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## FORESTRY FOR WILDLIFE HABITAT IMPROVEMENT. Nebraska Cooperative Extension Service EC 81-1747, EC 80-1747

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# FORESTRY FOR WILDLIFE HABITAT IMPROVEMENT

*out of  
front*



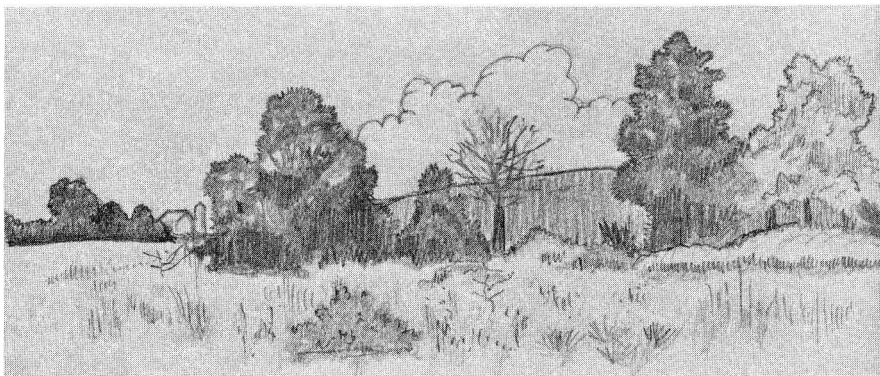
Extension work in "Agriculture, Home Economics and Subjects relating thereto,"  
The Cooperative Extension Service, Institute of Agriculture and Natural  
Resources, University of Nebraska-Lincoln, Cooperating with the  
Counties and the U.S. Department of Agriculture  
Leo E. Lucas, Director

Frank A. Hershey  
and  
Howard L. Wiegers<sup>1/</sup>

## INTRODUCTION

Wildlife cannot exist without food and protective cover. Natural and planted woodlands contribute significantly to these essentials.

This circular describes habitat needs of wildlife, recommends forestry practices for habitat improvement, and gives examples of practices to improve habitat for pheasant, quail, and deer.



Variety, rather than uniformity of vegetation, benefits most wildlife species. Management which results in a diverse plant community with many stages of growth can increase the numbers and species of wildlife. Techniques which create improved conditions for woodland wildlife are fundamentally the same as those designed to grow good timber.

## FOOD

Wildlife must have an adequate food supply. Food supplies should be sufficiently varied to meet the needs of different kinds of wildlife throughout every season of the year. Natural and cultivated trees, shrubs, grasses, grains, legumes and other plants provide this variety of food.

In woodlands and other areas not suitable for agricultural crops, plant and maintain trees, shrubs and other vegetation which will provide fruits and seeds during the winter and early spring when food is often inadequate (see your county Extension agent for NebGuide No. G76-316 "Guide to Clarke-McNary Shrubs").

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<sup>1/</sup> Formerly Forest Resources, Planner, UNL, IANR, Dept. of Forestry, Fisheries and Wildlife (Currently, Resource Forester, Missouri Dept. of Conservation). Extension Wildlife Specialist, Forestry, Fisheries and Wildlife.

## **PROTECTIVE COVER**

Cover is necessary for sustained wildlife production. Cover is essential for escape from predators, successful rearing of young, and protection from severe weather. Woodlands provide excellent cover for many forms of wildlife, especially where the stands are composed of a mixture of tree species of various ages.

Woodland borders are particularly valuable cover. Wildlife make extensive use of the **edge** created where woodlands border pasture, crop lands, or other habitats.

## **WOODLAND SUCCESSION**

Woodlands grow and develop following natural cycles, a process called **succession**. Young woodlands are composed of a large variety of trees, shrubs, grasses, and other plants all competing for the available nutrients, moisture, light, and space. Gradually, trees will shade the understory vegetation. The lush understory of a young forest changes under shaded conditions until shade tolerant plants populate the forest floor. Most species of trees also shade their own lower branches causing the branches to die and prune off naturally.

Mature forests have a dense understory only at their **edges**, or where sunlight can penetrate, such as in small clearings created by the death of old trees. Occasionally, a natural disaster such as fire, insects, disease, or severe weather destroys an area of forest setting back plant succession and creating the opportunity for a new forest to grow.

## **WILDLIFE AND SUCCESSION**

Wildlife are a part of the forest and are closely tied to plant succession. In general, the greatest number and variety of wildlife species are found in young forests; those with a wide variety of trees, shrubs, grasses, and other plants. As the forest matures, vegetation composition and structure changes are accompanied by changes in wildlife populations. Forests approaching natural maturity support increased abundance and variety of birds while many other wildlife species decline.



## MANAGEMENT

Many options are open to a woodland owner. He may manage his woodland to increase value for timber products, improve water quality, provide recreation, enhance wildlife habitat, or increase natural beauty. Fortunately, management for one option frequently benefits others. With a few modifications, forestry techniques designed to grow good timber also will provide wildlife habitat.

### MANAGEMENT FOR TIMBER

Timber Stand Improvement (TSI) denotes management practices that improve vigor, productivity, and quality of stands of trees. When management is aimed solely at increasing the value of wood products, certain types of trees are removed from woodlands to provide opportunity for more desirable trees to grow. Types of trees usually removed are:

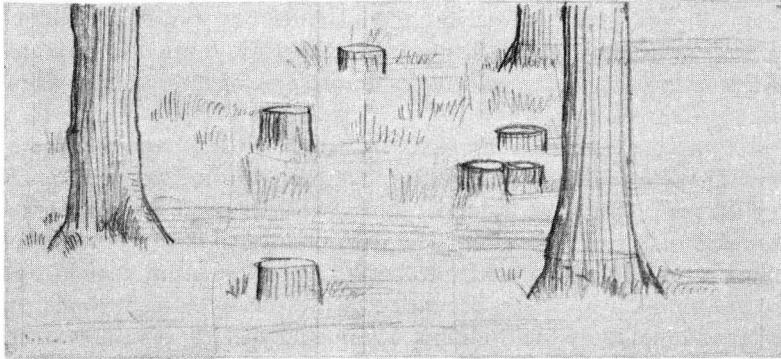
1. Cull (poorly formed) and wolf (wide spreading trees).
2. Inferior tree species (little or no cash value).
3. Trees interfering with the growth and development of selected desirable trees.
4. Damaged trees (broken off, bent over, fire scarred, seriously barked) but expected to live several years.

5. Seriously diseased trees or trees serving as a breeding ground for undesirable insects.

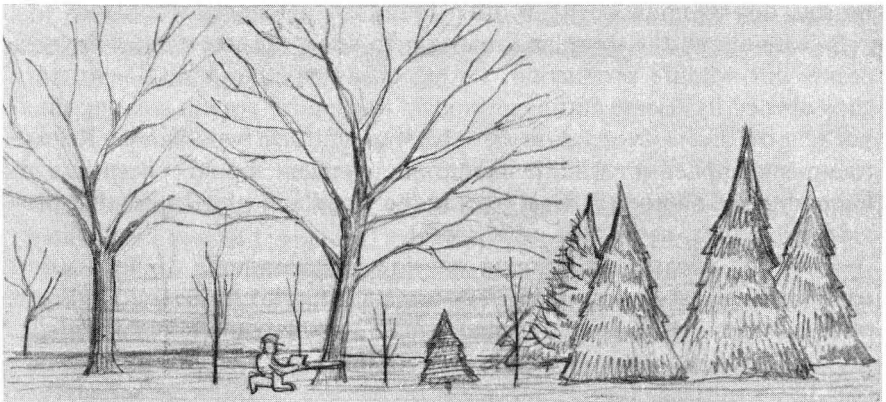
The following practices are among those used in TSI:

Preparing sites for natural reproduction in understocked stands, preparing the site to allow natural seeding or resprouting of desirable species; or underplanting seedling stock to fully use the available growth space. This practice is used in poorly stocked stands or recently harvested stands to fill large openings, increase stand density, improve the species composition and eliminate poor quality or undesired species.

**Thinning** — cutting trees from an immature stand to increase the rate of growth and improve form of the remaining trees.



**Release** — removing or killing undesirable older overtopping trees to encourage fast growth and better quality of vigorous young desirable trees.



**Pruning** — removing lower limbs to produce the maximum clear lumber or veneer in a log. Prune only selected high value hardwood species such as black walnut or black cherry.

**Vine removal** — some vines can girdle and kill trees, cause trees to be deformed or may damage live trees by growing over their branches and robbing them of sunlight.

## TSI FOR WILDLIFE

Where wildlife production has a high priority, some adjustments must be made in the timber-production-oriented TSI practices. Select and retain some trees necessary for den trees or special foods regardless of their commercial value. While some trees are useful to wildlife only and are comparatively valueless for timber, the majority of trees are valuable for both purposes. Examples are oak, black cherry, black walnut, hickory, hackberry, linden, cottonwood and maple.

A woodland should contain at least 15 trees of wildlife value per acre (38 trees per hectare (ha)). Some of these should be hollow den trees. Girdling large cull or wolf trees and leaving them stand intact can help develop den trees. A few hollow logs left scattered on the ground are also desirable.

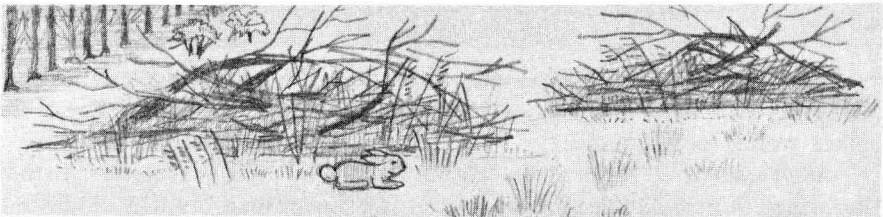
TSI practices especially helpful for improving wildlife habitat are thinning and release.

Thinnings are normally applied to crowded forest stands where the crowns of the trees have grown close together and the trees are competing with each other. Some of the most undesirable trees are removed allowing those remaining to grow faster. The gaps created in the crown canopy by thinning allows more sunlight into the forest. Vegetation growth on the forest floor which normally declines and dies under natural shade conditions, is stimulated by the thinning. Many wild species, especially deer, respond favorably to the increased growth.

Woodlands managed for timber products are thinned frequently to keep the best trees growing rapidly. This frequent thinning maintains the dense, brushy, diverse understory not often found in unmanaged woodlands.

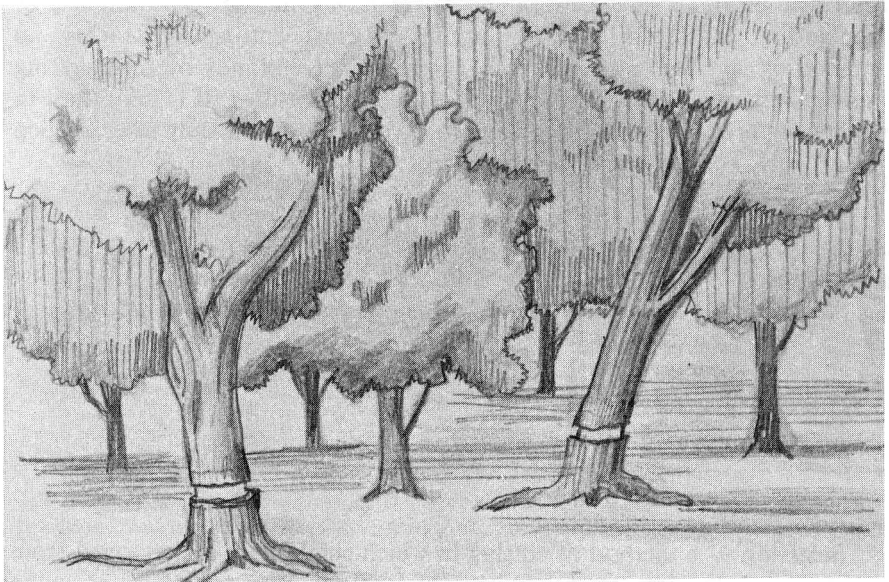
Release allows the woodland manager to select the tree species he most desires for wildlife production, timber production, or both. Temporary gaps opened by release cuttings stimulate understory growth creating small pockets of diverse vegetation in otherwise uniform woodlands. Release treatments applied for wildlife habitat improvement should concentrate on increasing the number of **mast** trees in the woodland (those trees that provide edible nuts, acorns, or other seeds).

Thinning, release and pruning provide large amounts of dead wood useful for habitat improvement. Loosely stacking this dead wood in brush piles provides escape cover for many small animals, especially cottontails.





Girdling undesired trees and leaving them standing is an effective method of thinning or release. Girdling is cutting away the bark and live layers in a band all around the tree trunk. These trees develop into den trees, create nesting sites for cavity nesting birds and provide feeding sites for woodpeckers.



Some vines, such as wild grape, provide food and shelter for many forms of wildlife, especially songbirds. Removing vines from some live trees may be necessary but vines growing on dead trees or those which grow only in the understory need not be removed.

## WOODLAND HARVEST

Harvesting trees for wood products is an important part of wildlife habitat management. Harvests create openings in old forests, set back succession, and provide an opportunity for a young, vigorous forest to develop. If a harvest is carefully planned and carried out, the new forest will provide the variety necessary to support a larger and more diverse wildlife population. An additional benefit to the landowner is gaining income from wildlife habitat areas.

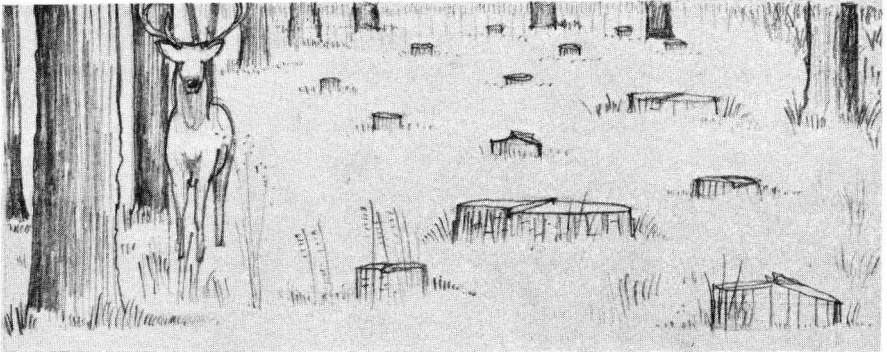
Some types of harvest especially beneficial to wildlife are:

**Shelterwood** — a three-step method of harvesting timber which allows natural reproduction and protection from a seed tree crown cover. Over several years three cuttings are made in the stand to (1) remove undesirable species and dead, dying and defective trees, (2) to open the stand further by



harvesting some large trees to obtain the amount of light on the forest floor that young seedlings need (the best large trees are left to provide seed and shelter for young seedlings) and (3) remove the shelter or seed trees to release the seedlings.

**Small clear cut** — a method of harvest where the stand is removed in one cutting. Clear cut areas can be regenerated by natural reproduction or replanting. Hardwood stands respond to clear cutting by sending up numerous sprouts from live root systems. These stands of regenerating sprouts are excellent wildlife habitat, especially for deer. It is important to apply site preparation TSI practices to a clear cut immediately after logging to properly release young desirable trees.



**Selection** — a method of cutting in which single trees are removed from the woodland as they reach maturity. Natural reproduction occurs as young trees grow up in the small opening created by this removal. Such practice insures that some protective tree cover is always left on the land. This is a favored management system for maintaining a constant and diverse wildlife habitat.

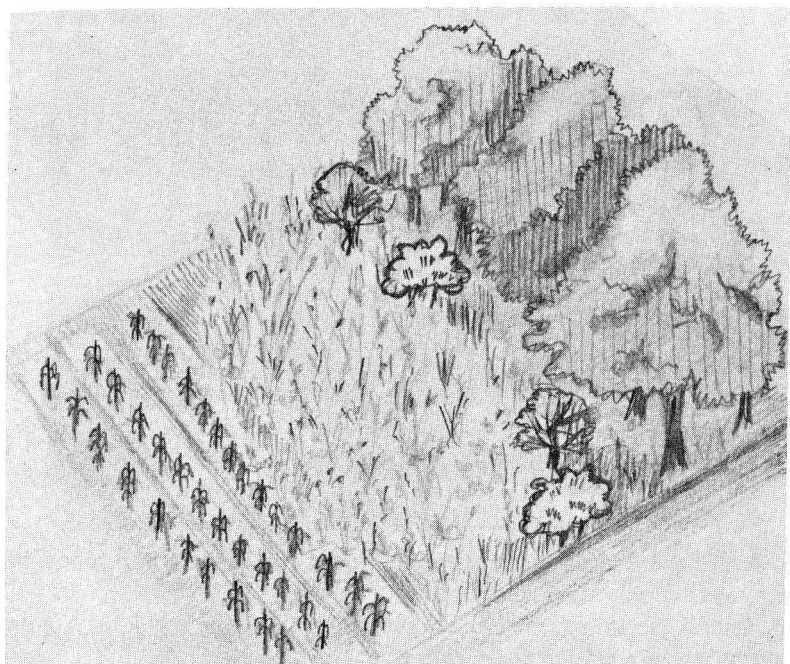
**Small group selection** — similar to the selection method except small groups of mature trees are removed and a larger opening is created.

## GENERAL WOODLAND MANAGEMENT FOR WILDLIFE

The following woodland management practices and considerations will substantially improve habitat quality.

1. Restrict grazing. Grazing is usually detrimental but occasional light grazing may benefit quail when thick cover limits their movements on the ground.

2. Create a buffer or transition zone between timber and adjoining crops or grassland. This should be 20 to 30 feet (6 to 9 m) wide and free of trees and tall shrubs. This allows development of a dense mixture of low growing shrubs, grasses and herbaceous cover such as wildberries, buckbrush, sweet clover, red clover, lespedeza, and cool season grasses.



3. Establish wildlife travel lanes by connecting timber with other habitat types. Utilize, when possible, existing features such as fence rows, waterways, ditch banks, ponds, pits, and shelterbelts so animals can move about in the security of protective cover.

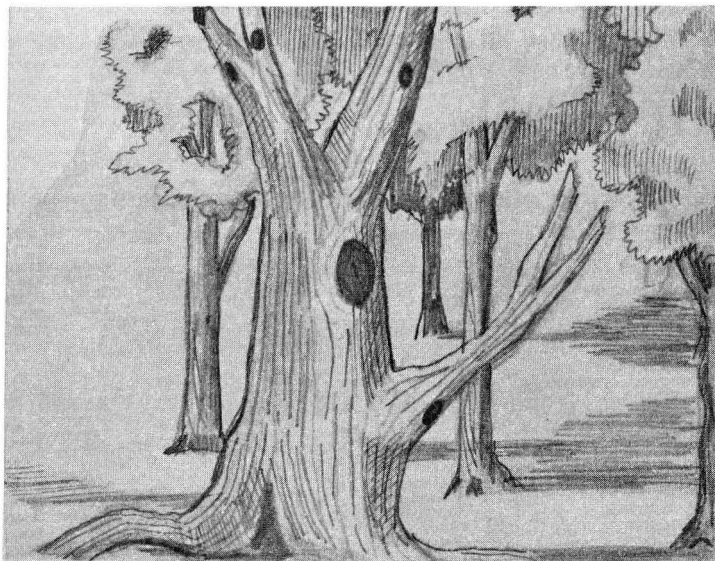
4. Vegetate ditch banks and natural stream banks. This will aid in erosion control and add wildlife shelter. When practical plant a combination of trees, shrubs and other plants. Avoid using one plant exclusively.

5. Introduce or favor mast-producing trees with commercial as well as wildlife value. Mast is a term used to include nuts, seeds and fruits eaten by wildlife. Examples include hackberry, oaks, hickory, ash, black cherry and linden.

6. Leave occasional mast-producing trees and clumps that would normally be removed in timber production operations. Some examples are mulberry, dogwood, wild plum, elderberry, eastern red cedar and hawthorne.

7. Create 1/8 - 1/4 acre (.05 - .1 ha) clearings in uniform timber stands 20 acres (8 ha) or larger. Maintain these openings relatively free of woody vegetation. Odd-shaped clearings are more effective than circles or blocks because they provide more edge.

8. Leave 3 to 4 hollow trees standing per acre (8 to 10 per ha) as den trees and nesting sites.



9. Avoid manicured stream banks. Some fur bearers and wood ducks prefer overhanging trees and shrubs.

10. Avoid disruptive forestry activities from February 1 to August 31 when wildlife are raising their young.



11. Manage and harvest timber by the selection method or in small groups to obtain greater woodland diversity.

12. When possible, create or leave winter food patches in or near woodlands. Favor odd or irregular shaped tracts over block plantings. Several small 1/2 acre (.2 ha) plots or less in size are better than one large plot. Corn or milo left standing is good winter food for many wildlife species.

13. Thin the woodland occasionally to let sunlight through the canopy to maintain plant growth on the forest floor.

14. Plan all management practices to minimize erosion and maintain soil fertility.

## **MANAGEMENT FOR SPECIFIC SPECIES**

Woodlands can be managed for the benefit of one or several favored species of wildlife. The habitat needs of the species desired must be known and habitat management practices applied which favor the species if optimum populations are to be obtained. Management considerations for three popular game species are given as examples.

### **Pheasants**

Pheasants primarily use timber during severe winter weather. Pheasants seldom venture more than a few hundred yards into timber. They use thick, brushy low-growing shrubs for cover along the edge of timber extensively during severe winters. The edge of these areas will sometimes serve for nesting cover.

1. Provide nesting habitat by establishing permanent patches of legume and cool season grasses in strips between woody cover and field crops. Alfalfa, sweet clover, or lespedeza are desirable.

2. Establish small conifer clump plantings on waste areas or near the edges of predominantly hardwood timber stands for severe weather cover. Eastern red cedar is excellent.

3. Convert "waste areas" to trees, shrubs, legumes, or native grasses to increase brooding and rearing habitat. These "islands" of cover can be productive for both game and nongame species.

### **Bobwhite Quail**

Bobwhite Quail requirements include dense, brushy cover. This can often be found in woodland borders but if not present can and should be encouraged. It appears naturally in 5-15 years if hardwood clearcuts are allowed to sprout back after cutting. Quail prefer long, narrow wooded and brushy areas for travel lanes interspersed with crop land for food sources.

1. Maintain occasional thickets of conifers and shrubs that will provide travel lanes.

2. Establish small conifer clumps in waste areas or predominantly hardwood timber stands for severe weather protection. Eastern red cedar is ideal.

3. Manage timber to favor mast-producing trees, especially oaks, ash and hackberry.

4. Plant outer edges of waste areas to permanent native grasses or legumes and the interior to mixtures of herbaceous plants and shrubs. Permit some ragweeds and similar seed-producing wild plants to provide food.

5. Harvest timber using shelterwood, seed tree, small clear cut, or small group selection harvesting methods.

6. When harvesting timber leave one or two good mast-producing trees per acre (13 trees per ha). These should be left near the edge of the harvested area to make food more accessible.

### **White-tailed Deer**

Deer prefer cutover timber tracts that are returning to trees but are still in the early brush and sprout stages. During winter, deer browse on the tips of hardwood trees and shrubs. As timber matures, less browse is available and quality of deer habitat declines.

1. Manage to favor mast-producing trees, especially oaks. Deer eat acorns when available.

2. Create permanent clearings in uniform timber stands, 1/4 to 1/2 acre (.1 to .2 ha) for every 20 acres (8 ha) of timber.

3. Thin pole-sized trees in larger timber stands at regular intervals to maintain shrubs and other browse plants on the forest floor.

4. Harvest small areas of larger woodlands periodically so that some portion of the woodland is always in a brushy regrowth stage.

### **PROFESSIONAL ASSISTANCE**

Professional help is available through foresters and wildlife specialists from the Institute of Agriculture and Natural Resources, and the Nebraska State Forest Service. Help ranges from advice and technical assistance, to management plans. The service is available to everyone and may be obtained by contacting a County Extension Agent.

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