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Snags for Wildlife

James R. Kitts
extension specialist, Wildlife

Introduction

Minnesota has a wide variety of plants and animals (flora and fauna). This provides the resources which attract all ages to participate in outdoor recreation activities. Bird watching (birding) is one of the most popular activities. Young and old enjoy identifying birds or watching them build a nest and raise their young.

In Minnesota, 43 species of birds (table 1) and at least 25 species of mammals (table 2) use cavities in trees as nest or den sites. Of the birds, 21 species prefer to make cavities themselves (primary excavators) or have such specific requirements that they only nest in natural cavities. Removal of dead and dying trees, called snags, means loss of these nesting sites. Secondary excavators sublet: are willing to use homes in snags abandoned by another animal.

Continued high demand for forest products such as lumber and firewood may prove a serious threat to the survival of cavity nesting birds and mammals unless their requirements are considered a part of forest management plans. For those 21 species of birds, snags represent the sole source for present and future nest sites. There is no way humans can replace the lost snag with a manufactured substitute.

Table 1. Snag nesting species in Minnesota

Species	Excavators	
	Primary	Secondary
Wood duck		X
Goldeneye		X
Bufflehead		X
Hooded merganser		X
Common merganser		X
Red-breasted merganser		X
Turkey vulture		X
Merlin (pigeon hawk)		X
Am. kestrel (sparrow hawk)		X
Peregrine falcon		X
Barn owl		X
Hawk owl		X
Screech owl		X
Barred owl		X
Long-eared owl		X
Saw-whet owl		X
Chimney swift		X
Common flicker	X	
Pileated woodpecker	X	
Red-bellied woodpecker	X	
Red-headed woodpecker	X	
Yellow-bellied sapsucker	X	
Hairy woodpecker	X	
Downy woodpecker	X	
Black-backed three-toed woodpecker	X	
Northern three toed woodpecker	X	
Great creasted flycatcher		X
Tree swallow		X
Purple martin		X
Black-capped chickadee	X	
Boreal chickadee	X	
Tufted titmouse		X
White-breasted nuthatch		X
Red-breasted nuthatch	X	
Brown creeper	(occasionally)	X
House wren		X
Winter wren		X
Bewick's wren		X
Carolina wren		X
Easter bluebird		X
Starling		X
Prothonotory warbler		X
House sparrow		X
	12	31
Total species		43

Table 2. Minnesota mammals which use snags

Animals	Importance of snags to animals		
	High	Medium	Low
Squirrels			
Fox	X		
Gray	X		
Red	X		
Northern flying	X		
Southern flying	X		
Bats			
Little brown		X	
Big brown		X	
Pipistrelle		X	
Silver-haired	X		
Red	X		
Hoary	X		
Others			
Porcupine	X		
Raccoon	X		
Opossum		X	
Long-tailed weasel		X	
Ermine		X	
Short-tailed shrew			X
Masked shrew			X
Artic shrew			X
Least shrew			X
Deer mouse		X	
White-footed mouse		X	
Pine martin	X		
Fisher	X		
Least chipmunk	X		
Eastern chipmunk	X		

Snag Types

In this publication, a snag is any dead, partially dead or dying tree with a minimum diameter at breast height (d.b.h.) of 4 inches and a minimum height of 6 feet. This is considered the smallest snag birds use for nesting.

Will any snag do? No, each wildlife species has specific, characteristic habitat requirements. Sometimes these are quite flexible, at other times the requirements are very rigid.

Snags are classified as either hard or soft. Hard snags have some value as marketable wood. Soft snags are in advanced stages of decay and have no commercial value. Both classes of snags are valuable to wildlife. Some birds, such as chickadees, bluebirds, and nuthatches excavate nest cavities in soft snags. Others, primarily the woodpeckers, excavate cavities only in hard snags.

Forest Insect Control

It has not been conclusively established that insectiverous (insect-eating) birds are a major factor in the *suppression* of insect epidemics. There is, however, ample evidence establishing birds as major elements in *preventing* forest insect epidemics. This role is emphasized in northern latitudes during winter as the birds feed on overwintering adult and larval insects.

Birds should not be considered complete answers to insect outbreaks, but they are important components in a natural regulation system. In some European forests, insectiverous

birds are considered so important that forest managers have placed as many as 400,000 nest boxes in an area of 345,947 acres.

Wildlife Use of Snags

Three conditions influence snag use by wildlife: the class of the snag—hard or soft, the surrounding plant community, and the size of the snag.

The types of snags change year by year. Hard snags eventually become soft. The speed of this process depends on such factors as, tree species, cause of death, tree condition at death, location, site conditions, and the types of decay organisms present. However, every stage in the process has value to some species of wildlife and a variety of dead and dying trees is needed to maintain a variety of wildlife.

Stages of the surrounding plant community influence snag use. Snags in open areas will be used by species of wildlife characteristic of open areas. Bluebirds and house wrens would use cavities in soft snags located in meadows or along woodlot edges; while chickadees and nuthatches would use soft snags in heavily wooded areas. Snags should be considered necessary in all stages of forest land management.

Each species of cavity-dependent wildlife has distinct requirements for the diameter and height of snags in which to build a nest or den. Physical size of the bird or animal determines the minimum snag diameter needed. For birds, snag height requirements are often related to feeding or perching habits.

Meeting Snag Requirements

Woodlot and forest managers might wish to remember: the same snag can be used by several species, birds of the same species will not usually excavate twice in the same snag, and large snags can substitute for small snags but not the other way around. There are a number of techniques which may be used to produce snags.

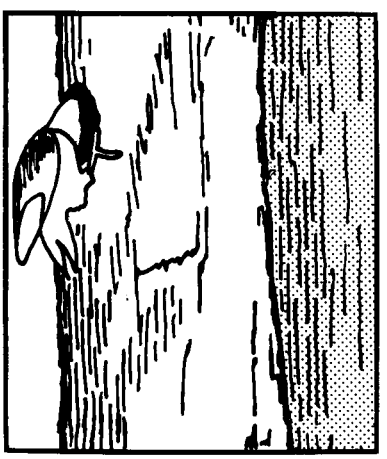
Long rotation periods for stands or individual trees provide snags naturally. Selective killing of trees by girdling or silvicides, rather than tree removal during stand thinnings, is an intensive practice for controlling the type and size of snags produced. Keeping existing snags during timber harvesting or thinnings is also a simple effective way of maintaining this resource.

This dead tree has excavations made by the pileated woodpecker.

Presence of soft snags is critical for the majority of snag-dependent wildlife. In intensively managed forests these snags are rare because they develop from hard snags which seldom are left standing long enough to soften.

All soft snags should be retained unless they present distinct fire or safety hazards. Normally, they are not fire hazards since the tops are broken off and do not attract lightning. They have no commercial value and rarely serve any forestry purpose such as wood production, beauty, wind or sun shelter, sound barrier, etc. If hard snag requirements for woodpeckers are met and all soft snags are retained, the requirements for all snag-dependent wildlife will be met.

It is really just guessing to suggest the minimum number of snags required per unit area; rather, this must be considered on a community basis. In many instances, there is insufficient data on key wildlife species to calculate these figures. Tables 3 and 4 contain hard snag requirements for several woodpeckers in various plant communities; these should be used as guides until data specific to Minnesota plant communities are available.



Most woodpeckers prefer to make their own excavations.

Table 3. Hard snag requirements for selected woodpecker species (adapted from Appendix 22 Agriculture Handbook No. 553,USFS, 1979)

Cavity dependent species	minimum snag d.b.h. (inches)	Snags required per 100 acres at selected population management levels				
		100%	70%	50%	30%	10%
Mixed conifer						
Pileated woodpecker	⩾ 20	14	9	7	4	1
Common flicker	⩾ 12	38	26	19	11	4
*Black-backed, three-toed woodpecker	⩾ 12	59	41	29	18	6
Hairy woodpecker	⩾ 10	180	126	90	54	18
Quaking aspen						
Common flicker	⩾ 12	38	26	19	11	4
Yellow-bellied sapsucker	⩾ 10	150	105	75	45	15
Downy woodpecker	⩾ 6	300	210	150	90	30

*Northern three-toed woodpecker has identical requirements for snags at these management levels.

Table 4. Generalized hard snag requirement for woodpeckers in mixed conifer and quaking aspen plant communities

Minimum snag d.b.h. (inches)	Snag required per 100 acres at selected population Management levels				
	100%	70%	50%	30%	10%
Mixed conifer					
⩾ 20	14	9	7	4	1
⩾ 12	45	32	22	14	5
⩾ 10	121	85	61	36	12
Total	180	126	90	54	18
Quaking aspen					
⩾ 12	38	26	19	11	4
⩾ 10	112	79	56	34	11
⩾ 6	150	105	75	45	15
Total	300	210	150	90	30

Management Recommendations

Although the specific requirement for each species of cavity-dependent wildlife is not known, a useful list of general management practices follows. It is reproduced from a report prepared by Evans and Conner (1979).

- Manage for maximum feasible rotation age.
- Consider old growth a high priority. Select stands for deferred cutting as early as possible—20 years is optimum.
- Leave a 0.1 hectare (ha), about ¼ acre, clump permanently uncut in each 2 ha of regeneration cut.
- Discontinue removal of dead, dying, and decayed trees for use as materials or firewood in areas where nest cavity sites are limited.
- Consider management techniques such as providing artificial nest boxes and boring holes in suitably sized trees when cavity availability is limited.
- Consider leaving permanent uncut buffer strips on both sides of streams.
- Consider leaving shelterbelts or reestablishing them where they have been removed. This is especially needed in agricultural areas where woodlots (shelterbelts) are widely separated.

Additional References

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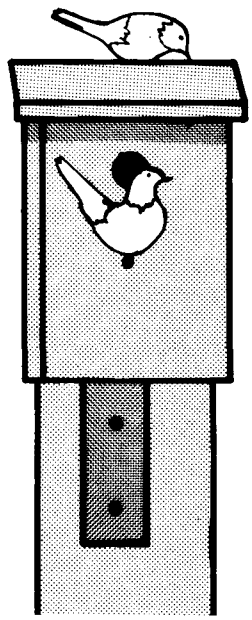

Nest boxes can be a replacement for snags. These house wrens like them.

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editor . . . . . Mary K. O'Hearn
designer/illustrator . . . . . Kelly Conner