SUNY College of Environmental Science and Forestry
Waterfowl & Wetlands @ ESF

Mid-season report

July 30, 2021

from

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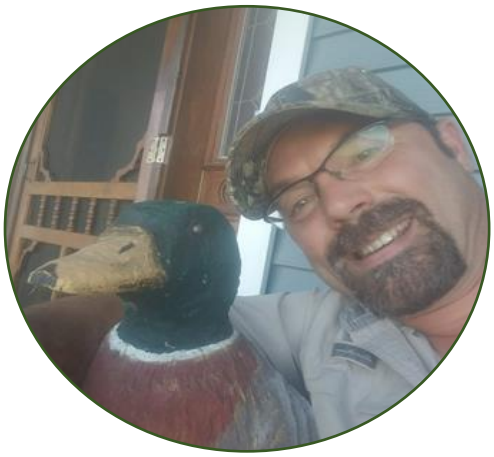
On the web: https://schummerlab.weebly.com/

Facebook: https://www.facebook.com/OurWaterfowl/

I am happy to report that the Waterfowl and Wetlands lab at SUNY ESF continues to successfully meet our **Mission** and **Vision** during 2021.

Mission: Train the next generation of waterfowl and wetlands scientist, conservationists, and managers while producing the robust science needed by our conservation stakeholders.

Vision: Populate the Atlantic region with highly-skilled young professionals that have a hunter-conservationist ethic to ensure the future of waterfowl, other wetland-wildlife, and people.



We graduated another Master of Science student (Molly Jacobson; co-advised with Dr. Melissa Fierke) in May 2021 who was nearly immediately hired as a Research Associate for the Restoration Science Center at ESF. Stephen Sliwinski, who studied snow geese and completed his Master of Professional Studies degree with us in 2020, moved from his temporary position at Montezuma National Wildlife Refuge to a permanent Biologist position near Watertown, NY with New York State Dept. of Environmental Conservation working in their wetlands program. Two other 2020 graduates from our lab are also making their mark on waterfowl conservation; Matt Wagner is a Biologist at Marais des Cygnes Wildlife Area in Kansas where his primary role is managing wetlands for waterfowl; and Ed Farley was promoted from Mitigation Biologist to NY State Biologist with Ducks Unlimited. This year we also continue to deliver science to peer-reviewed journals on various topics including wetlands management, diving duck population estimates, band analysis techniques, black duck conservation, and influences of waste grain on waterfowl food availability. This fall, new additions to our lab will include 1 MS, 1 PhD, and 1 Post-doctoral Research Associate. In the following pages, we update you on our 2021 activities to-date, report on future efforts, and end with notes on our important 5-year goal to endow a Chair in Waterfowl & Wetlands Conservation @ ESF in perpetuity.

Yours in conservation,

Michael L. Schummer, PhD

Investigations into Eastern Mallard Decline

Waterfowl are environmentally, ecologically, economically, & culturally important. Among these birds, the mallard is one of the most common and recognizable. At around 3 million birds or 30% of the annual duck harvest in the US, mallards are among the most important game species to North American waterfowlers. **Following a long period of population growth, mallards in eastern North America have been declining about 1% per year for the past 20 years. Surprisingly, until recently, few studies have been completed and published about reasons for the decline.** Population trends have not been consistent across the region. Estimates of mallards in the Atlantic Flyway Breeding Waterfowl Survey that spans from Virginia to Maine, have declined by ~40% and mallard harvest in the Atlantic flyway has declined by a similar rate during this period. In contrast, mallard population estimates from the Waterfowl Breeding Population and Habitat Survey, which includes eastern Canada and Maine, have been stable for the past 20 years. The cause of the decline in eastern US mallards is not well understood. Banding data has not shown a decline in survival rates since the population was stable in the early 1990s, nor have harvest rates increased. Additionally, estimates of the number of young produced per adult have not significantly changed. The disagreement between the demographic estimates and the population surveys suggests inconsistencies in available data. Two different genetically distinct mallard types in eastern North America also may complicate the capacity to pin-point reasons for the decline. Releases of game-farm mallards beginning in the 1920s lead to the establishment of a feral breeding population. As of 2001, it was estimated that at least 200,000 birds are released annually, although these numbers are not well-documented. European mallards bred on game farms and released in North America are ~10% genetically different from wild North American mallards; to put this in perspective wild North American mallards and American black ducks are about 1.5% genetically different. Interbreeding of wild and game farm mallards has resulted in what we call a "hybrid swarm" of European and North American mallard genes whereby hybrids (wild × game farm) breed with hybrids, leading to vary degrees of wild and game-farm genes in the eastern mallard population. For this reason, we are currently testing if game-farm genes could be maladaptive in the wild.

To what extent genetic composition of the population, breeding habitat and reproduction, and harvest play in the decline in mallards is relatively unknown, making it difficult to make effective and efficient management decisions. Because of the importance of mallards to North American waterfowl enthusiasts, we are currently completing 8 projects aimed at reducing uncertainties in datasets and testing assumptions about drivers of mallard abundance in eastern North America. In the following pages, we provide highlights from several of those projects.

Mallard Productivity and Breeding Pair Abundance

Successful reproduction is critical in sustaining mallard populations. As such, with primary financial support from Delta Waterfowl and Ducks Unlimited and technical assistance from the USFWS and Atlantic Flyway Technical Section, we aim to understand relative contributions of regions of eastern North America to mallard production and breeding pair abundance. **We are using wings from juvenile or "hatch-year" mallards from the USFWS Parts Collection Survey and stable isotope analyses of feathers grown on breeding grounds to determine the origin of mallards harvested in the US portion of the Atlantic flyway.** We also are determining genetics (game-farm/European, wild, or hybrid) on a subsample of those wings. To determine the influence of landcover composition on the number of mallard breeding pairs, we are using data from >1,000 km^2 plots from the Atlantic Flyway Breeding Waterfowl Survey and the National Land Cover Database. Combined we are providing critical information on where mallards breed and are produced in eastern North America.

Graduate student Sam Kucia is leading this research effort and is expected to complete his MS degree in December 2021.

We expect to provide final results in our 2021 ANNUAL REPORT in January 2022.

Additional support provided by the University of Texas El Paso, Birds Canada, Waterfowl Research Foundation, Long Island Wildfowl Heritage Group, and SUNY ESF. Technical support provided by the Dr. Keith Hobson Lab of Western University.

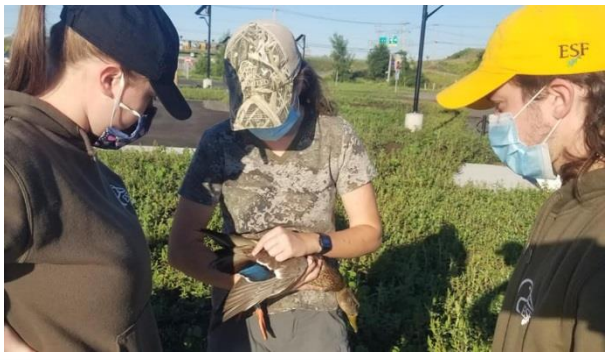
Long Island Wildfowl Heritage Group, Ltd.

Origins & Genetics of Preseason Mallards

An important assumption of banding data is that populations do not move during the banding period and that recruitment is similar among breeding populations. **Estimates using banding data suggest that nearly 80% of the mallards banded in the northeastern US are also harvested in those states. However, what if the assumption of movement of mallards during preseason banding was violated? This would have substantial consequences on how we interpret banding data** and, if mallards in the Canada and US have different population trends, this could complicate our capacity to manage these two populations separately. For example, despite a decline in the mallard population in the US, there was no detectable change in hen mallard survival for that same region. But what if those were not just US mallards, but also included hen mallards from Canada? This is the question that graduate student **Kayla Harvey** will answer. What are the origins of the hatch year mallards that we band in the US portion of the Atlantic and Mississippi flyways? Kayla also aims to determine if the genetics of mallards varies by origin. We sampled feathers (origin) and blood (genetics) from mallards during preseason banding to conduct stable isotope and genetic analyses (2019 & 2020), and will again collect these data in August & September 2021. Kayla aims to complete her MS degree by summer 2022.

A MUCH-NEEDED ASSESSMENT OF BLOOD SAMPLING OF MALLARDS

As an addition to **Kayla Harvey's thesis research**, she also is investigating the effect of blood sampling on survival of mallards. Blood sampling is critical for studies of mallard genetics, but is currently coded differently by the USGS Bird Banding Lab and typically excluded from banding quotas. As such, state and federal biologists are often reluctant to allow extensive blood sampling. Surprisingly, such an analysis for ducks has not been completed; in Canada geese, blood sampling has no effect on survival, but in several species of passerines it may have some impacts. Kayla's investigation will provide needed information to biologists and geneticists, who increasingly collaborate, especially considering the questions currently surrounding eastern mallard genetics.



Financial support provided by the University of Texas El Paso, Birds Canada, Delta Waterfowl, Ducks Unlimited, Waterfowl Research Foundation, Camp Fire Conservation Fund, and SUNY ESF. Technical support provided by the Atlantic Flyway Technical Section, Mississippi flyway biologists, Michigan State University, and Western University.

National Science Foundation grant projects

As part of our ongoing collaboration with Dr. Philip Lavretsky of the University of Texas El Paso, we continue to further research into the geographical reach of game-farm mallard genetics in North America. Partnered with many state/provincial and federal agencies across USA and Canada, Dr. Lavretsky has processed 2,000+ mallards spanning space and time (i.e., pre- versus post-season). Though sampling is on-going, current trends are clear: (1) game-farm mallards are of Eurasian source, and are substantially genetically different from wild North American mallards (i.e., ~10%), (2) the highest rates of hybridization is in the Atlantic flyway and consistent with where numbers of game-farm mallard releases persist, (3) the number of mallards carrying game-farm mallard genes decreases going westward, (4) the majority of hybrids can be categorized as part of a wild × feral mallard hybrid swarm (i.e., hybrid × hybrid crosses), and (5) there are greater numbers of birds carrying game-farm mallard genes in more southern (i.e., USA) versus northern (i.e., Canada) regions (Fig 5). The latter suggests some form of regional partitioning between wild North American and feral/feral × wild mallards. **As part of a recently awarded 4-year National Science Foundation grant in 2019, and along with Dr. Lavretsky, Forbes Biological Station, Mississippi State University, and Smithsonian Institute, we will be taking a deep dive into understanding the genetic consequences of domestic × wild mallard interactions on the adaptiveness of wild populations.** Specifically, we will be using state-of-the-art genomic methods to identify genes that have been under artificial selection for over a century in game-farm mallards, and then associate morphological and ecological traits to these genetic regions to understand how the movement of these genes into wild populations may change survival or fecundity. With genetically vetted pure wild mallard, game-farm mallard sources, and more importantly, different generations of their hybrids, we will be able to track how natural selection acts on these potentially maladaptive genes and their associated traits. Finally, we will be coupling ancient DNA methods with hundreds of museum specimens spanning the entirety of North America and across the last 150 years to track how the interaction of game-farm and wild mallards resulted in today's eastern hybrid swarm. In short, we aim to understand how these interactions ultimately changed the genetic diversity of North America's wild mallard, and potentially their ability to survive and adapt.

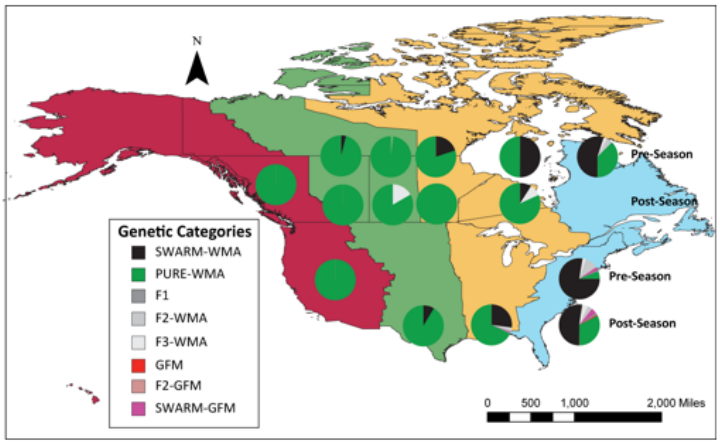


Figure 5. Percentage of pure wild mallard (Pure-WMA), pure game farm mallard (GFM), hybrid swarms mallards (Swarm WMA and Swarm GFM), and filial generations of offspring (F1, F2-WMA, F3-WMA, and F2-GFM) during pre-season and post-season banding in North America.

National Science Foundation grant cont.

As a component of our NSF grant, ESF graduate student **Susannah Halligan** is currently studying how well mallards of wild and game-farm origin feed on native wetland seeds and corn at the Forbes Biological Station in Illinois. Susannah and undergraduate assistant, **Jeffrey Mitchum** (Clemson University) will determine if bill and other body morphologies differ between wild and game-farm mallards and if bill morphology influences feeding efficiency. For fall 2021, **Laura Wallace** (ESF 20' – BS Wildlife Science), will continue the study from August to November. Studies of bill morphology in Europe detected that game-farm mallard bills are shorter, taller, and have fewer lamellae (the tooth like structures used to strain food) than their wild counterparts, but a similar study has not been conducted in North America. We also will obtain internal and external 3D imagery of duck heads using the CT scanner at the Smithsonian Institute to determine bill volume and other cranial measurements to estimate relationships with feeding efficiency. We suspect that game-farm mallards are efficient at feeding on corn and pellets, but less adapted to eat small native seeds like those from pigweed and barnyard grass. **This study provides a critical investigation into potential mechanisms for mallard decline because limited reproduction in the US could partially explain the mallard decline.** Reduced duckling output could result from hen mallards of game-farm ancestry not acquiring adequate nutrients for reproduction because they have bills and body sizes artificially selected for by domestic breeders that are maladaptive in the wild.

We are grateful to the quality partnership with Forbes Biological Station for this study along with the dedication of California Waterfowlers Association to provide eggs from wild mallards for the Mississippi State University portion of this study being conducted by Dr. Brian Davis, the James C. Kennedy Chair in Waterfowl and Wetlands Conservation.

Origins of Atlantic Flyway Scaup

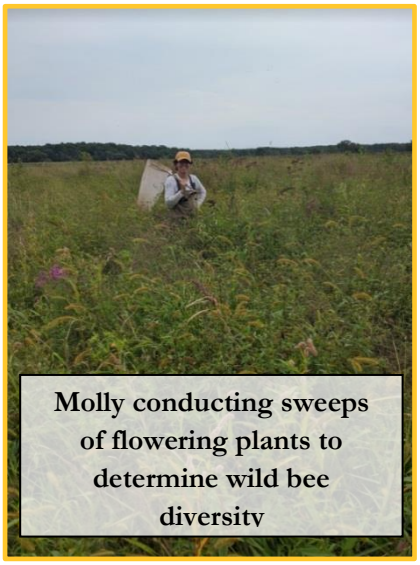
Historically, tens of thousands of lesser and greater scaup wintered at Great South Bay (GSB), Long Island, New York. Beginning around 1990, Scaup numbers at GSB declined to nearly zero. Substantial anthropogenic influences decreased water quality in GSB over the last century, caused declines in scaup foods, and is hypothesized as the reason for the decline in scaup using GSB during winter. The disturbance of Superstorm Sandy in 2012 created a breach in Fire Island near Bellport Bay, increasing tidal flushing and potentially alleviating anthropogenic stressors on traditional foods of molluscivorous ducks in GSB (e.g., duck clams). In 2016, wintering scaup returned in abundance to GSB, but coordinated efforts to obtain robust population estimates did not occur. Further, **prior research by Schummer and colleagues suggest that up to 50% of the scaup breeding in Quebec may be missed by traditional waterfowl surveys and this eastern migration corridor and breeding population may contain more scaup than previously thought. As such, increases in scaup wintering at GSB may result from a growing eastern breeding population.** We sought to use banding, mark-recapture techniques to estimate the wintering population of scaup at GSB and historic banding records and feather sampling and stable isotope analyses to estimates the relative contribution of Quebec to Atlantic coast wintering scaup populations. **Master of Professional Studies student, Jake Chronister (20'), recently published in Northeastern Naturalist.** Jake detected that numbers of scaup observed on GSB were substantially greater than estimates using banding, mark-recapture methods and this indicates that our models did not accurately represent the entire GSB population. This warrants consideration when using banding data because individuals not available for capture may have different vital rates (e.g., survival) than those captured and banded. We also detected a shift eastward in mean hunter recovery longitude of lesser scaup banded on the Atlantic coast from 1920 to 2019 which may suggest that more of this wintering population of lesser scaup may be derived from eastern Canada than those wintering in areas farther south along the Atlantic Coast. This prompted us to initiate a stable isotope project which included collecting feathers from scaup banded at GSB in winter 2020 and 2021, as well as obtain scaup wings from the USFWS Parts Collection Survey in 2021. **MS student Brittnie Fleming is leading this project and will use unique directional banding techniques to estimate percentages of scaup migrating and wintering along the Atlantic Coast that originate from eastern Canada (e.g., Quebec), the mid-continent, and Alaska.** Banding stations for scaup do not exist at their eastern breeding locales because it is impractical, but stable isotope analysis of feathers that are grown where scaup hatch can inform waterfowl managers of the relative importance of the region to Atlantic coast scaup.

Photo credit: Cole Tiemann

Financial support provided by The Long Island Wildfowl Heritage Group and Waterfowl Research Foundation. Technical assistance provided by the USFWS, Maryland DNR, and Western University.

Influence of Wetland Management on Native Bee Pollinators

Molly Jacobson (MS 21'; co-advised with Dr. Melissa Fierke), led this research project to determine how management of restored wetlands influences flowering plant abundance and wild bee diversity. In 2019 and 2020, Molly sampled over 30 wetlands each month from June to September at Northern Montezuma Wildlife Management Area, Montezuma National Wildlife Refuge, and Seneca Meadows Wetlands Preserve. Most of these areas were previously drained wetlands that had been farmed for decades, largely at the expense of fish and wildlife. Funding to restore these wetlands came from the NY Department of Environmental Conservation, the North American Wetlands Conservation Act, and Ducks Unlimited with the focus of restoring habitat for migratory birds, especially waterfowl. While the benefits to birds have been widely studied by our lab and others, we needed information on the benefits to flowering plant and bee diversity to inform restoration and management actions. Molly conducted plant surveys, set pan traps, and conducted sweep-netting to quantify plant and bee diversity as well as understand pollinator-plant associations. She collected and identified an astonishing diversity and abundance of bees; 9,046 individual bees of at least 80 different species. Notably, **Molly found several rare pollinators, and some that specialize on only one plant. She also detected that flowering plant diversity decreased with increasing amounts of open water and invasive cattail cover. Interestingly, two management techniques used to create food for hungry migrating waterfowl are 1) water removal to mimic seasonal drying and stimulate annual and flowering plant germination, and 2) controlling invasive cattail that competes with diverse, native plants. So, what is good for birds also seems good for bees.**



Molly conducting sweeps of flowering plants to determine wild bee diversity

Molly completed and defend her MS thesis in spring 2021, and is joining the Restoration Science Center at ESF as a Pollinator Ecologist – supported by philanthropic funding.

She is a true ambassador for bees!

Our future goal for this research is to use these important findings to expand to wetlands on private lands that are embedded in agricultural landscapes throughout the northeastern US. We hypothesize that wetlands restored in these landscapes may serve as sources or refugia for pollinators in an otherwise inhospitable landscape. That is, wetlands may save bees and serve an important role in pollinator conservation.

Analysis of Kansas Waterfowl Survey Data

For a decade, our lab and collaborators have been studying how a changing climate may influence timing and intensity of waterfowl migration to southern latitudes during the non-breeding season (i.e., waterfowl hunting season). This has substantial implications for birders and hunters at southern latitudes that increasingly note fewer ducks and geese making it to their traditional southern wintering grounds. Indeed, results presented by Schummer et al. (2017) in the Wildlife Society Bulletin detected that the weather causing migration of ducks to southern latitudes had become milder during November – January 1979 – 2013. The result was that 1,654,720 ducks could winter farther north than in the past during November through January. That is, they had no need to migrate to southern locales where they would be available for viewing and hunting.

Kansas is positioned at a latitude that can experience weather severity that is great enough to cause ducks and geese to move farther south, but also where ducks may be increasing staying later into winter. They also may have later timing of peaks in migration of ducks and geese with a changing climate, making it difficult to time waterfowl seasons to capture the periods of greatest availability of ducks and geese for hunters. In August 2021, **Benjamin West will matriculate into ESF's doctoral program to study waterfowl migration patterns in Kansas and beyond.** While we have developed weather severity indices (WSI) for dabbling ducks, these important indices are not available for diving ducks, sea ducks, or geese. Development of WSI for these species will enable us to better estimate the ecological and economic implications of changing weather and waterfowl migration. We have predicted changes in dabbling duck migration under climate change scenarios through 2100, but Ben also will determine relationship between WSI, waterfowl migration, and birder and hunter activity. Rough estimates suggest an economic loss of at least $8-million dollars to businesses when weather is mild and ducks don't arrive during hunting season at southern latitudes (e.g., AR, LA, MS). Ben also will coordinate with colleagues to determine relationships between eBird waterfowl count data and those collected by trained biologists during standardized surveys. Data from eBird are readily available at a large-spatial scale and may provide substantial opportunity to accurately track annual waterfowl migration while saving time and funds by state and federal biologists charged with maintaining waterfowl migration records. Ultimately, this work will enable Kansas to better serve their waterfowl hunting public which is important because studies suggest that hunters are among the most active conservationists.

Kansas Department of Wildlife, Parks and Tourism

Analysis of NY DEC Marsh Bird Monitoring Data

The New York State Department of Environmental Conservation (NYS DEC) has conducted annual secretive marsh bird surveys from 2010 – 2019 to document the occurrence and assess population trends of several species. The NYS DEC Marsh Bird Monitoring Program (MBMP) targeted Virginia rail, sora, king rail, American bittern, least bittern, black rail, clapper rail and pied-billed grebe as primary focal species. Secondary focal species included marsh wren, willow flycatcher, swamp sparrow, black tern, American coot, common gallinule, and Wilson's snipe. The MBMP is a combination of a long-term marsh bird conservation project (2004−2006) and New York's participation in the National Marsh Bird Monitoring Program Pilot Study coordinated by the U.S. Fish and Wildlife Service.

The goal of the MBMP was to determine population trends of the focal marsh bird species. The specific objectives included: (1) estimating temporal trends in marsh bird distribution and occupancy to inform management decisions regarding population status; (2) determining changes in the annual distribution and occupancy to inform regulator decisions for migratory game bird species; and (3) document species-specific habitat associations at multiple scales to inform habitat management on state-owned wetlands.

In August 2021, Sean Peterson will join ESF as a Post-doctoral Research Associate to investigate analytical techniques that are able to estimate precisely the trends in occupancy and abundance of these marsh birds and provide additional options for methods (field and analytical) to attain the desired confidence in trends in occupancy and abundance estimates in NY State. Sean comes to us with extensive analytical experience and work with black rails in California (UC-Berkeley).

Bald Eagle Rehabilitation Techniques

Alexa Blunck completed her MPS internship this summer working with Bald Eagles in lead-poisoning rehabilitation at Friends of the Feathered and Furry Wildlife Center in Hunter, NY. Wildlife rehabilitators use a method called chelation that essentially "scrubs" the eagle's blood clean of lead before they are released back into the wild. However, the amount of chelation time and success rate of releases, post-chelation, are relatively understudied. The hypothesis is that current chelation time is too short and bald eagles released back into the wild that are later found dead, succumb to elevated lead levels. These lead levels may result from stress of release and mobilization of stored lead into the blood when the eagles metabolize tissues to survive. As such Alexa, will assist in chelation of bald eagles for extended periods of time at the facility before releasing them with a GPS backpack to track their movements and survival. She will compare these results with those of typical, shorter chelation times from other facilities and published research.

The Master of Professional Studies program with an emphasis in Waterfowl and Wetlands is aimed at retooling career professionals already working, year-round or seasonally, within federal, state, and non-profit entities. The graduate program's aim is to provide opportunity for wildlife biologists holding Bachelor's degrees to advance academically and professionally through an experiential, coursework-based program. The program promotes field techniques and face-to-face people skills. Positions are competitive. No more than 4 students are supervised at one time.

ESF State University of New York College of **Environmental Science and Forestry**

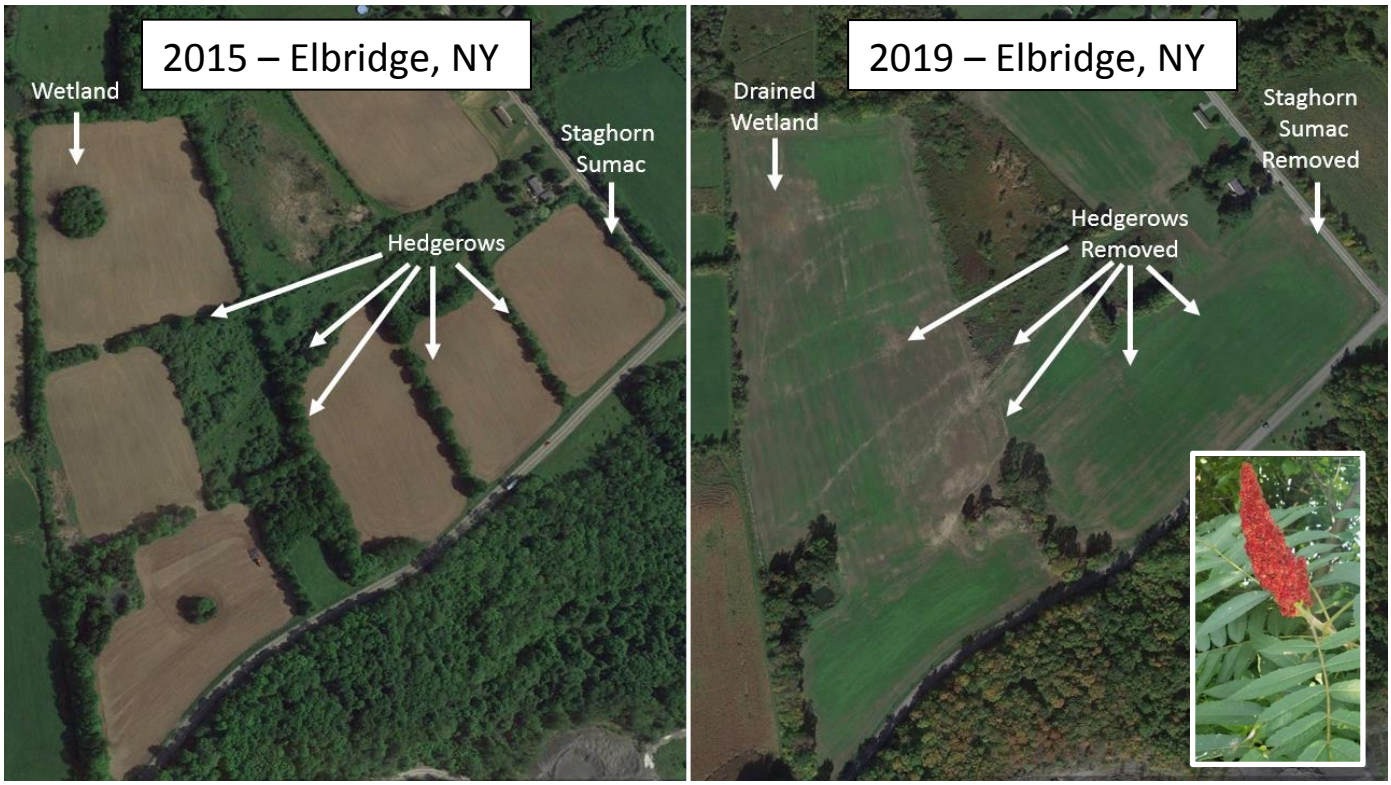
Nutrients and Microbial Source Tracking on Cayuga Lake

In collaboration with the Cayuga Lake Watershed Network and the Dr. Hyatt Green microbiology lab at ESF, we are determining nutrient inputs and conducting microbial source tracking on key streams entering the northern portion of Cayuga Lake. Nutrient loading and resulting harmful algal blooms in the Finger Lakes region threatens access to clean water and impacts the multi-billion-dollar recreation and tourism industry of the region. General degradation of water quality in the Finger Lakes region is ongoing with nutrients, pathogens, and sediments often exceeding acceptable levels. Levels are exceeded during storm and season runoff events, but chronic inputs can occur throughout the year from unabated pollutant sources. Cayuga Lake is relatively ice-free much of the winter and is a prime destination for migratory waterfowl in the Atlantic flyway. Situated directly south of the Montezuma Wetlands Complex that hosts > 2 million waterfowl use days each year (1 duck using the area for 1 day is 1 use day), Cayuga Lake is the next stop for waterfowl as shallow marshes freeze. Some of these ducks, geese, and swans stay the winter and others moving farther south. As such, Cayuga Lake water quality is important for migratory birds of the Atlantic flyway. The missing piece in water quality sampling has been microbial source tracking, which provides a new powerful tool to determine potential sources of nutrients entering the lake. **Our team aims to determine links between nutrient-loading, that can lead to harmful algal blooms, and microbes such as *E. coli* bacteria. Microbial source-tracking will enable us to determine if bacteria associated with nutrient events primarily comes from humans, manure, or wildlife; important information for understanding how to preserve the pristine Finger Lakes waters for all users.** Funding for the project was generously provide by the Emerson Foundation through a grant to the Cayuga Lake Watershed Network and Seneca Meadows Preserve. Thank you to all the volunteers that are making our extensive water and microbe sampling possible.

April 5, 2005 Taughannock Falls and Cayuga Lake view north photo by Bill Hecht

Wildlife Use of Staghorn Sumac

While appearing outside of our typical study focus on waterfowl and wetlands, this study remains focused on landscape change and game species; both are central to our training of the next generation of conservation professionals and the related science they produce. **Staghorn sumac is a common species of hedgerows and roadsides throughout the northeast and upper mid-west US and southeast Canada. It is a super-plant; nearly all parts provide some benefit to wildlife. Deer, turkey, and songbirds eat the fruit. Rabbits and deer feed on the bark of the young plants during winter. Native bees collect pollen from the flowers and nest in the hollow stems. The eastern bluebird, the NY state bird, relies heavily on staghorn sumac seeds to survive winter.** Unfortunately, along with other farming practices such as wetland drainage that aim to maximize yield, staghorn sumac abundance on the landscape suffers from removal of hedgerows and roadside vegetative. The aim is to increase crop yield and maximize profit margins, but it appears to come at a cost to wildlife in the process.



Starting in fall 2021, Sam Krebs will investigate wildlife use of staghorn sumac in relation to phenolic compound concentrations in fruits and bark of the plant; he also will document changes in staghorn sumac abundance in agricultural landscapes in the CNY region.

NY State Hunter Safety Course and Delta University Hunt Program

In fall 2021, **ESF student once again will have the opportunity to take the NY State Hunter Safety course required to hunt in NY State & elsewhere**. The course will be offered exclusively to up to 25 ESF students in October. **Further, Delta Waterfowl will generously be hosting 8 to 10 students on a goose hunt in the St. Lawrence River Valley in November.** The hunt is intended for those that have not previously hunted, or have hunted other species, but have not had the opportunity to waterfowl hunt. **This provides a professional development opportunity for ESF students to understand the role of hunter-conservationists as environmental stewards.**

The trip will include a practice trap shoot and gun safety the day prior to the hunt, the actual hunt, and a following cookout of the game harvested. This is an excellent opportunity for those who haven't hunted to see if they'd like to incorporate hunting into their lifestyle.

In addition, ESF student will have the opportunity to obtain their NY Waterfowl ID Certification that is needed to hunt waterfowl on USFWS National Wildlife Refuges in NY. The course will be taught be retired ESF museum curator, Ron Giegrich.

Waterfowl & Wetlands @ SUNY ESF -- Fact Sheets

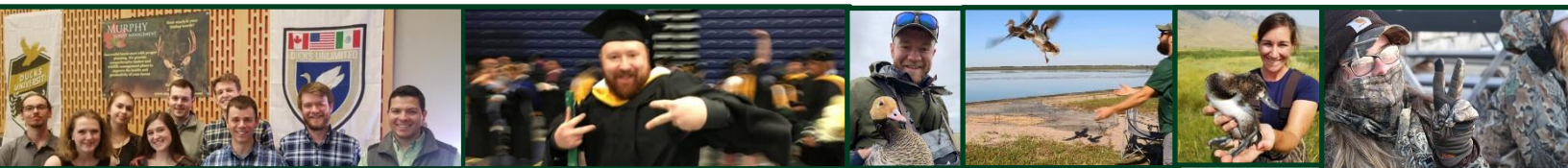
Mission: Train the next generation of waterfowl and wetlands scientist, conservationists, and managers while producing the robust science needed by our conservation stakeholders.

Vision: Populate the Atlantic region with highly-skilled young professionals that have a hunter-conservationist ethic to ensure the future of waterfowl, other wetland-wildlife, and people.

History: Ecologists have been teaching us for decades of the need to consider all organisms to sustain a healthy planet for people. Following this important message was a refocus of academia towards all-species and away from traditional game-species conservation and management. Missing in that conversation was much evidence that game-species conservation and management had been meeting the needs of many species all along. Also missing were additional funds for employing professionals to sustain all-species. In this process, we lost sight of the accomplishments directly in front of us, how to capitalize on them, and how to advance within a built infrastructure of progress (e.g., North American Waterfowl Management Plan, North American Wetlands Conservation Act). We aim to sustain waterfowl and wetlands expertise at ESF to produce students capable of meeting the needs of the hunter-conservationists of NY and the Atlantic region while sustaining all wetland-wildlife and places for people to thrive.

Today: Today, game-species oriented professors are few at institutions of higher education, especially in the eastern US where the stressors on wildlife and wild places are among the greatest in North America. As such, the interests of people with the hunter-conservationist ethic are too seldom represented within our wildlife conservation workforce and their decisions. Simply, we are producing fewer well-rounded, young professionals to fill waterfowl and wetlands conservation and management positions in the federal government, state agencies, non-profits (e.g., DU and Delta), and industry. It is increasingly difficult for employers to fill positions with qualified personnel in the waterfowl and wetlands field.

Need: A 2018 publication in the Journal of Wildlife Management noted, "the number of academic programs and faculty that teach and mentor students in basic and applied waterfowl research is rapidly declining, and as a result, fewer undergraduates and graduate students are trained in the skills needed by the management community (Kaminski 2013)." Since the 1970s – 1990s, the era that produced the North American Wetlands Conservation Act (the 'vehicle' for the corresponding North American Waterfowl Management Plan), there has been a nearly 40% decline in professors with waterfowl and wetlands expertise. We aim to reverse this decline.



Accomplishments at ESF: Funding from 2015 to present to support student research = $3,903,280
State = $1,629,087
Federal = $1,096,923 – includes a substantial National Science Foundation grant
Industry = $25,000; NGO = $573,145
Foundations = $529,000; Crowd-funding = $50,125

- ✓ Revitalized the ***Ecology and Management of Waterfowl*** course at ESF, which has been enrolled at maximum capacity
- ✓ Developed an additional course entitled ***Wetlands Conservation and Management for Wildlife*** to ensure ESF students are skilled at managing wetland complexes on federal, state, and private lands
- ✓ Supported establishment of a thriving ***Collegiate Ducks Unlimited Chapter*** that ranked in the top 10 university chapters
- ✓ Facilitated a ***Delta Waterfowl University Hunt Program*** at ESF to introduce students to the role of waterfowl hunting in conservation

Students: Supported 3 Undergraduate Honors, 3 Master of Professional Studies, 10 Masters, 1 Doctoral, 1 Post-doctoral Associate since 2015. Completed students are currently employed with NYSDEC, Ducks Unlimited, USFWS, USDA-NRCS, Kansas Dept. of Wildlife, Parks, and Tourism, and Tennessee Wildlife Resources Agency. Others have gone on to graduate school in wildlife science at U. of Wisconsin – Stevens Point, Virginia Tech, and the University of Florida.

Funding and Partnerships: Grassroots to Industry to Public – Waterfowl and Wetlands @ ESF has broad support. Funding includes USFWS, NYSDEC, Kansas Dept. of Wildlife, Parks, and Tourism, NSF, Ducks Unlimited, Cargill Inc., Delta Waterfowl, Long Island Wildfowl Heritage Group, Waterfowl Research Foundation, Camp Fire Conservation Fund, Moore Charitable Foundation, Sussman Foundation, Fink Foundation, Friends of the Montezuma Wetlands Complex, Birds Canada, CNY Wildfowlers, & Barclay Damon. Partnerships include the above funding entities but also state agencies of the Atlantic Flyway Technical Section, Winous Point Marsh Conservancy, Minnesota DNR, Wisconsin DNR, Michigan DNR, Canadian Wildlife Service, Smithsonian Institute, Honeywell Inc., & Forbes Bio. Station.

5-year Goal: Secure an endowment of $3 million to establish a Chair in Waterfowl and Wetlands Conservation in perpetuity at ESF. This ensures continued repopulating of the Atlantic region with highly qualified young professionals to conserve and manage our waterfowl and wetland resources. Derived funds will support students.

10-year Goal: Grow to a $6 million endowment to sustain programmatic growth and productivity.

For more information contact Dr. Michael Schummer – mlschumm@esf.edu – 585-319-6763

CLOSING COMMENTS
Together we succeed

I am always amazed at the passion for learning, maturity, and dedication to conserving our planet displayed by our students at ESF. We likely attract such amazing students because ESF is the only doctoral-granting university of its size in North America focused exclusively on the environment. Students don't just come to ESF and take 'Biology' still wondering what they are going to do with their lives. These are mature students that have thought deeply about their careers and place on this planet. Students that come to ESF and become involved in Waterfowl & Wetlands with our lab want to make our planet a better place for wildlife, wild places, and people and they know exactly how they are going to accomplish that goal. For this reason alone, investing in ESF and the Waterfowl & Wetlands at ESF makes a-lot of sense. But it also makes financial sense and is critical for timely conservation actions.

The price-point of $3 million to establish an endowed Chair in Waterfowl & Wetlands Conservation in perpetuity at ESF seems like a heavy lift, but it is definitely a worthy investment. Here is why.

Firstly, funds derived from the endowment go to support students and student research. SUNY support of a Waterfowl & Wetlands professorship would be worth far-greater than $3 million. Matching funds by SUNY for the professorship can be substantial and important in keeping funds directed towards training students and producing quality applied-science to inform conservation.

A secondary, but nearly as important, point is that returns on $3 million dollars is often enough to annually support at least 2 MS students, 1 PhD student, or 1 Post-doctoral Research Associate. Why is this important for conservation? As an example, let us use the eastern mallard population decline that started about 20 years ago. As noted above, little was done to understand reasons for the decline until it became a dire situation and the population was 40% less and the daily bag limit on mallards in the flyway was reduced from 4 to 2. Through your philanthropic support we have started to address the eastern mallard population decline, but imagine if there were dedicated funds for Waterfowl & Wetlands work through an endowed Chair at ESF? What if we had high-quality researchers working on the problem now for 15 years; no need to wait for a government grant. I expect that many of the questions we are scurrying to tackle 20 years after the start of the mallard decline would already be answered. Of course, this is just one of many examples of how ESF would be a leader in Waterfowl & Wetland science aimed at tackling emerging conservation issues in a timely manner. Together we succeed. Thank you for your continued support of our students and our applied science focus.

Michael L. Schummer, PhD

THANK YOU to our 2021 partners and sponsors (January – July):

Waterfowl Research Foundation
Long Island Wildfowl Heritage Group
Camp Fire Conservation Fund
New York State Department of Environmental Conservation
US Fish and Wildlife Service
Atlantic Flyway Technical Section and Council
Delta Waterfowl Foundation
Ducks Unlimited, Inc.
Ducks Unlimited, Canada
Birds Canada
Moore Charitable Foundation
Barclay Damon
Suffolk County Parks
Maine Department of Inland Fisheries and Wildlife
Massachusetts Department of Fish and Game
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National Science Foundation
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Winous Point Marsh Conservancy
SUNY Oswego
Land Trust Alliance
The Nature Conservancy
Cayuga Lake Watershed Network

ESF students being honored at the NY Ducks Unlimited State Convention

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