

A SPECIAL  
REPORT  
FROM DELTA  
WATERFOWL



# 2019 Research



Sound waterfowl management decisions should always be based on science. It's a philosophy Delta Waterfowl has held since Hans Albert Hochbaum began his work as the organization's first science director in 1938 at the Delta Marsh. Delta has continually focused our research on ducks and duck hunting issues in North America.

Delta's research informs our duck production, habitat and hunter recruitment programs, as well as waterfowl management decisions throughout North America. Ultimately, all of our research supports Delta's mission to produce ducks and ensure the future of duck hunting.

This special report highlights our 2019 research. Although the descriptions of each project are brief, more information is always available. As always, feel free to contact me to discuss any of Delta's research.

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**Canvasback Nest Success**  
**Evaluating Predator Management for over-water nesting ducks**

TRENT ROHRER, M.S. STUDENT, AND DR. JOSH STAFFORD, SOUTH DAKOTA STATE UNIVERSITY

► Delta continues to seek effective and efficient application of Predator Management techniques to improve nest success for over-water nesting ducks such as canvasbacks, redheads and ring-necked ducks in the parkland habitat of Canada.

Armed with new data derived from Delta's 2018 trap type and bait study, we will apply those findings to increase effectiveness of predator reduction trapping efforts, especially on raccoons. In addition, this work will rely on an increased trapping intensity and use of trail cameras focused on nests to better determine which nest predators are having the largest impact on ducks.

The effects of Predator Management on pair numbers, nest success and brood survival will be evaluated.

**Raccoon Satellite Telemetry**  
**Studying movements and habitat use of raccoons to improve effectiveness of trapping**

DR. CHARLOTTE MILLING, DR. STANLEY GEHRT AND MR. SHANE MCKENZIE, MAX MCGRAW WILDLIFE FOUNDATION

► In 2018, we fitted 13 raccoons with GPS transmitting collars on Delta's canvasback study block in Manitoba. The transmitters collected incredible amounts of location data on each raccoon's daily movements. We discovered that raccoons spent a large percentage of time in wetland edges.

This year, we're again collaring 15 raccoons to track their movements in breeding duck habitat. The goal is to better understand raccoon habits so we can set traps in their preferred locations, thereby more effectively reducing these top duck-nest predators. Ultimately, the goal is to increase nest success and production of canvasbacks, redheads, ring-necked ducks and other over-water nesting ducks.

**Detecting Canvasbacks Using Drones**

**Flying drones with thermal-imaging cameras to count pairs, find nests and count broods of diving ducks**

JACOB BUSHAW, M.S. STUDENT, AND DR. KEVIN RINGELMAN, LOUISIANA STATE UNIVERSITY

► Delta continues the organization's innovative drone research, expanding on ground-breaking work conducted during the 2017 and 2018 duck nesting seasons. Delta will again work with thermal-imaging cameras and a traditional video camera mounted on the same drone to detect and enumerate breeding pairs, find over-water duck nests and count broods on the Canadian prairie. Part of the work this season is to monitor a subset of diving duck nests using drones, attempting to evaluate whether nest success improves with less disturbance from traditional nest searching activities. Importantly, we will build on last season's brood counting work with drones, a method which holds great promise to revolutionize waterfowl management.





## Counting Broods Using Drones

### Evaluating brood use of wetlands in agricultural landscapes

CATRINA TERRY, M.S. STUDENT, AND DR. KEVIN RINGELMAN, LOUISIANA STATE UNIVERSITY

► Using a special drone equipped with a thermal-imaging camera and a regular camera, researchers will survey selected wetlands in agricultural landscapes for brood use. The goal is to better understand brood use in order to conserve the most important habitat for breeding ducks. This research will evaluate the quality of wetlands as brood water by examining usage by ducks, as well as determining invertebrate abundance and vegetation structure.

## Ring-necked Duck Tracking

### Implanting satellite transmitters to monitor movements and habitat use

TORI MEZEBISH, M.S. STUDENT, AND DR. MARK MCCONNELL, UNIVERSITY OF GEORGIA

► After a successful first season of tracking 15 ring-necked ducks on their wintering grounds in southern Georgia and then during spring migration, Delta implanted 30 ringnecks with satellite transmitters in South Carolina and 48 more in southern

Georgia during the second year of the project.

The goals are to monitor migration paths, discover breeding areas, and understand habitat use and movements during the annual cycle. Little is known about ring-necked ducks, which is surprising because they are the most important diving duck in hunter harvest — the only diver consistently in the Top 10.

Ringnecks are doing well, and we hope to understand why they have been so successful at increasing in numbers. In addition, this research has immediate value to waterfowl managers in the Atlantic Flyway under the newly implemented multi-stock harvest regulation-setting method.

## Lower Mississippi Flyway Dabbler Tracking

### Determine duck locations during hunting seasons and migration

DR. DOUGLAS OSBORNE, UNIVERSITY OF ARKANSAS DIVISION OF AGRICULTURE, AND DR. MITCH WEEGMAN, UNIVERSITY OF MISSOURI

► Delta Waterfowl seeks to better understand the migration and wintering ground habits of dabbling ducks in the Mississippi Flyway to determine whether management are needed.

Employing backpack transmitters powered

by mini solar panels, Delta plans to install tracking devices on 90 dabbling ducks — primarily mallards, wigeon, gadwalls and green-winged teal — to record movements for a full year. Ducks will be caught after the 2019-2020 hunting season in Arkansas and Louisiana.

The goal is to understand when and where these ducks migrate (particularly in fall), as well as how they respond to hunting pressure and weather events.

## Working Wetlands

### Understanding farmers' perceptions of Delta's Working Wetlands program

DR. CHERYL WACHENHEIM, NORTH DAKOTA STATE UNIVERSITY

► Delta Waterfowl, in partnership with the U.S. Department of Agriculture Natural Resources Conservation Service, initiated a new approach to conserving small wetlands in cropland. This human dimensions survey work of program participants is designed to gain insight from producers and thereby learn how we can better serve farm operations and protect small wetlands that are critical for breeding ducks. The research will inform large, landscape-scale program development incorporated in the 2018 Farm Bill to conserve wetlands across the U.S. Prairie Pothole Region.

## Has Pintail Production Declined?

### Evaluating changes in pintail age structure and sex ratios

DR. TODD ARNOLD, UNIVERSITY OF MINNESOTA

► Pintail population trends are of great interest to duck hunters, especially in light of U.S. Fish and Wildlife Service regulations lowering the bag limit to one bird per day in 2017-2018, and again for the 2019-2020 season. Dr. Arnold is reviewing pintail age and sex ratios using USFWS Parts Collection Survey data to document how age ratios (proportion of juveniles in the fall flight) and sex ratios (females to males) have changed since 1961. This work is important to inform pintail harvest models used to set regulations.

## Pintail Harvest and Survival

### How does hunting harvest impact duck populations?

THOMAS RIECKE, UNIVERSITY OF NEVADA-RENO

► Researchers are undertaking one of the big unanswered questions in waterfowl management: What influence does hunting harvest have on populations?

By using new scientific approaches, the team can more accurately answer this question for a number of important species, including mallards, pintails and blue-winged teal. They will take a unique approach and look at population cohorts (male/female and juvenile/adult) to more fully understand how differing survival rates might help inform the relationship between harvest and populations. In addition, they will revisit our understanding of how density dependence works in duck populations.

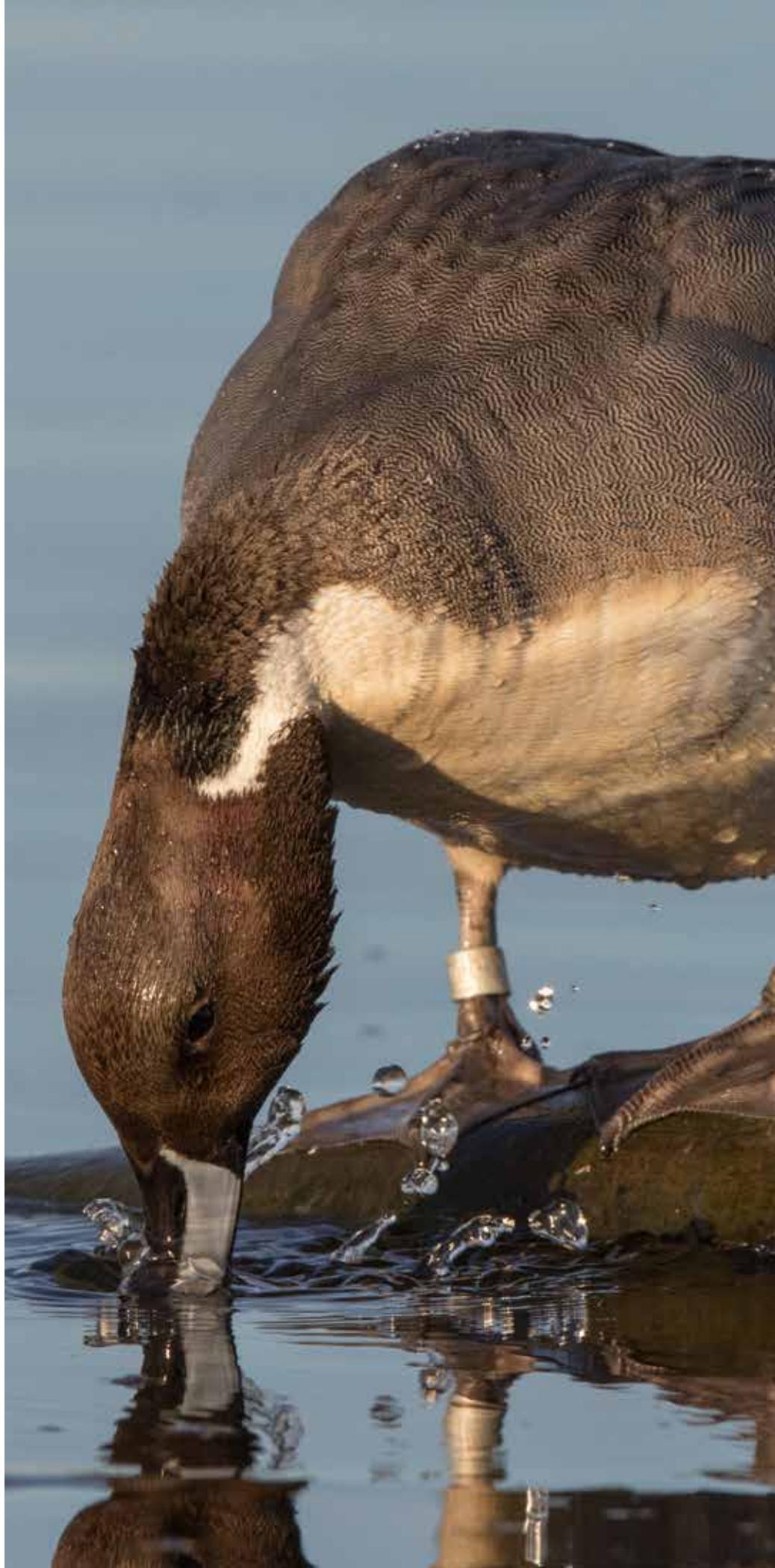
## Atlantic Flyway Mallard Stable Isotope

### Determining the origins of mallards taken by hunters

DR. MIKE SCHUMMER, STATE UNIVERSITY OF NEW YORK COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY

► Delta is undertaking this important research to inform mallard harvest regulations in the Atlantic Flyway.

By examining stable isotopes in the flight feathers of mallards shot in the Atlantic



Flyway, researchers can determine where the ducks grew those feathers that summer. Using mallard wings from the U.S. Fish and Wildlife Service Parts Collection Survey, we can determine where ducks in the hunter harvest came from, as well as determine the production (ratio of juveniles to adults) in different regions. As portions of the eastern mallard population have been declining, we need to understand the relative importance of different breeding areas. This decline in eastern mallards led the USFWS to reduce the bag limit to two mallards daily for the 2019-2020 hunting season.

## Canvasback/Redhead Integrated Population Models

Determine needs for management of these species

DR. DAVID KOONS, COLORADO STATE UNIVERSITY

► Redheads and canvasbacks use the same breeding habitat in the Prairie Pothole Region (primarily in Manitoba and Saskatchewan), and Delta has collected extensive nest success data on both species.

The goal of this data analysis work is to develop a model of the life cycles for canvasbacks and redheads to determine what factors drive population growth. The resulting models will characterize the importance of nest success, survival of nesting hens, brood survival, winter survival and hunting mortality on population growth of redheads and canvasbacks.

## Canvasback Habitat Modeling

Analyze nest success in relation to habitat variables

MICHAEL JOHNSON, PH.D CANDIDATE, AND DR. DAVID KOONS, COLORADO STATE UNIVERSITY

► After several seasons of extensive field work on nesting canvasbacks in Manitoba, Johnson will analyze habitat variables to determine their impact on nest abundance and nest success. The goal is to determine the best locations on the prairie breeding grounds for canvasback production. This information will help waterfowl managers where to best invest in wetland conservation programs to benefit canvasback production.

## Pintail Carrying Capacity Assessing habitat changes for pintails in the Prairie Pothole Region

DR. DAVID KOONS, COLORADO STATE UNIVERSITY

► We're assessing long-term changes in pintail populations by reviewing trends and transect scale of the U.S. Fish and Wildlife Service's annual Waterfowl Breeding Population and Habitat Survey. We will examine which regional groups of pintails have increased, decreased and remained stable. The goal is to understand how pintail carrying capacity has changed, because it is a key factor in harvest models used to set daily bag limits.





## Research Leaders

Throughout the organization's storied history, Delta Waterfowl has amassed an impressive body of research that includes supporting more than 300 graduate students and publishing 600 peer-reviewed scientific papers.

Delta's research has profoundly influenced how waterfowl, wetlands and annual harvest are managed. It has also provided biologists, technicians and young scientists with the opportunity to gain hands-on experience and guidance to become leaders in waterfowl and wetland conservation. We are extremely proud that many of Delta's former students are working for government and non-government agencies, as well as universities.

Delta Waterfowl's important waterfowl and wetland research is made possible by you — our generous donors, members and volunteers. We deeply appreciate your support. Thank you!



#### **OUR MISSION**

To produce ducks and secure  
the future of waterfowl hunting.

#### **OUR VISION**

Abundant waterfowl and endless  
opportunities for hunters.

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