Chapter 7. Managing Abandoned Orchards and Apple Trees for Wildlife

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Apple trees provide a valuable source of food, cover, and nesting sites for wildlife and old, abandoned apple orchards with thick herbaceous growth, shrubs, and small trees provide extremely important habitat to a myriad of species that require early-successional habitat (Table 1). With this in mind, it comes as a surprise to most landowners that the apple tree is not native to the United States. The tree originated in Asia, where it has grown since the late Stone Age. John Endicott, one of the early governors of the Massachusetts Bay Colony, is said to have brought the first trees to America from England in 1629. From the early plantings by colonists of seedlings and grafted trees in the eastern United States, apple trees rapidly spread to the western U.S. Native Americans, traders and missionaries carried seeds beyond established European settlements. The most famous of apple tree distributors was a missionary named John Chapman, who became known as Johnny Appleseed.

Value of apple trees and orchards to wildlife

Apples are the most widely grown and valuable fruit to people, and they are also highly valuable to wildlife, especially in the Northeast. The bark, buds, twigs, leaves, and fruit are used by a variety of wildlife. For example, porcupines, beavers, mice, cottontail rabbits and deer consume the bark; grouse and deer consume the buds; and beaver, deer, snowshoe hares and cottontail rabbits eat the twigs and leaves. Deer, turkeys, fox, fishers, porcupines, bobcats, coyotes, red squirrels, and black bears have all been known to eat the fruit.

Figure 1. Species such as Baltimore orioles benefit from apple orchards. Photo by Paul Fusco.

Apple trees provide a year-round food source in one form or another, but they are particularly important in the winter when many uneaten apples remain hanging on trees. These apples are readily eaten after other fruits have dropped off and rotted or have disappeared under the snow. Wildlife become familiar with apple tree locations and seek them out for food.

Apple trees provide perching and nesting sites for songbirds like orchard orioles, eastern kingbirds, eastern wood peewees, and least flycatchers. Old apple trees often have cavities that are used by eastern bluebirds,

black-capped chickadees, and white-breasted nuthatches for nesting. Unmaintained apple trees will have many dead branches and stubs, providing insects for woodpeckers, chickadees, and flickers.

While a lone apple tree here or there can provide an attractive source of food for wildlife, old, abandoned apple orchards are a great source of early-successional habitat. "Old, abandoned orchards" are those that are no longer being commercially grown or maintained for human consumption. These abandoned orchards may range from open in character with herbaceous ground cover under mature apple trees, to clumps of shrubs and small stands of seedling/sapling trees interspersed with herbaceous ground cover and apple trees. More successionally advanced abandoned orchards will have mature hardwoods (less typically softwoods) overtopping the apple trees. Which successional stage the abandoned orchard is in depends mainly on when the orchard was last maintained. Only periodic mowing and/or cutting of invading trees will prevent these areas from succeeding to mature forest.

With so many species in the Northeast wholly or partially dependent on early-successional habitat, abandoned orchards can play an extremely important role in providing needed habitat (Table 1). Depending on the successional stage, abandoned orchards can provide appropriate habitat for a variety of wildlife species, with many species overlapping use from one successional stage to the next. "Open" orchards dominated by grass, herbaceous ground cover and widely spaced apple trees create productive conditions for insects that are sought after by turkey and grouse poults. Eastern bluebirds utilize these open conditions for feeding and nest in cavities often found in apple trees. Not surprisingly, orchard orioles prefer orchard areas, but Baltimore orioles also make use of them. These open conditions also provide excellent habitat for eastern peewees, eastern kingbirds, least flycatchers, American robins, garter snakes, eastern hognose snakes, woodchucks, meadow voles, white-footed mice, and many other species.

Abundant small mammal populations found in abandoned orchards attract raptors and owls, which may perch in either apple trees or taller adjacent trees. The prey base also attracts red and gray foxes, eastern coyotes, and weasels. Many bat species found in the Northeast, including little brown myotis, northern long-eared bat, Indiana myotis, silver-haired bat, eastern pipistrelle, big brown bat, red bat, and hoary bat will use orchard areas for feeding or roosting.

Late- or mid-successional stage abandoned orchards that contain apple trees, areas of open herbaceous growth interspersed with clumps of shrubs, and some small trees provide extremely valuable successional habitat for many species due to their structural diversity and diversity of species available for food, cover and nesting. These areas are used by species such as ruffed grouse, American woodcock, indigo bunting, eastern cottontail, New England cottontail, and garter snake. Shrub-dependent wildlife species, including chestnut-sided warblers, blue-winged warblers, prairie warblers, and golden-winged warblers also exploit these overgrown abandoned orchards.

Figure 2. Species such as garter snakes (a) and chestnut-sided warblers (b) make use of late- or mid-successional stage abandoned orchards. Photos by Paul Fusco.

Species wholly or partially dependent on early-successional habitat often use apple orchards through a range of successional conditions. However, once the abandoned orchard is dominated by overtopping trees, use by early-successional species drops off markedly and is replaced by mature forest dependent species (Table 1 in chapter 5).

You may have only a few abandoned apple trees on your property or maybe you are lucky enough to have an old orchard of 1/2 acre or larger. The apple trees on your property may have seeded in naturally, particularly if you have only a scattered few. Larger orchards were likely planted from the early 1920s through the 1950s, when they were popular for home use and as a source of extra income. Apple trees can grow from seed or can be grafted (where a branch or scion is inserted into another stem and continues to grow).

Abandoned apple orchards are disappearing due to forest succession, human development, and a decline in agricultural activity. Few new orchards are being planted today and those that are provide little value to wildlife due to intensive management.

While single apple trees can provide food for a few individuals, an entire abandoned orchard can provide habitat for a variety of species. Abandoned orchards of 1/2 to several acres in size that are managed for wildlife can provide highly desirable early-successional habitat. Larger orchards (greater than 5 acres) are even more valuable for wildlife. Even though many species using abandoned orchards have small home ranges, a greater diversity of species will be supported if the abandoned orchard is larger. A larger area of habitat is also likely to produce more individuals of a species than a smaller area and thus may act as a "source" of individuals to disperse to other habitats.

Reclaiming abandoned apple orchards

Apple trees were originally planted in clearings because they need full sunlight to thrive and produce fruit. As people moved off the land and into cities and suburbs, many orchards were abandoned and were quickly grown over with taller hardwood trees. The remaining apple trees are sometimes called "wild," in various wildlife management publications, because they are no longer being grown for human consumption as part of a maintained orchard.

As the forest grows back around an apple tree, it crowds and shades the tree, causing a decline in vigor and lower fruit productivity. Eventually the tree will die; diminishing its value to wildlife (a dead or dying apple tree still supports insects, provides perching sites and may contain one or more useable cavities). Releasing apple trees is a common technique used to improve their vigor and fruiting capacity. This technique involves cutting the vegetation around the apple tree and allowing full sunlight to reach it, resulting in increased growth and fruit production.

Before the landowner or manager begins work, it should be decided if the orchard will be managed for more open habitat as described previously, or one offering a mosaic of apple trees, shrubs, grass and herbaceous growth. This decision should be based on the landowner's goals and objectives, the species being managed for, how much abandoned orchard habitat is present, its condition, and its placement on the landscape. For example, abandoned orchards being managed for eastern bluebirds, orchard orioles, and woodchucks should contain larger amounts of open grass or herbaceous vegetation and few small trees and shrubs. Abandoned orchards that contain valuable, native food-producing shrubs along with apple trees and herbaceous ground cover should be managed to maintain this shrub component, because shrubs provide valuable food, cover and nesting sites to a variety of species including ruffed grouse, indigo bunting, brown thrasher, blue-winged warbler, golden-winged warbler, New England cottontail, and various insects.

Any overtopping trees that could eventually shade out apple trees must be removed. In cases where there are a few overtopping trees that have outstanding wildlife value, such as a large tree with a well developed cavity, or one draped in grapevines (a good food and cover combination for wildlife) the decision can be made to leave one or two of these trees. Any trees larger than three inches in diameter should also be removed, since it's usually not long before they will compete with and overtop the apple trees. Abandoned orchards with trees and shrubs less than three inches in diameter can be re-cleared using a tractor with a brush hog, ASV® (all season vehicle) or Bobcat® machine with a heavy duty mowing head (or machine with similar

capabilities). Trees between three and nine inches in diameter can be efficiently and effectively cleared using a Brown Brontosaurus (specialized cutting head) mounted on a tracked excavator or rubber-tired machine. Refer to chapter 10 for a more detailed list of mechanical tools used for reclaiming and maintaining early-successional habitats. A qualified chainsaw operator can cut trees of any size, but it is usually most efficient to hand-cut trees too large to be handled by machinery. Of course very small orchard restoration jobs could be accomplished using a chainsaw and brush cutter if necessary. Portions of the orchard dominated by herbaceous plants should also be periodically mowed (using a tractor and brush hog or flail mower) to prevent tree and shrub invasion.

Maintaining the abandoned orchard

If the landowner or land manager desires open orchard habitat, all woody growth and most shrubs should first be removed. To maintain this condition, the entire area should be mowed every two to four years, depending on site conditions. If a slightly more advanced successional habitat is desired, the abandoned orchard area can be mowed every three to seven years, again, depending on site conditions. In some areas, soils, hydrology and existing vegetative conditions allow forests to regenerate more quickly. Abandoned orchards containing a combination of native shrubs, herbaceous growth, and apple trees are desirable to the greatest variety of species.

Herbiciding, while not popular, can be a very safe and effective tool for maintaining abandoned orchards. Spot herbicide applications will help to control undesirable trees and shrubs or invasive exotic plants that can quickly take over an orchard (refer to chapter 10 for more information on using herbicides). If the abandoned orchard area is large enough (more than ten acres) it can be managed to provide both an open condition (dominated by grasses and herbaceous growth) and a mix of shrubs, apple trees, grasses, and herbaceous growth. This is the ideal situation, as it meets the habitat needs of a wide range of wildlife species.

Pruning apple trees

Once the abandoned orchard has been cleared and reclaimed, the apple trees may be pruned. Pruning accomplishes two objectives: it improves tree vigor, and increases fruit production. Allowing more sunlight to reach all parts of the tree and removing dead and dying branches will improve tree health, resulting in increased fruit production. Additionally, removing excess live branches allows the tree to put more of its energy into growing fruit.

Pruning should be accomplished in stages, over a period of three or four years. Try to avoid the tendency to over-prune wild apple trees, which leads to stress and can harm the trees; it is better to under-prune than to over-prune. Following are a few basic steps for properly pruning apple trees:

- Remove dead, diseased and dying wood and low hanging branches, starting from the top of the tree. In the winter, dead wood can be differentiated from live branches by the lack of buds. Make the pruning cut just outside of the thickened live wood formed when the branch died.
- Cut branches that cross or rub on one another, drooping branches and branches with narrow "V" crotches (they are weak and split easily).
- Lower the height of the tree if needed so that it maintains a spherical shape, but do not remove more than five or six feet in any given year.
- Reduce overcrowding of live wood by removing roughly 1/3 of the live growth to open up thick clusters of branches. Thin out branches in all parts of the tree to allow more sunlight to get to the interior of the tree.
- Remove strong upright growing shoots and water sprouts (fast growing unbranching upright shoots) as well as other weak growth. Upright branches do not produce fruit.
- Leave the short spur branches that grow on the sides of larger branches because these are the fruit bearing branches.

- Encourage horizontal branches because they capture more sunlight and tend to bear more fruit. (Branches at a 45-degree or 90-degree angle are the most desirable.)

For more information on pruning apple trees and recommendations on what tools to use, refer to the publications listed at the end of this chapter.

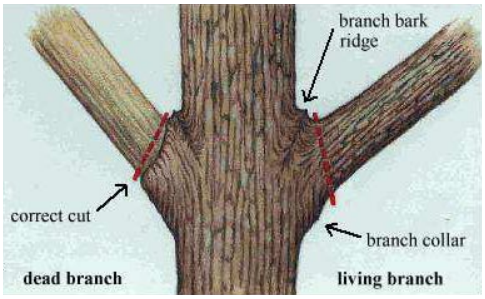

Figure 3. Targeting the cut. Picture courtesy of United States Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry. NA-FR-01-95

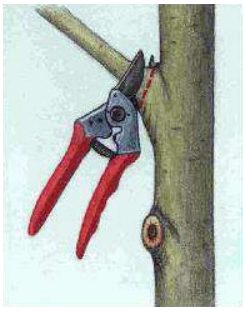

Figure 4. Cutting a small branch. Picture courtesy of United States Department of Agriculture, Forest Service.

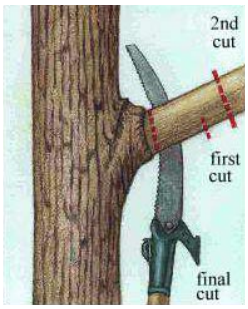

Figure 5. Cutting a large branch. Picture courtesy of United States Department of Agriculture, Forest Service.

When to prune

Pruning should be done in late winter or early spring before the leaves appear. Pruning at this time makes it easier to see the structure of the tree and what cuts are needed. By late winter, the tree is less susceptible to injury because it is fully dormant and able to form a protective barrier behind the cuts prior to spring disease and insect activity.

Brush piling

Branches cut from apple trees along with any other trees cut during the reclamation process can be used to make brush piles. Brush piles provide valuable cover to species such as weasels, rabbits, raccoons, chickadees, winter wrens, and ruffed grouse. Placing the brush over rocks, stumps, or logs produces a better brush pile with more hiding spaces.

Planting apple trees

Landowners and managers can also plant additional apple trees to supplement those already in the orchard, to improve pollination or to increase the amount of available food. Trees that are good apple producers and resistant to disease and insects should be chosen, since you don't want to have to use pesticides on apples

grown for wildlife. When buying trees from state or private nurseries explain that the trees are for use by wildlife so they can suggest the best varieties along with directions regarding planting and maintenance. Crab apples may be a good option; they are a close relative of the apple tree and produce large amounts of small fruit that persist throughout the winter.

All young apple trees must be protected from mice, rabbits and deer in order to become established. The stems should be protected by either a commercially-available plastic tree shelter or 1/4-inch by 1/4-inch mesh hardware cloth encircling the tree. Both will prevent animals from damaging the bark. Without protection, animals will gnaw through the cambium layer (nutrient transporting tissue) causing injury and possibly killing the tree. Plastic shelters have an added benefit of conserving heat and moisture, acting as "mini-greenhouses" and ensuring rapid seedling growth.

Abandoned orchards and apple trees provide food and cover for a plethora of wildlife. However, they must be maintained to keep their wildlife value. By applying the techniques outlined in this chapter, this can be accomplished. It is well worth the effort, as the landowner or land manager will be met with the rewards of numerous hunting and wildlife viewing opportunities, and the knowledge that he/she is contributing to the long-term conservation of numerous wildlife species.

Suggested reading

Bedker, P.J., J.G. O'Brien, M.E. Mielke. Undated. How to prune trees. USDA Forest Service, Northeastern Area State and Private Forestry. NA-FR-01-95. http://www.pueblo.gsa.gov/cic_text/housing/prune/prune.htm

Hill, L. 1979. Pruning simplified. Rodale Press. 208 pp.

Olson, D. and C. Langer. Undated. Care of wild apple trees. USDA Forest Service, Northeastern Area, NA-FB/M-5, Broomall, PA. 4 pp.

Reich, L. 1999. The pruning book. The Taunton Press, Inc., Newtown, CT.

Biography

Judy Wilson is the Private Lands Program Coordinator for the Connecticut DEP Wildlife Division. She earned her a B.S. degree in Wildlife Management from the University of New Hampshire in 1982 and an M.S. in Natural Resource Management specializing in wildlife, from the University of Connecticut in 2004. Judy began her career as the Eastern District Biologist in 1985 and in 1987 went to work as the Western District Biologist before assuming her current position in 2003.

Table 1. Summary of New England wildlife species that may use orchards as preferred or utilized habitat, based on DeGraaf and Yamasaki, 2000 (in conjunction with other habitats and features not listed).

Species	B	BF	W	WF	Species	B	BF	W	WF	Species	B	BF	W	WF
Sharp-shinned hawk		X		X	Black-capped chickadee	X	X		X	Northern long-eared bat		X		
Cooper's hawk		X		X	Tufted titmouse		X		X	Indiana myotis		X		
Northern goshawk		X		X	Red-breasted nuthatch				X	Silver-haired bat		X		
Broad-winged hawk		X			White-breasted nuthatch	X	X	X*	X*	Eastern pipistrelle		X		
American kestrel		X	X	X	Brown creeper				X	Big brown bat		X		
Peregrine falcon		X		X	House wren	X	X			Red bat		X		
Ring-necked pheasant	X	X	X	X	Blue-gray gnatcatcher	X	X			Hoary bat		X		
Ruffed grouse		X		X	Eastern bluebird	X*	X*	X	X	Eastern cottontail	X*	X*		
Wild turkey		X		X	American robin	X	X	X	X	New england cottontail	X	X		
Northern bobwhite	X	X	X	X	Gray catbird	X	X			European hare	X	X	X	X
Mourning dove	X	X		X	Northern mockingbird	X	X	X	X	Woodchuck	X*	X*	X*	
Black-billed cuckoo	X	X			European starling		X		X	Southern flying squirrel	X	X	X	X
Yellow-billed cuckoo	X	X			Bohemian waxwing			X	X	White-footed mouse	X	X	X	X
Barn owl		X		X	Cedar waxwing	X	X	X	X	Meadow vole	X*	X*	X*	X*
Eastern screech owl	X	X	X	X	Yellow warbler	X	X			Woodland vole	X*	X*	X*	X*
Great horned owl		X		X	Black-and-white warbler	X	X			Southern bog lemming	X	X	X	X
Barred owl		X		X	American redstart	X	X			Norway rat	X	X	X	X
Long-eared owl		X		X	American tree sparrow				X	House mouse	X	X	X	X
Northern saw-whet owl			X		Chipping sparrow	X	X			Meadow jumping mouse	X	X	X	
Common nighthawk		X			Field sparrow				X	Porcupine		X	X	X
Whip-poor-will		X			Vesper sparrow	X	X			Coyote		X		X
Chimney swift		X			Song sparrow	X	X	X	X	Red fox		X		X
Ruby-throated hummingbird	X	X			White-throated sparrow				X	Black bear		X*		
Red-headed woodpecker	X	X	X	X	Dark-eyed junco				X	Raccoon		X		
Red-bellied woodpecker			X	X	Northern cardinal		X		X	Long-tailed weasel		X		X
Yellow-bellied sapsucker			X*	X*	Rose-breasted grosbeak	X	X			Striped skunk	X	X		
Downy woodpecker			X	X	Indigo bunting	X	X			Bobcat		X		X
Hairy woodpecker			X	X	Eastern meadowlark			X	X	White-tailed deer		X		X
Northern flicker		X		X	Common grackle		X		X					
Eastern wood-peewee	X	X			Brown-headed cowbird	X	X		X					
Least flycatcher	X	X			Orchard oriole	X*	X*			Species	B	NB		
Eastern phoebe		X			Baltimore oriole	X	X			Eastern american toad		X		
Great crested flycatcher	X	X			Pine grosbeak			X	X	Fowler's toad		X		
Eastern kingbird	X*	X*			Purple finch				X	Wood frog	X	X		
Loggerhead shrike	X	X	X	X	House finch				X	Common snapping turtle	X			
Northern shrike			X	X	Common redpoll			X	X	Spotted turtle	X			
Warbling vireo	X	X			Hoary redpoll			X	X	Wood turtle	X	X		
Red-eyed vireo	X	X			American goldfinch	X	X	X	X	Eastern box turtle	X	X		
Blue jay	X	X	X	X	Evening grosbeak				X	Blanding's turtle		X		
American crow		X		X	Virginia opossum		X			Common musk turtle	X			
Purple martin		X			Masked shrew	X	X	X	X	Northern brown snake	X	X		
Tree swallow		X			Pygmy shrew	X	X	X	X	Common garter snake	X	X		
Northern rough-winged swallow		X			Northern short-tailed shrew	X	X	X	X	Eastern hognose snake	X	X		
Bank swallow		X			Least shrew	X	X	X	X	Northern black racer	X	X		
Cliff swallow		X			Eastern mole	X	X	X	X	Black rat snake	X	X		
Barn swallow		X			Little brown myotis		X			Eastern milk snake	X	X		

Birds and mammals: B=breeding shelter, BF=breeding feeding, W=winter shelter, WF=winter feeding.

Reptiles and amphibians: B=breeding activity, NB=non-breeding activity.

X=utilized habitat, X*=preferred habitat.