



Report to the Western Association of Fish and Wildlife Agencies from the USGS National Wildlife Health Center

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Dr. Jonathan Sleeman
Center Director

Tel: 608.270.2401
Fax: 608.270.2415

jsleeman@usgs.gov

U.S. Department of the Interior
U.S. Geological Survey
National Wildlife Health Center
6006 Schroeder Road
Madison, WI 53711-6223

www.nwhc.usgs.gov

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:

Avian botulism in Hawaii

Several large botulism outbreaks were documented this year in Hawaii. From Dec. 2011 to March 2012, >300 waterfowl including many endangered Koloa ducks and coots died from botulism at Hanalei NWR. In February 2012, several dozen coots died from botulism in Lanai. More recently, in June of this year, an outbreak occurred at Kanaha Pond on Maui where >60 waterfowl were lost to botulism. More information on botulism is available at http://www.nwhc.usgs.gov/disease_information/avian_botulism/.

Contact: Thierry Work, 808-792-9520, Thierry_work@usgs.gov

Toxoplasmosis in Hawaii

The cat parasite *Toxoplasma gondii* continues to intermittently kill endangered birds in Hawaii and the Pacific with recent cases in Hawaiian geese, Hawaiian coots (from Kauai) and purple capped fruit dove from American Samoa. This parasite occurs in pacific islands where feral cats are present. For more information, see <http://www.nwhc.usgs.gov/hfs/Toxoplasmosis.jsp>

Contact: Thierry Work, 808-792-9520, Thierry_work@usgs.gov

Invasive corallimorph on Palmyra

In 2007, the NWHC Honolulu Field Station (HFS) documented a corallimorph (a type of anemone) colony smothering coral reefs surrounding a shipwreck at Palmyra Atoll NWR. In 2011, another survey showed that the infestation on the reef has increased from 1 to 3 square kilometers. Trials to eradicate this anemone were done in 2011 and are promising but labor intensive. We suspect metals leaching from the ship may be fueling the growth of the anemone, and DOI is looking at options of removing the wreck from the atoll. **Contact:** Thierry Work, 808-792-9520, Thierry_work@usgs.gov

Coral disease in Hawaii

Coral diseases have been responsible for declines of coral reefs in many parts of the Western Atlantic. In the Pacific, diseases are taking on increased importance with several disease outbreaks of coral in Kaneohe Bay in the last two years. The NWHC Honolulu Field Station (HFS) has been collaborating with the University of Hawaii and other governmental and non-governmental organizations to understand the causes of coral diseases in the Pacific and to develop the laboratory tools necessary to understand causes of disease in this poorly known group of animals. To date, we have found that protozoa, parasitic corals, and helminths may all play a role in various diseases of corals in Hawaii and other Pacific islands. For more information, see <http://www.nwhc.usgs.gov/hfs/>

Contact: Thierry Work, 808-792-9520, Thierry_work@usgs.gov

Marine turtle fibropapillomatosis

Since 1995, the USGS has been collaborating with NOAA and the American Samoa Department of Marine and Wildlife Resources to understand the health status of marine turtles in Hawaii and the Pacific. In Hawaii, efforts have focused on trying to understand the cause of fibropapillomatosis (FP), a disease that results in external and internal tumors in threatened green turtles and that is the most important cause of strandings in sea turtles in Hawaii. FP is associated with a herpes virus, and the HFS is also developing laboratory tools to assess immune status of sea turtles and attempting to grow the FP associated virus in the laboratory to better understand its role in causation of disease. **Contact:** Thierry Work, 808-792-9520, Thierry_work@usgs.gov

Avian cholera in California

Pasteurella multocida (avian cholera) epizootics were reported in various locations within nine California counties (Alameda, Butte, Colusa, Glenn, Sacramento, San Joaquin, Siskiyou, Sutter and Yolo) during January –April 2012. Cases were investigated and reported by the California Department of Fish and Game in partnership with USGS National Wildlife Health Center. The smallest event involved an estimated 75 dead wood ducks on a pond in Butte County. State waterfowl areas such as Woodbridge Ecological Reserve, Upper Butte Basin, North Grasslands, and Yolo Bypass Wildlife Areas estimated losses ranging from 200 to 1,500 birds including ducks, geese, and shorebirds. Sutter, Stone Lake and Klamath Basin National Wildlife Refuge Complexes, which serve as wintering areas for an estimated 2 million migratory birds, estimated final mortalities ranging from 100 to over 10,000 waterfowl, shorebirds and gulls, respectively. Refuge staff and volunteers at Tule Lake/Lower Klamath Lake NWR (Klamath Basin NWR Complex) retrieved 3,908 dead birds between mid-February and late April. The staff estimates this is approximately one-third of the birds that died during the event. The species most affected were snow goose, American coot, American widgeon, white-fronted goose, and northern pintail. This was the largest outbreak of avian cholera the Klamath Basin NWR staff has seen since 2008 when an estimated 10,000 birds died due to avian cholera. **Contact:** Barbara Bodenstein, 608-270-2447, bbodenstein@usgs.gov

Avian cholera in the Midwest

Avian cholera was the second leading cause of avian mortality events (after trematodiasis) reported to the USGS National Wildlife Health Center in the Central and Mississippi flyways during the first quarter of 2012. Greater and lesser snow geese and Ross's geese were the primary species involved in all four mortality events in the Midwest. The first 2012 cholera event in the Midwest occurred in Pike County, Missouri, at the beginning of February and involved less than ten geese. The other three events in the Midwest were reported shortly thereafter, first in northwestern Missouri (Holt County) followed by Iowa and Nebraska. The event in Iowa involved an estimated 150 geese in Fremont County in a wildlife management area. The last avian cholera event in that area was reported in 2003. The largest event in the Midwest in 2012 occurred in Nebraska across multiple Waterfowl Production Areas in Clay, Phelps, and Kearney Counties and involved almost 1,300 birds, primarily snow geese and Ross's geese, as well as a few other species of waterfowl, such as Northern pintails and mallards. The avian cholera mortality in 2012 in Nebraska was the highest for the state since 1999 when an estimated 1,400 died from this disease. **Contact:** LeAnn White, 608-270-2491, clwhite@usgs.gov

North America white-nose syndrome update, Winter 2011/2012

Geomyces destructans, the fungus that often causes fatal skin infections of hibernating bats in eastern and central North America, continued to spread this past winter season. Most notably, characteristic skin lesions of white-nose syndrome (WNS) were confirmed on little brown bats at a hibernaculum west of the Mississippi River for the first time in Lincoln County, Missouri and the southern Appalachians of northern Alabama (Jackson County). While no mortality was detected at either location and mortality remains low along the western disease front, an estimated 5.5 million bats are believed to have died from

WNS since it was first recognized five years ago near Albany, New York. Winter bat populations have been reduced more than 80% in the northeast and mid-Atlantic United States although there are some early indications that bat populations may have stabilized at some of the original affected sites in New York. White-nose syndrome was also confirmed at the only known bat hibernaculum in Delaware for the first time this past winter, although *G. destructans* had been previously detected on bats returning early to known maternity roosts in April 2010 from this hibernaculum. WNS has now been confirmed in 19 states and 4 Canadian provinces, and it continues to expand into new counties and districts within the affected area. Iowa recently announced the detection of low levels of *G. destructans* DNA on a single little brown bat showing no clinical signs in Jackson County. The viability of the fungus at the Iowa site is still unknown. In addition to range expansion of WNS, the federally-listed endangered gray bat (*Myotis grisescens*) was also added to the list of North American hibernating bats confirmed with the disease, which includes little brown bats (*M. lucifugus*), Northern long-eared bats (*M. septentrionalis*), Eastern small-footed bats (*M. leibei*), endangered Indiana bats (*M. sodalis*), tricolored bats (*Perimyotis subflavus*), and big brown bats (*Eptesicus fuscus*). To view a recent (June 2012) fact sheet on WNS that includes updates on collaborative WNS research activities by USGS, please visit http://www.nwhc.usgs.gov/publications/fact_sheets/pdfs/WNS_Factsheet_2012.pdf.

Contact: LeAnn White, 608-270-2491, clwhite@usgs.gov

Common murre winter mortalities, Alaska

Two common murre mortality events were reported during January through March in Skagway/Sitka Burroughs and Afognak Island, Alaska. Birds were found dead or weak and unable to fly or escape capture. Some live birds were captured and recovered once returned to water, others died in hand. An estimated 15 birds were found dead, primarily in Nahku Bay, Skagway. An estimated 250 were found in bays near on Afognak Island. Historically, common murre are not frequent visitors to Skagway bays, but this year there were 120 counted on the Christmas Bird Count. Severe winter weather with temperatures hovering around zero to 10 (F) and north winds (20 mph, with gusts to about 40) was reported in Skagway. The probable cause of death in specimens submitted to the NWHC was attributed to emaciation and starvation. The birds were severely emaciated, had no body fat, no food in the upper gastrointestinal system, marked atrophy of skeletal muscles and hemorrhage in the intestine. **Contact:** Barbara Bodenstein, 608-270-2447, bbodenstein@usgs.gov

Pelagic bird mortalities along the Pacific coast of Ventura and Santa Barbara counties (California)

A mortality event involving primarily Western and Clark's grebes was reported along the Pacific coast of Ventura and Santa Barbara counties, California, in early November 2011 by the U.S. Fish and Wildlife Service (FWS), Ventura Fish and Wildlife Office, and California Department of Fish and Game Office of Spill Prevention and Response. As of March 2012, an estimated 670 pelagic birds and 7 marine mammals had been reported moribund or dead. During November and December, the NWHC received 26 birds representing 8 species for diagnostic evaluation and a field investigation by health center staff was conducted in mid-December. Emaciation has been the only consistent finding among all the birds examined. However, vacuoles (holes) in the white matter of brains in 12 birds examined have also been identified. Infectious diseases, such as pathogenic bacteria and viruses, have been ruled out. Electron microscopy of brain tissue and contaminant analysis is currently being pursued to better characterize the nature of these brain lesions and cause of mortality. Partners from FWS, CAFG and wildlife rehabilitation volunteers continue to monitor the area and receive individual bird stranding reports; however, peak mortality had subsided by late December. **Contact:** Barbara Bodenstein, 608-270-2447, bbodenstein@usgs.gov

Unusual mortality event of Harbor seals along the northeastern Atlantic Coast (Maine, New Hampshire, Massachusetts)

An unusual mortality event (UME) among Harbor seals (*Phoca vitulina*) was declared by the National Oceanic and Atmospheric Administration (NOAA) in November 2011 along the northeast Atlantic coast

from southern Maine to northern Massachusetts. Mortality involving mostly juveniles from early September to mid-October was three times the average annual mortality rate reported for the region. Total mortality was estimated at 158 animals by early November; upper respiratory signs were reported in sick animals observed. The USGS NWHC was one of several collaborating laboratories invited by NOAA to participate in the mortality investigation and provided virology support. Common findings reported by partners among the 23 animals examined included good to fair nutritional condition, hemorrhagic interstitial pneumonia, and ulcerative dermatitis. Bacterial pneumonia was thought to be secondary to an underlying infection. Influenza A virus (subtype H3N8 of avian origin) was isolated from multiple tissues of 5 seals collected from coastal New Hampshire during peak mortality. The role of avian influenza during the main mortality event could not be established because of insufficient suitable samples. Testing of seal samples collected late in the UME period has been negative. Mortality from influenza A infections have occurred in the past among free-ranging seal populations although this is the first report of the H3N8 subtype. Diagnostic investigations continue on available samples. **Contact:** Anne Ballmann, 608-270-2445, aballmann@usgs.gov

Investigating alopecia in Polar Bears of South Beaufort Sea, Alaska

During March through May of 2012, the USGS Alaska Science Center Polar Bear Project field capture crew observed multiple cases of alopecia and skin lesions on bears captured at the boundary of the Southern Beaufort seas. The USGS Polar Bear Project and the USGS NWHC are investigating the occurrence of the alopecia and skin lesions on various samples that were collected from bears during the 2012 field season to determine the causative agent and the potential implications to polar bear health. Similar alopecia and skin lesions have previously been observed in 1999, when clinical signs were observed in approximately 19% of the bears captured by the USGS Polar Bear Project. No causative agents were identified at that time. **Contact:** Barbara Bodenstein, 608-270-2447, bbodenstein@usgs.gov

Lake Michigan volunteer AMBLE (Avian Monitoring for Botulism Lakeshore Events) program

Avian botulism type E outbreaks have occurred on the Great Lakes annually since the late 1990s. With support from the Great Lakes Restoration Initiative, scientists from the U.S. Geological Survey, the National Park Service, and the private sector are working together to explore the ecological pathways through which the toxin produced by a natural bacterium (*Clostridium botulinum*) is transported to birds. The help of volunteer beach monitors to record timing, numbers, and species of bird carcasses deposited on beaches is providing valuable information needed to better understand this important wildlife disease. The 2012 AMBLE monitoring season began in May. As of mid-July, over 22 miles of transects are being covered and 20 dead birds have been reported. Continued monitoring of beaches in Door County, Wisconsin, and the extension of this citizen science network around Green Bay, will provide further insight into epidemiological patterns of avian botulism. More information about AMBLE can be found at <http://www.nwhc.usgs.gov/AMBLE/> **Contact:** Jennifer Chipault, 608-270-2473, AMBLE@usgs.gov

Disease Investigations Research

Sylvatic plague vaccine for prairie dogs

Laboratory studies have demonstrated that oral vaccination of prairie dogs against plague using raccoon pox-vectored vaccine is feasible, resulting in significant protection against challenge with *Yersinia pestis*. Further laboratory studies to assess duration of immunity in prairie dogs have demonstrated protection lasting at least 9 months. Studies on vaccine safety and efficacy in non-target species (ungulates and mice) are ongoing. The Sylvatic Plague Vaccine (SPV) Subcommittee, under the direction of the Executive Committee of the Black-footed Ferret Recovery Implementation Team, is continuing its work to complete development and delivery of the SPV as a management tool to combat plague in prairie dogs and promote the recovery of the black-footed ferret. Field trials to confirm the safety of the vaccine in

prairie dogs and non-target animals are ready to begin in the summer of 2012, pending regulatory approval. Field studies to assess vaccine efficacy in free-ranging prairie dogs are anticipated to begin in 2013. **Contact:** Tonie Rocke, National Wildlife Health Center, 608-270-2451, trocke@usgs.gov

Recent Publications

USGS Circular on Plague

Scientists at the National Wildlife Health Center recently released *Plague*, USGS Circular 1372. *Plague* offers readers an overview of this highly complex disease caused by the bacteria *Yersinia pestis*. The history of the disease, as well as information about *Yersinia pestis* and its transmission by fleas, is described. Tonie E. Rocke, the senior author, is a prominent researcher on oral vaccination of prairie dogs to prevent plague. She is currently working to transfer her success in the laboratory to the field to control plague in prairie dogs. Rachel C. Abbott is assisting Dr. Rocke in this process and will coordinate field trials of the vaccine. More information about the publication, including a PDF, can be viewed at <http://pubs.usgs.gov/circ/1372/>

Wildlife Health Bulletin on Surveillance for Avian Influenza

In May 2012, NWHC issued a Wildlife Health Bulletin entitled “NWHC Plan for Avian Influenza Surveillance of Wild Birds” that summarized the testing conducted during the surveillance program from 2006 to 2010, and explained that the NWHC is continuing surveillance for H5N1 highly pathogenic avian influenza by focusing on testing sick and dead migratory birds, particularly ducks, geese, and swans. The bulletin also reminds wildlife managers to be alert regarding wild bird morbidity and mortality events that meet certain criteria. The bulletin can be viewed at http://www.nwhc.usgs.gov/publications/wildlife_health_bulletins/WHB_2012-03_AI_Surveillance.pdf

New and Ongoing Wildlife Mortality Events Nationwide

USGS and a network of partners across the country document wildlife mortality events in order to provide timely and accurate information on locations, species and causes of death. For current wildlife mortality events Nationwide please see the link below or visit the NWHC website at: <http://www.nwhc.usgs.gov/> and go to the spotlight: View Recent Mortality Events.

http://www.nwhc.usgs.gov/mortality_events/ongoing.jsp

The NWHC Mortality Events Map shows recent mortality events that have been reported to the NWHC. Each event is shown on the map and listed on the left with newest events on top. To view the list of events in a tabular format please visit the New and Ongoing Wildlife Mortality Events page.

http://www.nwhc.usgs.gov/map/mortality_events.jsp

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.

Field Investigations Team

Dr. Anne Ballmann, 608-270-2445, aballmann@usgs.gov

Dr. LeAnn White, 608-270-2491, clwhite@usgs.gov

Barbara Bodenstein, 608-270-2447, bbodenstein@usgs.gov

Dr. Thierry Work, 808-792-9520, twork@usgs.gov

Jennifer Bradsby, 608-270-2443, jbradsby@usgs.gov