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### Scientists Target Gravest Threat to Bats

A select group of scientists, after meeting with colleagues from government agencies, universities and nonprofit groups, is recommending a research road map of sorts for attacking what may be the gravest threat ever faced by bats – a mysterious malady known as White-nose Syndrome.

WNS has killed tens, perhaps hundreds, of thousands of hibernating bats of at least five species in the northeastern United States during the past two winters. Mortality rates exceeding 90 percent have been reported in some hibernation caves, yet the cause is not known.

Die-offs have been documented at caves and mines in New York, Vermont, Massachusetts and Connecticut, and several possible WNS sites recently were reported in Pennsylvania. A year ago, it was found in just two caves in New York.

If unsolved, this could become an ecological calamity. Bats consume enormous quantities of night-flying insects, including many of the nation's leading crop pests. A nursing mother bat can eat up to her own weight in insects in a single night, and some nursery colonies include millions of bats.

The goal of the three-day (June 9-11) White-nose Syndrome Meeting in Albany, New York, was to identify the most urgent and promising research directions for investigators and management agencies that are working to identify the cause (or causes) of this unprecedented bat mortality. With so much at stake, organizers hope the results will help limit redundancy in research and suggest the most efficient approaches for solving this tragic puzzle before the damage becomes irreparable.

The 27 scientists at the Science Strategy Session concluded that immediate research should attack three top-priority questions concerning the cause of White-nose Syndrome:

– Why are affected bats starving?

– Are pathogens a direct cause of mortality?

– Are contaminants threatening either the bats or their food supply?

Most participants suspect that a combination of factors may be involved in these massive die-offs.

The malady received its name because many affected bats are found with a dusting of white fungus on their faces, although the fungus's role in the die-offs is unclear. An important part of the pathogen research will try to identify the fungus and determine whether it is a cause or result of the bats' poor condition.

Dead or dying WNS bats typically are emaciated (with little or none of the stored fat that bats must have to survive months of winter hibernation) and often dehydrated. This past winter, large numbers of these bats emerged from hibernation caves much earlier than

normal, and dead bats were found scattered thickly on the ground near cave entrances.

This spring and summer, scientists have been finding unusually large numbers of bats with wing injuries, which apparently were sustained during winter months from either fungal attack or emerging from hibernation while temperatures were still below freezing.

One affected species, the Indiana myotis (*Myotis sodalis*), is on the U.S. Endangered Species List. Little brown myotis (*M. lucifugus*) are hardest hit, while northern myotis (*M. septentrionalis*), eastern small-footed myotis (*M. leibii*) and tri-colored bats (*Perimyotis subflavus*), formerly eastern pipistrelles, are also confirmed as WNS victims.

Bats are especially hard-pressed to recover from shocks to their populations, since females of most species bear just one pup per year. Many bat species migrate long distances between summer foraging grounds and winter hibernation sites. If WNS is caused by a pathogen, it could be carried along during migrations.

The emergency meeting was organized by Bat Conservation International, Boston University, Cornell University College of Veterinary Medicine, the New York Department of Environmental Conservation and the U.S. Geological Survey, in close collaboration with the U.S. Fish and Wildlife Service.

On first day, 13 scientists, including specialists in bat ecology and physiology, pathology, infectious diseases, toxicology and environmental contaminants, presented their research findings and offered hypotheses for immediate study. More than 80 participants from two Canadian and 20 U.S. state and federal agencies, eight universities and four non-government organizations then discussed the existing knowledge and pending questions about the syndrome.

Managers and scientists met separately on the second day as each group identified what it considers the most pressing issues for solving White-nose Syndrome. They came together on day three to jointly plan the coordination and management of critical research efforts.

Some biologists have noted similarities between the bat die-offs and the "colony collapse disease" that has devastated honeybee colonies in the United States and Europe in recent years. Although no firm evidence links the two, some suggest mass fatalities among such essential organisms as bees and bats should sound an urgent and broad-based alarm over our stewardship of the environment.

Bat Conservation International organized funding for meeting facilitation and scientist travel, with leadership support from the Disney Rapid Response Fund, the National Speleological Society, Anton Schindler (in memory of his wife, Valerie), the U.S. Army Corps of Engineers and the U.S. Geological Survey. The New York State Department of Environmental Conservation and the U.S. Fish and Wildlife Service also contributed logistical support.

To help us combat this severe threat to North America's bats, please support BCI's White-nose Syndrome Emergency Response Fund.

All articles in this issue:

► [Bats & Birds: A potent team for coffee plantations](#)

- [Climate Change and Bats](#)
- [Restoring Lost Rainforests](#)
- [New Respect for Tropical Bats](#)
- [Scientists Target Gravest Threat to Bats](#)