

January 2010  
Issue 2

## Newsletter of the USGS National Wildlife Health Center

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- Unusual morbidity and mortality in Lake Erie water snakes

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Madison, WI 53711-6223

## Fact sheet on lead poisoning in wild birds

Despite the fact that lead has been identified as a mortality factor in wildlife for more than 100 years, and regulations restricting the use of lead shot for waterfowl hunting were implemented in 1991, lead ammunition is still commonly used in upland game and large game hunting as well as in fishing tackle. The general public and many hunters may not be aware that lead from these sources still poisons upland game birds,

birds of prey, scavengers, and waterbirds that consume spent lead ammunition and its fragments, or lost and discarded lead fishing tackle. The fact sheet *Lead Poisoning in Wild Birds* provides current knowledge on this issue.

This fact sheet illustrates hazards that lead exposure poses to wildlife—usually through direct ingestion of spent lead shot, lead fishing sinkers, tackle and

related fragments, or through consumption of wounded or dead prey containing lead shot, bullets, or bullet fragments.

Millions of pounds of lead used in hunting, fishing and shooting sports is introduced into the environment each year and can become a silent killer of wildlife. Lead is a metal with no known beneficial role in biological systems, and although its use in

*Continued page 2*

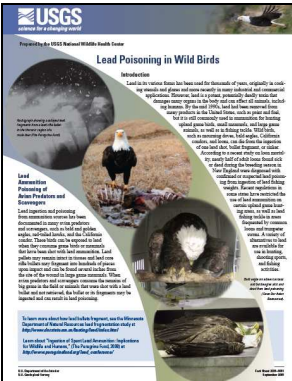
## Large-scale botulism type C outbreaks in waterfowl

Botulism type C is a neurotoxin produced by bacteria, *Clostridium botulinum*, under appropriate environmental conditions. Overall, botulism events decreased in 2009 with above normal precipitation values across many western states and below normal temperatures in the Midwest (National Climatic Data Center, <http://www.noaa.gov>). There were, however, several disease outbreaks that killed tens of thousands of waterfowl. The largest event in 2009 occurred at the Great Salt Lake, Utah. Biologists

with the U.S. Fish and Wildlife Service - Bear River Migratory Bird Refuge and the Utah Division of Wildlife estimated that more than 50,000 ducks, gulls, shorebirds, and grebes died between July and October. Historic records indicate botulism events occurred as early as 1912 at the Bear River refuge. Over fifteen outbreaks that killed thousands of birds have occurred sporadically over the years, the largest being in 1980 and 1997 with 100,000 and 250,000 birds, respectively. Less than 150 miles to the

north, American Falls reservoir, Idaho, and several surrounding water bodies experienced a die-off of 20,000 ducks, geese, shorebirds, and grebes between August and November of 2009. This was the first event of this magnitude at this location; previous smaller outbreaks occurred between 1982 and 1984, and in 1997. On-site management activities included the removal of carcasses to reduce further transmission of the toxin.

## Fact sheet on lead poisoning in wild birds



USGS Fact Sheet: Lead Poisoning in Wild Birds

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ammunition and in fishing tackle remains common, its use in gasoline, paint, pesticides, and solder in food cans has been nearly eliminated.

To request hard copies of

the fact sheet, please contact Gail Moede Rogall at [gmrogall@usgs.gov](mailto:gmrogall@usgs.gov), tel. 608-270-2438

Copies of the fact sheet can be downloaded from [http://www.nwhc.usgs.gov/publications/fact\\_sheets/pdfs/lead\\_poisoning\\_wild\\_b](http://www.nwhc.usgs.gov/publications/fact_sheets/pdfs/lead_poisoning_wild_b)

[irds\\_2009.pdf](#)

NWHC Web page on lead poisoning: [http://www.nwhc.usgs.gov/disease\\_information/lead\\_poisoning/index.jsp](http://www.nwhc.usgs.gov/disease_information/lead_poisoning/index.jsp)

## North American raptors susceptible to H5N1

USGS Research Virologist Jeffrey Hall is the lead author of a new article, "Experimental infection of a North American raptor, American kestrel (*Falco sparverius*), with highly pathogenic avian influenza virus (H5N1)," which was published on October 22 in the online journal *PLoS ONE*. The paper is based on a USGS National Wildlife Health Center

study in which American kestrels, used as a representative species of North American raptor, demonstrated that birds of prey may be at risk of infection and death if the bird flu virus reaches North America.

A USGS Technical Announcement about the publication and some of implications of the study

were released on October 30 and is posted on the USGS Newsroom site: <http://www.usgs.gov/newsroom/>.

Hall's article can be found online at <http://dx.plos.org/10.1371/journal.pone.0007555> and is also posted at <http://www.nwhc.usgs.gov>

## Chronic wasting disease susceptibility of rodents

The article discusses how four species of native cricetid rodents (meadow voles, red-backed voles, white-footed mice, and deer mice) were found to exhibit high susceptibility to CWD.

USGS Research Biologist Dennis Heisey is the lead author of an article published in January, "Chronic Wasting Disease (CWD) Susceptibility of Several North American Rodents That Are Sympatric with Cervid CWD Epidemics," in the *Journal of Virology*. His paper was selected by the *Journal* editors for inclusion in "Spotlight," a

feature that highlights research articles of significant interest from the current issue. The article discusses how four species of native cricetid rodents (meadow voles, red-backed voles, white-footed mice, and deer mice) were found to exhibit high susceptibility to CWD, a contagious, always-fatal prion disease of North American deer

and elk. Co-authors of the paper from the USGS National Wildlife Health Center include scientists Jay Schneider, Christopher Johnson, and Chad Johnson (<http://jvi.asm.org/>).

## USGS publications available

### Bat Rabies and Other Lyssavirus Infections Circular 1329

*Bat Rabies and Other Lyssavirus Infections* describes the worldwide occurrence of rabies in bats, its origins, how it spreads, and the degree of threat it poses to people, pets, farm animals, and wildlife. The book offers readers an overview of the virus variants that cause bat rabies and geographical patterns of occurrence.

This publication combines current science about bat rabies with rich illustrations and personal stories from the field. The author, Denny G. Constantine, is widely considered one of the world's foremost authorities on rabies. He provides a balanced perspective on the risk of bat rabies to animals, people and ecosystems. <http://www.nwhc.usgs.gov/publications/other/batrabies.jsp>

### Field Manual of Wildlife Disease — General Field Procedures and Diseases of Birds USGS Information and Technology Report 1999-001

This 426-page publication provides information on diseases and toxins that affect a variety of birds and practical information with how to deal with various bird diseases and carcass disposal. Highly illustrated with photographs, charts, maps, and life-cycle diagrams, it presents information in an easy-to-understand format and includes an index, a glossary and species lists.

[http://www.nwhc.usgs.gov/publications/field\\_manual/](http://www.nwhc.usgs.gov/publications/field_manual/)

### Disease Emergence and Resurgence: The Wildlife-Human Connection USGS Circular 1285

This 400-page publication focuses on disease emergence in wildlife, the general importance of wild animals as sentinels for disease emergence, and critical issues regarding wildlife as sources for zoonotic disease. This publication's content and writing style contribute to general public understanding of emerging and resurging wildlife disease; at the same time, it also addresses complex material and delves into scientific information useful for audiences with technical backgrounds. [http://www.nwhc.usgs.gov/publications/disease\\_emergence/](http://www.nwhc.usgs.gov/publications/disease_emergence/)



USGS Wildlife Disease Publications

## New research findings can improve avian flu surveillance programs

Genetic analyses of avian influenza in wild birds can help pinpoint likely carrier species and geographic hot spots where Eurasian viruses would be most likely to enter North America. "Our research demonstrates a genetically based technique for prioritizing wild bird species that are targeted for surveillance," said Dr. John Pearce, of the USGS

Alaska Science Center and lead author of the study. In the United States, state and federal agencies tested more than 326,000 wild bird samples from across the country from 2006 to 2008.

The research was published in the November 2009 issue of *Evolutionary Applications*, and was authored by scientists from three USGS centers: the

USGS Alaska Science Center, the USGS National Wildlife Health Center, and the USGS Western Ecological Research Center. More information is available online at [http://www.blackwellpublishing.com/eva\\_enhanced/editors\\_choice.asp](http://www.blackwellpublishing.com/eva_enhanced/editors_choice.asp)

## Parasitism of song and water birds



*Syngamus trachea* (gapeworm)  
Photo credit: Milton Friend

In August 2009, approximately 30 double-crested cormorants were found dead on a nesting island in Lake County, Montana. Only one carcass was suitable for submission to NWHC; this bird was emaciated and heavily parasitized by *Syngamus trachea* and several other gastrointestinal parasites. *S. trachea* is a nematode that infects the respiratory tract of wild and domestic birds and is often referred to as a gapeworm because

adult worms can block the trachea of infected birds causing them to “gape” or gasp for air. Severe gapeworm infections that cause clinical illness are thought to be uncommon in wildlife; however, recently lowered water levels in the reservoir surrounding the nesting island may have increased the availability of invertebrates, crustaceans, mollusks, or fish (which serve as host for various parasites) to foraging cormorants.

Parasitism also was a cause of death for American robins found in the yard of a private residence in Montana. The parasites involved in this mortality event were acanthocephalans (*Plagiorhynchus* sp.) and several nematode species. The pathogenesis associated with acanthocephalan infections are poorly understood, but paralyzed and moribund American robins with acanthocephalans have previously been reported.

## Viral and bacterial infections in pelicans

During an annual banding project of American white pelicans by the Minnesota Department of Natural Resources, biologists reported a large number of dead and moribund animals at a large pelican breeding colony in Minnesota. West Nile virus (WNV) was determined to be the

primary cause of this large die-off; however, several fledglings from one focal location of nestlings had severe infections with the bacteria *Riemerella anatipestifer*. WNV has been documented previously in juvenile American white pelicans at this Minnesota location and several other major

breeding colony locations in the northern plains. *R. anatipestifer* infections are primarily observed in domestic waterfowl, but also have been observed in several other waterfowl species including wood ducks, snow geese, and tundra swans.

## Unusual morbidity and mortality in Lake Erie water snakes



Lake Erie Water Snake  
Photo credit: Ohio DNR

In early July 2009, several dead Lake Erie water snakes (*Nerodia sipedon insularum*) were found floating in the water without obvious signs of trauma. Sick snakes were weak and lacked a righting reflex when placed on their backs. Subsequent submissions in late August presented with small blister-like lesions rather than neurologic signs. Of

the eleven snakes submitted to NWHC, no singular cause of death could be determined. Snakes experienced mortality from trauma, dystocia, malignant leukemia, and bacterial sepsis. Botulism type E was initially suspected in snakes with neurologic signs, due to the water snake’s diet consisting mainly of round gobies

(*Neogobius melanostomus*) and links to botulism type E in water birds feeding on round gobies, but conventional tests for botulism were negative. The Lake Erie water snake lives offshore on islands in western Lake Erie and is federally listed as a threatened species by the U.S. Fish and Wildlife Service.

## Medical wallet card for wildlife professionals

Biologists working with wildlife may be exposed to a variety of disease agents. NWHC has developed a wallet card that wildlife professionals can carry with them to alert medical personnel about potential exposure to zoonotic

diseases. Contact information is provided for the Centers for Disease Control for information on zoonotic diseases in humans. Contact NWHC for more information on diseases in wildlife.

The wallet card is available for download at: [http://www.nwhc.usgs.gov/outreach/medical\\_alert\\_wallet\\_card.pdf](http://www.nwhc.usgs.gov/outreach/medical_alert_wallet_card.pdf)

## National Wildlife Health Center diagnostic services and submission guidelines

NWHC provides complete diagnostic services, which includes direct access to Field Investigation Team (FIT) Wildlife Disease Specialists to assist field personnel with carcass submission, wildlife disease questions, or outbreak management support through phone, email, and on-site assistance.

The FIT are regionally based and are sources of information for choosing appropriate diagnostic specimens, communication and interpretation of results, and field response activities.

Timely submission of suitable samples and a comprehensive event history are key components toward determining the correct diagnosis.

Prior to submission, contact a member of the

FIT to obtain shipping approval and discuss shipping arrangements.

Freezing/thawing impedes isolation of some pathogens and damages tissues. The NWHC prefers chilled specimens if they can be sent within 24-36 hours of collection or death. The FIT will provide guidance on freezing samples on a case-by-case basis. As a general guideline, if you cannot call or ship within 24-36 hours, freeze the animal(s).

Specimens should be shipped by overnight service, Monday through Wednesday, to guarantee arrival at NWHC before the weekend. If specimens are fresh and need to be shipped on Thursday or Friday, special arrangements can be made with a FIT member.

A specimen history form and tracking number are required before specimens arrive at the Center. These may be sent to a FIT member either electronically or by FAX. Packages will not be opened if a specimen history form does not arrive first.

Instructions for collection and shipment of avian and mammalian carcasses, as well the required specimen history form, can be found at our website. [http://www.nwhc.usgs.gov/mortality\\_events/reporting.jsp](http://www.nwhc.usgs.gov/mortality_events/reporting.jsp)

Due to new restrictions, specimens should be sent to the National Wildlife Health Center, Necropsy Loading Dock. The new address can be found on the shipping instructions.

### ATTN: Medical Personnel

This person works with wildlife and may have been exposed to certain zoonotic diseases not routinely considered in the differential diagnoses of febrile illnesses. In case of sickness in this individual, please consider zoonotic diseases including, but not limited to the following:

Anthrax, Arbovirus encephalitis, Brucellosis, Giardiasis, Hantavirus, Hendra Virus, Highly Pathogenic Avian Influenza, Histoplasmosis, Leptospirosis, Lyme Disease, Monkeypox, Mycotocicosis, Nipah Virus, Psittacosis, Q Fever, Rabies, Rocky Mountain Spotted Fever, Salmonella, Sylvatic Plague, Tularemia, Typhus, & West Nile Virus.

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For more information on the occurrence of these diseases in humans, please contact:

The Centers for Disease Control and Prevention  
1600 Clifton Rd.  
Atlanta, GA 30333  
1-800-232-4636 (1-800-CDC-INFO)  
<http://www.cdc.gov/>



For more information on the occurrence of these diseases in wildlife, please contact:

USGS National Wildlife Health Center  
6006 Schroeder Rd.  
Madison, WI 53711-6223  
(608) 270-2400  
<http://www.nwhc.usgs.gov/>



Medical Wallet Card available for download

*A specimen history form and tracking number is required before specimens arrive at the Center.*

**USGS National Wildlife Health Center**

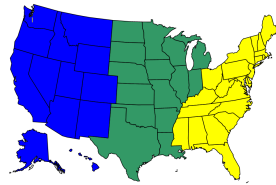
6006 Schroeder Road  
Madison, WI 53711-6223

PHONE:  
(608) 270-2400

FAX:  
(608) 270-2415

We're on the Web!  
Visit us at:  
<http://www.nwhc.usgs.gov/>

**To report a wildlife mortality event, contact a member of the NWHC Field Investigation Team**



*If your agency is involved in an event that is not reported, please contact:*

Western U.S.:  
Dr. Krysten Schuler,  
608-270-2447,  
[kschuler@usgs.gov](mailto:kschuler@usgs.gov)

Eastern U.S.:  
Dr. Anne Ballmann,  
608-270-2445,  
[aballmann@usgs.gov](mailto:aballmann@usgs.gov)

Central U.S.:  
Dr. LeAnn White  
608-270-2491  
[clwhite@usgs.gov](mailto:clwhite@usgs.gov)

Nationwide, single animal cases only:  
Jennifer Bradsby,  
608-270-2443,  
[jbradsby@usgs.gov](mailto:jbradsby@usgs.gov)

**Disclaimer**

Information presented in this newsletter represents the most current data available to the USGS National Wildlife Health Center at the time of publication. For mortality event details, we encourage researchers to contact us to acquire data directly.

External request forms for

mortality information can be obtained from Jennifer Bradsby at 608-270-2443 or by email:  
[jbradsby@usgs.gov](mailto:jbradsby@usgs.gov).

Information presented in this newsletter is not intended for citation as scientific literature.

For citable information or general information

regarding the Center, please contact Gail Moede Rogall, Information Specialist/Outreach Coordinator, at 608-270-2438 or by email:  
[gmrogall@usgs.gov](mailto:gmrogall@usgs.gov)

**Words for thought...**

“A society grows great when old men plant trees whose shade they know they shall never sit in”. ~ Greek Proverb