A JOINT PROJECT BETWEEN

USDA APHIS WILDLIFE SERVICES

AND

INDIANA DNR DIVISION OF FISH AND WILDLIFE

Indiana Wildlife Disease News

Volume 6, Issue 2 Spring 2011

Special points of interest:

- Deer fibroma
- Results from Ft. Wayne Coyote
- Update on WNS and other disease in the Midwest
- Information on new Hepatitis E surveillance

Inside this issue:

Disease in Focus

Deer fibroma

Description

Wart-like growths found on the skin of white-tailed deer and other members of the deer family are fibromas. They are popularly referred to as skin tumors, or simply warts. Histopathologists identify skin tumors from deer as papillomas, fibromas, or papillofibromas depending upon the predominate type of tissue making up the tumor. Since there is evidence that skin tumors common to deer are caused by one kind of virus, and the differences that have been described for them is due to their age, all will be treated as one, the fibroma, in this discussion.

An infection with fibromas is called fibromatosis.

Fibromas are conspicuous as firm, nodular masses fastened only to the skin and varying in diameter from 10 to more than 100mm. All are fleshy. Some are covered with gray or dark skin which often is scratched and bleeding. Others have a black, dry, hard surface that may be fissured much like the head of a cauliflower. The larger ones tend to be pendulous because of their weight and stem-like attachment to the skin.

Fibromas are randomly distributed on deer but occur most frequently about the eyes, neck, face, and forelegs. They may be

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Disease Investigation Update

Oral squamous papillomas in an Indiana Coyote

In January 2011, USDA-APHIS-Wildlife Serices Wildlife Disease Biologist Caudell was referred to a landowner in northeast Indiana who had shot a coyote with obvious signs of disease around the muzzle. Caudell picked up the animal and prepared it for submission to the diagnostic lab at the National Wildlife Health Center (NWHC). The coyote was shipped to the NWHC in March 2011. The coyote was negative for heartworm, distemper, parvo virus, and was generally in good condition. The coyote was diagnosed with multiple squamous papillomas of the mouth of an unknown origin. While this is not common is coyotes, it has been reported several times in the literature (Trainer et al. 1968, Samuel et al. 1978).

References

Samuel, W. M., G. A. Chalmers, and J. R. Gunson. 1978. Oral papillomatosis in coyotes and wolves of Alberta. Journal of Wildlife Diseases 14:165-169.

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J. N. Caudell, USDA

Deer fibromas (Cont. from pg 1)

single or multiple. A heavily infected deer may have 25 or more. Occasionally, in multiple infections, they are so numerous and close together that they join into a coalescent mass. However, the incidence of severe involvement is extremely low, judging from the fact that not more than 2 or 3 cases in the whole state are reported to us a year.

Distribution

The disease occurs statewide in Michigan, and has been reported in white-tailed deer, black-tailed deer, and mule deer over much of their respective North American ranges. Similar skin tumors have been reported from moose on Isle Royale and in British Columbia.

In a survey made in New York state it was found that the incidence of fibromatosis is highest in deer 2.5 years of age and younger, and 5 times higher among bucks than does. Records obtained for Michigan through necropsies, field reports, and check station operations also indicate this is primarily a disease of young male deer.

Geographic distribution for type A (red circles) and type B (yellow circles) *Francisella*

Transmission and Development

Fibromas can be experimentally transmitted by rubbing fibroma tissue onto the scratched skin of a susceptible deer. How transmission is accomplished in the wild is not known. Possibly, it is through contact of broken skin with infectious material, either from an infected deer or vegetation which has been rubbed or brushed by an infected deer. The fact the incidence is highest among bucks suggests that fighting is a means for the spread of the disease. Biting insects may possibly be responsible since many viruses are transmitted by insect vectors.

Clinical Signs and Pathology

The fleshy or wart-like growths attached to the skin are the only sign of fibromatosis. Infected deer behave normally unless the location of the fibromas blocks vision or results in other physical impediment to normal activities.

On cross section, fibromas show a white, tough core of uniform texture covered with a rind of varying thickness and color. Those with a thin layer of skin show a thin and lightly pigmented rind, while those with a hard fissure external surface have a thick dark rind.

Fibromas involve only the skin and have no direct effect on the general health of deer. There may be a secondary effect if the growths are particularly large and located where they cause physical difficulties as in seeing, eating, and running.

Diagnosis

Diagnosis is based on the gross appearance and structure of the growths, and the fact they are attached only to the skin, not the underlying muscles and bones. Confirmation is based on microscopic examination of the tumor tissue.

Treatment and Control

It has been learned from experiments that infections stimulate an immune response in host deer, and thus become self-limiting. In most deer, the fibromas develop to only a few mm in diameter; they abruptly stop growing, dry up, and disappear. Only in an occasional deer do they develop into conspicuous skin tumors. Results of the New York survey indicate that wild deer are exposed and develop an immunity to the fibroma virus early in life.

Treatment is not feasible for most wild populations. The disease has not been reported as a problem in captive herds. Presumably, the growths could be removed surgically if it became important. Since exposure to the virus leads to immunity, it should be possible to develop a vaccine if prevention becomes necessary. To date, clinical disease has been too rare to justify such actions.

Significance

Fibromatosis is not an important cause of deer mortality. The disease is not known to infect humans. It's main significance lies in the consternation and concern experienced by the hunter who shoots a deer covered with ugly-looking lumps. Though they don't harm the meat, fibromas are repulsive to most persons and therefore render a fine trophy aesthetically undesirable.

Some domesticated animals (cattle, dogs, etc.) are subject to "warts" common to their kind. There is no reason to believe that fibromatosis of deer is infectious to domestic animals.

Source: Michigan DNR Wildlife Disease Manual found at http://www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220---,00.html (last accessed on June 2011).

Disease Surveillance Update

Coronavirus surveillance in wild turkeys

Corona viruses are widespread in humans and a number of animals including canids, bovidae, suidae, galliformes, and other species groups. These viruses are often responsible for respiratory and intestinal diseases which differ depending upon the species infected. Corona viruses are assigned to 3 groups. Group 1 consists of different species of corona viruses affecting pigs, canids, felines, humans, and bats. Group 2 consists of different species of corona viruses affecting rodents, humans, cattle, canids, pigs, puffins, and humans. Group 3 consists of different species of corona viruses affecting chickens, turkeys, pheasants, geese, ducks, and pigeons (Cavanaugh 2005). The turkey corona virus was first discovered in Washington State in the late 1940's and in Minnesota in the early 1950's. This disease is highly contagious and often causes heavy losses in commercial poultry. It has been found in the turkey producing areas throughout the U.S. (Clark 2003). In 2009 and 2010 there was a significant outbreak of turkey corona virus in confined turkey houses in Dubois County (primarily the north east quadrant of the county), Indiana, as well as isolated instances in turkey house in Daviess, Pike, and Greene counties. Prior to this, the last outbreak of turkey corona virus in Indiana was in 1995.

Wild turkey. Photo USDA APHIS WS

Turkeys are thought to be the only natural host of turkey corona virus. Pheasants, gulls (species not specified), coturnix quail, and hamsters are immune to infection (Saif 2003). The turkey corona virus can infect turkeys of all ages (Saif 2003). In young poults, it is can cause mortality. In older birds, it can results in reduced growth and egg production (Cavanaugh 2005). In captive birds, the entire flock is exposed to the disease with up to 100% of the birds possibly affected. Mortality commonly ranges from 5 to 50% (Clark 2003). Droopy wings, watery feces, weight loss, dehydration, and fecal staining of the feces are seen in affected birds.

The turkey corona virus is shed in the feces of affected turkeys and ingested by other turkeys. Insects, such as darkling beetles and flies, can also serve as mechanical vectors which can be ingested by turkeys. Other farms and areas can be infected through other mechanical vectors such as people, transportation of litter, movement of equipments, and wild birds. The incubation period for this virus is typically 2 to 3 days. Turkey corona virus is typically shed for several weeks after turkeys have recovered and, during this period, can infect susceptible birds (Saif 2003). Older birds are typically thought to serve as a reservoir for younger birds. For this reason, it is undesirable to have birds of different ages on a single farm (Clark 2003).

Birds that recover from an infection are resistant to additional infection; however, the extent and nature of the immunity is not completely understood (Saif 2003). Corona viruses can be inactivated through common disinfectants. It can also persist for extended periods in dirty or contaminated locations.

Potential effects on wild birds

The actual effect of turkey corona virus on a localized wild turkey population has not been studies; however, I believe we can draw some hypothesis based upon the effects on domestic turkeys and the differences in behavior and ecology of wild turkeys. It is likely that wild turkey can be affected by this disease, probably in a similar manner as domestic turkeys (i.e., reduced weights, reduced egg production, etc.). On a population scale, I would expect that mortality to be significantly less because wild turkeys do not flock in large numbers or live in the same area where they defecate. A mortality event of a localized flock could possible occur, but based on the mortality of captive birds, it would probably be less than 50% of the size of the flock. Because wild turkey flocks consist of young birds during on time per year, any infection should run its course through the flock within a couple of months and should not persist over multiple years without reinfection.

Wild turkeys could become infected through direct contact with infected domestic turkeys (which is unlikely in a typical confined turkey operation), contact with an infected premise (such as the inside of a recently depopulated turkey house), ingestion of insects which serve as a mechanical vector of the disease, or contact with feces that have been recently spread on a pasture or other field. Wild turkeys are most likely to become infected through ingestion of infected insects or through fields that have been recently fertilized with infected feces. The primary concern of infected wild birds would be the reintroduction of the disease to a farm that has been recently decontaminated. However, growers should be able to be mitigated with proper biosecurity.

While we hypothesized that the introduction of turkey corona virus would not have a significant effect on a typical wild turkey population, it is still of interest to determine if wild turkeys are becoming infected around positive farms. We conducted surveillance of wild turkeys around the affected turkey farms during the 2011 Indiana spring wild turkey season to determine if the disease is present in the wild flock.

Disease Surveillance Update

Coronavirus surveillance (Continued from page 3)

Methods

During the spring wild turkey hunt of 2011, surveillance occurred around or on the infected premises in Dubois County. Anyone hunting on these previously infected farms collected a blood samples from wild turkeys that were harvested. The samples were tested atthe Heeke Lab at the Southern Indiana Purdue Agricultural Center in Dubois, Indiana. The blood was spun down and the serum tested using an indirect immunofluorescent antibody test.

Blood collection packets were also sent to 5 Indiana DNR properties in northern Indiana. The properties were chosen because of there were no commercial poultry facilities within the immediate proximity. At these properties, the entire pluck (the trachea, heart, lungs, intestines, and other internal organs) were also removed from the bird.

Results

A total of 39 wild turkeys were collected during the spring turkey season. Eleven birds were collected from Dubois County, 8 samples were collected from Winamac Fish and Wildlife Area (FWA) in Pulaski County, 3 samples were collected from Pigeon River FWA in LaGrange County, 10 samples were collected from Jasper Pulaski FWA in Jasper County, 2 samples from Willow Slough FWA in Newton County, and 3 samples were collected from Kingsbury FWA in LaPorte County. Two additional samples were also collected from wild turkeys in Jackson and Lawrence Counties. 1 sample from Dubois County was positive for turkey corona virus. All other samples were negative.

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Disease Surveillance Update

National surveillance for hepetitis E in wildlife

Hepatitis E Virus (HEV) is one of the five (A, B, C, D, and E) hepatitis viruses that can cause swelling or inflammation of the liver in humans. HEV is a single stranded RNA virus in the genus *Hepevirus*. This disease is prevalent in most developing countries and is primarily spread through contaminated water supplies or consumption of undercooked meat. Since HEV is considered a waterborne disease, major outbreaks are typically observed immediately following typhoons and heavy rains that result in flooding. There are 4 genotypes of HEV found throughout the world. Genotypes 3 and 4 are zoonotic, with domestic swine and several wildlife species (rodents, deer, feral swine) potentially serving as reservoirs. Recent studies have indicated that domestic swine operations may have infection rates as high as 95%. The National Wildlife Disease Program is collaborating with the National Institutes of Health (NIH), and the Food and Drug administration to collect samples to identify whether HEV is circulating in wildlife species and if so which genotypes are most prevalent. Surveillance for HEV will allow for both detection and identification of the genotypes circulating in feral swine and cervid populations. Paired samples (serum and fecal) will be collected to distinguish active shedding from exposure (seroprevalence). Genotyping will be conducted on positive samples. USDA APHIS Wildlife Services will be collecting samples from Indiana white-tailed deer and feral swine to aid in this surveillance.

Feral swine in Indiana. Photo: USDA APHIS WS

Article by J. Caudell, USDA APHIS Wildlife Services

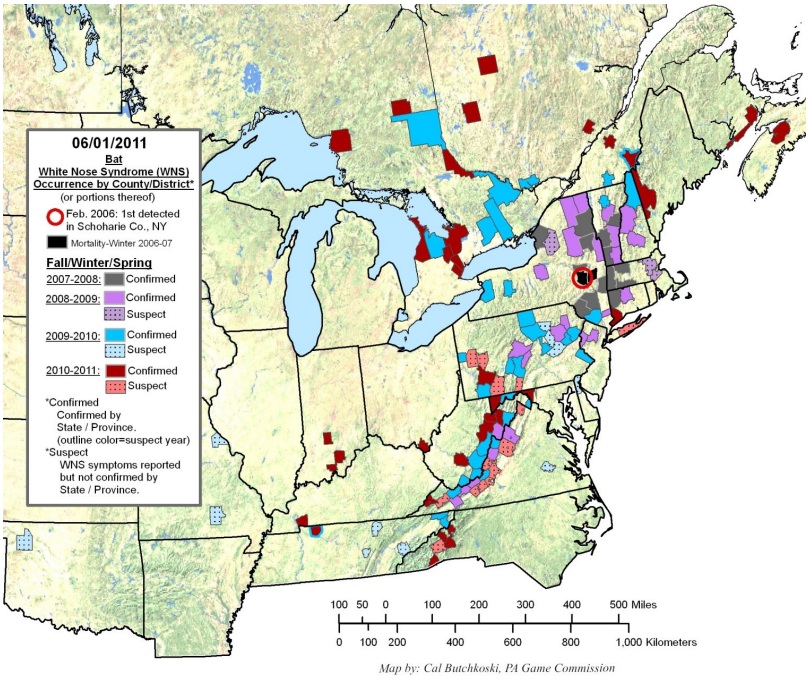
Midwest Wildlife Disease Update

Midwest Wildlife Disease Update
June 2011

Tick-borne Powassan Virus Increasing In Northern US-
A woman in her 60s from northern Minnesota has died from a brain infection due to Powassan (POW) virus. This is the first death in the state attributed to the disease. One other likely POW case has been identified this year in Minnesota, in an Anoka County man in his 60s who was hospitalized with a brain infection and is now recovering at home. POW virus is transmitted through the bite of an infected tick.
Both 2011 cases became ill in May after spending time outdoors and noticing tick bites. Health officials say this death serves as a reminder of the vital importance of preventing tick bites.
"Although Powassan cases are rarely identified, it is a severe disease which is fatal in about 10 percent of cases nationwide, and survivors may have long-term neurological problems" said Dr. Ruth Lynfield, state epidemiologist with the Minnesota Department of Health (MDH). "Powassan disease is caused by a virus and is not treatable with antibiotics, so preventing tick bites is crucial."
In Minnesota, POW virus can be transmitted by the blacklegged tick (also called the deer tick), which can also carry Lyme disease, anaplasmosis, and babesiosis. The blacklegged tick is abundant during our warm weather months in hardwood and mixed-hardwood forests of Minnesota.
POW was first detected in Minnesota in 2008, in a Cass County child who was exposed near home. In 2009-2010, five additional POW cases were identified in Minnesota. These cases were likely exposed to infected ticks in north-central or east-central counties (Cass, Carlton, Hubbard, Itasca, or Kanabec).
POW virus was first described in 1958 in Powassan, Ontario. Since then, about 60 cases have been identified in North America. Most of these cases were from eastern Canada and the northeastern U.S. until the last decade, when cases began to be reported from Michigan, Wisconsin, and now Minnesota.

POW virus is related to West Nile virus (WNV). Like WNV, POW virus can cause severe disease of the central nervous system, involving inflammation of the brain (encephalitis) or the lining of the brain and spinal cord (meningitis). People with POW may have fever, headache, vomiting, weakness, confusion, loss of coordination, speech difficulties, and memory loss. Signs and symptoms occur within one to five weeks of an infectious tick bite. (Source- Wildlife Disease News Digest, July 6, 2011. Weblink to Echo Press News Article, Edited.)

White-Nose Syndrome Expands Presence In Midwest-
The Kentucky Department of Fish and Wildlife Resources and the U.S. Fish and Wildlife Service (USFWS) have detected the presence of white-nose syndrome in a bat residing in Trigg County, located in southwest Kentucky. A suspect little brown bat from a cave in Trigg County, about 30 miles southeast of Paducah, was submitted to the Southeastern Cooperative Wildlife Disease Study (SCWDS) in Athens, Ga., which confirmed the disease in April 2011.



Current distribution of WNS cases. Map courtesy of C. Butchkoski, PA Game Commission.

Ohio and federal biologists surveyed Ohio mines in February and March for white-nose syndrome and to assess bat populations. Samples collected in an abandoned mine, which is gated and protected from public access, on the Wayne National Forest were tested at the Southeastern Cooperative Wildlife Disease Study (SCWDS) in Georgia where scientists confirmed presence of the disease in little brown bats.

In March 2011, wildlife officials sounded the all-clear for white-nose syndrome in Illinois for this year, but after several bats tested positive for white-nose syndrome in south central Indiana last month, it's just a matter of time before the deadly fungus will spread to the Illinois.

White-nose syndrome, a fungus spreading like wildfire through hibernating North American bats, has just been reported in 12 European countries. But unlike the American epidemic, which typically kills 75 percent or more of exposed bats, the European infection has not been associated with mortality. (Source- National Wildlife Health Center, White-Nose Syndrome News, March and April Continued on pg. 6

Indiana Wildlife Disease News

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Indiana DNR
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National Wildlife Disease Surveillance and Emergency Response Program

to provide information on wildlife diseases in Indiana and surrounding states.

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We welcome individuals or agency representatives to act as reviewers or to provide assistance in the production of this newsletter. To assist, please contact one of the editors.

Providing information on wildlife diseases in Indiana and surrounding states

Indiana Department of Natural Resources Division of Fish and Wildlife

The mission of the Division of Fish and Wildlife is to professionally manage Indiana's fish and wildlife for present and future generations, balancing ecological, recreational, and economic benefits. Professional management is essential to the long term welfare of fish and wildlife resources, and providing for human health and safety. Communication between agency professionals and educating the public are important aspects of professional management.

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USDA APHIS Wildlife Services

NATIONAL WILDLIFE DISEASE SURVEILLANCE AND EMERGENCY RESPONSE PROGRAM

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Midwest Wildlife Disease Update (Cont. from pg. 5)

reports, http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/wns_news.jsp, Edited)

Incidence of Lyme Disease Increases Nationally- Last year [2010] nearly 30 000 Americans were diagnosed with Lyme disease and Pennsylvania leads the nation in the number of confirmed cases. According to Allegheny County Health Department spokesperson Guillermo Cole, the number of cases among Allegheny County residents has been hovering in the 20-30 a year range for some time. In 2009 there were 4950 confirmed cases of Lyme disease in all of Pennsylvania.

Lyme disease, which is transmitted by black-legged ticks (Ixodes spp.) or deer ticks, are up in the state of Wisconsin as well. The number of cases statewide in 2010 rose to 2511, up from 1948 in 2009. Locally, both Eau Claire and Chippewa Counties saw an increase in the number of Lyme disease cases. Eau Claire County went from 158 cases in 2009 to 196 in 2010. A bigger deer population, more people living near wooded areas and greater awareness about Lyme disease could be reasons for the higher numbers says Vicky Buhr, a Mayo Clinic Health System nurse practitioner. (Source- ProMED Digest, V2011 #239, June 3, 2011. Edited.)

Column by D. Zimmerman, IDNR