

A JOINT PROJECT
BETWEEN

USDA APHIS
WILDLIFE SERVICES

AND

INDIANA DNR
DIVISION OF FISH AND
WILDLIFE

Indiana Wildlife Disease News



Volume 6, Issue 3

Summer 2011

Special points of interest:

- Brucellosis
- Update on feral swine in Indiana
- Feral swine in Michigan
- Midwest Wildlife Disease Update
- CWD disinfection research

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Disease in Focus

Brucellosis

Description

Brucellosis is a highly contagious disease of many animals and is caused by bacteria of the genus *Brucella*. *Brucella abortus* most commonly affects cattle; *B. Suis* is most common in swine; *B. melitensis* is most common in goats. Although infections may occur in other species, including man, such situations are rare. *B. abortus* is the species of most concern to wildlife workers.

Distribution

Brucellosis has been reported throughout the world since its discovery in the latter part of the

nineteenth century, and has long been considered an important disease in man, cattle, goats and swine. It has been found in bison, elk, moose, Dall sheep, caribou and several species of deer. It has been diagnosed in dogs, foxes, hares, mice, rats, ticks and fleas. The disease is relatively rare in deer in the U.S., slightly more significant in elk, bison and moose. Hares in Europe have been afflicted with the disease for many years, but it is not felt that they play an important part in maintaining brucellosis in domestic animals. In Michigan, brucellosis has never been identified in any wildlife species.

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Feral Swine Update

Feral Swine in Indiana

Domesticated pigs (originally bred from Eurasian wild boar about 8,000-10,000 years ago) were intentionally introduced into the New World by Christopher Columbus. Since then, they have expanded due to numerous releases for hunting and open range livestock practices. Today, feral pigs and Eurasian boar hybrids are numerous and widespread throughout the United States. Feral hogs are variable in appearance ranging in black to multicolored. They are very adaptable and can be observed in a variety of habitats although dense brush and cover is preferred. Feral hogs have social groups or "sounders" that include adult females and piglets – adult males are solitary. Their size is variable with average adult weights of about 75-250 pounds.



Feral swine can cause a lot of damage in a short amount of time by rooting for food or creating wallow. Photo USDA.

Due to the problems discussed below, feral hogs have received increasing attention from wildlife professionals around the country. The good news for Indiana is their range is limited and their control is manageable. However, while they have been reported in Indiana since the early 1990's their primary breeding range is limited to only a few counties including Jackson, Lawrence, and Wayne counties. However, it is important to know that a wild hog, such as escaped domestic hogs, illegally released Eurasian boar, or even Vietnamese pot bellied pigs, could be encountered in

Continued on page 3

Brucellosis (Cont. from pg 1)

Transmission and Development

Brucella infections are usually transmitted by oral exposure, but susceptible animals can also be infected by contamination of the eyes, wounds and the genital tract. Males can transmit brucellosis during copulation, either by contaminated semen, or by genitals contaminated by an infected female.

Edible tissues of infected animals can infect humans and predators. Several species are known to spread *Brucella* organisms in their feces and urine. Milk from infected cattle and goats is a potential source of infection. Within animal populations, aborted fetuses, vaginal discharges and drainage from abscesses are all likely means of disseminating the disease. As bison constitute a potential threat to the bovine brucellosis eradication program in the U.S., they are subject to federal interstate regulations similar to those affecting cattle. In Alaska and Siberia, reindeer seem to be affected more disastrously by brucellosis than other wild species.

During bacteremic stages of infection, blood-sucking parasites may serve as vectors. The role of ticks, fleas and other parasites can only be conjectured; but the fact that they become contaminated establishes their role as potential vectors.

In many areas of the U.S., white-tailed deer (*Odocoileus virginianus*) are known to associate with cattle. Yet, of over 17,000 white-tailed and mule deer (*O. hemionus*) tested, only 20 white-tailed deer reacted positively to *Brucella* tests. No reactors were found in over 1,200 white-tailed deer in Michigan. Also, of 435 miscellaneous wild birds and mammals representing 23 species from southern Michigan, all were negative. It is generally felt that *Brucella* organisms are not readily transmissible from their preferential host to dissimilar hosts, and that no serious or threatening reservoir of infection exists presently in wild animals in the U.S.

Clinical Signs

Brucellosis affects many different organs in animals and consequently the signs of the disease will be influenced by the nature and extent of the infection and the species involved. Some infected animals may not show signs, yet will shed organisms in their feces and urine. In infected ruminants, brucellosis commonly induces abortion during the latter half of gestation. Calves are often born immature and weak. Inflammation of the uterus and excessive vaginal discharge are common signs which often result in reproductive failure or breeding difficulties in cattle and possibly in reindeer. Chronic infections of bones and joints occur in livestock and reindeer, resulting in lameness and abscesses. No significant signs of brucellosis have been reported in deer, moose or elk.

Pathology

Brucella infection in ruminants usually localizes in the pregnant uterus and associated tissues. Abortions usually occur late in the gestation period and are followed by retained fetal membranes. Carpal bursitis is the most common condition associated with brucellosis in Siberian reindeer.

Diagnosis

The common method for diagnosing brucellosis is the plate agglutination test. This is accomplished by mixing a drop of serum from the suspect animal with a drop of *Brucella* antigen. Clumping indicates infection. If the mixture remains clear, the result is negative.

Treatment and Control

Antibiotics have been used with some success to reduce the severity of brucellosis in man and animals. In cattle, a national eradication program in the U.S. has been quite successful. This, coupled with an extensive vaccination program, has practically eliminated the threat of serious epidemics of brucellosis in cattle.

Of wild animals, only reindeer and bison warrant serious consideration for treatment, the former, for reasons of economy in reindeer husbandry, the latter as a threat to the success of the bovine brucellosis eradication program in the U.S.

Significance

Before a nation-wide eradication program was instituted in the U.S. in the 1940's, brucellosis was of major economic significance to the entire dairy industry. Pasteurization of milk practically eliminated the disease (undulant fever) in man.

It is generally agreed that, rather than wildlife posing a threat to domestic species, the reverse is true: wildlife are more likely to acquire the disease from domestic species. Regardless, the incidence of brucellosis in wildlife is extremely low, and is of little significance in the population dynamics of any wild species.

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).

Feral Swine in Indiana (Continued from page 1)

almost any county in Indiana. Any sighting of a wild hog can be reported to USDA APHIS Wildlife Services at 765-404-0382.

Problems Caused by Feral Hogs

Disease threats from feral swine include domestic diseases such as trichinosis, tularemia, swine brucellosis, and pseudorabies, and foreign animal diseases such as classical swine fever. Feral hogs can damage crops including corn, wheat, melons and pastures. Feral swine are also known to eat and damage morel mushroom patches. They can also impact native wildlife by consuming eggs of ground nesting birds or outcompeting others for resources including hard mast (e.g., acorns). Tusking and rooting by feral pigs can also damage dikes and impact forest restoration.

Laws in Indiana

Laws are designed to facilitate the elimination of feral hogs in Indiana while eliminating future introductions which is thought to be a major contributor to their population growth across the country. Feral swine can be taken year round by any legal means. However, the possession and relocation of live feral hogs is illegal in Indiana. Contact the Indiana Department of Natural Resources for more information about feral hog laws.

What Can Landowners Do?

Damage caused by feral hogs is substantial in the southeastern United States. Wildlife professionals need your help in identifying where feral hogs occur in Indiana

- Report all feral swine to the Indiana Department of Natural Resources or USDA Wildlife Services in Indiana.
- Rooting, scat and tracks are good signs of feral hog presence in an area.

- Do not release feral swine on your property.
- Do not feed wild pigs – feeding pigs can increase their productivity. Feeding wildlife is generally not a recommend practice and can artificially increase densities of local wildlife.

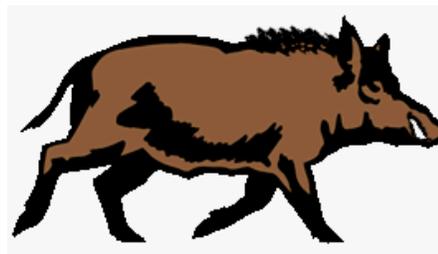
Additional Information Sources

West, B. C., A. L. Cooper, and J. B. Armstrong. 2009. Managing wild pigs: A technical guide. Human-Wildlife Interactions Monograph 1:1-55. www.berrymaninstitute.org/publications

Indiana Wildlife Conflicts Information Website, <http://www.ag.purdue.edu/entm/wildlifehotline/pages/default.aspx>

National Feral Swine Mapping System, www.feralswine.org

Article by Brian MacGowan (Purdue University Department of Forestry and Natural Resources) and Joe Caudell (USDA APHIS Wildlife Services)



Disease Surveillance Update

Michigan feral hog tests positive for pseudorabies

A feral hog infected with pseudorabies has been captured and shot in Midland County, Michigan, says Keith Creagh, director of the state Department of Agriculture and Rural Development.

The disease and the growing number of wild pigs helped earn them a "nuisance species" designation by the Department of Natural Resources (DNR). This status relaxes hunting restrictions on the animals; and this latest finding of a diseased pig helps support a proposed sporting pig ban that DNR employees could enforce beginning 1 Apr (2012?), should restrictions not be enacted.

Creagh said the USDA Wildlife Services commenced the Midland County trap-kill-and-test program for



hogs in June [2011]. Since that time, 6 feral hogs were captured and tested for pseudorabies and other diseases. "One of the samples, it was a young, female sub-adult, came back positive for pseudorabies," Creagh said. "And that's why we're killing feral swine."

A sporting pig ban was to take effect 8 Jul 2011, but the DNR delayed the action until 8 Oct 2011 to give legislators time to create restrictions if they choose. The order would prohibit owning or breeding non-livestock swine. (Source-ProMED Digest V2011 #378, August 20, 2011, edited.)

Article by D. Zimmerman, Indiana DNR

*Feral Swine Update***Feral hogs killed in Michigan Near Indiana Border**

On Monday, September 12, the USDA-Wildlife Services Program in Michigan received a call from a horse owner in southwest Hillsdale County. The location of the farm is only 1 mile from the Indiana border and about 5 miles from the Ohio border. He reported that 2 feral hogs were chasing their horses on the previous Saturday and that he had shot both with his rifle. One was killed and the other was wounded and left the property. The incident was recorded, but as too much time had elapsed for collecting blood samples from the killed hog, a site visit was not warranted. The man was instructed to call back immediately if the other hog returned. The hog did return and the owner was able to shoot and kill it and contacted Wildlife Services again. Wildlife Disease Biologist Marks collected blood and swab samples for disease testing. Only the 2 feral hogs were observed and no others are believed to be in the area at this time.



Feral swine from Hillsdale County, Michigan

Article by D. Marks, USDA APHIS Wildlife Services

*Disease Research Update***New Research Shows that it is Possible to Clean-Up Chronic Wasting Disease from the Soil**

New research has shown it is possible to destroy chronic wasting disease (CWD) prions that are bound to the soil. This is good news for captive elk and deer ranchers whose lands are infected with the deadly neurological disease.

“Deer and elk can ingest or inhale prions in the environment in the environment making them susceptible to CWD,” states USDA APHIS Wildlife Services - National Wildlife Research Center (NWRC) research biologist Dr. Kurt VerCauteren. “Having a decontaminant that could be used on soil in paddocks or barn, as well as on farm equipment and fences, would be invaluable.”

In a laboratory study, NWRC, University of Nebraska-Lincoln, and Creighton University scientists showed that the commercially available subtilisin enzyme, Prionzyme, successfully degraded soil-bound and unbound CWD prions at normal environmental conditions (i.e., neutral pH and 22° Celsius / 68° Fahrenheit). Researchers are hopeful that a topical application of this or other subtilisin enzymes solutions may be an effective decontamination method that helps to limit CWD transmission.

The citation for the article is Saunders, S. E., J. C. Bartz, K. C. VerCauteren, and S. L. Bartlet-Hunt. 2010. Enzymatic Digestion of Chronic Wasting Disease Prions Bound to Soil. *Environmental Science and Technology* (44) 4129-4135. The full article can be found at the NWRC web site at http://www.aphis.usda.gov/wildlife_damage/nwrc/publications/annual_publication_lists/annpubs2010.shtml

Article from 2011 Fall issue of NWRC Science Update

Enzymatic Digestion of Chronic Wasting Disease Prions Bound to Soil

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Chronic wasting disease (CWD) and sheep scrapie can be transmitted via indirect environmental routes, and it is known that soil can serve as a reservoir of prion infectivity. Given the strong interaction between the prion protein (PrP) and soil, we hypothesized that binding to soil enhances prion resistance to enzymatic digestion, thereby facilitating prion longevity in

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Midwest Wildlife Disease Update

Midwest Wildlife Disease Update
September 2011

West Nile Virus Threat Lingers in Indiana

The ISDH is reporting Indiana's first confirmed case of West Nile Virus in a human for the 2011 season. The Jefferson County Health Department investigated a report of an individual that became ill earlier this month. Laboratory testing came back positive for West Nile Virus. This serves as a reminder that the virus is circulating in the state and humans are still susceptible to infection. So far this year, ISDH has collected and tested 91,713 mosquitoes divided into 1684 pools for West Nile Virus (WNV) and Saint Louis Encephalitis (SLE). 16 mosquito pools have been tested for Eastern Equine Encephalitis (EEE). To date there have been positive pools for WNV located in eleven Indiana counties: Adams, Allen, Bartholomew, Boone, Carroll, Hamilton, Hendricks, Henry, Marion, Morgan, and Vanderburg. There has been one WNV positive crow found in Marion County. The ISDH does not conduct avian surveillance. In addition, there has been one confirmed WNV positive horse reported to the Board of Animal Health; that horse was located in Noble County. SLE and EEE testing has remained negative to date.

Testing of mosquitoes will continue for EEE, SLE, and WNV, and information will be released concerning any changes in the status of transmission. Updates to county level data will be posted at <http://www.in.gov/isdh/23592.htm>. For additional information, please contact Jennifer House (IN State Dept. of Health) at jhouse@isdh.in.gov or at 317-233-7272. (Source- IN State Dept. of Health email by Jennifer House, August 22, 2011, edited.)

Indiana Records EHD Positive in Late August 2011

On August 29th a whitetail deer yearling doe was reported as listless, weak, drooling, and lacking fear of humans near the Wabash River in northern Vermillion County. Neighbors in a rural residential area had watched the deer move around their neighborhood for about a day. The DNR was contacted, and upon arrival the deer had died. There was a bluish hue about the eyes, lips and tongue.

Necropsy by the Purdue Animal Disease Diagnostic Lab confirmed through a FATS assay of liver and spleen tissue, the deer was positive for the EHD virus. Dry weather in late summer and early fall contrib-



White-tailed deer sampled for EHD in Vermillion County. Photo D. Zimmerman, IDNR.

utes to conditions where larger outbreaks occur. (Source- Dean Zimmerman, co-editor)

Michigan Carp Die Off Tied to Koi Herpesvirus

The Michigan Department of Natural Resources announced Wednesday [3 Aug 2011] that samples taken from a June 2011 fish kill at Kent Lake at Kensington Metropark indicate the presence of koi herpesvirus. An estimated 300 to 500 common carp died at the lake within a span of a few days in late June 2011.

Koi herpesvirus had not been previously found in wild fish samples in Michigan, though it has been detected in a private koi pond near Grand Rapids in 2003. It does not pose any human health risk.

"This virus is capable of large-scale common carp die-offs, as seen in Ontario in 2007 and 2008," said Gary Whelan, DNR Fish Production Manager. "The virus is an internationally reportable disease, and it is being officially reported at this time."

Whelan said the koi herpesvirus affects common carp, goldfish, and koi. At this time, the impact of the virus on native minnow species, which are members of the carp family, is unknown. He said koi herpesvirus is found worldwide and likely was introduced to Michigan waters from the release or escape of infected ornamental fish. (Source- ProMED Digest V2011 #356, August 7, 2011)

Michigan Upper Peninsula Dogs Pick Up Fungus

Officials say a number of dogs in northern Marquette County have been diagnosed with a fungal infection. The Mining Journal of Marquette reports blastomycosis has been diagnosed in dogs in Big Bay and surrounding areas. Dogs may be exposed to the organism for 1 to 5 months before they start to show signs of the infection, which is being seen more in the Upper Peninsula.

Blastomycosis is treatable if detected early. Clinical signs in dogs include loss of appetite, weight loss, a cough and skin lesions. Blastomycosis, caused by the agent *Blastomyces dermatitidis*, is a systemic fungal disease that primarily affects dogs and humans, but has also been known to infect cats, sea lions and horses. *Blastomyces dermatitidis* is a dimorphic soil fungus that is found in the Mississippi, Missouri, and Ohio River valleys, as well as the mid-Atlantic states and the Canadian provinces of Quebec, Manitoba and Ontario. (Source- ProMED Digest V2011 #340, July 30, 2011. Edited)

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Indiana Wildlife Disease News

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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. 5)

Virus Cause of Large Fish Kill In Minnesota

Spring Viremia of Carp (SVC), a notifiable disease to the World Organization for Animal Health, is the confirmed cause of a fish kill that occurred during June in Minnehaha Creek. The kill, which involved 200-300 carp, occurred June 15, 2011 along a stretch of Minnehaha Creek within Minnehaha Regional Park.

SVC is a serious fish disease that primarily affects carp; however, it also can affect other species including bluegill and largemouth bass. The virus has been found in the United States on eight other occasions, including an isolation from the Mississippi River's Pool 8 near Dresbach in 2007.

"The discovery of this virus reinforces the importance of new laws designed to prevent

the spread of aquatic invasive species and fish diseases by prohibiting the transfer of water between water bodies," said Paula Phelps, aquaculture and fish health consultant for the Minnesota Department of Natural Resources (DNR). "Spring Viremia of Carp can be spread through waters, so it is very important not to move live fish or water between water bodies." She added that all unused bait should be disposed of in a trash can, not in the water or on the ground. (Source- World Fishing Network website (www.worldfishingnetwork.com), August 16, 2011 post, edited.)

Column by D. Zimmerman, IDNR