



# Managing Iowa Habitats:

## Restoring Iowa Woodlands

### Introduction

When asked about Iowa's native landscape, most people think of prairie. Covering about 30 million acres of the state, the prairie was indeed a significant piece of Iowa's natural history.

What fewer people know is that Iowa forests were and are important, as well. Prior to Euro-American settlement, about 7 million acres of Iowa's land was forested. Today, about 2 million acres of timbered lands remain. Of this, 95 percent is privately owned.

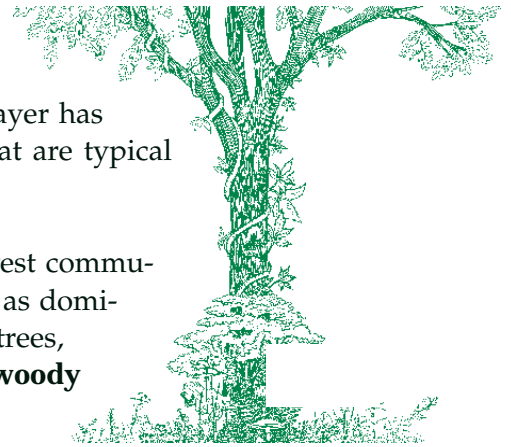
A growing interest in this natural community is the result of increasing awareness and understanding of the value of woodlands for wildlife habitat, watershed protection, energy conservation, timber production, and natural beauty. Fortunately, landowners understand it is possible to manage woodlands for more than just one reason. This publication is to assist landowners interested in the restoration and management of Iowa woodlands for wildlife.

### Defining a woodland community

Proper woodland management begins with a general understanding of woodland ecology. Because they are very different habitats, interrelationships found within a woodland community are different than those associated with prairies or wetlands.

A woodland community includes a variety of interacting plants and animals adapted to the often cool, moist conditions of a shaded environment. Woodlands can be divided into several layers of vegetation. Each layer has different plants that are typical of it.

The layers in a forest community are separated as dominant or **overstory** trees, **understory** trees, **woody vines, shrubs**, and **herbaceous** (non-woody) ground plants. Examples of plants in each layer include oak, iron-



wood, Virginia creeper, dogwood, and mayapple, respectively.

In addition to the different plants, each layer has different animal associations. Woodlands in the central hardwood region (in which Iowa falls) provide food, water, and shelter to an incredibly diverse array of wildlife. Woodcocks, warblers, and woodchucks. Flying squirrels, fox snakes and frogs. All wildlife play important roles in a woodland community and influence productivity.

## Types of woodland communities

Just as there are many different plant and animal species within a forest community, there are several different types of woodland communities in Iowa.

Soil type and topography influence the type of plants growing in a given area because of their effect on moisture, nutrients, exposure, and temperature. Many

species often have similar environmental requirements and may group together, forming a sort of vegetative alliance, according to site conditions. There are five common forest communities in Iowa.

### *Oak-Hickory*

The oak-hickory forest community is found on dry upland, or southwest facing slopes. Although the overstory trees are predominately oaks, others are often associated with this community. In addition to common canopy trees, there are characteristic understory trees and shrubs. Herbaceous plants include mayapple, bloodroot and several types of sedges.

### *Oak-Maple-Basswood community*

This community occurs in moist, well-drained uplands, particularly on north- and east-facing slopes, and on the upper hillsides of large riparian valleys. Herbaceous plants include hepatica, ginger, and sweet cicely.

## Benefits of woodland restoration

### *Environmental quality*

Woodland restorations have the potential to protect or improve environmental quality by limiting soil erosion and protecting watersheds. Woodlands reduce run-off by intercepting and softening the impact of falling rain. In addition, the root systems stabilize soils. Riparian (streamside) woodlands protect rivers and streams by absorbing excess nutrients in run-off, thereby reducing pollution in the stream, and cooling water temperatures.

### *Wildlife habitat*

Woody plants are important to wildlife as den or nest sites, as well as valuable food sources. Den species include sycamore, silver maple, cottonwood, and basswood. Important food species include oaks, red cedar, chokecherry, and dogwoods.

### *Economic*

Woodlands maintained as natural areas have economic potential in the production of maple syrup, fuel wood, and timber. Iowa timber production is valued worldwide for its high quality oak and black walnut.

### *Bottomland Hardwoods community*

The bottomland-hardwoods community occurs on floodplains and low-lying terraces in large stream valleys. Herbaceous plants include several types of buttercups and nettles, as well as jewelweed and Virginia waterleaf.

### *Riparian community*

The riparian forest association forms slender corridors along lakeshores, stream banks, and sandbars. It includes several varieties of neighboring bottomland tree and herbaceous plant communities.

### *Northern conifer-hardwoods community*

The northern conifer-hardwood forest type is limited to the steep, moist, north-facing slopes of northeastern Iowa. Herbaceous plants commonly found in this community include twinflower, bunchberry, and big-leaved aster.

## **General guidelines for woodland management**

The primary management goal of any woodland restoration should include providing suitable habitat for the re-establishment of overstory, understory, and non-woody plants. As with any restoration work, start by defining management goals and objectives, and developing a specific plan.

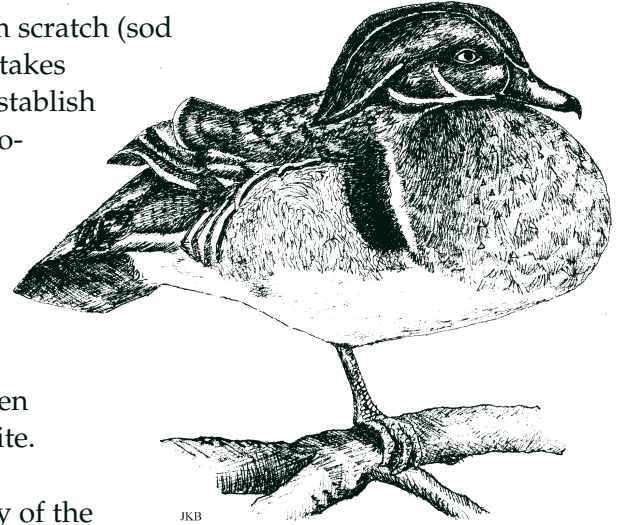
The age of the woodland or its location relative to water, or other forested tracts of land may limit management goals or objectives. For example, young or newly planted woodlands simply will not attract or support a specialist species like the wood duck. Wood ducks generally nest in cavity-filled trees, preferring those at least 15 inches in diameter and located within one-half mile of water.

Site and species selection, site preparation, planting methods, and plant or seedling

sources need careful consideration during the planning phase.

### *Site selection*

Woodland restoration is most suitable on once-forested sites. Starting from scratch (sod or bare soil) takes decades to establish all the components of a woodland community. There are several factors to consider when choosing a site.



An inventory of the existing plant community provides clues to the area's natural history and influences how the restoration proceeds. It should include adjacent woodlands which will likely be a valuable seed or plant source for the re-vegetation of an area. Similarly, an inventory of the animals present should be done.

In addition to a thorough plant and wildlife inventory, evaluate the site's soil resources. Differences in soil texture, pH, and drainage characteristics influence plant growth and development.

Under the pressure of different soil-forming factors, forest soils are lighter in texture and color than those developed under Iowa's prairie sod. These distinctive attributes make soil an excellent indicator of once-wooded areas.



*Typical species of the oak-hickory community*

County soil maps containing location and descriptions can assist in the identification of forest soil types and are available from the Natural Resource Conservation Service (NRCS).

When choosing the types of trees to plant in an area, evaluate both the management objectives and site characteristics. First, make a list of the species that match the site. For example, a high, dry, south-facing site is inappropriate for bottomland hardwoods but excellent for establishing white oak and hickory. Next, from this list, select those varieties that favor the project's management goals. If these include managing the area for a specific type of wildlife, knowledge of the animal's habitat requirements is necessary.

In addition to individual environmental requirements, when selecting which species to include, considerations should be given to winter hardiness, purpose in the landscape, ultimate size and form, and insect and disease resistance.

Planting several species is recommended to minimize planting failure and maximizes benefits. It is one way to provide a diverse, year-round selection of berries, seeds, and nuts for woodland wildlife. In addition to providing a variety of foods, multi-species plantings provide variety in structural form. Managing a diverse woodland attracts a greater variety of wildlife and enhances visual appeal.



*Typical species of upland hardwoods communities.*

### **Site preparation**

Competition control is critical for woodland restoration success. If the project involves planting additional trees, begin site preparation well in advance of the planned planting.

Proper site preparation minimizes competition from grass and weeds. Stripping or tilling is one method used to remove existing sod or vegetation cover. It may be necessary to apply a non-persistent chemical herbicide, like glyphosate, to eliminate competition from grasses and weeds.

### **Planting methods**

There are two methods commonly used for planting trees depending on the size of the restoration: hand planting and mechanical planting.

Hand planting is preferred when the number of seedlings being planted is small or when site characteristics restrict the use of equipment (e.g., prone to erosion, steep slopes, or inaccessible). The two techniques commonly used in hand planting are the hole method and the slit method. Although the slit method is faster, using the hole technique results in better root-to-soil contact and better seedling survival. The hole technique involves digging a hole (shovel, spade, tree spud, or power auger) large enough to hold the root system of



*Use a treespade or an auger to dig a hole large enough to hold the seedling's roots.*

the seedling or transplant, arranging the plant's roots naturally, and firming the soil around the roots, excluding all air. The slit method involves making a slit with a tree spud, pushing the roots down in the slit, and then firming the soil around them with the spud and/or the heel of your boot. Although more time-consuming, the hole method usually results in greater water and nutrient uptake.

For larger areas, where the use of equipment is optional, tree-planting machines are more efficient. A machine carves a slit in the sod, the seedling is inserted, and packer wheels close the slit and firm the soil around the root system. Tree planters are sometimes available on loan from local natural resource management agencies and conservation organizations. Follow species-specific guidelines for proper spacing of trees with each method.

### *Plant or seedling sources*

Planting stock is available in many sizes and forms from a variety of state and regional sources. Planting stock can be obtained as seed, seedlings, bare-root trees (no soil attached), container-grown trees, and unrooted cuttings. Although transplanted stock is more expensive, survival and growth rates are usually better because of more developed root systems.

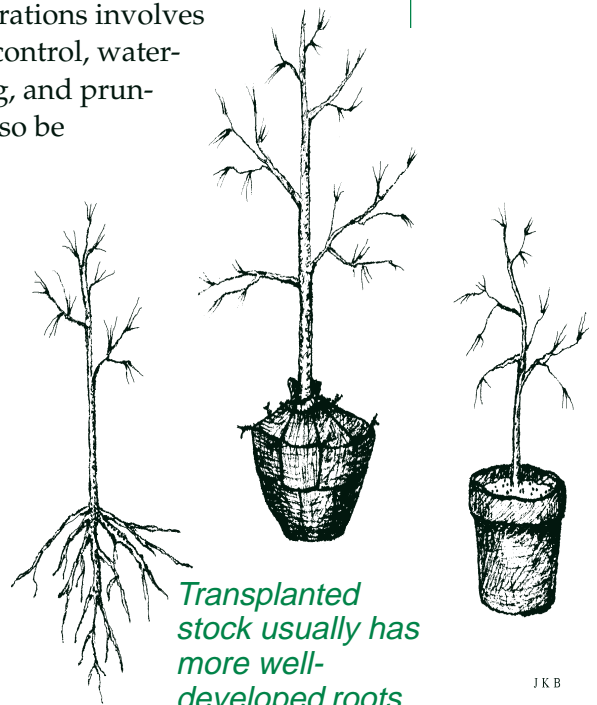
If ordering seedlings, buying 5-10 percent more than you initially think you need will allow you to select and group small plants and allow for some loss. The magnitude of the restoration, costs, and availability of water in the establishment year should be considered when choosing the type of stock to use. Consulting with a local professional may prove beneficial.

### *Maintenance*

The maintenance of newly planted restorations involves competition control, watering, mulching, and pruning. It may also be necessary to protect newly planted small trees from damage caused by wildlife such as deer, rabbits, and mice.

Some restoration projects involve implementing a variety of management practices to improve or enhance existing conditions. Depending on the management objectives, these may include timber stand improvement, selective harvesting, crop tree release, pruning, and prescription burns.

There are several extension publications that provide detailed information on maintaining Iowa woodlands. They are available through ISU Extension Publication Service.



*Transplanted stock usually has more well-developed roots.*



*Typical species of the bottomland hardwoods community*

## Managing woodlands for wildlife

Properly managed woodlands meet the basic needs (food, water, shelter, and space) of a variety of wildlife throughout the year. Management plans may focus on attracting or maintaining one specific type of wildlife, while others may be more general and manage for a variety of wildlife.

Regardless, managing a woodland for wildlife requires specific knowledge about



*Typical species of the riparian community.*

the target species' habitat requirements. For example, deer prefer woodland edges and dense shrubby understory. Whereas other species, like pileated woodpeckers, require deep, mature woodlands. Landowners wanting to manage for deer should consider improving woodland borders. For example, create a transition or edge area consisting of

shrubs, grasses, and legumes. This can be accomplished by thinning or cutting trees

10–20 feet from the forest edge and planting (if necessary) a mix of shrubs and forbs.

Sometimes there are consequences associated with management practices. If the woodland is small, managing for edge species may be at the expense of interior woodland critters like the pileated woodpecker. Often landowners must choose what to manage for. Sometimes doing nothing is a choice.

It is important to remember that woodlands are natural communities of interacting plants and animals. Even the best management plans cannot guarantee the absence or presence of desired or unwanted plants and animals. Wildlife often ignores the best-made plans and finds its own balance. The key to successfully managing woodland habitats for wildlife is diversity of plant species for food and cover needs.



*Typical species of the northern conifer-hardwood community.*

## Sources for additional information and technical support

Iowa Department of Natural Resources, Wallace Building, Des Moines, IA 50319  
515/281-5145

County Conservation Boards – Listed under the “Government-County” section of your local phone book.

Natural Resource Conservation Service—County offices listed under “Government—Federal, USDA” section of your local phone book.

Soil Conservation District—Listed under the “Government-County” section of your local phone book.

Trees Forever, 770 7<sup>th</sup> Ave., Marion, IA 52302, 319/373-0650

Iowa State University Extension Service—County offices listed under the “Government-County” section of your local phone book. ISU Extension Forestry Department, Bessey Hall, ISU, Ames, IA 50011, 515/294-1168

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## Other Iowa State University Extension publications useful in woodland restoration

IAN-202	Iowa Woodlands
IAN-304	Iowa Trees
IAN-307	Iowa's Shrubs and Vines
IAN-407	Iowa Biodiversity
Pm-1677	Tree Planting: Establishment and Care
Pm 1347a	Woodland Management: Understanding Trees and Woodlands
Pm-718	Woodland Management in Iowa
Pm 1347c	Woodland Management: Improving Woodlands
Pm-1351b	Managing Iowa Habitats: Wildlife Needs That Dead Tree
Pm-1302c	Managing Iowa Wildlife: Woodpeckers
Pm-1302e	Managing Iowa Wildlife: Raccoons
Pm-1302f	Managing Iowa Wildlife: Wild Turkeys
Pm-1302g	Managing Iowa Wildlife: White-tailed Deer
WL-46	Mouse Damage to Tree Plantings
WL-47	Rabbit Damage to Tree Plantings

## Aphabetical index of common and scientific names used in text

<u>Common name</u>	<u>Scientific name</u>
balsam fir	<i>Abies balsamea</i>
basswood (linden)	<i>Tilia americana</i>
big-leaved aster	<i>Aster macrophyllus</i>
bigtooth aspen	<i>Populus grandidentata</i>
bitternut hickory	<i>Carya cordiformes</i>
black ash	<i>Fraxinus nigra</i>
black oak	<i>Quercus velutina</i>
black walnut	<i>Juglans nigra</i>
bladdernut	<i>Staphylea trifolia</i>
bloodroot	<i>Sanguinaria canadensis</i>
boxelder	<i>Acer negundo</i>
bunchberry	<i>Cornus canadensis</i>
burr oak	<i>Quercus macrocarpa</i>
buttercup	<i>Ranunculus spp.</i>
Canada yew	<i>Taxus canadensis</i>
chinquapin oak	<i>Quercus muhlenbergii</i>
chokecherry	<i>Prunus virginiana</i>
cottonwood	<i>Populus deltoides</i>
elderberry	<i>Sambucus canadensis</i>
ginger	<i>Asarum canadense</i>
gooseberry	<i>Ribes spp</i>
grapes	<i>Vitis spp</i>
green ash	<i>Fraxinus pennsylvanica</i>
hackberry	<i>Celtis occidentalis</i>
hazelnut	<i>Corylus americana</i>
highbush cranberry	<i>Viburnum trilobum</i>
ironwood	<i>Ostrya virginiana</i>

jewelweed  
 Kentucky coffee tree  
 mayapple  
 mulberry  
 paper birch  
 pecan  
 prickly ash  
 quaking aspen  
 red-berried elder  
 red cedar  
 red oak  
 red-ossier dogwood  
 river birch  
 round-lobed hepatica  
 sedge  
 serviceberry  
 shagbark hickory  
 silver maple  
 speckled alder  
 stinging nettle  
 sugar maple  
 sumac  
 sweet cicely  
 sycamore  
 twinflower  
 Virginia creeper  
 Virginia waterleaf  
 white ash  
 white oak  
 white pine  
 willow  
 witch hazel  
 yellow birch

*Impatiens capensis*  
*Gymnocladus dioica*  
*Podophyllum peltatum*  
*Morus spp.*  
*Betula papyrifera*  
*Carya illinoensis*  
*Zanthoxylum americanum*  
*Populus tremuloides*  
*Sambucus racemosa*  
*Juniperus virginiana*  
*Quercus rubra*  
*Cornus stolonifera*  
*Betula nigra*  
*Hepatica americana*  
*Carex spp.*  
*Amelanchier arborea*  
*Carya ovata*  
*Acer saccharinum*  
*Alnus rugosa*  
*Urtica dioica*  
*Acer saccharum*  
*Rhus glabra*  
*Osmorhiza claytonii*  
*Platanus occidentalis*  
*Linnaea borealis*  
*Parthenocissus quinquefolia*  
*Hydrophyllum virginianum*  
*Fraxinus americana*  
*Quercus alba*  
*Pinus strobus*  
*Salix spp*  
*Hamamelis virginiana*  
*Betula alleghaniensis*



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File: Wildlife 2

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