

The Dying Tree: Nature's Legacy

By Gillian Martin

Our eyes dismiss the value of a dying tree.

Our fears tell us to cut it down and haul it away quickly. How often do we ask, “Does the tree need to be cut down completely?”

A dying tree has a commendable destiny. Whether it still stands, is reduced to a hollowed stump, or exists as downed wood, most of its “life” occurs in a complex, intriguing, unseen world. Imagine a tree as a time-share used by different species, for vastly different purposes, in every stage of its decline. A dying tree is an awesome thing! No man-made structure matches the ecological usefulness of a sizable dead tree. Few living things are as overlooked and unappreciated, but wildlife and the vast community of industrious inhabitants that will eventually work on a tree's remains in the soil below know the value of a tree in decline. Nature bequeaths dying trees to enrich habitats.

Let's start with cavities in upright trees. Across the continental United States, they serve as nest sites for about 85 species of birds in a wide variety of habitats, climates, and elevations. Every species has a habitat preference and breeding range, but some cavity nesters are more adaptable than others about where the cavity is located and in what tree species. Many have adapted to urban living, benefitting from site conditions such as sources of water and insects in parklands, protection provided by increased habitat edges, as well as high rodent populations.

If the cavity size and location is suitable, other wildlife may find them beneficial as dens or roosts. This includes bears, bats, foxes, and raccoons. Pollinators, such as bees, are among the long list of insects that also use them. And did you know that cavities also make for a useful pantry? Storage sites for nuts, berries, and insects tip the scale as to who makes it through a bitter winter.

A tree with loose bark invites other occupants as well. Look closely and you may discover a lizard tucked behind; it's likely regulating its body temperature, escaping a predator, or dining on insects breeding there. That is, if the probing woodpecker didn't beat him to it. And where mature, large coniferous or deciduous trees reside, tiny woodland birds, like the brown creeper, make their nest in the same shaded rooms that loosened bark provides. Insect cocoons and spider egg cases help the nesting creeper bind her twigs, moss, leaves, and lichen together.

In addition to providing nesting sites, shelter, and food for wildlife, a dead tree supplies perches for hunting, territorial defense, and courtship. What better place for a red-tailed hawk, whose habitat comprises much of North and Central America, or a great horned owl, in most all of the Americas, to survey for prey and dine with their kingdom laid out before them?

The tree submits willingly to its many dismantlers. All types of industry and territorial issues are being attended to by its visitors. Fungi are important. Over time, they will ultimately help to convert the tree to duff, and return its nutrients to the soil. The shuffling and wing gyrations of the dark-eyed junco, a flashy, medium-sized sparrow, may suggest just how much it enjoys a dust bath, and all thanks to a rotting log!

Fungi, too, are good hosts and job-sharers. They accommodate insects that raise their families within their close, moist, fleshy corridors, or under their leathery canopies. Fungi become food for deer, raccoons, and countless other foragers. Those that dine on fungi effortlessly return the favor; their bodies transport its spores to other locations.

But that's not the end of the story. The dead tree's offerings are then broken down and transported beneath the soil by bacteria and various decomposers, including other types of fungi, called mycorrhizae. Think of a subterranean spider web made up of strands many times finer than a root hair. When plant roots send chemical “green lights” to the fungal web, the fungal web (through a complex relationship with



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Red fox in a cavity at base of a dead tree.

root cells) delivers minerals, such as phosphorus and inorganic nitrogen, to the plant. In some cases, a bonus may be included. The fungi add resistance to certain diseases. In exchange, the fungi receive moisture and carbohydrates from the plant. In the world of a dying tree, reciprocation abounds.

One of the most critical relationships between dead trees and wildlife involves the woodpecker. With a few exceptions, this family of birds needs rotting wood in which to excavate nest sites. Is it accidental “wisdom” that the woodpecker reciprocates by contributing to the decay process? While excavating and probing for insects, it too, picks up and transports fungal spores on its bill and feathers. More fungal colonies mean more rotting wood, and in time, more nesting and roosting opportunities.

Woodpeckers generally prefer to make a new cavity than to reuse one. (The northern flicker, the poorest excavator, is an exception.) As if giving back to their neighborhood, woodpeckers leave abandoned cavities to be used by dozens of secondary cavity-nesting species. Could the bluebird, nuthatch, or chickadee conceive of a better neighbor? Perhaps we’re overdue in hailing the efforts of woodpeckers! It should come as no surprise to learn that habitat loss was identified as the greatest threat to woodpeckers worldwide, per the 2014 International Conference of Woodpeckers in Vitoria-Gasteiz, Spain.

Let’s address two things—hazard trees and how to select the best candidates. Assuming a tree is considered safe to stand for some time, there are several management options. Did you know that some birds will indeed nest in what amounts to a four-foot (1.2 m) high pole? They’ll accept a tree without a single limb! Of course, the larger and taller the tree, the greater its usefulness. It’s best if the trunk diameter is at least 15 inches (38.1 cm), but even eight inches (20.3 cm) will do. Better yet if the tree offers strong limbs for perching. Top and shorten the dying tree, and shorten its limbs, if you must, but if you can, leave limbs at least 18 inches (45.7 cm) in length. (This size allows room for the deep cavities woodpeckers excavate.)

Bump up the tree’s perceived value by calling it a wildlife tree. Put a sign on it that explains its benefits. You can create an opportunity to change public perception, and turn the conversation toward education.

Medium- to large-sized dead limbs, on healthy trees, should not be overlooked as options for retention. They are sometimes the best of all worlds for cavity-nesting species. The dead limb provides soft wood for excavating cavities, while the fully leafed tree offers shelter from the elements and reduced visibility to predators. Leave as much as the dead limb in place as you can. Limbs that are eight inches or more in diameter are of greatest value.

Hard snags, those with sound sapwood and decayed heartwood, are ideal for most woodpeckers. The sound sapwood offers some integrity and hence protection to the cavity. It also provides greater insulation against the elements and better protection from predators. The softened heartwood allows for easy excavation.



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Soft snags are those in advanced stages of decay. Most of their bark has been removed. These trees possess shorter longevity and may leave nests vulnerable to predators. However, they are sometimes useful to weaker excavators, such as nuthatches and chickadees. And because dead trees typically offer prey items in all stages of decay, they are beneficial to a variety of wildlife in every phase.

Are you wondering about the most valuable locations for dead trees? Those along riparian areas and bodies of water are preferred by many species. Dead trees are also vital for cavity-nesting waterfowl. Since some birds and wildlife prefer habitat edges, trees in those areas are quite useful. But birds of open meadows and grassy areas will accept dead trees that stand alone. Some woodpeckers prefer clusters of dead trees, some prefer open canopies, others denser ones, but several will accept snags virtually wherever they can be found. A mix of dead and live trees in settings with lower vegetation and some coarse, woody debris is a winning situation for most wildlife.

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Woodpecker excavating in tree.



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Every clue an organism leaves behind on a drying tree is a hieroglyph, a Thank You for nature's bequest to it. A dead tree is a story about the cycle of life; about respecting and preserving nature's intentions; an invitation to look a second time, even at the "ugly" and infested. It may even be sending us a message that something is wrong in the surrounding environment. That warning is a gift to us as well.

A dead tree is a legacy that can take dozens of years to replace, and in many cases, it will never be replaced. Whenever a tree is cut down needlessly and hauled away prematurely, we shortchange our urban forests and our planet. Dead trees represent one of the finest examples of reciprocity within the environment. A study of the relationships between a dead tree, wildlife, and organisms above and beneath the soil illustrates the fact that independence in any ecosystem is an illusion.

Naturally there are overriding safety reasons that favor of removing a tree, whether it is dying or otherwise healthy. Removal may also be necessary to control an infestation and thereby protect the health of surrounding trees. An ISA Certified Arborist® is best-qualified to make such decisions. But let's consider other circumstances in which we might not want to retain a dead tree.

At the urban interface or in high-use areas, such as on playgrounds or along walking trails, several good arguments against retention can be made. Dead trees do not have the aesthetic, shelter, or energy-savings value of healthy trees. Here's another example: a short trunk with few or no limbs may be attractive to youngsters who welcome the challenge of climbing, swinging, and jumping. And in locations where fire risk is high, and where surrounding vegetation is particularly dry, too many dead trees or downed wood could serve as fuel and obstacles to wildfire management.

Concerns about safety and liability are strong and legitimate factors for consideration. No responsible arborist ignores them. But next time, before you spray that red X on the tree, ask yourself, "Does it have to be removed completely?"

Gillian Martin is the program director of the Cavity Conservation Initiative (www.cavityconservation.com).

MULTIMEDIA SPOTLIGHT

Learning About Trees

Kids love trees. But they probably don't know as much about them as we arborists do. Let's get our kids out and into the trees to engage with the urban forest. Instill in kids an appreciation for all of the benefits and beauty that trees provide. Check out this fun video for tips and talking points for teaching kids about trees.

Media type: video

Length: five minutes

Where to watch: <http://www.pbs.org/parents/adventures-in-learning/2013/10/lets-learn-trees-video>

