U.S. Fish and Wildlife Service Listing Decision for Northern Bat Could Impact Forest Management in Virginia

By: Alexander Silvis, Virginia Tech

As a forest landowner in Virginia and a consumer of global agricultural goods, you should be thanking bats for their invaluable ecosystem services, even though they are easy to overlook. Worldwide, bats are important pollinators, seed dispersers, and voracious consumers of insects. In North America alone, bats provide an estimated $3.7 billion of agricultural pest control per year (Boyles et al., 2011). Although the economic benefit of bats to the forest industry has not yet been formally evaluated, bats consume a variety of insects that affect forest health and tree condition, including the eastern tent caterpillar (*Malacosoma americanum*), various leaf rollers, and roost, stem, and fruit borers (Dodd et al., 2012).

Unfortunately, a lethal infectious disease called white-nose syndrome (WNS) has been decimating the populations of seven bat species in eastern North America. Caused by the fungus *Pseudogymnoascus destructans*, WNS was first discovered in 2006 in a cave near Albany, New York. This disease, with a mortality rate of approximately 90%, infects hibernating bats and causes them to prematurely deplete the fat reserves necessary to survive the winter. To date, the U.S. Fish and Wildlife Service (USFWS) estimates that more than 6 million bats have died as a result of WNS. Due to severe reductions in populations, the USFWS proposed in October 2013 that one species, the northern bat (*Myotis septentrionalis*) be listed as an endangered species under the Endangered Species Act (ESA).

Many people associate bats with caves, but most bats in eastern North America use caves only for hibernation and spend April through October (this is broadly referred to as the active season by bat biologists) in forests. The northern bat, in particular, is closely associated with forests, day-roosting and foraging in conditions ranging from mature forests to newly regenerating stands. The exact distribution of northern bats in Virginia is unknown, but prior to 2006 the northern bat was common and widely distributed across eastern North America and probably occurred in almost all of the commonwealth. As a result of their wide distribution, once the northern bat listing process is finalized, many forest landowners in Virginia may learn that they own and manage habitat occupied by the northern bat. For those interested in a quick initial assessment of this, my research and that of my collaborators suggests that northern bats key in on forests with successional conditions that have resulted in an abundance of snags (standing dead trees) and decaying live trees.

A sassafras snag used as a northern bat maternity day-roost in Kentucky. Photo by: Alexander Silvis, Virginia Tech.

In Kentucky and West Virginia, clearcutting and subsequent old field regeneration have led to the species day-roosting in sassafras (*Sassafras albidum*) and black locust (*Robinia pseudoacacia*) trees. It is too early to know exactly what the USFWS regulations for protection of northern bat habitat will be, if listing indeed goes forward, but precedent from the related and already endangered Indiana bat (*Myotis sodalis*) offers valuable insight into how forest landowners could be impacted.

The specific details of USFWS regulations for protection of the Indiana bat differ slightly among state, federal, corporate and private landowners, but all are required to protect known hibernacula and forest day-roosts. Protections for northern bat cave hibernacula will likely consist of access restrictions to caves and conservation of surrounding forest habitat. Given that many caves have already been closed to protect other bat species and to prevent the spread of WNS, access restrictions seem unlikely to have a significant impact on most landowners. Because few landowners other than public agencies such as the U.S. Forest Service have identified northern bat day-roost areas, being required to protect

known roosts is likely a non-issue for most. However, measures that seek to project possible or likely day-roosting habitat could be an issue for private forest landowners.

Generally, protecting possible day-roosting habitat consists of limiting the size of forest clearing projects, conducting operations outside of the bat active season, and in some instances giving consideration to the creation or maintenance of future habitat. Available to state, corporate and non-industrial private landowners, the USFWS has a Habitat Conservation Planning process that can be used to develop long term management plans that minimize legal liability. Although private landowners are legally required to comply with protections for endangered species, in practice without a direct federal "nexus", indirect or unknown impacts from habitat modification typically do not meet close scrutiny under ESA.

Adult female northern bat with numbered arm band.
Photo by: Alexander Silvis, Virginia Tech.

Nonetheless, it is prudent to comply with clearing restrictions and hibernacula protection measures. In fact, federally supported programs like the USDA NRCS cost-share program may require participants to demonstrate compliance. Individuals owning large acreages may want to consider developing Habitat Conservation Plans. In cases when large forest clearing projects, or projects that cannot take place outside of the bat active season, are unavoidable, the most economically viable management option may be to assume northern bat presence and take mitigation actions. It is unclear what mitigation activities might be approved for the northern bat, but it will be incumbent upon the USFWS to devise guidelines.

Virginia forest landowners will have to wait to until next fall when the USFWS makes a final decision about the proposed rule to list the northern bat to know if or how they will be impacted. Knowing that prior to WNS, forest habitat supporting the northern bat was not limited, overly restrictive habitat protection measures probably are not going to help recover the species or win the fight against WNS. Still, how the reduced numbers of northern bats on the Virginia landscape respond to habitat change and disturbance is unknown, a factor the USFWS is likely to take into consideration. My collaborators and I are conducting an experiment to determine how northern bats respond to disturbance; our initial results suggest disturbance has minimal impacts. Forest managers in Virginia and elsewhere are a resourceful and resilient group prepared to meet new challenges in constructive and proactive ways. Harvesting restrictions may be a nuisance, but we are confident that forest managers in Virginia will be able to continue to manage our forests and wildlife in economically and ecologically viable ways.

References

Boyles, J.G., Cryan, P.M., McCracken, G.F., Kunz, T.H., 2011. Economic Importance of Bats in Agriculture. Science 332, 41–42.

Dodd, L.E., Chapman, E.G., Harwood, J.D., Lacki, M.J., Rieske, L.K., 2012. Identification of prey of *Myotis septentrionalis* using DNA-based techniques. J. Mammal. 93, 1119–1128.

Alexander Silvis is a graduate student in the Department of Fish & Wildlife Conservation; silvis@vt.edu.