



**National Wildlife Health Center
Wildlife Health Bulletin 2013-04**

White-Nose Syndrome Updates

To: Natural Resource/Conservation Managers
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Surveillance Updates

White-nose syndrome (WNS) was confirmed in cave-hibernating bats in three new states: South Carolina, Georgia, and Illinois; and one new Canadian province, Prince Edward Island, during the 2012/2013 winter season. In addition, Arkansas and Minnesota recently reported detection of the genetic signature of *Pseudogymnoascus (Geomyces) destructans*, the causative agent of WNS, from research surveillance samples collected from hibernacula during the previous winter. This represents a continued geographic expansion of *P. destructans*; thus far, no evidence exists of barriers to prevent its continued spread.

White-nose syndrome has now been confirmed in 22 states and 5 Canadian provinces since it was first recognized near Albany, New York in 2007. Numerous additional counties throughout Tennessee and Kentucky had confirmed cases of WNS this winter, indicating that within two years of its initial detection in these areas, the disease is now endemic in these states. Sites in several northeastern states — where WNS has been present the longest— continue to be occupied by bats although in much lower numbers than before the disease was detected. Several states within the endemic area have reported an increase in bat populations at some sites during winter bat counts. However, these increases may represent immigration from other sites and/or shifts in roosting locations of the local bat population from un-surveyed portions of the hibernaculum. Winter hibernacula survey data are being reviewed by state and federal management agencies to better understand the on-going impacts of WNS on bat populations in affected regions.

Also of note, *P. destructans* genetic signature has been detected on endangered Virginia big-eared bats (*Corynorhinus townsendii virginianus*) hibernating in at least one known contaminated site; however, no mortality or visible signs of disease are reported in this species at this time.

NWHC bat submission guidelines are available at:
http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/USGS_NWHC_Bat_WNS_submission_protocol.pdf

Research Update

Recent phylogenetic analyses by U.S. Forest Service scientists have demonstrated the WNS fungus should be placed in the genus *Pseudogymnoascus* rather than *Geomyces*. Thus, the fungus has been reclassified as *P. destructans*. This reclassification allows scientists to more easily determine how this fungus is related to other fungi and determine what its closest relatives are. In doing this, it may also help scientists to determine why this particular fungus is pathogenic whereas its close relatives are not.

Citation: Minnis, A.M., and Linder, D.L., 2013, Phylogenetic evaluation of *Geomyces* and allies reveals no close relatives of *Pseudogymnoascus destructans*, comb. nov., in bat hibernacula of eastern North America: *Fungal Biology*, In press.

Additional recent WNS publications:

Warnecke, L., Turner, J.M., Bollinger, T.K., Misra, V., Cryan, P.M., Blehert, D.S., Wibbelt, G., and Willis, C.K.R., 2013, Pathophysiology of white-nose syndrome in bats: a mechanistic model linking wing damage to mortality: *Biology Letters* 9: 20130177. doi:10.1098/rsbl.2013.0177

This publication investigates how damage to bat wings from infection with the causative fungus affects physiology of the bat and leads to mortality. Similar to the study by Cryan et al. 2013, electrolyte depletion was found in bats with WNS in addition to dehydration and a pH imbalance in their blood. Given the scale of wildlife population declines caused by *P. destructans*, understanding the pathophysiology underlying this disease is important for developing strategies to hopefully mitigate mortality of affected species.

Cryan, P.M., Meteyer, C.U., Boyles, J.G., and Blehert, D.S., 2013, White-nose syndrome in bats: illuminating the darkness: *BMC Biology* 11: 47. doi:10.1186/1741-7007-11-47.

This article provides a comprehensive survey of what is known and has been published about white-nose syndrome, especially the pathogenesis of the disease.

Cryan, P.M., Meteyer, C.U., Blehert, D.S., Lorch, J.M., Reeder, D.M., Turner, G.G., Webb, J., Behr, M., Verant, M.L., Russell, R.E., and Castle, K.T., 2013, Electrolyte depletion in white-nose syndrome bats, *Journal of Wildlife Diseases* 49: 398-402. doi:10.7589/2012-04-121

This publication investigates a possible mechanism by which bats die as a result of infection by *P. destructans*. While further work is necessary to explore the hypothesis that WNS leads to electrolyte depletion, it could be an important first step in revealing how the disease kills animals. Eventually, this information may be useful in determining why some species are so susceptible to WNS and whether humans can intervene to increase the survival of infected individuals.

An updated list of WNS-related publications from the USGS is available at:

http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/wns_publications_list.jsp

To report or request assistance for wildlife mortality events or health issues, please visit the NWHC Web site at http://www.nwhc.usgs.gov/mortality_events/reporting.jsp or contact Dr. Anne Ballmann, 608-270-2445, aballmann@usgs.gov; Dr. LeAnn White, 608-270-2491, clwhite@usgs.gov; Barb Bodenstein, 608-270-2447, bbodenstein@usgs.gov; Dr. Thierry Work, 808-792-9520, thierry_work@usgs.gov (Hawaii and Pacific Islands); or Jennifer Buckner, 608-270-2443, jbuckner@usgs.gov (single animal mortalities, nationwide).

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