Wildlife Health Matters

A Snapshot of the Health of Wisconsin Wildlife, 2016
The wildlife health team’s mission is to investigate, manage, and educate about disease and other health issues affecting wildlife to help conserve Wisconsin’s rich wildlife heritage.

Necropsy

The Wildlife Health Program investigates wildlife mortality events where there are five or more sick or dead birds or three or more sick or dead mammals reported in one area over a short timeframe. Mortality of selected individual species is also investigated. During 2016, 80 wild animals were submitted for necropsy to determine the cause of death. Eighteen mortality events were investigated.

Two separate mortality events were confirmed due to Salmonellosis in 2016. The first occurred in February in Juneau County and involved reports of approximately 30 pine siskins. The second event involving approximately 25 pine siskins and redpolls occurred in April in Oneida County.

Salmonellosis is caused by various *Salmonella* sp. bacteria. These bacteria are found in the feces of many animals and healthy animals can be carriers. Illness in wild birds usually occurs when the bird is under stress from other health or environmental issues.

Outbreaks of Salmonella in wild birds can occur at any time of year but are more frequently reported in the spring and fall when birds are stressed from migration and are congregating at backyard bird feeders. The bacteria are passed to healthy birds through fecal contaminated feeding and water bathing stations. Signs commonly seen in wild birds include multiple dead songbirds on one property or inactive birds with a “puffed up” appearance.

Recommendations to prevent outbreaks or to respond during outbreaks include keeping bird feeders and bird baths clean and disinfected using a 10% bleach solution and regularly cleaning up spilled bird feed and feces from the ground. Additional information and recommendations can be found on the DNR website by searching keywords “wildlife health” and clicking on “bird diseases”.

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Photo by Ryan Brady
During August and September mortality from West Nile virus (WNV) was confirmed in blue jays and gulls. Increased reports of dead blue jays were shared from citizens in Marinette County. Additionally the Wisconsin Human Society’s Wildlife Rehabilitation Center reported an increase in admissions of ring-billed and herring gulls from Milwaukee that were exhibiting neurological signs consistent with WNV including weakness, incoordination and tremors. In both mortality events, WNV was confirmed as the cause of death.

For more information on WNV activity in Wisconsin see the Wisconsin Department of Health Services WNV webpage.

Canine distemper virus (CDV) was determined to be the cause of death in a mortality event involving multiple sick and dead raccoons reported in Peninsula State Park in Door County during August. Canine distemper was also confirmed in raccoons collected in October from Sauk County and in November in raccoons from Iowa County, a gray fox from Columbia County and a sick skunk from Marathon County.

Reports of sick or dead raccoons are collected throughout the year and entered into the Wildlife Health (WH) Database. Where 3 or more are reported, investigation through necropsy of available carcasses is pursued. Reports of fewer than 3 or where carcasses suitable for necropsy are not available the information is logged into the WH Database for tracking long term trends in disease outbreaks.

In addition to raccoons, foxes and skunks, CDV can affect wolves and coyotes. This virus can also affect domestic dogs and is one of the routine vaccinations recommended for dogs. It is common in WI to see localized mortality events associated with this virus especially in foxes, raccoons, and skunks. However, signs observed in wildlife infected with CDV cannot be distinguished from the signs seen in rabies infections. These signs can include not showing fear, appearing dazed or unresponsive, wandering aimlessly or seizures. All foxes, raccoons and skunks submitted for necropsy are also routinely tested for rabies.
A mortality event involving approximately 200 double-crested cormorants from one island breeding colony on Lake Michigan in Door County was investigated by the National Wildlife Health Center (NWHC) in July and August. The majority of the affected cormorants were young of the year. A few herring gulls were also affected. The cause of death was determined to be virulent Newcastle Disease virus.

Virulent Newcastle Disease virus was also confirmed in a smaller mortality event at Horicon National Wildlife Refuge in Dodge County during this same timeframe. This mortality event involved mostly young of the year double-crested cormorants from a nesting colony but also affected a few white pelicans and ring-billed gulls.

Newcastle Disease is caused by an avian paramyxovirus (APMV-1). There are a number of strains of this virus but only a few of them cause significant illness or death in wild birds, usually affecting young of the year cormorants and occasionally gulls and white pelicans. According to the National Wildlife Health Center WHISPers database, Newcastle disease has been the cause of mortality in cormorant breeding populations in Wisconsin as far back as 1992 (Bayfield County). Other mortality events attributed to Newcastle Disease occurred in cormorant breeding colonies in 2003 and 2011 in Brown County, in 2006 and 2010 in Door County, 2011 in Milwaukee County and 2012 in Marinette County.

Map from the National Wildlife Health Center WHISPers Database
A large mortality event of over 600 water birds occurred in the fall on Lake Michigan due to **botulism type E**. The majority of the deaths were found on the Michigan shores of the Upper Peninsula. However, 5 common loons were found dead in Door County as part of this mortality event. Significant numbers of red-breasted mergansers, long-tailed ducks, white-winged scoters and common loons were reported by the Michigan DNR and Common Coast Research and Conservation.

Botulism is caused by a toxin produced by the bacteria, *Clostridium botulinum*. These bacteria are present in soils and lake sediments. Mortality from type E botulism generally occurs during certain environmental conditions that favor toxin production such as warmer temperatures, low oxygen levels in water and decaying plant material. Fish eating birds are affected when they eat fish that contain the toxin. For more information on botulism in the Great Lakes see Michigan Sea Grant’s Frequently Asked Questions.

Three **bald eagles** were submitted for necropsy. One eagle was banded by DNR staff in 2003 on Buff Lake in Sawyer County. It was found dead in September in Sauk County and determined to have died from lead toxicity. A juvenile eagle from Marinette County died from severe pneumonia and fungal infection of the air sacs. The third eagle was an adult male found in January in La Fayette County. It had wounds consistent with puncture wounds suspected to have been caused from fighting with another eagle.

Reported causes of death for three **snowy owls** were starvation, pneumonia due to fungal infection, and trauma. All three owls were juveniles and were emaciated at the time of death.

All **peregrine falcons** that are found dead in Wisconsin are submitted for necropsy. Three falcons were necropsied in 2016. Unfortunately all three were found days after death and decomposition made evaluation difficult. The tissues of two falcons were too decomposed to determine a cause of death. The third died from pneumonia and fungal infection of the lungs and air sacs.
Nine **gray wolves** were found dead and submitted for necropsy. Causes of death included trauma (5), starvation (1) undetermined (1), bacterial pneumonia (1) and fibrosarcoma (cancer) (1).

The wolf that died from starvation was an adult male estimated to have been 9-10 years old at the time of death in Sawyer county. He had been radio-collared by DNR staff in 2011 and was thought to be the alpha male in his pack at that time. Locations from his radio-collar during the year prior to his death indicated that he was dispersing from the pack, returning to the edge of the pack and leaving again. This is pretty typical movement patterns for an older wolf. He was likely kicked out of the pack and kept trying to re-integrate for most of the year prior to his death.

Cancer is rarely found in free-living wildlife. This wolf was an adult male that was radio-collared by DNR staff in 2010. Locations from his radio-collar indicated that he stayed with his pack until his death in Washburn county. The cause of death was attributed to complications from a large (17cm diameter) mass (fibrosarcoma) under the skin of the abdomen. Other incidental findings included an old healed rib fracture, mild heartworm disease and mild sarcoptic mange.

Amphibian Mortality Investigations

In September approximately 600 dead **tadpoles** were observed on a public pond in Green County. The tadpoles were all in good body condition suggesting that death occurred rapidly. A cause of death could not be determined, however culture for viruses of concern to amphibian populations, including ranavirus, was negative.

Also in September a private citizen reported finding approximately 50 **blue-spotted salamander larvae** and ten **green frogs** with "tumors" on the body and a few with limb growth abnormalities in a small pool in Oneida County. No cause of the abnormalities could be found but ranavirus was ruled out.

All testing was performed at the National Wildlife Health Center (NWHC). For more information on amphibian malformations and ranavirus see the NWHC’s [Disease Information](#) page.
Surveillance of sick and dead wild birds for avian influenza (AI) continued in 2016. Since no avian influenza activity was detected in Wisconsin in 2016 DNR surveillance was limited to selected species or in mortality events of 5 or more birds. Thirty-one samples were collected from birds submitted for necropsy and tested for AI. Species sampled included bald eagles, owls, hawks, gulls, loons, ducks and songbirds. No strains of AI were detected in any of the samples collected at necropsy.

Testing of wildlife for rabies is conducted when there is a risk that either a human or a domestic animal has been exposed to a wild mammal’s saliva through a bite or scratch. In these situations samples are submitted directly to the WI State Lab of Hygiene for rabies testing. In 2016, the rabies lab reported 29 rabies positive bats. The total number of wildlife submitted directly to the rabies lab for testing was not available at the time of this report.

Wild mammals that are submitted to the DNR Wildlife Health Program for necropsy are also tested for rabies based on species, neurological signs observed, and history. Eleven wild mammals tested negative for rabies at necropsy including 7 raccoons, 1 fisher, 1 skunk, 1 elk, and 1 white-tailed deer.

Additional information on rabies and what to do if a person or domestic animal is exposed to a sick wild animal can be found on the WDNR webpage search keyword “wildlife health” and click the link for “mammal diseases”. Also see the Department of Health Services or the Department of Agriculture, Trade and Consumer Protection - Division of Animal Health.
There were no suspect or confirmed cases of epizootic hemorrhagic disease (EHD) in 2016. Epizootic hemorrhagic disease (EHD) is an acute, infectious, viral disease spread by biting insects (especially midges) that affects white-tailed deer and some other hoofed animals. In white-tailed deer the severity of the disease depends upon the deer’s previous exposure to the virus and strain of the virus. At this time, it does not appear that EHD is endemic (always found) in Wisconsin which means that when the virus does appear here, it is more likely to be fatal to infected deer.

During the 2016 CWD year (which runs from April 1st, 2016 through March 31st, 2017) over 6,000 deer were tested for CWD and 440 deer tested positive. One of the positives was a sick deer from the central farmland zone in Portage County, four deer were from the central forest zone in Adams County and the rest were from the southern farmland zone.

This year surveillance continued in the southern farmland zone as well as sampling deer in the 10 mile radius areas surrounding the Juneau, Adams, Portage and Washburn positives. In the Washburn area sampling also expanded out from the 10 mile radius to include the four counties of Polk, Barron, Burnett and Washburn. Sampling also occurred in 10 mile radius areas surrounding the locations of captive facilities with a positive including Marathon, Eau Claire, Oconto and Oneida.

More information on CWD can be found by visiting the [DNR website](https://dnr.wi.gov) and searching keyword “CWD”.

**Wisconsin Dept. of Natural Resources**

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**Epizootic Hemorrhagic Disease (EHD)**

**Chronic Wasting Disease (CWD)**
Sick deer are reported through the Wildlife Health Sick Deer Database. If the deer has signs consistent with chronic wasting disease (CWD) and the carcass is available, then the report is entered as a deer sample and samples are collected for CWD testing. If the deer does not have signs consistent with CWD, or the deer was not available for sampling then the report is entered as a field observation.

In the calendar year of 2016, 171 reports of sick deer were entered into the database. These included 121 deer that were sampled for CWD from 34 counties. Of the sick deer tested for CWD, 52 tested positive. Also included were 50 field observations of 57 sick deer that either were not available for sampling or were reported with signs consistent with trauma or other non-CWD health issues such as cranial abscessation syndrome (CAS). Additional information on selected health concerns in deer can be found on the DNR website by searching keywords “wildlife health” and clicking on “deer diseases”.

In May a doe in Oconto County was reported unable to stand and remaining in the same spot for several days prior to death. A field examination found no obvious abnormalities however she was carrying three full term fawns. Submitted tissues also had no detectable abnormalities. It was speculated that there could have been undetectable metabolic changes related to her pregnancy that affected her health.

A follow up field necropsy was performed on a sick deer reported in Oconto County in late summer. The deer was observed emaciated and with large swollen areas at the inside corner of each eye. Examination of the carcass revealed an infection resulting from an injury to the sinuses.

Information on how to report a sick deer can be found by visiting the DNR website and searching keywords “sick deer”.

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Sick Deer Response

Wisconsin Dept. of Natural Resources
In January and February, reports of approximately 10 lame deer or dead deer with at least one swollen hoof were investigated from a small area involving Columbia and Dodge counties.

Initially a veterinarian in Columbia County collected legs from deer found dead on a neighbor’s property. All of the dead deer were extremely thin and had a single leg that was severely swollen directly above the hoof causing the toes to separate. Local DNR staff and citizens worked together to collect and submit additional samples and carcasses that were found in the area. A single adult, male deer from Iowa County with similar lameness and a swollen rear hoof was also collected for necropsy.

The Wildlife Health Section worked with the National Wildlife Health Center (NWHC) and the Wisconsin Veterinary Diagnostic Laboratory (WVDL) to necropsy three of these deer (2 adults and 1 juvenile) and examine limbs from additional deer.

All three necropsied deer were in poor nutritional condition and the swellings above the hooves were firm to the touch and appeared chronic (occurring over an extended time). All of the hoof lesions were infected with two bacteria, *Fusobacterium necrophorum* and *Trueperella pyogenes*. Two of the deer also had pneumonia involving these bacteria that affected 90% of the lung tissue in one of the deer.
The identified bacteria are commonly found on the skin or intestinal tracts of animals and can survive in moist soil. *Fusobacterium necrophorum* is the bacteria most commonly associated with a disease referred to as “foot rot” in domestic animals, and often results in illness when animals are stressed by environmental factors such as food scarcity and crowding in a contaminated environment. These bacteria enter the body through cuts and abrasions. In these deer the bacteria likely entered through small wounds in the skin surrounding the base of the hooves leading to infection, swelling, accumulation of dead tissue and subsequent lameness in the affected limbs.

In cases where the bacteria enter the bloodstream they can spread to the entire body leading to additional abscesses or areas of infection in other parts of the body or causing general illness and death. This appears to have occurred in at least two of these deer leading to pneumonia. Stress, poor nutrition, or chronic health issues can decrease the immune response to infection. The findings suggested that this event was localized to a specific area and that the environmental conditions of that area plus seasonal stresses likely contributed to the resulting hoof infections.

Historical DNR records indicate that a similar event involving a small number of deer in Dodge County occurred over the 1997-1998 winter. One of these same bacteria was cultured from a swollen hoof from one of those deer.

The contributions of the citizens’ reports to the department of lame deer and dead deer with swollen hooves and the assistance of our partner agencies (NWHC and WVDL) were essential to our investigation of this localized event.
The Wildlife Toxicology program examines the causes, fates, exposures, biological accumulation, and adverse effects (including sublethal effects) of environmental contaminants on wildlife species and populations. The program utilizes wildlife as indicators of ecosystem health and environmental change.

Consumption advisories for mallard ducks are currently in effect within the Fox River/Green Bay Area of Concern (AOC). The current advisory suggesting that hunters “remove and discard all visible fat and skin prior to cooking” is the result of bioaccumulation of PCBs by waterfowl. We are evaluating current advisories by monitoring waterfowl for contaminants at locations where consumption advisories already exist and determine if any existing waterfowl consumption advisories can be removed or whether any new advisories are necessary.

Resident mallards were collected from the Fox River/Green Bay AOC in 2014 and 2015. Results indicate that PCB levels have not decreased in mallards from this area. In addition, mercury levels in these mallards were above advisory concentrations and as a result, we have recommended that due to the mercury contamination, the current advisory to be revised to “no more than 1 meal/week” for children and women of childbearing years.
The Wisconsin Bald Eagle Biosentinel Program is a collaborative project that has tracked eagle productivity and contaminant levels in WI since 1990. The results of this monitoring program have illustrated that bald eagles can be a sentinel indicator species for changes in the environment.

This long-term biomonitoring program utilizes nestling bald eagles as indicators of environmental change, ecosystem health, and contaminant exposure within aquatic, riverine, and riparian ecosystems in Wisconsin. While we still monitor legacy contaminants (PCBs, organochlorines, lead, mercury), there is a new focus on newly emerging contaminants including brominated flame retardants, fluorinated compounds (used in non-stick coatings and other industrial purposes), and endocrine disrupting chemicals. A different eagle population is sampled each year on a rotating basis in order to assess spatial distribution and exposure trends of contaminants.

In 2016, eagles along the Fox River, Green Bay, and Lake Michigan shorelines were monitored and 26 bald eagle territories were visited with 47 blood samples collected. Preliminary results indicate levels of fluorinated compounds remain unchanged. In addition, we continue to observe an increase in detections of other industrial compounds such as phthalates, which warrant continued monitoring.
Elk Translocation

The second year of the multi-year translocation effort to reintroduce elk into Jackson County and supplement the herd by Clam Lake with elk from Kentucky was a great success. As part of this effort, Wildlife Health supported the greater DNR elk team and our partners through planning for the elk trapping and their caretaking in Kentucky all the way through monitoring the elk following their release in Wisconsin.

In January and February of 2016, WDNR and Kentucky Department of Fish and Wildlife staff captured and started the quarantine process to relocate elk to Wisconsin. The health team provided constant oversight of husbandry and animal health, drawing upon the previous year experience as well as those of other states. Following initial testing for diseases of concern, forty elk were ultimately approved to move from KY to WI in March.

The elk all did well during the required additional holding period in WI, and passed their final health test. Thanks to the addition of 10 calves born in the holding facility, 50 elk were released into the Black River Falls State Forest in July. Unlike the previous year, Babesia odocoilei did not affect the herd during quarantine in Wisconsin. Previous exposure as well as factors affecting tick emergence are theorized to have played a role.

2016 also saw the birth of two free-ranging calves, the first in Jackson County since the late 1800s.

More information regarding the elk translocation project can be found by visiting the DNR website and searching keywords “elk reintroduction”.