



# Wetlands Working Group

The Wildlife Society



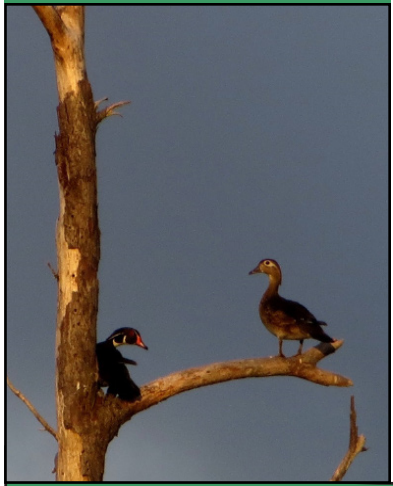
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## Examining Bird Response to Wetland Conservation Strategies in a Working Landscape

by Lindsey A.W. Gapinski, Adam Janke, and Evangelin R. Von Boeckman  
Department of Natural Resource Ecology and Management, Iowa State University, Ames, Iowa

The Prairie Pothole Region (PPR) in the upper Great Plains region of North America is renowned for its sprawling wetland–grassland complexes, which serve as breeding habitat for many wildlife species, particularly waterfowl and other birds. The eastern PPR in southwestern Minnesota and north-central Iowa is highly productive for growing crops due to its warmer and wetter climate. This led to a high percentage of land being converted to row crops; in Iowa, an estimated 89% of wetlands were lost between 1780 and 1980 (Dahl 1990). In general, increased row-crop production has negatively impacted birds and other wildlife, however, we acknowledge the complexity of the issue; less agriculture may improve conditions for wildlife, but may also lead to reduced crop yield for consumption by humans and livestock. While there is no single solution to satisfy this dilemma, strategies to mitigate the negative effects of annual agriculture on ecosystem function in a working landscape have emerged. In the last ~40 years, there has been a significant movement in the PPR to restore wetlands as a means of conserving wildlife and restoring ecosystem services in working



Constructed wetland in central Iowa. Photo by Adam Janke.

# Bird Response to Conservation Strategies (continued from page 1)

landscapes. Here we provide an overview of our recent work identifying how wetland restorations and creations have benefitted breeding birds in the agricultural landscape of Iowa. We implemented two studies focused on several relatively understudied areas: 1) how birds have responded to aging wetland restorations, 2) whether wetlands established to improve water quality benefit breeding birds.

## *Aging wetland easements support diverse breeding bird species*

Previous studies explored how birds used wetland restorations in the PPR shortly after restoration (e.g., Delphey and Dinsmore 1993, VanRees-Siewert and Dinsmore 1996, Fairbairn and Dinsmore 2001, Ratti et al. 2001, Fletcher and Koford 2003), however, we aimed to contribute to a smaller pool of published works exploring bird use of aging wetland restorations in the PPR (e.g., Vanausdall and Dinsmore 2020). Vegetative characteristics at wetland restorations can change over time as restorations age (e.g., increasing woody encroachment or invasive species, changes in diversity; Mulhouse and Galatowitsch 2003), often with consequences for the wildlife that use them. We monitored wetland easements, most of which also contained restored wetlands. A primary goal of these easements is wildlife conservation, however, they also aim to promote other ecosystem services like water quality improvement and flood prevention (NRCS 2022). To learn how birds responded to aging wetland easements, we completed bird point counts and vegetation surveys using established statewide protocols (Iowa DNR 2016) in 2022–2023 and compared them with data collected during 2007–2009 by the Iowa Department of Natural Resources using the same methods (Gapinski 2024).

In 2022–2023, we monitored 52 out of 55 wetland easements that were first monitored in 2007–2009. Study sites were properties enrolled in easement programs between 1993 and 2005 and were located within or very near the boundaries of the Iowa PPR. One objective of this study was to identify bird species occupying aging wetland easements during the breeding season. We fit a multi-species occupancy model to estimate occupancy probability, which is the probability of a given species occupying an area (MacKenzie et al. 2002). We detected 134 species in 2022–2023, including both wetland-dependent and non-wetland-dependent

species. We found 10 species with occupancy probabilities  $>0.50$ , indicating that they were present at greater than 50% of aging wetland easements (in descending order): common yellowthroat (*Geothlypis trichas*), dickcissel (*Spiza americana*), red-winged blackbird (*Agelaius phoeniceus*), brown-headed cowbird (*Molothrus ater*), ring-necked pheasant (*Phasianus colchicus*), American goldfinch (*Spinus tristis*), song sparrow (*Melospiza melodia*), American robin (*Turdus migratorius*), sedge wren (*Cistothorus stellaris*), and swamp sparrow (*Melospiza georgiana*). Several species, including spotted sandpiper (*Actitis macularius*), Henslow's sparrow (*Centronyx henslowii*), and red-headed woodpecker (*Melanerpes erythrocephalus*), had relatively low occupancy, but still used these sites during the breeding season. The diversity in breeding bird species that used aging wetland easements reflected the highly variable vegetation and hydrology between and within sites, which included depressional and riverine wetlands alongside grasslands, forests, shrublands, and more (Figure 1).

Another objective of this study was to determine how occurrence of species of conservation concern changed at wetland easements as the properties aged. To answer this question, we compared results from 2007–2009 and 2022–2023 using single-species occupancy models. Again, the variation in vegetative and hydrologic conditions was reflected in the birds occupying these sites, however here we focus just on wetland and grassland birds of conservation concern. In general, wetland-associated species, including American bittern (*Botaurus lentiginosus*), black tern (*Chlidonias*



**A researcher completes an avian point count survey at a wetland easement in Iowa. Photo by Anna Tucker.**

## Bird Response to Conservation Strategies (continued from page 2)



**Research crew lands drone following a brood survey at a constructed wetland in central Iowa. Photo by Adam Janke.**

niger), and blue-winged teal (*Spatula discors*) had stable occupancy across time periods. Grassland birds showed mixed results, with western meadowlark (*Sturnella neglecta*), upland sandpiper (*Bartramia longicauda*), sedge wren, and bobolink (*Dolichonyx oryzivorus*) declining while eastern meadowlark (*Sturnella magna*), and grasshopper sparrow (*Ammodramus savannarum*) remained stable, and Henslow's sparrow and dickcissel increased in occupancy. With these results alone, it is difficult to know whether these changes were due to changing conditions at the properties, or if they were perhaps due to larger regional population trends occurring with these species. To address this, we compared occupancy changes to statewide eBird trends from 2012–2022 (Fink et al. 2023). We identified several species with occupancy rates higher than expected based on the regional eBird abundance trends; these species include American bittern, black tern, eastern meadowlark, upland sandpiper, grasshopper sparrow, Henslow's sparrow, and dickcissel. This indicates that there may be local-scale characteristics at wetland easements that are promoting greater occupancy by these species compared to what we would expect based on regional population trends. Overall, this suggests that wetland easements in agriculture-dominated landscapes may be acting as strongholds for species of conservation concern that are declining at a regional scale, however, future work is warranted to explore survival and nest success of these species at these sites.

### *Constructed wetlands support breeding birds*

Wetland drainage in Iowa and other intensively-farmed states has been facilitated by millions of miles of underground pipes known as tile. These pipes buried a few feet under the surface of the soil rapidly

transport water from fields to surface waters, and with it often high concentrations of nitrate. The resulting high nitrate concentrations in surface waters cause issues for water utilities and aquatic ecosystems from the headwaters of the Mississippi River to the Gulf of Mexico. Wetlands create conditions that remove nitrate from surface water through the natural process of denitrification and have therefore been lauded as a solution to the challenge. Specifically, interest in Iowa among entities working to improve water leaving farm fields has focused on building artificial wetlands in landscape positions where they can receive flow from drainage tiles rich in nitrate and allow for denitrification before the water goes further downstream (Cheng et al. 2020). Previous research has shown these wetlands perform that task well (Crumpton et al. 2020). We wanted to understand if birds benefited too.

During 2022–2023, we conducted breeding bird surveys on constructed wetlands and compared them to nearby wetlands of a similar size that had been restored by Ducks Unlimited with the primary goal of providing habitat for breeding and migratory waterfowl species (Von Boeckman 2024). We used two techniques to survey birds: the North American Marshbird Monitoring Protocol and mid-summer brood surveys with thermal cameras mounted on drones. We found a wide diversity of birds on both wetland types and interesting differences between them. There were a few more species found on restored wetlands than on the constructed wetlands. But most species were found on each. Marshbirds, including marsh wrens (*Cistothorus palustris*), yellow-headed blackbirds (*Xanthocephalus xanthocephalus*), and soras (*Porzana carolina*) were more common on restored wetlands. Broods of waterfowl, including wood ducks (*Aix sponsa*), mallards (*Anas platyrhynchos*), blue-winged teal, and trumpeter swans (*Cygnus buccinator*) were more common on constructed wetlands. Each result aligned with past work in similar systems that suggests marshbirds are more sensitive to vegetation communities, which were more diverse on restored wetlands, and broods were sensitive to hydroperiods, which were longer on constructed wetlands. We explored factors influencing bird communities on constructed wetlands in more detail and found large, shallow constructed wetlands with more diverse persistent emergent vegetation were those with the greatest bird diversity. Future wetland

# Bird Response to Conservation

## Strategies (continued from page 3)

constructions in the region could target these factors to derive greater benefits to birds without negative impacts on the wetlands' denitrification performance.

### *Final thoughts*

From these related studies, we found that wetlands from a broad range of wetland conservation paradigms support diverse breeding birds in working landscapes, regardless of the conservation goals of the wetlands. These projects highlighted the importance of these areas for species of conservation concern including wetland-dependent species like blue-winged teal and trumpeter swans. Equally important is the persistence of these benefits to birds over time; we found that aging wetland restorations were valuable to wetland- and non-wetland-dependent bird species alike and may even be strongholds for some declining species such as American bitterns, eastern meadowlarks, and grasshopper sparrows. Importantly, bird communities varied, depending on the conservation goals of each wetland conservation strategy, promoting regional biodiversity by introducing a heterogeneous landscape. A diverse portfolio of wetland restoration strategies used in the region may help reverse long-term declines in breeding birds in working landscapes while also providing a range of positive ecosystem goods and services.

## Wetlands in the News

- Latest Fish and Wildlife Service report documented continued decline of wetlands in the United States, with losses particularly prevalent in the Southeast and Mid-Atlantic regions.

[Read here.](#)

- Mangroves officially documented in Georgia, which is the latest evidence of this tropical wetland species shifting poleward across the globe as winters become increasingly mild.

[Read here.](#)

- The World's Largest Wetland Is Burning, and Rare Animals Are Dying.

[Read here.](#)

- Scientists are investigating an emerging virus that is literally called Wetland Virus.

[Read here.](#)

- Millions of dollars allocated to wetland conservation and restoration in Ohio and North Carolina.

[Read here](#) and [here.](#)



Wetlands throughout the Prairie Pothole Region of Iowa. Aging wetland easements had variable vegetation and hydrology, leading to a wide variety of bird communities among sites. Photos by Lindsey Gapinski.

# Call for Officer Nominations

## Want to join a fun team to advance the mission of the Wetlands Working Group?

The Wetlands Working Group Board of the Wildlife Society is seeking nominations for the Vice Chair officer position. This position will help develop content for newsletters, assist with organizing symposia, identify social media content applicable to the Group's mission, and participate in other activities as needed to increase communication about wetland and wildlife-related issues among WWG members. The Vice Chair will serve as such for the 2025 term, succeed to Chair in 2026, and become Past Chair during the 2027 term: a total service period of 3 years. Service runs on calendar years and begins January 1, 2025.

Board Meetings are held once per month by conference call (1 hour), so you can participate from anywhere! Including monthly meetings, time commitments average 2-4 hours/month for Vice Chair, Past Chair, and Secretary/Treasurer, and 4-8 hours/month for Chair.

VICE CHAIR, per bylaws —The Vice Chair assumes the duties of the Chair in the absence of the Chair and performs other duties as needed. The Vice Chair helps with promotion and marketing responsibilities (e.g., newsletters) and other duties as needed. Upon completion of a full term as Vice Chair (or Chair-elect), the Chair-elect succeeds to the position of Chair. The Chair's responsibilities are detailed above. Upon completion of a full term as Chair, the Chair succeeds to the position of immediate Past Chair. The Past Chair shall serve as the Chair of the Nominating and Election Committee and will be responsible for soliciting two additional members to serve on the committee. In addition, the immediate Past Chair will perform any duties assigned by the Chair.

Nominations are open through October 31, 2024. Membership will have an opportunity to vote on board service nominations for 30 days after the nomination deadline. Selected candidates will be announced in December.

**Please submit all nominations to the  
Wetlands Working Group Board via email at,  
wwg.tws@gmail.com by Oct 31, 2024.**

*Nominations should include name, contact information, photo of you in the field, and a brief bio.*

# Student Scholarships

Each year, the WWG is proud to offer student scholarships to graduate students conducting research related to wetland dynamics. These scholarships are 100% funded through membership dues, WWG fundraising efforts, and donations. YOUR contribution as members directly supports these students and their research! Typically, we offer a \$1,000 research scholarship and depending upon the cost of early registration fees for the annual TWS conference, one or two travel scholarships to cover a full reimbursement for students attending the conference.

The announcement for scholarship applications occurs in August of each year; the deadline, September 15. Applications are simple and involve submitting a CV, cover letter, and two-page project description including an abstract, rationale, need for funds, and management implications. All members of the WWG conducting research related to wetlands or wetland wildlife can apply. Non-member applications will be considered, though it is expected that membership be attained prior to submission deadline. Disbursed funds to recipients have no strings attached – these funds are intended to help students wherever needed; to help with research costs, publication costs, or general living expenses! Awardees are announced during the annual WWG meeting each fall (usually held during the annual TWS conference), though there is no attendance requirement to receive the scholarship. Keep an eye peeled next summer for the announcement and get your application in!

## Recent Scholarship Awardees



**Akshith Suthar**, James C. Kennedy Waterfowl and Wetlands Center, Clemson University, *Deploying Autonomous Recording Units (ARUs) using Unmanned Aerial Vehicles (UAVs) to Estimate the Abundance and Occupancy of Secretive Marsh Birds.*



**Emma Weber**, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville, *Acoustic Monitoring of Waterfowl in Wetland Sanctuaries on the Texas Mid-coast.*

If you'd like to donate to the WWG to further support these scholarships or have questions, please reach out to the Wetlands Working Group Board at [wwg.tws@gmail.com](mailto:wwg.tws@gmail.com).

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## 2024 Board Members

James Morel, Chair

Jordan Giese, Vice Chair

Jay VonBank, Past Chair

Paul Taillie, Treasurer/Secretary

Emma Weber, Communications Chair

## How to Join WWG

When you renew your TWS membership, sign up for the Wetlands Working Group!

If you're already a member of TWS, you can add membership in the Wetlands Working Group at any time by logging into your account at <http://wildlife.org/>.

Membership dues are only \$5 annually, and help support activities at meetings, student travel awards, and outreach events.