



Extension FactSheet

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Dead Trees as Resources for Forest Wildlife

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Although dead wood might seem expendable in a forest or may even be regarded as unsightly, it serves an important role in supporting wildlife and assisting ecological processes. Dead wood may be in the form of *snags* (standing, dead trees), dead limbs, or logs. All provide habitat to numerous animal species and play an important role in nutrient cycling.

Biological Impacts of Dead Trees

Birds are the most obvious benefactors of dead trees. They use snags, limbs, and logs for perching, foraging, and nesting. In some forests, 30 to 45 percent of the bird species are cavity nesters. In North America alone, 55 avian species nest in cavities. Cavity-nesting birds are classified as *primary excavators* (who can excavate hard wood), *weak excavators* (who can excavate soft, dead wood), or *secondary cavity-users* (who can utilize existing cavities). In Ohio, eastern bluebirds, American kestrels, and wood ducks are examples of species that rely on cavities in dead wood for successful reproduction. Other birds, such as ruffed grouse, will use logs for drumming and courtship displays.

However, birds are not the only creatures that benefit from dead wood. Mammals, amphibians, reptiles, and invertebrates seek refuge in natural cavities and dens. For example, salamanders rely on the security and dampness of soil found beneath a rotting log. Small mammals find cover and relief from the hot midday sun in dead limbs and downed wood, while spiders, beetles, worms, and microbes move and feed within the decaying matter. Additionally, fungi and mushrooms flourish on and around logs, breaking down the organic matter to release important nutrients back into the forest ecosystem.

Logs provide other important ecological functions as well. Decaying logs retain moisture and nutrients that aid in new plant growth. Young trees may sprout from a single downed limb known as a *nurse log*. The soft wood tissue of a nurse log offers an ideal substrate for many young trees during their initial growth and development. Logs also store energy and fix nitrogen. Furthermore, dead wood serves as a ground cover, lessening soil erosion and preventing animals such as deer from over-browsing plant seedlings.

Dead Tree Management

The potential benefits to wildlife from the retention of dead wood are dependent on several factors. The size, species, level of decay, and location affect the usefulness of dead wood to wildlife. Consider these factors to guide your decisions regarding dead wood retention.

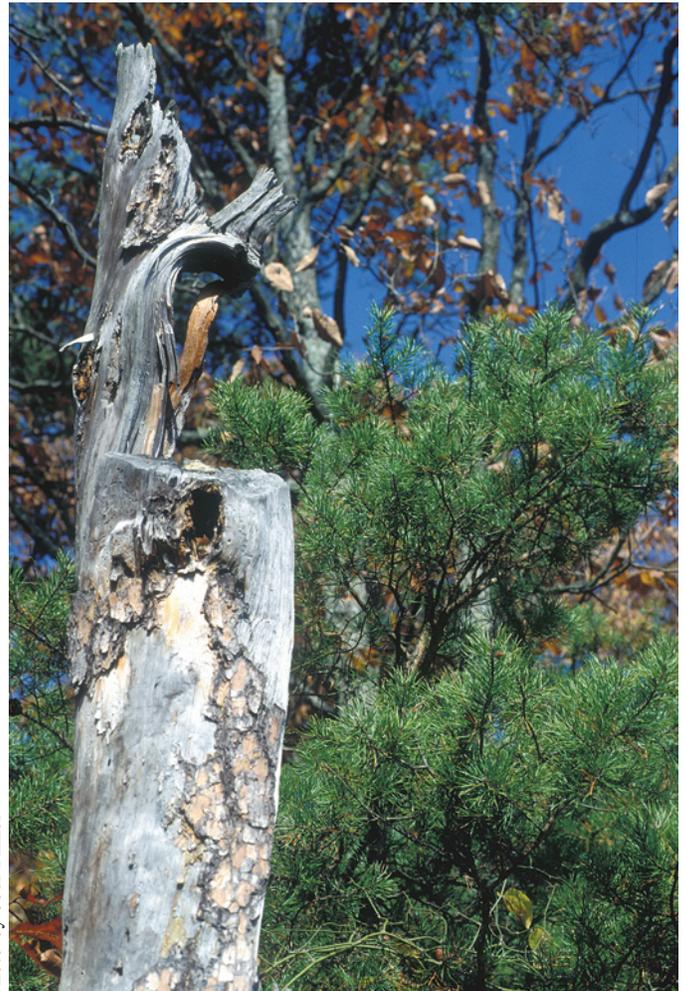


Photo by Jodi Miller

Large snags (greater than 15 inches diameter at breast height and taller than 6 feet) are required for large animal species, such as the pileated woodpecker; whereas, smaller animals may use snags or dead limbs from 4 inches in diameter. In general, retain the greatest number of snags possible, and try to include at least one large snag per acre. Large snags will also stand longer and decay more slowly than their smaller counterparts. The same is true for logs. Those greater than 12 inches and 3 feet long will provide longer lasting habitat than smaller logs. Still, retaining a variety of sizes and types of downed wood is usually the best strategy to establish habitat for wildlife.

Consider the species of origin of the dead wood when deciding what to keep or remove in a forest. Animals sometimes show a preference for snags of certain tree species. These tree species preferences may vary from region to region. Species of snags retained should reflect the tree species found in the area. It may be appropriate to retain slower-decaying species, such as cedars, over those that tend to rot more quickly, such as alders. Furthermore, deciduous trees are more likely to develop larger cavities than conifers. Plan to allow a variety of trees to age and die naturally in order to provide a continuous source of replacement snags and nurse logs.

The level of snag decay is another important factor to recognize when making management decisions. Harder trees that have recently died, still with bark intact, will stand longer than older, softer snags that have lost their bark over the years. However, in order to maximize the wildlife benefits, keep a variety of soft and hard wood snags. Weak excavators like nuthatches and titmice may need softer wood in which to make their nests. Also, many species will use trees that are only partially dead. *Den trees* often form from hardwoods; they are live trees in which some of the heartwood has rotted out to create cavities.

The location of dead wood will impact opportunities to provide wildlife habitat. Snags should be available throughout the forest stand. Some of the trees can also be clustered. When possible, keep snags dispersed over 60 percent of the total land area. For wildlife benefits, research suggests maintaining 2 to 4 snags per acre. Offering a substantial number of snags will

lessen competition for nesting, foraging, and roosting sites. In areas that have recently been logged, *slash* (timber debris) should not exceed 8 inches depth on 75 percent of the site, in order to facilitate movement of large mammals and reduce fire hazard. Yet, some level of slash provides cover for wildlife and enriches soil quality.

As with any forestry issue, safety should be a top priority. Consult a professional when determining if a snag presents a substantial hazard. In some situations, it may actually be more dangerous to remove a tree than to let it stand. If it is not possible to retain snags on portions of your property, installing nest boxes will offer cavities for some species to reproduce. However, this is impractical on a large scale. For more extensive wildlife habitat, foresters can create snags of adequate size for you in safe locations.

Conclusion

If we recognize and understand the natural value of snags, dead limbs, and logs, they become more appealing to the human eye. Snags and logs are not signs of “unkempt” forest, nor are they waste materials to be discarded. Rather, dead trees are home to many animals and storage for moisture and nutrients. Because so many animals rely on dead wood during some part of their lives, snag, limb, and log retention is an essential component of any wildlife conservation or management plan.

References

- Bolen, Eric G. and William L. Robinson. 1995. *Wildlife ecology and management*, Third Edition. Prentice Hall. Englewood Cliffs, New Jersey: 325-326.
- Hunter, Malcolm L. Jr. 1990. *Wildlife, forests, and forestry: Principles of managing forests for biological diversity*. Prentice Hall. Englewood Cliffs, New Jersey: 161-180.
- Mannan, W. R., R. N. Connor, B. Marcot and J. M. Peek. 1996. *Managing forestlands for wildlife. Research and Management Techniques for Wildlife and Habitats*. T. A. Bookhout, ed. 699-704. Allen Press, Inc., Lawrence, Kansas.

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