



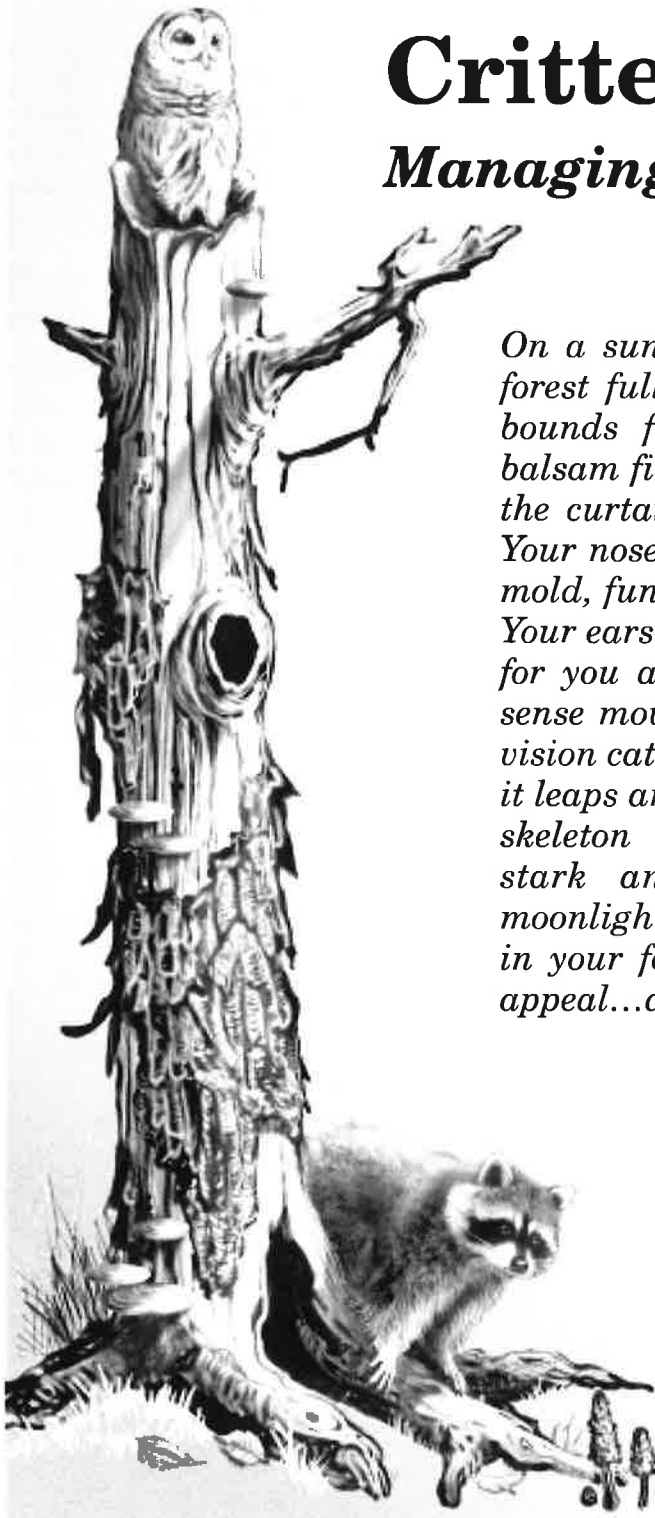
Critter Condos

Managing Dead Wood for Wildlife

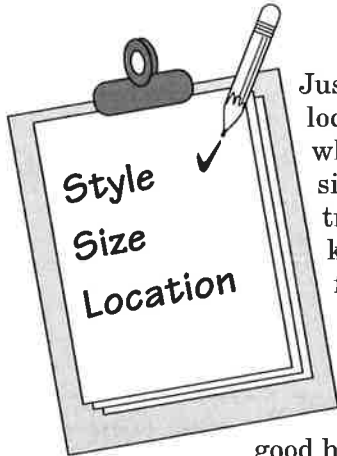
On a sunset stroll through your woods, you find a forest full of activity...full of life...a snowshoe hare bounds for cover, a red squirrel scampers up a balsam fir, a blue jay scolds from a branch above. As the curtain of darkness falls, your senses heighten. Your nose intercepts the pungent, earthy odor of leaf mold, fungi, and rotting wood drifting on the breeze. Your ears snatch a few "who cooks for you, who cooks for you all?" notes of a barred owl. Suddenly, you sense movement overhead! Turning, your peripheral vision catches the floating form of a flying squirrel as it leaps and glides from a snag. The smooth, barkless skeleton of this dead tree stands stark and whitewashed in the moonlight. It's then you realize that in your forest, even dead things have appeal...a life of their own....



Snags. By night, they look ghostly in the misty, moonlit darkness. In reality they teem with life. Over 70 kinds of Wisconsin mammals, birds, reptiles and amphibians, not to mention swarms of insects, spiders, millipedes and other invertebrates use snags...dead or dying trees. These critter condos provide den, nest and feeding sites, as well as sites for food storage, perching, preening and courtship rituals. This publication illustrates the variety of dead wood that benefit wildlife and the ways you can manage for it.



The Critter's Criteria



Just as the style, size and location of housing affect where you live, the style, size and location of dead trees determine what kinds of wildlife you'll find in, on or under them. For example, snags—which are **standing** dead and dying trees—make

good homes for cavity nesters such as woodpeckers, bluebirds, nuthatches and squirrels. **Downed** trees or logs provide great hiding places for salamanders, snakes, deer mice, weasels and chipmunks. If large enough, these can make good bear dens. Riverside snags, with their tangled mass of gnarled roots provide shelter for brown trout and burrowing sites for muskrats. Their upper limbs may be used for nesting by herons, egrets, bitterns and cormorants. When managing your land for snags, consider where you live in the state. This will determine what wildlife are most likely to inhabit the dead wood on your land. The more you know about dead wood and the types of wildlife that depend on it, the better you'll be at providing homes for wildlife—in essence, you'll be moving one step closer to becoming a wildlife realtor!

☑ Style: Hard vs. Soft Snags

Snags come in two styles: hard and soft. Both are important to wildlife. **Hard snags** have rotten centers, a solid exterior and usually a few limbs attached—they make the best den trees. As snags decay, the wood softens and becomes punky and the limbs gradually fall off. **Soft snags**, with their pulpy wood fibers, make good forage sites for insect-eating birds and excellent nest sites for woodpeckers and songbirds such as black-capped chickadees.

A tree's characteristics determine its snag and cavity potential. For example, sugar maple, elm, black and white oak, hickory and butternut are excellent cavity trees with high wildlife value. These hardwood trees grow to large sizes, decay slowly, and produce hard, upright and long-lived snags. The beech tree, common along Lake Michigan and Green Bay, also makes a good cavity tree because it's prone to heart rot.

Softer trees, like aspen and birch, have short lifespans and rot quickly. These rapid growers make superior soft snags of high value to wildlife since they produce cavities more quickly than hardwoods and provide habitat for swarms of insects which feed many forest songbirds.

Snags of medium value to wildlife come from white ash, basswood, red maple, white pine, red oak, yellow poplar, box elder, black cherry and black walnut. Coniferous snags generally do not last as long as hardwoods, though pine and tamarack make excellent nest and perch sites for osprey when located next to water.

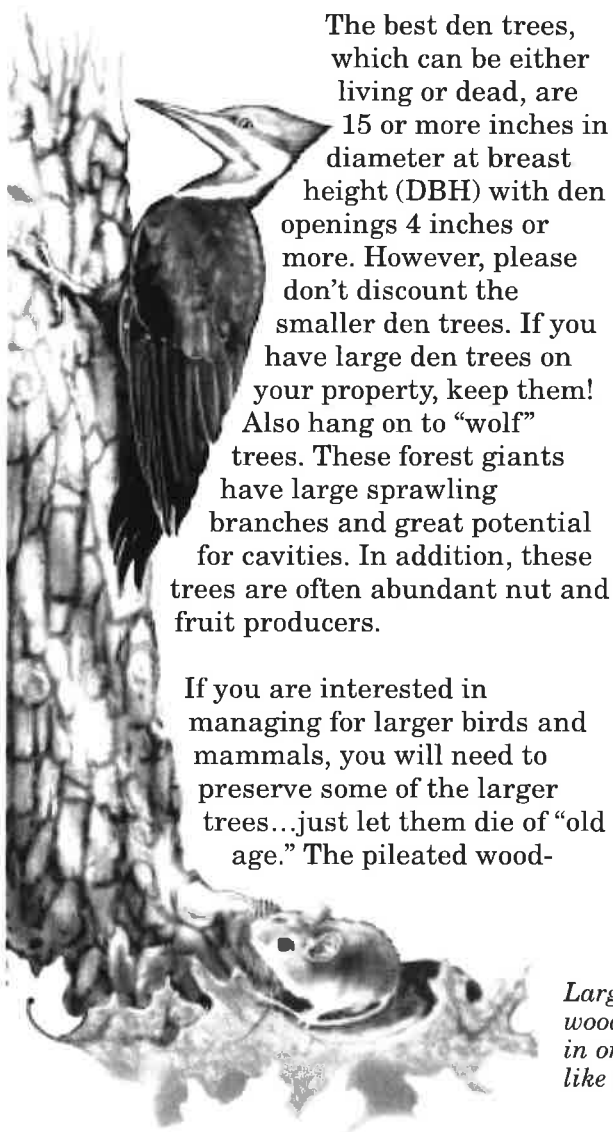
Ever "snag" your line while fishing? As frustrating as it is to lose a lure, every good angler knows that fallen logs in a pond or stream provide trout, bass and other fish with a sheltered, shady place to rest and feed. Downed logs in

or near water are especially vital and should be spared at all costs. And while you're cutting your line free, you'll probably startle a few turtles lazily sun-bathing on a log....kerplop....



☑ **Size:** *Small vs. Large Snags*

Human condos come in all sizes and so do critter condos. In general, the larger the snag, the more kinds of wildlife it can host. While small snags are important in their own right, they can only host small creatures such as the red-breasted nuthatch, downy woodpecker, house wren, bluebird and white-footed mouse. But large snags can suit small *and* large wildlife such as pileated woodpeckers and raccoons. Imagine the size of the log den needed for a black bear!



The best den trees, which can be either living or dead, are 15 or more inches in diameter at breast height (DBH) with den openings 4 inches or more. However, please don't discount the smaller den trees. If you have large den trees on your property, keep them! Also hang on to "wolf" trees. These forest giants have large sprawling branches and great potential for cavities. In addition, these trees are often abundant nut and fruit producers.

If you are interested in managing for larger birds and mammals, you will need to preserve some of the larger trees...just let them die of "old age." The pileated wood-

pecker, Wisconsin's largest woodpecker, needs a tree at least 20-22 inches DBH in order to excavate a nest cavity. Pine martens also need very large trees.

☑ **Location:** *Forests, Waterways and Fields*

Snags are most commonly associated with forests. Many a forest mammal from bat to bobcat, bear, pine marten, porcupine, red squirrel, and gray fox use snags for dens and lookouts. So do many forest birds. Woodpeckers are the primary excavators. They drill out new homes in snags. When abandoned, these cavities become residences for other creatures like saw-whet owls, nuthatches and great-crowned flycatchers. Besides woodpeckers, the only other bird that is a primary excavator is the black-capped chickadee. However, these diminutive birds, which lack the powerful chisel-like beak of woodpeckers, can chip out a cavity only in soft snags.

Snags located near waterways and wetlands also offer great benefits to wildlife. Wood ducks, hooded mergansers, common goldeneyes and buffleheads need tree cavities for nesting. Herons, egrets, eagles and ospreys build their nests high atop snags standing in or near water. Snags also serve as lookout towers for keen sighted fish-eating birds, such as belted kingfishers.

Snags located near open fields attract some types of hawks and owls. From high atop their lookouts, these birds use telescopic vision and radar-like hearing to detect mice, rabbits, squirrels and other prey. The flicker,

Larger cavity dwellers need large trees. The pileated woodpecker needs a tree at least 20-22 inches in diameter in order to excavate a nest cavity. Small cavity dwellers, like this mouse, can utilize both large and small trees.

unlike its woodland dwelling woodpecker relatives, prefers to nest in snags along woodland edges bordering farm fields or open grasslands. Kestrels and eastern bluebirds will often move into old flicker holes. Colorful bluebirds frequently nest in snags along farm fence rows and adapt well to wooden fence posts and nest boxes too.

Even backyard snags can attract house wrens, black-capped chickadees, red-bellied woodpeckers, and flying squirrels. If a snag poses no threat of dropping large branches on people—leave the snag in place. If you must cut a tree, leave it lie as a log.

Downed Wood: Let Sleeping Logs Lie

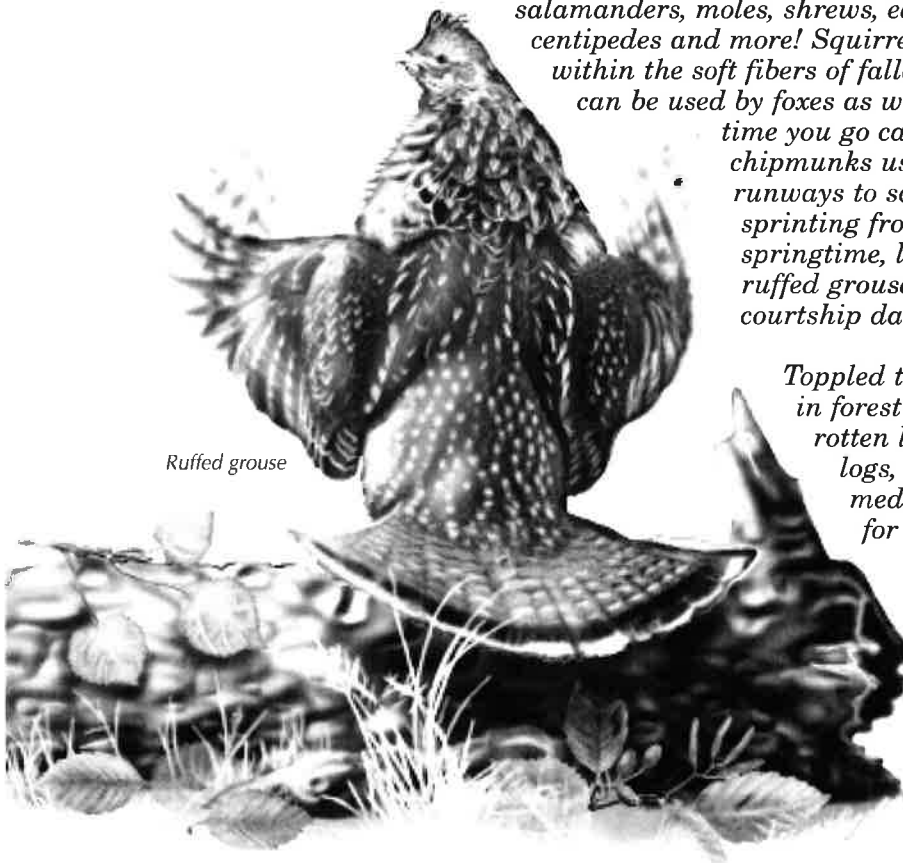
Once a snag has toppled over it doesn't lose its value to forest wildlife. Downed and rotting logs provide moist and earthy homes for

salamanders, moles, shrews, earthworms, millipedes, centipedes and more! Squirrels will cache their food within the soft fibers of fallen trees. Hollow logs can be used by foxes as winter dens. The next

time you go camping watch how chipmunks use downed logs as runways to scurry through the forest, sprinting from log to log. If it's springtime, listen for drumming ruffed grouse which perform their courtship dance atop mossy logs.

Ruffed grouse

Toppled trees also are important in forest regeneration. Some rotten logs, known as nurse logs, provide a good growing medium, rich in nutrients, for tree seedlings to get a healthy start in life.



Wisconsin Wildlife Dependent on Snags



Birds	Food	Nest	Perch
Wood Duck		✓	✓
Common Goldeneye		✓	
Bufflehead		✓	
Hooded Merganser		✓	✓
Common Merganser		✓	✓
Great Blue Heron		✓	✓
Black-crowned Night Heron		✓	✓
Double-crested Cormorant		✓	✓
Common or Great Egret		✓	✓
Belted Kingfisher			✓
Turkey Vulture		✓	✓
Merlin		✓	✓
American Kestrel		✓	✓
Barn Owl		✓	✓
Screech Owl		✓	✓
Barred Owl		✓	✓
Saw-whet Owl		✓	✓
Bald Eagle		✓	✓
Osprey		✓	✓
Red-tailed Hawk		✓	✓
Chimney Swift		✓	
Ruffed Grouse			✓
Common Flicker*	✓	✓	✓
Pileated Woodpecker*	✓	✓	✓
Red-bellied Woodpecker*	✓	✓	✓
Red-headed Woodpecker*	✓	✓	✓
Yellow-bellied Sapsucker*	✓	✓	
Hairy Woodpecker*	✓	✓	✓
Downy Woodpecker*	✓	✓	✓
Black-backed Woodpecker*	✓	✓	
Three-toed Woodpecker*	✓	✓	
Great-crested Flycatcher		✓	✓
Tree Swallow		✓	
Purple Martin		✓	✓
Black-capped Chickadee*	✓	✓	✓
(soft snags only)			
Boreal Chickadee*	✓	✓	✓
Tufted Titmouse		✓	
White-breasted Nuthatch	✓	✓	
Red-breasted Nuthatch	✓	✓	
Brown Creeper		✓	
House Wren		✓	

Birds, continued	Food	Nest	Perch
Winter Wren		✓	
Bewick's Wren		✓	
Carolina Wren		✓	
Eastern Bluebird		✓	✓
Prothonotary Warbler		✓	

Non-native Pest Birds			
Starling	✓	✓	✓
English Sparrow	✓	✓	✓

Mammals			
Opossum		✓	
Big Brown Bat		✓	
Little Brown Myotis Bat		✓	
Silver-haired Bat		✓	
Eastern Pipistrel		✓	
Red Bat		✓	
Hoary Bat		✓	
Black Bear	✓	✓	
Raccoon		✓	
Pine Marten		✓	
Fisher		✓	
Mink		✓ (under logs)	
Gray Fox		✓	
Bobcat		✓	✓
Least Chipmunk		✓	✓
Eastern Chipmunk			✓ (logs)
Red Squirrel		✓	✓
Gray Squirrel		✓	✓
Fox Squirrel		✓	✓
Southern Flying Squirrel		✓	✓
Northern Flying Squirrel		✓	✓
Deer Mouse	✓ (stores food)		✓
White-footed Mouse		✓	
Porcupine		✓	
Snowshoe Hare		✓ (hollow logs)	

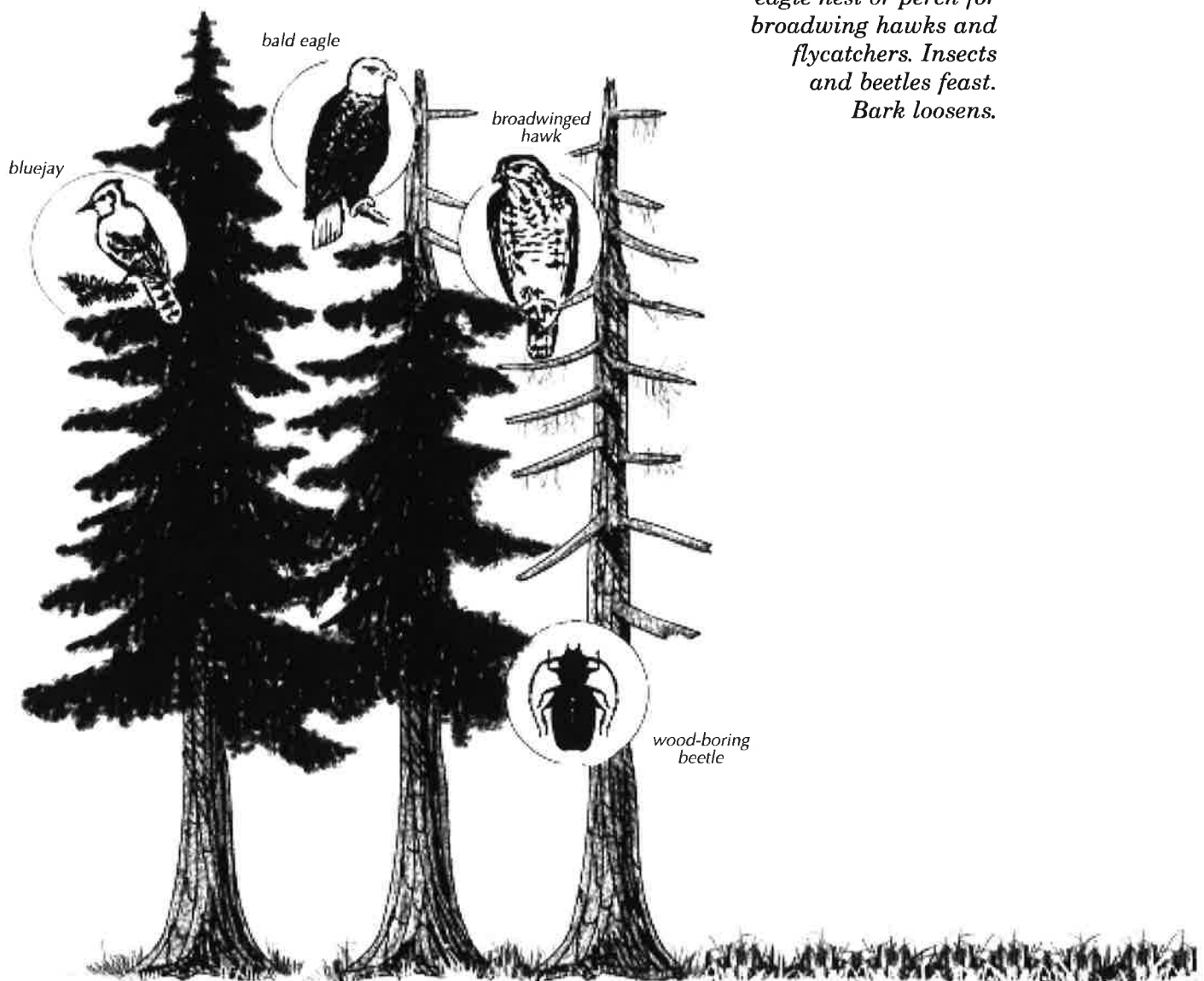
Reptiles and Amphibians			
Most Salamanders		✓ (under logs)	
Tree Frogs		✓	

***Primary Excavators:** Primary excavators drill their own cavities out of dead wood. Later these cavities can be used by other wildlife.

The Life Cycle of a Dying Tree

The decline of a tree begins when heart rot fungi invade the tree through a wound to the tree's bark. Slowly, the tree's core begins to rot—

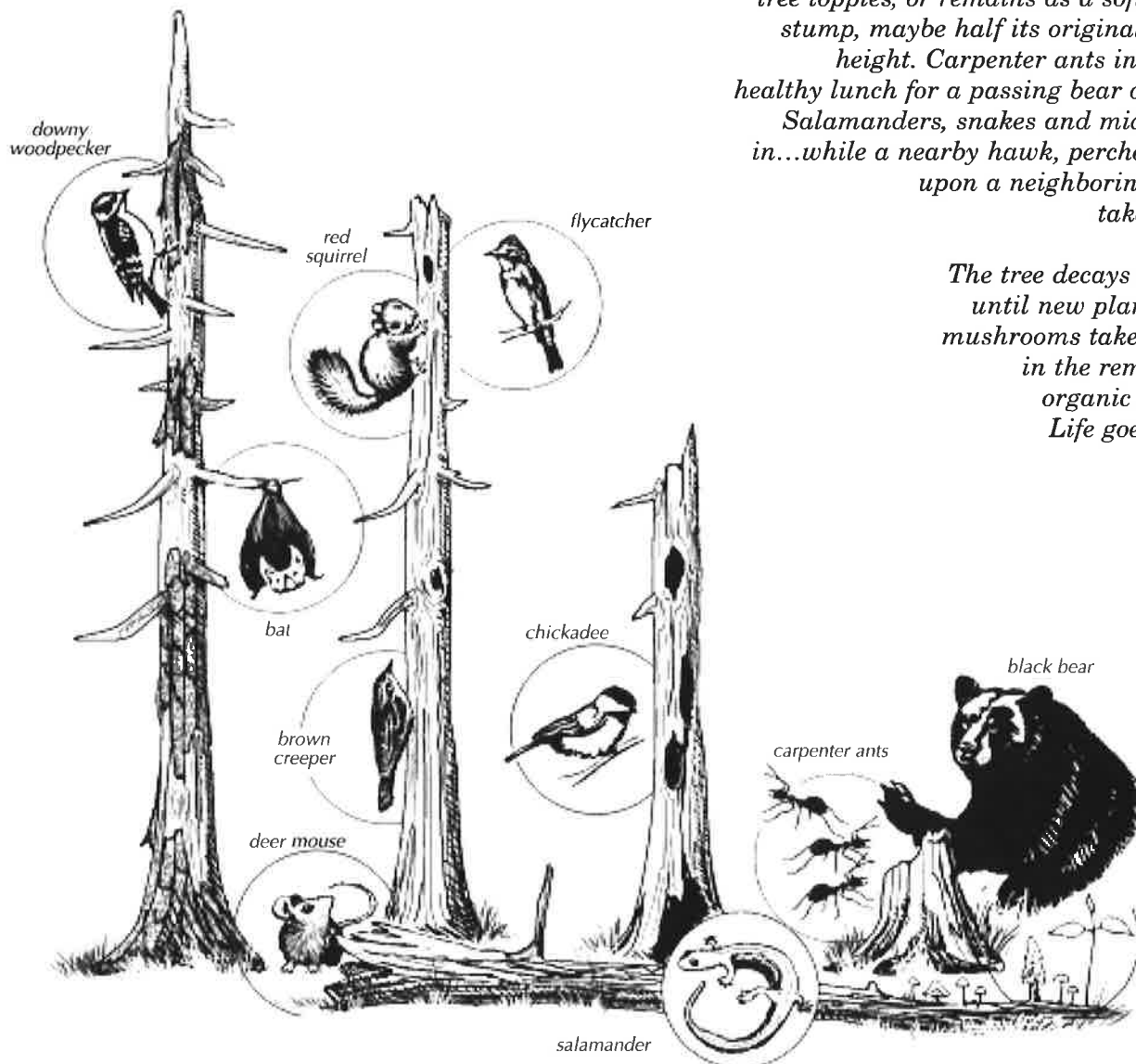
—barren branches appear, perhaps a good site for an eagle nest or perch for broadwing hawks and flycatchers. Insects and beetles feast. Bark loosens.



Woodpeckers soon follow, in search of food and potential home sites. Using their specialized bills, these birds chip away at the softened wood to create a cavity large enough for nesting. They raise their young, feed on the insects harbored within the decaying wood, and move on. The empty cavity then becomes home to another creature—perhaps an owl, squirrel, bluebird or bat.

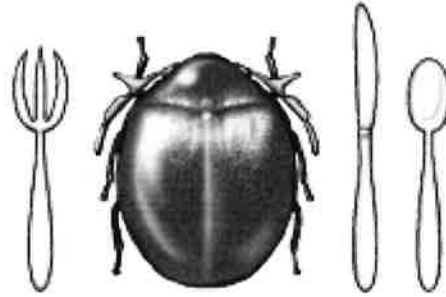
Eventually, the battered ghost of a tree topples, or remains as a soft stump, maybe half its original height. Carpenter ants invade, a healthy lunch for a passing bear or coon. Salamanders, snakes and mice move in...while a nearby hawk, perched high upon a neighboring snag, takes note.

The tree decays further until new plants and mushrooms take sprout in the remaining organic matter. Life goes on....



Insect Cafeterias

Snags teem with life. So, too, do diseased and fallen trees. Their loose bark and many nooks and crannies shelter a multitude of tiny creatures. Just turn over a rotting log and watch the insect activity. While the swarming, creeping, slithering tangle of ants, spiders, millipedes, centipedes, beetles, worms and slugs may seem unsettling to you, this ***insect cafeteria*** provides a nutritious lunch for many birds, mammals, reptiles and amphibians.



For example, pileated woodpeckers actively seek out elm and aspen trees infested with wood boring insects, and black bears lap up ants found in rotting logs. Brown creepers, small brown birds with curved beaks, search for insects hidden under loose bark as they spiral up the trunk. Other cavity dwellers are voracious insect eaters, though the insects they eat may not live in dead wood. For example, a house wren can feed 500 insects to its young every summer afternoon and a swallow can consume 1000 insects every 12 hours. In fact, these birds act as natural pesticides and help keep insect populations in check. So hang on to dead wood, it's good for wildlife and it does not always pose a threat to your woodland. For years, however, this was not the prevailing attitude.

In the past, loggers cut down all dead trees during timber harvests because they had limited value as timber, harbored forest insect pests, and were potential fire and safety hazards. Subsequently, cavity nesting bird populations have declined in recent years due to a loss of large trees with natural cavities.

Today, loggers, foresters and wildlife managers work together to protect these valuable trees and the insect cafeterias they harbor. It is now understood that insects and disease are natural parts of the forest and contribute to its stability, productivity and diversity of life.



Snags located next to water serve as lookout towers for the fish-eating kingfisher.

A saw-whet owl takes up residence in a cavity that was earlier excavated by a woodpecker.

Managing for Dead Wood

Seek Out Snags



Consider this, it takes about 40 years before completely cleared land becomes suitable for most woodpeckers and other snag dependent wildlife. It takes about 80 years before trees can support the larger cavity dwellers like raccoons and pileated woodpeckers. So, before you cut firewood or implement a timber stand improvement plan, you should identify existing *and future* snag and den trees.

Snags in advanced stages of decay are easy to identify—they stand out like skeletons. Diseased trees are a little harder to spot. Look for signs of injury or a rotten core—fungal heart rot. Dead branches, rotting branch stubs, fungal growth, old wounds, scars and discolored or soft bark are all signs of a dying tree. Also, look for woodpecker holes. Woodpeckers actually seek out trees with rotten cores. Always note the wolf trees.



When a woodpecker begins pecking away on a tree, it may be in the early stages of decay. Mark it as a future snag tree. Also look for dead branches and stubs, fungal growth, old wounds, scars and discolored or soft bark.

Create More Dead Trees



Look around you. If you find few snag or den trees on your property, create them yourself using some simple techniques.

To create a *snag*, select a living tree that's over a foot in diameter—the bigger, the better. Also, try to select a tree that's either diseased or severely deformed, or select those that are

crowding more valuable trees that you would like to grow larger. Good trees for creating snags include sugar maple, black oak, white ash, elm and basswood. Take an axe and cut away a 3- to 4-inch band of bark around the entire circumference of the trunk. Make sure you remove the bark and cut well into the sapwood. This technique is known as *girdling*. It disrupts the flow of nutrients within the living layer of the tree found just underneath the bark. This causes the tree to die, and eventually become a snag.



Girdling disrupts the flow of nutrients within the living layer of the tree found just beneath the bark.

To create a *den tree*, cut off a 4- to 6-inch limb about 6 inches from the trunk, or chop out a section of bark 6 X 6 inches at the base of a suitable wolf tree. These open wounds should allow fungal disease to enter the tree

and start the decay process. A natural cavity will form over the years. Elm, ash, boxelder, maple and basswood are especially prone to form natural cavities.

Since it takes several years for these practices to create suitable nest and den cavities, you may want to build and place nest boxes for birds and mammals until trees become available. Please realize, however, that properly locating and maintaining nest boxes is extremely important. Also, not all cavity nesters will use nest boxes. Chickadees, house wrens, wood ducks, purple martins, and eastern bluebirds readily accept them, whereas woodpeckers prefer to excavate their own nest cavity.

Save Snags When Cutting Timber



If you are managing your woodland for wildlife *and* timber production, consider the following rules of thumb:

- 🪵 Preserve about one to six hard snags per acre and as many soft snags as possible.
- 🪵 For every 20-acre woodlot, leave the following: four to five snags or den trees over 18 inches DBH, 30 to 40 snag or den trees over 14 inches DBH, and 50-60 snags over 6 inches DBH.
- 🪵 Save at least one tree of any size per acre showing potential for den or snag tree development, especially those with broken tops, woodpecker holes or wounds.
- 🪵 Never cut a wolf tree; they make excellent den trees.
- 🪵 Check for wildlife before cutting a tree; avoid cutting inhabited trees.
- 🪵 Leave most snags evenly spaced, though include a few patches where they are clumped together.
- 🪵 Leave fallen snags on the ground to provide food and cover for wildlife.
- 🪵 Cut green, rather than dead wood for firewood and cure for several years.

Management Techniques in Review

When managing your land for dead wood, keep in mind the following rules of thumb:

🪵 The Critter's Criteria:

Size: Bigger snags can accommodate more wildlife.

Style: Maintain hard and soft snags.

Location: Location often determines what wildlife will use it.
Where you live in the state is also important.



Management:

Always plan for future snag and den trees.

Girdle diseased or deformed trees to create snags and

Manage for snags when timber cutting



Notes





Wildlife and Your Land Staff: Mary K. Judd, Project Director; Diane Schwartz, Project Assistant; Todd Peterson, Agricultural and Rural Land Use Specialist. Graphics and layout, Kandis Elliot. Funding for this project was provided in part through the Federal Aid in Wildlife Restoration Act and through the Natural Resources Foundation of Wisconsin, Inc., P.O. Box 129, Madison, WI, 53701. Published by the Bureau of Wildlife Management, Wisconsin Department of Natural Resources, P.O. Box 7921, Madison, WI, 53707.



PUBL-WM-222

Potential Funders for High Priority Projects at the Neversink Mountain Preserve

POTENTIAL FUNDER	PROGRAM
PA Department of Conservation and Natural Resources (DCNR) <i>Contact:</i> Dennis DeMara 610-377-5780 ddemara@pa.gov	<i>Schuylkill Highlands Conservation Landscape Initiative Mini-Grant Program</i>
	<i>Community Conservation Partnership Program</i>
	<i>PA Recreational Trails Program</i>
PA Department of Environmental Protection (DEP) <i>Contact:</i> Reading District Office 1005 Crossroads Boulevard Reading, PA 19605 610-916-0100	<i>Environmental Education Grants Program</i>
	<i>Growing Greener Watershed Grants</i>
	<i>Nonpoint Source Implementation Program (Section 319)</i>
Natural Resources Conservation Service (NRCS) <i>Contact:</i> Berks County Ag Center 1238 County Welfare Road Leesport, PA 19533 610-372-4655 ext. 3	<i>Wildlife Habitat Incentives Program (WHIP)</i>
	<i>Environmental Quality Incentives Program (EQIP)</i>
	<i>Conservation Stewardship Program (CSP)</i>
PA Department of Community and Economic Development (DCED) <i>Contact:</i> Hon. David R. Kessler 2 School Drive Oley, PA 19547 610-987-0980 Sen. John C. Rafferty, Jr. 3770 Ridge Pike Collegeville, PA 19426 610-831-8830	<i>Community Development Grants</i>
National Park Service and PA DCNR <i>Contact:</i> Schuylkill River Heritage Area 140 College Drive Pottstown, PA 19464 484-945-0200	<i>Schuylkill River National and State Heritage Area Grant Program</i>
Berks County Community Foundation <i>County:</i> Richard Mappin P.O. Box 212 501 Washington Street, Suite 801 Reading, PA 19603 610-685-2223	<i>The Conservation Equity Funds</i>
Pottstown Health and Wellness Foundation <i>Contact:</i> 152 East High Street, Suite 500 Pottstown, PA 19464 610-323-2006	
Wyomissing Foundation <i>Contact:</i> 960 Old Mill Road Wyomissing, PA 19610 610-376-7494	
Local Corporations	<i>Corporate Charitable Giving Programs</i>
	<i>Employee Volunteer Programs</i>

Invasive Vegetation Management

excerpted from

Stewardship Handbook for Natural Lands in Southeastern Pennsylvania

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Natural Lands Trust

October 2008