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DEDICATED TO THE EXPLORATION, STUDY, AND CONSERVATION OF CAVES

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Trey Schillie
USDA Forest Service
740 Simms Street
Golden, CO 80401

Re: USFS Region 2 Environmental Assessment for White Nose Syndrome (WNS)

Dear Mr. Schillie,

On behalf of the more than 10,000 members of the National Speleological Society, I want to thank you for the opportunity to comment on management options for caves and abandoned mines. As you might suspect, the NSS' primary focus is on caves – and what we can do do protect and enjoy all cave resources, including bats.

As you may be aware, the NSS has been a collaborator in the investigation of WNS since its discovery at one of our own nature preserves in New York in 2007. We have funded twenty research grants conducted by many of the leading WNS researchers, participated in the development of state and national WNS strategies, educated the general public as well as the caving community, and testified twice before Congress on the issues of WNS funding and policy. Many of our members actively assist in field and lab work on WNS projects throughout the country.

Within USFS Region 2, we have been active in working with and responding to state and federal agencies regarding WNS. Candidly, we were vocal in objecting to the initial blanket cave closure order issued by Region 2, but worked collaboratively with state and federal agencies, particularly around the planning and execution of our 2011 national Convention in Colorado, and most recently through our affiliate local chapters (grottos) and the Colorado Cave Survey in developing the exemptions to the current emergency closure order.

In your November 9 "Dear Interested Party" letter, you state the current order will expire this coming August. We believe that is appropriate. Indeed, while the current exemptions have allowed some cave visitation consistent with the purposes and activities of the Memorandum of Understanding between the NSS and the USFS, those continue to be more restrictive than we believe necessary. We sincerely hope that the development of an "adaptive management plan" can address some of those shortcomings, yet still provide the necessary protections for both caves and bats.

The NSS supports your stated purpose and need: "to reduce the potential for human introduction, spread, and impacts of the fungus *Geomyces destructans* and the bat disease known as white-nose syndrome (WNS) by providing management options for caves and abandoned mines..." This statement appears to acknowledge two

very important points: the scientific consensus that bat to bat contact is the primary method of spread of the disease; and that blanket cave and mine closures have proven ineffective in preventing WNS.

Put bluntly, we can't stop bats from spreading the disease, but we may be able to prevent humans from being an inadvertent vector, however small.

Research to date has only proven bat to bat transmission ("Experimental infection of bats with *Geomyces destructans* causes white-nose syndrome" Lorch, et al, Nature, Oct. 26, 2011). That same study attempted to prove aerosolized transmission, but failed. A just-published study by many of the same researchers, "Distribution and Persistence of the Causative Agent of White-Nose Syndrome, *Geomyces destructans*, in Bat Hibernacula of the Eastern United States" (Lorch, et al; Applied Environmental Microbiology, 14 December 2012) provides some evidence of the ability of the fungus to persist in cave sediments (soils) for some time in the absence of bats.

While this raises the potential for WNS-affected caves and mines to become reservoirs for the disease, many other factors must be considered. Seven years into the investigation of WNS, scientists still do not know the Multiplicity of Infection (MOI) – how much of a dose is needed to cause the disease. Typical disease presentations require a critical coming together of factors – a pathogen, a host, and an appropriate environment. The mere presence of the fungus alone is not sufficient to cause the disease, as witnessed in the first Lorch study. There, even appropriate environmental conditions weren't sufficient under strict laboratory control. The amount of fungal load necessary is still unknown.

Add to that the body of field evidence suggesting a wide variety of factors affects WNS transmission, even bat to bat. These include species differences, where some hibernating bat species have high mortality rates, such as the Little brown bat (*Myotis lucifugus*), and others – even in the same cave – aren't affected at all, such as the Virginia Big-eared bat (*Corynorhinus townsendii virginianus)*. We don't even know if any of the Western bat species will be affected by WNS.

Other factors, such as cave and mine temperature and humidity levels, can have a significant impact on whether or not there are optimal environmental conditions for fungal growth, even in the presence of a host.

In terms of appropriate management of cave resources, cave environmental and other factors frequently dictate whether or not they are used at all by bats. In examining whether or not restricting human access to a particular cave will help address the spread of WNS, it would seem obvious that knowing whether or not the cave is even used by bats would be a critical first piece of evidence.

Hibernating bats are particular about their roosts. Some caves are too shallow, and outside temperatures would reach sub-freezing levels in some caves, which would be fatal to bats. Others are too windy, with multiple entrances causing air flow issues. Others flood periodically or seasonally, making them unacceptable. Others may simply be sealed by ice and snow. Working to create a baseline of information seems a critical activity to undertake, particularly when Region 2 has the luxury of not being affected by WNS at this time.

Thus, in terms of several of your stated EA goals – access restrictions, seasonal restrictions, inventory and monitoring – having an open and collaborative effort to evaluate and assess significant bat caves and mines prior to the arrival of WNS would seem prudent.

The current closure order, which permitted exempted visitation for only a month or two prior to blanket seasonal closure, did not allow sufficient time to inventory caves for targeted management. Indeed, not only consistent with the MOU, but with the purpose and intent of the Federal Cave Resource Protection Act (FCRPA), WNS provides an incentive for doing a comprehensive assessment of cave resources. While the focus is on bats, the organized caving community can certainly be enlisted to assist in identifying critical bat caves for focused protection, while at the same time identifying those caves which have no need for even seasonal closure.

While the purpose of this EA is directed to bats and WNS, other criteria enunciated under the FCRPA can be identified at the same time, such as significant archeological, anthropological, geological, and other cave resources. This would be an additional benefit of the work being done for bats, and certainly consistent with the goals of both the USFS and the NSS and the nation to manage and protect significant cave resources for the benefit and enjoyment of the public.

Indeed, unnecessary closure of non-bat caves opens the cave resource to vandalism, such as has occurred in Eastern caves under closure orders, rather than monitoring by responsible cavers.

In your EA letter, you also use the term “adaptive management.” This implies both flexibility and responsiveness; flexibility in terms of adapting to changing circumstances, knowledge, or events and responsiveness in terms of adapting to changing conditions in a timely manner.

However, the letter seems to imply only a more restrictive adaptation – such as restricting cave access if and when WNS nears or arrives. What about the opposite? If a particular management strategy is no longer useful for purposeful, shouldn't it be loosened or abandoned? In other words, what's the exit strategy?

Specifically, you suggest a “trigger” for certain management actions, such as closing caves if WNS gets within a certain distance. If the purpose of closing the caves is to keep humans out because they might hasten infection, then what happens when the cave gets infected anyway by bats, as has happened frequently in other parts of the country? Does it make sense then to keep the caves closed? Why? It's no longer to keep the disease out.

However, it might make sense to close an affected hibernaculum while bats are present, to protect survivors from disturbance, lessening the chance that they be unnecessarily aroused, causing them to burn precious body fats and ultimately starve. Cavers have long known to avoid hibernating bats, so targeted winter closures of hibernacula would find wide support.

To raise another issue about this same trigger – distance – it's puzzling to us why a closure trigger decision would be made once the disease was within the flying/seasonal migration distance of the affected bat species. Keeping humans out at that point won't do anything to prevent disease spread.

Further, if sufficient baseline information has not yet been collected about caves or mines at that trigger distance, decisions will be made (and have been) to close caves that don't need to be closed as they aren't used by bats.

On the subject of decontamination requirements, the NSS has long-supported and helped develop the U.S. Fish and Wildlife Service's decontamination protocols. These protocols include things such as gear dedicated to single cave systems, as well as the earlier chemical and now hot water cleaning and disinfecting techniques. We are aware that the USFS has had a national decon order in place for all caves on USFS lands, so this is an understood "given" when discussing USFS caves, and a current condition of visitation.

That said, we have concerns about unnecessary overuse of the disinfecting procedures. These include exposure to humans, equipment, and the environment to chemicals. This can be of particular concern in wilderness areas. We urge a practical approach that balances the needs. For example, visiting numerous caves at the same time in close proximity may not require decon between each and every site. Similarly, the use of dedicated gear can avoid unnecessary exposure. Further, while WNS is not yet in or near the region, USFS officials should have the management flexibility to adapt. If the purpose is to keep WNS out, but the caver, USFS employee, or academic research is from the area, and only using gear from the area, then disinfecting serves no WNS purpose.

However, the NSS strongly supports prohibiting the use of gear from WNS-affected regions in Region 2, and in other unaffected regions. ***If humans are a vector for WNS, this is probably the single most effective thing that can be done to prevent its inadvertent transmission.***

While USFS Region 2 is beyond the current reaches of WNS – and we sincerely hope it remains that way – a truly long-range adaptive management plan would look not only to if or when WNS arrives, but beyond. As has unfortunately been the case in many eastern regions, WNS has come and conquered. In the Northeast, bat populations are showing signs of resilience and recovery. What are the management strategies then?

To date, the active and practical responses have been to avoid winter hibernacula – leave the bats alone while they are there – and a short list of monitoring and surveillance activities. The public has been educated and encouraged to report bat sightings and erect bat houses. Caves have been re-opened in some areas, certainly outside of hibernation season. Regional cave organizations and grottos have engaged their state and federal agencies in a variety of collaborative projects, including winter and summer acoustical monitoring.

Regarding applications and permits, while the current USFS Region 2 closure order requires permission under the exemptions, we don't believe a permit system is practical in the long term. We certainly understand the unique circumstances that have evolved in Region 2 over the past couple of years, but would hope that we could move away from this in the future. Certainly, without sufficient staff resources to effectively implement such a program, the sheer volume of caves would make it impractical. We would urge a local or regional MOU that could reduce the bureaucracy and paperwork, yet focus on substance, such as baseline data collection, collaborative resource monitoring and protection. The organized caving community has provided a tremendous

amount of human, scientific, and financial resources for federal cave resources for many years, and stands ready to continue.

On a final, yet extremely important note, we would urge the USFS to drop any mention or consideration of fungicidal applications as part of any management response. Caves are fragile ecological environments. They are also low-energy environments, meaning everything that lives in them – mammals, fish, insects, microbes – has found its niche, and it's in balance. WNS has upset that balance in some caves, and the extent of that upset is certainly not yet fully understood.

However, early research has shown that while some fungicides can certainly kill *Geomyces destructans,* they have also killed the bats. To do something as drastic as spraying in a cave ecosystem would certainly affect far more than the target fungus. It would affect all other cave creatures, and could affect groundwater and ultimately water for human consumption. Given that cave systems can be miles, tens of miles, even hundreds of miles in length, we don't believe there is any ecological or practical management decision to be made in favor of fungicidal applications to the cave environment.

From a strictly regulatory point of view, to have the USFS include this in an Environmental Assessment might trigger a full Environmental Impact Statement. We believe that is totally unnecessary, and urge USFS to drop any reference to it.

In conclusion, we would summarize our points as the following:

We support the goals, and an adaptive approach;
Allow the closure order to expire;
Enlist the organized caving community through collaborative agreements to collect and analyze baseline data on caves and bats, and for ongoing cave resource monitoring and management
Identify significant bat caves for targeted protection;
Recognize evolving science to drive management decisions, and adapt;
Be practical and sensitive in terms of decon and bureaucratic access requirements;
Recognize that “adaptive” can mean both restricting and loosening;
Look beyond WNS to when prevention isn't the primary goal, but recovery may be;
Drop consideration of fungicidal applications.

Again, we thank you for the opportunity to provide you with these comments, and look forward to working with you to protect and enjoy the cave and bat resources of USFS Region 2 for the benefit of all.

Sincerely,

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