Quarterly Wildlife Mortality Report
January 2019

Written and compiled by members of the U.S. Geological Survey National Wildlife Health Center - Wildlife Epidemiology & Emerging Diseases Branch.

Summary of Greater Sage-grouse Submissions to the National Wildlife Health Center

Investigating the causes of mortality and identifying diseases of greater sage-grouse (Centrocercus urophasianus) provides documentation of threats to their populations and guidance for sound management decisions by natural resources agencies. Between January 1986 and August 2018, 61 greater sage-grouse were submitted to the U.S. Geological Survey’s (USGS) National Wildlife Health Center (NWHC) for cause of death determination. The majority of submissions were from Montana, along with several from California, Idaho, Nevada and Oregon. The most common cause of mortality was trauma due to predation, followed by emaciation. Infectious disease made up 13% percent of the mortalities (n=8). West Nile virus (WNV) infection was confirmed or suspected in six of these mortalities (two adult females, one hatch-year female and three adult males). Clostridium perfringens caused the death of one adult female. An individual hatch-year bird died due to a Staphylococcus infection. Cause of death could not be determined for nine young-of-the-year and five adult carcasses, primarily due to postmortem condition. NWHC has also assisted partners with determining greater-sage grouse exposure to WNV, which has been found in other grouse species. Of the 91 samples from wild-caught and dead sage grouse tested at NWHC, only two were positive for WNV. The primary findings of predation and emaciation are consistent with other reports of threats to sage grouse populations; habitat loss can contribute to loss of cover from predators and also loss of food sources, which can lead to emaciation. Human activity can also contribute to death by non-specified trauma, such as fence and vehicle collisions. There has been significant improvement in conservation efforts for the greater sage-grouse in recent years; however, sage brush habitat requires over 20 years to recover. It will continue to be important to monitor and investigate causes of greater sage-grouse mortality over time as their primary habitat continues to change. For additional information on greater sage-grouse submissions to the NWHC contact Barb Bodenstein at bbodenstein@usgs.gov.

Vaccine Research at the National Wildlife Health Center

Success stories involving disease management in free-ranging wildlife populations are rare, but active vaccine research ongoing at the U.S. Geological Survey’s (USGS) National Wildlife Health Center (NWHC) holds the potential to alter the outcome for three wildlife diseases: sylvatic plague in black-footed ferrets (Mustela nigripes) and prairie dogs (Cynomys sp.), white-nose syndrome (WNS) in North American bats, and rabies in vampire bats (Desmodus rotundus). For more information on wildlife vaccine research at the NWHC contact: Dr. Tonie Rocke at trocke@usgs.gov.

Sylvatic plague vaccine

Plague, caused by the bacterium Yersinia pestis, is widespread throughout the Western U.S. and frequently occurs in wild rodents. All four species of prairie dogs in the US are susceptible to plague, suffering high mortality rates during outbreaks (> 90%). The loss of prairie dogs negatively impacts numerous other species that depend on them for food or shelter, including endangered black-footed ferrets. The NWHC conducted a large, collaborative field test (from 2013 to 2015 in seven western states) of the sylvatic plague vaccine (SPV). This study involved state, federal, tribal and non-government
agencies organized under the Black-footed Ferret Recovery Implementation Team, a multi-agency effort led by the US Fish and Wildlife Service (USFWS). We found that vaccine treatment increased prairie dog abundance and also increased survival at sites with plague outbreaks. Ongoing field research is being conducted by partners in USFWS and state agencies to scale-up SPV use and further test it on a landscape scale (sites with 1,000 acres or more) as a management tool for threatened and endangered species, including black-footed ferrets.

**Development of a vaccine for white-nose syndrome**

The NWHC is investigating the potential for a virally vectored vaccine to protect bats against *Pseudogymnoascus destructans*, the cause of white-nose syndrome. This experimental vaccine uses a recombinant raccoon poxvirus vector (which the NWHC successfully used for the sylvatic plague vaccine) and includes two potential antigens, calnexin and serine protease. Initial testing showed promise in reducing morbidity and mortality of bats from WNS. Survival of orally vaccinated bats in a laboratory was much higher and the lesions and impact of WNS were less severe than unvaccinated control bats. Work to register WNS vaccines with the U.S. Department of Agriculture’s Center for Veterinary Biologics is in progress to clear the path for eventual field studies.

**Oral delivery of vaccine to control rabies in vampire bats**

Rabies transmitted by vampire bats to cattle or people is a tremendous economic burden in Central and South American countries. Vampire bats are also moving north and in the next decade are expected to disperse into southern Texas. Currently, managers cull vampire bats to reduce their populations by applying a poison to the skin of captured bats and releasing them for transfer of the poison to other bats via mutual grooming. Using this effective transfer mechanism as a basis for vaccine delivery, the NWHC is developing an oral vaccine for rabies that can be applied to the skin and transferred to other bats during grooming. An experimental trial is underway to confirm efficacy of the vaccine and determine the minimum required dose. The intended goals of this project are to find better ways to manage rabies in bats and reduce risks to humans and domestic animals while protecting bat populations. This work is being conducted in close collaboration with the U. S. Department of Agriculture’s Animal and Plant Health Inspection Service in Mexico.

*Check out the new USGS National Wildlife Health Center website at: www.usgs.gov/nwhc.*

*To learn more about the NWHC investigation services, go to: www.usgs.gov/nwhc/services.*  
*To request disease investigation services or report wildlife mortality: www.usgs.gov/NWHC/submit.*

*To view, search, and download historic and ongoing wildlife morbidity and mortality event records nationwide visit the Wildlife Health Information Sharing Partnership event reporting system (WHISPers) online database: https://www.nwhc.usgs.gov/whispers/*