



**Report to the Western Association of Fish and Wildlife Agencies
from the USGS National Wildlife Health Center
December 17, 2009**

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The following information is of a topical nature for wildlife management agencies and entities; many partners and collaborators are involved in gathering and researching the information herein.

Field Investigation Team Summaries: July 2009 to September 2009

Parasitism of song and water birds (Montana)

In August 2009, approximately 29 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. **Contact:** Krysten Schuler, National Wildlife Health Center, 608-270-2447, kschuler@usgs.gov

Viral and bacterial infections in pelicans (Minnesota)

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) and severe infections with the bacteria *Riemerella anatipestifer* were determined to be the primary causes of this large die-off. 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. **Contact:** LeAnn White, National Wildlife Health Center, 608-270-2491, clwhite@usgs.gov

Large-scale botulism type C outbreaks in waterfowl (Utah, Idaho)

Botulism type C is a neurotoxin produced by the bacterium, *Clostridium botulinum*, under appropriate environmental conditions. Overall, botulism events decreased this year 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 this year 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, although 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. **Contact:** Krysten Schuler, National Wildlife Health Center, 608-270-2447, kschuler@usgs.gov

White-Nose Syndrome

Research progress on white-nose syndrome of bats (MA, NY, VT, NH, CT, NJ, PA, WV, VA)

Scientists continue to investigate the cause of bat white-nose syndrome (WNS), an emerging disease associated with the estimated loss of over one million insectivorous bats of six species in the Eastern United States. Little brown bats have been particularly hard hit with mortality approaching 100% at some hibernation sites. Preliminary findings from a collaborative study funded by the U.S. Fish and Wildlife Service, the U.S. Geological Survey, the U.S. Forest Service, the National Speleological Society, and Symbiology, LLC, indicated that a genetic signature of *G. destructans* was present in sediments collected in WNS-infested hibernacula. However, the genetic signature has thus far not been detected in environmental samples or on bats collected from outside the known WNS-infested region. Identification of *G. destructans* genetic material in environmental samples suggests that the fungus is present, and the potential exists for fungus to be transmitted between bat hibernation caves as an unwanted hitch-hiker upon humans, their clothing, or caving gear.

Preliminary data from WNS infection studies conducted at NWHC suggest *G. destructans* can be transmitted from bat-to-bat in a controlled environment. This finding, coupled with the recently confirmed first case of WNS this fall from a bat collected on November 4, 2009 in Virginia, suggests that WNS transmission may occur during the fall bat swarm, as well as during hibernation.

The NWHC has developed a rapid PCR test that can quickly screen samples for the genetic signature of *G. destructans*. This test will be used for surveillance and monitoring efforts this winter. Also, genome sequencing of *G. destructans* is underway at the Microbial Sequencing Center of the Broad Institute with funding provided by the National Human Genome Research Institute and the U.S. Geological Survey. Determination of the *G. destructans* genome sequence will facilitate future research into mechanisms of WNS pathogenesis and will enable molecular

epidemiological studies into the origin of *G. destructans*. Future WNS research directions include predicting the potential for WNS spread, evaluating possible treatment and control options, examining the persistence of *G. destructans* in the environment, and determining the cycle of WNS transmission.

Sample Collection Protocol

The NWHC has established a [sample collection protocol](#) to be used by state and federal biologists surveying bat hibernacula or evaluating unusual bat morbidity and mortality during the fall/winter 2009–2010. The guidelines are designed to assist with triaging samples and submissions from different geographic areas with a focus on identifying new sites with WNS. The NWHC sample submission protocol is available at <http://www.nwhc.usgs.gov/> (under Hot Topics). Please contact a field investigation team member prior to submitting samples.

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Sylvatic Plague

Oral vaccination of prairie dogs against plague via ingestion of vaccine-laden baits

Prevention of plague in wild rodents by immunization could reduce outbreaks of the disease. NWHC has developed a pox-virus based vaccine for plague that can be delivered orally to prairie dogs, resulting in nearly 100% survival upon plague challenge in laboratory studies. Recently we tested a bait that could be used for field delivery of the vaccine, testing its palatability for prairie dogs and the stability of the vaccine when incorporated into the bait. We found that prairie dogs in both the laboratory and in the field readily consumed the baits, even in the presence of a biomarker, and that the vaccine was stable for nearly 1 month at room temperature with minimal loss of titer. Studies are currently underway to evaluate the efficacy of these vaccine-laden baits upon consumption by prairie dogs. This work will pave the way for future field studies and eventual use of the vaccine to control plague in prairie dogs. **Contact:** Tonie Rocke, National Wildlife Health Center, 608-270-2451, trocke@usgs.gov

H5N1 Highly Pathogenic Avian Influenza

The Federal, State and Tribal partnership formed to develop and implement the National Interagency Early Detection System for Highly Pathogenic H5N1 Avian Influenza in Wild Migratory Birds has continued into its fourth year of surveillance. Birds have been tested from all 50 states and 6 freely-associated states and territories. While the surveillance focused on waterfowl, shorebirds, gulls and terns, a total of 284 species were sampled. So far, during the 2009 sampling year (April 1, 2009 – March 31, 2010), cooperating agencies collected and analyzed over 14,900 wild bird samples, which were analyzed at NWHC, and the highly pathogenic avian influenza H5N1 virus was **not** detected. Of these, 560 have tested positive for avian influenza based on molecular screening; 27 were H5 positive, but none were highly pathogenic avian influenza H5N1 Subtype.

Up-to-date information on the U.S. wild bird surveillance program is available at: <http://wildlifedisease.nbi.gov/ai/>. Current information on results of the sampling and testing

efforts in Canada can be found at the website of the Canadian Cooperative Wildlife Health Centre: <http://wildlife1.usask.ca/en/aiv/index.php>

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THANK YOU

The NWHC thanks all the state, federal and tribal agencies who worked with us the past year. We are at your service to provide technical support, field investigation assistance and diagnostic capabilities as your needs dictate.

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