APPENDIX C

Creating Snags for Wildlife

by

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This stand received a Crop Tree Management prescription that included wildlife considerations. Snags were created to provide suitable habitat for such species as woodpeckers.

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When doing Crop Tree Management for landowners with a wildlife objective, give some thought to developing some standing, dead, woody habitat. Because standing, dead trees (commonly referred to as "snags") provide excellent habitat for insects, they serve as an important food source for those wildlife species that feed on insects. They may also be a source of shelter, although it is important to remember that cavities in snags are usually not an adequate substitute for cavities in live trees. Some wildlife species use cavities in dead trees; others use cavities in live trees.

This tree was girdled several years ago to release adjoining trees. The life within it now is a family of pileated woodpeckers.

Girdling is perhaps the best way to create good snags for wildlife. However, this can be a tricky process. For years, foresters have been frustrated trying to kill trees by girdling. Tree death by girdling often takes longer than we like to wait, and if done improperly, it may not happen at all. I've found double-chainsaw girdling (two complete bands cut well through the bark and one inch into the wood) to be fairly effective. ***Caution: Cutting more than one inch deep may result in the tree blowing down during wind storms.***

When applying a crown-touching release to selected crop trees, there are four primary considerations in deciding which competing trees to girdle and which ones to fell:

1. Size of Tree - Generally, large trees are more desirable than small ones for use as standing, dead, woody habitat. They usually stand longer and can support larger cavities necessary for some species. Depending on the wildlife species being managed, tall snags may or may not be desirable.

2. Resistance to Death by Girdling - Some trees die fairly quickly after girdling, while others may literally live for years. This resistance to death by girdling varies by species, by individual tree, and, at least for some species, by season when the girdling is done. The ring-porous and semi-ring-porous species transport water from the roots to the crown in the outer ring(s), just inside the cambium. It makes sense that these trees could be killed easily by girdling with a chainsaw. My application of this theory has given me mixed results regarding how quickly the ring-porous and semi-ring-porous species have died.

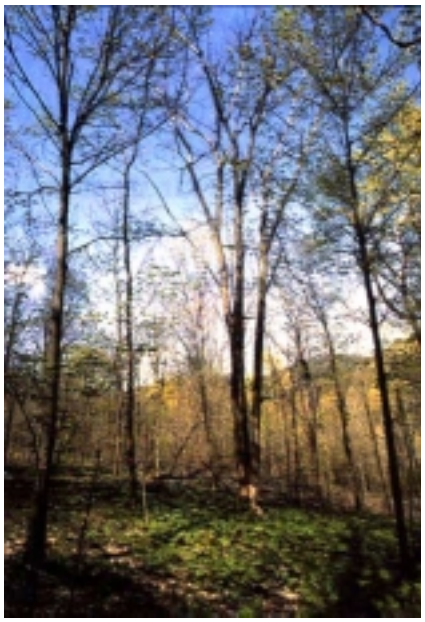
The following description of my experience with girdling is not based on any scientific experiment; it is based on my observations.

I have girdled elm, ash, and black cherry in southwestern Pennsylvania. Double-chainsaw girdling elm and white ash usually results in a quick kill (within two months) if the girdling is done during the growing season (especially from mid-July to mid-September). Generally, trees girdled during the dormant season not only leaf out in the spring, but continue to live for some time (often about two growing seasons). Results with black cherry are more varied. Some trees girdled during the growing season die quickly; others don't.

I have very limited experience girdling oak. The red oaks I've girdled during the growing season died quickly. This is consistent with published information which indicates that red oak transports water in the outer growth ring only. White oak and black oak did not die as quickly.

It may take several years for a diffuse-porous tree to succumb to the effects of girdling. Unlike ring-porous and semi-ring-porous trees, the diffuse-porous species transport water through a greater number of growth rings. Therefore, a quick kill would require such a deep cut into the tree that, in most cases, it is not feasible. Girdling deep enough to sever many growth rings usually results in an unstable tree that will not stand long. Therefore, diffuse-porous species should generally be considered as snag recruits only when it is acceptable to have trees that die over a period of years.

A girdled, diffuse-porous tree usually doesn't die until the roots expire from the interruption of the food supply, which is normally transported from the crown to the roots. This starvation of the roots may take a long time, especially if the tree is in good condition prior to girdling. Ring-porous and semi-ring-porous trees may die quickly if girdled during the growing season because the water supply to the crown is severed. Following is a list of Eastern trees categorized by porosity:



The elms in the center of this photograph were double-chainsaw girdled in August. They died within two weeks, and by the following spring, they were no longer competing with adjacent crop trees. Instead, they became a source of standing, dead, woody habitat.

Ring-Porous		Diffuse-Porous	
Black Cherry*	Elm	Maples	Holly
Black Walnut*	Ash	Beech	Hophornbeam
Butternut*	Oak	Yellow-Poplar	Hornbeam
Black Locust	Hickory	Birch	Sourwood
Honeylocust	Catalpa	Blackgum	Dogwood
Sassafras	Chestnut	Sycamore	Sweetgum
Hackberry	Coffeetree	Basswood	Cucumber
Red Mulberry	Persimmon*	Cottonwood	Aspen
Osage-Orange		Buckeye	Pines
		Spruces & Firs	Hemlock

* ***These species are semi-ring-porous. Bitternut Hickory is also semi-ring-porous, but the other hickories are ring-porous.***

A means of stretching out the availability of snags after a treatment is to girdle some trees in the ring-porous category between mid-July and mid-September, hoping for a quick kill. At the same time, girdle some trees in the diffuse-porous category, since they are likely to take quite some time to die. Similarly, another death-delaying tactic for the ring- and semi-ring-porous species is to girdle during the dormant season rather than the growing season.

3. Snag Durability - Some trees are more resistant to decay; consequently, they will provide standing, dead, woody habitat for a longer period of time. The following list categorizes trees according to their decay resistance:

RESISTANCE TO DECAY				
EXTREMELY RESISTANT	**RESISTANT**	**MODERATELY RESISTANT**	**NON-RESISTANT**	
Black Locust	E. Redcedar	Honeylocust	Willows	Ash
Red Mulberry	Junipers	E. White Pine	Aspen	Birch
	Chestnut		Cottonwood	Beech
	Osage-Orange		Basswood	Maple
	Catalpa		Buckeye	Hickory
	Sassafras		Butternut	N. Red Oak
	Black Cherry		Cucumbertree	Black Oak
	Black Walnut		Yellow-Poplar	Hemlock
	White Oak		Sweetgum	Spruce & Fir
	Chestnut Oak		Elm	Other Pines
			Hackberry	

If it is desirable to have snags in various stages of decay over a period of time, it may be advantageous to select potential snags from more than one category. Trees killed in the non-resistant category will provide punky wood relatively soon, and about the time they are falling down, trees in the resistant category will just be getting punky.

Another factor affecting snag durability is the degree of lean of the tree. Trees that lean significantly are less likely to stand for a long period of time.

4. Potential Forest Pest Influences - Creating snags to benefit wildlife may have some health implications for the crop trees remaining in the stand. For example, black cherry is resistant to decay, which makes it a desirable choice for a relatively long-term snag. However, girdling black cherry trees may provide conditions for a build-up of bark beetles. These pests cause gum spots, a serious degrade in black cherry.

There may be a necessary trade-off between providing standing, dead, woody habitat for wildlife and some loss of timber value in residual crop trees caused by gum spots. This value loss may be mitigated by killing the selected trees between July and January. This way, the dying trees do not create favorable habitat for bark beetles. However, it is particularly difficult to time the deadening of black cherry so that death will reliably occur between July and January.

Making Snag Selection Decisions

Following are steps that can help in making good choices for selection of trees to convert to snags:

1. Interview the landowner to be sure that your client's stand-specific wildlife management objectives can be accomplished by creating snags. For example, is the landowner interested in providing habitat for pileated woodpeckers?

2. Inventory the stand. Determine the species composition, size (dbh and height), and number of trees per acre that need to be cut or deadened to release the crop trees.

3. Analyze the size and species of potential snags, and evaluate how selection of a combination of species and/or season of treatment could be used to spread out the availability of standing, dead, woody habitat. Keep in mind, if there are many snags remaining in the stand at the time of the next management activity, they could pose a hazard to the people doing that work.

4. Consult with a wildlife biologist to determine the size class and number of snags needed to accomplish species-specific wildlife management objectives. Compare these needs with the inventory to see how they match up.

This black cherry was girdled to release the sugar maple crop tree. Snag selection decisions may affect future insect populations, which can be detrimental to other trees.

5. Evaluate the potential negative effects of creating snags in any particular species. For example, will creation of snags of any species cause forest health problems? Or, will delayed death of competing trees cause undue loss of growth or health risk for the crop trees? Consultation with an entomologist or a pathologist may be needed.

6. Select the species and size mix of snags that will best meet the wildlife management objective for the stand without jeopardizing the other stand-specific objectives. Select individual trees that lend themselves well to girdling. For instance, choose trees without seams or other indications of ingrown bark that could prevent a complete girdle of the tree.

Snags not only provide habitat for some species of wildlife, but when seen in the right light, they may also be aesthetically attractive.

Girdling trees can be a good way to create standing, dead, woody habitat needed to accomplish stand-specific wildlife management objectives. Using the preceding information, you can make informed choices regarding which trees to girdle and when to girdle them. This can enhance your ability to maximize benefits produced by minimizing the conflict between stand-specific objectives.