

White-nose Syndrome 2012 – A Struggle for Balance

Peter Youngbaer

NSS 16161 CM FE, and White Nose Syndrome Liaison

(Author's note: *The National Caves and Karst Management Symposium was held in Midway, Utah, October 3-7, 2011. I was invited to give the banquet address Thursday evening, October 6. As a special visual enhancement to the remarks, I used juggling balls to emphasize various points, and to add an element of entertainment to the speech. At the request of NSS Conservation Division Co-Chair, Val Hildreth-Werker, this article is based closely on this presentation, reconstructed from my file card notes. Unfortunately, there is no juggling to accompany the article.*)

Thank you. I'd like to give a special thanks to Cami McKinney, who was very brave to take this conference on. Please join me in thanking her with a round of applause. I'd also like to thank the NCKMS, the Northeastern Cave Conservancy, and the NSS for making it possible for me to be here.

Before I begin my formal remarks, I'd like to read you all a quote from a state wildlife official that appeared in a newspaper story on March 25, 2010.

"Several of the caves on the conference's visitation list were the very same caves where the first cases of white nose syndrome were discovered shortly afterward. The speculation is that it arrived on the clothing and gear of some of the conference's European participants. It's as close to a 'smoking gun' as we have toward determining the route cause."

When many of us saw this quote, we scrambled to try to find out what he was talking about. It turns out, he was referring to the meeting of this very organization, the NCKMS, which took place in Albany, New York, in 2005.

As those of us who were there know, there were no European participants, and the only visits to caves were surface site visits to properties owned and managed by the Northeastern Cave Conservancy.

Yet this unfounded rumor continued to spread for several years, until the official was contacted directly and the facts passed on to him. It's an unfortunate example of misinformation that has spread about White Nose Syndrome, and it threw things out of balance.

I am speaking here tonight as the White Nose Syndrome Liaison for the NSS, which I have been since April of 2008. But I am

also here in my role as Vice President of the Northeastern Cave Conservancy, managers of caves and karst that had to respond in the face of WNS.

There are three parts to my presentation this evening. First, is the story of the arrival of WNS and how the Northeastern Cave Conservancy dealt with it. Second, I'd like to share some Eastern lessons for Western consideration that most of you, as cave and karst managers from the West may find helpful. Finally, I'll talk about our varied missions, and some of the challenges they present as we face WNS.

If there is a theme to my talk, it is Balance. As cave and karst managers, we are pulled one way or another, constantly balancing competing needs and interests. In terms of the disease, it appears that perhaps an invasive pathogen has upset the balance of our cave ecosystems. I hope my remarks shed some light on the need for balance as we all approach dealing with WNS.

WNS AND THE NORTHEASTERN CAVE CONSERVANCY

I'd like to start with the story of how WNS was discovered in the Northeast, and how we, the Northeastern Cave Conservancy (NCC), responded as cave and karst managers. Warning: these details may be different than what you've heard.

On January 18, 2007, a caver, Steve Janesky, noticed an unusual number of bats roosting near the entrance of Schoharie Caverns, in New York, and a number of dead bats floating in the water. Schoharie Caverns is an NSS-owned nature preserve. The cave is a single vadose canyon with a half mile of walking, or rather, wading passage, until it reaches a series of full sumps. Steve reported the finding to other cavers, who speculated as to what might have caused this—a flood event? Vandals? No one knew.

A short while later, hundreds more dead bats were found at the NCC-owned Knox Cave and the NSS-owned Gages Cave. On March 14, thousands of bat carcasses were found during a biennial Indiana bat survey at New York State-owned Hailes Cave—a cave closed to the public and managed as an Indiana bat roost since the 1970s. At the same time, the NY health department's rabies lab was being inundated with calls about bats being out and about on the countryside—on people's roofs, porches, and woodpiles.

AND THEN IT WAS SPRING

At the Northeastern Cave Conservancy meeting in December, 2007, Al Hicks, wildlife mammalogist and bat specialist for New York's Department of Environmental Conservation and also an NCC Board member, shared a poster on this bat mystery he had made for a conference. He told us we needed to be vigilant and ready to act if something happened again.

It did, and on February 12, 2008, we held an emergency board meeting. We took three key actions:

We and the NSS closed all our caves—21 caves on 10 preserves—and asked cavers to voluntarily restrict caving in any cave known to host bats until May 15.

In cooperation with the U.S. Fish and Wildlife Service, we established a caver visitation data base, asking anyone who had been to one of the initial four sites since 2007 to tell us where, and where they had gone since. Cavers responded in droves, quickly compiling nearly 600 entries. Unfortunately, over a year later no more than 13% of the sites had been checked.

We worked with the NYDEC, Vermont Fish and Wildlife, and the U.S. Fish and Wildlife Service to survey as many sites as possible until spring emergence to determine the extent of the disease spread.

It was at this time that local hydrologist and caver, Paul Ruben, while going over old photos, found earlier signs of WNS. His photos, from 2006, showed tell-tale signs of the fungus on eighteen dead bats found in Howes Cave, the non-commercial section of Howe Caverns, the Northeast's most popular show cave. These photos are now widely recognized as the first evidence of WNS in the U.S.

On May 15, 2008, we re-opened our caves. The NCC alone manages fourteen caves on seven preserves, and co-manages three nearby NSS preserves. Our caves are visited by thousands of people each year, and nearly 120 regular special use groups, such as camps, scouts, churches, and outing clubs plan trips each year. We sent letters to all of them informing them about WNS and telling them of our management plans, and also posted information on our preserve kiosks.

Now, Carol Zokaites, who is here, is all about education, as we know. And earlier, we heard Cami McKinney be so passionate about educating the next generation on the value of caves. That was quite inspiring. At the NCC, we feel the same way, inform-

WNS Benchmarks

May, 2011 – National WNS Plan Released <http://tinyurl.com/7cx7w99>

June, 2011 – NSS Testifies at Congressional Hearing <http://tinyurl.com/7dm5m6y>

June, 2011 – U.S. Fish and Wildlife Service Finds Endangered Species Review Warranted for

Two Bat Species <http://tinyurl.com/7gk74sq>

October, 2011 – The Fungus, *Geomyces destructans*, Confirmed to Cause WNS <http://tinyurl.com/73f9v1m>

December, 2011 – Resistant Bats Found in Vermont Colonies and New York WNS Bats

Reproducing <http://tinyurl.com/csxte6h> and <http://tinyurl.com/89wjdj8>

January, 2012 – USFWS Estimates WNS Bat Deaths at Least 5.7 Million <http://tinyurl.com/82w5tw8>

January, 2012 – NSS Asks USFWS to Release Data and Methodology for Bat Death Estimate <http://tinyurl.com/88dqlvy>

January, 2012 – WNS Confirmed in Czech Republic <http://tinyurl.com/7nzbmw>

ing our visitors about the fragile nature of our cave resources, and about safe caving techniques. This is an important part of what we do.

The summer passed uneventfully, but on Sept. 25, 2008, we again closed our bat caves, both as a precaution, and to help the surviving bats rest undisturbed. Some of these caves had not previously been closed in the winter, and for others, this was an earlier date, upon advice of the NYDEC. Over the winter, we again assisted with bat surveys in New York and Vermont.

In early March, I got a phone call from Jeremy Coleman regarding USFWS's plans to issue a caving advisory. We spoke for an hour and a half, discussing the pros and cons of the proposal, and the possible reaction of the caving community. It was a frank and substantive discussion, and I'm sure Jeremy remembers it well. I see his head nodding.

One of the proposed aspects of the caving advisory was that it was going to be open-ended. I strongly recommended against that, suggesting rather that a date certain be announced. It could always be extended, but I felt having a specific date would be easier to swallow than an open-ended proposal.

Jeremy did not tell me when the USFWS was going to make the announcement, but we had our quarterly NCC board meeting scheduled for March 19. How many of you

are associated with cave conservancies? (show of hands) Well, if you're like us, you have to have motions ahead of time. Now, I knew the announcement was coming, but couldn't say anything publicly.

So, I proposed that the NCC close all its caves indefinitely. To say that got people's attention is about as big an understatement as you can make. It circulated widely, and the Internet being the Internet, and nature abhorring a vacuum, I quickly became persona non grata, and was called all sorts of names.

Thankfully, USFWS saved my butt by issuing its caving advisory on March 26. People now understood why I did what I did. The result was we had a huge attendance at our meeting, drawing cavers from all over the Northeast, as well as community members and adjoining landowners.

There were lots of concerns about balance. Why close all caves versus just those used by bats? What about vandalism to cave and surface properties without the usual cavers around? What about neighboring landowners' properties? Wouldn't closing these caves put pressure on other, more sensitive or potentially more dangerous caves? What about the loss of educational opportunities with the public? What about the financial impact on the NCC's primary mission—acquiring and protecting cave resources? Why would people donate if they couldn't enjoy the preserves?

After all the input, the NCC Board passed a substitute motion and voted to close all our caves for the following six weeks—until May 15—in order to work with USFWS on a reasonable management plan.

In May, the NCC and NSS preserve managers and officers met with NYDEC and USFWS to discuss all the concerns. One of our concerns was that local cavers, if shut out of local caves, would travel out of the area to cave, potentially spreading WNS, if there was a human vector to the disease. At the end of the meeting, we thought we were all on the same page, but USFWS begged off afterward.

Still, we decided to go ahead and carefully re-opened the caves. We again communicated in writing to all our group users and the public. We urged people to cave locally, and not travel. We asked them to follow the USFWS decon protocols. We said, if you do travel to cave, leave your gear here.

And yet, despite our best efforts, the unexpected happened. Along comes a Michigan college professor and her geology class—touring the Northeast, completely oblivious to WNS, traveling from cave to cave throughout the region, with no decon and no idea they may be assisting the spread of the disease. It serves to illustrate that, despite our best outreach efforts, there are

a whole bunch of unaffiliated, unorganized cave visitors whom we miss. A recent survey of Howe Caverns visitors showed that less than 15% of the people coming to visit the cave have heard of WNS.

So, I hope this recounting helped you understand how we, as cave and karst managers, facing the unknown of WNS, rose to meet and balance the challenges and competing interests that presented, and that you might take from our experiences some lessons for your own sites.

EASTERN LESSONS FOR WESTERN CONSIDERATION

Earlier this summer, I gave a talk by this title at the NSS Convention. In preparing for tonight, Cami suggested that some of those remarks would be highly appropriate, given the Western focus for the majority of folks here. As managers, understanding some of the major differences facing those in the West versus the East can be helpful.

First, bat colony sizes differ. In the East, it's not unusual to see colonies in the thousands, sometimes tens of thousands or more. West Virginia's largest hibernaculum, Hellhole, has more than 110,000 bats.

In contrast, Pat Ormsbee, of the U.S. Forest Service, did a study of some 2900 caves looking for those used by various *Myotis* species of bats, those most affected in the East. She found just 39 used by these bats, with most colonies number less than ten bats. The largest had 38.

Another example is found in a 2009 study by Greg Falxa, of Washington State's Townsends bats. He estimated a total of 600 bats statewide, found in an estimated 20 nursing colonies of between 20 and 200 bats.

WNS affects bat species differently. While the Little Brown has been heavily impacted, with mortality rates up to the high 90%, the decline in Big Brown population has been around 48%. Some suspect some Big Browns may have moved to man-made structures to avoid infected roosts. Interestingly, summer acoustic monitoring shows the Big Browns now to be the most populous bat on the summer landscape in some regions of New York where early years of WNS wiped out large groups of Little Browns.

In Hellhole, which I mentioned earlier, while over 50,000 Little Browns were lost, there was an increase of 5000 in federally endangered Indiana bats, now numbering around 15,000, as compared to two years prior. Less than 1% showed signs of WNS. In the same cave, the federally endangered Virginia Big-eared bat population doubled in size, from roughly 5,000 to 10,000.

A closer look at where these bats roost in the cave is informative. Temperature

and humidity apparently have a significant impact on the disease. Where the Little Browns primarily roost, the temperature is warmer—in the optimal range where the fungus thrives—and humidity is at or near 100%. For the Virginia Big-ears, a colder and drier micro-climate prevails, with humidity around 70%.

In New York, two mines about a mile apart showed starkly different mortality rates over a couple years of data. The Fisher Hill Mine had a colony of 13,000 bats completely wiped out, while the nearby Barton Hill population went from 9393 to 9564, essentially unchanged. Same bats, same rock, same foraging area; the only difference was humidity.

This is a good time to say something about the bats and the fungus. Let me use these two (large white) balls to illustrate. Epidemiologists and mathematical modelers of disease progression inform us of the relationship between a host and its attacking pathogen.

This ball (held high in my left hand) represents the healthy bat population. This other ball (held far below it in my right hand) represents the population of the pathogen, in this case the fungus. As the pathogen attacks the host, the fungal population grows, and the bat population shrinks. The two lines cross, like an “x” until there isn’t sufficient host to support the pathogen. At that point, the pathogen population crashes down to the host level, and a new equilibrium is obtained.

Traditional wildlife management recovery efforts have set goals of returning populations to the numbers that existed prior to the catastrophic event that caused the decline. In the case of WNS, this may be an unrealistic goal, and needs to inform our thinking about recovery.

Cave location and density are other factors to consider. Dick Blenz, the long-time NSS keeper of the cave files, listed 56,950 known caves in his report to the NSS Board of Governors this summer. Tennessee has more than 9000 caves, more than all 11 western states combined. Mines are another matter entirely, and while coal-rich states like Pennsylvania have lots of abandoned mines, their numbers can’t compare to the hundreds of thousands in the West.

Cave ownership also plays a significant role in management options and decisions. Little land in the East is federally owned, yet vast expanses of the West are. Nevada leads with federal ownership at an astounding 84%. Utah is at 57%, and California 45%. In contrast, the vertical caving mecca known as TAG (Tennessee, Alabama, and Georgia) comes in at 3.2%, 1.6%, and 3.8% in contrast. West Virginia is only 7.4%.

With private land ownership dominant in the East, the ability for federal and

state agencies to dictate management of cave and bat resources is far more limited. In the West, agencies have the ability to enact management orders of far wider geographic impact. That, of course, needs to be balanced with the public expectation of use of public lands and other cave and karst conservation needs.

Finally, understanding the socio-economic impact of management decisions is vitally important. As cave closure orders were implemented in various locations, unintended consequences became apparent.

For example, at Maquoketa Caves State Park in Iowa, where WNS has been seen yet, the state closed the park caves—the major attraction for families. Annual visitation dropped from 250,000 visits to 40,000, costing significant state revenue losses.

Similarly, in Kentucky, 600-800 people gathered each January for over 25 years for the annual Carter Caves Crawlathon. Listed by the Kentucky Tourism Council as one of the top 10 Kentucky events, this brought much-needed tourism revenue to area lodging, restaurants, and other support businesses during the off season. It now has not been held for three years running.

Imagine if Carlsbad Caverns were to be closed, which has been called for by the Center for Biological Diversity. Imagine the impact on the surrounding community. I would think the White Family might have something to say.

So, as you look at the potential for WNS to affect your western bats, all of these factors should be considered, and will need to be balanced as you manage your cave and karst resources.

OUR VARIED MISSIONS

Did anyone see the Interim Policy on WNS issued by the Department of Defense in September? In it, DoD says, “WNS threatens the recovery of federally listed bat species populations and may hasten the listing of additional bat species, thereby posing a direct threat to mission readiness.”

A direct threat to mission readiness? During World War II, the military considered using bats to deliver incendiary bombs. What happened? Now they’re considered traitors or infidels? The mind wanders: “Sorry, sir, the enemy’s hiding in caves in the mountains, and there’s a closure order in effect.” “Yes, Sarge, we lost a few men when we stopped to decon.” “Does Tyvek come in



Bats showing signs of White-Nose Syndrome in an Indiana Cave

camouflage?”

All kidding aside, one of the challenges we face is that our own organizations have different missions—a different focus to what we do. Here are some examples from some of those represented here in the room:

The U.S. Fish and Wildlife Service’s is to “preserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people.”

The U.S. Forest Service strives to “achieve quality land management under the sustainable multiple-use management concept to meet the diverse needs of people.”

The National Park Service works to “conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

The Bureau of Land Management’s is to “sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.”

The Northeastern Cave Conservancy’s is for the “conservation, study, management, and acquisition of caves and karst areas having significant geological, hydrological, biological, recreational, historic, or aesthetic features.”

The NSS is “dedicated to the scientific study of caves and karst; protecting caves and their natural contents through conservation, ownership, stewardship, and public education; and promoting responsible cave exploration and fellowship among those interested in caves.”

As an example of how our varied missions present a challenge, we can look to the WNS National Plan. In its formal comments on the U.S. Fish and Wildlife Service’s draft National WNS Plan, one of the NSS’ major concerns was a lack of balance. It’s a wildlife plan, as USFWS’s mission is wildlife-focused, this is not surpris-



Cheryl Jones

Congressional testimony on WNS, June 24, 2011. L-R: Dr. David Blehert (USGS), Dr. Gabriela Chavarria (USFWS), Jim Peña (USFS), Dr. Jonathan Gassett (KY Dept of Fish and Wildlife Resources), Nina Fascione (BCI), Peter Youngbaer (NSS), Dr. Justin Boyles (Univ TN)

ing. But other cave conservation concerns are not addressed, and some proposed actions we considered counterproductive.

Whether the concern is public use and enjoyment of our natural resources, multiple-use strategies, or protection of geologic or other features, the challenge is to recognize the legitimacy of all of these, and bring a balanced approach to our response.

In 2007, WNS was found in New York. In 2008, it moved to Vermont, Massachusetts, and Connecticut. In 2009, it spread to New Hampshire, Pennsylvania, New Jersey, Virginia, and West Virginia. In 2010, our Canadian neighbors joined in with reports from Quebec and Ontario, and also Maryland and Tennessee.

Missouri and Oklahoma were also on the 2010 list, but in a slightly different way. A single bat from Oklahoma and a few from Missouri tested positive for the fungus, but showed no other signs of WNS. No reports of WNS came from either state in 2011.

In 2011, WNS spread to Maine, New Brunswick, Nova Scotia, North Carolina, Indiana, Ohio, and Kentucky.

What will 2012 bring? Continued spread? Something different? Will Southern climate or Western climates slow the spread? Will smaller colony size or species differences resist the disease?

We don't know, but whatever happens, our response will require balance. Thank you.



Mike Warner

Dr. David Blehert (l), discoverer of the *Geomyces destructans* fungus, and Peter Youngbaer (r), NSS WNS Liaison, discuss the latest WNS research during a break at the October North American Symposium on Bat Research, Toronto, Ontario.

NATIONAL SPELEOLOGICAL SOCIETY CALLS FOR DETAILS ON U.S. FISH AND WILDLIFE SERVICE BAT DEATH ESTIMATE NSS SAYS ESTIMATE IS TOO HIGH

[Note: What follows is a Press Release that the NSS sent out asking the USFWS to publicly release its data and methodologies for its much higher WNS bat death estimate. The entire letter to USFWS is too long to include in the News, so we are running just the press release. The full letter can be viewed online at www.caves.org/WNS/Ashe_Bat_Estimate_Letter_1-24-12.pdf]

The National Speleological Society today called on the U.S. Fish and Wildlife Service to publicly release its data and methodology for how the agency arrived at its recent estimate that "at least 5.7 to 6.7 million bats have now died from white-nose syndrome."

In a six-page letter to USFWS Director Daniel Ashe, the NSS laid out its own research indicating the federal estimate is significantly higher than available information would support. Further, the Society said that simply releasing a raw number is not helpful in determining whether the disease spread is accelerating, remaining steady, or slowing down.

Peter Youngbaer, White Nose Syndrome Liaison for the NSS, said, "Public accountability and good science both demand transparency, so that the decisions we all make in our responses to WNS are evidence-based, and subject to scientific scrutiny."

In its press release, the USFWS said that people meeting at a conference in Pennsylvania recently came up with the new estimate. However, Youngbaer said, the release contained absolutely no details as to how that estimate was calculated.

"We have no new state by state data, no new information year by year, or any other indication of what would drive this estimate," he added.

Youngbaer did acknowledge that the three-year-old estimate of "more than a million" dead bats had long been in need of updating, and that the Society had been among those asking for such an update for over a year.

"The stakes are high," Youngbaer said. "Management and conservation decisions are being made all the time, such as closing publicly-owned caves to the public that paid for them, telling a private landowner what they can do with their own land, or telling a commercial cave owner what they can do with their own cave. The impact on species conservation, and local and regional economic activity can be significant. It is imperative that the information that drives these decisions be as accurate and defensible as possible. We hope the USFWS will be

forthcoming quickly with the information we've requested."

The seventy-year-old NSS has more than 10,000 members nationwide. It is a non-profit membership organization dedicated to the scientific study of caves and karst; protecting caves and their natural contents through conservation, ownership, stewardship, and public education; and promoting responsible cave exploration and fellowship among those interested in caves.

The NSS has been involved in the White Nose Syndrome investigation since the disease was first discovered in caves the Society owns in New York State, and has funded sixteen WNS research projects from funds the Society has raised.

GROUP AND GROTTO CONSERVATION AWARDS

The Cave Conservation and Management Section presents two conservation awards to NSS organizations each year at the NSS Convention.

These awards are given to an NSS grotto and an NSS group that do the most for cave conservation and management. They are a continuation of the NSS Conservation Award that was given to an internal organization from 1975 to 1993. The NSS changed criteria of the conservation award in 1994. Under the new rules, the NSS conservation award always goes to an individual. The Section decided to continue the group award in order to encourage NSS groups to work for cave conservation. Starting in 1994 the section presented a group conservation award each year; and beginning in 2005 also presented a grotto conservation award restricted to NSS grottos.

Candidates for the group conservation award may be any of the following: an NSS commission, committee, subcommittee of a committee, division, conservancy, expedition, project, region, section, survey, taskforce, affinity group, institutional member, or a subunit of any of the above. A group or grotto to be nominated for these awards should be in good standing with the NSS.

Each awardee gets a check for \$100, a certificate, and their name on a plaque.

The criteria for both awards, nominations forms, past recipients, and the awards committee members are available at the section's website www.acave.us/ccms. Nomination advice and assistance is available from the committee chair, John Wilson at 804-740-0339 or jmwgeo@gmail.com. To nominate either a grotto or group for the award, please use the nomination form and send it to John M. Wilson by email at jmwgeo@gmail.com, chair of the NSS Cave Conservation and Management Section Awards Committee, before 31 May 2010.