Winous Point Marsh Conservancy

Vision:

The vision of the Winous Point Marsh Conservancy is to protect, restore and enhance wetland habitat and wildlife in the southwest Lake Erie region by serving as advocate, practitioner, and educator.

Mission:

The WPMC's area of focus is the wetlands and tributaries of southwestern Lake Erie in pursuit of the following goals:

1) *To assure the protection and stewardship of the Winous Point Marsh Conservancy wetlands and property.*

2) *To aid and facilitate wetland conservation and restoration efforts in the greater southwest Lake Erie region.*

3) *To support and develop research and educational opportunities in wetland and wildlife ecology.*

Winous Point Marsh Conservancy

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Executive Summary

Staff: John Simpson, Executive Director
Brendan Shirkey, Research Coordinator
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This year was the 20th year that the Winous Point Marsh Conservancy (WPMC) has worked to deliver its mission of research, education, and conservation in Great Lakes coastal wetlands, and it was, by all measures, a successful one. We hosted, housed, or supported a record number of students, technicians, and projects; published a record annual number of publications; and delivered our message at more conferences and meetings than ever before. The results of all of this work are outlined throughout this report which was written by partners from all of these projects and which I genuinely hope you take the time to read and enjoy.

Our research interest in secretive marshbirds progresses and expands each year. OSU student Jim Hansen defended his Virginia rail and sora population demographics thesis last spring, Michelle Kane (Central Michigan University) will defend her thesis on occupancy rates of state-endangered king rails in coastal Lake Erie marshes in February 2020, and M.Sc student Nicole Hengst (Ohio State University) will defend her Virginia rail and sora habitat use thesis this coming spring. Ph.D. student Dustin Brewer (Central Michigan University) will start his second field season this April researching a variety of aspects of king rail ecology. WPMC staff also continue to be very involved in regional marshbird research, with Brendan sitting on the Upper Mississippi River Great Lakes Regional Joint Venture marshbird working group, and all staff participating in early morning surveys to help inform the Midwest Coordinated Marshbird Monitoring Program that tracks population trends of these species.

Winous Point Marsh Conservancy staff members worked hard to communicate the results of the Conservancy's research and to bring our wetlands and waterfowl conservation message to target audiences. Combined, our staff attended 20 conferences and meetings, gave seven professional seminars or presentations, and hosted 21 different meetings and conservation group events at Winous Point Marsh. Our staff and students also continued to disseminate our research in peer-reviewed journals and professional publications, publishing six peer-reviewed articles or theses in 2019 with another three manuscripts and two theses in preparation for 2020. In addition to our own work, WPMC staff also provided peer-review for another 10 manuscripts submitted for publication by other authors in 2019.

In addition to the important research covered in this report, the Winous Point Marsh Conservancy furthered its commitment to conservation of Lake Erie marshes with the acquisition of a 10-acre parcel in 2019. This parcel, though small relative to our other landholdings, is an

important inholding that borders our existing marshlands. Over time, it will be restored into native habitat and protected under easement as wildlife habitat and coastal wetland.

Lastly, in 2019, the Trustees of the Winous Point Marsh Conservancy furthered their commitment to its long-term mission by establishing the Legacy Endowment Program. This program provides a financial vehicle for supporters of the Conservancy to make donations and planned gifts into a perpetual endowment. Annual income from this endowment will support the Conservancy's three main objectives - conservation, education, and research – with a regional focus on coastal Lake Erie and the greater Great Lakes/Upper Midwest. For more information see the insert inside the back cover of this report.

The Winous Point Marsh Conservancy has been able to consistently grow, evolve, and develop as a result of the generous support and dedication we receive from our trustees, donors, partners, and neighbors. An organization of our size can only have a significant regional impact on wetland research and conservation by forging a multitude of relationships with other conservation-focused organizations. We genuinely value the support that our partners and contributors bring to this organization and look forward to the many challenges and accomplishments next year and beyond.

Regards,

John Simpson
Executive Director

Influenza A Virus Surveillance in Wild, Free-Ranging Waterfowl at Winous Point Marsh, Port Clinton, OH: 1986-2019

Investigators: Andrew S. Bowman, Richard D. Slemons, Jacqueline M. Nolting, and Sarah E. Lauterbach, Animal Influenza Ecology and Epidemiology Research Program, Department of Veterinary Preventive Medicine, The Ohio State University

Collaborators: Ohio Division of Wildlife and Winous Point Marsh Conservancy

Schedule: 1986 - Present

Summary: For more than 20 years the Winous Point Marsh Conservancy (WPMC), the Ohio Division of Wildlife, and the Department of Veterinary Preventive Medicine at The Ohio State University have participated in a proactive, collaborative influenza A virus (IAV) surveillance program in wild ducks. The objective of this ongoing effort is to better define the natural history of IAV in wild birds by identifying how genetic and antigenic diversity of these viruses are maintained in wild bird populations over time. Since highly pathogenic H5N8 and H5N2 was identified in avian species in the United States in December 2014, increased IAV surveillance has been initiated to monitor transmission and spread of these viruses of concern. This collaborative project has provided valuable insight into the relationship between host and viral ecology and the environment.

In addition to the valuable data collected at the Winous Point Marsh, many students have completed honors, Master's, and Ph.D. projects through this long-standing collaboration. In 2017, graduate student Sarah Lauterbach began her Master's thesis entitled "Filling a gap in influenza A virus surveillance in wild migratory mallard ducks" at WPMC. Previously, IAV surveillance has occurred primarily during summer banding and hunting seasons, thus limiting the understanding of IAV ecology throughout an entire year. Sarah's expanded project aims to conduct surveillance during winter and spring over the course of two years to understand transmission dynamics among mallards (*Anas platyrhynchos*); a species known to play a role in IAV transmission during summer and autumn. Understanding IAV over a two-year period in mallards may help fill gaps in knowledge for this individual species, as well as direct future surveillance efforts to address specific hypotheses.

After two years of intensive spring and summer trapping, and sample collection during hunting season, cloacal swabs were collected from 2,096 mallards at WPMC. All samples have been tested for IAV; 12.7% tested positive for IAV genetic material (indicating presence of IAV but not necessarily active infection) while viable virus was recovered from 6.2% (indicating active infection). IAV positive samples will be further evaluated for their genetic information while assessing ecological data to identify any potential risk factors for IAV infection in the birds.

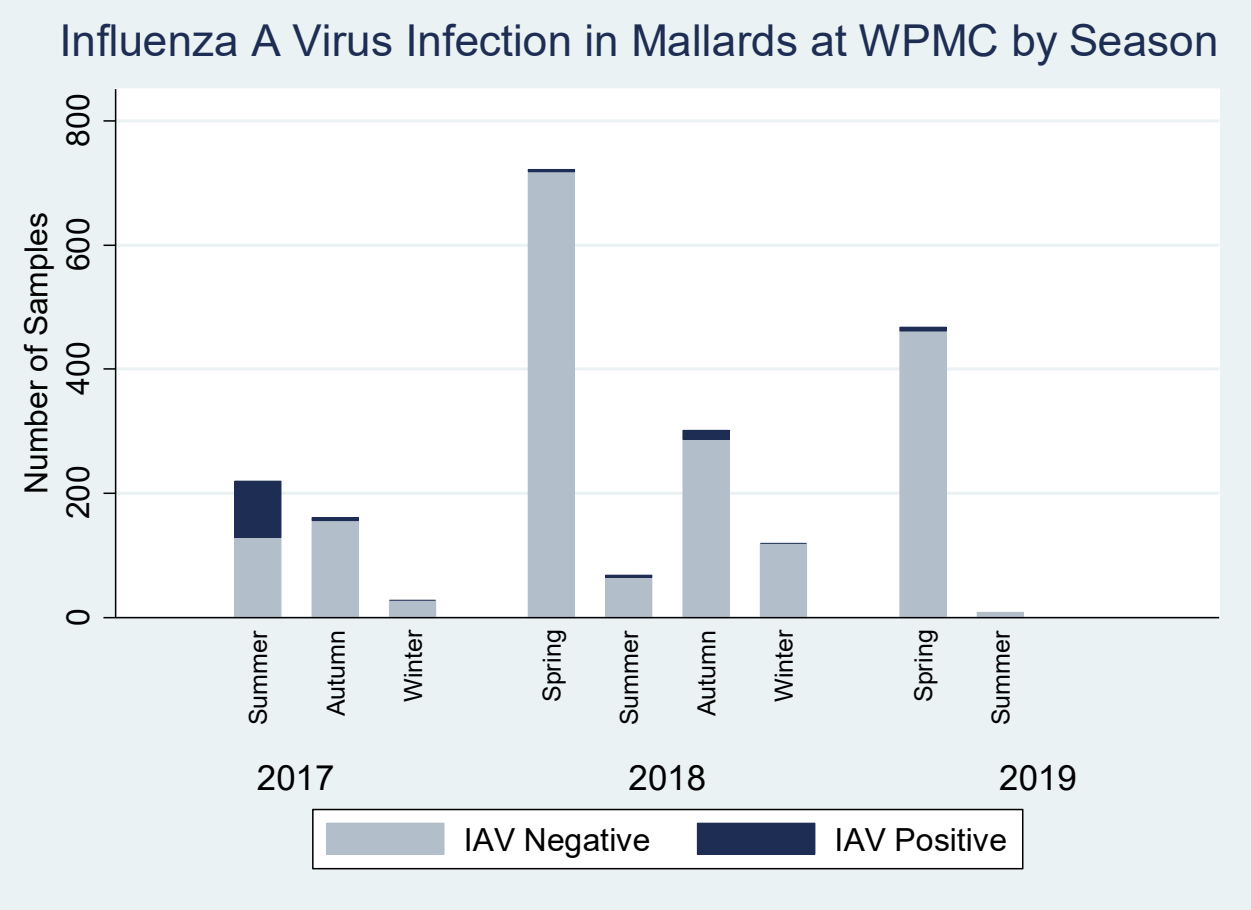

Figure 1. Influenza A virus (IAV) surveillance data for mallards at Winous Point Marsh Conservancy during the two-year study period, July 2017-July 2019. The bars represent the total number of samples collected and the number of samples from which viable virus was recovered during each season. Spring: March-May, Summer: June-August, Autumn: September-November, Winter: December-February.

Publications:

Li, L., Bowman, A.S., DeLiberto, T.J., Killian, M.L., Krauss, S., Nolting, J.M., Torchetti, M.K., Ramey, A.M., Reeves, A.B., Stallknecht, D.E., Webby, R.J., Wan, X.F., 2018. Genetic Evidence Supports Sporadic and Independent Introductions of Subtype H5 Low-Pathogenic Avian Influenza A Viruses from Wild Birds to Domestic Poultry in North America. J Virol 92.

Xiao, Y., Nolting, J.M., Sheng, Z.M., Bristol, T., Qi, L., Bowman, A.S., Taubenberger, J.K., 2018. Design and validation of a universal influenza virus enrichment probe set and its utility in deep sequence analysis of primary cloacal swab surveillance samples of wild birds. Virology 524, 182-191.

Nolting, J.M., Lauterbach, S.E., Slemons, R.D. and Bowman, A.S., 2018. Identifying Gaps in Wild Influenza A Surveillance in Ohio, United States. Avian diseases, 63(1s), pp.145-148.

Table 1. Type A Influenza samples collected and tested at Winous Point Marsh Conservancy, Port Clinton, OH since 1986.

Year	# Collected	# Flu Positive	% Positive
1986	191	18	9.42
1987	196	3	1.53
1988	104	4	3.85
1989	0	0	0
1990	0	0	0
1993	54	0	0
1998	0	0	0
1999	58	4	6.9
2000	22	3	13.64
2001	56	12	21.43
2002	96	7	7.29
2003	39	4	10.26
2004	106	5	4.72
2005	222	18	8.11
2006	346	21	6.07
2007	458	11	2.4
2008	549	36	6.56
2009	652	48	7.36
2010	657	57	8.68
2011	356	20	5.62
2012	712	39	5.48
2013	1,192	185	15.52
2014	925	50	5.41
2015	1,039	84	8.07
2016	950	52	5.47
2017	1,233	134	10.9
2018	1,580	37	2.3
2019	1,026	10*	2.0*
Total	**12,819**	**862****	**7.0****

**489 samples have been tested for 2019*

***12,282 samples have been tested in total*

Winous Point Marsh Conservancy supports this project through sample collections and housing interns and staff as needed.

This work was funded by the Centers of Excellence for Influenza Research and Surveillance, National Institute of Allergy and Infectious Diseases, National Institutes of Health (NIH), Department of Health and Human Services contract HHSN272201400006C.

Winous Point Marsh Conservancy and Ohio Division of Wildlife Cooperative Waterfowl Banding

Investigators: Brendan Shirkey, John Simpson and Jessica Schmit, Winous Point Marsh Conservancy; and the Ohio Division of Wildlife

Collaborators: Black Duck Joint Venture; Tom Kashmer, Sandusky County Park District; Mark Shieldcastle, Black Swamp Bird Observatory; Bob Gates, The Ohio State University

Schedule: Long-term

Introduction: Winous Point Marsh Conservancy (WPMC) has been involved in the Ohio Division of Wildlife's (ODW) summer banding program targeting wood ducks (*Aix sponsa*) and mallards (*Anas platyrhynchos*) and the winter banding program targeting black ducks (*Anas rubripes*) since 2011. The program operates under a cooperative agreement with the ODW with established goals of WPMC banding 50 black ducks, 400 mallards, and 150 adult male wood ducks annually. This work helps the ODW meet banding quotas for the US Fish and Wildlife Service and Mississippi Flyway Waterfowl Administrative Council. WPMC banding efforts since 2010 have now accounted for 6,379 banded waterfowl of 11 different species and 900 band recoveries (Tables 2 and 3).

Figure 1. Volunteers and students Dan Vargo, Nicole Hengst, and Megan Owens releasing banded black ducks at Winous Point Marsh Conservancy, spring, 2019.

Summary: Banding efforts in 2019 coordinated by WPMC staff resulted in the capture and banding of 5 different duck species totalling 716 individuals (Table 1). In a reversal from the 2018 banding season, we were successfully able to meet our summer mallard banding quota but instead struggled to locate and capture wood ducks in July and August. In addition to meeting our mallard banding quota, one of the most gratifying aspects of the waterfowl banding program is the continued involvement of a wide range of volunteers. It truly is a fantastic program to expose newcomers to wetlands and waterfowl and hopefully instill the conservation ethic that we all share.

Figure 2. Summer technicians Jess and Trevor band wood ducks at Winous Point Marsh Conservancy, summer, 2019.

Table 1. Total number of banded individuals during the winter (January - April, 2019) and summer banding program (July – August, 2019).

Species	Winter totals	Summer Totals
Black Duck	63	1
Mallard	29	411
Wood Duck	0	67
Redhead	143	0
Lesser Scaup	2	0
Seasonal Total	**237**	**479**

Table 2. Total of waterfowl banded at Winous Point Marsh Conservancy since 2010, by species.

Year	Black Duck	Mallard	Redhead	Gadwall	Wood Duck	Pintail	Widgeon	Canvasback	Scaup	Ring Neck	Shoveler
2010	41	3	0	0	0	0	0	0	0	0	0
2011	42	186	0	0	39	0	0	0	0	0	0
2012	125	49	0	0	143	0	0	0	0	0	0
2013	51	237	123	0	140	0	0	1	10	0	9
2014	23	181	7	341	164	7	6	5	5	2	1
2015	9	582	126	0	232	0	0	35	13	32	0
2016	127	679	80	10	307	1	0	0	0	2	0
2017	84	575	148	0	266	0	0	13	11	0	0
2018	169	71	0	0	150	0	0	0	0	0	0
2019	64	440	143	0	67	0	0	0	2	0	0
Totals	**735**	**3003**	**627**	**351**	**1508**	**8**	**6**	**54**	**41**	**36**	**10**

We are beginning to see a substantial number of band recoveries specific to ducks banded at WPMC (Table 3, Figures 3 and 4). The band recovery data is of general interest to those who study and hunt waterfowl, but the data also provides valuable information for those responsible for managing the resource. Band recovery data is an important tool for waterfowl managers used to estimate harvest rates, harvest derivations, and survival rates, all of which ultimately help inform harvest regulation frameworks. Our banding efforts should continue to provide valuable data to harvest managers as recent bag limit changes have been enacted on mallards and black ducks in Ohio and could be evaluated in the future using band recovery data.

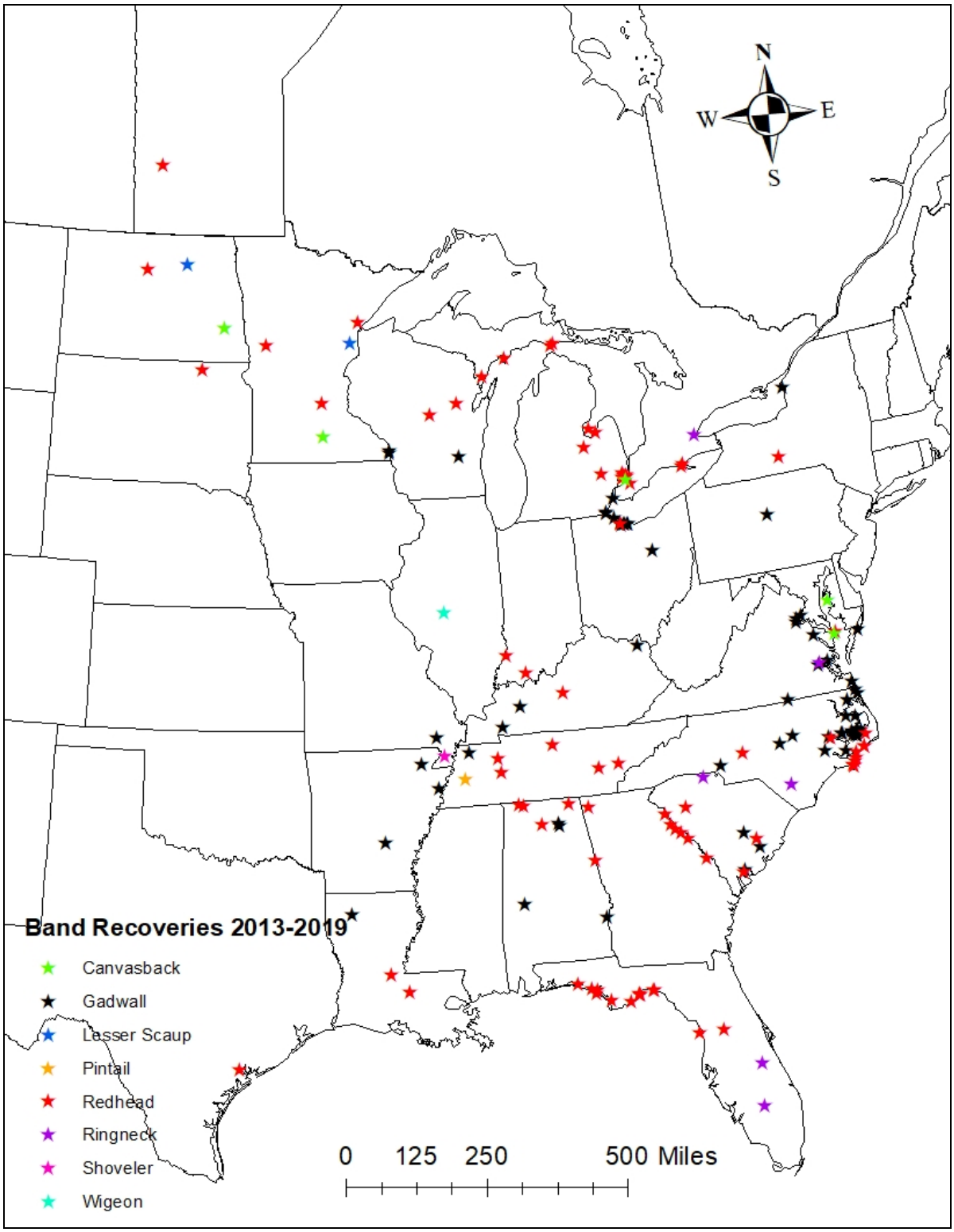

Figure 3. Band recoveries from canvasback, gadwall, lesser scaup, northern pintail, redhead, ring-necked duck, northern shoveler and American wigeon banded at Winous Point Marsh Conservancy from 2013 to 2019.

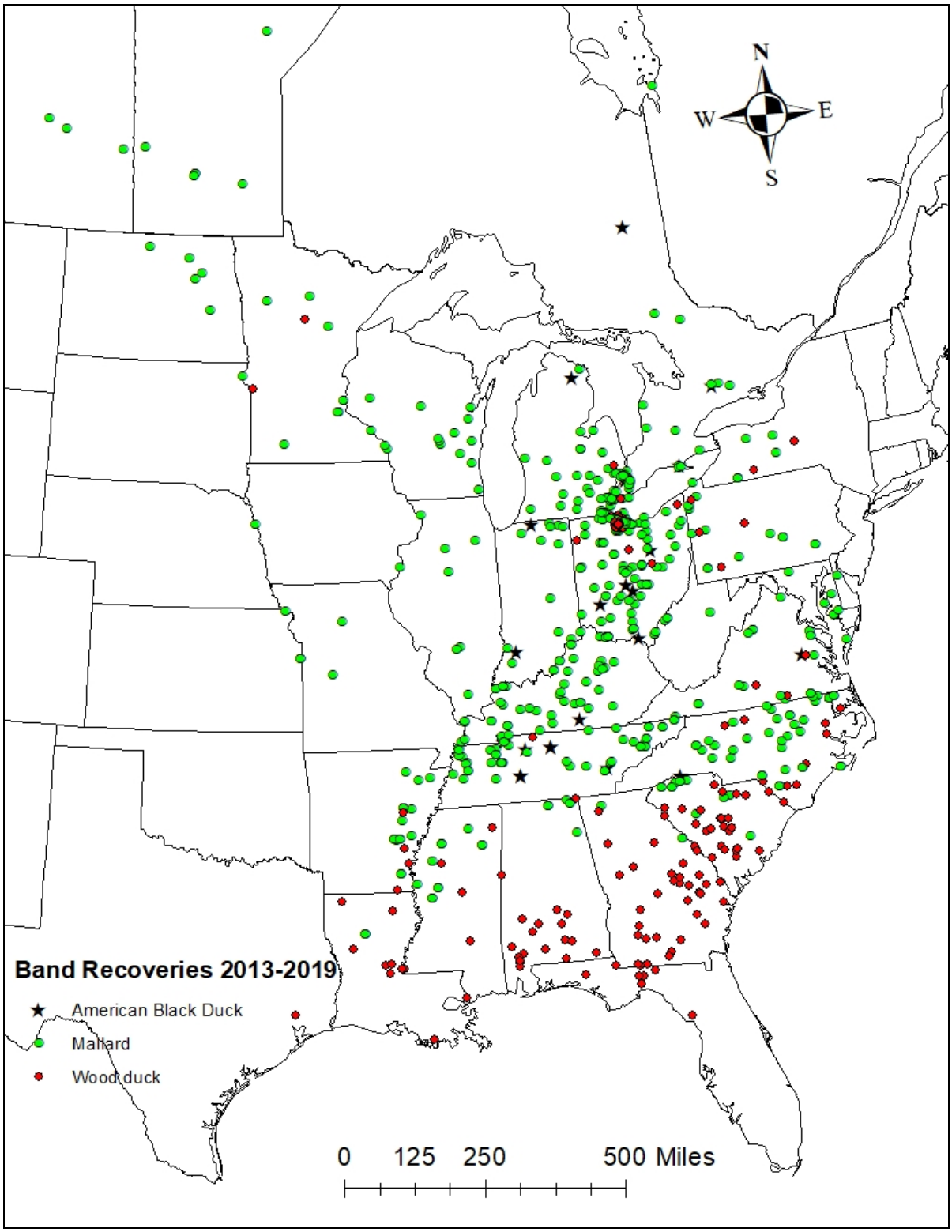

Figure 4. Band recoveries from mallards, wood ducks, and black ducks banded at Winous Point Marsh Conservancy from 2013 to 2019.

Table 3. Band recovery totals from birds banded specifically at Winous Point Marsh Conservancy for the three species identified in the ODW's cooperative agreement from 2014 to 2019.

	Mallards	American Black Ducks	Wood Ducks
2014	20	1	11
2015	65	1	27
2016	97	5	46
2017	173	10	61
2018	128	6	52
2019	24	1	10
Total	**507**	**24**	**207**

Winous Point Marsh Conservancy supports this project through a cooperative agreement with the Ohio Division of Wildlife whereby WPMC supplies field staff, time, and materials to band waterfowl and analyze data. In addition to ODW, project funding is also sourced from the Black Duck Joint Venture and Ohio State University. Sandusky County Park District and Black Swamp Bird Observatory provide additional banding staff and resources.

Winous Point Marsh Conservancy Purple Martin Monitoring

Investigators: Lisa Rock and Tom Kashmer, Green Creek Wildlife Society; Mark Shieldcastle, Black Swamp Bird Observatory; Megan Owens, Nicole Hengst, Grant Ravary, Jessica Schmit, Winous Point Marsh Conservancy

Collaborators: Ohio Division of Wildlife - Wildlife Diversity Program

Schedule: 2017 - 2021

Summary: The purple martin (*Progne subis*) is a colonial cavity nesting swallow that now relies almost solely on artificial nesting cavities. Winous Point Marsh Conservancy (WPMC) has provided purple martin housing since the 1940's, and there is evidence of colonial farms providing nesting cavities as early as the first half of the 18th century. Purple martin housing traditionally had an ornamental design focus consisting of a pole with several dozen cavities on the sides. These houses could not be lowered for cleaning or monitoring, and also resulted in cavities being overrun by invasive birds like European starlings (*Sturnus vulgaris*) and house sparrows (*Passer domesticus*). Many purple martin landlords, including WPMC, have decided to upgrade their nesting structures to improve management practices to discourage invasive species and also contribute to Green Creek Wildlife Society's purple martin research and monitoring program.

Figure 1. Purple martins resting on their colony tower at Winous Point Marsh Conservancy, summer, 2019.

Winous Point Marsh Conservancy worked closely with Green Creek Wildlife Society in their songbird nesting monitoring projects in 2019. This past year, WPMC used $10,000 in grant funds to purchase new nesting cavities and supplies for 3 more housing units (bringing our total number to 8 rigs and 144 gourds) and for general support to Green Creek Wildlife Society's regional martin project.

Figure 2. Volunteers helping on a purple martin nestling banding session in 2018.

As in years past, the purple martin, tree swallow and bluebird monitoring projects encourage citizen science and are a great way for volunteers to get involved in wildlife conservation. One of our summer technicians, Megan Owens, enthusiastically led the way in fostering public interest in our purple martin colonies. Her infectious excitement about purple martins and tree swallows was contagious, and effective in bringing people in to assist with weekly nest checks. Altogether, 495 purple martins were banded, as well as 65 tree swallows. We were proud to receive recognition as a "Parent of the Year" for helping with the purple martin project, but hand that distinction to Megan for her dedication to the birds!

Our partners with Green Creek Wildlife Society, Tom Kashmer and Lisa Rock, will continue to band nestlings at our colonies this summer. They hope to band over 5000 birds at all their nesting locations, and WPMC looks forward to supporting this monitoring effort. Green Creek Wildlife Society also plans to capture and equip adult purple martins with nanotag transmitters to collect improved migration data. With that goal in mind, the 2020 season will be a pilot season to test different capture methods for adults, including mist nets and in-gourd traps.

Figure 3. A purple martin inspects a nesting gourd at Winous Point Marsh Conservancy, summer, 2019.

Winous Point Marsh Conservancy staff continued this research out of self-interest and historical significance. We appreciate the hard work of the graduate students and volunteers who assisted with maintenance and monitoring on this project.

A 137 Year History of the Summer Avian Community at the Winous Point Marsh, Port Clinton, Ohio

Investigators: John Simpson, Brendan Shirkey, and Mike Picciuto; Winous Point Marsh Conservancy

Figure 1. Flock of American Avocets observed on Horseshoe Island during the spring of 2018. Although not observed during our brief 2017 survey window, we did note these rare spring migrants in our "137-year Avian History" manuscript published in the Ohio Journal of Science.

Summary: In the spring of 2017 our friends at the Black Swamp Bird Observatory in Oak Harbor, OH, gifted us a paper copy of a historic record of summer bird surveys completed at Winous Point Marsh. The paper is a unique and historically significant record of the summer (breeding) birds at Winous Point Marsh, beginning with an observational survey in 1880 and repeated in 1930 and 1960. Though not designed with rigorous scientific sampling standards in mind, the paper provides a fascinating look at changes in bird communities at Winous Point Marsh throughout European settlement and in response to a multitude of anthropogenic changes. Moreover, the records were kept by notable people, including the son of early Winous Point Shooting Club member J.B. Porter (joined 1886), and past member J.B. Semple (joined 1921; Figure 2), and the first Winous Point Shooting Club biologist-manager, John Anderson.

The history associated with this century old survey effort spurred our interest in replicating and updating the summer bird species list to reflect current conditions in 2017. Although not a

rigorous scientific sampling design, we felt it worthwhile to update the survey and specifically to take note of species that have changed in abundance, or presence over the 137-year period. From July 5 to July 8, 2017 then research technician, Mike Picciuto, and three graduate student volunteers informally surveyed the property for summer bird species noting relative abundance, breeding prevalence, and anecdotal notes about population trends. We also added anecdotal notes based on our observations of certain species in the last ten years, whether they were observed during the survey effort or not. Though not a typical scientific study, the Ohio Journal of Science accepted, and recently published, a manuscript we submitted comparing our 2017 survey to those completed in 1880, 1930, and 1960. Below is a brief synopsis of that manuscript titled "A 137 Year History of the Avian Community at the Winous Point Marsh, Port Clinton, Ohio."

> *The Winous Point Marsh Conservancy and Shooting Club with landholdings in both Sandusky and Ottawa Counties, Ohio has attempted to census the summer resident bird population on the property 4 times spanning 137 years. Although achieving a true census is unrealistic, these surveys have provided a unique, long-term history of changes in the avian community in northwest Ohio since the 1880s. Surveys were completed in 1880, 1930, 1960, and 2017. Draining and deforestation of the wetlands in northwest Ohio in the late 1800s resulted in the loss of many forested-wetland dependent species such as Blue-gray Gnatcatcher (Polioptila caerulea), Solitary Sandpiper (Tringa solitaria), and Northern Water Thrush (Parkesia noveboracensis) after the 1880 survey. Intensification of agricultural practices after the 1930 survey likely resulted in the loss of early successional habitat that was associated with smaller, less intensive agricultural practices and consequently the loss of many grassland nesting species such as Bobolink (Dolichonyx oryzvorus), Eastern Meadowlark (Sturnella magna), Northern Bobwhite (Colinus virginianus), Blue-winged Teal (Anas discors), Northern Pintail (Anas acuta), and Northern Shoveler (Anas clypeata). Several new species were documented during the 2017 survey including Osprey (Pandion haliaetus), Sandhill Crane (Grus canadensis), Trumpeter Swan (Cygnus buccinator), and American White Pelican (Pelecanus erythrorhynchos). This long-term dataset provides a unique opportunity to investigate the avian immigration, extirpation, and recolonization of a specific site over the past 137 years providing some insight into how changes in the avian community reflected landscape-level habitat changes.*

In addition to the peer-reviewed manuscript, we also gave a brief interview with the Port Clinton News Herald regarding the historical surveys. Our serendipitous encounter with the historical surveys resulted in an excellent opportunity to convey the work the Winous Point Marsh Conservancy does today, and also the strong interest in avian conservation that can be traced all the way back to the inception of the Winous Point Shooting Club. Furthermore, it allowed us to highlight the work done here at Winous Point Marsh Conservancy both to a regional scientific audience and more local, general-public audience.

Figure 2. Winous Point Shooting Club (WPSC) member John B. Semple joined in 1921 and undertook the second summer bird survey in 1930 with the assistance of Bayard H. Christy. Semple is one of many past and present WPSC members with a keen interest in natural history and conservation. Winous Point Marsh Conservancy continue this research out of self-interest and historical significance.

Winous Point Marsh Conservancy and Ohio Division of Wildlife Cooperative Common Tern Monitoring

Investigators: Brendan Shirkey and Jessica Schmit, Winous Point Marsh Conservancy, Laura Kearns, Ohio Division of Wildlife

Schedule: Long-term

Introduction: Common terns (*Sterna hirundo)* have been listed as state endangered in Ohio since 1974. Common terns have a high priority conservation status in the Great Lakes due to declines in breeding pairs and shrinking breeding distribution. While once frequent nesters on the sand and gravel covered islands and shorelines of western Lake Erie, common terns are now almost entirely dependent on artificial nesting platforms for continued reproductive success. Threats to common terns include nesting habitat loss due to high lake levels, human disturbance at nesting sites, and nest predation from several species. The Ohio Division of Wildlife's (ODW) 1990-1995 Strategic Plan established the goal of maintaining common tern populations in Ohio and began several management projects to achieve those goals. Primarily, artificial nesting platforms were established at several sites in northwest Ohio beginning in 1994 and data needed to estimate nest success, chick survival and fledging rates have been collected annually since 2016. Since April 2018, Winous Point Marsh Conservancy (WPMC) research staff has taken over banding chicks and monitoring fledglings at the two nesting colonies, with support from the ODW and U.S. Department of Agriculture Wildlife Services.

Figure 1. Common tern artificial nesting platform at Cedar Point NWR, Ohio, summer, 2019.

Summary: In 2019, the ODW deployed 7 platforms at Cedar Point National Wildlife Refuge (Lucas County, OH) and 5 platforms at Willow Point State Wildlife Area (Sandusky County, OH). Beginning in the middle of May and until late August, WPMC research staff monitored the platforms weekly to band chicks and record recapture status. The recapture data collected helped determine nest success and overall productivity of the colony. We banded 374 chicks with a federal aluminum band once they were old enough to move about on their own and banded chicks with a colored band specific to each colony. Despite the differences in number of platforms, both colonies had similar numbers of breeding pairs and nests, but the Cedar Point colony produced a higher number of young than the Willow Point colony (Table 1). Overall production (283 young) was lower than 2018 (340 young), but still above the 5-year average (277 young) and the long-term average (184 young) goal set forth by the Detroit River – Western Lake Erie Common Tern Management Plan (Figure 3). This plan set goals in 2015 of a 5-year average number of breeding pairs at Willow Point of 150 or greater, and at Cedar Point of 100 or greater. Currently, the 5-year average is 123 breeding pairs for the Willow Point colony, and 89 breeding pairs for the Cedar Point colony.

Figure 2. A juvenile recaptured before fledging in 2019. Note the metal USGS band and the colored bands used for re-sighting purposes.

Table 1. Estimated number of dead or missing chicks, estimated fledging rates, and nest success rates by artifical nesting platform at Willow Point and Cedar Point during the 2019 season.

Willow Point

Platform	# Dead	# Missing	Est # Fledged	Total	Fledging Rate	Total Nests	Success Nesting Rate
1	4	4	19	27	70.4%	26	84.6%
2	1	2	13	16	81.3%	36	50.0%
3	9	2	17	28	60.7%	31	77.4%
4	3	1	32	36	88.9%	29	86.2%
5	4	1	27	32	84.4%	35	77.1%
Total	**21**	**10**	**108**	**139**	**77.7%**	**157**	**75.1%**

Cedar Point

Platform	# Dead	# Missing	Est # Fledged	Total	Fledging Rate	Total Nests	Success Nesting Rate
1	2	3	13	18	72.2%	23	56.5%
2	4	3	38	45	84.4%	26	76.9%
3	4	4	17	25	68.0%	28	67.9%
4	2	4	34	40	85.0%	20	90.0%
5	8	3	27	38	71.1%	21	66.7%
6	9	2	24	35	68.6%	29	75.9%
7	2	0	22	24	91.7%	21	66.7%
Total	**31**	**19**	**175**	**225**	**77.8%**	**168**	**71.5%**

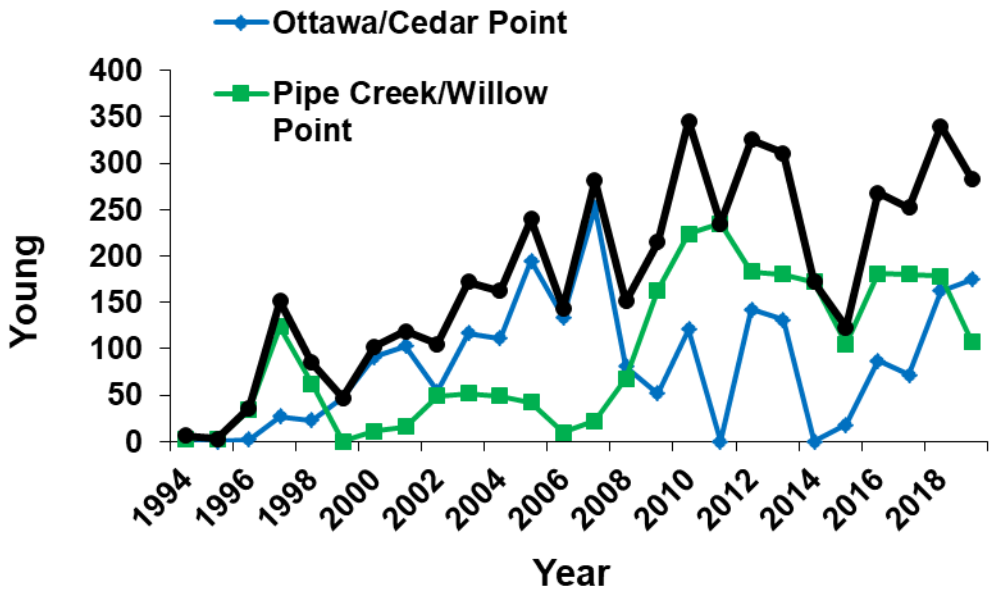

Figure 3. Number of young produced at two common tern colonies in Ohio from 1994-2019. Black line denotes the sum total of both colonies. (Laura Kearns, ODW, 2019).

Future Work: There has been recent discussion to move the Cedar Point colony to Howard Marsh, part of the Toledo Metroparks, prior to the 2020 nesting season. Additionally, there are plans to run a pilot year with another design of a floating island nesting platform. It is the hope of all parties involved that moving the colony will help eliminate some of the predation issues that frequently occur at the Cedar Point colony. The Howard Marsh location also offers a new opportunity to further our understanding of how human disturbance affects tern nesting success and answer other potential questions about the dynamics of common terns in western Lake Erie.

Winous Point Marsh Conservancy works cooperatively with the ODW on this project by banding tern chicks and monitoring tern nesting, hatching, and fledging. ODW staff maintain and seasonally remove and install the floating platforms.

Estimating Virginia Rail and Sora Abundance Using Standardized Secretive Marshbird Surveys and Radio-Marked Individuals

Investigators: Brendan Shirkey, Jessica Schmit, Megan Owens, and John Simpson, Winous Point Marsh Conservancy

Funding: Upper Mississippi River and Great Lakes Region Joint Venture.

Introduction: An understanding of population size and habitat requirements is important for effective management of wildlife populations. Currently, so little is known about secretive marshbirds, including rails and bitterns, that many existing estimates of population size are based on expert opinion. A long-term monitoring program was established throughout the Midwestern United States in 2010 with one fundamental objective being to estimate population size for a suite of marshbird species. If population size can be estimated from current survey techniques, this would provide valuable, and much-improved, information for conservation planners such as the Upper Mississippi River and Great Lakes Region Joint Venture (UMRGLJV).

Winous Point Marsh Conservancy (WPMC) has been an active participant in the Midwest Coordinated Marshbird Monitoring Program since 2011. Despite nearly a decade of data, no attempt has been made to estimate secretive marshbird abundance until this year. Mike Monfils (Michigan Natural Features Inventory) and Dr. Dan Hayes (Michigan State University) completed the first ever analysis estimating abundance of a variety of marshbird species across the Midwest using distance sampling techniques. At the same time, here at WPMC, we used a small-scale pilot project to test several key assumptions that could greatly improve regional population estimates. The main assumption critical to obtaining unbiased estimates using distance sampling is that all birds immediately adjacent to the survey point are detected. Since most marshbird detections are auditory, there is a possibility of violating this assumption if all birds present do not call during the 10-minute survey window. We developed 3 objectives for our pilot project including:

1) Test the assumption that detection of Virginia rail and sora is 100% directly at survey points.
2) Explore potential variation in rail response rates to call playback surveys and how other variables (i.e., weather, time of year, distance) might affect rail response rates.
3) Generate a “correction factor” that can be applied to distance sampling techniques for estimating population size for Virginia rail and sora if detection is not 100% immediately at survey points.

Methods: We conducted 214 marshbird surveys from April to June of 2017-2019. Of these, 40 were conducted to radio-marked sora and 184 to radio-marked Virginia rails. We completed

correction factor surveys by approaching radio-marked rails to less than 30 meters. One fundamental assumption of our research was if a bird vocalizes the observer will hear it every time. Through investigation of historical distance sampling data and observer experience, we assumed 30 meters to be a conservative cut-off for the distance at which all vocalizing rails can be heard regardless of observer ability or environmental conditions. We approached rails as close as possible and then conducted a standardized secretive marshbird survey. Surveys consisted of a 5-minute silent listening period followed by 5 minutes of broadcasted marshbird calls designed to elicit responses from various secretive marshbird species. After completing the survey, the exact distance from the observer to the radio-marked bird was determined either by the location of the bird's vocalization (if the bird responded) or by approaching the radio signal until the bird was flushed from its initial location (if the bird did not respond). We collected a variety of environmental and temporal variables as outlined by the standardized secretive marshbird protocol to examine their potential impact on rail vocalization rates. These included: date, time, precipitation, cloud cover, temperature, wind, background noise, response of other marshbirds, and observer.

Figure 1. Research tech Jessica Schmit tracking a radio-marked rail at Winous Point Marsh Conservancy in June, 2019.

Results: We approached radio-marked individuals to an average distance of 17.7 m. We generated an *a priori* list of candidate logistic regression models that contained variables potentially influencing rail response rates during a standardized secretive marshbird survey. The top ranked model included the categorical variables "species", "conspecific", and "minutes". This model indicated that response rates differed by species, with 46.2% of Virginia rail and 30.0% sora responded during a 10-minute standardized marshbird survey period. It also indicated that radio-marked individuals of both species were more likely to respond if other individuals of the same species were present and calling (Figure 2). Lastly, the model indicated that radio-marked birds were more likely to respond during surveys periods closer to sunrise or sunset.

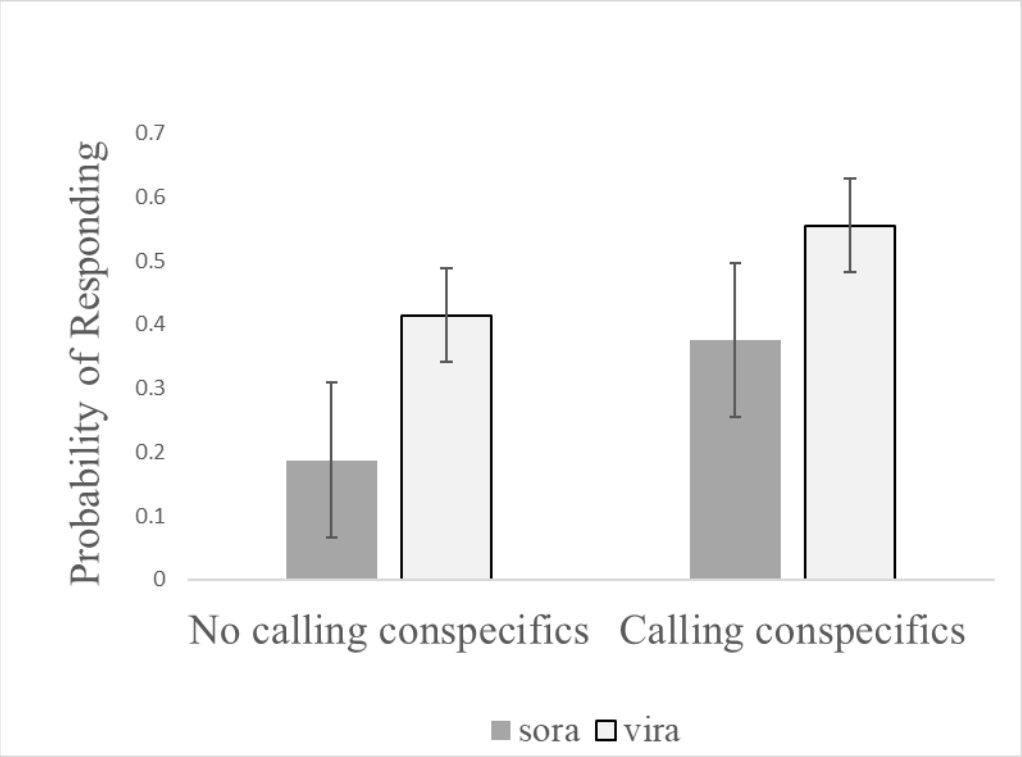

Figure 2. Probability of a radio-marked rail responding during a secretive marshbird survey at Winous Point Marsh Conservancy in April-June, 2017-2019 dependent on whether other individuals of the same species also responded.

We completed 3 marshbird survey routes (n= 27 survey points) in 2018 and 2019 on WPMC property during each of the 3 secretive marshbird survey windows (Ohio's 1st window = May 7-17; 2nd window May 24-June 2; 3rd window = June 9-19). Detections for Virginia rail and sora were limited with 16 detections being the most we ever recorded during a single survey window. We were able to generate abundance estimates using a correction factor generated from our surveys to radio-marked birds and distance sampling protocol for the first 2 survey windows in 2018 and the first survey window in 2019. However, we had to combine Virginia rail and sora detections to do so. The abundance estimates for Virginia rail and sora combined on WPMC

property during the 1st survey window in 2018 was 1,228 individuals (95% CI = 449-3,358) and during the 2nd window was an estimated 207 individuals (95% CI = 62-689). In 2019, we estimated 3,483 Virginia rails and sora during the first survey window (95% CI = 1,840-6,559).

Discussion: Approaching and conducting secretive marshbird surveys to radio-marked individuals proved to be an effective study demonstrating that detection probability immediately adjacent to survey points is less than 1.0. Consequently, regional population estimates obtained using distance sampling techniques for Virginia rail and sora are likely biased low unless a correction factor is applied.

We did not find a significant difference in Virginia rail and sora response rates between years or through time (Julian date). This suggests that distance sampling could be used to track abundance between years and between surveys and is at least a reliable index of rail populations. Further information regarding rail response rates across space and time is needed before reliable abundance estimates can be made.

We documented a significant decline in Virginia rail and sora abundance between the 1st and 2nd secretive marshbird survey windows. This finding supports concurrent research conducted by Ohio State University that has found a significant number of radio-marked rails leave WPMC property during Ohio's secretive marshbird survey windows (see pages 28-30). This finding suggests many migrant rails are likely present during the 1st and 2nd survey window, possibly inflating estimates of the assumed breeding population. Consequently, our region of the UMRGLJV appears to hold more Virginia rail and sora during migratory periods relative to breeding periods.

Figure 3. Radio-marked Virginia rail captured in spring of 2019 at Winous Point Marsh Conservancy.

Winous Point Marsh Conservancy staff completed this project in collaboration with many regional partners including the Midwest Marshbird Working Group and the UMRGLJV. We continue to be committed to helping both groups improve understanding of the needs of secretive marshbirds throughout the midwestern United States.

Population Monitoring, Ecology, and Habitat Relationships of Sora and Virginia Rail in Northwest Ohio

Investigators: Nicole Hengst, Robert J. Gates and Christopher M. Tonra, The Ohio State University; Laura Kerns, Ohio Division of Wildlife; and Brendan Shirkey and John Simpson, Winous Point Marsh Conservancy

Schedule: 2016 - 2020

Project Overview: The amount of wetland habitat across North America has declined substantially over the last century, and this loss has been associated with declines of many marshbird species. The goal of this project is to provide empirical data on distribution, abundance, local population densities, and habitat selection of two hunted marshbird species, the Virginia rail (*Rallus limicola*, VIRA) and sora (*Porzana carolina,* SORA). Knowledge of population demography, life history phenology, and population-habitat relationships will help address the current population status of these species as well as inform harvest management in Ohio. Knowledge of seasonal movements, home range, and habitat use of Virginia rails and soras will also inform habitat management recommendations for these two species.

Summary: Our fourth field season at Winous Point Marsh Conservancy (WPMC) commenced with trapping on 9 April 2019. A total of 151 rails (45 SORA and 106 VIRA) were captured during 9 April – 25 July 2019. We deployed VHF radio-transmitters on 85 rails (32 SORA and 53 VIRA) and VHF pulse-coded radio-transmitters on 42 Virginia rails (Figures 1 and 2). No rails were recaptured from banding efforts conducted in previous years. Rails equipped with radio-transmitters were tracked from date of capture to when their signal was lost, or the rail was found dead. Only 9 Virginia rails remained at WPMC from date of capture through the onset of fall migration, approximately 1 September. Daily ground searches and monthly aerial searches were made to locate missing radio-marked rails during April – October 2019. Search efforts found rails at 4 state, federal, and privately-owned wetland complexes in the area after disappearing from WPMC.

Figure 1. Sora marked with a radio transmitter at Winous Point Marsh Conservancy during spring, 2019.

Figure 2. Virginia rail marked with a radio transmitter at Winous Point Marsh Conservancy during the spring 2018 field season.

Radio-triangulated and homing locations were gathered on rails to determine their home range size and distribution. We recorded 1 – 34 locations ($\bar{x}$ = 6) of 74 individual radio-marked rails during 10 April – 30 August 2019. Minimum convex polygon (MCP) and Kernel Density Estimator (KDE) home ranges were estimated for 8 Virginia rails with 10 - 20 or >20 locations, respectively (Figure 3). No radio-marked soras had a sufficient number of locations to estimate home range. Mean home range size was 2.43 ha (0.24 – 8.10) for Virginia rails in 2019.

The VHF pulse-coded radio-transmitters (nanotags) were registered with the Motus Wildlife Tracking System which utilizes automated radio-telemetry towers to detect tagged individuals.

Since April 2018, we have been maintaining 12 – 14 towers along the western basin of Lake Erie; however, the Motus network extends worldwide, and we have access to all uploaded data connected to our tagged rails. Data processing from the telemetry towers is ongoing as we continuously receive updated detection data from the Motus tower network.

Figure 3. MCP and KDE home ranges of radio-marked Virginia rails at WPMC during 10 April – 30 August, 2019.

In addition to capturing and tracking rails, we also conducted habitat assessments with the objective of analyzing movement patterns and habitat selection of Virginia rails and soras in response to changing water levels and vegetation structure. We conducted a total of 164 water surveys and 86 vegetation surveys at known locations of radio-marked rails and paired random locations on a weekly basis during 15 April – 26 August 2019. Each location was categorized into a habitat class based on the Integrated Waterbird Management and Monitoring approach developed by the U.S. Fish and Wildlife Service and then further separated into a habitat type based on land cover and vegetation species if applicable. Rails were located in areas characterized by emergent vegetation 86% of the time (Table 1). Survey measurements included water depth, distance to open water, distance to edge, visual obstruction, percent cover, and interspersion within a 10-m radius plot. Preliminary analysis of survey measurements has shown the differences between rail locations and random locations are not statistically significant; therefore, more detailed analysis of the habitat assessments in connection with movement patterns and habitat selection is in progress.

Table 1. Categorization and summary of habitat assessments into habitat classes and if applicable habitat types for radio-marked rail locations and random locations.

Habitat Class – Habitat Type	Rail Locations	Random Locations	Total
Water – Standing Water	4	5	9
Water – Submergent Aquatic Vegetation	0	2	2
Water – Floating-Leaved Vegetation	2	2	4
Bare Ground - Unvegetated	0	0	0
Emergent – Cattail/Bur-reed	28	23	51
Emergent – Rose mallow/Reed canary	5	6	11
Emergent – Loosestrife	0	0	0
Emergent – Phragmites	2	2	4
Emergent – Broadleaf	0	1	1
Emergent – Moist Soil	2	2	4
Scrub-Shrub	0	0	0
Forest	0	0	0
Total	**43**	**43**	**86**

Winous Point Marsh Conservancy is a lead investigator on the project, assisting with the proposal development and research implementation. This project is funded by the Ohio Division of Wildlife through the Terrestrial Wildlife Ecology Lab at Ohio State University.

King Rail Habitat Use and Response to Conspecific Playback

Investigators: Dustin Brewer and Thomas Gehring, Central Michigan University; Brendan Shirkey, Jessica Schmit, John Simpson, Winous Point Marsh Conservancy

Schedule: 2019 – 2023

Figure 1. Ph.D. candidate Dustin Brewer with a king rail captured at Winous Point Marsh Conservancy in spring of 2019.

Introduction: King rail (*Rallus elegans*) populations appear to have sharply declined in the Midwest during the last century. The most likely cause for this decline is habitat loss. A previous study using birds captured at Winous Point Marsh Conservancy tracked migration routes of individual king rails using satellite telemetry and helped to refine capture methods. Similar to other rail species, king rails likely are not 100% detectable when a surveyor is within a few meters of individuals. This violates a crucial assumption of distance sampling, which can be used to estimate population abundance. Further, it is unknown how king rails respond to different call types that surveyors broadcast to them. Determining response rates to the standard track used by

surveyors will allow an appropriate "correction factor" to be applied to population models in order to improve king rail population estimates. Furthermore, determining what broadcasted king rail call types elicit the most responses from king rails that are present can improve population estimates by informing surveyors which call types to use during playback surveys. Therefore, the main objectives of the current study are to determine what habitat types these rails are using and determine the rate at which king rails respond to different audio playback tracks.

Methods: Trapping efforts were focused at Winous Point Marsh, but also occurred at nearby wetlands including Ottawa National Wildlife Refuge. We attempted to catch king rails by using walk-in traps baited with an audio lure (Figure 1). Bungee propelled nets were also used for opportunistic trapping attempts. In 2020, these trapping efforts will occur across a broader geographical area in NW Ohio and SE Michigan.

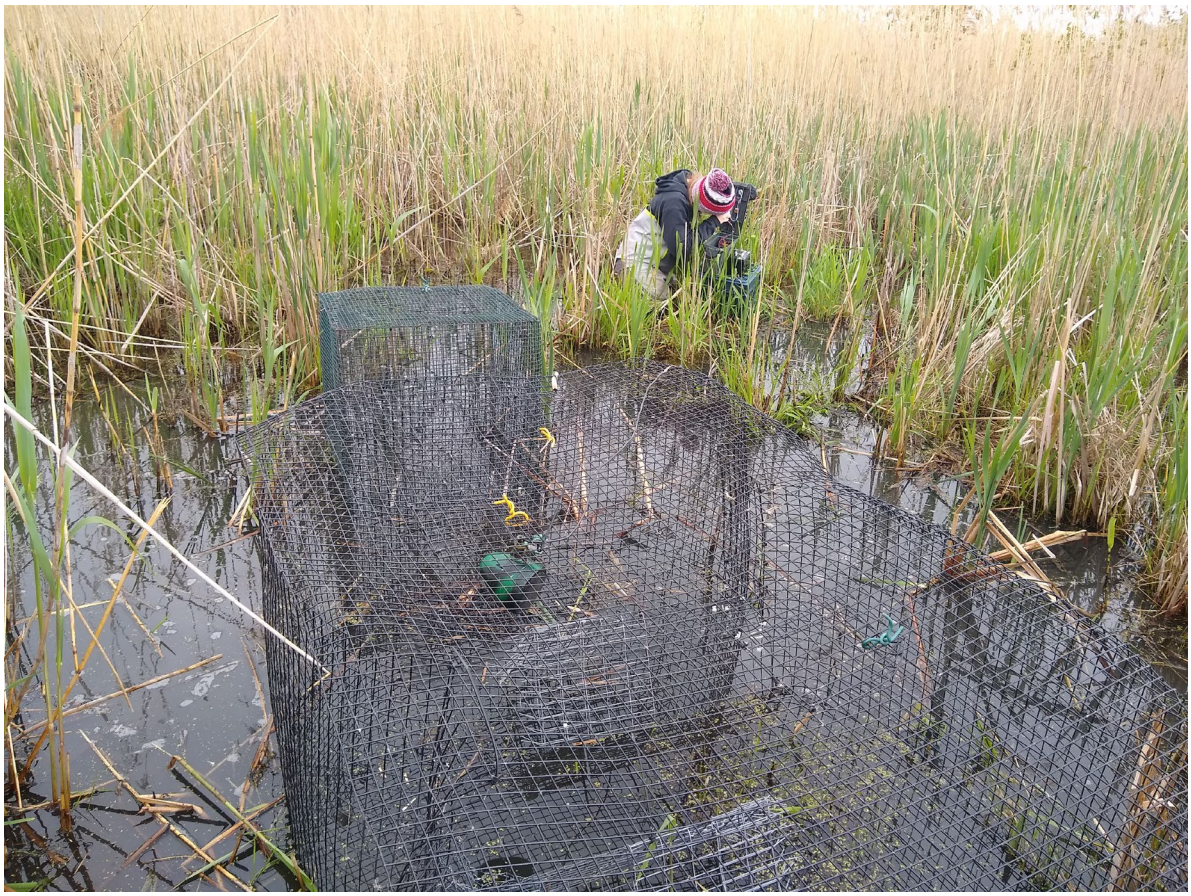

Figure 1. Walk-in funnel trap and audio lure system used to catch king rails.

Habitat

After a bird was radio-tagged, we recorded homing and random locations at least twice per week for that individual. We determined these locations by tracking the bird using radio telemetry, marking the location with a GPS, and then marking another location 50 m away in a random

direction. This allowed us to determine, upon completing vegetation surveys at both random and homing locations, if king rails are selecting for specific habitat components within their home range.

Playback

Similar to the procedure for describing habitat, we tracked individual king rails using radio telemetry equipment. Then, we conducted a standardized marsh bird survey while that individual was within 30 m. This allowed us to estimate the rate at which king rails respond to playback during monitoring surveys.

Results: In 2019, we captured only one king rail due to a variety of challenges, including a delay in funding and apparently fewer king rails at Winous Point Marsh Conservancy compared to previous years. The single king rail was captured in the Horseshoe Marsh unit on May 14th by using a walk-in trap. Given that only one king rail was caught in 2019, we treated the 2019 field season as a pilot season in preparation for 2020.

Figure 2. King rail captured at Winous Point Marsh Conservancy in 2019. Their reddish and brown color patterns afford them great camouflage in their preferred marsh habitat.

Winous Point Marsh Conservancy is a co-lead investigator on the project with Dr. Thomas Gehring of Central Michigan University. The project is funded by Central Michigan University and grant funding from the Upper Mississippi River and Great Lakes Region Joint Venture.

King Rail Habitat Use and Community Relationships in Lake Erie Coastal Wetlands

Investigators: Michelle Kane, Dr. Thomas Gehring, Dr. Kevin Pangle, and Dr. Donald Uzarski, Central Michigan University; Brendan Shirkey, Michael Picciuto, and John Simpson, Winous Point Marsh Conservancy

Schedule: 2018-2019

Introduction: King rails (*Rallus elegans*) are a large species of secretive marshbird that has declined alarmingly in the past 50 years. The Second Atlas of Breeding Birds in Ohio estimates fewer than 140 individuals remain in Ohio, where they may have once been the most abundant rail species. Due to their decline, king rails are listed as threatened or endangered in 12 states. Although their secretive nature makes them difficult to study, king rail decline has been linked to habitat loss, fragmentation, and degradation. One of the problems that has plagued studies of king rails in the Midwest is low detection rates. During two years of research at Winous Point Marsh Conservancy, standardized callback surveys for marshbirds failed to detect any king rails, but trail cameras baited with recorded king rail calls detected at least 13 individuals. The presence-absence data gained from trail cameras allows the estimation of site occupancy with occupancy modeling techniques. Occupancy modeling can be used to predict where a species occurs by determining what variables best discriminate between locations where the species is present and where the species is absent. Gaining a further understanding of the Midwest population of king rails and their habitat is critical for conservation. The objective of this project was to use data collected from trail cameras deployed at western Lake Erie coastal wetlands to create occupancy models. The information from these models provides important ecological information for king rail management and identifies potential habitat for monitoring and/or restoration.

Figure 1. An adult king rail detected on camera in NW Ohio coastal wetland in 2019.

Methods: Study sites (in order from north to south) were established at Pointe Mouillee State Game Area and Erie Marsh Preserve in Michigan, and Cedar Point National Wildlife Refuge, Ottawa National Wildlife Refuge, Magee Marsh State Wildlife Area, Winous Point Marsh Conservancy, Pickerel Creek State Wildlife Area, and Pipe Creek State Wildlife Area in Ohio. We gathered occupancy data on king rails using motion sensitive game cameras baited with an audio lure. Camera traps were placed at each randomly generated sample point 3 times between April 20th and July 5th, 2019. Camera traps were left at the sample point for 6-8 days before being moved to a new location. To collect data on other bird species, call-broadcast surveys were conducted at each of the 50 sample locations between May 20th and July 10th, during times when camera traps were not deployed at the point. These surveys followed the standard operating procedures outlined by the Great Lakes Coastal Wetland Monitoring Program. Habitat surveys were conducted at each sample location between July 10th and July 23rd, 2019 to collect fine scale habitat data. Broad scale habitat data was obtained at 250 m and 2 km scales from the National Wetland Inventory, the National Land Cover Dataset, and the Topologically Integrated Geographic Encoding and Referencing Program. We built single species occupancy models using the package unmarked in R to estimate detection probability and probability of site occupancy. We compared all models using second order Akaike's information criterion adjusted for small sample sizes (AICc). We then calculated ΔAICc values and AICc weights, w_i, for each model. Any model with a ΔAICc value ≤2 was considered to have strong empirical support.

Figure 2. A king rail chick at a northwestern Ohio wetland in 2019.

Results: During the survey season, 10 detections of king rails occurred at 9 sites (Figure 1), an 18% naïve occupancy rate. 8 detections came from camera traps and 2 from call-broadcast surveys. 9 detections were of individual adults, and 1 was of a juvenile. The model with the most empirical support (w_i = 76%) had constant detection probability and 4 variables informing occupancy. King rail occupancy was positively related to amount of interspersion within a 5-m radius, average water depth within a 5-m radius, and percent cover of emergent vegetation within a 5-m radius, whereas occupancy was negatively associated with presence of other rail species (i.e. sora and/or Virginia rail). The Mackenzie and Bailey goodness of fit test showed the model had a good fit (df=18, χ^2=15.11, p=0.66). The fitted probability for detection was 16.6%. Using this information, managers can predict the occurrence of king rails and identify potential habitat for monitoring and/or restoration on a local scale.

Figure 3. Adult king rail detection at night in an Ohio wetland in 2019.

Winous Point Marsh Conservancy assists with this project by providing housing for students, electronics and traps for the audio lures used to attract king rails, and grant administration. Funding was provided by Central Michigan University.

Additional Research and Education Programs Supported by WPMC in 2019

In addition to the projects detailed above, Winous Point Marsh Conservancy (WPMC) annually supports a variety of smaller projects or supplies field, housing and logistical support for larger projects not directly initiated by our staff. These projects are important components towards achieving program objectives.

Wood Duck Nesting

Wood duck (*Aix sponsa*) boxes have been placed around Winous Point Marsh and monitored for decades. Some of our marshes have great habitat for cavity nesting waterfowl like wood ducks and hooded mergansers (*Lophodytes cucullatus*), and WPMC staff want to encourage more nesting of these species. One of our goals for 2020 is to repair, build and install 20 wood duck nesting boxes and implement a monitoring system to collect nesting data. Plans are to monitor the boxes weekly in the spring and summer, and band adults and web tag ducklings when they finally hatch! Additional plans are underway to install a webcam into a successful nest to watch nesting progress throughout the season and share it on our social media page. We are working on getting that project underway and recruiting new volunteers and students to help with the monitoring. We aim to involve scouts and other student groups to give them a chance to participate in the research going on here at Winous Point Marsh Conservancy and learn more about waterfowl conservation.

Figure 1. Research tech Jessica Schmit maintaining and monitoring wood duck boxes at Winous Point Marsh Conservancy.

Eastern Mallard Stable Isotope and Genetics

Atlantic Flyway mallards (*Anas platyrhynchos*), and to a lesser extent Great Lakes mallards, have undergone significant population declines in the last 10 – 20 years. This project proposes to investigate two possible hypotheses for this eastern mallard population decline. First, that breeding productivity of these mallards has declined, or at least is different across the range of the species. Second, that wild mallards have been genetically swamped by the release of captive mallards, a common practice on the eastern coast of the United States, and as a result their fitness has been reduced.

Figure 1. Mallards, northern pintails, and black ducks at Winous Point Marsh Conservancy, winter, 2016.

Goals: 1) Develop and share a δ^2H (deuterium) database for eastern mallards harvested and banded in the Atlantic Flyway to determine harvest, banding, and productivity derivation for application to eastern mallard population dynamics studies among partners and collaborators and 2) determine proportions of game-farm and wild mallards harvested in the Atlantic Flyway by location and determine relationships between natal origin and genetic assignment.

Methods: To determine harvest, banding, and productivity derivation, we will use δ^2H to determine molt locales of mallards following Hobson et al. (2009). In summary, we will combine the known breeding range of mallards, δ^2H values of feathers from juveniles grown at natal sites,

models of δ^2H for growing season precipitation, and band-recovery data from mallards banded in the Central, Mississippi, and Atlantic flyways to generate probabilistic natal origin landscapes for individual mallards. We also will use samples collected during breeding season to validate δ^2H values used in isoscapes (Hobson et al 2012). We will apply Bayes' Theorem to assess model assignment uncertainty from among individual δ^2H variance estimates from mallards of known molt origin and also from band-return data summarized at the flyway level in the United States Geological Survey Gamebirds database. Also, following Hobson et al. (2009), we will compare origins of HY harvested mallards to breeding mallard densities for the eastern survey area and Atlantic Flyway Breeding Waterfowl Population Survey. Genetic assignment as game-farm or wild mallard will be conducted at the University of Texas El Paso (UTEP).

This project is led by Dr. Michael L. Schummer, Department of Environmental and Forest Biology, State University of NY College of Environmental Science and Forestry (SUNY ESF). Winous Point Marsh Conservancy is supporting this project by collecting wing-feather samples from hunter-harvested mallards and mallards handled during banding programs.

Eastern Pintail Stable Isotope Project

Northern pintails (*Anas acuta*) have a wide breeding range and little is known about the origins of pintails harvested across the USA. This project proposes to use stable isotope analysis of feathers collected from wing samples to determine origins of east coast and Great Lakes harvested pintails and to compare the relative productivity of those stocks.

Figure 1. Northern pintails at Winous Point Marsh Conservancy, spring, 2015.

Goal: Determine harvest, banding, and productivity origins of northern pintails harvested in the Atlantic Flyway to 1) estimate proportions derived from a) Alaska, b) the prairies, and c) eastern Canada and 2) estimate and compare age ratios of juvenile and adult female pintails among regions.

Analytical Methods: To determine harvest, banding, and productivity origins, we will use δ^2H (deuterium) to determine molt locales of pintails following Hobson et al. (2009). We will combine the known breeding range of pintails, δ^2H values of feathers from juveniles grown at natal sites, models of δ^2H for growing season precipitation to generate probabilistic natal and breeding season origin landscapes for individual pintails. We also will use samples collected during breeding season to validate δ^2H values used in isoscapes (Hobson et al 2012).

This project is led by Dr. Michael L. Schummer, Department of Environmental and Forest Biology, State University of NY College of Environmental Science and Forestry (SUNY ESF). Winous Point Marsh Conservancy is supporting this project by collecting wing-feather samples from hunter-harvested pintails and pintails handled during banding programs.

Blanding's Turtle Research

Winous Point Marsh Conservancy has been involved in two research and management projects investigating the productivity and distribution of state-listed Blanding's turtles. Blanding's turtles (*Emydoidea blandingii*) are a long-lived (> 80 years) emydid turtle, easily identified by their prominent yellow chin and appearance of a smile. Blanding's turtle life history traits including delayed sexual maturity, low annual fecundity, and longevity exacerbate the effects of negative impacts on populations. Although once common throughout the Great Lakes, thriving in the abundant wetland habitats, Blanding's turtle have become increasingly uncommon. Fragmentation and loss of habitat has led to drastic declines in many areas, many of which have not been assessed in the last 25 years. Blanding's turtles are listed as *threatened* in Ohio and are currently under review for listing under the federal Endangered Species Act, with a listing decision expected in 2023.

For the eighth consecutive year USDA Ohio Wildlife Services conducted trapping efforts as part of an integrated approach to managing meso-predator populations, mainly raccoons (*Procyon lotor*), in northwest Ohio. The focus of the project is on increasing the nesting success and enhancing the survival rate of the state-threatened Blanding's turtles and spotted turtles (*Clemmys guttata*). Winous Point Marsh Conservancy acts as a study area and logistic hub for housing and storage for this Great Lakes Restoration Initiative-funded project.

Figure 1. Blanding's turtle located in northern Ohio in summer of 2019 (photo credit Greg Lipps).

Blanding's Turtle Ecology and Conservation

The Toledo Zoo, OSU's Ohio Biodiversity Conservation Partnership, Michigan Natural Features Inventory, Purdue University Ft. Wayne, Ohio Division of Wildlife, and Michigan Department of Natural Resources were awarded a federal Competitive State Wildlife Grant to assess Blanding's turtle populations in the Lake Erie Basin. Objectives of this project are: 1) Develop and implement a comprehensive monitoring strategy, 2) Develop and refine distribution models to inform survey efforts and identify priority areas, 3) Determine the genetic composition of Blanding's turtles within and among populations in the Lake Erie Watershed, and 4) Develop and begin implementing a Blanding's turtle conservation strategy. To accomplish these goals, we surveyed wetlands using both large and small collapsible hoop traps and through visual searches. When captured, all turtles were measured and marked by placing notches along the margins of the shell. Blanding's turtles were permanently marked with a PIT tag and a small amount of blood was collected for genetic analysis.

In 2019, we conducted both visual and trap surveys, resulting in a total of 1560 trap-nights at Winous Point Marsh Conservancy. This effort resulted in the capture of 12 Blanding's turtles and visual observation of two more turtles. In addition, we captured 85 snapping turtles (*Chelydra serpentine*) and 386 painted turtles (*Chrysemys picta).* In April, a Blanding's turtle shell was found near Pickerel Creek Wildlife Area. This turtle was originally marked in 2004 at Winous Point Marsh on the north side of Sandusky Bay. The number of Blanding's turtles captured seems low, however, we were unable to trap the area of Winous Point Marsh where the most observations occurred previously until early-August. Despite the relatively low capture rate for Blanding's turtles, our efforts overall resulted in the collection of the largest data set on turtles in Ohio, which includes the capture, measurement, and marking of 217 Blanding's turtles, 2,046 painted turtles, and 689 snapping turtles. This data set will provide important information to ensure turtles continue to be a part of the rich natural heritage of the Lake Erie Basin.

Winous Point supports this project by acting as one of several field research sites and by providing housing and logistical support to project technicians.

2019 WPMC Activities and Presentations

January	Presented at Midwest Fish and Wildlife Conference, Cleveland, OH
January	Presented at Upper Mississippi River/Great Lakes Joint Venture waterfowl and marsh bird committee meetings, Cleveland, OH
January	Participated in Ohio Division of Wildlife Hunter Recruitment/Retention Summit, Columbus, OH
January	Attended Ohio Fish and Wildlife Management Association Conference, Columbus, OH
February	Judge for the Ohio State Duck Stamp Competition, Columbus, OH
February	Presented at the Ohio Division of Wildlife Research Staff and District Supervisor Meeting, Columbus, OH
March	Erie/Ottawa/Sandusky County Pheasants Forever Banquet, Oak Harbor, OH
March	Hosted Ohio Wetlands Association "Volunteer Marsh Monitoring" workshop
March	Hosted Northwest Ohio Purple Martin landowner workshop
March	Attended special seminar "Understanding Healthy Wetlands" hosted by Dr. Jacob Straub, Columbus, OH
April	Attended Long Point Waterfowl Science Advisory Committee meeting, Port Rowan, Ontario, Canada
April	Hosted Midwest Migration Monitoring Network team meetings
April	Hosted staff from the National Audubon Society for rail trapping
April	Attended Jim Hansen's Master's thesis defense, "Survey Methods and Habitat Associations of Secretive Marsh Birds in Coastal Wetlands of the Western Lake Erie Basin", Columbus, OH
April	Hosted Ottawa County Professional Women's group tour and meeting
April	Hosted North American Banding Council meeting and workshop
April	Hosted Ohio Division of Wildlife Marshbird Training workshop
April	Participated in (4) meetings of the Western Lake Erie Collaborative Learning Group: Phosphorous Retention Capabilities of Coastal Wetlands, northwest Ohio

May	Hosted Upper Mississippi River/Great Lakes Joint Venture Landbird committee meeting
May	Hosted Winous Point Marsh Conservancy annual meeting
May	Co-hosted Association of Midwest Fish and Wildlife Management Agencies field trip with ODNR Division of Wildlife
May	Hosted Black Swamp Bird Observatory spring birdwatching field trips (3)
June	Attended USFWS Secretary of the Interior press conference and roundtable discussion
June	Hosted Ohio State University Stone Lab invertebrate collection field trip
June	Co-hosted Association of Midwest Fish and Wildlife Management Agencies directors tour with ODNR Division of Wildlife
July	Co-hosted "Women in Conservation" field trip with Ottawa Soil and Water Conservation District
July	Hosted Lake Erie Marsh Association summer meeting
July	Co-hosted "A Day on the Wildside" youth conservation camp with Ottawa Soil and Water Conservation District and other partners
July/August	Hosted Sandusky County Park District bird tours (4)
August	Attended special seminar "Mitigating Harmful Algal Blooms" hosted by Dr. William Mitsch, Huron, OH
August	Hosted Green Creek Wildlife Society summer workshop
August	Co-hosted and attended U.S. Environmental Protection Agency Sandusky Bay water quality tour and meeting with ODNR Office of Coastal Managment
August	Attended and presented at the North American Duck Symposium, Winnipeg, MN, Canada
September	Presented at the Great Lakes Coastal Wetlands Symposium hosted by the Audubon Great Lakes and U.S. Fish and Wildlife Service, Oregon, OH
September	Hosted Ohio State University Wildlife Techniques field course
October	Hosted Ohio Division of Wildlife Officer Cadets field training workshop

October	Participated in the Ohio Bird Conservation Initiative meeting, Columbus OH
November	Attended Upper Mississippi River/Great Lakes Joint Venture waterfowl committee meetings, Alton, MO
November	Attended Ohio Department of Natural Resources H2Ohio water quality initiative press conference, Maumee Bay, OH

Youth Education

We participated in several educational programs this past year. For the tenth year in a row we hosted "A Day on the Wild Side" which is a youth outdoor education program targeted at middle-school age students and organized by the Ottawa Soil and Water Conservation District. Activities include shooting and fishing, wetlands education, and bird research. We also assisted with instructing at the 6th annual "Waterfowlers of Tomorrow" event held at Ottawa National Wildlife Refuge each fall. This event focuses on waterfowl hunting and includes a mentored hunt after the day-long sessions. Winous Point Marsh Conservancy also annually administers Conservation Club Grant funding from the Ohio Division of Wildlife and U.S. Sportfish and Wildlife Restoration Fund that helps sponsor these events.

Figure 1. Joe Uhink (Ottawa Soil and Water Conservation District) educating middle-school children about wetland wildlife at Day on the Wild Side, 2019.

2019 WPMC Publications

Published:

Responses of Colonial Wading Bird Populations within the Lake Erie Marsh Focus Area to Cormorant Control and Wetland Management. *Thesis, Ohio State University.* Kristi Stein

Survey Methods and Habitat Associations of Secretive Marsh Birds in Coastal Wetlands of the Western Lake Erie Basin, *Thesis, Ohio State University*. James Hansen

Occupancy and Relative Habitat Suitability of King Rails in the Midwest, *Thesis, Central Michigan University.* Michelle Kane

A 137 Year History of the Avian Community at the Winous Point Marsh, Port Clinton, Ohio. *Ohio Journal of Science*. Brendan T. Shirkey, John W. Simpson, and Michael A. Picciuto

Migration Chronology and Wintering Locations of King Rails (*Rallus elegans*) Captured in the Upper Midwest. *Waterbirds*. Michelle Kane, Thomas M. Gehring, Brendan T. Shirkey, John W. Simpson, and Michael A. Picciuto

Energetic Carrying Capacity of Submersed Aquatic Vegetation in Semi-Permanent Wetlands Important to Waterfowl in the Upper Midwest. *Wetlands*. Margaret C. Gross, Joseph D. Lancaster, John W. Simpson, Brendan T. Shirkey, Sarah E. McClain, Christopher N. Jacques, J. Brian Davis, and Heath M. Hagy

Variation in True Metabolizable Energy Among Aquatic Vegetation and Ducks. *Journal of Wildlife Management.* Margaret C. Gross, Sarah E. McClain, Joseph D. Lancaster, Christopher N. Jacques, J. Brian Davis, John W. Simpson, Aaron Yetter, and Heath M. Hagy

In Review:

Land Cover switching in Autumn by Female Mallards in Ohio. *Journal of Wildlife Management*. Brendan T. Shirkey, Dr. Matt Palumbo, and John W. Simpson

Survival, Harvest, and Lincoln Estimates of Ohio Banded Wood Ducks. *Journal of Fish and Wildlife Management*. Brendan T. Shirkey and Dr. Robert J. Gates

Balancing Public Waterfowl Hunting Opportunity and Quality to Recruit, Retain, and Reactivate Hunters. *The Wildlife Society Bulletin.* Dr. Mike Schummer, John W. Simpson, Dr. Kenneth Wallen, Dr. Brian Davis, and Brendan T. Shirkey

2019 WPMC People

A glimpse into field work at Winous Point Marsh. Clockwise from top left: OSU grad student Nicole taking morphometric measurements on a Virginia rail; WPMC summer intern Trevor banding a common tern chick at the Cedar Point colony; WPMC research technician Jessica doing early morning marsh bird surveys; CMU technician Tomas banding a common tern chick; WPMC technician Megan posing with a radio-marked Virginia rail before it's released into the marsh.

Left: CMU grad student Michelle kayaks into a wetland to check a trail camera for king rail sightings.

Right: OSU rail technician Grant focusing intently as he bands a common tern chick at the Willow Point colony.