

SCWDS BRIEFS

A Quarterly Newsletter from the
Southeastern Cooperative Wildlife Disease Study
College of Veterinary Medicine

Phone (706) 542-1741

The University of Georgia
Athens, Georgia 30602

FAX (706) 542-5865

Volume 38

July 2022

Number 2

The HP H5N1 Outlook

There are currently more questions than answers regarding potential impacts and risks associated with the clade 2.3.4.4b Goose/Guangdong1/1996 H5N1 (GsGD) lineage of highly pathogenic (HP) influenza A virus (IAV). At present **we do not know** what the future holds relative to the establishment of this virus in North America, but based on the European experience, establishment appears likely. **We do know** that significant wild bird mortality events have occurred both in North America and Europe with most of this mortality occurring in **waterfowl and raptor** populations. Although this particular lineage of HP H5N1 currently is not regarded as a high public health risk, **we do know** that this virus is rapidly changing in North America as it reassorts with our low pathogenic (LP) IAV. Finally, **we do not know** how or if this virus will directly or indirectly impact wildlife resources in North America.

Much of what was observed this year was not unexpected. Numerous species of waterfowl, which represent the natural reservoir for avian influenza viruses, were infected and the virus spread rapidly as these birds migrated between wintering and breeding habitats. Although some waterfowl mortality was expected, large-scale mortality appeared focal rather than wide-spread and was limited to a few species such as lesser scaup in Florida and Georgia and snow geese in the midwestern states. Gulls and terns also were infected as were scavenging birds such as raptors and corvids. Mortality was also observed in wild mammals but the extent of these infections remains unknown. These events, and the spillover to domestic birds, all mirror what has been observed in wildlife in Europe associated with this same IAV lineage. There were some unique surprises, however. For example, although some species of shorebirds, such as ruddy turnstones and red knots

on the eastern Atlantic coast are routinely infected by LP IAV, reports of HP H5 related mortality are presently limited and recent surveillance of these populations on the Atlantic coast has not detected infections with HP H5N1. Mortality in bald eagles was not unexpected but measurable impacts on breeding success were not anticipated. The sensitivity of this species as a sentinel to local infections also exceeded expectations. Finally, extensive mortality in black vultures and the possibility of a unique and self-perpetuating transmission cycle appears to be unique to this outbreak.

There are several areas that we should focus on as the fall migration approaches. With waterfowl, we are currently entering a period when influenza prevalence in ducks is at its annual peak. This relates to the annual influx of susceptible naïve juvenile birds. As migration progresses and birds are exposed, population immunity normally increases and infection rates decline. In ducks, results from experimental infections indicate that protective immunity can result from exposure to the same influenza virus subtype, but in addition and potentially more important, partial immunity can develop related to exposure to other subtypes and this immunity is increased as ducks are exposed to multiple infections with these other subtypes. This suggests that waterfowl mortality associated with HP H5 may vary seasonally with the greatest risk associated with early infection in the juvenile cohort. For this reason, early premigration and early migration surveillance is important as is the detection, reporting, and testing of any mortality. With eagles and other raptors, we suspect that HP H5 infections are associated with scavenging, with dead or moribund waterfowl representing a likely source. However, in most cases, this connection has not been made. This suggests (1) another potential source or (2) that there is an abundance of undetected waterfowl mortality. With eagles we also

Continued...

do not understand if the observed mortality or the observed local reduction in nest success are significant threats to population status. To better understand this, we need to coordinate current efforts related to bald eagle biology and influenza surveillance of this species. Finally, black vulture mortality events continue to occur and sustained monitoring efforts are needed. With a potentially novel self-perpetuating transmission cycle, population-level effects on black vultures and increased potential for spillover to domestic poultry both are possible. Given the scale of this outbreak and the potential impacts to wild birds as well as poultry, there is much we need to learn. As always, SCWDS is here to help where possible. (Prepared by Dave Stallknecht and Becky Poulson)

Reproductive Tract Tumor in a Wild Turkey

During November 2021, a sick wild turkey was reported unable to walk and covered in flies by a private citizen in Bleckley County, Georgia. The hen was dispatched and collected by Georgia Department of Natural Resources personnel and submitted to the SCWDS Research and Diagnostic Service for diagnostic evaluation. Necropsy revealed several cystic ovarian follicles, which contained an off-white to clear fluid. The oviduct of the reproductive tract was severely distorted and displaced other internal organs to the left side of the body cavity (Figure 1). The external surface had multiple yellow nodules (Figure 2).

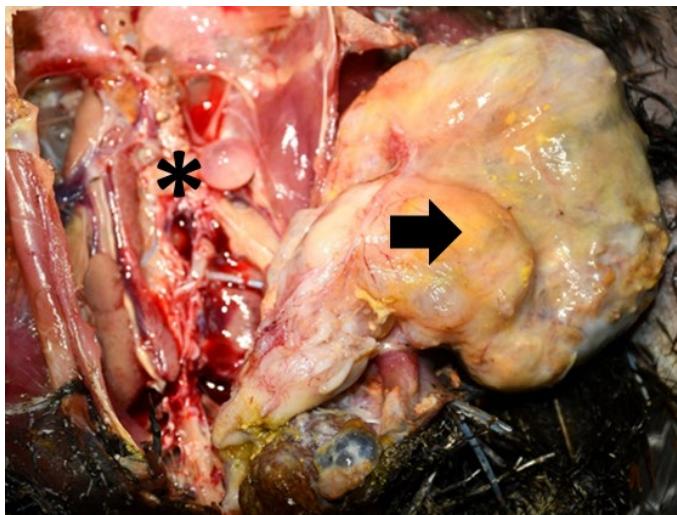


Figure 1. Gross image of the oviductal tumor in a wild turkey. The large tumor and reproductive tract (arrow) have been removed from the body cavity (asterisk).

The oviductal wall was severely thickened, had multiple cystic structures on cut surface and contained multiple, firm, malodorous, yellow to brown egg-shaped masses. Similar masses were

adhered to the external surface of adjacent organs in the body cavity. On microscopic examination, the oviductal wall was expanded and invaded by cancerous cells of epithelial origin that formed glandular structures (i.e., adenocarcinoma) containing proteinaceous material, necrotic debris, and moderate numbers of inflammatory cells (heterophils, macrophages, and multinucleated giant cells). Cancerous cells also were evident along the outer portion of the oviductal wall.

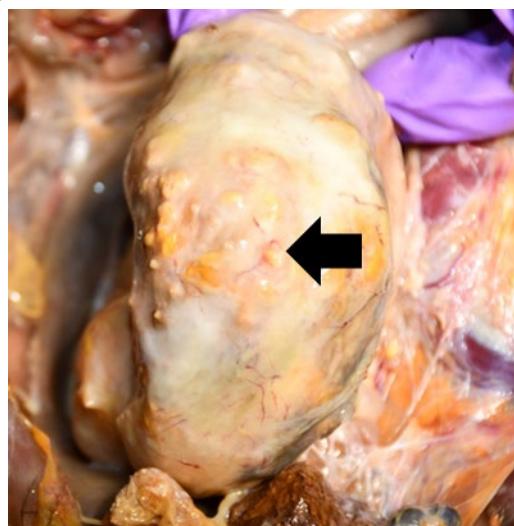


Figure 2. There are multiple small yellow cancerous nodules on the surface of the oviduct (arrow).

The gross and microscopic changes in this wild turkey were consistent with carcinomatosis, a cancerous condition found most commonly in adult female domestic chickens with rare reports in domestic turkeys. It has also been reported in budgerigars, guinea fowl, and greater flamingos. The condition is due to a metastatic (disseminated) adenocarcinoma typically originating in the ovary or oviduct which spreads and replaces normal tissue. As in the above case, it is generally not possible to determine the specific organ the cancerous cells originated from based on microscopic examination. Cancerous cells are typically shed into the body cavity, implanting on different organs and forming hard yellow nodules, like those observed in this hen and shown in Figure 2. In domestic hens, incidence increases with age and commonly occurs in animals aged 2 years or older. Age-associated degeneration was considered a possible factor in this wild turkey, as other microscopic changes were suggestive of advanced age. Ascites (fluid accumulation in the body cavity) is a common clinical sign in domestic poultry.

Reports of carcinomatosis in wild turkeys are rare and, unlike other neoplastic conditions in this

species, it is not believed to be transmissible or associated with a viral infection. This condition is not expected to be a significant threat to wildlife populations, nor is it considered a public health threat. We would like to thank the Georgia Department of Natural Resources for submission of this interesting case, which represents a rare condition in a wild turkey. (Prepared by Caitlin Burrell).

SCWDS Faculty News

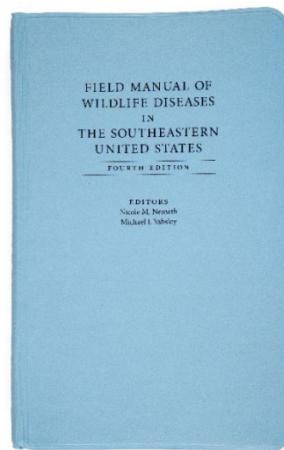
We want to congratulate one of our faculty members, Dr. Michael Yabsley, who was named to a distinguished endowed position at the University of Georgia. Since 2021, Dr. Yabsley has been in the endowed Warnell Professorship in Forestry and Natural Resources position. This endowed professorship was open to tenured full and associated faculty within the Warnell School of Forestry and Natural Resources (SFNR), and Dr. Yabsley was selected based on his excellence in research and teaching. However, through the generous donation by the Mace family, the Dr. Arnett Mace Jr. Distinguished Professorship was recently formed and approved. Dr. Mace was the former Dean of the Warnell SFNR and provost of the University of Georgia. This fall, Dr. Yabsley was appointed to this new distinguished position. This professorship will provide support for undergraduate student experiential learning opportunities in Dr. Yabsley's research program and SCWDS. We are very proud of Michael, and he is very deserving of this honor.

After serving as SCWDS Director since 2019, Dr. Dave Stallknecht has resumed his role as research faculty and professor at SCWDS and the Department of Population Health. Dr. Mark Ruder was appointed to Director in July 2022. During his 3.5 years as Director, Dave helped to lead SCWDS through the monumental challenges posed by the COVID-19 pandemic. In addition to the public health and operational challenges we experienced during the pandemic, we leaned heavily on Dave's expertise in the epidemiology of infectious diseases and wildlife biology when navigating the swirling questions around SARS-CoV-2 and wildlife. As if that was not enough, the emergence of RHDV2 in wild and domestic rabbits and the unprecedented and ongoing HPAI outbreak in North American wild birds also occurred during Dave's tenure as Director. We thank Dave for his expertise, dedication, and leadership during these last few years, but we are

even more grateful that he is still providing these attributes to our faculty, staff and students, as well as our Cooperative member agencies. (Prepared by SCWDS Faculty)

4th Edition of the Field Manual Available

We are excited to announce the recent publication of the Fourth Edition of the *Field Manual of Wildlife Diseases in the Southeastern United States*. We



thank Nicole Nemeth and Michael Yabsley who served as editors for this edition, as well as the 17 current and former SCWDS personnel who authored sections. In addition to routine updates to content from the 3rd Edition, multiple additions have been made to the content. For example, new species/species group sections (e.g., bats, raptors, herpetofauna) or new diseases in existing sections (e.g., rabbit hemorrhagic disease) have been added. Despite additional content, the 4th Edition has a lesser page count because we made the book slightly taller than previous editions. Throughout the book you will notice updated and improved photographs, as well as beautifully illustrated parasite life cycles by a former graduate student, Henry Adams. We have begun providing books to agencies in the Cooperative, but books are also available for order on the SCWDS website: <https://vet.uga.edu/education/academic-departments/population-health/southeastern-cooperative-wildlife-disease-study/scwds-resources/> (Prepared by Mark Ruder)

Note to Our Readers – SCWDS BRIEFS Moving On-line

We thank you for your sustained interest in our quarterly newsletter, the *SCWDS BRIEFS*. After decades of mailing hard copies of the *BRIEFS* to subscribers on our mailing list, we are transitioning to an electronic format and e-mail distribution only. In recent years, our e-mail distribution list has grown, and this natural transition will save resources and be a more efficient mechanism of distribution. Further, the electronic format will enable the inclusion of more visual content. However, it is critical that you **provide us a current e-mail address for our**

SCWDS BRIEFS distribution list. We want to reach as many of you as we can, but can do so only if you subscribe to our distribution list. Please send an e-mail to (brewton@uga.edu) to update your e-mail address or to be added to our distribution list. You will then receive an email to inform you when each new issue is posted on our website (four emails each year). As always, if you have suggestions for improvement of the *BRIEFS*, please let us hear from you. Our goal is to provide information of interest to you. (Prepared by Mark Ruder)

Recent SCWDS Publications Available

Below are some recent publications authored or co-authored by SCWDS personnel. Many of these can be accessed online from the web pages of the various journals. If you do not have access to this service and would like to have a copy of any of these papers, let us know. Most can be sent to you electronically with minimal effort. For your convenience, please email Jeanenne Brewton (brewton@uga.edu) directly with requests, or fill out the form on page 7, and check the appropriate box to receive either an electronic copy or a hard copy and return it to us: SCWDS, College of Veterinary Medicine, University of Georgia, Athens, GA 30602.

____ Allen, S.E., S.L. Vigil, C.M. Jardine, T. Furukawa-Stoffer, N. Colucci, A. Ambagala, M.G. Ruder, and N.M. Nemeth. 2022. New distribution records of biting midges of the genus *Culicoides* (Diptera: Ceratopogonidae) Lattreille, *Culicoides bergi*, and *Culicoides baueri*, in southern Ontario, Canada. *Journal of Medical Entomology* 59(4): 1467-1472. doi: 10.1093/jme/tjac047.

____ Ayala, A.J., L.K. Haas, B.M. Williams, S.S. Fink, M.J. Yabsley, and S.M. Hernandez. 2022. Risky business in Georgia's wild birds: contact rates between wild birds and backyard chickens is influenced by supplemental feed. *Epidemiology and Infection* 150: e102. doi: 10.1017/S0950268822000851.

____ Baumgartner, W., F. Gonul Aydin, K. Bateman, M. Clinton, P. Duignan, M. El-Matbouli, M. Forzan, L. Foyle, S. Hatem, G. Lewbart, R. Loh, N. Nemeth, and A. Alcivar-Warren. 2021. Pathology and Epidemiology of Aquatic Diseases. Chapter 4 in *Fundamentals of Aquatic Veterinary Medicine*. Urdes L, Walster C, Tepper J (eds.). Wiley Blackwell. ISBN: 978-1-119-61270-4.

- ____ Box, E.K., C.A. Cleveland, K. Subramaniam, T.B. Waltzek, and M.J. Yabsley. 2021. Molecular confirmation of ranavirus infection in amphibians from Chad, Africa. *Frontier Veterinary Science* 8:733939. doi: 10.3389/fvets.2021.733939.
- ____ Christie, K.F., R.L. Poulsen, J.S. Seixas, and S.M. Hernandez. 2021. Avian influenza virus status and maternal antibodies in nestling white ibis (*Eudocimus albus*). *Microorganisms* 9(12): 2468. doi: 10.3390/microorganisms9122468.
- ____ Clarke, L.L., D.G. Mead, M.G. Ruder, D.L. Carter, J. Bloodgood, and E.W. Howerth. 2021. Experimental infection of domestic piglets (*Sus scrofa*) with Rift Valley Fever virus. *American Journal of Tropical Medicine and Hygiene* 106(1): 182-186. doi: 10.4269/ajtmh.21-0188.
- ____ Cleveland, C.A., K.B. Garrett, E.K. Box, A.T. Thompson, E.K. Haynes, D.L. Elder, R.L. Richards, A.A. Majewska, S.A. Guagliardo, R.E. Wiegand, J.A. Bryan II, F. Torres-Velez, K. Unterwegner, M. Romero, H. Zirimwabagabo, M. Sidouin, P. Tchindebet Oaukou, M.M. Ada, B.N.R. Ngandolo, C.D. Mackenzie, T.G. Geary, A.J. Weiss, and M.J. Yabsley. 2022. Investigating flubendazole as an anthelmintic treatment for Guinea worm (*Dracunculus medinensis*): Clinical trials in laboratory-reared ferrets and domestic dogs in Chad. *American Journal of Tropical Medicine and Hygiene* 106(5): 1456-1465. doi: 10.4269/ajtmh.21-1222.
- ____ Cunningham, M.W., D.P. Onorato, K.A. Sayler, E.H. Leone, K.J. Conley, D.G. Mead, J.A. Crum Bradley, R.K. Maes, M. Kiupel, D.B. Shindle, S.M. Wisely, K. Subramaniam, A.G. Wise, B.C. Clemons, L.M. Cusack, D. Jansen, P. Schueler, F.A. Hernandez, and T.B. Waltzek. 2021. Pseudorabies (Aujeszky's disease) is an underdiagnosed cause of death in the Florida panther (*Puma concolor coryi*). *Journal of Wildlife Diseases* 57(4): 784-798. doi: 10.7589/JWD-D-20-00119.
- ____ Curtis, M.W., A. Krishnavajhala, A.R. Kneubehl, M.E. Embers, J.R. Gettings, M.J. Yabsley, and J.E. Lopez. 2022. Characterization of immunological responses to *Borrelia* immunogenic Protein A (BipA), a species-specific antigen for North American tick-borne relapsing fever. *Microbiology Spectrum* 10(3): e0172221. doi: 10.1128/spectrum.01722-21.

- De Luca, E., S. Alvarez-Narvaez, G. Maboni, R.P. Baptista, N.M. Nemeth, K.D. Niedringhaus, J.T. Ladner, J.M. Lorch, G. Koroleva, S. Lovett, G.F. Palacios, and S. Sanchez. 2021. Comparative genomics analyses support the reclassification of Bisgaard Taxon 40 as *Mergibacter* gen. nov., with *Mergibacter septicus* sp. nov. as type species: novel insights into the phylogeny and virulence factors of a *Pasteurellaceae* family member associated with mortality events in seabirds. *Frontiers in Microbiology* 12: 667356. doi: 10.3389/fmicb.2021.667356.
- Dorak, S.J., C. Varga, M.G. Ruder, P. Gronemeyer, N.A. Rivera, D.R. Dufford, D.J. Skinner, A.L. Roca, J.E. Novakofski, and N.E. Mateus-Pinilla. 2022. Spatial epidemiology of hemorrhagic disease in free-ranging white-tailed deer in Illinois. *Scientific Reports* 12(1): 6888. doi: 10.1038/s41598-022-10694-y.
- Francisco, R., S.M. Hernandez, D.G. Mead, K.G. Adcock, S.C. Burke, N.M. Nemeth, and M.J. Yabsley. 2022. Experimental susceptibility of North American raccoons (*Procyon lotor*) and striped skunks (*Mephitis mephitis*) to SARS-CoV-2. *Frontiers in Veterinary Science* 8: 715307. doi: 10.3389/fvets.2021.715307.
- Ganoe, L.S., J.D. Brown, M.J. Lovallo, M.J. Yabsley, K.B. Garrett, A.T. Thompson, R.H. Poppenga, M.G. Ruder, and W.D. Walter. 2021. Surveillance for diseases, pathogens, and toxicants of muskrat (*Ondatra zibethicus*) in Pennsylvania and surrounding regions. *PLoS One* 16(12): e0260987. doi: 10.1371/journal.pone.0260987.
- Garrett, K., A. Halseth, M.G. Ruder, J. Beasley, B. Shock, A.J. Birkenheuer, M. Gabriel, C. Fiorello, M.M. Haire, C. Olfenbuttel, M.K. Keel, and M.J. Yabsley. 2022. Prevalence and genetic characterization of a *Babesia microti*-like species in the North American river otter (*Lontra canadensis*). *Veterinary Parasitology: Regional Studies and Reports* PMID: 3525613. doi: 10.1016/j.vprsr.2022.100696.
- Greenfield, J.B., M.V. Anderson, E.A. Dorey, E. Redman, J.S. Gillear, N.M. Nemeth, and J.L. Rothenburger. 2022. Molecular characterization of *Sarcocystis* spp. as a cause of protozoal encephalitis in a free-ranging black bear. *Journal of Veterinary Diagnostic Investigation* 34(1): 146-152. doi: 10.1177/10406387211038389.
- Grunert, R.K., E.K. Box, K.B. Garrett, M.J. Yabsley, and C.A. Cleveland. 2022. Effects of Temephos (Abate®), Spinosad (Natular®), and Diflubenzuron on the survival of cyclopoid copepods. *American Journal of Tropical Medicine and Hygiene* 106(3): 818-822. doi: 10.4269/ajtmh.21-0818.
- Grunert, R.K.A., M.R. Kunkel, R. Radisic, N.M. Nemeth, L.A. Shender, V. Guzman-Vargas, M.W. Cunningham, and M.J. Yabsley. 2022. Notoedric mange (*Notoedre centrifera*) in two species of free-ranging rabbits from Florida, USA. *Veterinary Parasitology: Regional Studies and Reports* 33:100748. doi: 10.1016/j.vprsr.2022.100748.
- Jerry, C., D.E. Stallknecht, C. Leyson, R. Berghaus, B. Jordan, M. Patin-Jackwood, and M.S. Franca. 2021. Age-associated changes in recombinant H5 highly pathogenic and low pathogenic avian influenza hemagglutinin tissue binding in domestic poultry species. *Animals (Basel)* 11(8): 2223. doi: 10.3390/ani11082223.
- Kunkel, M.R., D.G. Mead, R.D. Berghaus, K.G. Adcock, M.G. Ruder, and N.M. Nemeth. 2021. Experimental West Nile virus infection in northern bobwhite quail (*Colinus virginianus*). *Avian Diseases* 65(4): 523-529.
- Kunkel, M.R., D.G. Mead, M.G. Ruder, and N.M. Nemeth. 2022. Our current understanding of West Nile virus in upland game birds. *Wildlife Society Bulletin* 46: e1269. doi: 10.1002/wsb.1269.
- Longshaw, M., W. Baumgartner, T. Becker Welsh, J.E. Bogan, E. Danyer, S. Kasper, N.M. Nemeth, A. Maas, and A. Alcivar-Warren. 2021. Taxonomy, Anatomy and Physiology. Chapter 2 in *Fundamentals of Aquatic Veterinary Medicine*. Urdes L, Walster C, Tepper J (eds.). Wiley Blackwell.
- MacDonald, A.M., J.B. Johnson, M.J. Casalena, N.M. Nemeth, M. Kunkel, M. Blake, and J.D. Brown. 2022. Active and passive disease surveillance in wild turkeys (*Meleagris gallopavo*) from 2008-2018 in Pennsylvania, USA. *Wildlife Society Bulletin* 46: e1289. doi: 10.1002/wsb.1289.
- Murray, M.H., S.M. Hernandez, R.S. Rozier, A.D. Kidd, J. Hepinstall-Cyberman, S.E. Curry, M.J. Yabsley, H. Adams, T. Ellison, C.N. Welch, and E.K. Lipp. 2021. Site fidelity is associated

- with food provisioning and *Salmonella* in an urban wading bird. *Ecohealth* 18(3): 345-358. doi: 10.1007/s10393-021-01543-x.
- _____. Nalls, A.V., E.E. McNulty, A. Mayfield, J.M. Crum, M.K. Keel, E.A. Hoover, M.G. Ruder, and C.K. Mathiason. 2021. Detection of chronic wasting disease prions in fetal tissues of free-ranging white-tailed deer. *Viruses* 13(12): 2430. doi.org/10.3390/v13122430.
- _____. Nemeth, N.M., and M.J. Yabsley. 2021. *Field Manual of Wildlife Diseases in the Southeastern United States, 4th Edition*. Southeastern Cooperative Wildlife Disease Study College of Veterinary Medicine, University of Georgia, Athens, GA. 321 pp.
- _____. Niedringhaus, K.D., L.S. Ganoe, M. Lovallo, W.D. Walter, M.J. Yabsley, and J.D. Brown. 2022. Fatal infection with *Versteria* sp. in a muskrat, with implications for human health. *Journal of Veterinary Diagnostic Investigation* 34(2): 314-318. doi: 10.1177/10406387211064270.
- _____. Prosser, D.J., J. Chen, C.A. Ahlstrom, A.B. Reeves, R.L. Poulson, J.D. Sullivan, D. McAuley, C.R. Callahan, P.C. McGowan, J. Bahl, D.E. Stallknecht, and A.M. Ramey. 2022. Maintenance and dissemination of avian-origin influenza A virus within the northern Atlantic Flyway of North America. *PLoS Pathogens* 18(6): e1010605. doi: 10.1371/journal.ppat.1010605.
- _____. Prosser, D.J., H.L. Schley, N. Simmons, J.D. Sullivan, J. Homyack, M. Weegman, G.H. Olsen, A.M. Berlin, R.L. Poulson, D.E. Stallknecht, and C.K. Williams. 2022. A lesser scaup (*Aythya affinis*) naturally infected with Eurasian 2.3.4.4 highly pathogenic H5N1 avian influenza virus: movement ecology and host factors. *Transboundary Emerging Diseases* doi: 10.1111/tbed.14614.
- _____. Ramey, A.M., N.J. Hill, T.J. DeLiberto, S.E.J. Gibbs, M.C. Hopkins, A.S. Lang, R.L. Poulson, D.J. Prosser, J.M. Sleeman, D.E. Stallknecht, and X.F. Wan. 2022. Highly pathogenic avian influenza is an emerging disease threat to wild birds in North America. *Journal of Wildlife Management* 86(2): e22171; <https://doi.org/10.1002/jwmg.22171>.
- _____. Ramey, A.M., A.B. Reeves, B.J. Lagassé, V. Patil, L.E. Hubbard, D.W. Kolpin, R.B. McCleskey, D.A. Repert, D.E. Stallknecht, and R.L. Poulson. 2022. Evidence of interannual persistence of infectious influenza A viruses in Alaska wetlands. *Science of the Total Environment* 803: 150078. doi: 10.1016/j.scitotenv.2021.150078.
- _____. Rivera, N.A., C. Varga, M.G. Ruder, S.J. Dorak, A.L. Roca, J.E. Novakofski, and N.E. Mateus-Pinilla. 2021. Bluetongue and epizootic hemorrhagic disease in the United States of America at the wildlife-livestock interface. *Pathogens* 10(8): 915. doi: 10.3390/pathogens10080915.
- _____. Robinson, C.A., P.A. Dunn, L.M. Williams, R.L. Poulson, E.A. Miller, H.M. Brown, and J.D. Brown. 2021. Characterization of avian pox in a ruffed grouse (*Bonasa umbellus*) from Pennsylvania. *Avian Diseases* 65(3): 453-455. doi: 10.1637/0005-2086-65.3.453.
- _____. Romer, Y., K.G. Adcock, Z. Wei, D.G. Mead, O. Kirstein, S. Bellman, A. Piantadosi, U. Kitron, and G.M. Vazquez-Prokopec. 2022. Isolation of heartland virus from lone star ticks, Georgia, USA, 2019. *Emerging Infectious Diseases* 28(4): 786-792.
- _____. Roy, C.L., M. Carstensen, K. LaSharr, C. Humpal, T. Dick, M. Kunkel, and N.M. Nemeth. 2022. West Nile virus exposure and infection among hunter-harvested ruffed grouse (*Bonasa umbellus*) cohorts in a stable population. *Journal of Wildlife Diseases* 58(1): 30-39. doi: 10.7589/JWD-D-21-00018.
- _____. Seixas, J.S., S.M. Hernandez, M.R. Kunkel, A. Weyna, M.J. Yabsley, L. Shender, and N.M. Nemeth. 2022. West Nile virus infections in an urban colony of American white ibises (*Eudocimus albus*) in South Florida, USA. *Journal of Wildlife Diseases* 58(1): 205-210. doi: 10.7589/JWD-D-21-00030.
- _____. Sheikh, M.O., C.J. Capicciotti, L. Liu, J. Praissman, D.G. Mead, M.A. Brindley, T. Willer, K.P. Campbell, K.W. Moremen, L. Wells, and G.J. Boons. 2022. Cell surface glycan engineering reveals that matriglycan alone can recapitulate dystroglycan binding and function. *Nature Communications* 13(1): 3617. doi: 10.1038/s41467-022-31205-7.
- _____. Shender, L.A., T. Cody, M. Ruder, H. Fenton, K.D. Niedringhaus, J. Blanton, J. Motes, S. Schmedes, and E. Forys. 2022. Heavy rainfall,

- sewer overflows, and salmonellosis in black skimmers (*Rynchops niger*). *Ecohealth* 19(2): 203-215. doi: 10.1007/s10393-022-01596-6.
- Stallknecht, D.E., A. Fojtik, D.L. Carter, J.A. Crum-Bradley, D.R. Perez, and R.L. Poulsom. 2022. Naturally acquired antibodies to influenza A virus in fall-migrating North American mallards. *Veterinary Sciences* 9(5): 214. doi: 10.3390/vetsci9050214.
- Taylor, K., J.J. Wilson, A.W. Park, N.M. Nemeth, M.J. Yabsley, H. Fenton, M.K. Keel, and N.L. Gottdenker. 2021. Temporal and spatial patterns in canine distemper virus cases in wildlife diagnosed at the Southeastern Cooperative Wildlife Disease Study (SCWDS), 1975-2019. *Journal of Wildlife Diseases* 57(4): 820-830. doi: 10.7589/JWD-D-20-00212.
- Thompson, A.T., K.B. Garrett, M. Kirchgessner, M.G. Ruder, and M.J. Yabsley. 2022. A survey of piroplasms in white-tailed deer (*Odocoileus virginianus*) in the southeastern United States to determine their possible role as *Theileria orientalis* hosts. *International Journal for Parasitology: Parasites and Wildlife* 18: 180-183. doi: 10.1016/j.ijppaw.2022.05.005.
- Vinson, J.E., A.W. Park, C.A. Cleveland, M.J. Yabsley, V.O. Ezenwa, and R.J. Hall. 2021. Alternative transmission pathways for guinea worm in dogs: implications for outbreak risk and control. *International Journey for Parasitology* 51(12): 1027-1034. doi: 10.1016/j.ijpara.2021.05.005.
- Weaver, G.V., N. Anderson, K. Garrett, A.T. Thompson, and M.J. Yabsley. 2022. Ticks and tick-borne pathogens in domestic animals, wild pigs, and off-host environmental sampling in Guam, USA. *Frontier Veterinary Science* 8:803424. doi: 10.3389/fvets.2021.803424.
- Weyna, A.A.W., K.D. Niedringhaus, M.R. Kunkel, H.M.A. Fenton, M.K. Keel, A.H. Webb, C. Bahnsen, R. Radisic, B. Munk, S. Sanchez, and N.M. Nemeth. 2022. Listeriosis with viral coinfections in 8 gray foxes, 8 wild turkeys, and 2 young cervids in the southeastern United States. *Journal of Veterinary Diagnostic Investigation* 34(4): 654-661. doi: 10.1177/10406387221104830.
- Weyna, A.A.W., M.G. Ruder, M.F. Dalton, C. Bahnsen, M.K. Keel, H. Fenton, J.R. Ballard, and N.M. Nemeth. 2022. Distinctive gross presentation in free-ranging white-tailed deer (*Odocoileus virginianus*) with rabies. *Journal of Wildlife Diseases* doi: 10.7589/JWD-D-21-00176.
- Willis, E.E., K.D. Niedringhaus, J.R. Ballard, and N.M. Nemeth. 2021. Pathology in Practice: Chondrosarcoma in a duck. *Journal of the American Veterinary Medical Association* 259(10): 1114-1116. doi: 10.2460/javma.19.07.0325.
- Yabsley, M.J., and S.G.H. Sapp. *Ascarids*. 5th Edition. Greene's Infectious Disease of Dogs and Cats. 1,376 pp.
- Young, K.T., J.Q. Stephens, R.L. Poulsom, D.E. Stallknecht, K.M. Dimitrov, S.L. Butt, and J.B. Stanton. 2022. Putative novel avian paramyxovirus (AMPV) and reidentification of AMPV-2 and AMPV-6 to the species level based on wild bird surveillance (United States, 2016-2018). *Applied and Environmental Microbiology* 88(11): e0046622. doi: 10.1128/aem.00466-22.

PLEASE SEND REPRINTS MARKED TO:

NAME _____

E-MAIL _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

ELECTRONIC COPY HARD COPY

SCWDS BRIEFS

Southeastern Cooperative Wildlife Disease Study
College of Veterinary Medicine
The University of Georgia
Athens, Georgia 30602-4393

Nonprofit Organization
U.S. Postage
PAID
Athens, Georgia
Permit No. 11

RETURN SERVICE REQUESTED



Information presented in this newsletter is not intended for citation as scientific literature. Please contact the Southeastern Cooperative Wildlife Disease Study if citable information is needed.

Information on SCWDS and recent back issues of the *SCWDS BRIEFS* can be accessed on the internet at
<https://vet.uga.edu/scwds>.

Beginning January 2023, the *BRIEFS* will only be available online and distributed by email. In anticipation of this change, please send an email to Jeanenne Brewton (brewton@uga.edu) or Michael Yabsley (myabsley@uga.edu) and you will be informed each quarter when the latest issue is available.
