

SUNY College of  
Environmental Science  
and Forestry  
Waterfowl and Wetlands  
Initiative

2019

ANNUAL REPORT





**Training the next generation of waterfowl and wetlands scientists, conservationist, and managers while producing the robust science needed by conservation stakeholders...** that is our guiding principle for the Waterfowl & Wetlands Initiative at SUNY ESF. As you can see, students are at the forefront. We partner with federal, state, academic, non-profit, and industry stakeholders to deliver quality science for decision-making, but the students are the engine of that science.

The focus of our 2019 Annual Report is “students”; this year we highlight their passion for wildlife conservation and culture, their contributions to our lab, SUNY ESF, and science, and we highlight their placement into professional careers in our “Where are they now” section.

SUNY ESF truly has the best students I’ve ever had the opportunity to guide, work alongside, and see grow into well-trained young professionals. In the past year, we’ve had substantial growth in the number of students that our lab has been able to impact and, as highlighted in our mid-year report (July 2019), partnerships are what provided us with the capacity to grow and train these budding professionals. Thank you.



Our aim now is to capture the energy highlighted in our 2019 Annual Report to deliver a Waterfowl & Wetlands emphasis at SUNY ESF in perpetuity. Across North America professors with waterfowl expertise has declined by nearly 50% and many remaining are likely to retire in the next decade. Unfortunately, this leads to students graduating from university programs and starting careers without the applied skills necessary to sustain healthy waterfowl populations and wetland ecosystems. Like people, waterfowl and other wetland-wildlife also require clean water. Our Waterfowl & Wetlands Initiative is reversing the decline in well-trained students and producing the science needed to sustain waterfowl, wetlands, and people. At the end of our 2019 Annual Report you can learn more about ways to help us sustain a Waterfowl & Wetlands emphasis in perpetuity at SUNY ESF.

Thank you to all the dedicated students in our lab for your countless hours in the field, classroom, and lab and thank you for the substantial support of all of our partners.

*--Michael L. Schummer, PhD*



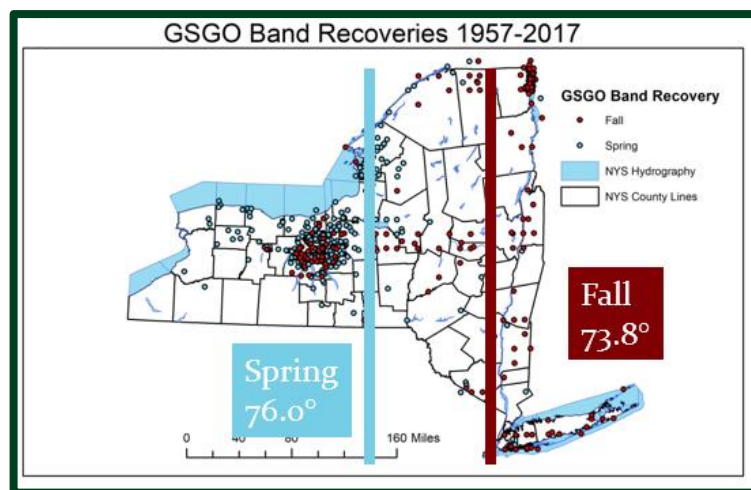




## COMPLETED PROJECTS

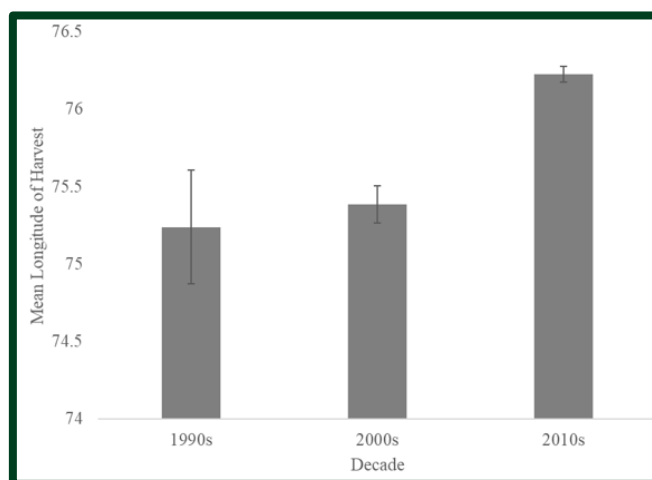
### **Determining Migration Patterns of Greater and Lesser Snow Geese Through New York State**

Stephen Sliwinski successfully completed his Master of Professional Studies degree with a Waterfowl and Wetlands emphasis. During his tenure at ESF, Stephen was the recipient of the Central New York Wildfowlers - Roy W. Glahn Memorial Scholarship and the Eaton Birding Club - Elon H. Eaton Scholarship. He used morphological measurements and genetic tests to determine that snow geese migrating through NY in spring are 80% greater and 20% lesser snow geese (4.5% error rate in designation).



He also used band recoveries to determine that mean harvest longitude of greater snow geese differ in New York between Fall and Spring migration and that mean longitude of harvest and presumably migration has shifted east in New York over the past 3 decades.

His results **helped refine migration maps for snow geese used by the Arctic Goose Joint Venture** and provide a basis for understanding **harvest dynamics of snow geese in the Atlantic Flyway.**





## Surveys of Waterbirds in the Darkhad Depression, Mongolia During Summer and Autumn

Mikayla Call completed her undergrad Honors degree at ESF in December 2018 and was the Biology Scholar of the academic year, 2018 –2019. Her research was published in *Wildfowl*, the journal of the Wildfowl and Wetland Trust and can be accessed at the link [here](#). She conducted the first large-scale survey for waterbirds in the Darkhad Depression of Mongolia and detected 37 species in spring and 24 in autumn. Six species were on the IUCN Red List or Mongolian Red Book including falcated duck, common pochard, common crane, northern lapwing, Eurasian curlew, and horned grebe. The Darkhad Depression is classified as an Important Bird Area (IBA) by Birdlife International and our surveys provide baseline information for conservation planners.



## Banding and nanotag tracking of sora, Virginia rail, and common gallinule to inform secretive marshbird surveys in the Great Lakes region



In cooperation with NYSDEC, Birds Canada (formerly Bird Studies Canada), and Winous Point Marsh Conservancy, we developed capture techniques for sora, Virginia rail, and common gallinule, 2016 – 2019. These three species are relatively common and their habitat use represents the shallow to deeper water areas used by the suite of secretive marshbirds in the Great Lakes region. Our aim was to use nanotags (small radio-transmitters), radio-receivers, and the [MOTUS Wildlife Tracking System](#) to understand their habitat use, detection probabilities, and seasonal movements to inform marshbird surveys and refine population estimates in the Great Lakes region. Collectively, we banded 13 sora, 143 Virginia rail, and 25 common gallinules and marked 11 Virginia rails and 6 common gallinules with nanotags. Similar to prior research in NE Ohio at Lake Erie marshes, 80 – 90% of marked individuals emigrated from the study area during the spring marshbird survey period when their population was assumed to be closed/sedentary. Our results suggest that population and occupancy estimates should be conducted at the regional level and that local level estimates may be biased by emigration and immigration during the spring survey window.

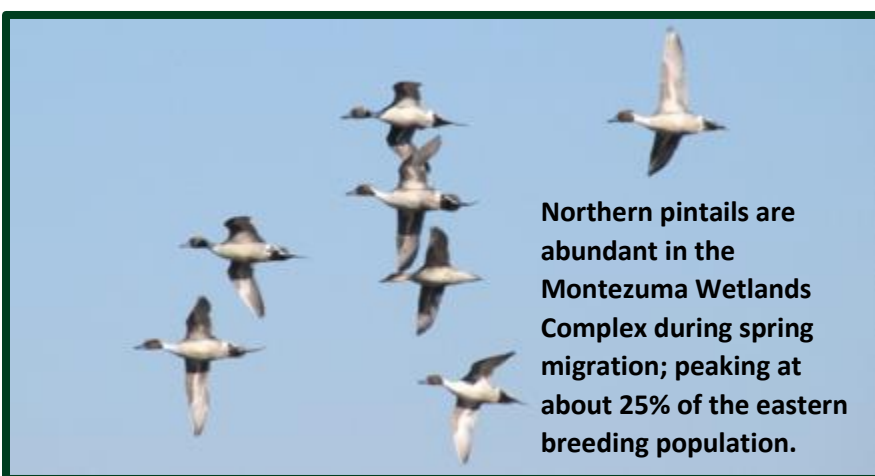




## PROJECTS WITH PRELIMINARY RESULTS

### Ecological Assessment of Wetland Management Techniques in New York

Ed Farley is completing his Master's degree in Fish and Wildlife Biology and Management at SUNY ESF while concurrently employed with Ducks Unlimited as a Mitigation Specialist/Biologist. Wetland managers need to understand how wetland management techniques influence food availability for waterfowl to help meet regional conservation goals. However, there is an information deficit on ecological returns on post-construction management of restored wetlands. Ed and his "small army" of undergraduate research assistants assessed the response of vegetation (summer), invertebrates (summer), seeds and tubers (autumn), and waterfowl (autumn and spring) to three wetland hydrology regimes (full water drawdown, partial water drawdown, and passive) on thirty randomly selected wetlands in the Montezuma Wetlands Complex, New York, 2016-2018. They detected 127% and 90% percent greater seed and tuber densities in full (3-year mean =  $848.7 \pm 126.0$  [SE] kg/ha) and partial drawdowns ( $681.8 \pm 62.5$  kg/ha) than passively managed wetlands ( $365.0 \pm 20.5$  kg/ha), respectively. Results suggest seed and tuber densities in managed wetlands central of New York are comparable to or greater than other parts of North



America and moist-soil management should be considered an important technique to meet regional Duck-Energy-Day goals. Partial drawdown wetlands had greater submerged aquatic vegetation densities (3-year mean =  $1,754.4 \pm 473.0$  kg/ha) than passively managed wetlands (3-year mean =  $1,201.1 \pm 527.4$  kg/ha) across all years of the study. Partial drawdowns (3-year mean =  $1,489.39$  macroinvertebrates/m<sup>2</sup>  $\pm 116.48$ ) also

had 243% greater summer density of macroinvertebrates than passive drawdowns (3-year mean =  $785.97$  macroinvertebrates/m<sup>2</sup>  $\pm 50.94$ ) during the brood rearing period. During fall migration, passive wetlands had 367% and 182% greater waterfowl density than full and partial drawdowns respectively. In spring, waterfowl abundance was 216% and 156% greater in full and partial drawdowns than passive wetlands, with diving duck use 153% greater in both full and partial drawdowns and dabbling duck use 335% and 225% greater than in passive wetlands, respectively. These seasonal differences in waterfowl use result from dry autumn and wet spring flooding regimes. **Results reinforce the need for varying management techniques on wetland complexes to meet waterfowl needs throughout their annual cycle.**





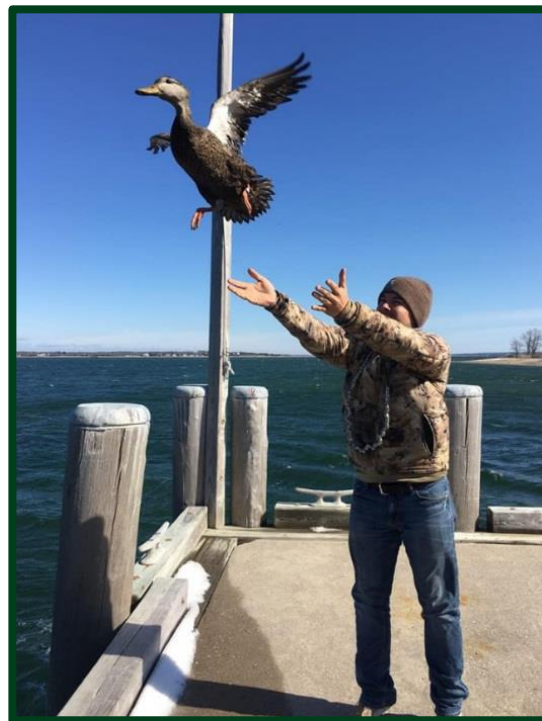


## Influence of Agricultural Grains on Diets, Body Condition, and Seasonal Stress in American Black Ducks and Mallards Wintering on Long Island



Aidan Flores is completing his Master's degree in Fish and Wildlife Biology and Management. As an avid waterfowl hunter, Aidan was a perfect match for this project on Long Island where he captured black ducks and mallards at agricultural sites where corn was available and compared their diets, body condition, and seasonal stress with black ducks lethally collected in coastal marshes where these supplemental grains were not available. He also measured grain depletion of chopped corn fields.

As coastal marsh habitat declines in quantity and quality, there may be a benefit, particularly in prolonged freeze events, for black ducks to feed on a more reliable food source such as chopped standing corn fields. Results suggest that diets differed between agricultural and coastal sites for black ducks, but not between species at agricultural sites. Adjusted body mass of black ducks at coastal ( $1,081.1 \pm 36.8$  g) and agricultural ( $1,114.6 \pm 15.6$  g) sites were similar, but mallards ( $1,180.7 \pm 26.0$  g) were 5.9% heavier than black ducks at agricultural sites. Red blood cell percentages were greater at agricultural ( $53.1 \pm 0.9\%$ ) than coastal sites ( $40.6 \pm 2.3\%$ ) for black ducks, whereas there was no difference between black ducks and mallards ( $52.9 \pm 1.5\%$ ) at agricultural sites. There were no differences in heterophil to lymphocyte ratios by treatments or species. Our results do not suggest substantial benefits of corn supplements to black ducks wintering on eastern Long Island. However, black ducks feeding on corn were not in worse condition, potentially suggesting that loss of coastal marshes foods could be offset by supplementing wetland foods with agricultural grains during winter.







## ONGOING PROJECTS

### Ecological Separation of Black Ducks and Mallards in the Adirondack Mountains of New York

The American black duck population decreased by 50% since the 1950s and is a focal species of the U.S. Fish and Wildlife Service. Mallards have since replaced black ducks across much of their



range in eastern North America. Black ducks and mallards are sympatric during breeding season in the Adirondack Park (AP), but also appear to segregate their habitat use between beaver-modified wetlands and human influenced areas, respectively. This segregation may favor mallards because wetland productivity is often greater in human influenced lakes relative to beaver-modified wetlands. Although studies of competitive exclusion between these ducks provide varying results, two species can't occupy the same niche indefinitely. Adam Macy is completing his Master's degree in Fish and Wildlife Biology and Management at SUNY ESF and will test for differences in



occupancy between black ducks and mallards in beaver-modified wetlands and human influenced lakes. Multi-species occupancy modeling is useful in generating estimates of occupancy for rare species (e.g., black

ducks) that co-occur with more common species (e.g., mallards). Adam adapted a multi-species occupancy model in a Bayesian statistical framework that uses a time to detection function for detection probability. He will apply this analysis method to waterfowl surveys of beaver-modified wetlands and lakes in the AP. Adam's second field season will occur May – August 2020.







## Assessing Utility of Unmanned Aerial Vehicles (UAV, AKA Drones) To Survey Breeding Waterfowl Populations in the Adirondack Mountains of New York

An additional component of Adam Macy's graduate research also includes use of a UAV to survey for waterfowl in the forested landscape of the Adirondack Park. He aims to determine detection probabilities by using a double-observer approach with one observer on the ground and the second as the UAV. Results from this research may have broader application to waterfowl surveys in the future.



Photo credit: Gary Adam James Macy

Species and sex of black ducks and mallards are easily identifiable at 100 feet+ when zooming in on images.



Photo credit: Gary Adam James Macy





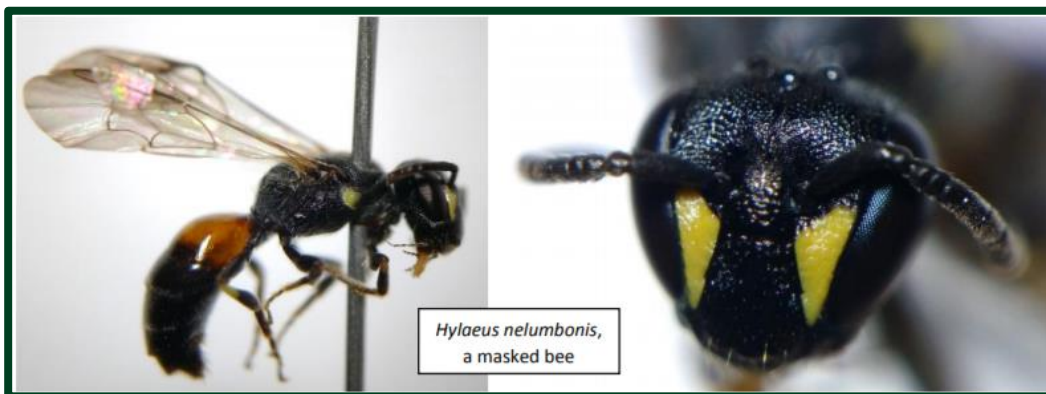


## Response of Wild Bee Diversity to Management of Restored Wetlands in an Agricultural Landscape

As part of our ongoing ecological assessment of wetland restoration and management techniques in the Montezuma Wetlands Complex, we initiated an important study in 2019 focused on native bees. It has been estimated that over 87% of flowering plants depend on animal pollination, including 70% of the world's most important crop species, which



accounts for more than a third of global food production. The economic value of pollination has been estimated at \$215 billion annually, and the majority of these services in temperate regions are performed by bees. Molly Jacobson is completing her Master's degree in Conservation Biology studying native bee assemblages and their plant-pollinator associations among wetland management treatments in the Montezuma Wetlands Complex and Seneca Meadows Wetlands Preserve of central New York. Wetlands tend to provide late-summer blooms like pickerelweed, swamp smartweed, beggarsticks, and Joe-pye weed, which bees use when many upland plants have already gone to seed. The objectives include 1) determining presence and frequency of entomophilous plants (plants pollinated by insects) as resources for bees between wetlands with differing management treatments, 2) conducting surveys to describe bee assemblage diversity in the



Complex, while collecting additional data on flower visitation, and 3) determining if these bee assemblages vary between treatments of passive, partial, and full water drawdown. In 2019, Molly conducted bee surveys at nearly

three dozen wetlands in central New York, centered at the Northern Montezuma Wildlife Management Area, Montezuma National Wildlife Refuge, and Seneca Meadows Wetlands Preserve.





## Wintering Scaup Population Estimates at Great South Bay, Long Island, New York Using Mark-Recapture Analysis

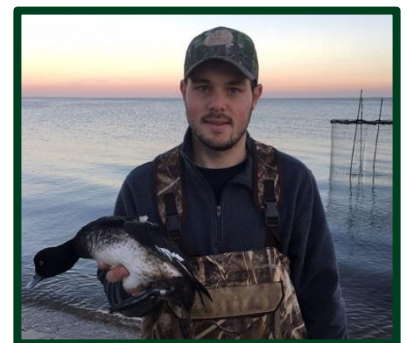
Historically, tens of thousands of greater scaup wintered at Great South Bay, Long Island, New York, but this population declined to near zero by the early 1990s due to poor water quality. Since super-storm Sandy in 2012, numbers of wintering scaup increased substantially, presumably because pollutants were flushed from the bay, revitalizing beds of duck clams. In response to the return of scaup



to Great South Bay, Jake Chronister, Master of Professional Studies candidate with a Waterfowl and Wetlands emphasis established a scaup banding station, February – April 2019. His efforts contribute to continental scaup banding efforts for use in Lincoln population estimates and multi-season survival estimates. Jake, with volunteers from the Long Island Wildfowl Heritage Group, captured scaup in dive-in traps baited with corn, banded these birds, and recorded recaptures. Jake banded 1,141 scaup (925 lesser and 216 greater scaup) over four weeks at two traps sites; and had



161 and 17 recaptures of lesser and greater scaup, respectively. Jake used the POPAN formulation of the Jolly-Seber open population model in program MARK which provided total population estimates of 3,988 lesser scaup ( $\pm 343$ ) and 2,168 greater scaup ( $\pm 675$ ) wintering at Great South Bay. A combined estimate of 6,156 scaup ( $\pm 1,018$ ). However, we typically observed 50,000 to 70,000 scaup offshore from traps daily. Differences in population estimates between program MARK and daily visual observations suggests that only a portion of the population is ever available for capture. Our results suggest potential bias in survival estimates produced from near-shore dive-in traps, especially if catchable and uncachable scaup have different survival rates. We aim to resume scaup banding at Great South Bay in February – April 2020.







## Montezuma Wetlands Complex Strategic Plan for Habitat Protection

Matt Wagner is a Master of Professional Studies candidate with a Waterfowl and Wetlands emphasis who is working with conservation partners throughout the Montezuma Wetlands Complex (hereon Montezuma) to develop a comprehensive strategic plan for habitat protection.

Montezuma is a diverse mosaic of wildlife habitat types held in federal, state, non-profit, working lands, and private hunt club ownership. Graduate students in our Ecology and Management of Waterfowl course used available waterfowl survey data from federal and state partners to estimate a maximum of nearly 4-million waterfowl-use-days during autumn-winter and spring migration through Montezuma (a waterfowl use day is one duck, goose, or swan remaining at this location for one day). As such, Montezuma is New York's foremost Waterfowl Focus Area in the Atlantic Coast Joint Venture Waterfowl Implementation Plan. Montezuma has great opportunities for implementing the goals of the North American Waterfowl Management Plan.



Matt has worked throughout many regions of North America as a biological technician, he calls rural Fulton, NY home, and his MPS degree from ESF will open many new professional opportunities.



Matt's charge is to work with the diversity of partners in the Montezuma region to develop a stakeholder plan for restoration and protection of what many consider the most important wetland resources in the Atlantic Flyway. Current partners involved in wetlands protection, restoration, and management in the region include the US Fish and Wildlife Service, New York Dept. of Environmental Conservation, Ducks Unlimited, The Nature Conservancy, Finger Lakes Land Trust, and Land Trust Alliance.

Waterfowl and wetlands are important environmentally, ecologically, economically, and culturally in the Montezuma and Finger Lakes region of New York. Specifically, waterfowl hunting and birding are important economically and culturally in the region. As such, protecting and restoring wetlands at Montezuma will sustain these important roles and regional economic drivers.







## Evaluating Response of Milkweed, Nectar Plants and Monarch Butterflies to Management Techniques in Restored Wetlands of Central New York

Scott Kostka is an undergraduate Honors student assisting Molly Jacobson and concurrently studying the density of swamp milkweed, other nectar plants, and monarch butterfly larvae and adults among wetland treatments. Wetlands appear to provide abundant habitat for monarchs, but few assessments have been conducted.



Wetland management aimed at providing resources for waterfowl may provide habitat for a diversity of insects, including monarchs. Scott aims to provide recommendations to wetland managers to optimize habitat for monarchs while ensuring the needs of all wetland-wildlife are met. In 2019, Scott sampled 33 wetlands at the Northern Montezuma Wildlife Management Area, Montezuma National Wildlife Refuge, and Seneca Meadows Wetlands Preserve. He is currently using distance sampling methodology to estimate swamp milkweed and monarch densities among wetlands of different management treatments.







## Eastern Mallard Population Dynamics

SUNY ESF is working with our conservation partners to determine why the eastern mallard population has declined in the past 20 years. Several hypotheses exist, but there are few studies to help clarify if habitat, harvest, genetics, or a combination of these factors are to blame. Further, datasets do not provide a clear answer. A long-term decline may mean that survival, production, or survival+production is too low to maintain the population size. However, banding data indicate that eastern mallard survival rates are not measurably different now than they were in the 1990s, when the population was stable. Production estimates (juveniles/hen) obtained from the USFWS Parts Collection Survey have not decreased either. Our goal is to work with partners to investigate these inconsistencies in critical data sets and determine mechanisms for the population decline.



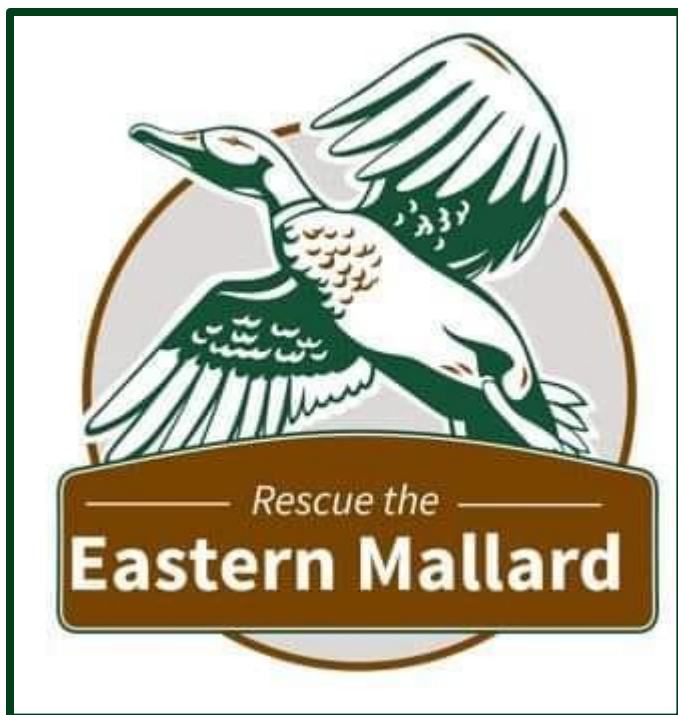
SUNY ESF has partnered with Delta Waterfowl Foundation to determine where mallards harvested in the Atlantic Flyway are produced using stable isotope analyses of feathers. Mallard feathers grown during summer on breeding areas will tell us the origin of juvenile mallards; are they primarily Canadian or US hatched?



We also are partnering with Philip Lavretsky at the University of Texas – El Paso to understand eastern mallard genetics. Recent evidence suggests that eastern mallards are now a hybrid-swarm of European decent in much of their range, resulting from continued and abundant release of domesticated, game farm mallards. While these ducks may look just like wild mallards from the western US states, they may differ greatly in size, bill morphology, and potentially reproductive output. What is the distribution of these genes; are Canadian and US mallards genetically different? Did mallards in Canada colonize from the west and remain ‘wild’ or are they just migrants from the population of released, hybrid swarm eastern US mallards?

In 2020, Sam Kucia will matriculate at SUNY ESF as a Master’s candidate in Wildlife Fish and Wildlife Biology and Management and lead this project. In addition to shepherding the above partnerships, he also will use data from the [Atlantic Flyway Breeding Waterfowl Survey](#) to determine types of landscapes result in increasing, decreasing or stable mallard breeding pairs.





To support our **Eastern Mallard Population Dynamics** research, our lab has partnered with the SUNY ESF College Foundation to raise grassroots funds in direct support of our research. Delta Waterfowl is currently our prime supporter. Other supporters include Ducks Unlimited, the Long Island Wildfowl Heritage Group, and the Waterfowl Research Foundation. To reach our crowd-funding page, click on the link below.

<https://fundly.com/rescue-the-eastern-mallard>

Long-term data collected in the Atlantic Flyway indicates mallard numbers are falling dramatically, but scientists cannot explain why. **Be sure to watch our 4 videos on [this page](#)** to better understand the science and direction of our work.

We will use innovative techniques to help get mallards back on track. Our thematic areas include productivity (ducklings/hen), habitat change, and genetics. In the process of producing robust science to provide information vital to wildlife managers, we also will train the next generation of wildlife conservationists. Indeed, our campaign to Rescue the Eastern Mallard will bring back wildlife and help SUNY-ESF train the future generation of conservationists!

All charitable donations made here will be fully dedicated to the Rescue the Eastern Mallard project. Your donation is being made to the ESF College Foundation, a 501c3 nonprofit organization which handles all philanthropy for the SUNY College of Environmental Science and Forestry in Syracuse, NY. The tax id number is: 15-6023443. All charitable donations made to the ESF College Foundation are fully tax deductible, as allowed by law. If you have any questions or concerns regarding donations, please contact us in the ESF Development Office at (315) 470-6683. Or, you can email your question to [dpiwinski@esf.edu](mailto:dpiwinski@esf.edu)







## COURSES TAUGHT

### **Wetlands Conservation and Management for Wildlife**

In Spring 2019, we are adding this course to expand our capacity to teach the breadth of concepts needed to produce the next generation of waterfowl and wetland professionals. It is the companion to the current waterfowl course (below).

The intent is to ensure students completing degrees in Wildlife Science, Conservation Biology, and related majors have the opportunity to learn the applied skills necessary to properly conserve and manage wetlands for wildlife; a skill very much needed by our federal, state, and non-profit partners.

### **Ecology and Management of Waterfowl**

A key component of our Waterfowl and Wetlands Initiative is to ensure that students understand waterfowl life-histories and methods used to ensure healthy waterfowl populations in North America and beyond. Our Ecology and Management of Waterfowl course is comprehensive and ensures students are well-prepared to tackle waterfowl-based tasks in their professional careers. Waterfowl number in the millions, have relatively high-energy requirements, and are diverse, occurring from oceans to forests and habitats in-between. As such, they are important ecologically. They also are environmentally important because their conservation also benefits a diversity of other wetland and grassland species. Culturally and economically, birding, hunting, decoy carving and collection, and culinary opportunities also make waterfowl important.


NEW COURSE SPRING 2019

**Wetlands Conservation and Management for Wildlife**

The goal of the course is to prepare undergraduate and graduate students with a foundation in strategies used in conserving wetland-dependent wildlife. Student will gain the applied skills necessary to pursue careers in conservation where knowledge of wetland-wildlife and wetlands management are required or preferred.


Find at registrar:  
 EFB 496 Section 13 - Wetlands Cons&Mgmt for Wildlife (#42426)  
 EFB 696 Section 03 - Wetlands Cons&Mgmt for Wildlife (#42429)

F 12:45 pm-3:35 pm Tlick 251 SCHUMMER, email at [mschummer@esf.edu](mailto:mschummer@esf.edu) with questions



← Wetlands are one of the most threatened habitats on Earth and knowledge by biologists of active restoration and management are often needed to sustain wetland-dependent wildlife.

Our course will provide you the knowledge needed to sustain biological diversity of wetlands through contemporary conservation, restoration, and management techniques used throughout North America →





Josh Stiller, NYSDEC Waterfowl Biologist, gives a guest lecture on waterfowl population management at the state and federal levels.

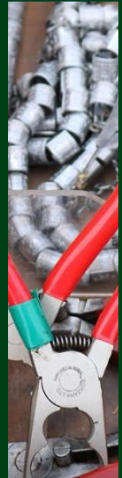
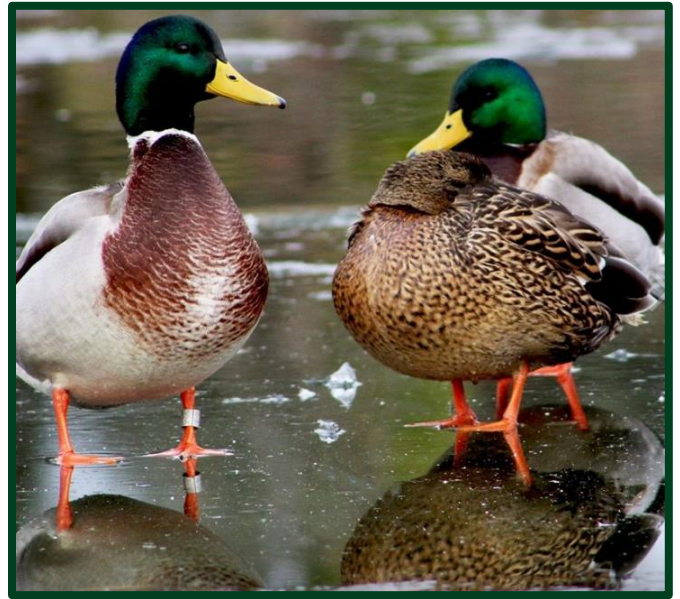




## OUTREACH

### Waterfowl banding

As part of our efforts to assist our partners throughout NY and the Atlantic Flyway we help meet annual banding goals. Some of these efforts are linked to ongoing research (e.g., black duck capture on Long Island), whereas others are outreach and student training efforts. Students obtain valuable training in capture, proper handling, and banding under our USFWS Master Banding Permit. We were pleased to be able to band 245 black ducks, 123 mallards, 6 mallard × black duck hybrids, 935 lesser scaup, 214 greater scaup, 35 ring-necked ducks, 1 redhead, 400 Canada geese, and 17 common gallinule in 2019.



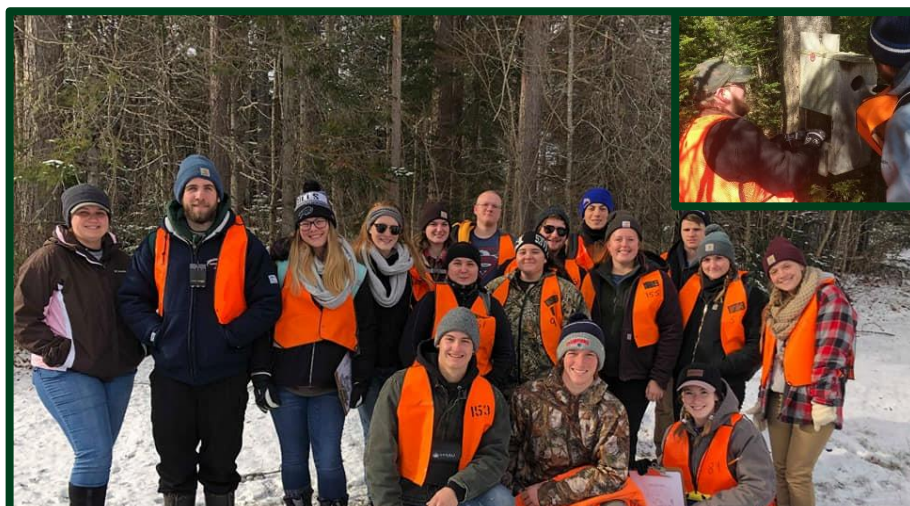




## Ducks Unlimited Collegiate Chapter at SUNY ESF

Our active Ducks Unlimited Collegiate Chapter at SUNY ESF had another amazing year! The fall fund-raiser & spring "Conservation Night Out" again gained them top honors from Ducks Unlimited. ESF ranked among the top 24 college chapters in the country and was the only in the NE US to make this prestigious list. A testament to the quality of our students.

In addition to fund-raising and networking activities, members of the Ducks Unlimited Collegiate Chapter at SUNY ESF also plan trips to our Newcomb Campus to check and install duck boxes each year, participate in duck banding opportunities at Montezuma National Wildlife Refuge, participate in the NY state Ducks Unlimited Convention, and have helped with clean-up events at local lakes and Wildlife Management Areas.



**ESF DU PHOTO CONTEST**

**We want to see your best waterfowl or wetland photo**

Submissions will be featured on our social media pages and winners will be announced at our annual banquet on April 5th

Send submissions to [esfducksunlimited@gmail.com](mailto:esfducksunlimited@gmail.com) with the subject line: **DU Photos 2018**





## Delta Waterfowl University Hunt Program

In 2019, our lab facilitated opportunities for SUNY ESF students to engage as hunter-conservationists. SUNY ESF students obtained their New York State Hunter Education Certification and Waterfowl Identification Certification (necessary to hunt waterfowl on US Fish and Wildlife National Wildlife Refuges in NY) in autumn 2019. Seven of these students had the opportunity to participate in a waterfowl hunt sponsored by Delta Waterfowl Foundation.



Waterfowl hunters have and continue to play a primary role in wetland conservation efforts throughout North America and beyond. Our lab facilitates opportunities for ESF students to develop a deep-appreciation for the history of the hunter-conservationist and professional appreciation for the role of hunters in funding conservation efforts in North America and beyond.







## ONLINE DUCK MIGRATION FORECAST

Our lab produces the only science-based duck migration forecast on the internet. We publish our weekly duck migration forecast each Sunday, October through January.

We forecast the daily likelihood of migration using weather data available on the internet and statistical models that predict southward movements of mallards and other dabbling ducks.

In 2010, Schummer and colleagues published their [Weather Severity Index](#) (WSI) in the Journal of Wildlife Management. The WSI predicts the southward migration of mallards and other dabbling ducks to southern latitudes. These models were improved upon by [Van Den Elsen 2016](#) and are also reported in [Notaro et al. 2016](#). We apply these WSI to produce our weekly duck migration forecasts for dabbling ducks in the Mississippi and Atlantic Flyways. We use several locations throughout eastern North America to produce our migration predictions each week. We also produce a long-term forecasts twice each year using information from [Dr. Judah Cohen of Atmospheric and Environmental Research](#) and the [Climate Prediction Center](#).



In the past two years, our Duck Migration Forecast has 10,000+ unique visitors.

Waterfowl hunting is important culturally, economically, and environmentally in North America and we hope our weekly duck migration forecast enables people with increasingly limited time to maximize their hunt quality and satisfaction. Culturally, waterfowl hunting is important with over 1 million people participating in the US alone. These hunters currently generate \$26 million in Duck Stamp dollars which are used for purchase of National Wildlife Refuge lands and enables wetland conservation easements on private lands. Environmentally, lands conserved for waterfowl help conserve a larger-suite of wetland-dependent wildlife.

Find our migration forecast at <https://schummerlab.weebly.com/duck-migration-forecast.html>.





## AWARDS

Sigma Xi – Molly Jacobson

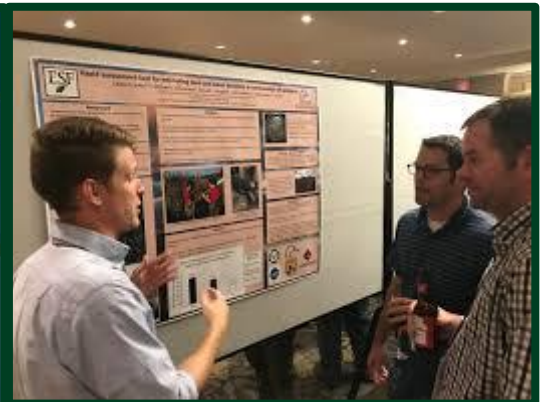
Roy W. Glahn Memorial Scholarship – Jake Chronister

North American Duck Symposium Student Travel Award – Ed Farley

Elon Eaton Student Research Award - Stephen Sliwinski

Leroy C. Stegeman Invertebrate Ecology Award - Molly Jacobson

Southeast Association of Fish and Wildlife Agencies – Best Technical Paper – Schummer et al.



Ed Farley (left) receives a student travel award to the North American Duck Symposium and explains his research to colleagues (above).



Co-authors Rick Kaminski (Clemson University) and Kevin Hunt (Mississippi State University) accept our Best Technical Paper Award at the 2019 Southeastern Association of Fish and Wildlife Agencies Conference for our research on **Influence of Achievement-oriented effects of waterfowl-hunt quality at Mississippi Wildlife Management Areas.**







## **PRESENTATIONS**

Chronister, J. 2019. Scaup capture techniques using dive-in traps. New York Department of Environmental Conservation North American Banding Council training. Savannah, New York.

Chronister, J., and M. L. Schummer. 2019. Scaup banding on Great South Bay, Long Island, New York. 8<sup>th</sup> North American Duck Symposium, August 2019, Winnipeg, Manitoba, Canada.

Farley, E., M. L. Schummer, D. J. Leopold, J. Coluccy, and D. C. Tozer. 2019. Ecological assessment of wetland management techniques on restored wetlands in the Montezuma Wetland Complex. 8<sup>th</sup> North American Duck Symposium, August 2019, Winnipeg, Manitoba, Canada.

Farley, E., M. L. Schummer, D. J. Leopold, J. Coluccy, and D. C. Tozer. 2019. Rapid assessment too for estimating seed and tuber densities in northeastern US wetlands. 8<sup>th</sup> North American Duck Symposium, August 2019, Winnipeg, Manitoba, Canada.

Flores, A., and M. L. Schummer. 2019. Influence of agricultural grains on diets, body condition, and stress in American black ducks and mallards wintering on Long Island. 8<sup>th</sup> North American Duck Symposium, August 2019, Winnipeg, Manitoba, Canada.

Flores, A., and M. L. Schummer. 2019. Yield, waterfowl use, and grain depletion on chopped corn fields on Long Island, New York during winter. 8<sup>th</sup> North American Duck Symposium, August 2019, Winnipeg, Manitoba, Canada.

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Schummer, M. L., J. Coluccy, M. Mitchell, D. James, L. Van Den Elsen, and M. Notaro. 2019. Incorporating climate science into conservation planning for waterfowl during the non-breeding period. 8<sup>th</sup> North American Duck Symposium, August 2019, Winnipeg, Manitoba, Canada.





## PRESENTATIONS CONTINUED

Schummer, M. L., J. Simpson, B. Shirkey, B. Davis, and K. E. Wallen. 2019. Balancing waterfowl hunting opportunity and hunt quality in R3 Initiatives. 8<sup>th</sup> North American Duck Symposium, August 2019, Winnipeg, Manitoba, Canada.

Schummer, M. L. 2019. Wetlands Conservation and Management for Wildlife. North Country Birding Club, Watertown, New York.

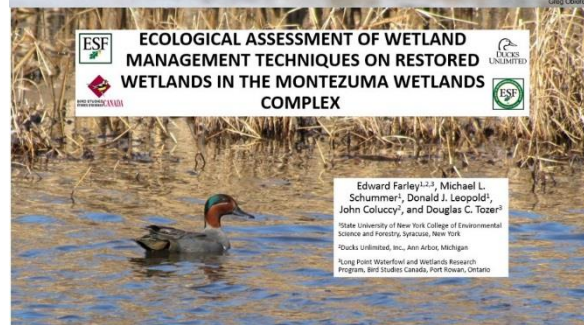
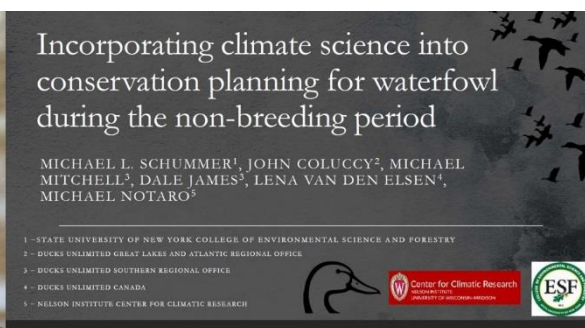
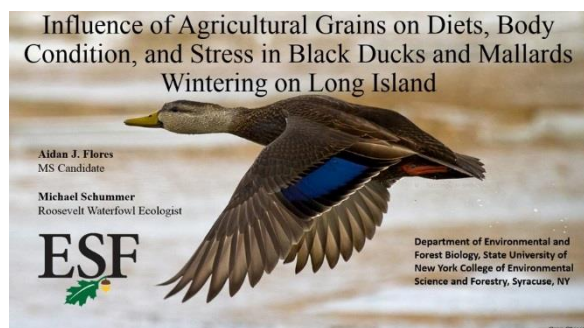
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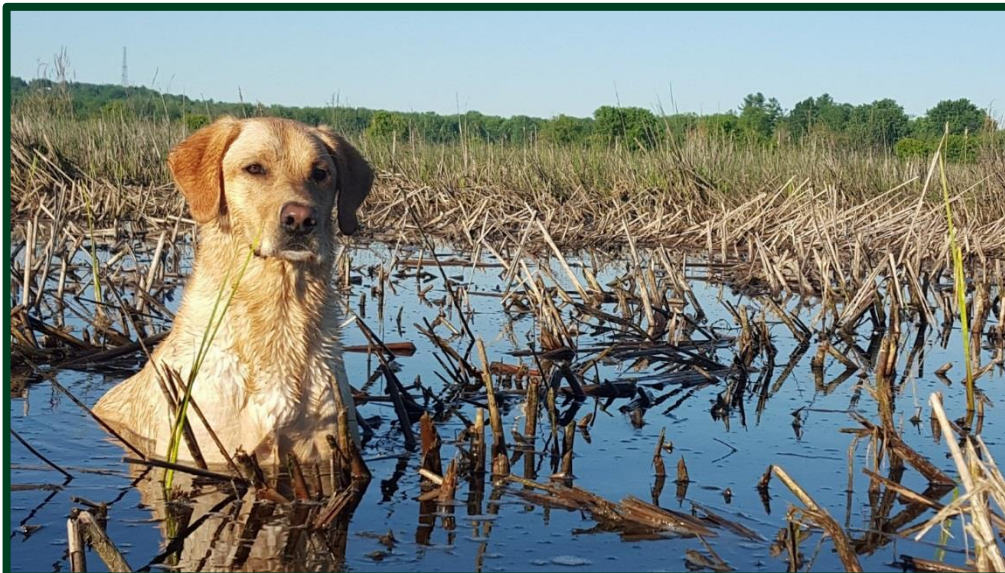
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## New to TEAM DUCK

Join us in welcoming Sam, Brittnie, and Cole to TEAM DUCK in 2020.

### SAM KUCIA



Sam Kucia will lead our eastern mallard population dynamics project.

A graduate of the University of Maine-Orono in Wildlife Science and Management, passionate waterfowl hunter, and Maine registered guide.

Sam has worked at the famed Barker Ranch in Washington, served as a biological technician with Ducks Unlimited, and was part of an extensive spruce grouse radio-tracking project.

Most recently Sam was an Ecological Modeling Assistant at the USGS Northern Prairie Wildlife Research Center in Jamestown, North Dakota.

His work led to publication of the following science product. Click on the image to read his open access publication.

Article

### **Synergistic Interaction of Climate and Land-Use Drivers Alter the Function of North American, Prairie-Pothole Wetlands**

Owen P. McKenna <sup>1,\*</sup>, Samuel R. Kucia <sup>1</sup>, David M. Mushet <sup>1</sup>, Michael J. Anteau <sup>1</sup> and Mark T. Wiltermuth <sup>2</sup>

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<sup>2</sup> U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, WI 54603, USA; mwiltermuth@usgs.gov  
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**Abstract:** Prairie-pothole wetlands provide the critical habitat necessary for supporting North American migratory waterfowl populations. However, climate and land-use change threaten the sustainability of these wetland ecosystems. Very few experiments and analyses have been designed to investigate the relative impacts of climate and land-use change drivers, as well as the antagonistic or synergistic interactions among these drivers on ecosystem processes. Prairie-pothole wetland water budgets are highly dependent on atmospheric inputs and especially surface runoff, which makes them especially susceptible to changes in climate and land use. Here, we present the history of prairie-pothole climate and land-use change research and address the following research questions: 1) What are the relative effects of climate and land-use change on the sustainability of prairie-pothole wetlands? and 2) Do the effects of climate and land-use change interact differently under different climatic conditions? To address these research questions, we modeled 25 wetland basins (1949–2018) and measured the response of the lowest wetland in the watershed to wetland drainage and climate variability. We found that during an extremely wet period (1993–2000) wetland drainage decreased the time at which the lowest wetland reached its spill point by four years, resulting in 10 times the amount of water spilling out of the watershed towards local stream networks. By quantifying the relative effects of both climate and land-use drivers on wetland ecosystems our findings can help managers cope with uncertainties about flooding risks and provide insight into how to manage wetlands to restore functionality.

**Keywords:** prairie pothole wetlands; climate change; land-use change; wetland drainage; PHyLIS model







### **BRITTNIE FLEMING**



Brittnie is a graduate of Louisiana State University with a degree in Natural Resources Ecology and Management. She will lead our scaup banding station on Long Island for winter 2020 and matriculate as a Masters of Professional Studies candidate at SUNY ESF in Fall 2020.

Brittnie has banded over 20 species of waterfowl in Louisiana, California, Nevada, and North Dakota.

We welcome Brittnie and her expertise to TEAM DUCK at ESF!





### COLE TIEMANN

Cole comes to us as recent graduation of Unity College in Maine with a Bachelor's degree in Wildlife and Fisheries Management. An avid waterfowler, Cole completed his senior thesis at Unity College on movement patterns and stable isotopes analysis of Canada geese.

Cole also has spent substantial time working with Maine Dept. of Inland Fisheries and Wildlife banding geese, eiders, and black ducks. Last summer Cole worked for the US Fish and Wildlife Service in Alaska capturing and banding 700+ ducks.

We welcome Cole as our Research Assistant on our Long Island scaup banding project.







## Where are they now

Here we celebrate the successes of our graduates and former TEAM DUCK members that have gone on to gainful employment or graduate school. Our main focus is training the next generation of waterfowl and wetlands scientists, conservationists, and managers.



**Justin Droke** - 18' MS in Fish and Wildlife Biology and Management – Tennessee Wildlife Resources Agency, Wildlife and Forestry Manager.



**Adam Bleau** - 18' MS in Fish and Wildlife Biology and Management – New York Department of Environmental Conservation, Brownville, New York, Biological Technician.



**Stephen Sliwinski** - 19' MPS in Fish and Wildlife Biology and Management – New York Department of Environmental Conservation, Northern Montezuma Wildlife Management Area, New York, Biological Technician.



**Jordan Thompson**, 18' BS Wildlife Science – MS candidate, Graduate Research Assistant, University of Wisconsin-Stevens Point.



**Mikayla Call**, 19' BS Environmental Biology/Wildlife Science – MS candidate, Graduate Research Assistant, Virginia Tech.



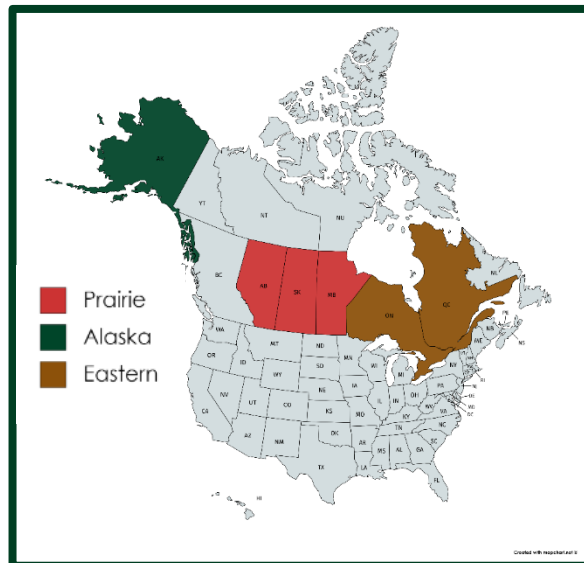




## On the Horizon – projects in pilot phase in need of funding

### Origins of northern pintails harvested in eastern North America

Northern Pintails harvested in eastern North America come from 3 main breeding populations in the prairies, Alaska, and the east. In the east, pintails primarily breed around Hudson and James bays and northern Quebec. Apparent increases in the number of pintails observed in the east have people suspecting that the eastern pintail population may be increasing relative to pintail breeding populations elsewhere.



Feathers grown on the breeding grounds can be used to determine summer origins of pintails. Flight feathers where ducks are produced, leave a signature, and that signature is stable in the feather. Locked in the feather until it is replaced the following year during summer. Stable isotopes are influenced by regional patterns that produce a specific map, or isoscape, that give us a relative understanding of where the duck was produced. Using this innovative technique, we can determine if a pintail harvested in the Great Lakes or Atlantic Flyway came from the prairies, Alaska, or the east.

### Origins of lesser and greater scaup wintering at Long Island, New York

Recoveries of lesser and greater scaup banded in 2019 suggest a strong eastern migration corridor. The Long Island population of scaup are potentially from the eastern breeding area more than the Alaska or mid-continent areas. While the continental population of greater and lesser scaup combined has declined since 1980, little is known about the eastern breeding population of these ducks which may be increasing in number and expanding in range. Previously, Schummer et al. used implanted satellite telemetry to track lesser scaup and determined that up to 50% of these birds may not be counted in traditional surveys. Determining general breeding areas requires less precision, and stable isotopes is more appropriate. Our findings will provide a novel and non-invasive method of assessing relative origins of scaup spp. wintering at Long Island and has potential to lead to further investigations of scaup movement ecology.





The successes of our Waterfowl and Wetlands Initiative do not happen in a vacuum, partnerships are a cornerstone of success in our lab, thank you for the quality partnerships.

## THANK YOU!

Waterfowl Research Foundation  
Long Island Wildfowl Heritage Group  
Birds Canada  
Community Foundation of Central New York  
Delta Waterfowl Foundation  
New York State Department of Environmental  
Conservation  
Ducks Unlimited, Inc.  
Ducks Unlimited, Canada  
Barclay Damon  
Moore Charitable Foundation  
US Fish and Wildlife Service  
Suffolk County Parks  
University of Texas - El Paso  
SC Coop. Fish & Wildlife Research Unit  
University of Idaho

Mississippi State University  
Robins Island Foundation  
Sigma Xi  
Friends of the Montezuma Wetlands Complex  
Seneca Meadows, Inc.  
Onondaga County Parks  
Honeywell, Inc.  
Cargill, Inc.  
Western University  
Round River Conservation Studies  
Central New York Wildfowlers  
Eaton Birding Club  
Winous Point Marsh Conservancy  
SUNY Oswego  
Land Trust Alliance  
Illinois Natural History Survey







## MAKING A GIFT TO THE SUNY ESF WATERFOWL AND WETLANDS INITIATIVE

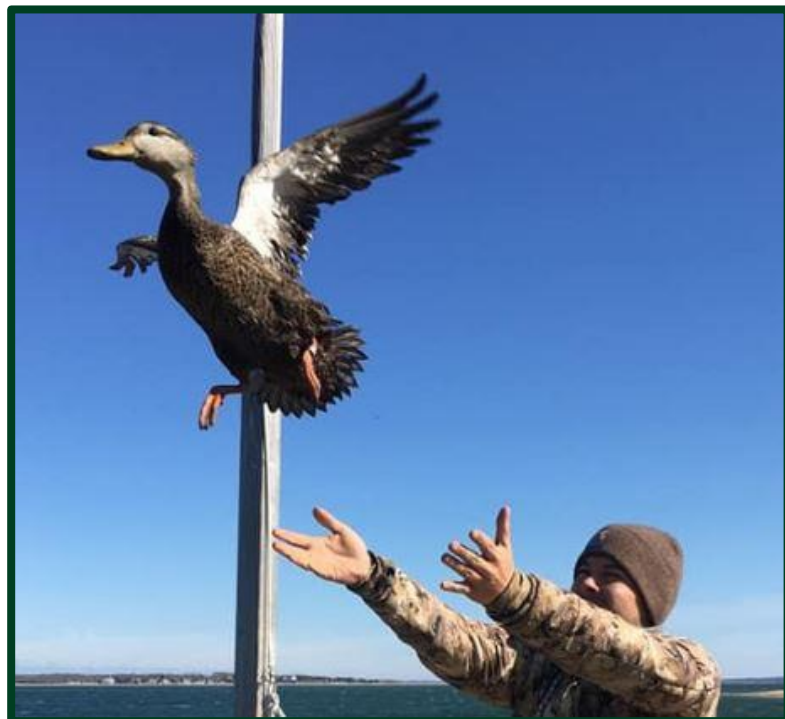
Sustaining funding for our students in perpetuity is a primary goal of the Waterfowl and Wetland Initiative at SUNY ESF.

If you wish to make a charitable donation to sustain the growth showcased in our 2019 Annual Report please contact:

Dr. Michael Schummer  
Roosevelt Waterfowl Ecologist  
SUNY ESF  
[mlschumm@esf.edu](mailto:mlschumm@esf.edu)

or

Dana Piwinski  
Development Officer—Major Gifts  
SUNY ESF College Foundation  
[dpiwinski@esf.edu](mailto:dpiwinski@esf.edu)







THANK YOU FOR YOUR GENEROUS SUPPORT

