



Winous Point Marsh Conservancy



2014 Research and Activities Report

February 2015

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Winous Point Marsh Conservancy

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Executive Summary

Staff: John Simpson, Executive Director
Opie Rohrer, Assistant Manager
Brendan Shirkey, Research and Management Technician

The Winous Point Marsh Conservancy continued its mission of delivering research, education, and conservation in 2014. Winous Point added new staff this year, bringing on former intern Brendan Shirkey to help lead and expand research and education initiatives. The addition of new research staff has allowed for the development of our own research projects, including research proposals for secretive marshbirds (Page 17), cooperative research on mallard ducks (Page 20), and cooperative agreements for waterfowl banding (Page 38). The additional research staff has also expanded our grantsmanship and fundraising capabilities, allowing us to submit twice as many grant proposals, fund more projects, and work cooperatively with the Ohio Division of Wildlife to expand waterfowl banding and analysis.

Our 2014 interns, Derek Benner (Hocking College) and Mark Wallen (Ohio State University), were kept busy this summer working for us and getting involved with the many ongoing research projects. Derek and Mark worked for Winous Point for the summer and through the fall on our grounds and marsh maintenance crew. We also continued our partnership with the Sandusky County Park District, utilizing grant funding to partially support a shared intern, Mike Piccutio (University of Toledo), who spent the summer assisting with *Phragmites* control, aiding in waterfowl, rail, and shorebird banding here at Winous, and supporting the Park Districts conservation and research programs.

Winous Point Marsh Conservancy was once again honored to host the fourth-annual “Great Lakes Partners Forum” in May of 2013. This three-day conference brings together waterfowl researchers, conservations staff, and wetlands managers from around the Great Lake Region for talks, discussion, and interaction that furthers research and information sharing. Forty people representing state and federal agencies, universities, and conservation groups from Illinois to New York and into Ontario, Canada attended and enjoyed not only the agenda but the atmosphere at Winous Point.

The Winous Point Marsh Conservancy has been able to continually grow, evolve, and develop because of the generous support and dedication we receive from our trustees, donors, partners, and neighbors. We genuinely value the support that our partners and contributors bring Winous Point and look forward to many challenges and accomplishments next year and beyond.

Regards,
John Simpson

Youth Education Programs

Summary: Over the last five years Winous Point has gradually become involved in youth education programs held locally that focus on conservation, hunting, the outdoors, and career development.

Partners: Ottawa Soil and Water Conservation District, U.S. Fish and Wildlife Service - Ottawa National Wildlife Refuge, Ohio Division of Wildlife, Winous Point Marsh Conservancy, Black Swamp Bird Observatory, Sandusky County Park District, Erie County Metroparks, The Ohio State University, Zink Calls and Avian X, Mossy Oak, and numerous local donors and volunteers.

“Day on the Wild Side”

Since 2010 Winous Point has been a key organizer and host of the “Day on the Wild Side” program. This day-long event is aimed at sixty youth from Grades 3 to 8 with a goal of introducing them to outdoors sports and conservation careers. Kids rotate between stations that include fishing, shooting, archery, bird banding, and wetlands education. Each year we also include a variety station that has included bird house building, GPS, trapping, tree planting, and fish sampling in the past.



Figure 1. Participants take an educational punt boat tour in the marsh.



Figure 2. School-aged children have had the opportunity to trap, handle, band, and release birds every summer at Winous Point as part of “Day on the Wild Side”.



Figure 3. Two youth take aim as part of supervised instruction and lessons on firearms handling and safety.

“Land Stewardship Workshop”

The success of Day on the Wild Side generated a need for a more advanced workshop for kids that have “graduated” from Day on the Wild Side and are now interested in careers in conservation and wildlife. In 2014 Ottawa Soil and Water Conservation District took the initiative to bring together partners that could deliver a day-long conservation curriculum to introduce 20 high-school aged kids to conservation careers. The Ohio Division of Wildlife, USFWS Staff from Ottawa National Wildlife Refuge, and staff from Winous Point all organized and led sessions at the event. The field day included workshops on waterfowl trapping and banding (Figure 4), radio-telemetry (Figure 5), and avian anatomy.



Figure 4. Participants handle Canada Geese as part of a banding exercise.



Figure 5. Youth learn from professionals how to locate marked wildlife using radio telemetry.



Figure 6. Successful participants and the end of the day in the Land Stewardship Workshop.

“Youth Waterfowlers of Tomorrow”

In 2013 Ottawa National Wildlife Refuge initiated a day-long workshop aimed at introducing youth, first time hunters, and prospective duck hunters to the sport. This event has rotating workshops which include laws and safety, cooking and cleaning (Figure 7), calling (Figure 8), ID, and gear. After the workshops conclude lunch is provided and all participants are invited to participate in a special youth waterfowl hunt on the refuge (Figure 9).



Figure 7. Winous Point staff members demonstrate cleaning, preparing, and cooking waterfowl.



Figure 8. Staff from Zink Calls demonstrate goose and duck calling for the new hunters.



Figure 9. Successful hunters at the completion of the program and hunt.

Type A influenza virus surveillance in wild, free-ranging waterfowl at Winous Point Marsh, Port Clinton, OH and Magee Marsh Wildlife Area, Oak Harbor, OH: 1986-2014

Investigator: Richard D. Slemons, DVM, Professor, Department of Veterinary Preventive Medicine, Ohio State University

Collaborators: USDA National Research Initiative, The Ohio State University, Ohio Division of Wildlife, Winous Point Marsh Conservancy, other private landowners.

Schedule: Initiated in 1986, long term

Summary: For more than twenty years Winous Point Marsh Conservancy (WPMC), the Ohio Department of Natural Resources and the Department of Veterinary Preventive Medicine at The Ohio State University have participated in a proactive, collaborative type A influenza virus surveillance program in wild, free-ranging ducks. The objectives of this ongoing effort were to: 1) better define the natural history of type A influenza A virus in wild birds (how the genetic and antigenic diversity of these viruses are maintained in the duck population over time); 2) assess the threat these viruses present to wild birds and domestic birds; 3) develop a database to be used by government agencies for making science-based policy decisions when dealing with the isolation of type A influenza viruses from wild birds and/or poultry; 4) and since 2003, contribute to the national effort to detect the introduction of the Asian lineage of high pathogenic H5N1 avian virus into North America via wild birds. Fortunately, no one has detected the movement of the Asian high pathogenic H5N1 influenza virus into the Western Hemisphere by wild birds or by humans, exotic birds or animal products. Over the years our collaborative project has provided valuable insight into the natural history of influenza A viruses in waterfowl and demonstrated that the threat presented to the poultry industry by these low pathogenic viruses can simply be addressed by the widely accepted, standard biosecurity measures currently being used by the U.S. poultry industry. Lastly, our, and other investigators have not shown influenza A virus infections to have a significant negative impact on waterfowl populations; however, more work is needed in this area.

Table 1 provides the number of samples collected at WPMC by year since 1986 and the number of type A influenza viruses recovered from these samples.

Table 1. Type A Influenza samples collected and tested at Winous Point Marsh, 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	1192	185	15.52
2014	994	5*	
Total	7060	500*	6.58

*Not all samples have been tested yet

Winous Point supports this project through shorebird and waterfowl sample collections, assistance with trapping waterfowl and shorebirds, and housing interns and staff as needed.

Ecology of Influenza A Infections: Using Intrinsic Biomarkers to determine the Origin of Mallards (*Anas platyrhynchos*) Accessioned into Type A Influenza Virus Surveillance Investigations

Investigators: Anthony C. Fries, H. Lisle Gibbs, and Richard D. Slemons, Ohio State University

Collaborators: Waterfowl scientists and organizations across North America

Schedule: 2009 - 2014

Summary: The Animal Influenza and Ecology lab at Ohio State University started as an avian influenza surveillance lab monitoring wild bird infections across the United States. The emergence of H5N1 required our lab to grow to a large, multi-disciplinary collaborative task force working with a variety of different private, state and federal agencies. We focus on exploring the vast amount of diversity of avian influenza in wild bird populations in North America as wild birds are considered the reservoir for the genetic diversity of all influenza A viruses that infect all ranges of organisms from birds to humans.

One novel project headed by Anthony Fries, a graduate student at Ohio State who will finish this upcoming spring, attempts to determine the geographic origin of certain individual ducks commonly infected with influenza virus. Knowing where infected birds are coming from gives us a better understanding of variables surrounding the maintenance, longevity and transmission of influenza viruses in wild birds and what regions of the globe may hold the mixture of variables that are conducive for finding influenza “hotspots”.

To determine the origin of these birds, we use methods to source ducks using elemental, isotopic and genetic markers that we obtain from analyzing the feathers of sampled birds. Certain populations of ducks have a certain pattern of these markers that identify one population from another. This work requires sampling of birds on their breeding and molting grounds to obtain the “signature” of the birds in a specific region. We then take feathers from ducks of an unknown origin that we sample throughout the year for our influenza surveillance and trace them back to a region that exhibits a similar “signature” for the methods we are conducting.

We have collected feathers for the past three years from breeding grounds across North America, including sites in and around Winous Point Marsh Conservancy, Ottawa National Wildlife Refuge and Magee Marsh. The “signatures” of these feathers have been placed into our database and have been used to determine the migratory status of birds at sites in Northwest Ohio that have a high frequency of influenza infection in waterfowl. Results thus far indicate that birds, specifically mallards, sampled for influenza at “hotspots” have a high probability of being

migrant individuals and greater than 70% of the birds sampled at these locations are identified as migrant individuals. This information helps to build an understanding of influenza dynamics in its natural reservoir. Further, as a result of long-term feather sampling at WPMC we see that the population “signatures” of birds moving through WPMC during fall hunting season are more related genetically and elementally to Atlantic Flyway birds in the early season (Aug-Sept) and significantly switches to a signature of Mississippi flyway birds later in the year (Oct-Dec). We expect that these changes we see in bird populations throughout the year will match similar changes to what viruses are circulating in these populations at any given time.

Beginning in 2009 an attempt was made to verify movements of both wood ducks and mallards in the SW Lake Erie region (Figure 1 and 2). A better understanding of these movements will help with an understanding of both the genetic signatures of birds from this area and with understanding movements and patterns of avian flu.

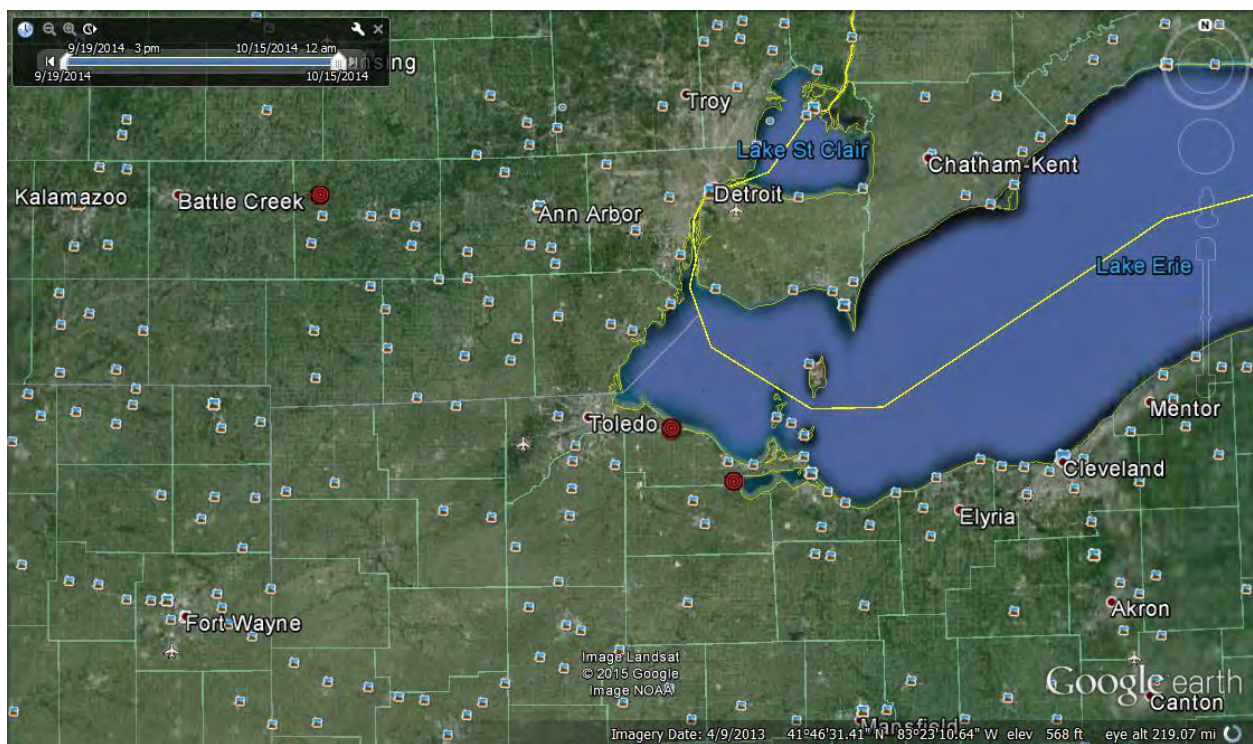


Figure 1. Regional movements of 3 hen mallards equipped with satellite transmitters during July 2014: one moved to central Michigan, one to Ottawa National Wildlife refuge near Toledo OH, and one remained on Winous Point property shortly after their releases.

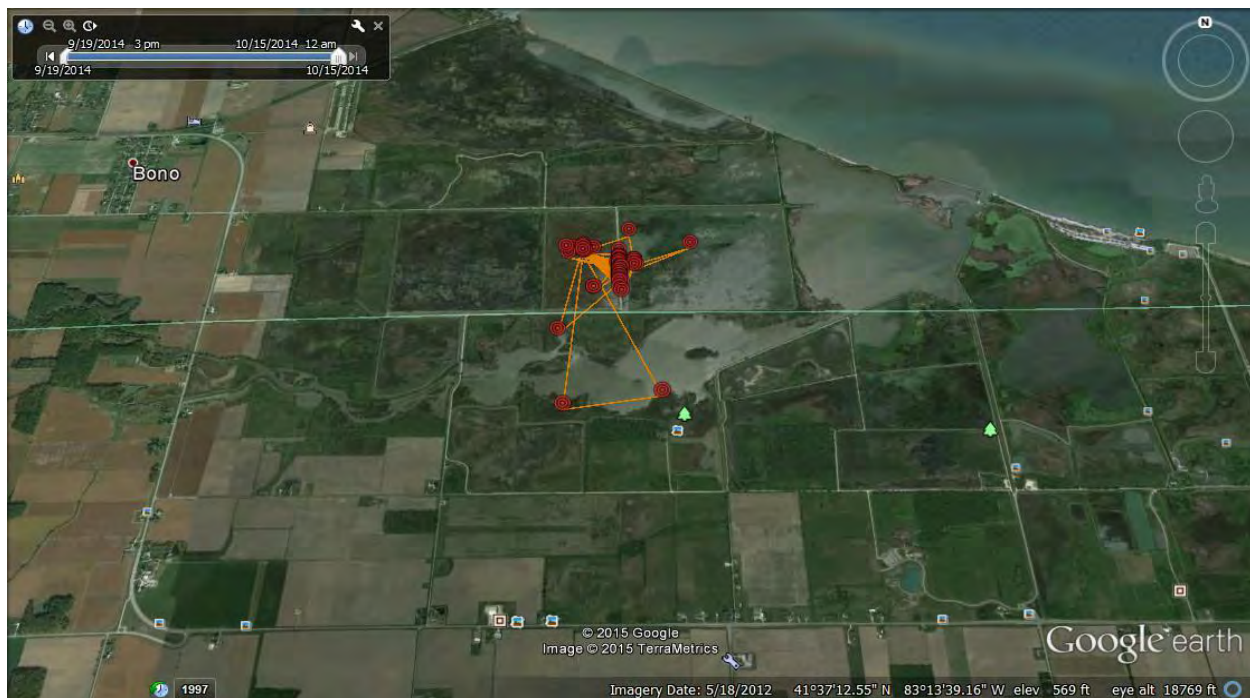


Figure 2. Local movements of hen mallard 63111 within Ottawa National Wildlife refuge July, 2014. This hen was ultimately harvested by hunters at a club just east of the refuge.

Winous Point supports this project by housing research staff, assisting with waterfowl trapping, and providing technical and logistical support.

Prevalence of Extended Spectrum beta-lactamases in the Intestinal Flora of Wild Waterfowl in Ohio

Investigators: Dimitria Mathys, Dixie Mollenkopf and Thomas Wittum, College of Veterinary Medicine, Department of Veterinary Preventative Medicine, The Ohio State University

Collaborators: Winous Point Marsh Conservancy

Introduction: β -lactamases are the most common mechanism of Gram-negative bacterial resistance to β -lactam antimicrobials. Extended-spectrum β -lactamases (ESBLs), those that can alter extended-spectrum cephalosporin antibiotic activity, have been reported in humans since the late 1980s. These ESBL resistance genes present in pathogens can have severe consequences in human medicine, including increased mortality, increased length hospital stay and increased medical costs for sepsis patients. Another important consequence of ESBL mediated-resistance is the resulting necessary increase in the use of carbapenem antibiotics to treat cephalosporin-resistant infections. This increased use of carbapenems has been associated with an increase in resistance genes encoding for carbapenemase production. Livestock populations have a high prevalence of ESBL genes in their intestinal flora, attributed to the high selection pressure due to conventional farming practices.

Very little is known about the epidemiology of extended spectrum beta-lactamase (ESBL) genes in wild bird populations in the United States. A limited number of studies have been conducted in Europe and Asia, demonstrating low prevalence in Mallards, Yellow-legged and Black-Headed Gulls, Rooks (Crows), and Pigeons. These prevalence estimates ranged from 3% to 9%. One study of Collared Flycatchers in Sweden reported a prevalence of zero. These studies indicate a low prevalence of ESBL resistance genes in the flora of a very diverse set of birds, ranging from anseres to passerines. Those birds with foraging behavior which puts them in contact with human garbage or foraging on the ground is a potential risk factor for obtaining ESBL genes from discarded food products or fecal contamination. This would explain why gull, crow and pigeon species were reported to carry ESBL resistance genes, while the Collared Flycatchers, which are aerial insectivores, did not. However, one study that collected concurrent water samples from a pond where the sampled gulls were also nesting reported a relatively high prevalence of antibiotic resistant *E. coli* and *Salmonella* spp. of 18%. This suggests a possible link between water contamination with fecal waste from livestock production systems and exposure of birds which feed and spend a large amount of time on the water. This also suggests that ducks which spend a large amount of time on the waterways in Ohio may serve as potential carriers of ESBL resistance genes originating in livestock operations.

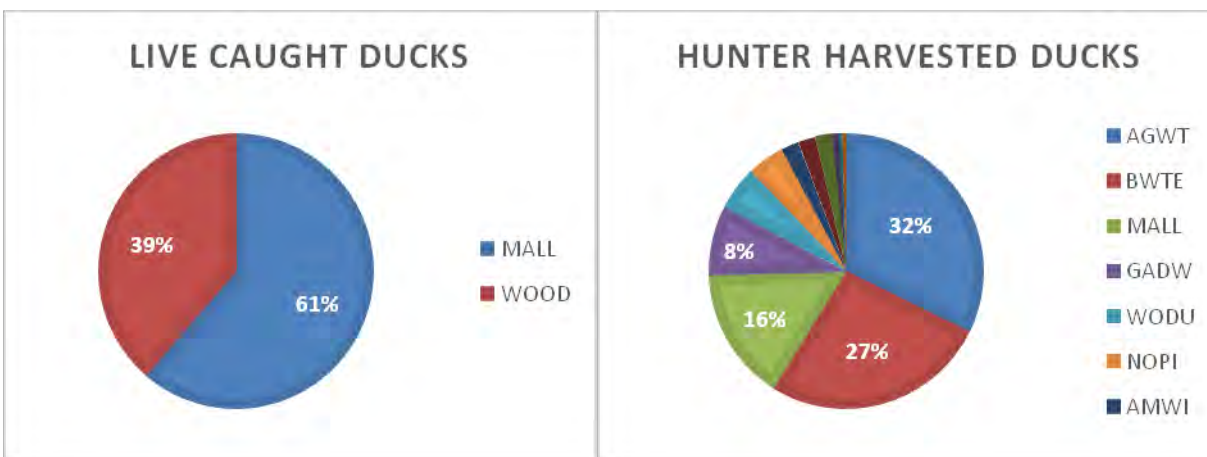
Livestock or human waste contaminating Ohio waterways can potentially spread human and animal diseases to wildlife populations. We aim to determine the level of ESBLs in wild bird

populations that spend a large amount of time in Ohio waterways. Wild birds harboring these resistance genes were likely exposed through contaminated water, since the presence of antibiotic selection pressure in wildlife populations is absent.

Hypothesis: We hypothesize that duck populations in Ohio serve as a reservoir and vector of ESBL resistance genes originating in livestock populations in Ohio. Our objective is to estimate the prevalence of ESBL resistance genes in the fecal flora of waterfowl populations in Ohio.

Methods: Cloacal swabs were obtained from both live caught and hunter harvested ducks from July 2014-Dec. 2014 from Winous Point Marsh. Swabs These swabs will be placed into a 2 ml microtube containing 1.5ml of Amies Transport Media and transported to the laboratory for processing. These samples were enriched in Buffered Peptone Water then inoculated into MacConkey broth containing 2 ug/ml cefotaxime and then inoculated onto 3 MacConkey Agar plates with 8 ug/ml of Cefoxitin, 4 ug/ml of Cefepime, and 2 ug/ml of meropenem. This procedure will screen for ESBL genes, *bla*_{CMY} and *bla*_{CTX-M} and carbapenemase genes. Once this screening is performed, the presence of these genes will be confirmed using standard PCR techniques. Samples were also inoculated into *Rappaport Vassiliadis* broth and then inoculated on XLT4 agar plates to screen for the presence of Salmonella.

Results: Winous Point staff sampled a variety of species of waterfowl including xxx ducks during summer 2014 banding operations and another 370 ducks during fall waterfowl hunting season (Figure 1). In addition, WPMC staff sampled 150 ducks including wood ducks and mallards during summer banding operation (Figure 1). Varying proportions of those samples tested positive (Table 1).



AGWT: Amer. Green-Winged Teal BWTE: Blue-Winged Teal MALL: Mallard GADW: Gadwall WODU: Wood Duck NOPI: Northern Pintail AMWI: Amer. Widgeon

Figure 1. Species composition of sampled waterfowl at Winous Point in 2014.

Table 1. Screening results for samples collected at Winous Point Marsh Conservancy.

	Total Ducks	<i>bla</i> _{CMY} Phenotype	<i>bla</i> _{CTX} Phenotype	Salmonella
Live Caught	150	64(42.7%)	0(0%)	0
Hunter Harvested	248*	84(33.9%)	2(0.8%)	2(0.8%)
Total	398	148(37.2%)	2(0.5%)	2(0.5%)

*not all samples processed yet

Discussion: The presence of these resistance phenotypes indicates that they are becoming exposed to either livestock or human waste, most likely from contaminated water sources. They have the potential to serve as a biologic vector of these genes. PCR is needed to confirm these phenotypes and sequencing of the *bla*_{CTX} is needed to determine the likely population leading to the spread of these genes, human versus livestock. A low prevalence of Salmonella was detected, indicating that while Salmonella can be spread by wild duck populations, this spread is likely of little impact.

Winous Point supports this project by utilizing staff time to swab waterfowl for samples during summer banding and fall hunting.

Virginia, Sora, and King Rail Banding and Telemetry

Investigators: Brendan Shirkey and John Simpson, Winous Point Marsh Conservancy, and Tom Kashmer, Sandusky County Parks District

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

Schedule: 2016 - 2020

Introduction: In spring of 2014 we expanded upon previous rail trapping efforts to gain an improved understanding of expected trapping success of state endangered king rails and the more common Virginia and sora rails. We established approximately eight trapping locations and trapped rails from April 18th to May 29th. We caught and banded a total of 94 Virginia rails, 14 sora rails, and 2 king rails, and we were also able to capture images of king rails frequently on trail cameras used to monitor two of the trapping locations. In addition, in cooperation with Dr. David Kremetz of Arkansas State University we equipped one of the captured king rails with a satellite transmitter (Figure 2) that has provided some of the first data documenting the migration route of a northern breeding king rail to its wintering grounds in south-central Louisiana (Figure 3).



Figure 1. Trail camera photo of a king rail taken during our spring 2014 trapping season.



Figure 2. King rail equipped with a satellite transmitter in May 2014.

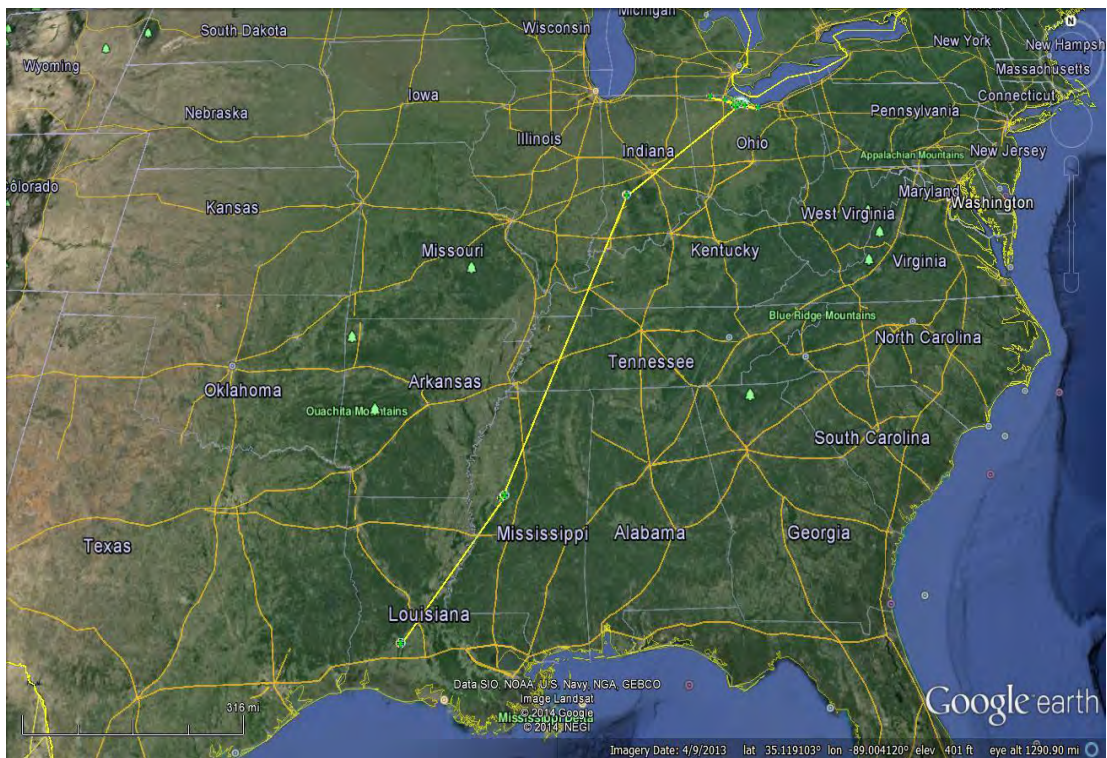


Figure 3. Fall migratory path completed by the marked King rail in September of 2014.

Building on our success trapping rails this past spring, we are now proposing 3 separate rail related research projects: 1) Experimental king rail trapping and satellite telemetry, 2) Virginia and sora rail population demographics and vital rates, and 3) Virginia and sora rail habitat association in northwest Ohio. Project objectives include:

King rail project

- 1) Test the efficiency of 2 different rail trapping techniques
- 2) Equip 5-10 king rails with satellite transmitters
- 3) Identify key migration stop-over sites, winter and fall habitat use, stop-over duration, and potential habitat bottlenecks king rails might encounter during migration

Virginia and Sora rail projects:

- 1) Determine distribution, occupancy, and abundance of sora and Virginia Rails using Marsh-bird Monitoring Protocol and an automated call-playback /trail camera system.
- 2) Identify landscape, habitat, and microhabitat factors associated with occupancy rates estimated from call play-back and surveys and seasonal home range and movement patterns of radio-marked sora and Virginia rails
- 3) Assess and compare the efficacy of survey protocols (National Protocol and automated system) with regard to meeting fundamental assumptions of distance sampling and occupancy modeling and recommend improvements to statewide marsh-bird survey design, methodology, and analyses.
- 4) Estimate demographic vital rates including survival, nesting success, and phenology of life history events including spring and fall migration, nesting, and post-nesting.
- 5) Evaluate or model the population viability and resilience of sora and Virginia rail populations to sustain harvest levels under the current regulatory framework using data collected the Harvest Information Program and results from this study.

We have applied for grant funding through the Webless Migratory Game Bird Program and the Upper Mississippi River and Great Lakes Region Joint Venture in addition to funding that will hopefully be provided by the Ohio Division of Wildlife. If funded, these projects have a target start date in spring of 2016 and would likely encompass both a Master's and Ph.D. student from the Ohio State University as well as collaborators from the United States Fish and Wildlife Service and the Ohio Division of Wildlife.

Winous Point is a lead investigator on the project, conducting the pilot bandings, grant writing, and developing research proposals with our partners.

Habitat selection and survival of mallards in the Lake St. Clair region during autumn and winter

Investigators: Matthew Palumbo Ph.D. student, Long Point Waterfowl, Western University Dr. Scott A. Petrie, Long Point Waterfowl Executive Director; Dr. Chris G. Guglielmo, Western University; Dr. Michael Schummer, Long Point Waterfowl Scientist

Collaborators: John Simpson and Brendan Shirkey, Winous Point Marsh Conservancy, Port Clinton, OH

Schedule: 2014 - 2017

Summary: The Lake St. Clair region of southern Ontario and the wetlands of western Lake Erie provide important staging habitat for millions of waterfowl from the Atlantic and Mississippi Flyways. Unfortunately, this region has experienced significant waterfowl habitat loss from converting wetlands to agricultural fields as well as other impacts. The habitat that remains is threatened by additional conversion in addition to stress from invasive species, industrial development, and population growth. Additionally, these wetlands may continue to experience increased use by waterfowl due to the fact that waterfowl are wintering at more northern locations than in the past.

Despite the threats to the waterfowl habitat and the potential for increased future use, little is known about how waterfowl use the remaining habitat and the impacts on their survival during autumn and winter. This project will estimate waterfowl use of different habitat types and how this use is influenced by land management practices. Additionally, this project will categorize different foraging strategies exhibited by the waterfowl to determine if these strategies influence their survival and how long they use the local resources.

Matt Palumbo is a PhD student studying with Long Point Waterfowl and Western University and is the project lead (Figure 1). Matt is studying Mallards as they are abundant, economically important and a perfect model species for studying the importance and use of St. Clair wetlands by dabbling ducks. Also, harvest information supports that Great Lakes Mallards need to be managed separate from Mid-continent Mallards because they are subject to different environmental conditions, habitat metrics, and population drivers. Further, research suggests that the Great Lakes Mallard population may be particularly sensitive to non-breeding season survival.

Assessing which habitats are used by Mallards and when they are most often utilized can provide area managers with important information on how to best manage the remaining waterfowl habitat.



Figure 1. Graduate student Matt Palumbo with a mallard ready for banding.

2014 Project Update: The 2014 -2015 field season started in June 2014, with Matt contacting landowners to verify habitat types and property boundaries. To determine habitat selection of adult Mallards, Matt is classifying habitat types into “Open Water,” “Flooded Agriculture,” “Marsh,” “Supplemental Food,” and dry “Agriculture.” Matt is continuing to contact landowners and digitize habitat types in a geospatial database.

Beginning in August 2014, Matt coordinated with local area managers, Canadian Wildlife Service, and Long Point Waterfowl staff and students to establish a trapping location to band waterfowl and equip Global Positioning Satellite (GPS) transmitters to adult female Mallards (Figure 2). During August and September the aforementioned group captured and banded 821 waterfowl, predominately Mallards, via five trapping sessions. All waterfowl received a federal aluminum leg band and all Mallards were weighed and measured to calculate body condition indices. Matt will use these indices to determine differences in harvest relative to body condition through band returns. Also, through these trapping sessions Matt was able to deploy 20 GPS transmitters on adult female Mallards. The GPS locations will be used to determine habitat selection, survival, and timing of departure from the Lake St. Clair region.



Figure 2. Female mallard equipped with a solar-powered GPS transmitter.

Matt has also been in contact with local area managers and landowners to ask for their participation in a volunteer waterfowl survey. This survey will provide information about how the landscape is used specific to certain habitat types important to waterfowl. Matt has also been in contact with wetland area managers and landowners to gain permission to weigh and measure harvested waterfowl during the hunting season. He will use these measurements to calculate a body condition index for harvested Mallards and investigate changes in body condition through the season.

Long Point Waterfowl and Winous Point Marsh Conservancy in Port Clinton, Ohio, USA have partnered in an effort to expand collaborative efforts to broaden the geographic application of the study. Winous Point deployed 5 GPS transmitters during July 2014, bringing their total to 25 transmitters since 2010. Mallards moved from Lake St. Clair to Ohio and the northern USA beginning in late December, revealing anticipated connectivity and relationships between the study areas (Figure 3). Winous Point will continue to expand the study and plans to deploy an additional 15 transmitters in 2015.



Figure 3. Movements of marked mallards from Lake St. Clair into the northern U.S. as of early January.

Winous Point is a key partner in this project through fundraising, deploying satellite transmitters, and completing harvest surveys, and taking morphometric measurements of mallards.

Control of Invasive Plant Species in Northwest Ohio

Investigators: John W. Simpson, Winous Point Marsh Conservancy; Jeff Finn, U.S. Fish and Wildlife Service; Tara Baranowski, The Nature Conservancy; Mathew Pierce, Lake Erie Cooperative Weed Management Mike Libben, Ottawa Soil and Water Conservation District; and Mark Witt, Ohio Division of Wildlife.

Schedule: Initiated in 2009, long-term

Summary: Aquatic invasive plants threaten the ecological integrity of wetlands across North America. Here in the Western Lake Erie basin invasive plants are especially prevalent and add

an extra stressor to the already degraded remaining coastal wetlands. Invasive plants damage coastal wetland by excluding native vegetation and thus reducing plant species diversity and eliminating animal food resources. In addition, invasive plants also typically reduce recreational opportunity and limit wetland functions related to water quality and flood storage.



Figure 1. Contract helicopter applicator treating phragmites at Winous Point.

In northwest Ohio the most widespread and damaging invasive plant is *Phragmites australis*, a large perennial rhizomatous grass, or reed. It is widespread in the United States and typically grows in wetlands usually inhabiting the marsh-upland interface. It is capable of vigorous vegetative reproduction and often forms dense virtually monospecific stands.



Figure 2. Controlled burn of dead phragmites.

In addition to phragmites, coastal wetlands in western Lake Erie are threatened by flowering rush (*Butomus umbellatus*), a newcomer under close watch, and purple loosestrife (*Lythrum salicaria*), an established species thought to be under control. Several other non-native invasive plant species such as narrow-leaf cattail (*Typha angustifolia*) and reed canary grass

(*Phalaris arundinacea*) are prevalent in this region but are not considered as damaging.

In 2009 a partnership including the Winous Point Marsh Conservancy, U.S. Fish and Wildlife Service, Nature Conservancy, and the Ottawa Soil and Water Conservation District joined forces to create the Lake Erie Cooperative Weed Management Area (CWMA). This CWMA has been extremely successful and now consists of a full-time director, three part-time staff, and three interns. CWMA staff work diligently delivering herbicide programs (Figure 1), controlled burn and smashing treatments (Figure 2), and landowner education programs (Table 1).

Table 1. *Phragmites* management under cooperative program.

Regional Phragmites Program				
Year	Aerial Application Acres	Ground Application Acres	Prescribed Burn Acres	Mechanical Treatment Acres (Smash/Mow)
2009	550	0	0	0
2010	625	175	0	0
2011	1120	325	0	0
2012	1100	429	318	306
2013	1140	292	113	32
2014	700	50	87	0
Totals:	5235	1271	518	338

Beginning in 2011 experimental sampling plots were established within various treatment stands to monitor the effectiveness of the treatment combinations in a) controlling the coverage and density of live phragmites stems, and b) reestablishing a diverse wetland plant community. In total, 78 vegetation plots were monitored across 11 different ownerships.

Each treatment type showed a significant reduction in percent cover of live phragmites between 2011 and 2013 (Figure 4).

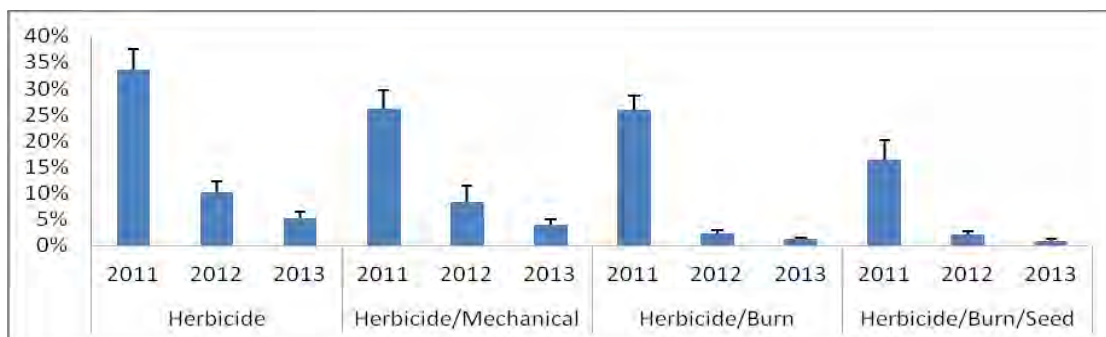


Figure 4. Percent live phragmites cover (+/- SE) across years by treatment type.

Each treatment type increased species richness by at least 36%. The treatment types incorporating prescribed fire averaged at least a two-fold increase in the number of species observed at each plot (Table 2). The Herbicide/Burn treatment showed a significantly greater increase in species richness than Herbicide only. Notably, treatments with fire resulted in significantly greater increases in species richness (Figure 4).

Table 2. Change in Species Richness between 2011 and 2013 by treatment type.

Treatment Type	2011 Species Richness (avg)	2013 Species Richness (avg)	% Increase (avg)	t	df	p
Herbicide	2.25	3.08	36%	-3.08	11	0.01
Herbicide/Mechanical	2.07	3.07	48%	-2.56	14	0.02
Herbicide/Burn	1.86	4.97	167%	-8.74	35	<0.01
Herbicide/Burn/Seed	2.2	4.87	121%	-3.45	14	<0.01
Overall	2.03	4.29	111%	-8.76	77	<0.01

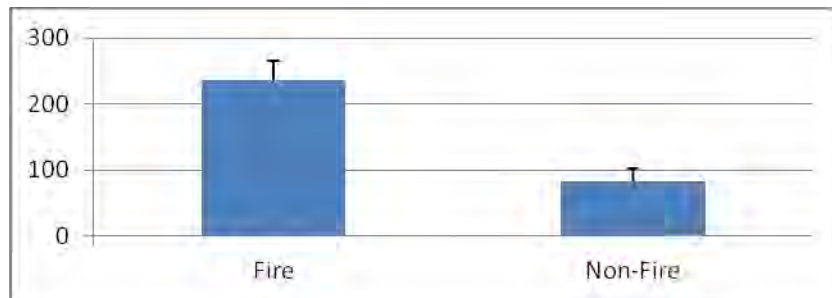


Figure 4. Percent increase in number of species (+/- SE) on plots with "fire" and "non-fire" treatments after 3 years of treatment.

Winous Point supports this project as a steering committee member, by acquiring and holding grant funding, by providing research locations, and by hiring and housing project staff.

National Marshbird Monitoring Program in Ohio

Investigator: David E. Sherman and Laura Kearns, Crane Creek Wildlife Research Station and Olentangy Wildlife Research Station, The Ohio Division of Wildlife

Collaborators: Upper Mississippi River and Great Lakes Joint Venture, Winous Point Marsh Conservancy, volunteer surveyors

Schedule: initiated in 2010, long term

Summary: The Ohio Division of Wildlife restructured its wetland breeding bird survey to fit the protocols of the National Marshbird Monitoring Program. This change will provide the ability to make inferences about statewide population trends for wetland birds. In addition, an improved wetland bird survey will enable the Division to gain baseline data on various species that are state endangered (American bittern [*Botaurus lentiginosus*] and king rail [*Rallus elegans*]), state threatened (least bittern [*Ixobrychus exilis*]), and of special concern (common moorhen [*Gallinula chloropus*], sora [*Porzana carolina*], and Virginia rail [*Rallus limicola*]) with data applicable to monitoring trends at both the focus area and statewide scale. The Upper Mississippi River and Great Lakes Joint Venture has also placed a high priority on determining population status and trends of secretive marsh birds (UMRGLR JV 2007). The king rail is listed both as a priority species and as focal species while American bittern, least bittern, and sora are listed as priority species. Ohio's integration of a standardized survey protocol will further enhance the development of a flyway-wide monitoring program by contributing data for regional monitoring of marsh birds.



Figure 1. King rail and chick at Winous Point Marsh; Summer, 2007.

Nine routes were randomly selected in the state with two routes in each of the wetland focus areas as well as the Killdeer/Big Island wetland complex. In addition, a route in public land outside of the focus area was also surveyed. The survey protocol used states that a survey is conducted at each point and consists of a five minute passive listening period followed by five one minute calls of least bittern, sora, Virginia rail, king rail, and American bittern. The calls were broadcast using an mp3 player and portable speakers set on maximum volume. Focal species

were Virginia rail, sora, king rail, least bittern, American bittern, common moorhen, American coot, pied-billed grebe (*Podilymbus podiceps*), and black tern (*Chilidonias niger*). Non-focal species that will also be recorded on the survey are willow flycatcher (*Empidonax traillii*), swamp sparrow (*Melospiza georgiana*), marsh wren (*Cistothorus palustris*), and wood duck (*Aix sponsa*). Each location was surveyed three times between May 1 and June 15. Surveys were conducted in the morning starting 30 minutes before dawn to 3 hours after sunrise or in the evening three hours before dusk and continuing for 30 minutes after sunset. Data for detections rates has not yet been estimated. Table 1 presents a summary of total species detections.

Table 1. Total species detections across 8 sites surveyed in northwest Ohio in 2014.

Species	Number of detections
Wood duck	150
Marsh wren	32
Swamp sparrow	15
American coot	2
Pied-billed grebe	45
Sora	29
Virginia rail	7
Sandhill crane	17
Willow flycatcher	22
Least bittern	2
Common Moorhen	16
King rail	2

Winous Point supports this project by acquiring and holding grant funding, by providing a research site, and by providing volunteer monitoring staff.

Meso-predator control to protect state listed T& E turtle species in the Great Lakes region of Ohio

Investigators: John Paul Seman, Caleb Wellman, and Caleb Kauffman, U.S. Department of Agriculture/APHIS/Wildlife Services

Collaborators: Lake Erie Allegheny Partnership for Biodiversity, Winous Point Marsh Conservancy, Division of Natural Areas and Preserves, Cleveland Metroparks, Cleveland Museum of Natural History, Ohio Division of Wildlife, and Gott Fen Preserve

Summary: Ohio Wildlife Services (WS) in cooperation with the Lake Erie Allegheny Partnership for Biodiversity (LEAP), which is comprised of over 40 partners including the Cleveland Museum of Natural History, the Nature Conservancy, The Cleveland Metroparks, the Ohio Department of Natural Resources, the National Park Service, and other state and local organizations, implemented a meso-predator management program in localized areas determined as critical habitat for the state-listed Threatened Blanding's (*Emydoidea blandingii*) and spotted (*Clemmys guttata*) turtles.

The Blanding's turtle is a moderately sized freshwater turtle that is most easily identified by its characteristic bright yellow neck (Figure 1). In Ohio, the Blanding's turtle is known only from the Lake Erie drainage, with records extending as far south as four counties inland from Lake Erie. According to the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, the Blanding's turtle is listed as Endangered given the extensive



Figure 1. Photo of an adult male Blanding's turtle (*Emydoidea blandingii*) captured at the Ohio and Erie Canal Reservation, 13 May 2014.

slow decline of most populations throughout their range. The ODNR, Division of Wildlife currently lists the Blanding's turtle population in Ohio as threatened.

The spotted turtle is a small freshwater turtle that inhabits shallow-water wetlands of the east coast and the Great Lakes Region including bogs, fens, wet prairies, vernal pools, the margins of ponds and lakes, or even roadside ditches. In Ohio, the spotted turtle is known from the southwest, northwest, and

Meso-predator damage to nesting turtles is well documented. Congdon et al. found raccoons to be the most common predator of Blanding's turtle nests in Michigan, where only 24 of 73 monitored nests were successful. In other years, predation of nests in some monitored populations reached 100%. In central Wisconsin, Ross and Anderson found striped skunks to be the most common nest predator, with 9 of 16 nests being destroyed by skunks. Similarly, a study in a national park located in Ontario Canada, attributed heavy predation of turtle nests from a dense raccoon population to be the main factor limiting Blanding's turtle recruitment.

Methods: Ohio WS used an integrated approach consisting of trapping and removal of raccoons, striped skunks, and Virginia opossums along with predator exclusion and monitoring. Trapping began mid May to early June to coincide with the beginning of turtle nesting movements. Initial trapping efforts were focused around known and potential nesting sites at eight locations known to support populations of one or both rare turtle species (Figure 2).

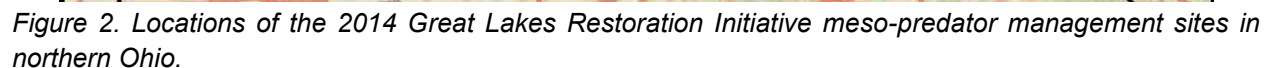




Figure 3. Raccoon attempting to dig up caged turtle nest is captured on camera.

To document and estimate turtle nesting success at each site, WS conducted nest searching surveys concurrently with trapping efforts. Many of the nests were found due to being disturbed by nest predators, others were identified through witnessing the actual nesting and at some of the sites soil disturbance and location indicated a nest. Predator exclusion cages were placed on select turtle nests at each of the sites (Figure 3).

Across all sites, raccoon captures declined substantially from 2011 to 2013 then leveled somewhat on most sites. This demonstrates that raccoon populations in a given area can be lowered to a given threshold with trap and removal programs (Table 1). For small scale sites such as these that may be of great importance to nesting turtles this suggests that predator trap and removal programs maybe a viable method to increase nesting success.

Table 1. Summary of four years of raccoon removal trap and removal at Winous Point.

Year	Site	Raccoons Captured	% Change	Trap Nights	% Change
2011	Winous Point	364	N/A	2535	N/A
2012	Winous Point	171	-53.02	1822	-28.13
2013	Winous Point	67	-60.82	1129	-38.04
2014	Winous Point	86	+28.36	746	-33.92

Winous Point supports this project by providing a research site and housing seasonal technicians.

Regional and Landscape Level Movements of Landbirds During Migratory Stopover in Western Lake Erie

Investigators: Bryant Dossman, Ohio State University; Dr. Paul G. Rodewald, Cornell University; and Dr. Stephen Matthews, Ohio State University

Collaborators: Winous Point Marsh Conservancy, Ohio Department of Natural Resources, and United States Fish and Wildlife Service

Summary: Avian migratory strategies, especially those associated with decisions to depart from stopover and continue migration, are governed by a host of external and internal forces. In particular, stopover habitat quality, fuel reserves and favorable wind conditions have been found to positively influence departure decisions in migratory birds. By understanding how migratory barriers influence these relationships, we are better able to predict the importance of stopover habitat (area and quality) in relationship to ecological context.

To better understand migratory bird movements locally within northwest Ohio and regionally around Lake Erie and northwards into Ontario Yellow-rumped (Myrtle) Warblers (*Setophaga coronata coronata*) and American Redstarts (*Setophaga ruticilla*) were captured and affixed with 0.29 g coded radio transmitters (Figures 1 and 2). Marked individuals were released within range of two automated radio telemetry arrays at the Ottawa National Wildlife Refuge (ONWR) and Long Point Bird Observatory which are located on the southern and northern side of Lake Erie, respectively (Figures 3 and 4). Automated telemetry towers were placed intensively at ONWR to monitor fine-scale movements and to determine departure directions. We also utilized the towers placed northwards into Ontario as indicators of migratory pathways when marked birds were detected by these towers. Bryant will continue his work during spring of 2015 to further address these research objectives.

Hypotheses:

1. Lake Erie should decrease the probability of departure given that migratory barriers should pose a perceived risk to migratory songbirds.
2. Fuel reserves are the key determinants of departure from the study site, it can then be expected that birds that arrive with larger fat reserves are likely to depart sooner than those individuals with relatively poorer fuel reserves.
3. Favorable tail wind conditions at the approximate time of departure should promote greater likelihood of departure relative to unfavorable winds.



Figure 1. American redstart and yellow-rumped warbler captured for banding and transmitter attachment.

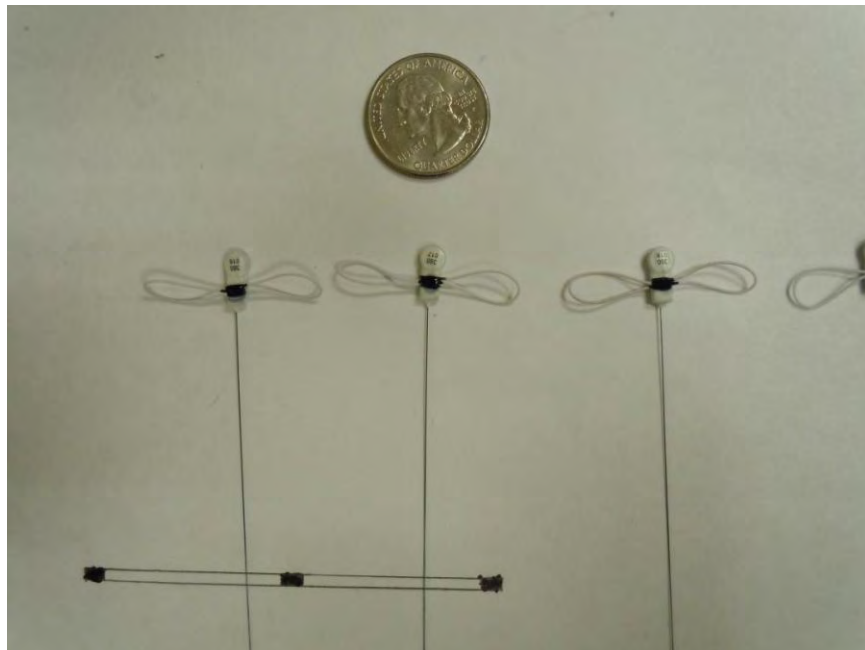


Figure 2. Backpack coded transmitters ready for attachment onto target bird species.



Figure 3. Automated tower and radio-signal receiver in place at Ottawa National Wildlife Refuge.



Figure 4. Locations of automated radio-tower arrays in northwest Ohio and southern Ontario. Intensive tower arrays are in place in western Lake Erie and at Long Point Ontario to study fine-scale movements. Towers further north in Ontario detect northward movements by migrants outside of the intensive array regions.



Figure 5. Landscape level movement breakdown based on subsequent tower detections. Grey line represents marked birds that were not subsequently found on any of the landscape level towers and are presumed to have gone either north or south. Red lines represent birds that were detected on Cedar Point but not Detroit River to the north and are presumed to have continued in a northwesterly direction. Blue lines represent birds that were detect at Detroit River and may or may not have been detected at Cedar point. Line widths are scaled according to the percentage breakdown of all marked birds.

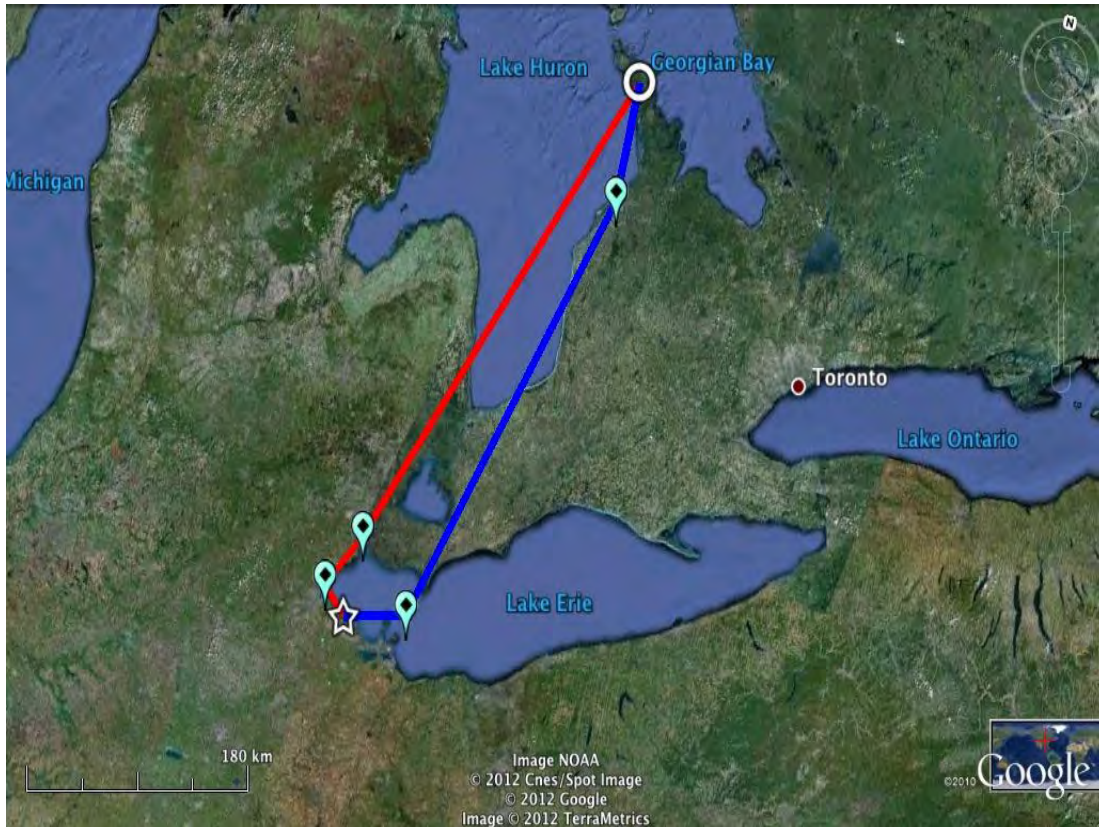


Figure 6. Two marked individuals were detected by the northern Ontario towers (~450 km).

Winous Point supports this project by providing a research site and housing seasonal technicians.

Cooperative Waterfowl Banding at Winous Point

Investigators: Brendan Shirkey and John Simpson, Winous Point Marsh Conservancy; Michael Ervin, Ohio Division of Wildlife; and Bob Gates, The Ohio State University

Schedule: 2014-targeted for long-term

Introduction: Since 2011 Winous Point has been heavily involved in the Ohio Division of Wildlife's (hereafter ODOW) summer banding program targeting wood ducks and mallards as well as the winter banding program targeting black ducks. Recently we have developed a more formal cooperative agreement with the ODOW with established goals of having Winous Point band 50 black ducks, 400 mallards, and 150 adult male wood ducks annually. Furthermore, Winous Point has been contracted by the ODOW to analyze over 20 years of the state's band recovery data to determine survival rates and band recovery distributions of wood ducks and canada geese (Figure 1 and 2).

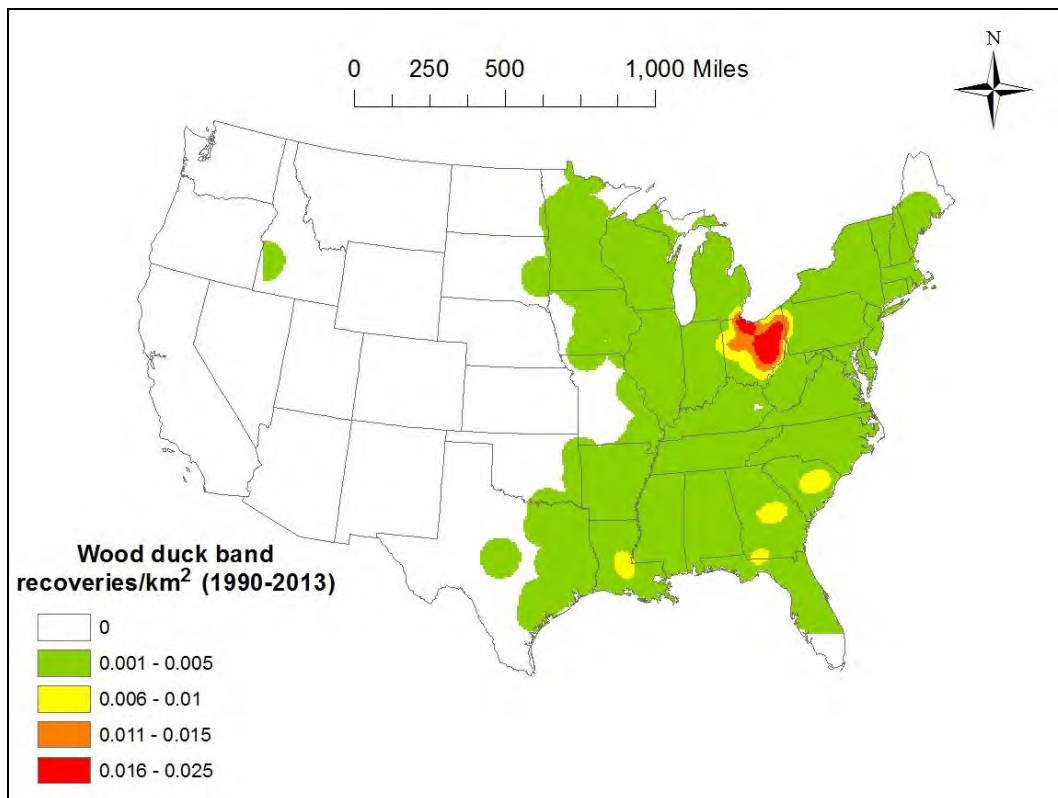


Figure 1. Preliminary results highlighting band recovery densities of all wood ducks banded in Ohio from 1990-2013.

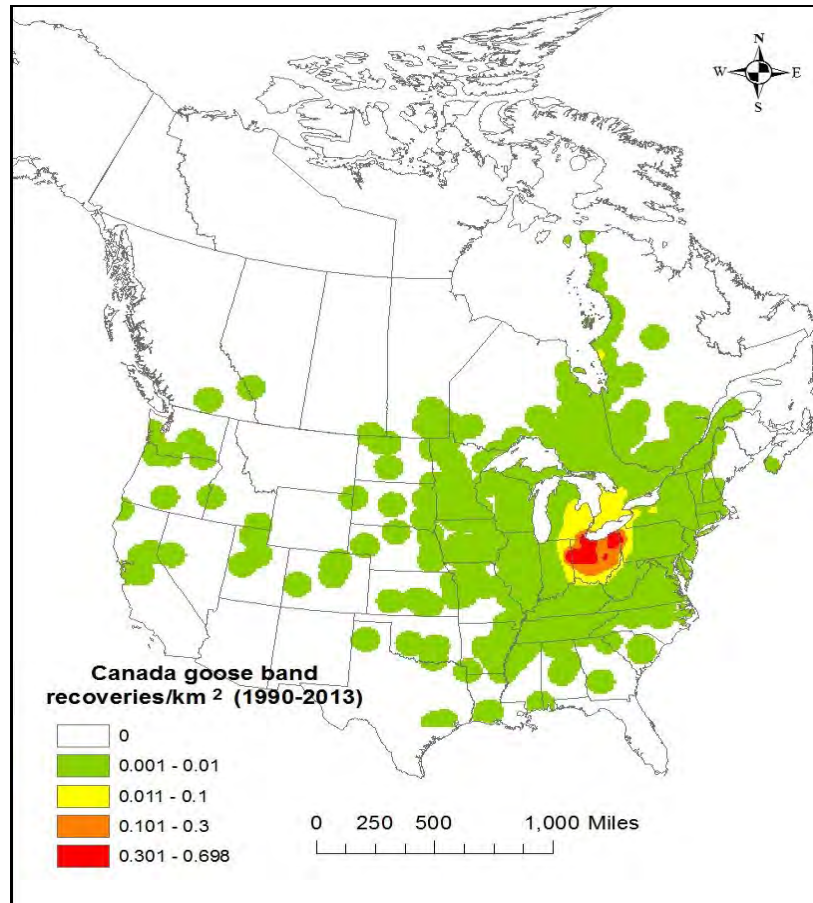


Figure 2. Preliminary results highlighting band recovery densities for all Canada geese banded in the state of Ohio from 1990-2013.

Summary: Banding efforts in 2014 involving Winous Point staff resulted in the capture and banding of 11 different duck species as well as over 700 banded individuals (Table 1).

Table 1. Total number of banded individuals during the winter banding program (January-March 2014) and summer banding program (July-August 2014).

Species	Winter totals	Summer Totals
Gadwall	341	0
Mallard	60	121
Black Duck	23	1
Wood Duck	8	156
Northern Pintail	7	0
Redhead	7	0
American Widgeon	6	0
Canvasback	5	0
Lesser Scaup	5	0
Ring-necked Duck	2	0
Northern Shoveler	1	0

This is an exciting opportunity for the Conservancy to become directly involved with Ohio and the Mississippi Flyway's waterfowl research community and it is important to note that waterfowl band recovery data plays a key role in determining flyway level harvest regulations for some species. In addition to the scientific benefits, waterfowl banding offers a tremendous hands-on opportunity to get kids and adults excited about ducks, duck hunting, and Ohio's wetland resources. This program builds on waterfowl banding that has been occurring at Winous as part of various programs and projects since 2010 (Table 2).

Table 2. Total number of banded individual waterfowl banded at Winous Point since 2010.

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
Totals	282	656	130	341	486	7	6	6	15	2	10



Figure 2. Winter 2014 black duck trapping

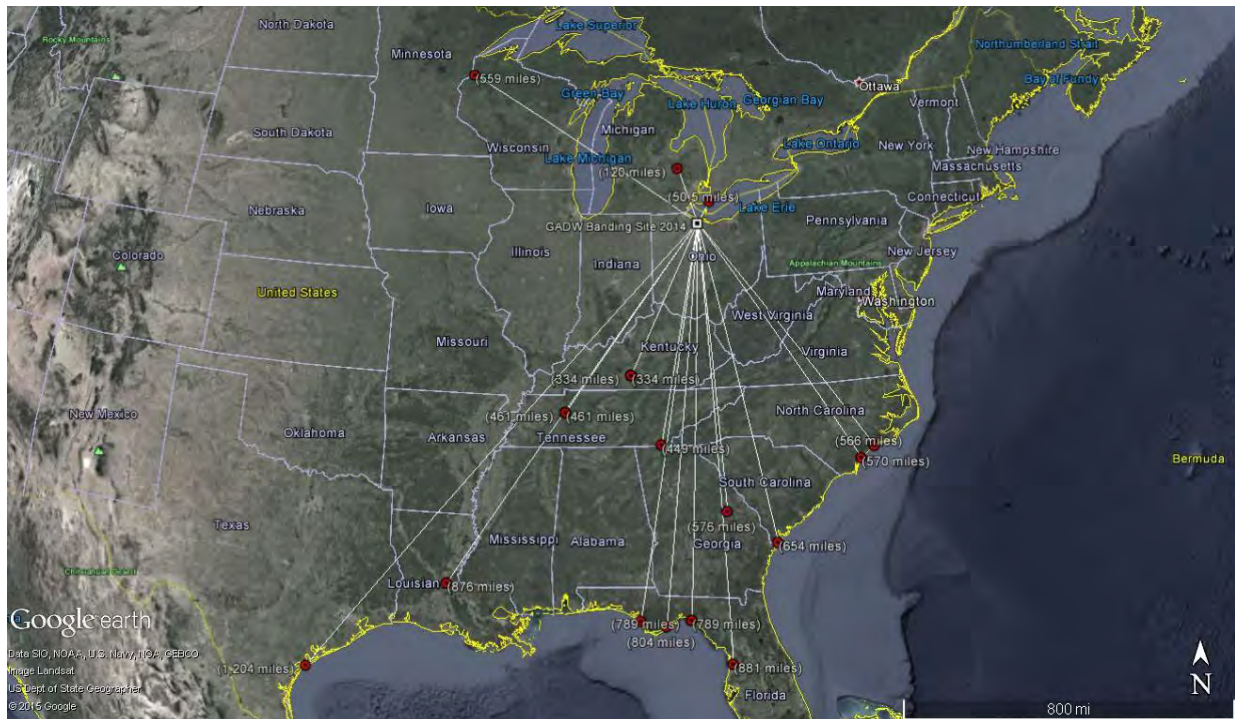


Figure 3. Band recovery locations for redheads banded during winter 2013 banding operations.

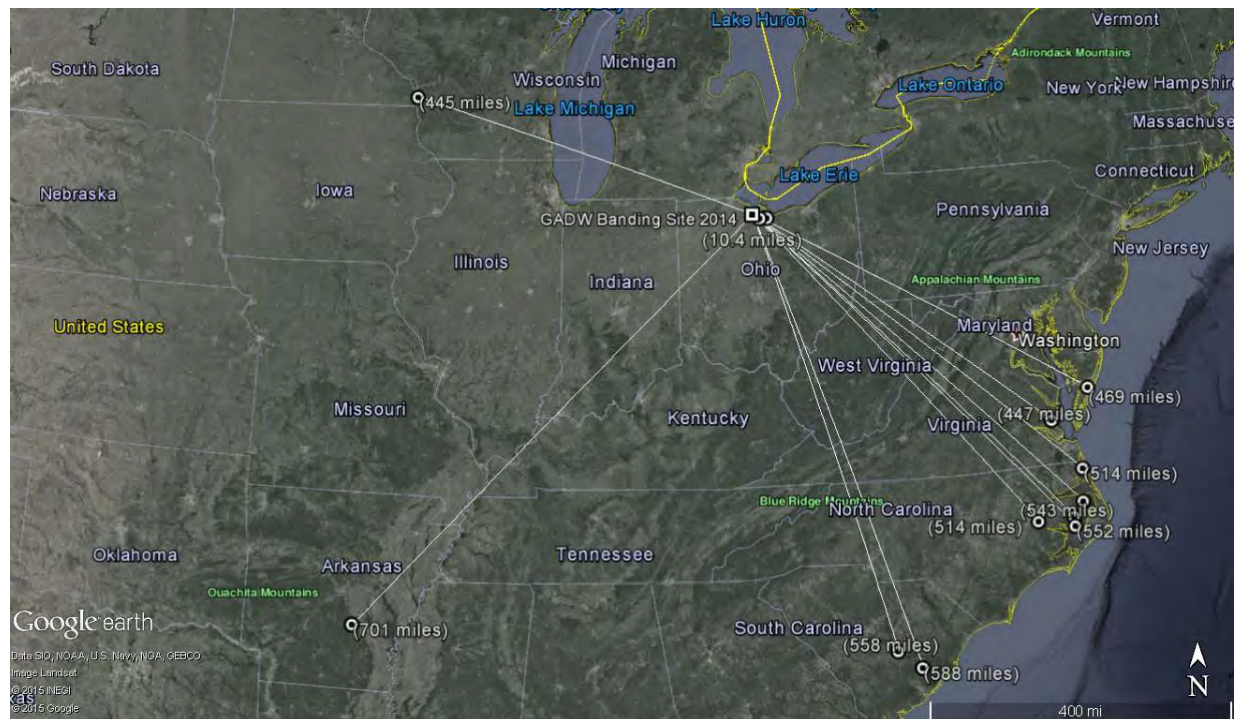


Figure 4. Band recovery locations for gadwall banded during winter 2014 banding operations.

Winous Point supports this project through a cooperative agreement whereby WPMC supplies field staff, time, and materials to band waterfowl and analyze data.

2014 WPMC Tours, Activities, and Events at Winous Point

March	Hosted Lake Erie Marsh Owners annual winter meeting
May	Hosted WPMC Annual Meeting and rail trapping tour
May	Black Swamp Bird Observatory birdwatching tours (three)
May	Hosted the Great Lakes Partners Forum
May	Hosted the Fremont Outdoor Adventure Club for an afternoon of fishing and marsh exploration
June	Hosted the Upper Mississippi and Great Lakes Region Joint Venture Science team meeting
June	Hosted Ohio Division of Wildlife Rocket Net Safety and Banding Training
July	Hosted “A Day on the Wild Side” Youth Conservation Education Day
August	Hosted Nature Conservancy Tour of Muddy Creek Bay and adjacent wetlands
September	Ohio State University Wildlife Management Class for 25 students
October	Hosted the youth waterfowl hunting and safety event

2014 WPMC Conferences and Meeting Attendance

January	Attended Ohio Fish and Wildlife Management Association Conference, Columbus, OH
January	Attended the Upper Mississippi Great Lakes Joint Venture science meetings, Kansas City, MO
March	Supported the Ottawa County Pheasants Forever Banquet, Oak Harbor, OH
March	Presented at the winter meeting of the Lake Erie Marsh Owners Association
April	Supported the Ottawa County Ducks Unlimited Banquet, Oak Harbor, OH
May	Presented at the Great Lakes Partners Forum, Port Clinton, OH
June	Attended the research presentation “Mapping landscape and habitat changes in northwest Ohio wetlands” at Ottawa National Wildlife Refuge.
June	Presented sessions at the “Land Stewardship Workshop”, Oak Harbor, OH
July	Attended the Lake Erie Marsh Association Summer Meeting, Fremont, OH
August	Attended the fellowship presentation “GIS mapping managed wetlands in northwest Ohio” at Ottawa National Wildlife Refuge.
October	Presented at Ottawa National Wildlife Refuge “Youth Waterfowlers of Tomorrow”
October	Assisted as youth waterfowl hunting guides for the Ottawa National Wildlife Refuge youth hunting event, Oak Harbor, OH
October	Attended the Ducks Unlimited Ohio Hunt reception, Port Clinton, OH
November	Participated in Upper Mississippi/Great Lakes Joint Venture science planning meetings, Harsen’s Island, MI
November	Participated in Michigan DNR and Michigan State University meeting discussing diving duck distributions on Lake St. Clair and western Lake Erie

- December Attended the program “Mark” workshop hosted by the Ohio State University and the Ohio Division of Wildlife, Columbus, Ohio
- December Attended the ODNR and Terrestrial Wildlife Ecology Lab Research Meeting, Delaware, Ohio.
- December Attended the master’s presentation “Secretive marsh birds and their habitat associations” at Ottawa National Wildlife Refuge.
- December Participated in Ottawa Soil and Water Conservation District annual planning meeting, Oak Harbor, OH