterfowl in Wisconsin appear to be working and we need to maintain these excellent conditions.



*Redhead, photo by Dennis Malueg*

The increasing Wisconsin duck breeding populations and good habitat programs have a direct impact on Wisconsin's fall duck harvest. It is no coincidence that mallards and wood ducks are the 2 most abundant breeding ducks in Wisconsin and are also the 2 most abundant ducks in the fall harvest. Wisconsin is unique in that our successful efforts to protect wetlands and provide spring, summer and fall waterfowl habitat have a direct impact on our fall duck harvest. Mallards comprise nearly 40% of Wisconsin's fall duck harvest and about 70% of these mallards are produced in Wisconsin (Fronczak 2006b, Gatti and Bergquist 2004). Further, wood ducks are near 20% of the total Wisconsin duck harvest and the birds harvested in Wisconsin are primarily hatched in Wisconsin or adjacent states/provinces. The 3<sup>rd</sup> most abundant Wisconsin breeder and 4<sup>th</sup> most abundant duck in the Wisconsin duck hunter's bag is the blue-winged teal at about 8% of the total harvest. Depending on the annual variation in breeding conditions in Wisconsin versus the prairies, 30 – 50% of the blue-winged teal harvested in Wisconsin are produced here (unpublished data). As a result, depending on annual conditions, 50 – 70% of our total duck harvest in Wisconsin is produced in Wisconsin.

Our resident Canada goose population has continued to grow at a rate of 13% per year since 1986 (Gatti and Van Horn 2006) with an average count in the spring survey of 141,000 for 2000–2006. This is characteristic of the surrounding region since giant Canada geese are now the most abundant subspecies in the Mississippi Flyway (Leafloor et al. 2003). However, this increasing population is not welcome in many urban/suburban locations and human/goose conflicts need to be considered in Wisconsin's future waterfowl management. The MVP Canada geese continue to experience annual changes in the spring population related to the suitability of weather on the spring breeding grounds each year. Over the last 17 years, however, the spring population appears stable near 600,000 geese, with several hundred thousand of these

geese migrating through Wisconsin each fall and many remaining in southern Wisconsin through much of the winter. Combined, these 2 populations are providing some of the highest fall Canada goose populations that Wisconsin has ever experienced.

As noted above, we lack the data to objectively evaluate any change in status of Wisconsin's statewide waterfowl populations in times of the year that are outside the spring breeding season. However, the draft UMR/GLRJV plan identifies Wisconsin as part of those conservation regions important for several migrating waterfowl species including: mallards, greater and lesser scaup (*Aythya marila*, *Aythya affinis*), three species of scoters (*Melanitta sp.*), common goldeneye (*Bucephala clangula*), hooded merganser and the MVP Canada geese. The importance of the Wisconsin pools of the Mississippi River has been well documented by fall surveys, which show peaks of over 50,000 dabbling ducks and over 400,000 diving ducks in early November (USFWS 1996–2006). In particular, this area is important to canvasbacks and tundra swans (*Cygnus columbianus*). With the continental breeding population of canvasbacks generally ranging from 500,000 – 700,000, peak fall count of over 300,000 canvasbacks and spring counts of over 100,000 canvasbacks on the Wisconsin pools of the Mississippi river illustrates the importance of Wisconsin to this species (USFWS 1996–2006). In 2006, a one day survey documented over 6,000 swans, 38,000 mallards, nearly 40,000 scaup, 25,000 common goldeneye and over 100,000 canvasbacks on the Mississippi River during the spring migration in late March (Jim Nissen, pers comm.). These numbers alone are significant but they only represent a one day snapshot of use during a several week period of high waterfowl use during the spring migration. Other high profile locations such as the Horicon Marsh are also known for large waterfowl concentrations up to 300,000 of Canada geese and over 50,000 of ducks each fall. Wisconsin is currently part of a spring migration study to evaluate the quantity and quality of food resources for migrating ducks in the Mississippi Flyway (Eichholz and Yerkes 2007). Additional information on the populations and habitat of migrating ducks in Wisconsin is warranted in order to guide future management across Wisconsin and provide information to the public.



Bufflehead, photo by Dennis Malueg

Wisconsin is normally not mentioned as an important location for wintering waterfowl, yet midwinter surveys conducted in the first week of January and other observations indicate that as many as 250,000 – 450,000 ducks, geese and swans use Wisconsin waters in early January (Fronczak 2005, Fronczak 2006a). This includes as many as 27,000 – 50,000 mallards and 100,000 – 300,000 Canada geese using agricultural fields and open waters. The bulk of the remaining birds (70,000 – 100,000) come

primarily from scaup, goldeneye, bufflehead, long-tailed ducks (*Clangula hyemalis*) and mergansers wintering on Lake Michigan and smaller numbers of these ducks on the Mississippi River and larger lakes in southern Wisconsin. In addition, swans (mute

[*Cygnus olor*], trumpeter [*Cygnus buccinator*] and tundra combined) are observed in the midwinter survey, with numbers ranging from a few hundred to up to 4,000 birds.

While better data is needed to provide an accurate picture of waterfowl numbers in Wisconsin throughout the year, the data available clearly show that Wisconsin remains an important state for waterfowl in all seasons. The spring survey estimates over 500,000 adult ducks have been common over the last 15 years and the trend has been increasing suggesting that average annual production in Wisconsin has been good. From the period 2000-2006, the average spring breeding duck estimate for Wisconsin was 622,444 (Van Horn et al. 2006b). Assuming these 600,000 ducks represented about 300,000 hens, this would result in about 900,000 resident adult and young of the year ducks in Wisconsin in September, given average summer vital rates. Early migrants such as blue-winged teal would be leaving and arriving Wisconsin prior to the opening day of duck season in the state, however, there clearly would be a substantial number of ducks in Wisconsin on opening day. Considering total season harvests in Wisconsin have averaged just over 400,000 ducks in recent years it does not appear that duck numbers are a limiting factor for harvest early in the season. The limited fall/winter survey information and annual harvest data suggest that Wisconsin provides fall migration habitat for 100,000's of ducks in addition to those ducks produced in Wisconsin. It would seem that if some hunters perceive a lack of duck numbers in the fall, that the issue is likely one of duck and hunter distribution locally within the state rather than whether ducks are present in Wisconsin during the fall. For example, Wisconsin is fortunate to have over 15,000 lakes, many of which are in areas with relatively low fall human populations and low hunting pressure. While these public waters would not provide the high quality habitat that a state managed impoundment might, they still provide moderate habitat quality, open water refuges on most lakes and low hunter pressure over a large landscape. Staff observations confirm that waterfowl habitat in many places where human densities are low is providing fall stop-over opportunities that retain ducks in Wisconsin. Additional data on fall waterfowl populations, distribution and behavior is necessary to provide a clear picture of this situation.

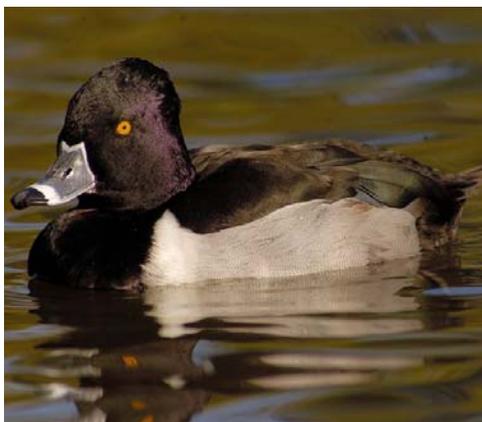
While Wisconsin is fortunate to have many quality water and wetland areas, there have been significant losses since pre-settlement periods. It is estimated that Wisconsin has lost about 50% of its original 10 million acres of wetlands, plus, our river systems have water control that limits natural fluctuations, and shoreline habitats along the Great Lakes and inland lakes continue to be impacted by development (Baker et al. 2000). While some wetland protections are in place to reduce additional losses,



*Photo courtesy of Ellen Lippincott / Judziewicz*

many factors such as drainage for agriculture, shoreland development, filling and altered hydrology for roads and development, declining water quality and nonnative species expansion continue to impact the quantity and quality of waterfowl habitat in Wisconsin. In addition to wetland loss, grassland loss has an impact on waterfowl nesting habitat and the quality of adjacent wetlands. In the face of this loss, Wisconsin has maintained a higher proportion of its original wetlands than many states and has been a leader in obtaining funds and implementing cooperative projects for restoration and enhancement of waterfowl habitat. Currently, 75% of Wisconsin's wetlands are in private ownership but there are a variety of public lands and programs, which contribute to waterfowl habitat (Table 3).

Wisconsin has been effective in securing and creating habitat for waterfowl but in order for our past successes to continue, conservationists must continue to express support for these programs. Wisconsin's waterfowl habitat goal is to restore/create 288,750 new acres as part of the JV in the period from 1998 to 2013; as of 2006, we have reached 76% of this goal and the Department has over 75 partner organizations involved in this effort. In 2006 alone, the Department, along with our partners, conducted 16,927 acres of habitat work under this plan. Since 1991, the Department and partners have obtained \$20 million in federal grants for waterfowl habitat, which was matched by \$50 million in partner or state funds, resulting in 97,000 acres of waterfowl habitat protected and/or enhanced. Under the federal North American Wetland Conservation Act, 50% of the available funds must be used for waterfowl habitat in Canada and must be matched by nonfederal (state) U.S. funds. The other 50% of this federal program is then available to states like Wisconsin to receive in grants. As a result, Wisconsin's state contributions to Canada are critical to the federal government releasing funds for states here in the U.S. The Wisconsin state waterfowl stamp program has generated on average over \$500,000 per year during the period 2000–2006 for waterfowl habitat work. Two-thirds of the state waterfowl stamp funds have been used in Wisconsin and most of this has been used on state wildlife areas



*Ring-necked duck, photo by Dennis Malueg*

that provide wetland habitat for waterfowl in spring, summer and fall. The Department has worked with Ducks Unlimited (DU) to send one third of those funds to Canada each year to contribute to waterfowl production habitat where birds that migrate through Wisconsin in the fall are produced. This money sent to Canada generates matching funds, which result in a 3 to 4-fold increase in funds spent on habitat there and in turn, DU has used other funds to create habitat back in Wisconsin. As of 2006, \$3.7 million dollars has been sent to Canada (Manitoba and Saskatchewan) through the Department's partnership with DU for breeding ground habitat

work since 1968. A total of 850,000 acres of habitat have been protected, restored or enhanced with these funds. In turn, DU has conducted extensive work by investing \$11.5 million in Wisconsin to protect 6,200 acres and restore/enhance 74,000 acres of

**Table 3: Public Lands Managed for Wildlife.**

June, 2007

<b>Federal</b>	<b>Total area (ac)</b>	<b>Wetland area (ac)</b>	<b>%</b>
Horicon NWR	21,000	17,000	81%
Necedah NWR	43,656	23,500	54%
Upper Miss NWR - WI portion	100,682	98,165	98%
Trempealeau NWR	6,226	4,592	74%
St Croix WMD	7,419 WPA	1,484	20%
	129 in easement	20	16%
Leopold WMD	12,118 in WPA	5,244	43%
	3,005 in easement	862	29%
CRP	611,336	17,396	3%
WRP	49,389	49,389	100%
<b>Totals:</b>	<b>832,289</b>	<b>217,652</b>	<b>26%</b>

<b>State</b>		<b>Total area (ac)</b>	<b>Wetland area (ac)</b>	<b>%</b>
Wildlife Management Areas	Easement	8,702	1,871	21%
	Fee	441,946	257,764	58%
	Lease	56,821	31,521	55%
Other wildlife lands	Easement	9,654	4,682	48%
	Fee	42,872	17,192	40%
<b>Totals:</b>		<b>559,994</b>	<b>313,030</b>	<b>56%</b>

land. In contrast to the threats to natural duck breeding habitat, the mixture of mowed grass, water and agricultural fields found across Wisconsin's landscape has supported an ever expanding population of resident Canada geese. While funding for the acquisition and restoration of waterfowl habitat over time has been good in Wisconsin, increasing maintenance needs, reduced staffing on USFWS and Department lands in Wisconsin and reallocation of staff time in the Department have reduced the capacity to maintain the quality of these habitats (USFWS 2007, WDNR staff pers comm.). The federal Wetlands Reserve and Conservation Reserve Programs (WRP and CRP, respectively) have been very important for creating and protecting private land grassland and wetland habitat important to waterfowl (Table 3). According to recent studies in Wisconsin, duck nest success on CRP grasslands was 30%, which is well over the 15-20% needed to maintain duck populations. Nest success on CRP was higher than on public grasslands (20%), which were still very productive (Gatti pers comm.). Current federal legislation reauthorizing these Farm Bill programs may reduce the effectiveness of these programs resulting in a significant loss of habitat in Wisconsin.

Wisconsin's 15,000 inland lakes, 2 Great Lakes and major river systems as well as its agricultural landscapes continue to provide important migration habitat for ducks and geese in the Mississippi Flyway, however, the changing landscape always raises new threats. The latest draft of the UMR/GLRJV plan noted the importance of Wisconsin

and the region to both spring and fall waterfowl migration habitat. However, the plan concludes that fall migration habitat is not a limiting factor for ducks or Canada geese (Soulliere et al. 2007). Late winter and spring habitat conditions necessary to support waterfowl production are not well understood and are currently under study in the Mississippi Flyway. It is suspected that the increased recreational use of Wisconsin's lakes may be reducing their suitability for some migrating waterfowl because of disturbance (Kahl 1991). The quality of river, lake and Great Lakes habitat and food for breeding and migrating waterfowl varies around the state. In some locations, water control or water quality degradation has lowered the overall quality of the habitat, while in others clean up and restoration efforts have made improvements. Additional research is needed to know more about current migrational use of habitats in Wisconsin and potential habitat needs to maintain ecological resources necessary for migrating waterfowl in Wisconsin. While our migration habitat may be available and able to meet the biological needs of waterfowl using the state, these same areas may not be accessible to waterfowl hunters. With over 75% of the wetland habitat in Wisconsin on private land and increasing competition for the use of lakes and rivers during the traditional duck hunting season from non-hunters, the importance of providing good habitat and controlling disturbance for waterfowl on lands open to hunting becomes more important.

Waterfowl hunters have experienced 60 day/6 bird daily bag seasons since 1997 and over 100 days of Canada goose hunting during most of this same period. There have been shorter periods with high bag limits or longer seasons in past decades but this combination of days available to hunt and relatively high bag limits for both duck and Canada goose seasons for this many years in a row has not been seen since the 1940's. Further, considering the high Wisconsin duck and Canada goose numbers, Wisconsin waterfowl hunters have likely had the best waterfowl hunting opportunity in



Canvasback, photo by Dennis Malueg

the last few years that has been experienced since hunting regulations were developed over 100 years ago. The current federal regulatory structure, combined with good mallard numbers across the traditional survey area plus Minnesota, Wisconsin and Michigan plus good wetland counts in the prairies/parklands of Canada have led to 60 day duck seasons with 6 bird daily bag limits. Providing these maximum duck season days has necessitated species specific reductions in hunting days or

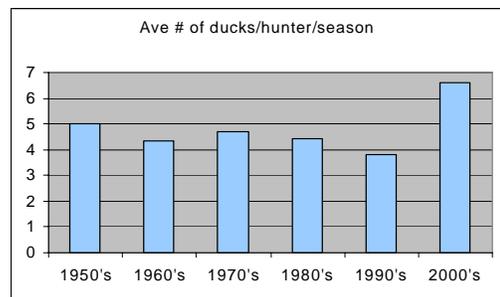
“season within a season” for canvasbacks and northern pintails (*Anas acuta*) in low population years for those species. The maximum number of days of open hunting for a species in a specific location in a season allowed by international treaty and federal law is 107 days. For most of the last several years, Wisconsin Canada goose hunting seasons have been at or very close to this maximum. The early September Canada goose season with 5 geese per day bag limits went statewide in 2000 and increased to

the maximum 15 day period in 2005. The Exterior and Horicon zones both had very long seasons during this period but bag limits were reduced in low MVP production years in accordance with quota restrictions. It has been suggested by hunter human dimensions research that as season length and bag limits are increased the expectations of hunters also increase, potentially decreasing satisfaction (Witter and Mycroft 2006). Despite this abundant waterfowl hunting opportunity and apparent good numbers of waterfowl, 58% of the Wisconsin duck hunters surveyed thought that duck hunting during this period had become worse. This information logically leads one to look more closely at the characteristics of the waterfowl hunter and the hunting experience.

**Table 4: Comparison of waterfowl hunting statistics.**

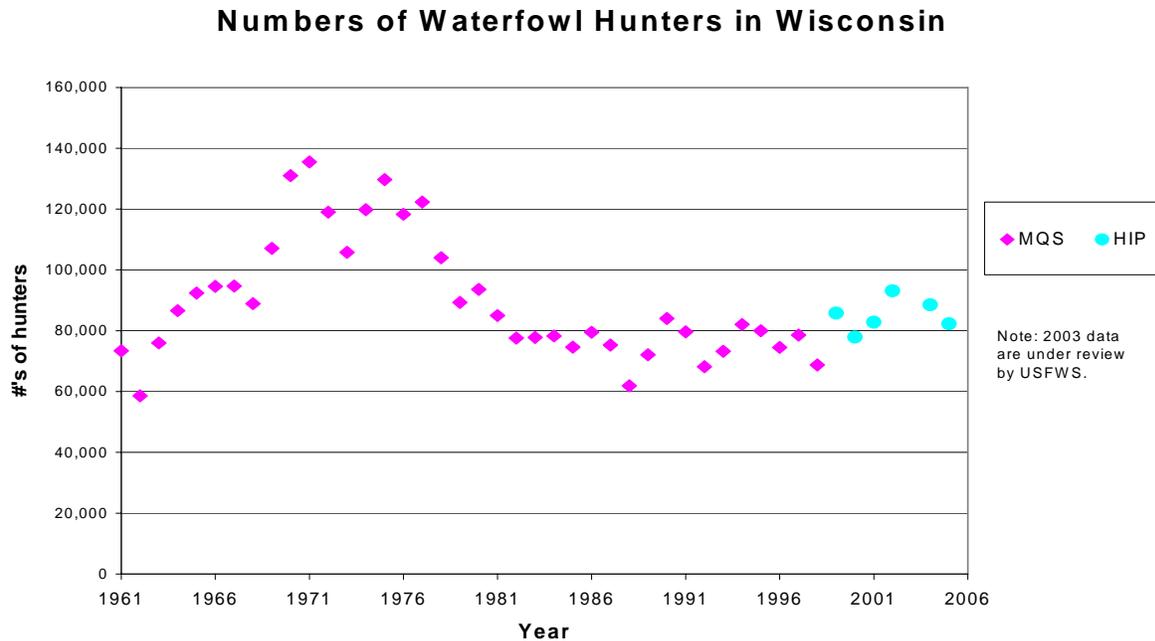
	Average # of Hunters	Ave # of ducks harvested	Ave # of ducks/hunter/season
1930's	35,000 to 84,000	501,000	5 to 14
1940's	66,000 to 102,000	472,000	4 to 7
1950's	100,000 to 134,000	560,000	4 to 6
1960's	85,800	410,000	4.33
1970's	117,000	595,300	4.71
1980's	77,500	380,000	4.43
1990's	75,500	307,000	3.82
2000's	85,000	436,000	6.60

Waterfowl hunting continues to be a popular and important part of Wisconsin's hunting experience. Wisconsin hunters typically hunt several different wildlife species in different seasons and nearly 20% of Wisconsin's population engages in some form of hunting or trapping (Prey et al. 2005). Wisconsin waterfowl hunters range from those seeking the early blue-winged teal and wood duck harvest in northern marshes to the early September Canada goose hunter in the southeast and from the Mississippi River hunter seeking canvasback in November to the later season mallard and Canada goose field hunters in central Wisconsin. Some duck hunters hunt primarily ducks while others occupy their fall with other forms of hunting from woodcock to archery deer hunting. Overall, they are a diverse and enthusiastic group that most defies generalizations about who they are and what they are looking for. Wisconsin ranked second in the nation behind Texas for the highest number of active waterfowl hunters in the most recent federal estimates of the 2005 season at 82,300 hunters (Padding et al. 2005). In previous years, Wisconsin generally ranked in the top 5 for the number of waterfowl hunters, nationwide. Comparing estimates of waterfowl hunters past and present is somewhat complicated by the fact that the federal system



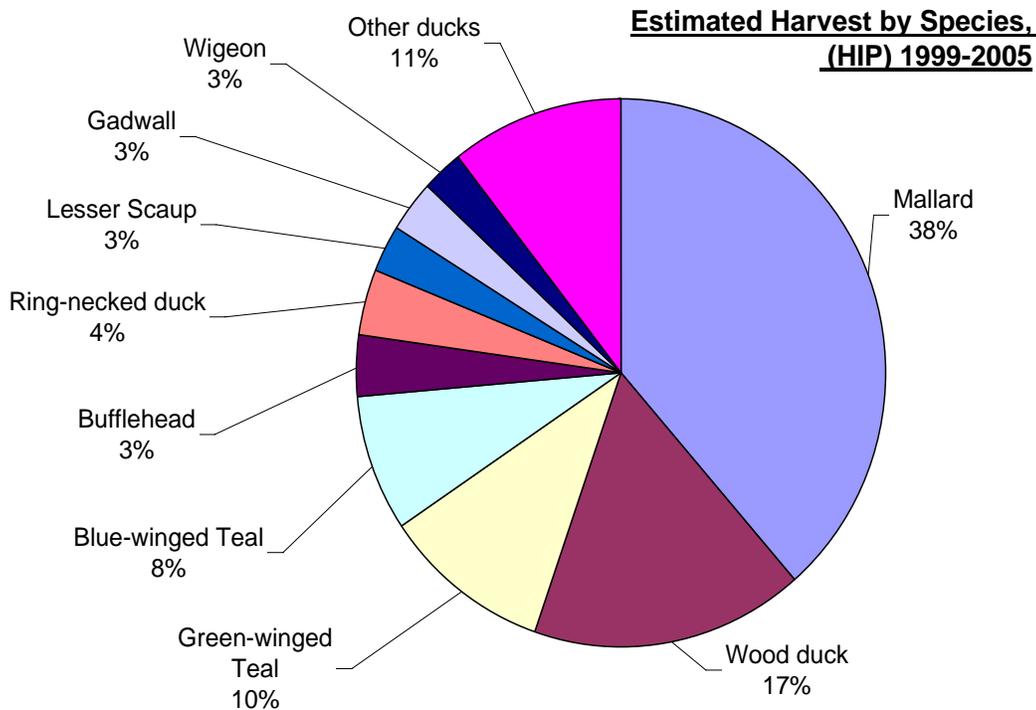
**Figure 8: Average numbers of ducks per hunter per season, by decade.**

for estimating waterfowl harvest and hunter numbers changed in 1999 upon introduction of HIP. This new system, however, provides confidence intervals, that the old MQS system did not, which allow for better assessment of the data. Recent intervals have



**Figure 9: Trend in Wisconsin waterfowl hunter numbers.**

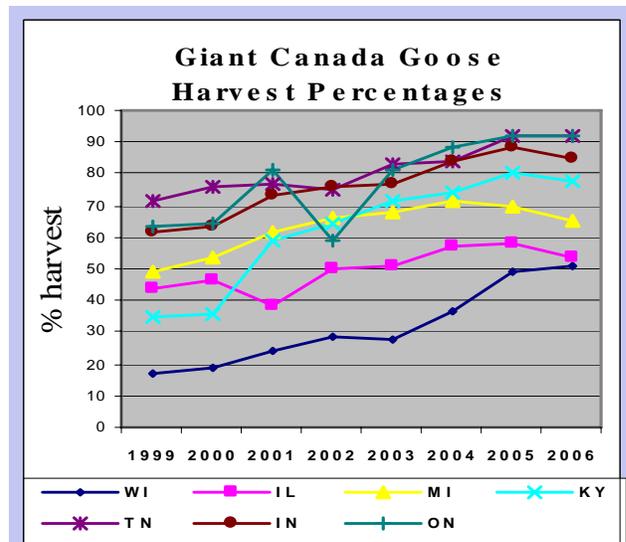
been +/- less than 10% (7% in 2005), which indicates a fairly precise estimate of hunter numbers. Further, recent published estimates of federal duck stamp sales from the last few years are in error and under review, so comparing past and present duck stamp sales as a measure of hunter numbers is problematic for this and for other reasons (Padding pers comm.). Estimates from HIP for the entire program period of 1999–2005 (excluding 2003 because it is under review by the UFSWS), show an average of 85,067 active waterfowl hunters in Wisconsin. When compared to the estimates available from different sources over the decades (Table 4, Figures 8 and 9), current waterfowl hunter numbers are similar to the average for the 1940’s and 1960’s, higher than average for the 1930’s, 1980’s and 1990’s and lower than the average for the 1950’s and 1970’s. The average total duck harvest for 1999–2005 as estimated from HIP is 436,043 ducks. This total duck harvest estimate is higher than the decade averages for the 1960’s, 1980’s, 1990’s and lower than the decade averages for the 1930’s, 1940’s, 1950’s and 1970’s. The average seasonal bag per hunter for 1999–2005 is 6.6 ducks/hunter/season. This estimate is higher than decade averages for the 1960’s–1990’s. While HIP is a different system than MQS for collecting this information, the data reviewed above, indicating high duck populations, long duck seasons and high bag limits during this same period, one might expect to see an increase in seasonal bag per hunter. Mallards (38%) and wood ducks (17%) remained the 2 ducks contributing over 50% of the state’s harvest (Figure 10). Green-winged teal (10%) and blue-winged teal (8%) contributed similar proportions to the total harvest as in the previous decade while all other species individually represented less than 5% of the total harvest. Also during this recent period, Canada goose harvest ranged from about 30,000 to about 74,000 in



**Figure 10: Estimated Wisconsin harvest by species, (HIP) 1999-2005.**

response to the changing season frameworks and annual MVP production. While this range is similar to the 1980's and 1990's, the early September season added an average of 13,500 more geese to the annual harvest total. The most significant change in Canada goose harvest in recent years is the increasing proportion of harvest in the regular season from the resident giant population, which increased from less than 20% in 1999 to about 50% in 2005 (Figure 11). While this is a significant change, Wisconsin still harvests a lower proportion of giants than all other states in the Mississippi Flyway.

Over the last few years, we have documented characteristics about Wisconsin duck hunters, which are helpful in planning for the future. In 2005, the Department partnered with the National Flyway Council and Wildlife Management Institute effort to conduct a nationwide and Wisconsin survey of duck hunters, which provided much needed information on hunter's opinions and experiences on a national, flyway and state level (National Flyway Council et al. 2006). With an estimate of over \$48 million spent annually on duck hunting alone, waterfowl hunters have a significant financial impact in Wisconsin. A large portion (91%) of Wisconsin duck hunters surveyed hunt



**Figure 11: Giant Canada goose harvest percentages.**

both ducks and geese. This is higher than the national result of 84% suggesting a response to the abundant Canada goose hunting opportunities in Wisconsin. Of the Wisconsin duck hunters surveyed in 2005, 58% said that duck hunting was one of their most important recreational activities while 9% said it was the most important. The 9% that rated duck hunting as most important was lower than the national results, where 14% of the duck hunters said duck hunting was their most important recreation. Wisconsin duck hunters are largely male (97%), which is similar to national results (99%). They are well distributed across most age categories; 13% are under 24 years old, 41% are of age 25 – 44, 40% are of age 45 – 64 and 6% are over age 65 (National Flyway Council et al. 2006). This is encouraging since the “under 24 year” category only represents about 12 years versus a 20 year span for the next 2 categories. Further, 18% of the Wisconsin hunters began waterfowling in recent years (1997–2004) and it appears a good number of the 25 – 44 year-olds began waterfowl hunting as adults. As mentioned above, interest in waterfowl hunting as measured by estimates of active waterfowl hunters appears to have been stable to higher in recent years. Further, Wisconsin waterfowl hunters continue to show enthusiasm for their recreation through strong involvement in private organizations and events. For example, the Wisconsin Waterfowl Hunters Conference held annually for the last several years had record attendance of 188 attendees in 2007. According to Ducks Unlimited, Wisconsin ranked 2<sup>nd</sup> in the nation for numbers of members (45,222) and 1<sup>st</sup> in the nation for grassroots fundraising in 2005 (\$3,175,000).

Wisconsin has a large and enthusiastic community of waterfowl hunters that have a history of strong conservation support. This community, however, is not uniform, so understanding the elements that bring satisfaction to waterfowling in Wisconsin is important to maintaining this interest. By examining the results of input from the duck



hunter survey, public workshops, special input sessions and annual public meetings, we can identify areas of satisfaction and areas in need of improvement from the perspective of the waterfowl hunter. When asked about the quality of duck hunting in Wisconsin, 58% thought that it had become worse between 2000–2004 while 39% thought it was about the same or better and 3% had no opinion (National Flyway Council et al. 2006). However, when asked about

their last duck hunting experience (fall 2004 season) 43% were satisfied, 25% neutral and 32% dissatisfied. In addition, 63% indicated that they were hunting the same or more days compared to 5 years before. We have no objective measure of the satisfaction of Wisconsin Canada goose hunters, however, based on increased participation levels in Canada goose hunting and relatively few issues raised during the

public input process it appears that the majority of Wisconsin's Canada goose hunters are having their expectations met most years.

Wisconsin waterfowl hunters are generally satisfied with the hunting season structures that they have experienced the last few years. At the state level various alternatives for the duck and goose hunting season structures are proposed each year and discussed throughout the regulatory process. Some options are consistently supported by Wisconsin's waterfowl hunters such as the 1 hen mallard bag limit and a desire for maximum days to hunt even if it means reducing daily bag limits (Van Horn pers comm., Van Horn 2006, Van Horn 2005b). The primary area of debate each year revolves around the scheduling of the season. Since there are a wide range of waterfowl hunting opportunities in Wisconsin, some hunters prefer later seasons in their pursuit of field hunting of Canada geese and mallards or diving duck hunting on large waters, while other hunters prefer earlier seasons for blue-winged teal and wood ducks and to avoid freeze up in some areas (Van Horn pers comm., Van Horn 2005a and Van Horn 2005b). The final season structure is normally a compromise between these competing desires. Wisconsin duck hunters surveyed were generally satisfied with the regulatory frameworks and decisions over the last few years with 64% indicating the season length was about right, 72% indicating that the daily bag limit was about right and 74% thought the timing of the duck hunting season was okay or improved in the last 5 years (National Flyway Council et al. 2006). In the future, maintaining an annual dialogue regarding which hunting season structure provides the maximum number of duck or goose hunting days and balancing the desires of those that would prefer to hunt earlier versus later should maintain general satisfaction with waterfowl regulations.

The aspects of the waterfowl hunting experience that seemed to lower satisfaction based on the collective public input since 2005 related to desires to see and harvest more ducks/geese and to have fewer contacts/conflicts with other waterfowl hunters. Wisconsin duck hunters indicated that the following had become worse in the last few years (2000–2004): when ducks arrive, how long ducks stay, overall duck numbers and number of places to hunt (National Flyway Council et al. 2006). They did not indicate that regulations, weather patterns or duck habitat had become worse.

However, in public meetings, hunters favored continued or increased levels of waterfowl habitat management on state wildlife areas (Van Horn 2005b). The hunters attending public meetings tend to be consistently more involved in issues so different results from a random survey of all waterfowl hunters on some issues is expected. When asked about problems related to their waterfowl hunting experience, hunters from the duck survey noted the following problems in order of most to least significant: crowding at hunting areas, hunting pressure, interference from other hunters, ducks arriving after



*Long-tailed ducks on a layout boat. Photo by Brian Buenzow.*

season close, ducks concentrating on fewer areas and shifting duck migration routes (National Flyway Council et al. 2006). In public input sessions, places to hunt where the hunter had low contact with other hunters and seeing ducks were the most important variables to a good waterfowl hunting experience (Van Horn 2005a and Van Horn 2005b). The strongest comments resulted from negative experiences hunters had with crowded hunting areas and poor ethics of other hunters. The number of ducks harvested generally came in as being not very important or moderately important for a good hunting experience. Given that available data indicate that overall duck



*Photo by James March*

populations during the last few years were good, it is likely that the local or in-state distribution of ducks is the reason why fewer ducks were seen. The number of ducks seen by an individual can be impacted by the site selection, habitat and the disturbance/pressure from other hunters. Overall, it appears that the variable most important to improving the duck hunting experience in Wisconsin is

providing sufficient locations for duck hunters to hunt without high hunting pressure and interference from other hunters. While other states in the Mississippi Flyway have fewer hunters than Wisconsin, nearly all of them have some public or private lands where hunter numbers or harvest pressure is managed in order to provide for a hunting experience where more ducks and fewer hunters can be observed.

**In summary**, a review of the present condition of waterfowl populations, habitat and hunting reveals the following:

- Waterfowl breeding populations in Wisconsin are at their highest levels since estimates were first attempted in the 50's and 60's and systematic surveys began in 1973.
- Over 10 years of 60 day/6 duck daily bag seasons combined with over 100 days of Canada goose hunting in most of these years, representing the highest combined hunting days and bag limits for Wisconsin waterfowl hunting opportunity in 60 years and hunters are generally satisfied with the regulations.
- While threats to waterfowl habitat continue, excellent programs are in place to continue a diligent system of acquisition, restoration and enhancement at the state and regional level. However, reductions in staffing and budgets on state and federal lands limit the ability to maintain quality habitat and conduct restorations, while state level private land policies and potential changes to national programs in the Farm Bill could significantly reduced private land habitat work.
- Waterfowl harvest levels are average to high compared with historical levels.

- Mallards, wood ducks and blue-winged teal are 3 of the 4 most abundant ducks in Wisconsin's harvest and local production is directly tied to the harvest of these species.
- Waterfowl hunter numbers are average compared to historical levels in Wisconsin and high compared with other states. Enthusiasm for the sport continues to be high in Wisconsin.
- There is a lack of information in Wisconsin on populations of waterfowl during migration and a lack of current information on waterfowl hunting pressure and activity at the local level.
- Despite long seasons and apparent high waterfowl populations, 30 – 60% of Wisconsin's duck hunters have not had their expectations met during recent hunting experiences.
- The most important variables for improving the waterfowl hunting experience for Wisconsin duck hunters are providing opportunities/locations for duck hunters to see more ducks and experience less hunter crowding.

For this last issue we can benefit from a bit of wisdom from the past:

*“To maintain the quality of wildfowling and to safeguard hunters on areas where waterfowl concentrate, one must limit the maximum numbers of hunters on the area at any one time, thereby providing sufficient space to insure an enjoyable experience for each party of hunters.” Jahn and Hunt (1964)*

## The Future

Interest in waterfowl and waterfowl hunting in Wisconsin has a long and interesting history. Waterfowl hunters have been a major conservation force in the state as they have raised millions of dollars through the purchase of federal and state waterfowl stamps, voiced grassroots support for wetland conservation and lands for waterfowl hunting, and partnered through many organizations on waterfowl habitat projects. The wetland and grassland habitat work funded and supported by these conservationists has provided habitat to many other wildlife species and provided multiple benefits to the state through the protection of wetland and water resources. The enthusiasm of this group remains strong in Wisconsin but their future enthusiasm and conservation strength depends on maintaining their passion for waterfowling, through good waterfowl populations, habitat and hunting experiences. A hope-filled future is ahead but will be realized only through continued strong partnerships across government, private organizations and waterfowl hunters.

Since 2005, the Department has been collecting public input and having discussions within state advisory groups, as well as at flyway and national levels, related to the future of waterfowl management and waterfowl hunting. Within the state of Wisconsin, the Department has held public workshops around the state, public input sessions at a statewide Waterfowl Hunter's Conference and has conducted discussions with the Migratory Game Bird Committee, the Conservation Congress Migratory Committee and

several waterfowl groups. At the Mississippi Flyway and national level, staff from the Department have been involved in numerous groups and processes, including the Future of Waterfowl Hunting Strategy Team formed by the National Flyway Council and the Wildlife Management Institute, development of the national duck hunter survey, development of the Great Lakes/Upper Mississippi Joint Venture Plan, as well as participation in a variety of flyway committees working with duck and goose hunting regulations as well as human dimensions of waterfowl hunting. The following program goal, objectives and strategies are proposals based on this collective information and they seek to balance the various (and sometimes competing) factors which influence our waterfowl management decisions.

**GOAL:** Continue to contribute to the continental management of waterfowl populations by providing year round habitats and management for migrating, wintering and local breeding birds while providing quality waterfowl hunting opportunities throughout the state, recognizing Wisconsin's diversity of habitats, hunting techniques, hunting heritage and waterfowl species.

**NOTE:** Under the following strategies, it is noted whether the strategy can be accomplished with **existing** Department resources or if **new** resources (funding, personnel, partnerships) would be required.

**Objective 1:** Continue to provide and expand habitats and management necessary to meet the year round ecological needs of Wisconsin's diverse waterfowl community and other wetland species with recognition given to the state's role as a waterfowl production state and its waterfowl hunting heritage.

Strategies:

- **New** – Conduct an evaluation of migratory (spring and fall), breeding and wintering habitats important for maintaining healthy populations of waterfowl and other wetland species across seasons and identify funding and policy needs to support the long term maintenance and enhancement of these habitats on public and private lands. Identify the existing state waterfowl areas that have aging wetland infrastructure needing replacement by 2009.
- **Existing** – Update the existing Wisconsin waterfowl habitat plan to reflect revisions of the Upper Mississippi River/Great Lakes Region Joint Venture (UMR/GLRJV) plan, the Department's Reversing the Loss: A Strategy for Protecting and Restoring Wetlands in Wisconsin, and other related efforts, and begin implementation by 2009.
- **Existing** – Seek a 5% increase over the 1997–2006 average in state breeding populations for mallards (265,000 to 278,250) and wood ducks (125,000 to 131,250) in accordance with the UMR/GLRJV plan and contribute to the UMR/GLRJV's goal of a 20% increase in blue-winged teal breeding populations (86,000 to 103,200) by 2018.
- **Existing** – Staff on state wildlife areas actively manage wetlands across the state to provide habitat for migrating waterfowl. Continue to manage wetland

habitat and wetland/water control infrastructure on public land to support fall hunting areas.

- **Existing** – Advocate within existing Department land acquisition and habitat programs for the need to focus attention on both ecologically important waterfowl habitat and lands near population centers to address hunter's desires for more hunting lands.
- **Existing** – Provide training and support opportunities on wetland and waterfowl management for land managers on a continuing basis.
- **Existing** – Continue to build on Wisconsin's successful partnerships for restoration and management of waterfowl habitat, including moist soil management and wild rice restoration.
- **Existing** – Continue to work at the federal level with agencies, conservation organizations and Wisconsin's congressional delegation to advocate for habitat programs in the Farm Bill, federal lands in Wisconsin and other programs.
- **Existing** – Continue to support Department-wide wetland protection and policy initiatives, contributing the knowledge necessary to provide for waterfowl populations in these wetland programs.
- **Existing** – Continue to support the need for nesting waterfowl habitat in public and private management and programs for grasslands.
- **Existing** – Invasive plant and animal species impact waterfowl and wetlands habitat. Continue to work across programs on control efforts for invasive plants and animals.

**Objective 2:** Monitor and evaluate waterfowl populations in Wisconsin across seasons and locations. Existing data provides a long term picture of Wisconsin breeding waterfowl populations, however, adequate data is lacking at a statewide and local scale for fall waterfowl numbers and distribution.

Strategies:

- **Existing** – Maintain existing annual spring breeding waterfowl surveys, assistance to MVP Canada goose breeding ground surveys, trumpeter swan surveys and annual waterfowl banding efforts (4,000 mallards, 4,000 Canada geese, 1200 wood ducks) in cooperation with the tribes, conservation groups, USFWS and Mississippi Flyway Council.
- **New** – Develop a coordinated system of fall waterfowl surveys across key regions of the state, including areas that may have little waterfowl hunting pressure, by 2010. To be fully implemented, these surveys will require additional LTE funding, cooperation from partners and aerial survey funding estimated at \$10,000 for airplane and other expenses, and funding for 400 man hours.
- **New** – Develop a system for statewide summary of fall waterfowl surveys and communication to the public via Internet information and postings.
- **New** – Reestablish property level brood surveys at important locations in the state through a coordinated program in order to add value to statewide

pair surveys and track long term trends in breeding around the state. Additional LTE funding and supply costs of about \$5,000 annually will be required.

- **New** – Use new survey data to evaluate statewide fall waterfowl populations, distributions, and local habitat conditions, and to evaluate the effectiveness of refuges and the need for disturbance reducing regulations.
- **New** – Convert the current LTE waterfowl assistant position to an FTE position in response to an increased work load from coordinating and communicating new surveys and other new responsibilities required to fully implement the strategies in this plan.

**Objective 3:** Improve the overall waterfowl hunting experience and the measures of waterfowl hunter satisfaction at the state level. Public input has consistently identified that the quality of the waterfowl hunting experience is affected by interactions (positive and negative) with other hunters as well as seeing and harvesting birds. No one strategy will improve the waterfowl hunting experience alone, but rather an integrated approach offering a range of hunting opportunities across the state would be ideal. The following strategies and those under other objectives seek to explore statewide regulations, reduce waterfowl disturbance, provide new hunting opportunities on private land and open water, and look at property based hunter management as methods to provide varied opportunities for waterfowl hunters.

Strategies:

- **Existing** – Continue to have a strong public involvement component as part of the annual process of establishing waterfowl hunting regulations.
- **Existing** – Continue a strong law enforcement presence during waterfowl hunting seasons.
- **New** – Establish regular waterfowl hunter surveys, bag checks and maintain regular public meetings to determine hunter and hunting characteristics (land types hunted, participation levels, etc), season regulation preferences and hunter satisfaction by 2009. New funding (\$15,000 annually) and cooperative Mississippi Flyway projects will need to be coordinated to increase data collection on waterfowl hunters. Additional LTE staff costs and supply funding for about \$6,000 annually will be required for property based work.
- **New** – Evaluate the effectiveness of refuges to “hold” birds on public waterfowl hunting grounds and other areas throughout the fall and use this evaluation to establish policy and criteria for waterfowl refuges.
- **New** – Evaluate rest days, reduced shooting hours and other methods for a few specific state properties or management units within properties to reduce waterfowl disturbance and improve waterfowl use on these areas throughout the fall.
- **New** – Seek legislative authority and funding to provide local managers an opportunity to innovatively create a few key quality waterfowl hunting

areas in the state where hunters could apply for and be provided a hunting location without disturbance from other hunters and an increased chance of seeing ducks in order to improve the hunting experience.

- **New** – Encourage managers of a few state wildlife areas important for waterfowl hunting to develop and test a combination of these quality hunting methods and waterfowl rest strategies on a few state lands as a way to provide alternative waterfowl hunting experiences. These efforts would be funded in part by hunt application fees at select locations.
- **New** – Evaluate the level, opportunities and strategies for waterfowl hunting on private lands.
- **New** – Develop new strategies for communicating waterfowl hunting locations around the state to better distribute hunters across available waterfowl hunting areas by 2010.
- **New** – Conduct a review of our current open water hunting regulations, new open water hunting techniques, open water waterfowl refuge values and open water hunting opportunities by 2009.

**Objective 4:** Manage resident Canada goose populations at a level that balances conflicting societal perspectives. One segment of society values our resident Canada geese for hunting and wildlife viewing while another segment considers them a nuisance or a source of damage to agricultural interests.

Strategies:

- **Existing** – Continue to work with flyway partners to monitor interior and resident Canada goose populations.
- **Existing** – Continue to provide both abundant and quality Canada goose hunting opportunities and continue to monitor statewide and local harvest levels.
- **Existing** – Continue to address human/Canada goose conflicts with integrated site specific management techniques (education, feeding ordinances, habitat alterations, deterrents, nest and egg destruction etc.) in partnership with landowners, local governments and U.S. Department of Agriculture-Wildlife Services (WDNR and US Dept. of Agriculture 2007, Wisconsin Urban Waterfowl Task Force 1998).
- **Existing** – Seek to manage the statewide resident Canada goose spring population index near the present level of 125,000, primarily through hunter harvest.

**Objective 5:** Strengthen and maintain Wisconsin's long waterfowl hunting heritage by developing new strategies for waterfowl hunting education and recruitment and by building upon existing Department programs (Warnke et al. 2002, March et al. 1998, Salwey 2004). Waterfowl hunter numbers in Wisconsin appear stable over the last 25 years while other groups of hunters (gun deer, small game etc.) have shown different trends from increasing to decreasing over this period. Education on waterfowl hunting techniques, opportunities and ethics can improve the overall hunting experience.

Strategies:

- **New** – Seek to increase the 10 year average of active waterfowl hunters by 5% over the current average of 85,000 by 2018.
- **New** – Develop waterfowl educational programs focused on multiple age groups as survey data suggests that new waterfowl hunter recruitment occurs at all ages and from other hunting groups.
- **New** – Explore ways to better inform hunters of places to hunt and waterfowl fall distributions (Internet information, periodic season updates etc.).
- **Existing** – Use existing Department and partner waterfowl hunter workshops to “train trainers” of other local groups to better distribute waterfowl hunting education opportunities around the state.
- **New** – Document and provide assistance to the current waterfowl hunting educational efforts being conducted around the state by wildlife and law enforcement staff, individuals, private groups and organizations (Green wing days, Learn to Hunt, etc.) by 2009.

**Objective 6:** Through continued research, refine and better understand the variables that affect resident breeding and migration populations of waterfowl, and apply this knowledge to management strategies.

Strategies

- **New** – Better define and apply information on fall/winter waterfowl populations and distributions and harvest derivations to improve state, regional and flyway level management strategies.
- **Existing** – Complete existing duck production studies and complete information transfer to ‘on the ground’ management.
- **New** – Expand and explore new research to address a wider range of questions such as those addressing spring and fall migration habitat limiting factors, changes in diver distribution during migration, statewide fall/winter waterfowl distribution, waterfowl disturbance issues and other emerging issues. This will require restoration of one FTE in Integrated Science Services and/or cooperative support for waterfowl research with the University of Wisconsin System.
- **New** – Expand and explore new research, monitoring and management approaches to investigate emerging diseases (such as avian influenza, Newcastles virus, trematodiasis) and detect trends in important endemic diseases (such as botulism).

With a rich waterfowl hunting heritage and a good foundation of habitat, waterfowl populations and hunters we look forward to a positive future for waterfowl and waterfowl hunting in Wisconsin. However, each year the threats to habitat continue, new

waterfowl issues emerge, the competing uses for land and people's time increase, and the management resources are stretched ever thinner. The objectives and strategies outlined above present a challenge to the Department and our many partners to maintain the key waterfowl management elements (land, water, hunting areas ...), collect and communicate accurate information, continue to work with flyway and national waterfowl management efforts, reclaim lost management resources (funding and staffing), and seek new strategies to assure a positive future for waterfowl in Wisconsin. The strategies identified as "new" will often require a combination of additional staffing and funding for waterfowl management in the Department as well as creative and productive partnerships through the state. If waterfowl enthusiasts wish to continue with a bright future, we will need to make our voices heard at the local, state and national level and have our hands ready to contribute to the future at all levels. With all the work and challenges ahead, we must remember also to get out and enjoy the whistle of wings across the marsh on a cool autumn morning....and bring a new waterfowl hunter along.



*Green-winged teal, photo by Ryan Brady*

## Appendix A. Hierarchy of waterfowl-related plans (detailed).



## Appendix B. Public Comments and responses on the Waterfowl Strategic Plan, Summer 2007.

In a review of the public comments, there emerged three primary groups of commenters with different themes of input. The three groups were waterfowl hunters/hunting groups, non-DNR agency/retired biologists and organizations/individuals with associated interests. The primary interest of the waterfowl hunters was how the plan would impact their specific hunting experience: issues of hunter density, season timing, places to hunt, and more waterfowl. The non-DNR agency/retired biologist group commented primarily on issues related to a desire to see the plan be more of a detailed work plan, and debated amongst themselves about priorities for management action or data related to waterfowl populations and hunters. Organizations or individuals with associated interests desired for this plan to address other issues ranging from shorebird habitat to private land value tax issues. The public input appeared to come from a good cross section of interested parties.

Most comments on the plan affirmed the following:

- Good history and background information
- Support the plan overall
- Happy to see this type of document put together
- Habitat work is the key, purchase more lands and we are willing to pay for it
- Wisconsin has many good things going for waterfowl and waterfowl hunting keep doing what you are doing.
- New strategies are generally on target with what is needed
- Glad to see hunter education and experience addressed
- Concerned that the funding is not available to implement this plan

Comment themes that require answers or changes:

**1) Objectives and Strategies need more detail, timelines, targets and resources**

The diversity of topics, programs and partners covered by the objectives and strategies make it difficult to provide detail in some areas. In some cases, the plan suggests a new direction that will first require some evaluation prior to outlining the details for implementation. However, we acknowledge that this is a good suggestion and where appropriate we have added targets, timelines and resources needed to accomplish the strategies.

**2) Why was the “Wisconsin Plan” for waterfowl habitat not updated as part of this strategic plan?**

The Department currently has more a detailed plan that outlines specific waterfowl habitat needs and priorities by township around the state. That plan is commonly referred to as the “Wisconsin Plan” for waterfowl habitat. The “Wisconsin Plan” is specific to habitat and is a step down plan which is a part of continental and regional strategies for the management of migratory waterfowl habitat. The management of migratory birds must be conducted in cooperation with other states and provinces because no one location provides all the annual habitat needs for waterfowl. The North American Waterfowl Management Plan is the continental guiding document for waterfowl habitat management while Wisconsin is part of a step down partnership of this plan called the Upper Mississippi Great Lake Joint Venture (UP/GRJV.) The UP/GRJV plan is currently under revision and soon to be completed. Once this regional plan is completed, the “Wisconsin Plan” will be revised and updated. The new “Wisconsin Plan” will incorporate the goals of the regional UP/GRJV plan as well as the objectives set for in the Waterfowl Strategic Plan and provide more detailed direction on priority areas for wetland habitat work.

**3) The Waterfowl Strategic Plan did not address economic barriers to privately owned wetland conservation nor regulatory wetland protection in detail.**

We recognize that the protection and restoration of wetland habitat on private lands is very important to waterfowl populations in addition to a wide range of other ecological values provided by wetlands on private lands. The protection of wetlands on private lands is important to the mission of the Department of Natural Resources in a number of program areas, thus, the Department is in the process of revising an umbrella document entitled “Reversing the Loss – A Strategy for Protecting and Restoring Wetlands in Wisconsin”. As a result, many wetland restoration and protection issues will be addressed in that document and do not need to be repeated here. However, this document will provide information regarding wetland habitat needs for waterfowl that can feed into the “Reversing the Loss” document.

**4) Some comments indicated that the Waterfowl Strategic Plan should include shorebird management while alternatively, other comments were concerned that**

**shorebirds and other non-game birds were going to be favored in wetland habitat work at the expense of ducks on state lands.**

We recognize that water and wetland management techniques can be valuable for both waterfowl and shorebirds and we regularly consider this in our public land management strategies. However, the management needs and issues related to shorebird conservation are provided for in national, regional and state level management plans. The WDNR is a partner in the Wisconsin Bird Conservation Initiative which has been developing an All Bird Plan which addresses the management needs for some shorebirds. Therefore shorebird information does not need to be repeated here. Much of the past and present wetland restoration and management through state and federal programs has been funded by duck hunters through hunting licenses, Pittman-Robertson firearm/ammunition taxes, state and federal waterfowl stamps and partnerships with duck hunting organizations. As natural resource managers, the managers of public and private lands have recognized that wetland management for ducks can benefit many wildlife species and sometimes minor adjustments in our practices can increase benefits to associated species while continuing to provide wetland habitat for waterfowl and waterfowl hunting.

**5) Some comments indicated that Wisconsin's waterfowl habitat program should be more focused on fall migration habitat while other comments indicated that we should focus on producing ducks through spring/summer breeding habitat.**

Wisconsin is identified as a waterfowl production state and is important to flyway and continental waterfowl production, however, it is also an important fall/spring migration location for several waterfowl species. In Wisconsin, efforts to restore, protect and manage habitat for waterfowl are multi-faceted. Some examples include advocacy for federal programs such as the Conservation Reserve and Wetland Reserve programs that have protected upland and wetland habitat for ducks on private land, acquisition of state and federal lands to protect or restore wetland and upland habitat, various programs and partnerships to restore habitat on private lands, and restoration and management of wetlands on public lands and waters. The reality is that most of the wetland restoration projects conducted in Wisconsin provide spring, summer and fall habitat for waterfowl in the same project. The vast majority of wetland projects supported by state waterfowl stamps funds and federal NAWCA grants in Wisconsin have created or enhanced wetlands on public lands/waters that produce ducks in the spring and provide migration habitat/hunting opportunities in the fall. Department wildlife managers across Wisconsin implement water drawdowns and other management each year that stimulate wetland plant growth, provide duck brood and shorebird habitat and provide good fall food plants for migrating waterfowl. The various state and federal programs that provide upland grassland habitat provide important nesting habitat for breeding waterfowl, habitat for a wide range of grassland wildlife and in many cases, good hunting opportunities for upland wildlife in the fall. In summary, the Department recognizes the value of both breeding and migration habitat for waterfowl and will continue to provide a balanced program for both needs. We see these needs as complimentary, not competing interests.

**6) Public comments on the idea of managing hunter densities on some public waterfowl hunting areas met with a number of very positive comments and a number of negative comments.**

The strategic planning process identified that hunter crowding and negative interactions between hunters was a major issue for waterfowl hunting in Wisconsin. One strategy proposed in the plan is to develop rules and strategies to provide some public land locations in the state where hunters could apply for and be provided waterfowl hunting locations on specific days where they would not be crowded. In general, the public input from hunters who had high quality waterfowl hunting experiences in other states favored Wisconsin having some of these opportunities on public lands. Hunters who had not experienced this type of hunting in other locations viewed this as potentially taking away their opportunity to hunt a specific location on a public hunting area. Some comments even proposed implementing a shell limit restriction on public hunting grounds. We acknowledge that the management idea for special hunting areas could have been explained better in the draft strategic plan and has been addressed in the final draft. At this point, the Department is proposing to establish a goal of providing a few public land areas in the state where waterfowl hunters could apply for or draw for locations to hunt waterfowl where there would be reduced hunter densities and a better quality hunting experience. We have one such location in Wisconsin already at the Bong Recreation Area. First, the opportunity for these locations would be developed and then local wildlife managers could propose all or a portion of their property to be included in this program for all or part of the duck hunting season. These proposals would be developed with public input at a local level, taking into consideration the property-specific management units and waterfowl hunting characteristics. It is not anticipated that this would occur on more than a few management units across the state. In addition, the management of hunter density on a few properties would be part of an integrated strategy of reviewing statewide regulations, exploring more hunting opportunities on open water areas and private land, providing better information to hunters on waterfowl hunting areas and reviewing options for closed areas or times in order to improve the overall waterfowl hunting experience.

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