SOUTHEASTERN COOPERATIVE WILDLIFE DISEASE STUDY

# SCWDS BRIEFS

A Quarterly Newsletter
Southeastern Cooperative Wildlife Disease Study
College of Veterinary Medicine
The University of Georgia
Athens, Georgia 30602

Summer 2025 — Volume 43 — Number 2

*Eds. M. Ruder and B. Kurimo-Beechuk*

White ibis, B. Kurimo-Beechuk

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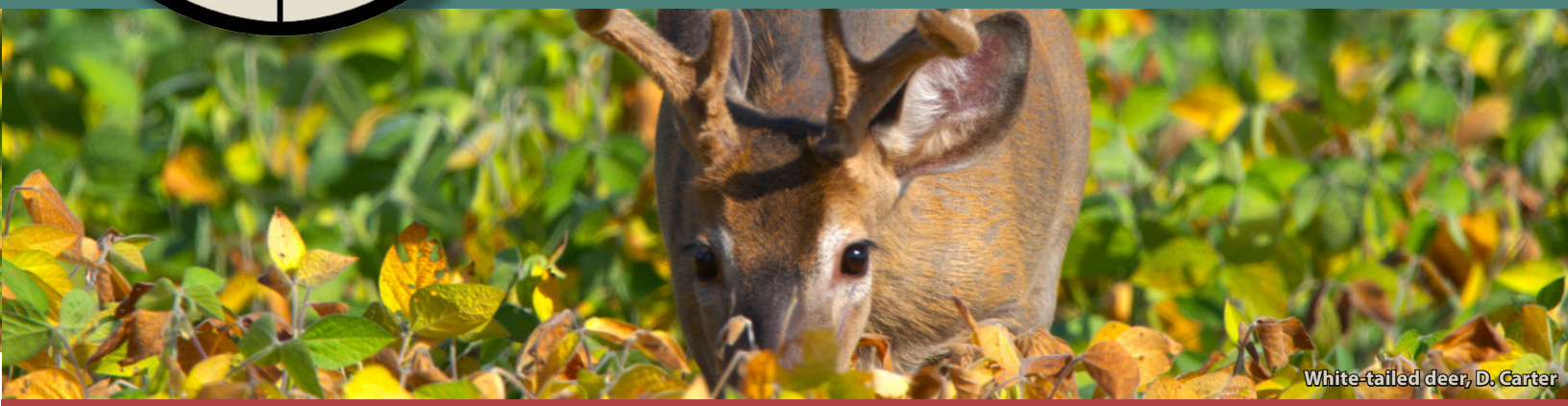

White-tailed deer, D. Carter

## Cervid health updates

### Off to the races: HD 2025

The 2025 hemorrhagic disease (HD) season got off to a slow start but erupted during the month of August. This is a familiar scenario with many previous HD outbreaks, where submissions to SCWDS typically peak during September. While we will need to wait a few months to fully understand how severe the 2025 HD outbreak will be, we are off to a concerning start.

Caused by either bluetongue virus (BTV) or epizootic hemorrhagic disease virus (EHDV), HD is one of the most visible and important infectious diseases of white-tailed deer. Every summer and fall, wildlife professionals investigate wild ruminant (e.g., deer, pronghorn, elk) mortality events and frequently submit tissue samples to SCWDS for EHDV and BTV diagnostic testing. Typically, submissions begin in June and July, peak in August and September, and begin to taper in October and November. At SCWDS, samples are screened for BTV and EHDV by real-time reverse transcription polymerase chain reaction (RT-PCR) test. Virus isolation and serotype determination are attempted on positive samples.

As mentioned above, this season got off to a slow start with five and nine white-tailed deer tissue sample submissions during June and July, respectively. While none of the June samples yielded a positive detection, we isolated EHDV-2 from four of nine deer in July. The earliest detection was a white-tailed deer from Erie County, PA that died on July 24. The other three detections were from WV, MS, and KY – all EHDV-2. The floodgates then opened and we received 141 submissions during August, yielding EHDV detections in an additional 13 states: GA, TN, IN, FL, MI, VA, AR, MO, OK, MD, NY, NC, and AL. Laboratory testing, including serotype determination, continue but both EHDV-2 and EHDV-6 have been detected. Samples positive for BTV from deer in TN and FL have been submitted to colleagues at the **National Veterinary Services Laboratories (USDA)** for additional characterization. All detections have been from white-tailed deer. Based on reports from biologists and our submissions, HD activity seems particularly bad in parts of OH, WV and PA, although other states are also seeing significant mortality. If we remain in a drying trend with high

temperatures, this could be a long HD season.

Please reach out to the **SCWDS Research & Diagnostic Service** if we can be of assistance while investigating suspected HD mortality. Preferred diagnostic samples include refrigerated lung and spleen. Other potential sample types include lymph node, blood, and bone marrow. We will provide an update on how the 2025 HD season ends in the winter issue of the **SCWDS BRIEFS**.

**Prepared by Mark Ruder, Lyndon Sullivan-Brugger, Dave Stallknecht, Tori Andreasen, Juliet Woodward, Paul Oesterle, Becky Poulson**

## Texas deer smuggling bust

They say that everything is bigger in Texas and this appears to hold true when it comes to allegedly illegal activities associated with captive white-tailed deer (*Odocoileus virginianus*). One of the largest deer smuggling cases in Texas history began in March 2024 when **Texas Parks and Wildlife Department (TPWD)** game wardens conducting a traffic stop in Montgomery County discovered seven deer being moved without proper documentation or identification. The subsequent "Ghost Deer" investigation conducted by Texas Game Wardens was extensive, nearing completion in August 2025 with more than 1,000 charges filed against 24 individuals statewide. The TPWD regards "ghost deer" as breeder deer that are not properly identified, or have had their identification hidden, illegally changed or removed.

The March 2024 traffic stop resulted in the arrests and convictions of a Texas deer breeder and his business partner who were caught attempting to smuggle seven deer from an East Texas deer breeding facility to Brazoria and Duval counties to illegally release them into the wild on private property. Further investigation revealed numerous violations of TPWD statutes and regulations as well as criminal and traffic violations. The pair was arrested and booked into the Montgomery County Jail.

The deer breeder pleaded guilty to three of the eleven penal code violations with which he was charged and to 29 deer breeder violations. His business partner was charged and convicted on two penal code and 28 deer breeder violations. The violations were committed to avoid disease testing and monitoring requirements. The TPWD violations included failure to conduct ante-mortem chronic wasting disease (CWD) testing, failure to obtain valid transfer permits, removal of breeder deer without required identification, and illegal possession of live game animals. The two were fined a total of $12,060.

On August 14, 2025, TPWD announced that the "Ghost Deer" investigation neared completion when two individuals facing felony charges of tampering with a governmental record turned themselves in to the Travis County District Attorney's office. The two also are charged with more than 100 misdemeanor breeder deer activities. They allegedly entered false information into the Texas Wildlife Information Management System to facilitate smuggling of breeder deer. This brings the total number of implicated individuals to 24 with approximately 1,400 charges filed across eleven counties.

The extensive investigation revealed widespread, coordinated deer breeding violations including smuggling captive breeder deer and free-ranging deer between breeder facilities and ranches, CWD testing violations, license violations, and both misdemeanor and felony drug charges associated with possession and mishandling of controlled substances used to sedate animals.

All of the above cases, except for the convictions of the two individuals arrested in March 2024, remain to be adjudicated in the eleven counties in which charges were filed.

**Prepared by John Fischer and Mark Ruder with information and excerpts from TPWD press releases here and here**

## *Salmonella* persistence: wildlife & human health implications

*Salmonella enterica* is a zoonotic bacteria that poses health risks to humans and animal species. While many human *Salmonella* infections are food-borne in origin, an increasing number of cases are linked to environmental exposure and contact with exotic pets or wildlife, particularly wild birds. Historically, the **SCWDS Research and Diagnostic Service** has routinely diagnosed salmonellosis in dead birds submitted by member agencies. However, SCWDS researchers also have an active research program focused on better understanding *Salmonella* pathogen dynamics in wildlife species. Recently, the findings from two studies analyzing *Salmonella* epidemiology in birds were published in the **American Veterinary Medical Association's Currents in One Health Collection** manuscript series. The results from these studies are summarized below.

Researchers from SCWDS, **UGA Warnell School of Forestry and Natural Resources**, **UGA College of Public Health**, **UGA College of Veterinary Medicine, UGA College of Engineering**, and the **UGA Center for Ecology of Infectious Diseases** conducted two experiments in the **first study** to investigate *Salmonella* persistence and prevalence on surfaces at elevated risk for wild bird-human interactions, such as bird feeders and picnic benches in public parks, such as those in the image on the right. To determine persistence, the first experiment utilized a *Salmonella* Typhimurium isolate recovered from a previous avian mortality event to inoculate chicken feces. Inoculated feces were then applied to bird feeders made of four different material types: plastic, wood, and each material with an antimicrobial coating, as seen in the image on the next page. Feeders were swabbed over the course of three weeks. No statistically significant differences were detected among feeder types; however, *Salmonella* persisted for up to five days and was most frequently isolated from the plastic and plastic-coated feeders. Contrary to expectations, antimicrobial coating did not reduce *Salmonella* detections. In the second experiment, feces on wooden picnic tables were sampled daily from a park frequented by the American white ibis (*Eudocimus albus*), a species that is commonly fed by humans. *Salmonella* was detected in 27% of the table samples and persisted on individual fecal piles for up to four days. A total of 14 serotypes were recovered, including five listed among the CDC's top 20 for human infection. The most commonly detected species was *S.* Newport, with 22% prevalence.

White ibis on a picnic table in south Florida. Photo credit American Journal of Veterinary Research

These results demonstrate that indirect contact with contaminated surfaces, especially in shared bird-human spaces, may facilitate zoonotic transmission for several days. The detection of human-relevant serotypes underscores the importance of routine cleaning of feeders, i.e., ideally biweekly using a 10% bleach soak. Public education discouraging wildlife feeding and increasing awareness about potential risks is warranted. This research informs practical management aimed at reducing *Salmonella* transmission among birds, other wildlife, pets and people.

In the **second study**, researchers from SCWDS, UGA Warnell School of Forestry and Natural Resources, UGA College of Public Health, **Odum School of Ecology**, and the **Georgia Aquarium** presented a deep-dive into the *Salmonella* dynamics of nestling white ibis in two separate analyses. In the first analysis, a captive colony of wild-caught ibis nestlings was monitored for six months after hatching to determine *Salmonella* prevalence, serotype diversity, shedding periods, and re-infection rates in an experimental infection trial. At the time of capture, 58% of nestlings were shedding the *Salmonella* serotypes Javiana or Poona. Shedding continued with varying prevalence for the first two months in captivity. At 20 weeks of age, once nestlings had not shed *Salmonella* for more than five consecutive weeks, they were inoculated orally with a 106 CFU (colony forming units) *Salmonella* Typhimurium suspension that was isolated from an aquatic bird mortality event in 2016 to determine susceptibility and clinical disease. *Salmonella* was detected in 35% of inoculated birds and shedding was detected on two occasions: Days Post Inoculation 1 (DPI 1), and DPI 5. No bird shed *Salmonella* for more than one day. For those birds that shed, the period was very short and only one bird displayed clinical signs such as fluffing of the feathers, hyperthermia, and anorexia at DPI 1. While *Salmonella* infections do not typically result in effective humoral immunity (i.e., antibody formation against *Salmonella*), acquired, local, gastrointestinal cellular immunity decreases susceptibility to *Salmonella* infections. These findings indicate some host resistance, perhaps due to an age-associated gastrointestinal microbiome maturity or immunity from previous exposure.

A researcher applies inoculated feces to the various feeder types used in the first study. Photo credit American Journal of Veterinary Research

Another analysis in the second study investigated the *Salmonella* prevalence and serotype diversity of free-living nestlings in both an urban site and two natural rookeries (image on the following page) in South Florida over the course of two years. A total of 114 free-living ibis nestlings were sampled, and some birds were sampled multiple times. A *Salmonella* status of either negative or positive was assigned to each sample (n=269) and each individual bird (n=114), and prevalence was calculated for both groups. The *Salmonella* prevalence of all samples was 43%, and was greater in urban samples at 52%, compared to a 13% prevalence in samples from natural colonies. *Salmonella* was detected in 62% of all nestlings at any given point during sampling; urban nestlings were more likely to shed *Salmonella* than their natural counterparts, as *Salmonella* was detected at least one time in 81% of urban nestlings, versus 19% of natural nestlings.

Further, only one natural nestling (3%) shed more than once. Despite *Salmonella* detections in both urban and natural chicks soon after hatching and shedding persisting at least 22 days, *Salmonella*-associated clinical disease or mortality was not detected, even in the urban rookery that was monitored weekly. Serotype diversity in the urban sites was also higher than in the natural sites (urban, n = 41; natural, 6). A total of 32 *Salmonella* serotypes across all sites were isolated, with *S*. Reading in 2020 and *S*. Rubislaw in

White ibis nestlings in a natural rookery in south Florida. Photo credit B. Kurimo-Beechuk

2021 accounting for 41% of all isolates. Of note, 19% of serotypes detected in these birds were in the top 10 serotypes responsible for human cases in the US from 2018 to 2022. Serotype data from both studies showed that nestlings, like adults, shed many *Salmonella* serotypes, and serotype composition varies between habitat type and years. Overall, our results indicate that, while *Salmonella* infection is common among ibis nestlings and shedding can last weeks, clinical disease appears to be rare, and early infections may lead to decreased susceptibility. This study also provides further support between factors in urban environments (e.g., resource provisioning) and shifts in pathogen dynamics; specific to *Salmonella*, urban nestlings shed more, for longer periods, and when they are older. As ibis and other aquatic birds continue to adapt to anthropogenic habitats, it is likely that urban colonies will increase and may pose a risk of spillover transmission to humans or other animals through environmental contamination.

**Prepared by Kimberly Perez & Sonia Hernandez**

# Diagnostic Case Highlight

## Presumed copperhead envenomation in a red-tailed hawk

*Copperhead snakes are a member of the Crotalinae family (Crotalids). Crotalid venom can cause damage to red blood cells (hemotoxic), delay blood clotting mechanisms (coagulation), and lead to cell and tissue death (necrosis). The venom of some species can also cause nervous system damage (neurotoxic). Crotalid bites are typified by severe local tissue damage that spreads from the bite wound site, resulting in discoloration, skin sloughing, and swelling. Fang marks are not always readily apparent as they may be obscured by inflammation, edema (swelling and fluid buildup) and bleeding around the bite site. These pathologic changes were observed in this case.*

Eastern copperhead, N. Friedeman

A juvenile red-tailed hawk (*Buteo jamaicensis*) was found dead near a creek in Rockwoods Wildlife Refuge, Missouri in August of 2024. The carcass was collected and submitted for diagnostic evaluation by the **Missouri Department of Conservation**.

Postmortem evaluation revealed poor nutritional condition and good feather condition. The right foot was severely swollen with a small amount of dried blood and an area of sloughed skin. The third foot digit had a small scab and the leg skin was discolored purple; top image on the next page. All other organs and the left leg and foot appeared grossly normal; however, the remains of a copperhead (*Agkistrodon contortrix*) were in the crop, revealing this as a recent (and its last) meal; bottom image on the following page. Histologically, the swollen right foot had damage and bleeding in the keratin layer overlying the skin and severe necrosis (cell death) in the layer just beneath the skin's surface (dermal collagen) and underlying muscle along with mild, multifocal dermal hemorrhage (bleeding) and marked, multifocal to coalescing, deep dermal edema (fluid accumulation).

# Presumed copperhead envenomation in a red-tailed hawk

Top image: Marked swelling of the right foot, which also has overlying dried blood. The skin of the leg also is discolored. There is also a small amount of skin sloughing in the proximal P3 digit (red arrow). Bottom image: Remains of a copperhead snake found within the crop of the hawk. Photo credits SCWDS

There were no other noteworthy histologic lesions, suggesting the hawk was otherwise healthy at the time of envenomation, and based on the copperhead in its crop, it had time to ingest most of the snake prior to death. While the case was in progress, common viruses were ruled out in having contributed to death – including highly pathogenic avian influenza virus and West Nile virus.

Diagnosis was supported by a historic **SCWDS publication** describing a similar condition in two immature red-tailed hawks and a Cooper's hawk (*Accipiter cooperii*) in northern Georgia and south Florida, in which fatal envenomation was attributed to cottonmouths (*Agkistrodon piscivorus*) and eastern diamondback rattlesnakes (*Crotalus adamanteus*) based on field findings and/or evidence of snake tissue in their digestive tracts. Notably, as in the present case, the two red-tailed hawks in the previous report were juveniles in poor nutritional condition, which may reflect their limited hunting experience and skill, and possibly increased chance of adverse outcome in a battle with venomous prey. We are thankful to the Missouri Department of Conservation for submitting this interesting case.

**Prepared by Sarah Kuchinsky, Tori Andreasen, Sam Maywald, Kathleen McCoy, Nicole Nemeth**

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# SCWDS BRIEFS

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## *Parting views from the Southeast*

Clapper rail, B. Kurimo-Beechuk