



WISCONSIN WATERFOWL MANAGEMENT PLAN

2020-2030

Taylor Finger and Trenton Rohrer
Wisconsin Department of Natural Resources

*Front cover photos: Background: Taylor Finger, Hunting dog: Trenton Rohrer, Mallard in flight: USFWS, Habitat: Trenton Rohrer
Facing page background: Taylor Finger*



TAYLOR FINGER

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Taylor Finger, Wisconsin DNR Migratory Game Bird Ecologist
Trenton Rohrer, Wisconsin DNR Assistant Migratory Game Bird Ecologist

Wisconsin Department of Natural Resources
Bureau of Wildlife Management
P.O. Box 7921
Madison, WI 53707

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Wisconsin DNR Mission

*To protect and enhance our natural resources:
our air, land and water;*

our wildlife, fish and forests and the ecosystems that sustain all life.

To provide a healthy, sustainable environment and a full range of outdoor opportunities.

*To ensure the right of all people to use and enjoy these resources
in their work and leisure.*

*To work with people to understand each other's views
and to carry out the public will.*

And in this partnership consider the future and generations to follow.





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Plan Writers:

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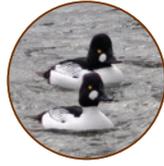
Acknowledgements

We would like to thank members of the Migratory Game Bird Committee for their assistance throughout the development and review of this Waterfowl Management Plan. This committee includes:

- Wisconsin DNR wildlife managers with responsibility for waterfowl management from each of the agency's five regions, the wetland habitat specialist, a research waterfowl biologist, and a conservation warden supervisor involved in waterfowl enforcement
- Representatives from federal and tribal agencies (USFWS, U.S. Department of Agriculture–Wildlife Services, Great Lakes Indian Fish and Wildlife Commission)
- Chair and multiple members of the Wisconsin Conservation Congress' Migratory Bird Committee
- Representatives from waterfowl and conservation organizations (Wisconsin Waterfowl Association, Ducks Unlimited, Wisconsin Wildlife Federation, La Crosse County Conservation Alliance, Green Bay Duck Hunters, Delta Waterfowl)

Approved by the Wisconsin Natural Resources Board on January 21, 2020.

Photo: USFWS



Executive Summary

Wisconsin has a long history of being an important state for waterfowl populations and waterfowl management. It has been nearly 150 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 Wisconsin's 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:

- Of the waterfowl estimated in spring surveys, mallard (*Anas platyrhynchos*), wood duck (*Aix sponsa*) and Canada goose (*Branta canadensis*) breeding populations in Wisconsin are all at or above their long-term averages, with blue-winged teal (*Anas discors*) breeding populations the only one still below the long-term averages.
- With over 20 years of 60-day/six-duck daily bag seasons combined with the maximum number of days of Canada goose hunting (107), hunters are generally satisfied with the regulations.
- While threats to waterfowl habitat continue, programs are in place to continue a diligent system of acquisition, restoration and enhancement at the state and regional level. Reductions in staffing and budgets on state and federal lands, however, limit the ability to maintain quality habitat and conduct restorations. State level private land policies and potential changes to national programs in the Farm Bill could significantly reduce private lands habitat work.
- Waterfowl harvest levels are average to high compared with historical levels.
- Mallards, wood ducks and blue-winged teal are three of the four 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 proving there is continued enthusiasm for the sport.
- 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, 20–40% of Wisconsin's duck hunters have not had their expectations met during recent hunting experiences.
- Based on state surveys, an important variable for improving the waterfowl hunting experience for Wisconsin duck hunters is to provide opportunities/locations for duck hunters to see more ducks and experience less hunter crowding.

Photo: Taylor Finger





Executive Summary continued

With this evaluation we present a goal, five primary objectives and associated strategies for the Wisconsin Department of Natural Resources' (Wisconsin DNR) waterfowl management program:

Goal: Continue to contribute to the continental management of waterfowl populations by providing habitats and management for nonbreeding and breeding species. Provide quality waterfowl hunting opportunities throughout the state, recognizing Wisconsin's diversity of habitats, hunting techniques, hunting heritage and waterfowl species.

 **Objective 1**

Maintain, enhance and manage habitats consistent with the Upper Mississippi River Great Lakes Region Joint Venture's Waterfowl Habitat Conservation Strategy to meet the year-round ecological needs of Wisconsin's diverse waterfowl.

 **Objective 2**

Monitor and evaluate waterfowl populations in Wisconsin across seasons and locations and use this information to guide habitat and harvest management.

 **Objective 3**

Through continued research, seek to better understand the factors that influence changes to resident breeding waterfowl populations, migrating waterfowl populations and waterfowl hunters. Apply new data to evaluate and update habitat and harvest management strategies as well as to seek a better understanding of hunter satisfaction and the public's interest in waterfowl.

 **Objective 4**

Improve waterfowl hunters' experiences and satisfaction, increase hunter recruitment and retention efforts and continue to educate hunters and the general public on Wisconsin's history of managing waterfowl and waterfowl hunting seasons.

 **Objective 5**

Manage resident Canada goose populations at a level that balances societal perspectives.

Photo: USFWS



CONTENTS

Executive Summary, iv

- Goal, v
- Objective 1, v
- Objective 2, v
- Objective 3, v
- Objective 4, v
- Objective 5, v

Commonly Used Acronyms and Abbreviations, 2

Introduction, 2

- Federal Management and the Flyway System, 5
- Waterfowl and Waterfowl Hunting, 5
- Wetland Habitat, 6

2010s-Present, 7

- Updates to Aging Documents, 7
- Waterfowl Surveys, 8
- Waterfowl Habitat/Stamp Funding, 11
- Canada Goose Management, 14
- Research, 15
- Waterfowl Health, 16
- Waterfowl Hunters, 18

The Future, 22

- Goal, 23
- Objective 1, 23
- Objective 2, 24
- Objective 3, 25
- Objective 4, 25
- Objective 5, 26

Appendix A. Hierarchy of Waterfowl Related Plans, 27

Appendix B. Canada Goose Conflict Management, 28

References, 30





PHOTOS: TAYLOR FINGER

Introduction

Waterfowl management and waterfowl related recreation are an important part of Wisconsin's past, present and future. The Wisconsin Department of Natural Resources (Wisconsin DNR) is charged with the primary stewardship responsibility for waterfowl populations and habitats in Wisconsin as well as the management of waterfowl hunting. The Wisconsin DNR is fortunate to have strong partners within the state who share the interest and responsibility for assuring a positive future for waterfowl populations and waterfowl hunting recreation in the state. The Wisconsin DNR has developed this management plan with the assistance and input of waterfowl hunters, conservation organizations, tribal interests and federal agencies. This plan documents the current status of waterfowl populations, habitats and hunting, identifies priority needs to assure a positive future for waterfowl management in the state and sets a course for maintaining waterfowl and waterfowl hunting as

COMMONLY USED ACRONYMS AND ABBREVIATIONS

- CRP** Conservation Reserve Program
- Wisconsin DNR** Wisconsin Department of Natural Resources
- DU** Ducks Unlimited
- Flyway** Mississippi Flyway
- HIP** Harvest Information Program
- JV** Joint Venture
- NAWMP** North American Waterfowl Management Plan
- UMR/GLRJV** Upper Mississippi River/Great Lakes Region Joint Venture
- USFWS** United States Fish and Wildlife Service

Figure 2. Wisconsin migratory game bird annual regulatory schedule.



Federal Plans



Flyway and Regional Plans



State Plans

Figure 1. Hierarchy of plans related to waterfowl management. See Appendix A for a detailed list of plans in each category.

important parts of Wisconsin’s future. It is a program-level plan that implements the overriding guidance provided by continental, Mississippi Flyway (flyway), Wisconsin DNR and Wildlife Management bureau plans and considers each of these as guidance (Figure 1, Appendix A). This plan is not intended to address all 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 Wisconsin DNR and partners.

Beginning in 2005, the Wisconsin DNR initiated the planning process to chart the future of waterfowl management with its first waterfowl strategic plan. The Wisconsin Waterfowl Strategic Plan identified management goals and objectives for 2008–2018. After a decade with specific management goals and objectives, we are in a place to review what we have accomplished and chart out the next 10 years of waterfowl management in Wisconsin. Throughout

this process Wisconsin DNR has worked to collect public input from a variety of sources including the department’s Migratory Game Bird Committee (see page iii), the Migratory Bird Committee of the Conservation Congress, a variety of waterfowl hunting and wetland interest groups, surveys of hunters, annual Wisconsin DNR waterfowl public meetings, special sessions at the annual Wisconsin Waterfowl Hunters Conference as well as letters, phone calls and emails. In addition, a plan for the management of migratory waterfowl requires annual communication with partners and other planning efforts at the state, regional, flyway, national and international level (Figure 2). An abundance of available scientific information has been reviewed and serves as a foundation for this plan. Table 1 presents the general process and timeline for development of this Waterfowl Management Plan and Table 2 identifies sources of public input used during the planning process.

FEBRUARY/EARLY MARCH

Meet with Wisconsin advisory and waterfowl groups.

EARLY MARCH

Meet with Conservation Congress Migratory Bird Committee.

MARCH

Conduct public hearings on waterfowl rule.

MID-APRIL

Natural Resource Board votes on permanent and emergency rule.

LATE-APRIL

Submit Wisconsin season selections to U.S. Fish and Wildlife Service.

MID-MAY

Publish Wisconsin migratory bird regulations.





Table 1. General process and timeline for development of Waterfowl Management Plan.

Issue Identification and Planning

Spring/Summer 2018 – Establish Waterfowl Management Plan Ad Hoc Committee with representatives from partner agencies and waterfowl groups

March 2018 – Public input session as part of the Wisconsin Waterfowl Hunter’s Conference. Conference is typically attended by 150 waterfowl hunters from across the state

March 2018 – Conduct public meetings in several locations around the state to seek initial information from waterfowl hunters on issues, desires and strategies for waterfowl management in Wisconsin

Data Collection and Coordination with Other Flyways and National Efforts

2017–2018 – Wisconsin DNR staff participation in related Flyway planning efforts and National Waterfowl Hunting Strategy Team

Fall 2017 – Survey mailed to a random sample of 1000 waterfowl hunters and results summarized

February 2018 – Results of Wisconsin Waterfowl Hunter Survey released

Spring 2018 – Analysis and presentation of Waterfowl Hunter Survey results, feedback from Wisconsin Waterfowl Hunters Conference, advisory committees and spring public hearings on plan development

Spring 2018 – Receive results from National Waterfowl Hunter Mail Survey

Plan Development

Fall/Winter 2018/2019 – Draft plan development

Fall/Winter 2018/2019 – Coordination with Joint Venture and Wisconsin Waterfowl Habitat Conservation Strategy Plans

Draft Plan: Public Presentation and Review

January 2019 – Initial draft plan for internal Migratory Game Bird Committee review

March 2019 – Presentation of draft plan objectives at Wisconsin Waterfowl Hunters Conference and Spring Waterfowl Hearings

April 2019 – Draft plan for internal Migratory Game Bird Committee review

May 2019 – Discussion of plan at Migratory Game Bird Committee meeting

August 2019 – Public meetings and review period

Fall/Winter 2019/2020 – Plan completion and presentation to Natural Resources Board

Table 2. Summary of public input process for Waterfowl Management Plan.

Annual Wisconsin DNR meetings/hearings – 100s of comments each year

Conservation Congress spring hearings annually – 1000s of specific questions

2018 and 2019 Waterfowl Hunters Conference – input from over 100 hunters

Waterfowl group and local meetings – several meetings each year

Statewide random duck hunter survey – 3000 mailed surveys

State and federal duck/goose harvest data

Annual youth hunt survey

Spring/Summer 2018 and 2019 input from meetings, groups, email, mail, etc. – Over 200 people

USFWS



Figure 3. Natural flyways.



Figure 4. Management flyways.

Federal Management and the Flyway System

Waterfowl are migratory birds, which are protected under international treaties and the federal 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, four councils of state and provincial agencies have been established based on general migratory flyways encompassing the continent to collectively work with the USFWS and the Canadian Wildlife Service. Wisconsin is a member of the Mississippi Flyway Council, 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).

Through this structure Wisconsin works with other states, tribes, provinces and the two 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 DNR staff have been active leaders in flyway, national and continental waterfowl programs and initiatives through this cooperative system.

Waterfowl and Waterfowl Hunting

For over 60 years, annual breeding waterfowl and habitat surveys have been conducted across North America through a cooperative effort among the USFWS, Canadian Wildlife Service, 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 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 to make recommendations on duck hunting season length and daily bag limits (USFWS 2018a). Spring breeding Canada goose estimates also guide goose hunting season structures. These proposals are discussed within each of the four 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 four flyways. Each state can then establish state-level duck hunting seasons within the sideboards established in these frameworks (Figure 2). Every year, Wisconsin DNR 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.

Wetland Habitat

Management of migratory waterfowl requires the coordinated management of breeding, migration and wintering habitat across North America. Therefore, international, federal and regional habitat programs were established 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 and 2).

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). The NAWMP has been revised and updated several times since 1986 with the most recent revision occurring in 2012 (USFWS and Canadian Wildlife Service 2012). 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 stepped down conservation plan in 1992 and has subsequently reviewed and revised this plan, with the most recent revision occurring in 2017 (Soulliere et al. 2017). Wisconsin is also in the process of updating and re-writing a state-level waterfowl habitat conservation strategy based on the continental and regional goals which should be available in 2020. Wisconsin benefits from the habitat conservation efforts of JVs 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 JVs 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 numerous other Wisconsin DNR/partner plans such as Reversing the Loss: A Strategy for Protecting and Restoring Wetlands in Wisconsin, the Fish, Wildlife and Habitat Six-Year Plan and the Wisconsin Bird Conservation Initiative’s All Bird Plan (Appendix A). Regarding habitat, this waterfowl management plan will identify habitat needs and priorities related to waterfowl that can then be incorporated in other habitat related plans.



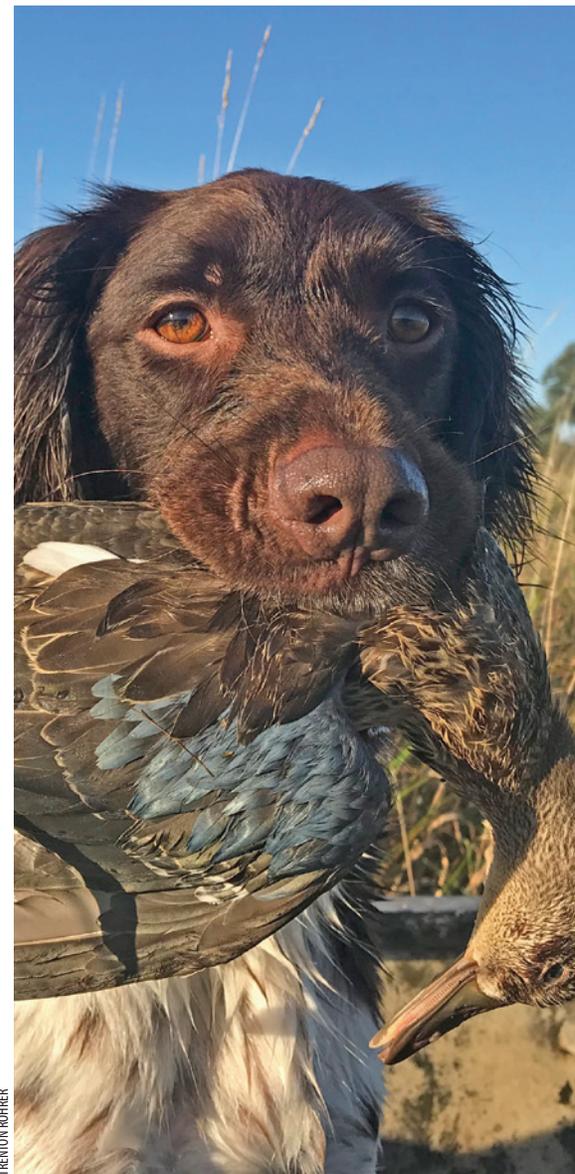
LEFT: TRENTON ROHREK, RIGHT: PATRICE EYERS

2010s–Present

Many management changes have occurred in the past decade in Wisconsin and across the Mississippi Flyway. These changes were influenced by new innovative forward-thinking management strategies, record setting continental breeding populations of ducks and geese and struggles with ever changing priorities, workloads and budgets. During this time, we began liberalizing and simplifying rules in the state and across the flyway. Wisconsin is fortunate in that it has a long-standing heritage of hunting, and a public that supports the acquisition and protection of Wisconsin's vast and diverse habitats across the entire state. Since the middle 1990s, budget and staffing cuts, increasing workloads and shifting priorities within the Wisconsin DNR's Bureau of Wildlife Management 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. Wisconsin DNR partners such as the Ducks Unlimited, Wisconsin Waterfowl Association, USDA and the USFWS continue to provide technical support on private lands wetland restoration while Wisconsin DNR resources dedicated to private lands assistance have been reduced.

Updates to Aging Documents

In the past decade we have also seen many aging waterfowl management documents updated, which has brought new strategies to habitat management in the state. In 2012, the North American Waterfowl Management Plan (NAWMP) was revised. The 2012 NAWMP was built to incorporate a third pillar to waterfowl management. The first two pillars of focus were waterfowl populations and waterfowl habitat, but managers recognized a need to include an important aspect which focuses on consumptive and non-consumptive users and their role on waterfowl management. The Upper Mississippi River/Great Lakes Joint Venture Plan was re-written and published in 2017. This plan has a regionally specific focus but reflects the same goals as the NAWMP. In 2018, the rewriting of the Wisconsin Waterfowl Habitat Conservation Strategy (formerly referred to as the "Wisconsin Plan") began and was finished in 2019. The Wisconsin Waterfowl Habitat Conservation Strategy is a step-down plan of the Upper Mississippi River/Great Lakes Joint Venture Plan and will help Wisconsin identify priority areas for waterfowl habitat management.



TRENTON ROHREK

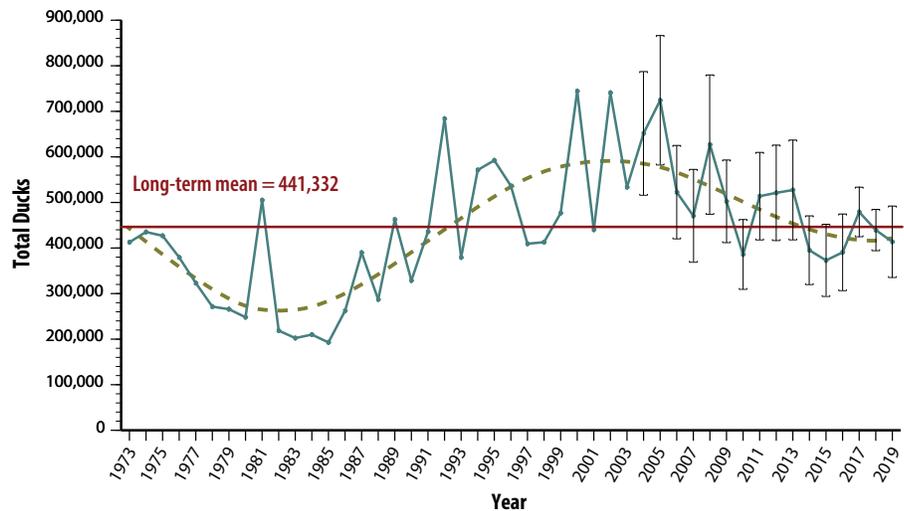


Figure 5. Wisconsin total breeding duck population estimates, 1973–2018.



TRENTON BOMBER

Waterfowl Surveys

Wisconsin’s spring breeding waterfowl survey continues to be evaluated, improved and remains an important part of the federal regulatory process. The Wisconsin DNR has continued strong banding efforts with an annual quota of 4,000 mallards, 1,500 wood ducks and 4,000 Canada geese while the USFWS staff has had to reduce their efforts for waterfowl banding in Wisconsin. Managers met in 2018 to take a part in a banding training session where they were trained in sexing, aging and capture techniques for the different waterfowl species banded in the state. The agency has also continued to evaluate and improve its banding efforts to assure that these efforts function at a level that meets Wisconsin’s commitments. In addition to spring surveying efforts, Wisconsin DNR also participates annually in the mid-winter waterfowl survey as part of its flyway commitments. Wisconsin’s management of the annual regulatory process (Figure 2), our annual waterfowl public involvement process and our contributions to Mississippi Flyway and national efforts are being maintained at adequate levels. The Wisconsin DNR 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 Wisconsin DNR to increase efforts with regards to maintenance of existing wetlands, monitoring of fall waterfowl populations and managing/monitoring waterfowl hunting satisfaction, which are reflected in this management plan’s goals, objectives and strategies.

Wisconsin continues to be an important state for waterfowl breeding and migration in the Mississippi Flyway. Most of Wisconsin’s breeding waterfowl populations are near or above their long-term estimates (Figure 5). At a continental level, waterfowl populations and breeding ground conditions have been at record highs with a slight decline occurring in 2017 and 2018. However, in Wisconsin the average total breeding duck population for the period 2010–2018 was 450,547 (Figure 5) and the average number of breeding mallards for this period was 184,644 (Finger et al. 2018). While there is always year-to-year variations in habitat



USFWS

quality and brood production, the stable 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 41% mallard, 23% wood duck, 14% blue-winged teal and 21% of 12 other species (Finger et al. 2018). A variety of other duck species breed in Wisconsin in smaller numbers including ring-necked ducks (*Aythya collaris*) redheads (*Aythya americana*), ruddy ducks (*Oxyura jamaicensis*), green-winged teal (*Anas carolinensis*), northern shovelers (*Anas clypeata*), gadwall (*Anas strepera*), black ducks (*Anas rubripes*), hooded mergansers (*Lophodytes cucullatus*) and common mergansers (*Mergus merganser*). Mallard populations now average two times more than those in the 1970s. The overall trend on the breeding mallard population appears to be leveling off following a 20+ year increase. Wood duck populations had increased 6% per year for over 30 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 or even slightly declining. Wood ducks continue to be a significant contribution to the state's breeding waterfowl population at a level near 100,000 birds annually. The lower than historic blue-winged teal breeding population numbers continue to be a concern and additional research on this species in Wisconsin has been conducted. Also, as a result of a successful reintroduction program, the trumpeter swan (*Cygnus buccinator*) breeding population estimate

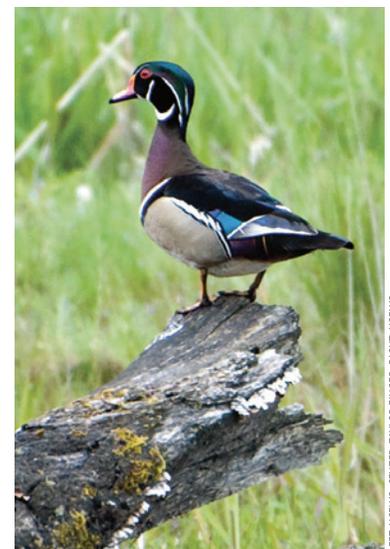
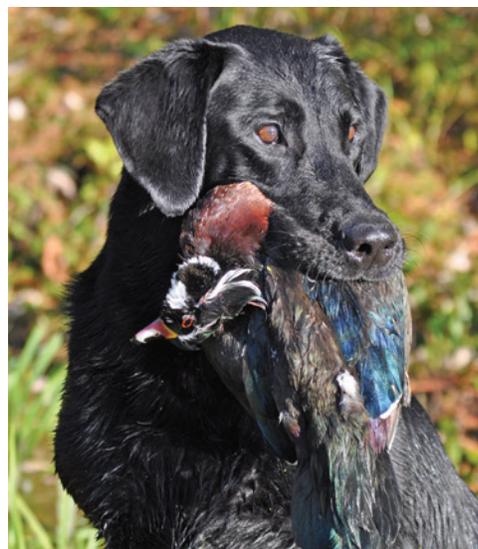
continues to increase annually, reaching 5,029 in 2016. The population was expected to increase at a rate of 6–8% annually, but we have observed a 14% annual increase exceeding our expectations. Our management efforts for breeding waterfowl in Wisconsin appear to be working and we need to maintain these stable to excellent conditions.

Wisconsin duck breeding populations and habitat programs have a direct impact on Wisconsin's fall duck harvest. It is no coincidence that mallards and wood ducks are the two most abundant breeding ducks in Wisconsin and are also the two 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 32% of Wisconsin's fall duck harvest and about 70% of these mallards are produced in Wisconsin (Arnold et al. 2013). Further, wood ducks are 22% of the total Wisconsin duck harvest and the birds harvested in Wisconsin are primarily hatched in Wisconsin or adjacent states/provinces. The third most abundant Wisconsin breeder and fourth most abundant duck in the Wisconsin duck hunter's bag is the blue-winged teal at about 7% of the total harvest (Figure 7). Depending on the annual variation in breeding conditions in Wisconsin versus the prairies, up to 30% of the blue-winged teal harvested during the regular season in Wisconsin are produced here (Szymanski and Dubovsky 2013). As a result, depending on annual conditions, 50–70% of our total duck harvest in Wisconsin is produced in Wisconsin.



Our resident Temperate Breeding Canada goose population has continued to grow at a rate of 7% per year since 1986 (Finger et al. 2018) with an average count in the spring survey of 145,453 for 2010–2018. This is characteristic of the surrounding region since giant Canada geese are now the most abundant subspecies in the Mississippi Flyway (Luukkonen and Leafloor 2017). This increasing population, however, is not welcome in many urban/suburban locations and human-geese conflicts need to be considered in Wisconsin’s future waterfowl management. The Interior Nesting (formerly 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. We have observed generally a stable to declining trend in this population with an average population estimate of 300,000 birds over the past 10 years (Finger and Dhuey 2016). Several hundred thousand of these geese migrate through Wisconsin each fall with many remaining in southern Wisconsin through much of the winter. Wisconsin is normally not mentioned as an important location for wintering waterfowl, yet mid-winter surveys conducted in the first week of January and other observations indicate that as many as 69,000–300,000 ducks, geese and swans use Wisconsin waters in early January (Fronczak 2017). This includes as many as 19,000–40,000 dabbling ducks (mostly consisting of mallards), 20,000–80,000 diving/sea ducks (mostly consisting of scaup, goldeneye and long-tailed ducks) and 23,000–200,000 Canada geese using agricultural fields and open waters (Fronczak 2017).

As noted previously, we lack the data to objectively evaluate any change in status of Wisconsin’s statewide waterfowl populations outside the spring breeding season. The Upper Mississippi River/Great Lakes Region Joint Venture (UMR/GLRJV) plan, however, identifies Wisconsin as part of those conservation regions important for several migrating waterfowl species including wood duck, gadwall, northern pintail (*Anas acuta*), green-winged teal, canvasback (*Aythya valisineria*) and lesser scaup (*Aythya affinis*) (Soulliere et al. 2017). The importance of the Wisconsin pools of the Mississippi River has been well documented by fall surveys, which show peaks of over 80,000 dabbling ducks and over 700,000 diving ducks in early November (USFWS 1996–2012). 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 counts of over 300,000 canvasbacks and spring counts of over 100,000 canvasbacks on the Wisconsin pools illustrate the importance of Wisconsin to this species (USFWS 1996–2012). Other high-profile locations such as the Horicon Marsh (southeastern Wisconsin) are also known historically for large waterfowl concentrations of up to 300,000 Canada geese and over 50,000 ducks each fall (USFWS 2018b). Green Bay/Lake Michigan have also shown increased duck use in the fall with estimates of over 80,000 birds using Green Bay alone (Martinez et al. 2017). Additional information on the populations and habitat of migrating ducks in Wisconsin is warranted in order



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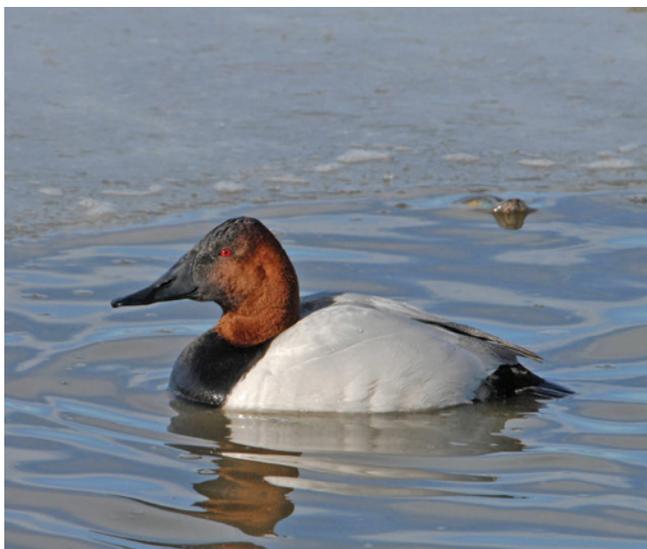
to guide future management across Wisconsin and provide information to the public.

While better data is needed to provide an accurate picture of waterfowl numbers in Wisconsin throughout the year, the available data clearly show that Wisconsin remains an important state for waterfowl in all seasons. The spring survey estimates over 450,000 adult ducks have been common over the last 10 years and this trend has been fairly stable, suggesting that average annual production in Wisconsin has been good. Early fall migrants such as blue-winged teal will be leaving and arriving 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. To take advantage of these early migrating teal, Wisconsin began the process of establishing an early teal season along with other waterfowl production states (Michigan and Iowa) in 2013. A three-year experimental season began in 2014 and after four years of experimental status, Wisconsin was granted operational status by the USFWS. To hold an early teal season, 180 observations of hunting parties were needed across the three years for all three states and hunters in each state could have a 25% attempt rate on non-teal ducks and a kill rate of non-teal ducks of 10%. With nearly 425 total observations across all three states, which more than doubled the requirement by the USFWS, and with a combined attempt rate of 5.5% and kill rate of 2.5% on non-teal ducks, all three states passed the experiment (Luukkonen et al. 2017). Wisconsin held its first statewide operational teal season in 2018.

Waterfowl Habitat/Stamp Funding

The limited fall/winter survey information and annual harvest data suggest that Wisconsin provides fall migration habitat for hundreds of thousands of ducks in addition to those 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 clearer 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, many 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 (Hagen 2008). While some wetland protections are



LEFT: USFWS. RIGHT: ROBERT METROPULOS OF ARBOR VITAE

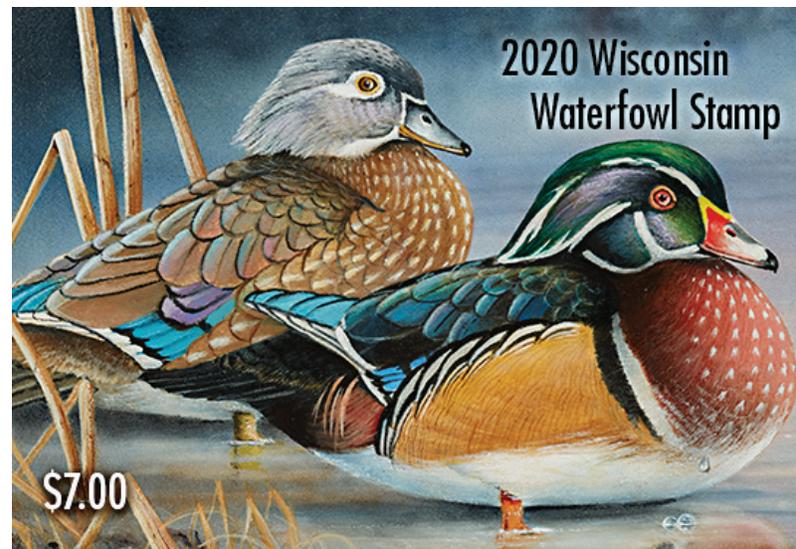




Table 3. Public lands managed for wildlife.

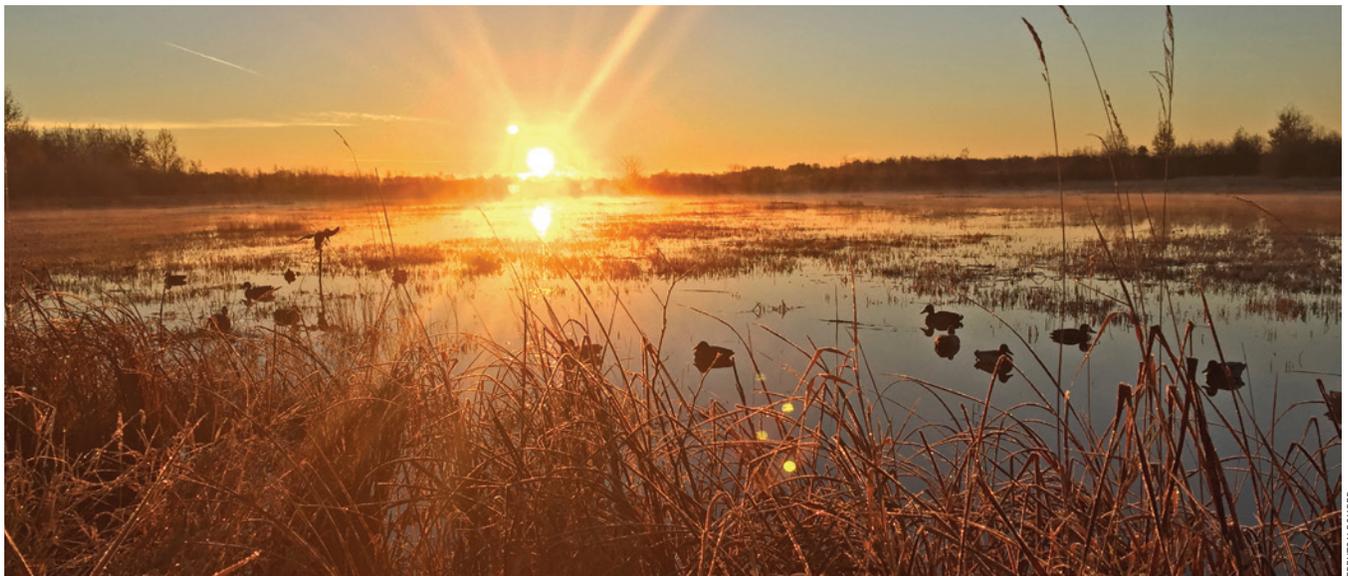
State/Federal	Total Area (ac)	Wetland Area (ac)	Percent %
Wisconsin DNR Managed Land	1,839,955	645,322	35%
Horicon NWR	21,000	17,000	81%
Necedah NWR	43,656	23,500	54%
Upper Miss NWR – WI portion	100,682	98,165	98%
Trempealeau NWR	6,226	4,592	74%
St. Croix WMD	7,419 WPA	1,484	20%
	129 in easement	20	16%
Leopold WMD	12,118 WPA	5,244	43%
	3,005 in easement	862	29%
CRP	231,278	5,268	0%
WRP	67,494	67,494	100%
Totals:	2,332,962	868,951	37%

Note: NWR=National Wildlife Refuge; Upper Miss=Upper Mississippi River Wildlife and Fish Refuge, WMD=Wetland Management District

in place to reduce additional losses, 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 for our past successes to continue, conservationists must continue to express support for these programs. Wisconsin's waterfowl habitat goal is to restore/create 223,458 new acres as part of the new JV plan. Since 1991, the Wisconsin DNR and partners have obtained \$45 million in federal grants for waterfowl habitat, which was matched by \$90 million in partner or state funds, resulting in 150,000 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 non-federal (state) U.S. funds. The other 50% of this federal program is then available for 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 2010–2017 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 that provide wetland habitat for waterfowl in spring, summer and fall. The Wisconsin DNR has worked with Ducks Unlimited (DU) and Delta Waterfowl

BOTTOM: BILL HIRT, CENTER: EEFREY WILLIAMS, TOP: BRANDON BRADEN



TREVIN ROHRE

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 three- to four-fold increase in funds spent on habitat there, and in turn, DU has used other funds to create habitat back in Wisconsin. From 2010–2018, \$1.4 million has been sent to Canada for habitat work on the breeding grounds. In addition, nearly \$5 million dollars have been sent to Canada (Manitoba and Saskatchewan) through the Wisconsin DNR’s partnership with DU for breeding ground habitat work since 1968. A total of over 850,000 acres of habitat have been protected, restored or enhanced with these funds. In turn, DU has conducted extensive work by investing over \$11.5 million in Wisconsin to protect over 6,000 acres and restore/enhance 80,000 acres of land. 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 Wisconsin DNR lands in Wisconsin, and reallocation of staff time in the Wisconsin DNR have reduced the capacity to maintain the quality of these habitats (Wisconsin DNR 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 highly productive (R. 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, two 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 updated UMR/GLRJV plan noted the importance of Wisconsin and the region to both spring and fall waterfowl migration habitat. The plan, however, concludes that fall migration habitat is not a limiting factor for ducks or Canada geese (Soulliere et al. 2017). Late winter and spring habitat conditions necessary to support waterfowl production are not well understood and are currently under study in the Mississippi Flyway. The quality of river, lake and Great Lakes habitat and food for breeding and migrating waterfowl varies around the state. 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. 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 is becoming more important.



Canada Goose Management

Waterfowl hunters have experienced 60-day/six-duck 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 1940s. Further, considering the high to stable Wisconsin Canada goose numbers, Wisconsin waterfowl hunters have likely had the best Canada goose hunting opportunity in 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 along with Minnesota, Wisconsin and Michigan plus good wetland counts in the prairies/parklands of Canada have led to 60-day duck seasons with six-bird daily bag limits. 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 the last several years, Wisconsin Canada goose hunting seasons have been at this maximum. The early September Canada goose season with five geese per day bag limits went statewide in 2000 and increased to the maximum 15-day period in 2005. Over the past decade we began seeing temperate breeding Canada geese begin to make up more of our hunter's bags than the interior nesting birds. The interior nesting Canada geese had been making up about 60% of our harvest in the 2000s, however, in 2011–2015 the harvest derivations changed showing only 45% of Wisconsin's regular Canada goose season harvest was occurring on Ontario nesting Canada geese (Dooley pers. contact 2016). Starting in 2018, Wisconsin increased the daily bag limit to 3 Canada geese, and the Wisconsin DNR will continue to monitor harvest and both Canada goose populations.

In 2017, due to legislative action the Wisconsin DNR's Canada goose registration requirement was eliminated and was replaced by a mailed goose hunter survey similar to the small game survey sent out annually. During this past decade some of the remaining special zones such as the Burnett County closed area, Rock Prairie Subzone, Collins zone, and multiple liberalizations were made to the Horicon zone, which included increased bag limits and reducing the area and time restrictions. In 2018, the Horicon Canada goose management zone was removed completely. The decision to remove the Horicon zone was based on a variety of regulatory, social and biological factors. We were no longer requiring goose registration making enforcement of the 12 goose per year limit no longer viable. Horicon goose permits only made up about 9% of the total Canada goose permits sold in Wisconsin and those hunters only contributed to about 8% of the total statewide harvest as of 2016 (Finger and Dhuey 2016). Biologically we observed that the harvest of Ontario nesting birds had begun to spread out over the past several decades (Figure 6). The Horicon zone was created to limit the impact of hunting on those birds around Horicon marsh. Now concentrations of Ontario nesting Canada geese have dispersed across a much larger area of the state.

BOTTOM: FRETTON ROHNER, TOP: TAYLOR FINGER



Research

Over the past decade, Wisconsin has conducted and produced very little waterfowl or migratory gamebird research. Our previous Waterfowl Research Scientist, Ron Gatti retired from the Wisconsin DNR in 2016 after a nearly 40-year career. Prior to his retirement, Ron was finishing a study on blue-winged teal production and habitat which will provide property managers the information needed to improve blue-winged teal production. Fortunately, in 2018, the Wisconsin DNR was able to fill the Waterfowl Research Scientist position with Dr. Drew Fowler. As Ron Gatti was departing, Wisconsin was also fortunate to receive a Waterfowl and Wetlands Endowed Chair position at the University of Wisconsin Stevens Point. The inaugural Kennedy-Grohne endowed chair position was filled by Dr. Jacob Straub who held the position from 2016–2019. This position is responsible for conducting waterfowl and wetland research in Wisconsin, along with teaching and developing a waterfowl-based student organization. University of Wisconsin (UW) – Stevens Point has a M.Sc. project currently underway concerning waterfowl management, Kali Rush is researching wood duck vital rates and beginning the process to develop a wood duck population and ecology model for Wisconsin. The University of Wisconsin-Stevens Point recently completed the process of recruiting and hiring the next Kennedy-Grohne endowed chair and hired Dr. Benjamin Sedinger. Additional waterfowl research was conducted in Wisconsin on Lake Michigan by Luke Fara (Southern Illinois University) who studied long-tailed duck migration patterns, habitat use, prey items and hunter harvest.



KALI RUSH

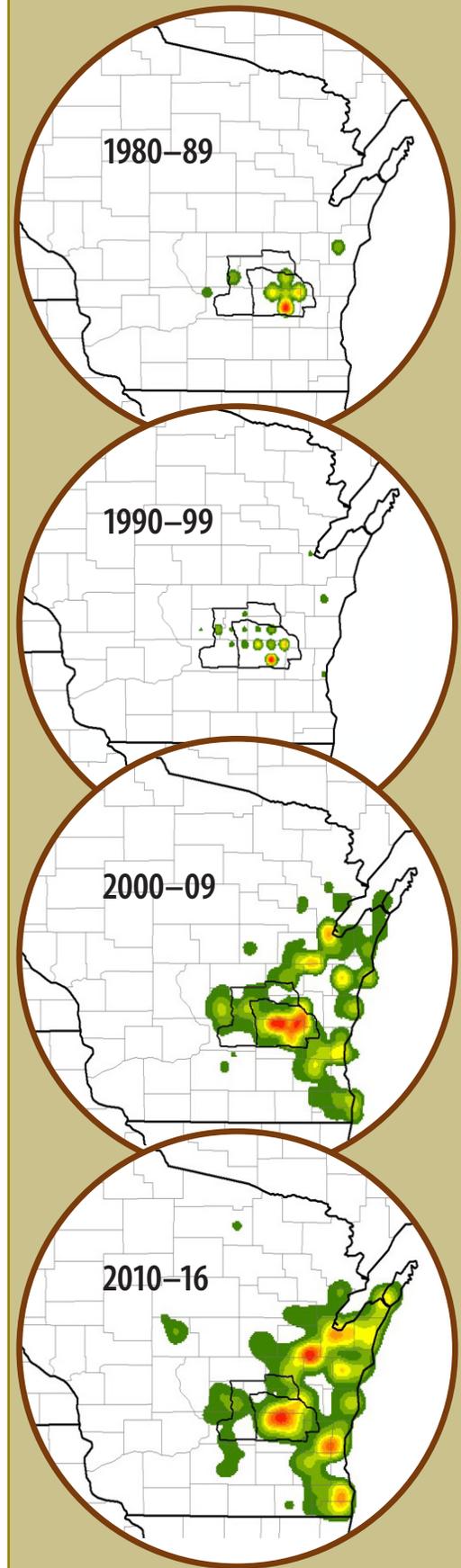


Figure 6. Spread of Ontario nesting Canada goose harvest in Wisconsin. Red indicates areas where the most harvest occurs, and no color represents little to no harvest.

Waterfowl Health

The risk of disease in waterfowl is greatest on areas where large concentrations of waterfowl congregate, especially during spring and fall migration when birds are under more physical stress. There are a few infectious diseases that affect waterfowl that are highly contagious and can spread rapidly through large flocks. These diseases have rarely been documented in Wisconsin, but the potential exists for large scale mortality events. The Wisconsin DNR maintains a Wildlife Health Program that investigates reports of five or more sick or dead waterfowl through collection of carcasses for necropsy and disease testing. Prompt identification of the cause of waterfowl morbidity and mortality informs decisions on the best response to mitigate losses in the event of an outbreak of one of these diseases. This section briefly describes the most significant diseases that have been identified in waterfowl, some of which have been detected in Wisconsin. Several diseases that are found in wild waterfowl, but not known to cause significant mortality, are also included.

 **Trematodiasis** is an infection with parasitic flatworms called trematodes or flukes. Three species of trematodes, *Sphaeridiotrema globulus*, *Cyathocotyle bushiensis* and *Leyogonimus polyoon*, have been documented to cause significant mortality in waterfowl. In Wisconsin, waterfowl mortality from trematodes was first documented in the late 1990s in American coots in Shawano Lake (U.S. Geological Survey-National Wildlife Health Center 2001). Waterfowl mortality from trematodes has also been documented on Little Lake Butte des Morts. Since 2002, these parasites have caused significant waterfowl mortality in the Upper Mississippi River National Wildlife and Fish Refuge and surrounding areas during spring and fall migration. Mortality is primarily affecting lesser scaup and American coot, but other affected species include blue-winged teal, ring-necked duck, ruddy duck, bufflehead, redhead, northern shoveler, mallard, American black duck, northern pintail, gadwall, American wigeon and canvasback (Wildlife Health Information Sharing Partnership event reporting system on-line database, <<http://www.nwhc.usgs.gov/whispers/>>, accessed 7 Feb 2019). An exotic faucet snail, *Bithynia tentaculata*, is the intermediate host of these parasites. After

ducks ingest snails infected with the trematodes, the parasite develops and attaches to the intestinal mucosa of the duck causing anemia, shock and death. Due to the complex nature of the lifecycle of these parasites, management of the disease is difficult and research is ongoing.

 **Avian botulism**, also called limberneck, is caused by a toxin produced by the bacterium *Clostridium botulinum*. There are seven types of botulism toxins, but ducks and geese are primarily affected by botulism type C. In Wisconsin, waterfowl mortality due to botulism type C has been documented since 1978, generally in the late summer to early fall (Wildlife Health Information Sharing Partnership). It is most commonly documented on inland waters such as Horicon Marsh and Lake Winnebago. These bacteria are found in lake, pond or wetland substrates and produce the botulism toxin under certain environmental conditions, such as when water temperatures are high and oxygen levels are low. Exotic zebra mussel and round goby are thought to play a role in transmission. Waterfowl become affected when they eat invertebrates or fish containing the toxin. Scavengers can be affected by toxins contained within the maggots feeding on the carcasses. The toxin causes a progressive paralysis and birds often die quickly. Sick birds will lose the ability to fly or walk. They are unable to hold their head up and, if on the water, will drown. Paralysis of the muscles needed for breathing leads to respiratory failure. Management during mortality events includes prompt removal of dead birds to reduce additional sources of the toxin.

 **Avian cholera** is caused by the bacterium *Pasteurella multocida*. In North America, this disease was first reported in 1944 and is the cause of large-scale mortality of waterfowl in many states. In Wisconsin, it was the cause of mortality of over 800 mallards and Canada geese on Horicon Marsh from fall of 1979 to spring of 1980 (Wildlife Health Information Sharing Partnership). Mortality usually occurs in fall and winter and can affect all species of waterfowl. The disease has the potential to cause extensive mortality in a relatively short time. It is highly contagious and can spread rapidly through a flock of birds. Birds that survive infection can become sources of infection with potential to spread the bacteria throughout a flyway. The bacteria can be



transmitted from bird to bird and from exposure to contaminated food and water sources. Affected waterfowl may become sick very rapidly and the first signs of an outbreak may be multiple dead birds. Sick birds may be weak, twist their heads and necks over their back, have convulsions, swim in circles, and fly erratically. Management for this disease includes monitoring areas of high concentrations of waterfowl for mortality and promptly removing sick and dead birds to reduce the spread of the bacteria.

✦ **Duck plague** or duck virus enteritis is caused by a herpesvirus. This virus was first detected in the United States in 1967, however only two major outbreaks of wild waterfowl in the United States have been documented; in 1973 in South Dakota (40,000 birds) and New York (>1,000) in 1994. Most reports of mortality from this disease in Wisconsin have involved domestic waterfowl, however there was one documentation of mortality of approximately 200 black ducks in Waushara County in the spring of 1973 (Wildlife Health Information Sharing Partnership). Outbreaks are most common in the spring and all members of the family Anatidae are susceptible, though blue-winged teal, redhead duck and wood duck appear to be most susceptible. The virus can be transmitted from bird to bird and from exposure to contaminated food and water sources. It is highly contagious and has caused significant losses and decreased egg production in domestic ducks. It can cause large losses in wild waterfowl, but most outbreaks in wild waterfowl are smaller. Birds can die quickly from this virus and dead waterfowl may be the first indication of its presence. The virus causes internal bleeding and signs in sick birds can include diarrhea which may be bloody, weakness, drooping wings and a reluctance or inability to fly. Management for this disease includes monitoring areas of high concentrations of waterfowl for mortality and promptly removing sick and dead birds to reduce the spread of the virus.

✦ **Lead toxicity** in waterfowl is caused by ingestion of lead, generally due to spent lead ammunition or lost lead fishing tackle. Most documented cases of lead toxicity in Wisconsin waterfowl occurred in Canada geese during the 1980s (Wildlife Health Information Sharing Partnership). Lead was banned nationwide for waterfowl hunting in 1991 which helped to reduce the amount of spent

lead ammunition in lakebeds, reducing the risk to waterfowl. Signs of lead toxicity can include progressive weakness, green feces, incoordination, emaciation and atrophy of breast muscles.

✦ **Avian influenza** is caused by a type A influenza virus which has many different subtypes. The virus is found in healthy wild waterfowl but generally does not cause disease in them. It is shed in the feces and transmission between wild birds is believed to primarily occur through ingestion of the virus. Avian influenza viruses typically increase in wild bird populations during the late summer and early fall when previously unexposed, juvenile birds begin to concentrate in areas with older ducks that may be shedding the virus.

✦ **Avian pox** is caused by an avipoxvirus. There are several strains of the virus which is transmitted by mosquitoes. It is rare in wild waterfowl with only occasional reports in Wisconsin waterfowl. The virus causes two forms of disease. In the “dry” form, it produces wart-like lesions on the unfeathered areas of skin. In the “wet” form lesions can form in the mouth and upper gastrointestinal and respiratory tracts. Birds generally recover from this disease unless lesions interfere with the bird’s ability to see, eat or breathe.

✦ **Avian tuberculosis** is caused by the bacterium *Mycobacterium avium*. All birds, including waterfowl, are susceptible though it rarely causes significant mortality in wild birds and is more common in captive waterfowl. The bacteria are transmitted through direct contact with infected birds or a contaminated environment or through ingestion of contaminated feed and water. Signs in infected birds include weakness, emaciation and loss of muscle.

✦ **New duck disease** is caused by the bacterium *Riemerella anatipestifer*. The name “new duck” refers to the high mortality found in young (new) ducks in captivity. Wild waterfowl are susceptible though it rarely causes significant mortality in wild birds and is more common in captive waterfowl. It has been reported in small numbers of waterfowl deaths (<20) in Wisconsin in 2002 and 2004 (Wildlife Health Information Sharing Partnership). The bacteria are transmitted through direct contact with infected birds or a contaminated environment or through

ingestion of contaminated feed and water. Signs in infected birds include weakness, neck tremor and incoordination.

➤ **Other parasites** that can infect waterfowl include nematodes such as tracheal worms (*Cyathostoma bronchialis*) and gizzard worms (*Amidostomum* sp. and *Epomidiostomum* sp.) and thorny-headed worms (acanthocephaliasis). Some protozoan parasites of waterfowl include renal and intestinal coccidia (*Eimeria* sp.) and sarcocysts (sarcocystis or rice breast). Infection of waterfowl with protozoan blood parasites (hemosporidiosis) include hemoparasites in the genera *Haemoproteus*, *Leucocytozoon*, and *Plasmodium*. These parasites are commonly found in most waterfowl species and young or stressed birds are more susceptible to disease caused by their presence. The parasites do not commonly cause large losses in wild waterfowl.

➤ **Fungal infections** (aspergillosis and aflatoxicosis) in waterfowl are generally caused by exposure to moldy grains. Common sources include moldy corn or silage and waste grain left in farm fields. Birds are infected with fungal spores through inhalation. Young or stressed birds are more likely to develop disease from inhaled fungal spores. Signs can include difficult breathing, weakness and inability to fly. These fungal infections typically cause mortality in small numbers of birds and in small localized areas where the source grain is found.

➤ **Algal toxins** such as those produced by cyanobacteria, or blue-green algae, have been suspected to cause mortality in wild waterfowl. Confirmation of mortality due to algal toxins is difficult. Most suspected mortalities happen in conjunction with an algal bloom. Occasionally, algal toxins can be identified in potential food items, but the toxins are rarely identified in tissues of affected birds.

➤ **Wildlife rehabilitation** of sick, injured or apparently orphaned wild waterfowl is governed under both federal and state laws. Under Wisconsin statute, only licensed wildlife rehabilitators can provide care for sick, injured or apparently orphaned wildlife. All waterfowl are migratory birds and therefore covered by the Migratory Bird Treaty Act. Wildlife rehabilitators must have both a state wildlife rehabilitation license and a federal USFWS rehabilitation permit to care for any species of waterfowl.

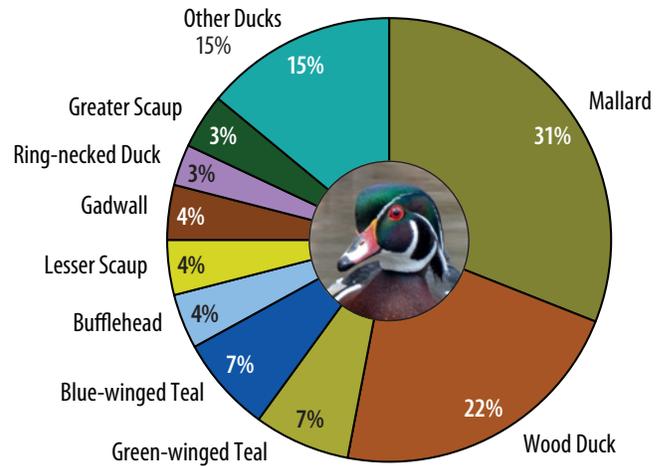


Figure 7. Estimated Wisconsin waterfowl harvest by species. HIP, 2008–2017. Center photo: USFWS

Waterfowl Hunters

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 and vary greatly to take advantage of all of the unique opportunities statewide. There are hunters that are seeking the early teal and wood duck harvest in northern marshes to the early September Canada goose hunting throughout the state. We have Mississippi River hunters seeking canvasback in November to the later season hunts of diving ducks on Lake Michigan. Combine that with field hunters that pursue mallards and Canada geese in central Wisconsin, we have a wide variation of hunting opportunities and hunting desires. Some duck hunters hunt primarily ducks while others occupy their fall with other forms of hunting from woodcock to archery deer hunting. Wisconsin consistently has ranked in the top 5 in the nation for the highest number of active waterfowl hunters (Raftovich et. al. 2017).

Federal estimates from the Harvest Information Program (HIP) survey for the past 10 years 2010–2018, show an average of 64,500 active waterfowl hunters in Wisconsin. The average total duck harvest HIP estimate for 2010–2018 is 416,825 ducks. This total duck harvest estimate is higher than the decade averages for the 1960s, 1980s, 1990s and lower than

Table 4. Comparison of waterfowl hunting statistics, 1930s–2010s.

Year	Total Number of Hunters	Average Number of Ducks Harvested	Average Number of Ducks/Hunter/Season
1930s	35,000 to 84,000	501,000	5 to 14
1940s	66,000 to 102,000	472,000	4 to 7
1950s	100,000 to 134,000	560,000	4 to 6
1960s	85,800	410,000	4.33
1970s	117,000	595,300	4.71
1980s	77,500	380,000	4.43
1990s	75,500	307,000	3.82
2000s	81,800	410,400	6.60
2010s	64,000	416,000	7.80

the decade averages for the 1930s, 1940s, 1950s and 1970s (Table 4). The average seasonal bag per hunter for 2010–2018 is 7.8 ducks/hunter/season. This estimate is higher than decade averages for the 1960s–2000s. Mallards (31%) and wood ducks (22%) remained the two species contributing over 50% of the state’s harvest (Figure 7). Green-winged teal (7%) and blue-winged teal (7%) 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 (Raftovich et al. 2017). Also, during this recent period, Canada goose harvest averaged around 50,000–65,000 in response to the changing season frameworks and annual Canada goose production (Finger and Dhuey 2016). While this range is similar to the 1980s and 1990s, the early September season added an average of 15,000 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 of the resident Temperate breeding population (resident giant), which increased from less than 20% in 1996 to over 55% in 2017. While this is a significant change, Wisconsin still harvests a lower proportion of Temperate breeding Canada geese than all other states in the Mississippi Flyway.

We have documented characteristics of Wisconsin waterfowl hunters, which are helpful in planning for the future. In 2017, the Wisconsin DNR partnered with the National Flyway Council and Wildlife Management Institute effort to conduct a nationwide and Wisconsin survey of duck hunters, which provided information on hunter’s opinions and experiences on a national, flyway and state level (National Flyway Council et al. 2018). 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 (87%) of Wisconsin duck hunters surveyed hunt both ducks and geese. This is higher than the Mississippi flyway result of 70% suggesting a response to the abundant Canada goose hunting opportunities in Wisconsin. Wisconsin duck hunters are largely male (94%), which is similar to national results (99%). They are well distributed across most age categories; 19% are 18–29 years old, 19% are of age 30–39, 15% are of age 40–49, 24% are of age 50–59 and 23% are over age 60 (Bradshaw et al. 2018). As mentioned above,



TAYLOR FINGER



BOTTOM: USFWS, CENTER: KALI TRISH, TOP: TAYLOR FINGER

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. 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.

In order to gain a better understanding of Wisconsin's waterfowl hunters we established a biannual hunter survey to identify and assess waterfowl hunter feedback, desires and satisfaction. By examining the results of input from these waterfowl hunter surveys, 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. 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 timing of goose seasons and a desire for maximum days to hunt even if it means reducing daily bag limits (Bradshaw et al. 2018, Finger and Rohrer 2018). 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 (Bradshaw et al. 2018, Finger and Rohrer 2018). 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 57% indicating the season length was about right, 79% indicating that the daily bag limit was about right and 67% were satisfied or neutral regarding the timing of the duck hunting season (Bradshaw et al. 2018). Continuing to maintain an annual dialogue regarding which hunting season structure provides the maximum number of waterfowl hunting days and balancing the desires of those that would prefer to hunt earlier versus later should maintain general satisfaction with waterfowl regulations. In addition, an important part of this dialog between hunters and the migratory bird program is to keep hunters engaged and educated on the decisions and process for setting the hunting season structure.

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. 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. When asked

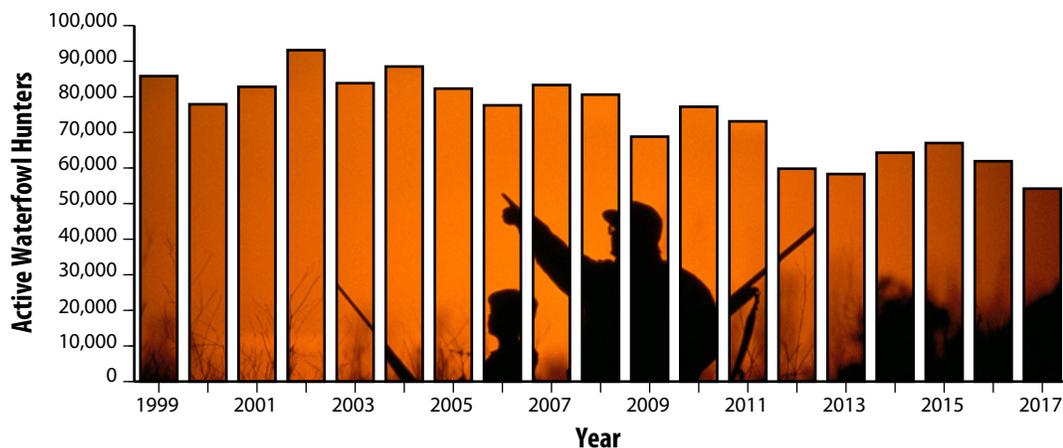


Figure 8. Wisconsin waterfowl hunter numbers, 1999–2017. Photo: USFWS

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 season close, ducks concentrating on fewer areas and shifting duck migration routes (Holsman and Petchenik 2016). The strongest feedback received stemmed from negative experiences with crowded hunting areas and poor ethics of other hunters. The number of ducks harvested were generally considered not very important or moderately important for a good hunting experience. 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. Given that available data indicate overall duck 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.

Unlike most other states Wisconsin has stayed fairly stable in hunter numbers (Figure 8) while surrounding states like Illinois has seen a decline of nearly 20% of hunters over the past decade. Likely due to Wisconsin's strong hunting heritage and numerous public land hunting opportunities, a stable population of waterfowl hunters remain in the state of Wisconsin. Wisconsin DNR has also

increased its focus on introducing new hunters with an active R3 initiative (Recruit, Retain, Reactivate). Management of hunters has changed in the recent decade and so too has the use of internet and social media sites. We have seen an increase in the amount and spread of misinformation which has required the use of new avenues to get information out to a wide variety of people. In 2018, for the first time, the migratory game bird program decided to use social media through informational posts and videos to help spread the word about our program and saw an immediate response. In the first year we saw a near 400% increase in public comments with about 86% of the total comments coming from people who hadn't commented on the seasons in the five years prior to 2018. There was also double the total attendance from prior years at our public meetings, and at some meetings, attendance increased by 300 percent. Continuing to explore and implement new and innovative techniques to engage with hunters will be important as we move forward into the new age of technology and social media.

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

- Of the waterfowl estimated in our spring survey, mallard, wood duck and Canada goose breeding populations in Wisconsin are all at or above their long-term averages, with blue-winged teal breeding populations the only one still below the long-term averages.
- With over 20 years of 60-day/six-duck daily bag seasons combined with the maximum number of days of Canada goose hunting (107), hunters are generally satisfied with the regulations.



- While threats to waterfowl habitat continue, 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. State level private land policies and potential changes to national programs in the Farm Bill could significantly reduce private land habitat work.
- Waterfowl harvest levels are average to high compared with historical levels.
- Mallards, wood ducks and blue-winged teal are three of the four 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, 20–40% of Wisconsin's duck hunters have not had their expectations met during recent hunting experiences.
- Based on state surveys, an important variable for improving the waterfowl hunting experience for Wisconsin duck hunters is to provide opportunities/locations for duck hunters to see more ducks and experience less hunter crowding.

The Future

Wisconsin has a long tradition of waterfowl hunting and waterfowl management. Despite being at the top of the flyway and mostly harvesting locally produced birds, Wisconsin hunters have consistently been in the top five in the nation in terms of total number of hunters. Those hunters have been a major conservation force in both the state and across the continent. These hunters have supported waterfowl management through the purchase of federal and state waterfowl stamps, grassroot support for wetland/grassland conservation and actively volunteering and working through partners and organizations to support waterfowl habitat projects.

This active and enthusiastic group remains strong in Wisconsin, despite declining hunter numbers throughout the continent. It remains important to actively engage and consider this enthusiastic and interested group regarding waterfowl management if we hope to maintain their passion and support. By continuing to work as partners with government agencies, private organizations and waterfowl hunters, we can ensure that we are actively working toward improving waterfowl populations, habitat and hunting experiences.

Since 2005, the Wisconsin DNR 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 Wisconsin, the Wisconsin DNR 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 Wisconsin DNR 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 and human dimensions of waterfowl hunting. The following management plan 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.

The Wisconsin DNR and migratory game bird program will provide an annual report summarizing the actions taken and accomplishments related to this plan. The report, both in hard copy and digital form will be available for agency, partners and waterfowl hunters alike.



TAYLOR FINGER



GOAL

Continue to contribute to the continental management of waterfowl populations by providing habitats and management for nonbreeding and local breeding species. Provide quality waterfowl hunting opportunities throughout the state, recognizing Wisconsin’s diversity of habitats, hunting techniques, hunting heritage and waterfowl species.

Objective 1: Maintain, enhance and manage habitats consistent with the Upper Mississippi River Great Lakes Region Joint Venture’s Waterfowl Habitat Conservation Strategy to meet the year-round ecological needs of Wisconsin’s diverse waterfowl.

Outcome: Seek growth in the annual mallard population such that seven out of 10 years are above the 2009–2018 population estimate (186,229), increase/maintain the wood duck population to within a minimum of 10% of 2009–2018 average (102,641) and seek growth in the blue-winged teal population such that seven out of 10 years are above the 2009–2018 average (69,507) by 2030.

Outcome: Seek growth in annual prairie nesting duck populations in Canada so as to strive to meet the population goals identified in the Prairie Habitat Joint Venture.

Outcome: Retain 578,552 acres of emergent wetland nesting habitat and restore 145,347 acres of emergent wetland nesting habitat by 2030. Retain 99,845 acres of forested wetland nesting habitat and restore 24,172 acres of forested wetland nesting habitat by 2030. Retain 270,002 acres of aquatic bed wetland habitat and restore 13,700 acres by 2030. Retain 322,497 acres of open water wetland habitat through 2030. Restore grassland nesting habitat by 363,368 acres by 2030.

Note: Acreage totals and goals are derived from the Wisconsin Waterfowl Habitat Conservation Strategy.

Strategies:

- Use the Wisconsin Waterfowl Habitat Conservation Strategy decision support tool to conduct an evaluation of nonbreeding and breeding habitats important for maintaining healthy populations of waterfowl in key areas for waterfowl, habitats, and human use and identify funding and policy needs to support the long-term maintenance and enhancement of these areas on private and public land.
- Promote, encourage and train Wisconsin DNR and other partner agency staff on best practices regarding actively managing wetlands to provide adequate food resources for migrating waterfowl. Continue to promote invasive species control as well as funding and encouraging maintenance of wetland/water control infrastructure on public land to support healthy wetlands.
- Continue to work at the federal level with agencies and conservation organizations in tandem with Wisconsin’s congressional delegation to educate and advocate for habitat programs that are favorable for wildlife in the federal Farm Bill.
- Advocate for land acquisition, habitat programs and work with partners to focus attention on ecologically important waterfowl habitat.



- Continue to support the need for nesting waterfowl habitat (i.e. grasslands) in public and private management programs.
- Continue to support Canadian restoration and protection efforts on the breeding grounds of prairie Canada through waterfowl stamp allocation and work to increase funding to meet Association of Fish and Wildlife Agencies and JV goals.
- Continue to collaborate with partners to support Wisconsin DNR wetland protection and policy initiatives, contributing the knowledge necessary to provide for waterfowl populations in these wetland programs.

Objective 2: Monitor and evaluate waterfowl populations in Wisconsin across seasons and locations and use this information to guide habitat and harvest management.

Outcome: Utilize a data driven, scientifically validated process for making decisions that effect the population sustainment, growth and management of Wisconsin’s most significant breeding and non-breeding waterfowl.

Strategies:

- Maintain federal obligations by conducting annual harvest and breeding waterfowl surveys, and by providing funding for Interior Canada goose breeding ground surveys and annual waterfowl banding (e.g., 4,000 mallards, 4,100 Canada geese, 1,600 wood ducks).
- With help from waterfowl research scientists, develop a coordinated system of surveys (i.e., aerial) in key regions of the state identified in the Wisconsin Waterfowl Habitat Conservation Strategy, to estimate statewide nonbreeding waterfowl populations, distributions, and local habitat conditions. Fully implementing these surveys will require additional staff funding, training and collaboration with partners.
- Integrate and synthesize data from waterfowl populations in Wisconsin with surrounding states and with data from the Mississippi Flyway to develop sound seasons structures and bag limits. Season structures and bag limits should reflect and balance the biological realities of Wisconsin’s waterfowl populations (i.e. data driven approach) with the needs and desires of the state’s hunters (i.e. human dimensions data).
- Explore opportunities to provide information on fall and spring waterfowl/migratory populations so that the general public has a better opportunity to observe/utilize this important natural resource.
- Continue to grow partnerships with Native American tribes, conservation groups, USFWS, Mississippi Flyway Council and other internal Wisconsin DNR staff/initiatives.



Objective 3: Through continued research, seek to better understand the factors that influence changes to resident breeding waterfowl populations, migrating waterfowl populations and waterfowl hunters. Apply new data to evaluate and update habitat and harvest management strategies as well as to seek a better understanding of hunter satisfaction and the public’s interest in waterfowl.

Outcome: Synthesize, document and articulate completed research results to inform staff and partners for ‘on-the-ground’ management.

Strategies:

- Work collaboratively with partners and University of Wisconsin System faculty and staff to 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 and sea duck distribution during migration, statewide fall/winter waterfowl distribution, waterfowl disturbance issues, effectiveness of refuges and other emerging issues. This will require adequate and consistent staffing.
- Undertake and continue human dimensions research and surveys to better understand the elements that brings satisfaction to various aspects of the waterfowling community and general public.
- Better define and apply information on spring/fall/winter waterfowl populations and distributions and harvest derivations to improve state, regional and flyway level management strategies.
- Expand and explore new research, monitoring and management approaches to investigate emerging diseases and detect trends in important endemic diseases.

Objective 4: Improve waterfowl hunters’ experiences and satisfaction, increase hunter recruitment and retention efforts and continue to educate hunters and the general public on Wisconsin’s history of managing waterfowl and waterfowl hunting seasons.

Outcome: From 2020–2030, maintain or increase the average number of active waterfowl hunters at or above the current 10-year average (2009–2018) of 70,000.

Strategies:

- Work with partners to collaborate and utilize new and innovative techniques to collect input from hunters to determine hunter and hunting characteristics, season regulation preferences and hunter satisfaction by 2021.
- Utilize contemporary and effective communication techniques to maintain and improve public involvement with establishing waterfowl hunting regulations.
- Identify and designate several State Wildlife Areas as key waterfowl management areas. These areas would specialize and experiment with innovative ways to improve waterfowl habitat and hunter satisfaction.
- With the assistance of partners and stakeholders conduct a thorough review of waterfowl hunting regulations, season dates and bag limits (concurrent with the duck zone review) to simplify, increase opportunity and improve the waterfowl hunter experience and satisfaction.

- Collaborate and provide assistance to the current R3 (recruitment, retention and reactivation) and waterfowl hunting educational efforts being conducted around the state by Wildlife Management and Law Enforcement staff, individuals, private groups and partner organizations (Learn to Hunt, Wingshooting, etc.) by 2020.
- Grow numbers of hunters by strategically placing and promoting accessible hunting areas that are near population centers, while improving access to state-managed properties to address hunter’s desires for increased quality and quantity of hunting lands.
- Develop new strategies (i.e. websites, smart phone applications, periodic updates, etc.) for communicating waterfowl hunting locations and waterfowl fall distributions around the state.
- Continue and expand statewide summary of breeding and nonbreeding waterfowl surveys and communication to the public via new and innovative communication techniques.
- Provide information regarding Wisconsin’s historic and current waterfowl/migratory populations, wetlands and habitat, annual production, hunting regulations, harvests, etc., to better inform and educate current and future waterfowlers and the public of Wisconsin’s important role in waterfowl management, utilizing social media, regulations pamphlet, publications, and other media sources.
- Conduct a review of our current open water hunting regulations including open water hunting techniques, open water waterfowl refuge values and open water hunting opportunities by 2022.

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Objective 5: Manage resident Canada goose populations at a level that balances societal perspectives.

Outcome: Seek to manage the statewide resident Canada goose population at its current population of 145,000 or at a level that does not exceed 10% of its current population.

Strategies:

- Continue to work with Mississippi Flyway partners to monitor interior and temperate nesting Canada goose populations.
- Continue to address human/Canada goose conflicts with integrated site-specific management techniques (communication, 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.
- Continue to provide both abundant and quality Canada goose hunting opportunities and continue to monitor statewide and local harvest levels.
- Seek guidance from social scientists to develop “social carrying capacity” studies to better understand breeding and migratory optimal goose populations in both rural and residential areas.

Appendix A. Hierarchy of Waterfowl Related Plans (Detailed)

Federal Plans

- North American Waterfowl Management Plan



Flyway and Regional Plans

- Upper Mississippi River/Great Lake Joint Venture Plan
- Mississippi Flyway Mississippi Valley Population Canada Goose Plan
- Mississippi Flyway Giant Canada Goose Plan



State Plans

- Wisconsin Waterfowl Management Plan 2020–2030
- Joint Venture- Wisconsin Waterfowl Habitat Conservation Strategy
- Reversing the Loss- Wisconsin Wetland Strategy
- Wisconsin Bird Conservation Initiative All-Bird Plan
- Wisconsin DNR Agency Strategic Plan
- Wisconsin DNR Fish Wildlife and Habitat 6-Year Plan
- Wisconsin DNR Wildlife Action Plan
- Wisconsin Statewide Comprehensive Outdoor Recreation Plan (SCORP)
- Multiple USFWS Plans in Wisconsin- Mississippi River Wildlife and Fish Refuge, Horicon and Wetland Management Districts

Appendix B. Canada Goose Conflict Management

Historically, conflicts with Canada geese were primarily limited to the area surrounding the Horicon National Wildlife Refuge and State Wildlife Area. Large flocks of migrating geese would concentrate in this area and cause significant damages to agriculture crops. Fast forward to recent times, urban development occurring throughout the state, often including the establishment of green spaces and water retention ponds, has created excellent habitat for geese and other waterfowl. Many of these areas provide refugia for the geese playing a large role in the significant increase in the giant Canada goose population. This growth in population has led to an increase in human conflicts with Canada geese.

In Wisconsin, Canada goose complaints are separated into two categories: agricultural damage conflicts and nuisance conflicts. Agriculture conflicts involve goose damage to commercial agriculture crops. Nuisance conflicts include all other conflicts and include issues like aggressive behavior, accumulation of feces, degraded water quality, loss of public use of recreational areas, and human health and safety concerns near airports.

Agriculture Conflicts: Canada geese are included under the State's Wildlife Damage Abatement and Claims Program (WDACP). Through this program damage abatement assistance and partial compensation are available to commercial agriculture producers experiencing damage from several wildlife species including Canada geese. In 2018, 117 commercial agriculture producers enrolled in the WDACP for assistance reducing crop damages caused by Canada geese.

Abatement methods used to reduce agriculture damages caused by geese vary based on the timing and location of damages. Damage abatement methods include the use of barriers, harassment, nest and egg management, public goose hunting, and in some cases the issuance of shooting permits to lethally remove geese outside the normal hunting season.

In 2010, the Wisconsin DNR in consultation with the USFWS implemented the 2006 Agriculture Depredation Order. This order allows the Wisconsin DNR to issue Canada goose removal permits to agricultural producers suffering crop damage from geese during the spring, May 1 through August 31 each year. These removal permits are intended to target the resident goose population. In 2018, 83 spring Goose Shooting Permits were issued, with 148 geese reported being removed under these permits.

Through the WDACP, partial compensation is also available to commercial agriculture producers for damages caused by Canada geese. At least 10 days prior to harvesting the crop, crop appraisals are conducted to calculate the amount damages caused by geese. Appraised goose damages in 2018 totaled more than \$67,000. Appraised damages can fluctuate significantly from year to year depending on the type and value of the crop being damaged. For example, in 2012 geese caused a considerable amount of damage to a cranberry operation in Sawyer County.



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Cranberries are a high value crop compared to other crops like corn and soybeans, so damages were considerably higher. Goose damage, however, most commonly occurs on corn, soybeans, and alfalfa.

Nuisance Conflicts: Nuisance goose conflicts are primarily handled by USDA-APHIS-Wildlife Services through a cooperative services agreement with the Wisconsin DNR. Through this agreement all nuisance bird complaints are directed to Wildlife Services for a response. Each year, Wildlife Services responds to numerous Canada goose complaints. Most goose conflicts are handled through education and providing technical assistance to the caller about non-lethal options available for resolving conflicts. In some cases, however, direct control through nest and egg management or removal of geese is needed to resolve conflicts.

In 2008, the Wisconsin DNR in coordination with the USFWS began implementation of the 2006 Nest and Egg Depredation Order which allows states to issue permits authorizing the removal or destruction of resident Canada goose nests and eggs. In 2018, 133 permits were issued to property owners and managers that allowed for the removal or destruction of Canada goose nests and eggs.

In addition to non-lethal recommendations, Wildlife Services assists communities with managing goose conflicts by directly removing local resident birds during their flightless period from late June into early July. Geese are captured after they are surrounded by Wildlife Services staff using net panels and are brought slowly together to enclose and confine the birds. The geese are then transported to a secure facility. Adult birds are transported to a state-license poultry processing facility where the birds are euthanized, and the meat is ground for distribution to food pantries. Juvenile birds, too small for processing, are humanely euthanized and delivered to an animal shelter/sanctuary, local wildlife rehabilitators or wildlife educational facilities to be used as animal food. All birds are removed under the authority of a Federal Depredation Permit issued to the community or to Wildlife Services by the USFWS.

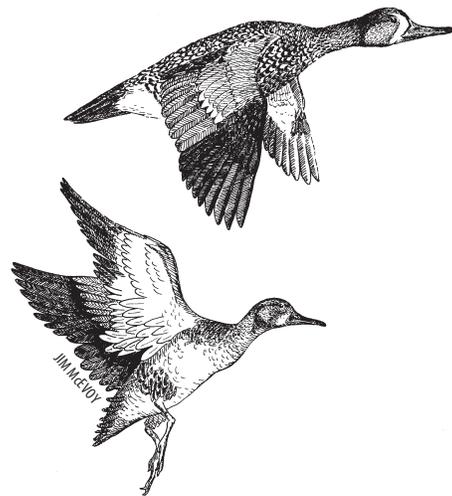
For communities choosing to donate goose meat to local pantries, Wildlife Services is required by the Wisconsin DNR to collect a minimum of five samples, or samples equaling ten percent of captured adults, for contaminate testing from each community or entity requesting assistance. When required, ground meat from the poultry processor is provided in one-pound packages to the Wisconsin Veterinary Diagnostic Laboratory for contaminant testing. After contaminant testing is complete, the Wisconsin DNR toxicologist, under guidelines established by the Wisconsin Department of Health Services, determines if the goose meat is safe for human consumption. If the meat is determined to be unsafe for human consumption, the community must test each year until it is determined that the meat is safe for human consumption two tests in a row. Communities may also choose not to donate meat for human consumption and in that case the meat is not tested for contaminants and the birds are provided to various outlets for animal consumption.



DNR FILE PHOTO

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