

# SOUTHEASTERN BAT POPULATIONS AFFECTED BY WHITE-NOSE SYNDROME: A REPORT FROM THE SOUTHEASTERN BAT DIVERSITY NETWORK

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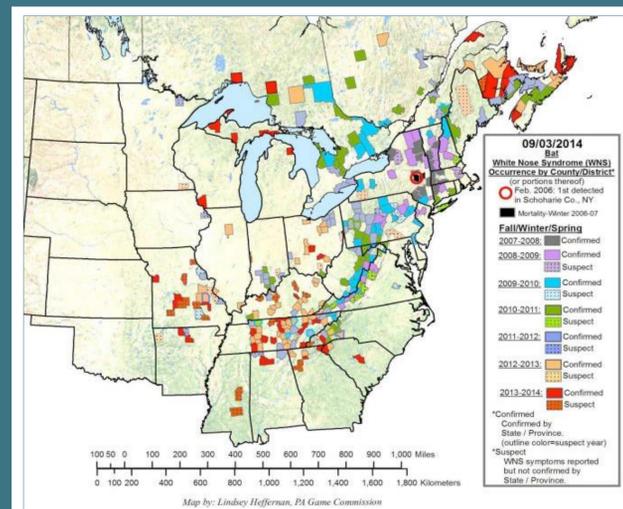


Figure 1: White-nose Syndrome Occurrence by County/State

**Introduction:** In the U.S., cave-hibernating bats are facing a conservation crisis of unprecedented magnitude as a result of White-nose Syndrome (WNS), a disease caused by the fungus *Pseudogymnoascus destructans* (*Pd*). This disease causes mortality in bats by increasing the frequency of arousal from torpor, resulting in the consumption of energy reserves that bats need to survive the winter. Mortality also appears to result from disruption of physiological process such as water balance and gas exchange. White-nose syndrome is currently known to affect seven cave hibernating bat species. Mortality rates > 90% have been reported for some species in hibernacula in the Northeastern U.S. and the disease is currently estimated to have killed more than 5.7 million individuals nationwide. Since its discovery in a NY cave during the winter of 2006-2007, WNS has spread to 25 U.S. states and 5 Canadian provinces. In the Southeast this includes: AL, AR, GA, KY, NC, SC, TN, and VA. Most recently *Pd* was discovered in MS, although WNS has not yet manifested in the state. It has been suggested that due to warmer winter temperatures, WNS might not have as devastating an effect in the Southeastern U.S. However, 2014 bat populations in some states appear to have exhibited increased mortality from the disease following an unusually cold winter. We present population trends by species across states in the southeast and highlight differences in mortality by state. In addition, we discuss priorities for southeastern bat and cave conservation.

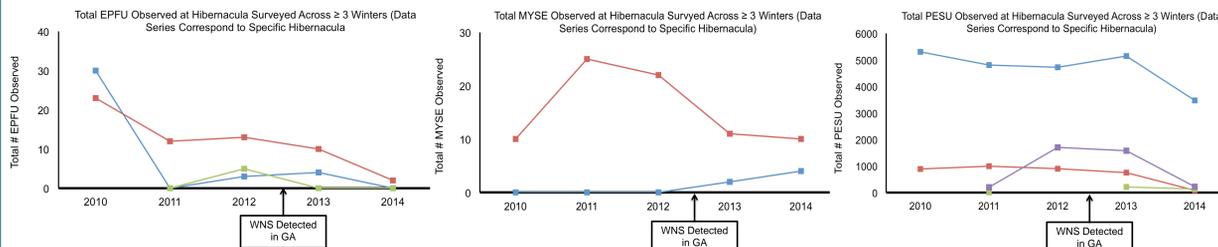
**Methods:** We requested data from biologists in 8 Southeastern states (i.e., AL, AK, GA, KY, NC, SC, TN, VA) known to be WNS+. We did not request data from MS as, although *Pd* has been detected in the state, there have yet to be any confirmed cases of WNS. Contingent on the data provided by a state, we prepared a summary of population estimates showing 1) number of individuals of different species observed at hibernacula over time or 2) percent decline of different species.

## Results by State:

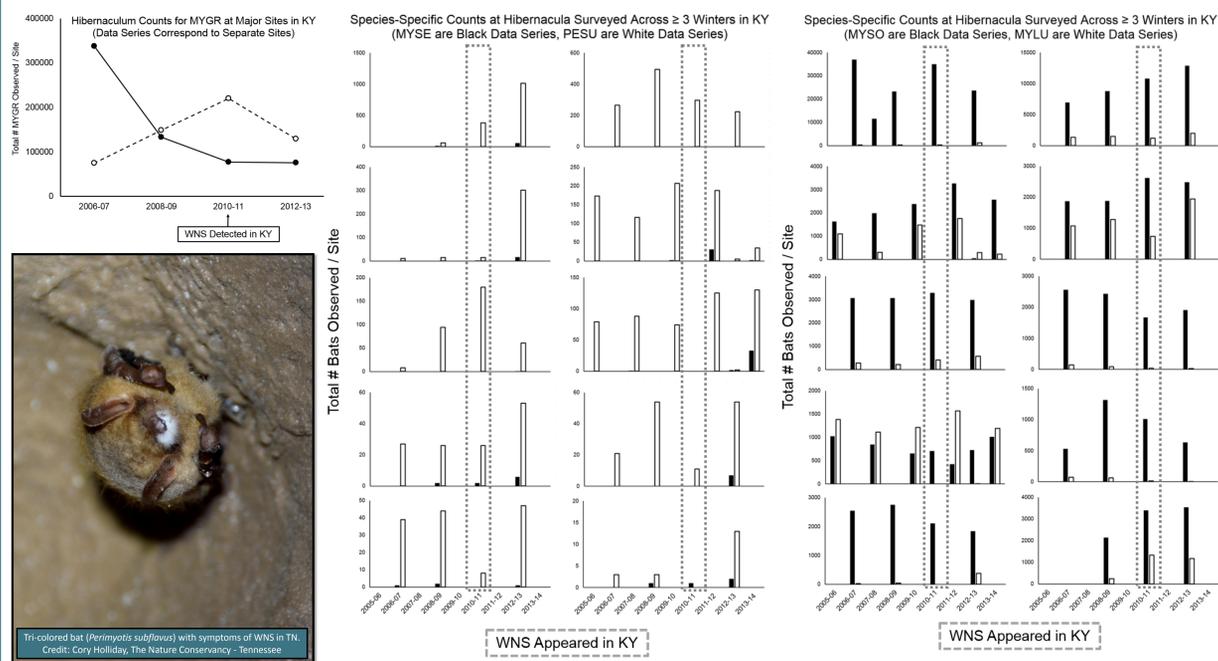
◆ **Alabama:** State-wide data across species are scarce, but monitoring of Priority 1, 2, and 3 summer roosts for gray bat (*Myotis grisescens*; MYGR) over the past 20 years suggests current abundance estimates are on par with past surveys. To date, only tricolored bat (*Perimyotis subflavus*; PESU) have been documented as WNS+ in this state.

◆ **Arkansas:** Species WNS+ in the state include PESU and northern long-eared bat (*Myotis septentrionalis*; MYSE). Population estimates (n) for specific cave-hibernating species include: Ozark big-eared bat (*Corynorhinus townsendii ingens*; COTO-I) 250, MYGR 450,000, little brown bat (*Myotis lucifugus*; MYLU) 1,000, (*Myotis sodalis*; MYSO) 1,100. No comprehensive estimates exist for MYSE or PESU due to roosting behavior.

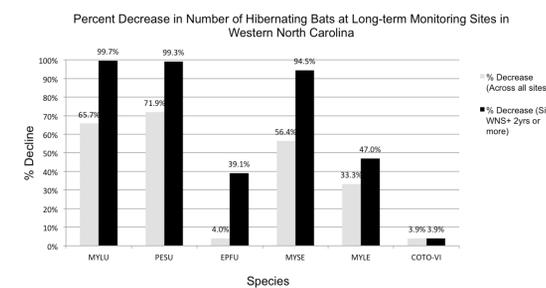
### Georgia:



### Kentucky:

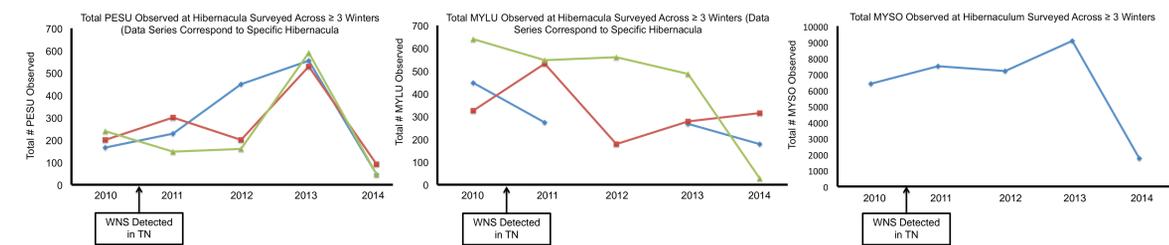


### North Carolina:



◆ **South Carolina:** State-wide data across species are scarce, but long-term winter monitoring of one site reveals fluctuations of PESU spanning 34 individuals in 1993 to 403 individuals in 2012. The most recent visit to this site in 2014 resulted in a count of 119 individuals. WNS was documented in 2013 for MYLE and PESU in this state.

### Tennessee:



◆ **Virginia:** State-wide capture rates during the fall swarming season demonstrate that MYLU, MYSE, and PESU are being captured at ca. 10% - 25% of previous levels (2009 vs. 2012). More recent data (2013) for MYSE suggests that summer capture rates for this species have dropped by as much as 96% since WNS was detected in VA. More recent data (2013) for hibernacula counts of MYLU and PESU likewise suggest population declines. Considering hibernacula that have been WNS+ for three years or more, mean (± SE) winter counts of MYLU and PESU have dropped by 98 (±1) % and 81 (±6) %, respectively. These statistics incorporate data from 16 hibernacula for MYLU and 17 hibernacula for PESU.

**Discussion:** These data are preliminary and have been collated *a posteriori*, so caution must be taken with interpretation. Data collection in most states prior to WNS was opportunistic and may not be representative of population levels. However, while these data are variable, there do appear to be declines in some species examined in most recent winters. This is most noticeable for PESU, but can also be observed in more sporadic instances for MYLU and EPFU. Although data from only one cave is presented in TN, there was also a considerable decline in MYSO in this state.

It has been suspected that the rate of spread and/or severity of WNS impacts in the southeast may be lessened due to a milder climate. However, as noted, this past winter was unusually cold and this may contribute to observations for 2013-2014.

**Management Recommendations:** It is imperative that southeastern resource managers take action to try and protect bats from WNS and to ensure individuals are as healthy as possible as they enter hibernation and face the disease. This includes:

- ◆ Minimizing disturbance at hibernacula by regulating human entry,
- ◆ Protecting hibernacula with bat friendly gates,
- ◆ Requiring USFWS approved decontamination of equipment and clothing by those entering hibernacula,
- ◆ Identifying and safeguarding maternity roosts and, if appropriate providing artificial roosting options, and
- ◆ Managing habitat to maximize insect food availability.

It is also imperative that state agencies standardize their survey protocols and make yearly assessments of bat numbers in caves to permit a thorough assessment of species status and potential population declines across the region.

## Acknowledgements:

