



**Report to the Fish and Wildlife Health Committee
of the Association of Fish and Wildlife Agencies
from the
USGS National Wildlife Health Center
March 16, 2012**

USGS National Wildlife Health Center unveils new strategic science plan

The mission of the USGS National Wildlife Health Center is to provide national leadership to safeguard wildlife and ecosystem health through dynamic partnerships and exceptional science. During the past 18 months, the NWHC has embarked upon an ambitious strategic planning process to guide our work and activities for the next 3–5 years so we can meet our responsibilities to be ever vigilant for the next emerging wildlife disease, and provide the exceptional science needed to serve our partners and understand and manage these disease threats in a timely and effective manner. The NWHC Strategic Science Plan will be used to guide and prioritize our work into the future. This plan charts a course for the future direction of the NWHC, and builds upon our past successes, collaborations, and unique facilities to ensure we conduct exceptional science that meets and exceeds the expectations of our partners, and utilizes the full potential and expertise of our staff. The wildlife disease issues we face are increasingly complex, and this plan will ensure we have the skills, tools, resources and partnerships to meet the needs of those we serve and help protect the Nation's natural resources. We are seeking and welcome partner comments on the plan. Please contact Jonathan Sleeman for a copy of the plan. Tel. 608-270-2401 or e-mail jsleeman@usgs.gov.

Wildlife Highlights

White-nose syndrome update for winter 2011/2012

White-nose syndrome (WNS) in cave-hibernating bats remains confined to the 16 states and 4 Canadian provinces thus far during the Winter 2011/2012 season. Westward expansion of WNS beyond Trigg County, Kentucky has not yet been detected. *Geomyces destructans*, the fungus which causes WNS, had been detected on bats sampled in Missouri, Oklahoma, and Delaware in previous years but the disease has yet to be confirmed in these states. The disease has continued to spread into new counties within WNS-confirmed states and provinces (Maryland, Virginia, West Virginia, Pennsylvania, Tennessee, Ohio, Kentucky, Indiana, New Brunswick, and Nova Scotia). Several of these range expansions have been associated with bat mortality. A recent analysis completed by USFWS biologists and collaborators estimates that since 2006, over 5 million bats have died from WNS. Six species, including little brown, northern long-eared, tri-colored, Indiana, eastern small-footed, and big brown bats, are known to be susceptible to the disease. Genetic evidence of *Geomyces destructans* has been identified on three additional species (Southeastern myotis, Cave myotis, and Gray bats). For the latest WNS updates, consult NWHC Wildlife Health Bulletins: http://www.nwhc.usgs.gov/publications/wildlife_health_bulletins/index.jsp.

Current bat submission guidelines to NWHC are available at:

http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/USGS_NWHC_Bat_WNS_submission_protocol.pdf

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White-nose syndrome research updates

The USGS National Wildlife Health Center and partners continue to play a primary role in WNS research, including WNS transmission/pathogenesis/recovery studies, development of improved tools for molecular detection of *G. destructans*, and investigations of the microbial ecology of *G. destructans* in bat hibernacula. A recently completed laboratory study demonstrated that infection of healthy hibernating little brown bats

with *G. destructans* resulted in the development of WNS, confirming the fungus as the sole cause of this disease. NWHC scientists and others are currently conducting laboratory experiments to determine how/why fungal skin infection kills bats. The leading hypothesis is that fungal damage to bat wing skin catastrophically disrupts physiological homeostasis during hibernation. A previous study demonstrated that bats with WNS can recover from the disease following emergence from hibernation with provision of supportive care (food, water, and warm temperature). These results confirm that hibernation predisposes bats to develop the disease following infection by *G. destructans* and further indicate that management actions to reduce infection severity may allow bats to survive and naturally recover from WNS following spring emergence. In support of the WNS National Plan for managing WNS in bats, work at the NWHC is ongoing to standardize non-invasive techniques (i.e., swabbing) to collect fungal samples from bat skin, and efforts are underway to develop/qualify a new quantitative PCR method for detecting *G. destructans* with enhanced specificity and sensitivity necessary to analyze environmental samples. Previous work conducted by USGS scientists demonstrated that viable *G. destructans* was present in soil collected from hibernation sites within the WNS-infested region of the United States, indicating that underground hibernacula serve as an environmental reservoir for *G. destructans*. Work is ongoing to determine capacity of the fungus to persist in hibernacula in the absence of bats and to define the fine-scale role of temperature in the proliferation and persistence of *G. destructans*. **Contact:** David Blehert, 608-270-2466, dblehert@usgs.gov

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

Highly pathogenic avian influenza (HPAI) surveillance

The Federal, State and Tribal partnership formed to develop and implement the National Interagency Early Detection System for HPAI H5N1 in Wild Migratory Birds continues into the sixth year of surveillance; currently, the focus is on birds sampled from mortality events. Birds have been tested from all 50 states and 6 freely-associated states and territories. Asian-lineage HPAI H5N1 has not been detected in North America. **Contact:** Hon Ip, 608-270-2464, hip@usgs.gov

Developing methods for the improved recovery of avian influenza virus (AIV) and evaluating factors affecting survival of AIV in natural water and wetland sediments

Wild birds, particularly waterfowl, are the natural reservoir for avian influenza A viruses. When these birds are infected, large amounts of influenza virus are shed into their environment; however, little is known about the role of the environment in terms of viral persistence and transmission. The NWHC has initiated a study that seeks to 1) improve the recovery of avian influenza viruses from wild birds, water, and wetland sediments; and 2) to use the improved techniques to understand how factors in natural water and wetland sediments affect avian influenza virus (AIV) persistence and viability in the environment. A better understanding of the environmental factors that affect avian influenza virus survival in the environment will aid in the assessment of the significance of the shedding of avian influenza viruses in general, including HPAI H5N1, by infected wild birds into the nation's watersheds. **Contact:** Bob Dusek, 608-270-2403, rdusek@usgs.gov.

Low pathogenic avian influenza viruses persist in California wetland during the summer

Scientists from the USGS National Wildlife Health Center, the Wisconsin Cooperative Wildlife Research Unit, the USGS Western Ecological Research Center, and the University of Wisconsin–Madison found that, rather than persisting primarily in colder northern wetlands as previously thought, low pathogenic avian influenza viruses can be carried within low-density waterfowl populations in high water temperatures. These findings indicate a previously unknown reservoir for low pathogenic avian influenza viruses and a potential source of infection for millions of wintering birds. Migratory birds—typically waterfowl, shorebirds, gulls and terns—are carriers of low pathogenic avian influenza viruses, and are considered the natural reservoir. The researchers found low pathogenic viruses—as opposed to the highly pathogenic virus, which has not been found in North American wildlife—in water and waterfowl fecal samples collected in the California Central Valley during summer, indicating on-going infections in resident waterfowl, persistent shedding and active transmission of low pathogenic viruses. Despite previous research suggesting that colder temperatures and increased bird densities as waterfowl congregate during migration are most favorable to the survival of these viruses, the recent findings suggest that high summer water temperatures do not prevent its circulation. This study was recently published in [PLoS ONE](#). **Contacts:** Bob Dusek, 608-270-2403, rdusek@usgs.gov; Hon Ip, 608-270-2464, hip@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. In spring of 2011, 52 volunteers in Door County, Wisconsin, were trained by NWHC staff to become beach monitors in the Lake Michigan Volunteer AMBLE (Avian Monitoring for Botulism Lakeshore Events) program. These volunteers walked segments of Lake Michigan shoreline to monitor for dead birds and record beach conditions every 7–10 days from June through November. AMBLE volunteers covered 34 segments of beach totaling 17.2 miles. Local partners in the creation of the AMBLE program include The Ridges Sanctuary, Wisconsin Department of Natural Resources, Northeastern Wisconsin Audubon Society, Crossroads at Big Creek, and The Nature Conservancy. During the 2011 monitoring season, over 15,000 healthy and 87 sick or dead birds were reported by AMBLE beach monitors. Double-crested cormorants, ring-billed gulls, and herring gulls were the species most frequently found sick or dead. Canada geese also accounted for a high percentage of the mortality detected on the shores of Door County, Wisconsin, but botulism type E was not confirmed during laboratory testing of 4 goose specimens. Botulism type E was confirmed in multiple cormorants and gulls submitted to NWHC for testing from Door County, Wisconsin, as well as in a hooded merganser and a horned grebe. AMBLE volunteers will monitor beaches of Door County again in 2012. More information about AMBLE can be found at http://www.nwhc.usgs.gov/mortality_events/amble/ **Contact:** Jennifer Chipault, 608-270-2473, AMBLE@usgs.gov

Disease Investigations

Grebe mortality in California

An unusual mortality event involving primarily Western and Clark's grebes was reported along the coast of Ventura and Santa Barbara counties, California in early November 2011 by the USFWS Ventura Field Office and California Fish and Game (CAFG). Birds were observed stranding on beaches and struggling to stay upright along the coastal waters of Ventura Harbor. The biologists involved believe the event may have been going on since early October based on conversations with local wildlife rehabilitation volunteers. To date, an estimated 565 pelagic birds and 12 marine mammals have been reported moribund or dead. Partners from USFWS and CAFG and a group of volunteers continue to monitor the event on the ground and continue to

receive individual bird stranding reports, but the event seemed to peak in October through December. During November and December, the NWHC received twenty-six birds (13 Western grebes, 5 red-throated loons, 2 horned grebes, 1 Clark's grebe, 1 brown pelican, 1 common murre, 1 brown pelican, 2 California gull) for diagnostic necropsies and a field investigation by NWHC staff was also conducted in mid-December. To date, the only consistent finding is that all birds are emaciated. However, vacuoles (holes) in the white matter of brains in 12 of 26 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 are currently being pursued to confirm the nature of these unusual brain lesions and cause of mortality. **Contact:** Barbara Bodenstein, 608-270-2447, bbodenstein@usgs.gov

Avian influenza virus found in Western Atlantic harbor seals

In autumn of 2011, juvenile harbor seals (*Phoca vitulina*) died in unusually high numbers along the coast of Maine, New Hampshire and Massachusetts. Most of the animals showed signs of respiratory infection, and some also had skin lesions on the trunk and flippers. The USGS National Wildlife Health Center, Columbia University and other laboratories were invited by the National Oceanic Atmospheric Administration (NOAA) to participate in the investigation into the cause of this unusual mortality event. While many animals were too decomposed for examination, tissues from five seals in good condition were collected by the staff of New England Aquarium, and were forwarded to NWHC for diagnostic evaluation. Influenza virus RNA was detected directly from tissues from each of the five animals and when sequenced, H3N8 influenza virus was identified. Tests at Columbia University further showed direct evidence of influenza replication in respiratory tissues. NWHC was able to rapidly isolate the virus from multiple tissues from four of the animals. Full-length RNA segment sequencing of the virus shows that the seal H3N8 is an avian influenza virus with no evidence of reassortment with other influenza viruses. The virus is most closely related to H3N8 viruses isolated from ducks from the Midwest but is distinct from the H3N8 lineage in dogs and horses. This is the first record of H3N8 in marine mammals associated with a mortality event. How it was introduced into the Western Atlantic harbor seal population and whether it contributed to the wider seal mortality event remain under investigation. **Contact:** Hon Ip, 608-270-2464, hip@usgs.gov

Trematodiasis in lesser scaup (Minnesota)

In April 2011, Minnesota Department of Natural Resources (DNR) began surveying Lake Winnibigoshish for avian mortalities. Biologists observed lesser scaup that were unable to fly and had difficulty diving. Approximately 300 lesser scaup were found dead between April and May on the lake and several were submitted to the US Geological Survey's National Wildlife Health Center where trematodiasis, specifically *Sphaeridiotrema globulus* and *Cyathocotyle bushiensis*, was confirmed. This lake has a history of almost annual mortalities associated with exotic trematodes (*S. globulus*, *C. bushiensis*, *Leyogonimus polyoon*) since 2007. The lesions associated with these gastrointestinal parasites include mild to severe ulcerative hemorrhagic enteritis and caseous plaques and mortality is thought to be associated with blood loss and shock. Lesser scaup (*Aythya affinis*) and American coot (*Fulica americana*) have consistently been the two most affected species by this disease in the midwestern United States. Increased susceptibility of these species may be a result of their increased rate of exposure to the infective stage due to foraging preferences; these include feeding on mollusks and preferences for deep, open water habitats with emergent vegetation. Another factor in increased susceptibility may be due to dense populations of these species that use infected areas during spring and fall migrations. **Contact:** LeAnn White, 608-270-2491, clwhite@usgs.gov

Newcastle Disease field investigation at Poplar Island Environmental Restoration Site (Maryland)

Wildlife disease specialists and biologists from the US Geological Survey's National Wildlife Health Center, Maryland Department of Natural Resources, and the U.S. Fish & Wildlife Service teamed up to investigate double-crested cormorant mortality at a rookery site on Poplar Island in Talbot County, Maryland, in June 2011. During the summer 2010, virulent Newcastle disease (vND) and concurrent salmonellosis were detected in young of the year cormorants at this rookery resulting in the death of approximately 84 birds. While juvenile cormorant mortality had not yet exceeded that observed during the previous summer, baseline

mortality for this population of 816 active nests was uncertain. Given the high density of domestic poultry in Maryland, resource managers wished to investigate the possibility of vND recurrence in this population. Fresh dead carcasses, as well as several 3–6 week old birds exhibiting lethargy, incoordination, and wing dragging were collected for diagnostic evaluation. In addition, serum and paired oropharyngeal and cloacal swabs were collected non-lethally from a subset of asymptomatic 4–6 week old juveniles for future analysis. No evidence of vND or closely related avian paramyxovirus-1 was detected in the affected birds. Aspergillosis was diagnosed in the cormorants found dead and no infectious diseases were identified among the clinically affected juveniles. Collaborative studies with USDA Wildlife Services and the Minnesota Department of Natural Resources were initiated the summer of 2011 to better understand vND disease ecology in double-crested cormorant populations. **Contact:** Anne Ballmann, 608-270-2445, aballmann@usgs.gov

Ranavirus mortality among amphibians and chelonians in the Eastern U.S. (Connecticut, Maryland, Florida)

Ranavirus infections were responsible for mortality events involving several species of frogs and eastern box turtles extending throughout the Atlantic states between April and June 2011. Ranavirus was previously confirmed in wood frogs and spotted salamanders in Connecticut during 2009, and various frog species in Florida during 2002 and 2006. Box turtle mortality due to ranavirus infection has occurred annually since 2008 in Montgomery County, Maryland, although the disease was first reported in amphibians elsewhere in the state in 2005. Four events have occurred in Montgomery County and ranavirus-associated mortalities in eastern box turtles have been detected in three separate locations in the county. Of the 34 turtle mortalities in Montgomery County, 28 have come from a single study site where intensive annual surveillance has occurred since 2009. Additional ranaviral disease outbreaks in box turtles have been reported by others in New York, Pennsylvania, Georgia, and Florida. Unexplained die-offs of wild box turtles with signs resembling ranaviral infection, although not confirmed, have been reported in Virginia and North Carolina. Larval and metamorph (tadpoles) stages of amphibians are most susceptible to infection by ranavirus. Ranavirus mortality often involves large numbers of individuals, which are found swimming erratically or floating upside-down in the water, and have reddened ventrums, hemorrhages, and skin ulceration. Clinical signs in box turtles include weakness, lethargy, oral plaques, swollen eyes, thick discharge from the mouth and/or nares, and difficulty breathing. It is thought that infected amphibians may serve as a potential reservoir for sympatric chelonians. Ranavirus infections, mostly involving amphibians, have been confirmed in 28 states nationwide since 1997. Maine, Rhode Island, Maryland, Idaho, and Wyoming account for over 40% of the reported ranavirus mortality events in the NWHC wildlife disease database. **Contact:** Anne Ballmann, 608-270-2445, aballmann@usgs.gov, and David E. Green, 608-270-2482, degreen@usgs.gov

Avian botulism type C throughout the U.S.

Late summer and early fall represents the peak period for avian botulism events and in 2011 botulism type C events were confirmed or suspected in all four migratory bird flyways.

In the Atlantic Flyway, botulism type C was the suspected cause of death for a mortality event in Orange County, Florida involving approximately 50 resident Muscovy Ducks (*Cairina moschata*).

In the Mississippi Flyway, mortality associated with botulism type C affected around 400 birds, with most of the events occurring in community ponds and retention areas and affecting primarily Mallards (*Anas platyrhynchos*) and Canada Geese (*Branta canadensis*).

The deaths associated with type C botulism were much higher in the Central Flyway, which had almost 3,000 bird deaths, primarily in waterfowl species. The largest event in this flyway occurred at Blue Blanket Lake, Walworth County, South Dakota where over 1,000 Redheads (*Aythya americana*), Gadwalls (*Anas strepera*), Blue-wing Teal (*Anas discors*), Mallards and American Coots (*Fulica americana*) were affected.

In the Pacific Flyway, ten confirmed avian botulism events were investigated by the NWHC and partnering agencies in Arizona, California, Nevada and Oregon. In addition, several mortality events in Utah and California were suspected to be a result of avian botulism type C. Mortalities involved less than 200 birds per event with the exception of an event that occurred in Nevada on private land near Carson Lake State Wetland Complex and Fallon and Stillwater National Wildlife Refuges. Due to the flooding of vegetated fields during hot weather, conditions at this location were favorable for botulism. This was the largest reported botulism event in the U.S. this year and involved an estimated 3,000 waterfowl and shorebirds of various species. In consultation with NWHC, Nevada Division of Wildlife and U.S. Fish and Wildlife Service biologists were able to respond and provide daily carcass pick up and disease management activities to mitigate the extent of this die-off. Disease management activities were essential since the location of the mortality was within two miles of a migratory staging area for over 80,000 additional waterfowl and shorebirds. One of the species most affected early in the mortality event were White-faced Ibis (*Plegadis chihi*). **Contact:** LeAnn White, 608-270-2491, clwhite@usgs.gov

Avian botulism type E in the Great Lakes Region

Avian botulism type E mortality events, which are typically confined to the Great Lakes in the United States, were confirmed on Lake Ontario (Monroe and Wayne Counties, New York), northern Lake Erie, southeastern Georgian Bay on Lake Huron, and on Lake Michigan (Door County, Wisconsin and Leelanau County, Michigan). The botulism-confirmed mortality events on Lake Michigan were much larger than those reported on Lake Ontario; however, active surveillance for bird mortalities is conducted on Lake Michigan by Sleeping Bear Dunes National Lakeshore volunteers and USGS Avian Monitoring for Botulism Lakeshore Events Program (AMBLE) volunteers. The largest mortality event occurred at Lake Huron beginning in August, and affected fish (mostly sturgeon) and later birds. Avian mortalities occurred between September and October with an estimated total mortality of 3,000-8,000 birds: affected species included Ring-billed Gulls (*Larus delawarensis*), Herring Gulls (*Larus argentatus*), Common Loons (*Gavia immer*), Red-necked Grebes (*Podiceps grisegena*), Long-tailed Ducks (*Clangula hyemalis*), and White-winged Scoters (*Melanitta fusca*). Reporting agencies include NWHC, Cornell University, and Canadian Cooperative Wildlife Health Centre. **Contact:** LeAnn White, 608-270-2491, clwhite@usgs.gov

Mortality in captive Mississippi gopher frog larvae (Harrison County, Mississippi)

In September, the NWHC was contacted for assistance with an overnight mortality event involving approximately 2,400 newly hatched endangered larval Mississippi Gopher Frogs (*Rana sevosa*) at the Harrison Experimental Forest within the DeSoto National Forest in southern Mississippi. The tadpoles originated from portions of several egg masses that had been collected one week earlier from a single natural pond for captive propagation. No natural mortality among adults or egg masses was observed at the pond at the time of collection. NWHC received representative specimens from each egg mass for diagnostic evaluation. Notable abnormalities in the 1-2 mm sized hatchlings from two egg masses included the presence of blisters and fluid accumulation in the skin and tails. Many of the tadpoles also had oddly curled tail tips. It could not be determined if these lesions occurred before death or represent post-mortem artifact. In addition, some of the tadpoles appeared too underdeveloped to have hatched under normal conditions, suggesting that some of the eggs might have prematurely burst open releasing the tadpoles. The cause of mortality is still under investigation although adverse husbandry conditions, such as exposure to acidified water, is one possible explanation for these findings. No fungi were observed and no viruses were isolated from pooled samples. Mississippi Gopher Frogs, a federally listed species since 2004, currently number less than 100 adults in two isolated populations in southern Mississippi. An undescribed systemic Perkinsus-like protozoan infection and chytridiomycosis are known disease threats to the remaining population, as is predation of egg masses by Caddisfly larvae and snakes. **Contact:** Anne Ballmann, 608-270-2445, aballmann@usgs.gov

Unusual mortality of heart urchins near Port Allen, Kauai, Hawaii

In early February on South Kauai, there was an unusual large scale die-off of heart urchins (*Brissus latecarinatus*) with large numbers of empty urchin tests littering a sandy area. Field investigations suggested

that mainly immature urchins were affected with a conservative estimate of over 50,000 individuals lost over an area spanning at least 35,000 square meters. The NWHC collected 28 specimens of sick or dying urchins, and these are currently being processed for laboratory examination. Urchins have historically been keystone species in coral reef ecosystems, and declines of coral reefs in the Caribbean have been preceded by massive die-offs of urchins; the causes of which are largely unknown. Thus, urchins serve as a potential “early warning system” for large-scale changes in marine biota. Irregular urchins, such as *B. latecarinatus*, are an important food source for many marine animals in Hawaii and so population crashes of these urchins may have important upstream implications. Striving to understand why urchins are dying in Hawaii will help us be better prepared in terms of response and management. **Contact:** Thierry Work, 808-792-9520, thierry_work@usgs.gov

Coral mortality in Kaneohe Bay, Oahu

In December 2011–January 2012, a die-off of corals was documented in Kaneohe Bay, Oahu. The NWHC Honolulu Field Station along with the Hawaii Institute of Marine Biology conducted a field investigation and documented mortalities of corals mainly limited to the South Bay with reefs on the northern regions largely unaffected. Historically, South Kaneohe Bay has suffered human impact (sewage outfalls) and has less water circulation, which could play a role. Samples have been collected and are being processed for laboratory analyses to determine cause of death. **Contact:** Thierry Work, 808-792-9520, thierry_work@usgs.gov

Avian botulism at Hanalei National Wildlife Refuge, Kauai

In January–February 2012, Hanalei National Wildlife Refuge in Kauai has been undergoing an extended outbreak of avian botulism with the loss of more than 200 native and introduced waterfowl. Botulism was also documented on the island of Lanai in February, suggesting that for unknown reasons, environmental conditions appear to be propitious for botulism on multiple wetlands in the state. The NWHC Honolulu Field Station has been working closely with USFWS and the State of Hawaii to confirm diagnoses and to provide management recommendations to mitigate effects of the die-off. **Contact:** Thierry Work, 808-792-9520, thierry_work@usgs.gov

Translocation of Nene Geese and veterinary assistance

The NWHC Honolulu Field Station (HFS) has been providing veterinary assistance to the state of Hawaii DLNR in their efforts to translocate endangered nene geese from Kauai Lagoons Golf Course to the Island of Hawaii. This is part of a larger effort to reduce populations of this endangered species whose large numbers at the golf course pose aircraft strike hazards at nearby Lihue Airport. As part of this effort, the HFS has also been examining birds from Kauai Lagoons for cause of death. Recently, one bird was found dead from lead poisoning and another died from a hemangiosarcoma. **Contact:** Thierry Work, 808-792-9520, thierry_work@usgs.gov