Program Updates from the Administrator

Special Symposium at the Annual NEAFWA Conference

NWDC and the Cornell Wildlife Health Lab organized a special symposium, “Ongoing and Emerging Threats to Wildlife Health in the Northeast,” at the 74th Annual Northeast Fish & Wildlife Conference (April 15-17, 2018, Burlington, Vermont). We had an outstanding group of speakers who presented on the following topics during the morning session on Tuesday, April 17. Several of the presentations were products of collaborations between NWDC Members and participating diagnostic labs.

8:00 Not just influenza virus: The emergence of novel orthomyxoviruses in the USA associated with morbidity and mortality in wildlife and humans (Andrew Allison, Virginia-Maryland College of Veterinary Medicine)

8:20 Perkinsus-like infection in amphibians - an emerging disease? (Maria Forzan, Cornell University)

8:40 Infection with a divergent clade of canine distemper virus in ten mesocarnivores in New Hampshire and Vermont from 2016-2017 (David Needle, New Hampshire Veterinary Diagnostic Lab)

9:00 Meet the new kid on the block: hemorrhagic disease of deer (Mark Ruder, Southeastern Cooperative Wildlife Disease Study, University of Georgia)

9:20 New York’s Adirondacks moose population health metrics (Krysten Schuler, Cornell)

10:20 Sources of mortality for bald eagles in New York State (Kevin Hynes, New York State Department of Environmental Conservation)

10:40 Naturally occurring diseases in the Canada lynx (Lynx canadensis) population of Maine (Brian Stevens, NHVDL)

11:00 Diagnosing the cause of mange in black bears (Ursus americanus) in Pennsylvania (Justin Brown, Pennsylvania Game Commission)

Member Questionnaire

NWDC staff have developed and distributed a questionnaire for members so we can assess their wildlife health-related needs going forward. We look forward to the responses and input on services that are high priority.

Request for Feedback on “Diagnostics 101” Webinar

We hosted a 1-hour webinar, “Diagnostics 101,” presented by Dr. Maria Forzan (Cornell Wildlife Health Lab) on March 16. Dr. Forzan described some of the diagnostic tests commonly used in wildlife cases (e.g. PCR, ELISA). We are seeking feedback on the webinar. Specifically, are there additional topics, related to diagnostics, that Members would like to learn more about? Would you like to hear the same webinar a second time with more time for questions? Please get in touch with NWDC staff with your suggestions.
Update on the Development of an ELISA for *P. tenuis*

On April 27, Dr. Rick Gerhold provided an update on his progress developing a serum assay for *P. tenuis* via webinar. The grant to accomplish this work is administered by NWDC and funding has been provided cooperatively by Maine Department of Inland Fisheries and Wildlife, the Vermont Fish and Wildlife Department, and the New Hampshire Department of Fish and Game Department.

From the Pathologists

Epizootic Hemorrhagic Disease of Deer (EHD) in a Whitetail Doe from DE

Julie B. Engiles, VMD, DACVP, Dept. of Pathobiology, New Bolton Center, Kennett Square, PA
Jacob M. Haus, Ph.D; Justin R. Dion; Jacob L. Bowman, Ph.D, Department of Entomology and Wildlife Ecology, University of Delaware, Newark, DE
Joseph E. Rogerson, Delaware Division of Fish and Wildlife, Smyrna, DE

As part of an ongoing investigation into white-tailed deer (*Odocoileus virginianus*) survival, researchers from the University of Delaware in collaboration with the Delaware Division of Fish and Wildlife captured and placed GPS tracking devices on adult deer in Sussex County, Delaware. An adult female (3.5 years old) was captured in early January 2017. Beginning 10 days prior to death, data from the device showed limited movement characterized by repeated long periods spent in one location followed by movement to a slightly different area with another long period spent in that location. The deer died 10/11/17 near a wetland area adjacent to an agricultural row crop field. Mild scavenging was noted on the hindquarters; however, the viscera were not exposed and there were no signs of trauma. The deer was submitted for postmortem examination to the University of Pennsylvania’s New Bolton Center.

Grossly, the heart sac and chest cavity contained a moderate amount of dark red bloody fluid (effusion) (Figure 1). Pinpoint hemorrhages (petechiae) were observed throughout the surface of the lungs, and the surfaces (serosa) of the forestomachs and abomasum. Multifocal 1-2cm dark red, wedge-shaped ulcers were observed throughout the surface of the lungs, and the surfaces (serosa) of the forestomachs and abomasum. Multifocal 1-2cm dark red, wedge-shaped ulcers were

Histologically, hemorrhages within the rumen mucosa (Figure 2A) corresponded to segmental leukocytoclastic vasculitis within the submucosa (Figure 2B). Mucosal hemorrhages within the urinary bladder (Figure 2C) were associated with erosion and ulcers of the epithelium (Figure 2D). The spleen contained foci of necrosis with hemorrhage and fibrin, as well as follicular lymphoid depletion (Figure 2E) and pigment deposition (hemosiderosis) (Figure 2F), indicative of prior hemorrhage. The colon had mild white blood cell infiltrates in the mucosa, and the covering of the brain was congested. Postmortem deterioration (autolysis) precluded histologic interpretation of the abomasum and small intestine. Postmortem lesions (necrotizing splanchic vasculitis with hemorrhagic mucosal infarcts, pulmonary edema, hemothorax and hemopericardium) and seasonal data were suspicious...
for Epizootic Hemorrhagic Disease Virus (EHDV), which was confirmed by PCR tests performed on the spleen and lung at the Pennsylvania Veterinary Diagnostic Laboratory (PVL- Harrisburg, PA).

EHDV (genus Orbivirus in the family of Reoviridae) is maintained in domestic and wild ruminants through transmission by biting midges (Culicoides insect vector) (Ruder, et al; 2015). Currently, seven serotypes of EHDV (1,2, and 4-8) have been identified worldwide (Anthony, et al; 2009). However, the temperate and tropical climates of the continental United States that support vector populations is where these viruses are reported to cause consistent disease (seasonal cyclical epizootics in mid-summer to late autumn) with serotypes 1 and 2 being most prominent (Howerth, et al; 2001). Endemic stability occurs in free-ranging Whitetail deer that have high percentage of seroconverted animals with generally few reports of clinically apparent disease or mortality (Stallknecht, et al; 1995). But, see http://vet.uga.edu/population_health_files/briefs/2017_OCT_SCWDS_Briefs_Newsletter.pdf for a summary of the intense outbreaks in the central and eastern U.S., including the first confirmation of EHDV in Connecticut, during the 2017 season. Clinical signs of EHDV in Whitetail deer includes anorexia and pyrexia, hypersalivation, lameness, and crustating and ulcerative stomatitis and mamillitis (Stevens et al; 2015), as well as edema of the head and neck, dyspnea and tachypnea in the peracute form, as well as ulcerative and hemorrhagic lesions throughout the alimentary tract in the acute “classic hemorrhagic” form, or hoof wall lesions in the “chronic” form of the disease (SCWDS, 2013; http://vet.uga.edu/population_health_files/hemorrhagic-disease-brochure-2013.pdf). The lesions in this doe are compatible with the acute “classic hemorrhagic” form of EHD occurring within the expected seasonal period.

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References


**From the Field**

Note: we encourage members to contact NWDC Wildlife Veterinarian, Dr. Walt Cottrell, with questions about diseased wildlife. This section of the newsletter highlights some of the inquiries he has received from agency biologists. The observations reported here are featured because they are particularly interesting or unusual, or because they may be useful to biologists in other states who could make similar observations.

**From the Vermont deer biologist:**

Hi Walt,

I hope this note finds you well and persevering through another Vermont winter. I received a note from a friend who noticed a blue stained patch of snow under an apple tree in his yard where deer are frequent visitors (Fig. 4). He describes it as though someone poured windshield wash fluid there. There appears to be just the single patch. He is wondering about blue deer urine. I am thinking if it is deer urine, it is reacting with something in the snow. Have you ever observed something like this?

Just curious,

John

**From Walt:**

John,

You do find the most interesting observations…

My first reaction to this history is “Were there any tire tracks?” Then I wondered about what in buried apples might be contributing.

However, there is a genetic condition in humans called porphyria. Porphyria (por-FEAR-e-uh) comes from the Greek “porphyrus”, which means purple. It is a group of disorders that result from a buildup of natural chemicals that produce porphyrin. Porphyrins are pigments and among them is heme, the red pigment that colors red blood cells. When these pigments are excreted in the urine and exposed to UV light they turn “glass cleaner blue.” Attacks of these conditions can be brought on by reducing total caloric intake to starvation levels, or following an unbalanced diet. The acute porphyrias can be affected by diet; the chemical pathway in the liver that makes heme from porphyrins and other precursor substances registers changes between the fed and fasting states. The normal fast that occurs between meals and overnight is not one of these, but prolonged fasting (greater than 24 hours) may be. Certainly, this year the deer have been able to move around pretty freely so fasts should be uncommon. And you’d think that with all the dead deer searches and similar invasions of winter habitat over the years, this phenomenon would have been reported. But these conditions are genetic in origin and uncommonly fatal, so may be quite isolated and go undetected. The pathways are basically the same in a ruminant and a human, so I see no reason why this tentative diagnosis can’t be applied to deer. For now, porphyria is the most plausible explanation for this reported observation.

Regards,

Walt

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*Figure 4. Blue stains in the snow, potentially from a white-tailed deer with porphyria.*
From the Vermont Deer Biologist:

Hi Walt,

See below. Any thoughts?

Hey Nick,

I was contacted by a hunter in Montgomery who shot a Doe with several tumors inside it. See pictures attached. Wants to know if this is fine to eat.

Please let me know as he has 48hrs to report it. If the deer is something you’d like to examine let me know!

Josh

From Walt:

Nick,

Sorry for the delay. Here’s what Brian Stevens, a pathologist at UNH says:

“To me, there are two possibilities I’d want to rule out for this type of lesion. The first would be a neoplasm of some description (most likely an ovarian or pancreatic neoplasm as they’ll be associated with carcinomatosis) and the second would be echinococcosis (caused by Echinococcus granulosus). If it’s a tumor then those nodules should predominantly be solid, whereas echinococcosis they would be cystic.

Obviously getting one or more of these nodules into formalin and examined by someone like us would be ideal, but I can’t see that happening. As for whether it is safe to eat. With the neoplasm then no problem at all. As for echinococcosis, the meat is safe to eat as long as the tissue is not affected by similar nodules (typically humans are infected via feces of infected canids so it’s unlikely the hydatid cysts seen in deer would be infective to humans, but I wouldn’t risk eating a cyst personally…plus that can’t taste great).”

As you can see the differential is either tumors or evidence of a parasite: The distinction can be made by seeing if these yellow masses are solid or cystic. In all cases if the hunter decides he wants to eat it they are trimmed aggressively and disposed of carefully.

Samples would be welcome but it would have to be decided by you and Scott if these fall into the “Unusual lesions” part of your Surveillance Plan.

Regards,
Walt

Follow up from VT

Walt,

I performed a very quick field-necropsy on this deer today. The doe was quite old (I estimate 8+ based on tooth wear), and in poor condition. She had almost no fat and the pelvis and spine were fairly prominent. The masses were all solid and associated with the peritoneum, supporting the suggestion of peritoneal carcinomatosis. The hunter somehow left the uterus and ovaries in while removing everything around them – they appeared normal. I collected several of the masses and have them in formalin, should we decide a more definitive diagnosis is necessary.

Nick