

A JOINT PROJECT
BETWEEN

USDA APHIS
WILDLIFE SERVICES

AND

INDIANA DNR
DIVISION OF FISH AND
WILDLIFE

Indiana Wildlife Disease News



Volume 6, Issue 1

Winter 2011

Special points of interest:

- Tularemia
- White-nose syndrome update
- Recent changes in administration in IDNR
- Midwestern wildlife disease update
- TB update

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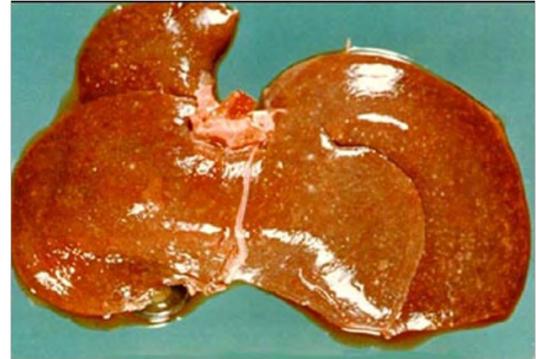
Disease in Focus

Tularemia

Description and Distribution

Tularemia is a disease of rabbits and rodents caused by the bacterium *Francisella tularensis*. The organism can be transmitted by a variety of ectoparasites and by contact with environmental contamination. Mammals (including man), birds and perhaps reptiles are susceptible to infection.

There is evidence that tularemia in man may have occurred in the nineteenth century in the U.S., Norway, Russia and Japan before the isolation of causative organisms from California ground squirrels in 1911. Since its identification, tularemia has been reported from all of the continental U.S. (except Vermont), Canada, Mexico, Venezuela, Ecuador and Colombia. The disease has also been reported from Japan, Russia, Turkey, Israel, Scandinavia, central and western



Liver of a rabbit infected with Tularemia. Photo: Michigan DNR

Europe, Italy, Thailand and Tunisia. It has not been detected in Australia or in the British Isle.

In Michigan, tularemia may be found anywhere in the state, including islands in the Great Lakes. It has been diagnosed in muskrats, beaver, cottontail rabbits, snowshoe hares and a great horned owl. It

Continued on pg. 2

Disease Update

2011 Winter Blackbird Mortality Events in the Southeast Explained

Early in 2011, several avian mortality events occurred that made national media. Below we provide an update on the leading hypothesis of the cause of death to those stories based on information from the USGS National Wildlife Health Center (NWHC):

ARKANSAS - a loud noise(s) caused birds to flush from their night-time roost. These birds became disoriented and stuck objects such as mailboxes,

buildings, and powerlines, resulting in death from blunt force trauma.

LOUISIANA - A strong storm front may have caused birds to flush into powerlines, killing the birds from blunt force trauma.

The NWHC and the US Fish and Wildlife Service reports that these types of impact trauma related cases are not uncommon. Birds that flush due to noises or other reasons can become disoriented and fly into

structures, vehicles, planes, trains (see *Midwest Wildlife Disease Update in this issue for Lafayette, IN example*), and other objects. In addition, migrating birds, especially those migrating at night, have been thought to collide with new structures, such as high rise buildings, that were not there the previous migration season. Birds will also collide with wind turbines and high-tension powerlines.

J. N. Caudell, USDA

Tularemia (Cont. from pg 1)

usually occurs as an epizootic of varying magnitude. However, isolated cases are not rare. The disease appears to be most prevalent in the spring, but it may occur at any time of the year.

Transmission and Development

Transmission of tularemia is accomplished directly by bloodsucking arthropods, mechanically by means of contaminated mouth parts, or by contamination of the host's skin by arthropod discharges. A variety of arthropods may be involved; mites, ticks, flies, midges, blackflies, fleas, mosquitoes and lice. The organism may also be transmitted by contact with infected vertebrates, by inhalation of feces-contaminated dust or ingestion of insufficiently cooked infected carcasses. In addition, waterborne epidemics have been reported, and *F. tularensis* has been found in ponds where there were epidemics among beavers in the northwestern U.S. Human infections are usually the result of dressing or skinning infected rabbits. In the U.S., rabbits are the source of infection in 90% of human cases, 70% of which result from contacts with the genus *Sylvilagus*. Jackrabbits are an important source of infection in some areas, but are a minor factor nationally. Snowshoe hares comprise less than 1% of the source of human infection.

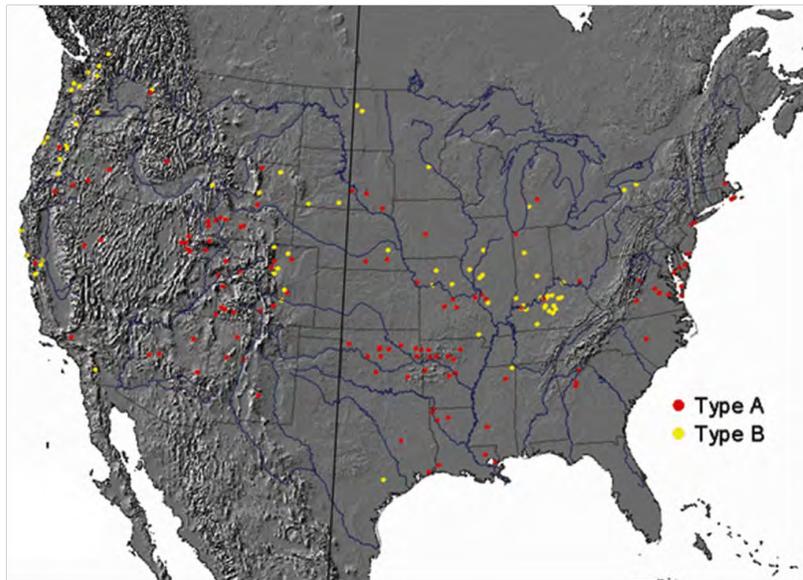
Clinical Signs and Pathology

Clinical manifestations of tularemia in wildlife are not always evident or clearly recognized. Furthermore, the opportunities to observe these signs in natural outbreaks among wild animal populations are extremely limited; when infected animals are found, they are usually moribund or dead.

Tularemia in hares and cottontails have been observed to behave oddly, to run slowly, and to be captured easily. Infected rabbits appear to be tame or in a stupor; they do not raise their heads or carry their front feet well; they rub their noses and forefeet into the ground. They have recurrent muscle spasms, and stagger for a few yards between spasms. Clinical signs in experimentally infected red foxes were loss of appetite, diarrhea, and noisy labored breathing.

In general, the gross and histopathologic lesions of tularemia in mammals resemble those of bubonic plague, or paratuberculosis, in rodents. Typical gross lesions are white foci or spots scattered throughout the liver (see illustration), spleen and lymph nodes, varying in size from pinpoint to large irregular conglomerate foci several millimeters in diameter. The spleen and liver may be dark bluish-red and enlarged.

Lesions in naturally infected muskrats and beaver may include excessive clear dark fluid in the peritoneal and thoracic cavities; petechiae or minute hemorrhages in the subcutaneous fat; congestion in the lungs, liver and spleen; and focal necrosis in the spleen, liver, kidneys and mesenteric lymph nodes.



Geographic distribution for type A (red circles) and type B (yellow circles) *Francisella tularensis* isolates from humans from 1964–2004. Source CDCP; Staples JE, Kubota KA, Chalcraft LG, Mead PS, Petersen JM. Epidemiologic and molecular analysis of human tularemia, United States, 1964–2004. Emerg Infect Dis [serial on the Internet]. 2006 Jul [date cited]. Available from <http://www.cdc.gov/ncidod/EID/vol12no07/05-1504.htm>

Diagnosis

Diagnosis of tularemia is based upon gross and microscopic lesions, and must be confirmed by isolation and identification of the causative organism from tissues or blood of the suspect animal.

Treatment and Control

Although broad-spectrum antibiotics such as tetracycline or chloramphenicol are effective, streptomycin is the most satisfactory drug for treatment of tularemia. Strains resistant to streptomycin, but not to tetracycline or chloramphenicol, have been encountered. It is not economically feasible to treat animals in the wild, and enzootic tularemia of rabbits and rodents cannot be eradicated.

Significance

At times, tularemia kills large numbers of wild animals. However, the effect of this disease on a species or population is not known. Since the disease can be fatal in man it is of public health significance. Sportsmen should be cautioned against drinking from streams in enzootic areas. Hunters should be very suspicious of "lazy" rabbits which are killed easily, and rubber gloves should probably be worn when dressing rabbits. The meat of these animals should be thoroughly cooked.

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 February, 2010).

Disease Surveillance Update

Bats in Indiana tests positive for white-nose syndrome fungus

The Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service have received confirmation that a bat found in a southern Indiana cave has tested positive for the fungus that causes white-nose syndrome (WNS). The case is the state's first for the WNS fungus, believed to be responsible for the deaths of more than one million bats in the eastern United States.

Researchers doing biennial bat counts at Endless Cave in Washington County discovered two little brown bats on Jan. 23 that exhibited the white fungus characteristic of WNS. One of the bats was euthanized and sent to the U.S. Geological Survey's National Wildlife Health Center in Madison, Wisconsin, which later confirmed the presence of the WNS-associated fungus.

Additional bats with signs of WNS were discovered during routine bat count surveys at other caves.

"We knew WNS was likely to reach Indiana caves this year, and we have been working closely with biologists from the DNR to prepare for this as well as we could," said Tom Melius, the Service's Midwest Regional Director. "Nonetheless, it is devastating to actually confirm the presence of the fungus and witness the symptoms of WNS in bats. While there is currently no cure and no treatment for this disease, we will put all our energies into contributing to the ongoing efforts to understand and combat WNS."

The fungus has been discovered in Connecticut, Delaware, Maryland, Massachusetts, Missouri, New Hampshire, New Jersey, New York, Oklahoma, Pennsylvania, Tennessee, Vermont, Virginia, West Virginia and the provinces of Ontario and Quebec, Canada.

Researchers associate WNS with a newly identified fungus, *Geomyces destructans*, which thrives in the cold and humid conditions characteristic of caves and mines used by hibernating bats.

Experts believe WNS is transmitted primarily from bat to bat, but

they also caution it may be transmitted by humans inadvertently carrying fungal spores from cave to cave on their clothing and caving gear.

The DNR closed public access to all caves on state-managed properties two years ago, including Endless Cave in the Cave River Valley Natural Area managed by the DNR Division of

State Parks & Reservoirs as part of Spring Mill State Park.

"We will continue to keep all of our caves closed, and we are urging private cave owners to either not allow access to their caves or require visitors to follow USFWS decontamination procedures," DNR deputy director John Davis said. "The whole effort is to slow the spread and have movement of the disease not be exacerbated by human interference."

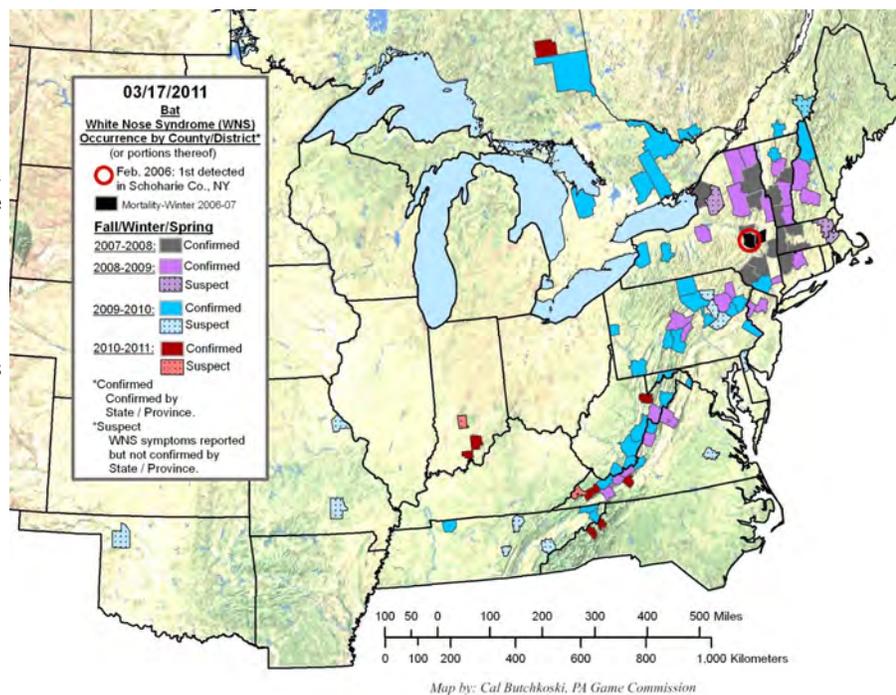
Physical signs associated with WNS are a white fungus on the bat's nose, wings,

ears or tail membrane. Bats afflicted with WNS often exhibit unusual behavior in winter, including clustering near hibernacula entrances. Affected bats also may leave their hibernacula during the day and may be observed flying or clinging to rocks outside or on nearby buildings. Dead or dying bats are often found on the ground near affected areas.

For more information about white-nose syndrome, visit www.dnr.in.gov/batdisease and www.fws.gov/whitenosesyndrome

Media contacts: Phil Bloom, DNR Division of Communications, 317-232-4003 or pbloom@dnr.IN.gov. Georgia Parham, U.S. Fish and Wildlife Service, 812-334-4261 x 1203 or Georgia_Parham@fws.gov

Update - 3/18/2011 Results were received from the NWHC on samples submitted in January. As expected, WNS was confirmed via histological tests in bats collected from 2 caves in Crawford County, IN



*Disease Update***Bovine TB case traced to Indiana farm**

INDIANAPOLIS (28 February 2011)— Indiana State Board of Animal Health (BOAH) has identified bovine tuberculosis (commonly called “TB,” or more formally known as *Mycobacterium bovis*) in a beef cattle herd in Southeastern Indiana. The disease was found in a cow that had undergone routine testing during slaughter at a meat processing facility in Michigan.

BOAH veterinarians are in the process of conducting a thorough investigation of the herd, including tracing the sources of the TB-positive cows, as well as any animals that have been sold from the herd. As information develops, BOAH will be notifying herd owners and others who may be impacted by the investigation.

BOAH is also coordinating efforts with the Indiana Department of Natural Resources to determine if the disease is present in free-ranging deer in the area.

Indiana has held a bovine tuberculosis-free status since 1984 with the U.S. Department of Agriculture. Under federal guidelines, that

status remains. The last time a Hoosier cattle herd tested positive for the disease was in the 1970s. In 2009, a cervid herd tested positive for TB, and was ultimately depopulated.

About Bovine TB

Bovine tuberculosis is a chronic bacterial disease that affects primarily cattle, but can be transmitted to any warm-blooded animal. TB is difficult to diagnose through clinical signs alone. In the early stages of the disease, clinical signs are not visible. Later, signs may include: emaciation, lethargy, weakness, anorexia, low-grade fever and pneumonia with a chronic, moist cough. Lymph node enlargement may also be present. Cattle owners who notice these signs in their livestock should contact their private veterinarian.

More information about the disease and the investigation, as it develops, will be available on the BOAH website at:

www.boah.in.gov.

*Disease Surveillance Update***Wild white-tailed deer test negative for TB in 2010**

Bovine tuberculosis (TB) is a chronic bacterial disease caused by the bacterium *Mycobacterium bovis*, and can affect nearly any mammal. *M. bovis* is most commonly transmitted by inhalation of aerosols or by ingestion. TB is most commonly maintained in cattle, but several species of wildlife can propagate the disease and are classified as reservoir hosts. These species makes eradication of the disease difficult. In Michigan, white-tailed deer appear to be reservoir hosts and significantly complicate eradication efforts.

In 2009, deer in a captive cervid farm in Franklin County, Indiana, tested positive for TB. Investigations conducted by the Indiana Board of Animal Health (BOAH) determined that two additional farms obtained cervids from the Franklin County farm, one each in Harrison and Wayne Counties. Further testing within these herds and subsequent depopulation found that the disease had not spread to other captive animals. Still, the Division of Fish and Wildlife (DFW), BOAH, and the United States Department of Agriculture (USDA) proceeded forward with efforts to collect heads from free-ranging deer in these counties to monitor if the disease had spread to wild deer.

These efforts continued in 2010, although sampling was limited to the area around the Franklin County source farm. The farms tested



Collecting deer heads from hunters on opening day of deer season for TB surveillance. Photo: USDA

in Wayne and Harrison counties were not likely to contain the *M. bovis* bacterium due to results from depopulation of the infected herds and subsequent sampling of wild white-tailed deer around those locations.

DFW staff manned 3 check stations in the affected counties during the opening week-end of the 2010 firearms season to voluntarily collect deer heads from hunters. Heads were prepared for submission to Purdue's Animal Disease Diagnostic Lab (ADDL) and the National Veterinary Services Laboratory (NVSL) in Ames, Iowa by BOAH and USDA personnel. A total of 178 deer heads were collected, with 49 coming from the Fayette County and 129 coming from Franklin County.

All samples have been returned by ADDL and NVSL and TB has not been detected in any of the collected deer. In two years of testing, 395 wild deer from Franklin and

Fayette counties have been tested without detecting the presence of TB. Hunters in these regions are still encouraged to report any harvested deer that exhibit symptoms of TB (white lesions on the internal organs or ribcage of harvested deer) to their local district wildlife biologist or the BOAH.

Article by IDNR Deer Biologist C. Stewart

*Disease Surveillance Update***Tularemia Surveillance in Indiana: 2007-2010**

Tularemia is a potentially serious illness that occurs naturally in the United States. It is caused by the bacterium *Francisella tularensis* sometimes found in wild animals (most commonly rodents, rabbits, and hares).

Tularemia can be spread to people in many different ways, including being bitten by an infected tick, deerfly or other insect, handling infected animal carcasses, eating or drinking contaminated food or water, and breathing in the bacteria, *F. tularensis*. Tularemia is not known to be spread from person to person. People who have tularemia do not need to be isolated. People who become infected from exposure to the tularemia bacteria should be treated as soon as possible, as some tularemia infections can be fatal if it is not treated with the right antibiotics.

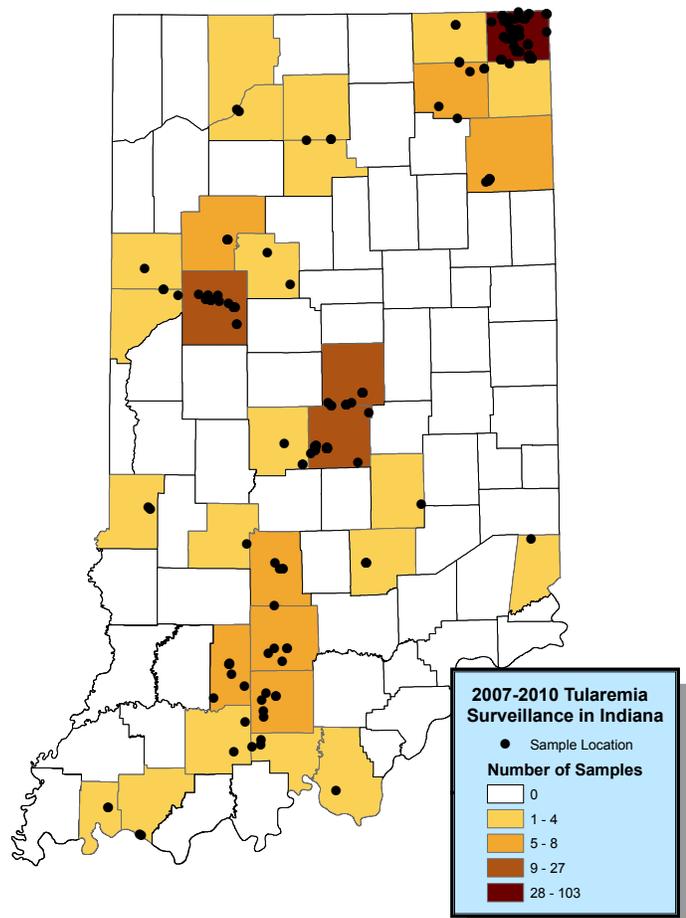
The CDC operates a national program for bioterrorism preparedness and response that incorporates a broad range of public health partnerships. Wildlife Services has partnered with CDC in establishing nationwide surveillance of wildlife diseases such as tularemia. Other things CDC is doing include: stockpiling antibiotics to treat infected people, creating new education tools and programs for health professionals, the public, and the media, and coordinating a nation-wide program where states share information about tularemia.

An integral facet of the nation-wide sharing of tularemia information is the development of baseline information on where tularemia is occurring, identification and mapping of tularemia types and strains, and notification to health facilities of the local presence of the organism. Routine monitoring of wildlife populations by Wildlife Services provides CDC with information to accomplish these goals.

In 2005, CDC initiated a nationwide surveillance for tularemia and asked USDA APHIS Wildlife Services to assist in collecting the blood samples for testing. Wildlife Services collects a small amount of blood on a Nobuto strip from various wildlife species taken during routine operational activities. Information including the species, location, and collector are recorded. The collected Nobuto strips are forwarded to the National Wildlife Research Center in Colorado for processing and then passed on to the CDC diagnostic laboratory in Fort Collins, Colorado for testing and mapping.

The goal of the surveillance program is to develop information on locations where tularemia occurs naturally, type the tularemia for each location, identify the animals involved and see if there is any correlation to human cases. Once this is accomplished it will be much easier for health officials to detect when introduced infections, whether accidentally or purposely (terrorists) introduced, can quickly be identified as not being a "normal occurrence" and determine where it came from.

Historically, surveillance for tularemia has occurred primarily in the western U.S. In 2006, surveillance was expanded to the eastern U.S. and USDA APHIS Wildlife Services, in cooperation with Indiana DNR Division of Wildlife Resources, initiated tula-



Map of tularemia surveillance in Indiana from 2007-2010. All samples have been negative for tularemia. Map: USDA. February 28, 2011.

remia surveillance in Indiana. Samples are collected by the Indiana Wildlife Disease Surveillance Network and sent to Wildlife Services for processing. Surveillance occurs primarily in predators (i.e., coyotes, foxes, etc.) and aquatic mammals, such as muskrats and beaver, but recently we have been collecting samples from all wildlife. If you routinely work with these animals (i.e., research, recreational trapping, nuisance control, etc.) and would like to participate in this surveillance effort, please contact Dr. Joe Caudell, USDA APHIS Wildlife Services Wildlife Disease Biologist at 765-496-3913.

The above map shows the location and density of surveillance since the program began. To date, all samples have been negative. This does not mean that Indiana is free from Tularemia, just that it has not been detected at the current level of surveillance.. Surveillance for tularemia will continue in Indiana and update will be posted in the Indiana Wildlife Disease News.



Midwest Wildlife Disease Update

Midwest Wildlife Disease Update
February 2011

Deer Parapoxvirus Infects Hunters - A report published in the *New England Journal of Medicine* in 2010 indicates that a novel parapoxvirus associated with deer may have human health implications. Many parapoxviruses are zoonotic and usually are seen in people who have direct contact with visibly infected livestock.

The article discussed the cases of two deer hunters who developed large, tender, non-painful and non-pruritic swellings on a finger. Both men, one in Connecticut and one in eastern Virginia, had a recent history of cutting themselves while field-dressing white-tailed deer. They had no history of recent contact with domestic livestock, and it was assumed they had contracted the virus from the deer. Both deer apparently were healthy and had no obvious lesions on the head or muzzle. Due to the persistence of the lesions, both men sought medical attention and the lesions were surgically removed. Histologically, both lesions exhibited characteristics of a parapox-like infection, and the virus type was confirmed by electron microscopy and PCR tests. Both men went on to recover uneventfully, although one reported lingering discomfort at the surgical site. (Source- Southeastern Cooperative Wildlife Disease Study Briefs, Volume 26, Number 4, January 2011. Article by Tiffany Umlaf, senior veterinary student, Univ. Of Georgia College of Veterinary Medicine.)

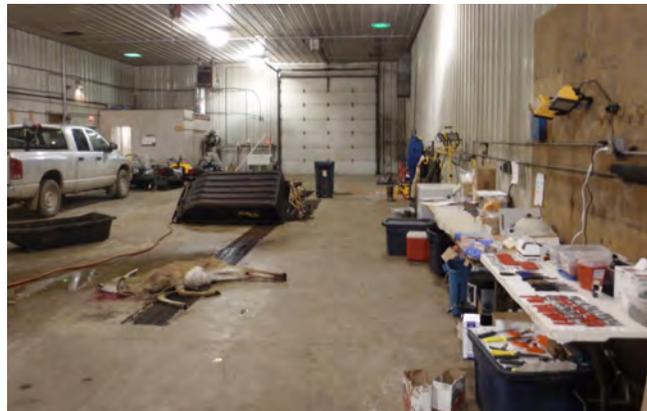
Woodchuck Victim of Raccoon Roundworm - A Mercer County Kentucky landowner just south of Frankfort, contacted Dr. Aaron Hecht, wildlife veterinarian with the Kentucky Dept. of Fish and Wildlife Resources to report a woodchuck was doing back flips in his backyard. The animal was also reportedly not walking correctly, seemed to have difficulty breathing, and was easily approached. Dr. Hecht euthanized the animal and submitted it to the Southeast Cooperative Wildlife Disease Study for necropsy.

A gross exam showed no visible lesions. With the neurological problems, a rabies test was run and negative. Microscopic examination of brain sections revealed severe chronic inflammation and areas of necrosis (tissue death). Additional evidence suggested a parasite migration through the brain. Cross sections of nematode larvae were seen in tissue samples examined microscopically, and features were consistent with an ascarid. The location in the brain makes it all but certain that these were larvae of the raccoon roundworm, *Baylisascaris procyonis*. (Source- Southeastern Cooperative Wildlife Disease Study Briefs, Volume 26, Number 4, January 2011, Article by Kevin Keel, edited)

Minnesota and Maryland Added To CWD List- Two new states were added to the list of states with Chronic Wasting Disease found in wild cervid populations. In late January 2011 Minnesota announced that a wild white-tailed deer harvested by an archery hunter last November tested positive for CWD.

Although Minnesota has been managing CWD in its captive deer and elk facilities since 2002, this newest case marks the first time the disease has been found outside the fence. The deer was taken near Pine Island in southeastern Minnesota, not far from where a female elk tested positive in 2009 at a captive elk facility.

In February 2011, the Maryland DNR received confirmation that a white-tailed deer taken by a hunter in Allegany County was infected with CWD. The positive came in a county adjacent to border lands of Virginia and West Virginia where CWD has been documented six miles from the Maryland state line. (Source- Wildlife Management Institute E-Newsletter, February 16, 2011, edited)



2011 CWD Surveillance in Minnesota. Photo (USDA)

Fifty Crows Found Dead Along Lafayette Railroad Track- On February 3, 2011 a day following the large snow/sleet storm that hit much of the Midwest, the West Lafayette Div. of Fish and Wildlife office received a call that about 50 crows were dead along the railroad tracks near downtown Lafayette. A field visit showed that indeed 50 crows were laying dead along a 200 foot stretch of tracks. There appeared to be no spill of any kind and a minimal amount of grain along the tracks. A few of the dead crows showed signs of trauma with broken wings and visible blood. Two of the dead crows were taken to the Purdue Animal Disease Diagnostic Lab for necropsy.

The necropsy report reported both birds had pulmonary hemorrhage, one had a fracture of the right ischium (hip bone), and the other had a dislocation of the left hip accompanied perirenal hemorrhage. Further, they had acute hemorrhage in multiple organs suggestive of trauma, and that there was no morphologic evidence of an infectious cause of death. The gizzards of both birds were empty. Though hard to believe that fifty hungry crows would fall victim to a passing train, the trauma reported suggests this as the best explanation. (Source- Purdue ADDL Report A11-8637, February 9, 2011, and personal account by Dean Zimmerman)

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Indiana Wildlife Disease News

A joint project between:

Indiana DNR
Division of Fish and Wildlife

and

USDA APHIS Wildlife Services
National Wildlife Disease Surveillance and Emergency Response Program

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

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Submissions or Participation

If you would like to submit a wildlife disease related article, ideas, comments, or other information, please contact one of the editors.

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

The mission of the National Wildlife Disease Surveillance and Emergency Response Program is to provide Federal leadership in managing wildlife disease threats to agriculture, human health and safety, and natural resources by assisting Federal, State, Tribal, and Local governments, private industry, and citizens with management of zoonotic and other wildlife diseases of concern.

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Midwest Wildlife Disease Update (Cont. from pg. 6)

Raccoon Variant Rabies Found In Ohio

Calf- In December 2010 a 6-week old calf from Guernsey County Ohio was confirmed rabid by the Ohio Dept. of Health Laboratory. The calf came from a south central Pennsylvania farm and auction in November 2010 along with 142 other calves to the Guernsey County operation. The calf showed illness, and died five days later. A local veterinarian observed no significant gross pathology that would have contributed to the calf's death. Based on clinical signs described by the caretakers, the veterinarian submitted the head for rabies testing. Rabies was confirmed, and later the Centers for Disease Control and Prevention confirmed the calf was infected with the eastern raccoon rabies variant.

Guernsey County is about halfway between Columbus, Ohio and Wheeling, West Virginia

and west of the area baited with rabies vaccine (aerial drop) to prevent the spread of eastern raccoon rabies into Ohio and westward. The Guernsey County facility was quarantined and under the supervision of the Ohio Dept. of Agriculture, made the decision to euthanize approximately 68 of the remaining calves – all those with a remote possibility of exposure to the sick calf.

Had this gone undetected and with a little bad luck, the eastern raccoon rabies variant could have gotten a foot hold in central Ohio with nothing to stop it from spreading west into Indiana. We are indebted to that alert veterinarian. (Source- ProMED Digest, February 21, 2011, Volume 2011:076, edited)

Column by D. Zimmerman, IDNR