

# EXTENSION NOTES



## MANAGEMENT OPTIONS FOR ABANDONED FARM FIELDS

Over the past few decades, people have been planting trees in abandoned farm fields to restore native forests and to grow wood products. However, planting trees is just one of several management options for abandoned fields. This Extension Note discusses these options and provides step-by-step instructions for choosing one that suits your property.

### OLD FIELD SUCCESSION

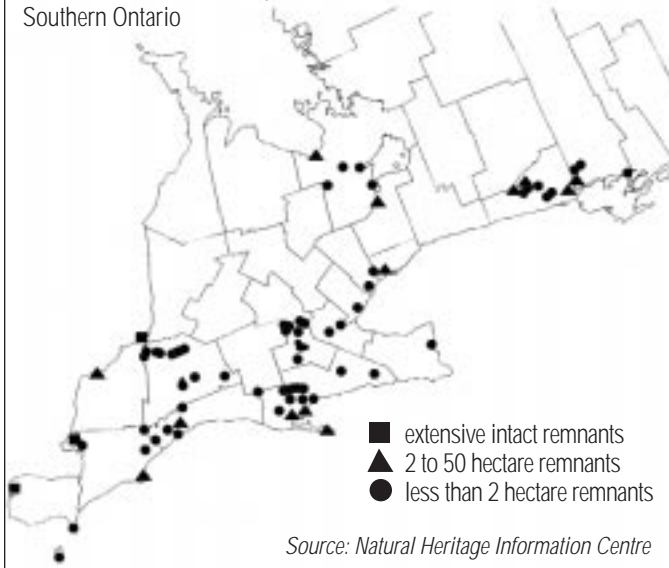
Before European settlement, southern Ontario was a diverse landscape of forests, wetlands, meadows, savannas, prairies, alvars and rock barrens. Farming and other land uses have greatly altered most of this original landscape. In the fertile lands south and east of the Canadian Shield, over 70 per cent of the original forests and wetlands have disappeared. And only tiny remnants of prairies and savannas remain (see Map 1). Most fields that were cleared for agriculture are still being farmed. However, many have been abandoned over the past 50 years due to changing agricultural practices and impoverished soils. We call these abandoned agricultural lands *old fields*.



This shows typical succession patterns in old fields —from initial establishment of grasses and herbs (foreground), to invading shrub thickets and trees (midground) and eventual forest (background).

## MAP 1

Distribution of current tallgrass prairie and savanna remnants in Southern Ontario



Source: Natural Heritage Information Centre

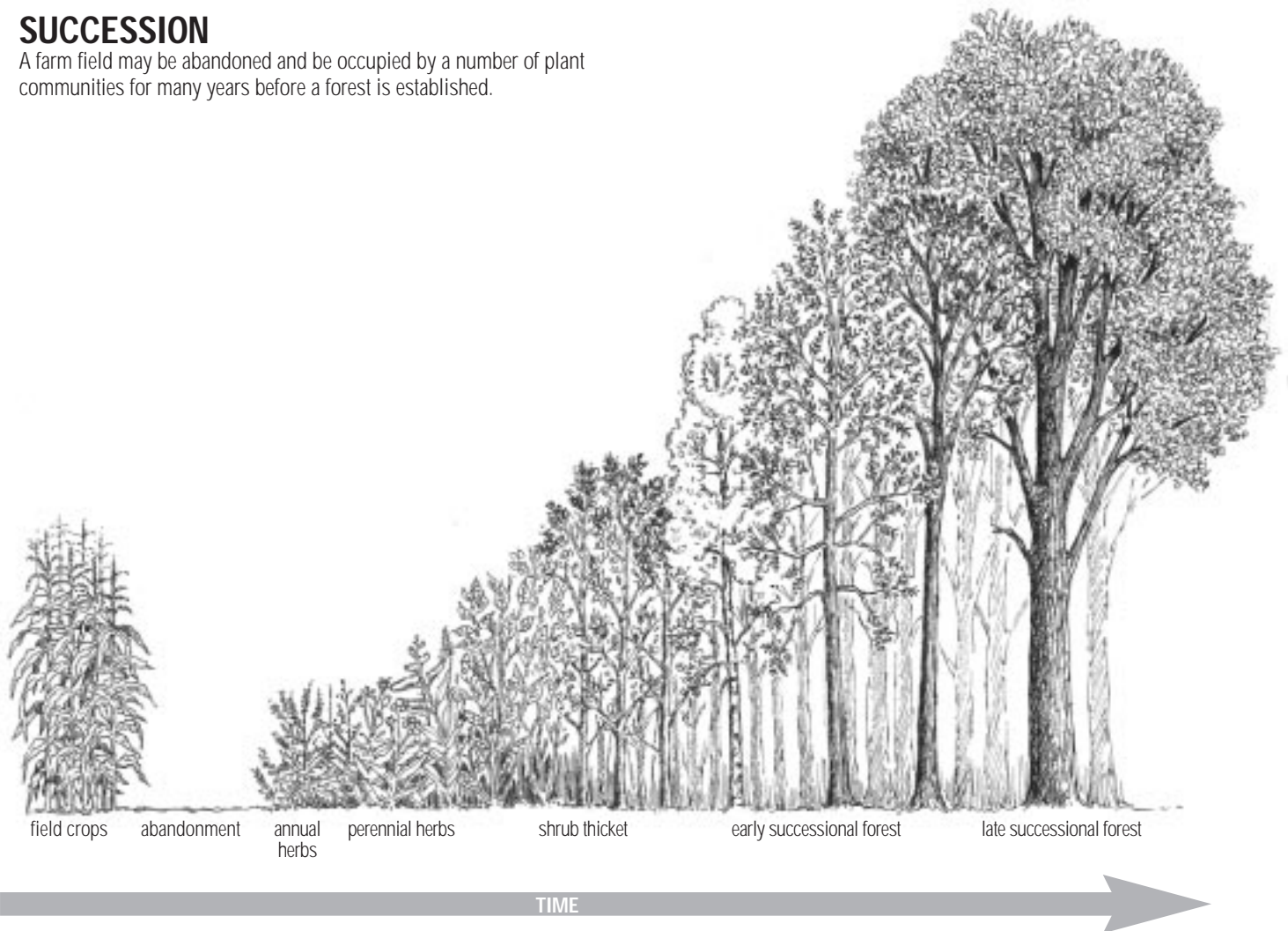
If old fields are left alone, many of them can eventually become forests again through the natural process of succession. For example, shrubs and trees will slowly invade old fields that are now dominated by grasses and a variety of herbaceous plants such as asters, goldenrod and hawkweed. In a few hundred years, a relatively stable community, such as a maple-beech forest, can evolve.

The different plant communities that grow in an area over time are called successional stages. Predicting which plants will dominate a site and for how long is difficult because so many factors influence a species' ability to become established (see Factors that Influence Succession in Old Fields).

Each successional stage supports different wildlife species. For example, the grasses and plants that grow during early stages of succession provide food for deer but little shelter from winter's cold and snow. On the other hand, patches of conifer trees found in later stages of old field succession provide good shelter but limited food.

## SUCCESSION

A farm field may be abandoned and be occupied by a number of plant communities for many years before a forest is established.



## OLD FIELDS AND WILDLIFE

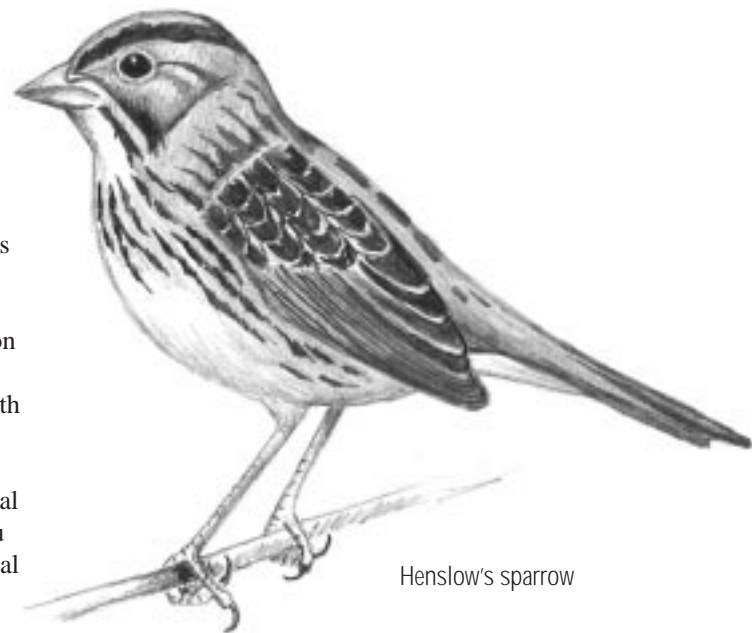
Many wildlife species depend on old field habitat. Birds that use old fields include upland sandpipers, northern harriers, bobolinks, eastern meadowlarks and a variety of sparrows. Mammals that use old fields include voles, mice, woodchucks, skunks, foxes, deer and weasels. Old fields also provide habitat for many species of butterflies, moths, and grasshoppers, as well as snakes, turtles and frogs.

Some species use old fields for all or part of their lives, while others rely on them for particular seasons or parts of the day. Deer, for example, often feed in old fields in the evening but spend the rest of the time in nearby forests. As plant communities change in the old field, so do many of the wildlife species that use them. However, some animals are always present.

## ENDANGERED SPECIES

Old fields are important habitat for two endangered bird species in southern Ontario. The Henslow's sparrow prefers relatively large old fields with tall, dense grasses and few shrubs, especially those with lots of dead matted herbaceous material on the ground. The Eastern loggerhead shrike continues to use abandoned pasture lands, although they prefer pasture lands with short plants and hawthorn shrubs.

If an endangered species is using your old field, you have a legal obligation not to harm the species or its habitat. Otherwise, you can choose the option that best meets your aesthetic, recreational or economic goals.



Henslow's sparrow

## CHOOSING THE BEST OPTION FOR YOUR PROPERTY

Many people used to think that all old fields should be planted with trees. The many conifer and hardwood plantations that were planted in southern Ontario created new wildlife habitat, improved landscape diversity where woodlands were rare and sometimes generated income for landowners. Today, biologists better understand the importance of old field habitats to many plant and animal species. As a result, conservation agencies are asking landowners to consider four different options for managing old fields.

To choose an ecologically sound option for your old field, ask yourself the question posed under each of the following four options.

### OPTION 1: MAINTAINING AN OLD FIELD

Is there a strong possibility that rare species of plants or animals live in the field or in nearby old fields? If yes, choose Option 1.

### Considerations

Fields with locally uncommon soils that have been abandoned for at least 20 years are more likely to support rare plant species. A neighbor or former owner may know some of the past history of the field. The nearest office of the Ontario Ministry of Agriculture, Food and Rural Affairs can help determine if your field is on soil or bedrock that is uncommon in your area. If there is good reason to suspect the presence of rare species an ecologist from the Ontario Ministry of Natural Resources (OMNR) or a naturalist group may be willing to survey the field, identify any significant species and offer advice.

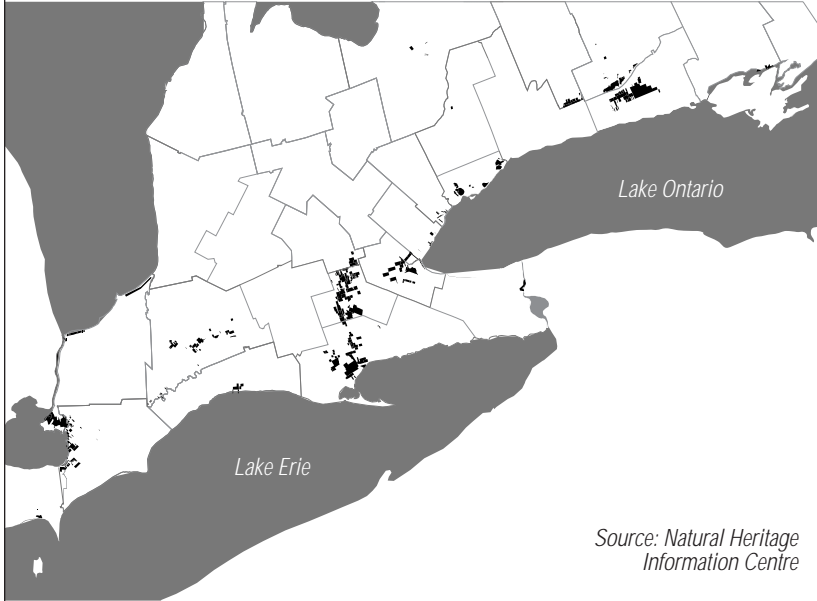
### Benefits

Keeping an old field in its present state will provide habitat for rare, threatened or endangered species that rely on old field habitat. If there are endangered species on the property, maintaining the habitat will help you fulfil your legal obligations.



## MAP 2

Historical extent of prairie and savanna vegetation based on original survey records and other information sources



### Action

Mow the old field once every few years. This should be done in late summer, after the breeding season for birds has ended and when soils are dry. Avoid mowing in the fall. This can adversely effect plant species composition and growth, and may encourage invasion by non-native grass species. Flag rare plants before mowing and avoid cutting.

### OPTION 2: RESTORATION OF A PROVINCIAL RARE COMMUNITY

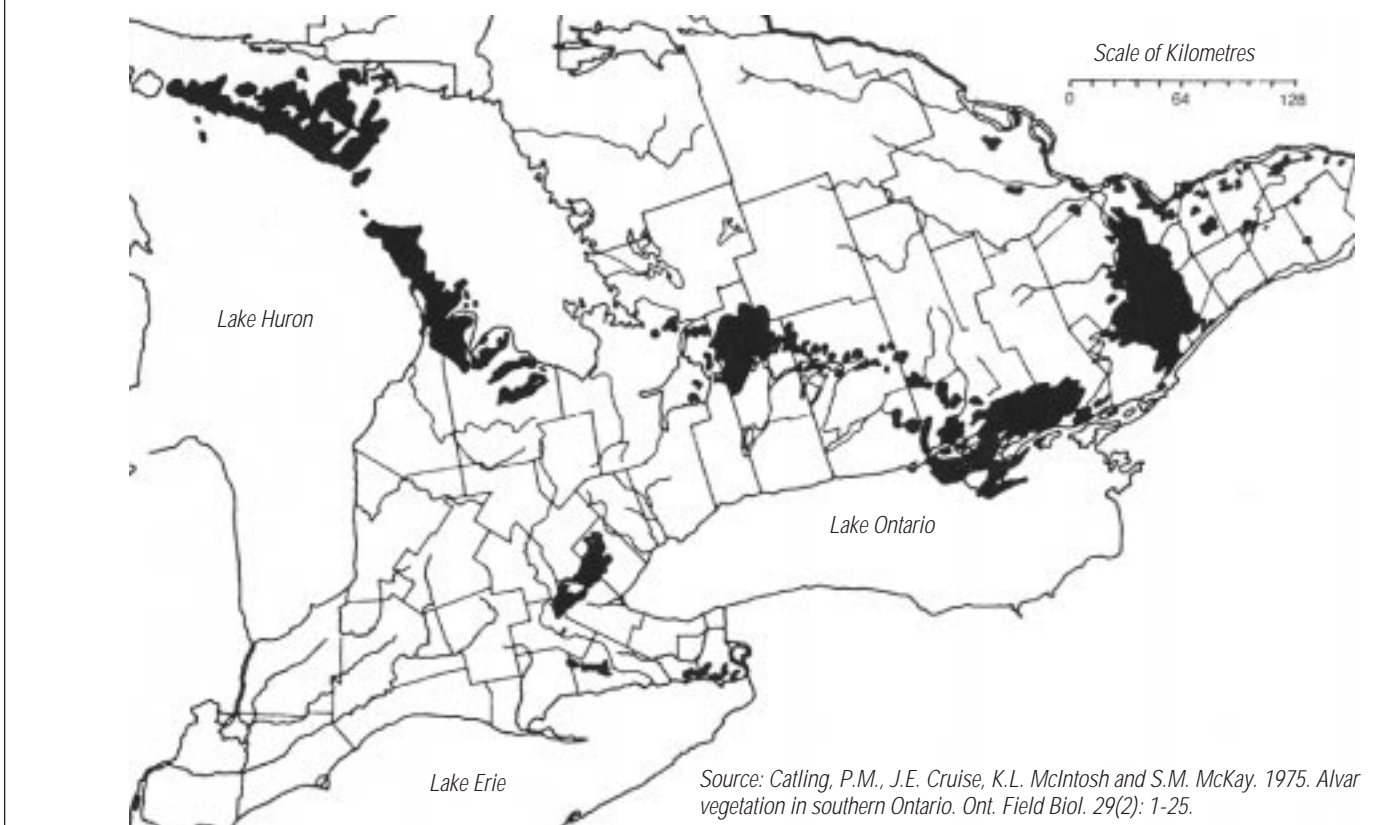
Is the old field located in the historic range of prairies, savannas or alvars? If yes, choose Option 2.

### Considerations

Prairies are open grasslands dominated by herbaceous native species. Savannas are a closely related community, consisting of both open grown trees (usually oak, but sometimes may include pine) and prairie grassland species, which give this community a natural park-like appearance.

## MAP 3

Distribution of limestone plains in southern Ontario



Before European settlement, prairie and savanna were common in parts of Essex, Lambton, Kent, Haldimand-Norfolk, Middlesex, Brant, Waterloo and Northumberland counties. They also occurred to a lesser extent in the other counties west of Rice Lake (see Map 2).

Prairie and savanna provide habitat for many wildlife species. Almost 20 per cent of Ontario's 681 rare plant species occur in these communities. Rare animals that use this habitat include the wild indigo dusky wing butterfly and Butler's garter snake. The Karner blue and the frosted elfin butterflies also occurred here, but became extinct in Ontario by the late 1980s.

Alvars are natural open areas of thin soil over essentially flat limestone or marble rock. They support sparse vegetation cover of shrubs and herbs. Trees are often absent, few or widely scattered. Limestone plains, which may support alvars, are common in the following areas: Bruce, Grey, Prince Edward, southern Lennox and Addington, Ottawa-Carleton and Victoria counties, Manitoulin Island and parts of Leeds and Grenville. Limestone plains also occur in smaller patches in Hamilton-Wentworth, Halton, Haldimand-Norfolk, Niagara and Prescott and Russell counties (see Map 3).

Alvars are home to a wide variety of plants and animals. At least 43 rare plant species occur in alvars, including lakeside daisy and juniper sedge. Many rare and unique animals are found here, including olive hairstreak, hoary elfin and mottled dusky wing butterflies, Massassauga rattlesnake, many species of beetle and sawfly, birds such as the endangered Eastern loggerhead shrike, as well as snails. A number of these snail species are thought to be new to science and are only known in the world from alvars in Ontario.

Ecologists and naturalists know the locations of most prairies, savannas and alvars. To determine whether your old field lies within the historic range of these rare communities call your local OMNR office. You can also study the local landscape, particularly fence rows and natural roadsides. If trees, especially large open-grown ones, are rare in the surrounding area, your old field may lie in what was once a native open ecosystem, such as savanna, prairie or alvar.



Massasaga rattlesnake

### Benefits

Restoring prairie, savanna or alvar will provide crucial habitat for many rare plants and animals that depend on these increasingly rare ecosystems and contribute to the overall biodiversity of the local area.

### Action

Plant native plants, including native grasses, that typically occur in these open ecosystems. Your local naturalist group and the OMNR ecologist can suggest the most suitable species to plant. The Society for Ecological Restoration (Ontario Chapter) produces an annual list of growers that sell native plant materials. Contact them at <http://www.trentu.ca/ser> for instructions on how to obtain a copy.

Control vegetation that is not typical of these ecosystems, especially the more invasive, non-native species such as common and glossy buckthorns, dog-strangling vine and purple loosestrife. The Society of Ecological Restoration can also tell you how to most effectively control these and other species.

### OPTION 3: WOODLAND RESTORATION

Should the site be restored to a woodland? If yes, choose Option 3.

### Considerations

To fully answer this question you could speak with the local OMNR or conservation authority forester or ecologist. They can tell you whether the old field should be restored to a woodland. For example, if there is less than 30 per cent



Lakeside daisy

forest cover in your municipality, and the site is not a native open area, woodland restoration may be the best option. They can also tell you whether the field can be successfully restored to a woodland, and if so, the type of woodland that will most likely develop over time.

### Benefits

Reforestation in areas with limited woodlands will enhance wildlife habitat in your area, particularly if mast-producing species such as oak, hickory, and black cherry are planted to provide food for birds and mammals. Also the restoration of old fields to forested areas will provide more connectivity between existing woodlands and provide safe travel corridors for wildlife to move between natural areas.

**Action**

Woodlands can be established in old fields by promoting natural succession or by planting trees. Natural succession is usually less expensive than planting but it is slower and the old field may be dominated by grasses, herbaceous plants and shrubs for a long time before trees become established. To determine the most suitable approach, ask yourself the following questions. If the answer to all five of them is “yes,” choose natural succession. If not, plant trees.

**Will the soil and soil conditions support a forested area?**

Find out how the field was farmed in the past. Intensive cropping can result in reduced nutrients and slow growth, and intensive use of herbicides or fertilizers can make it difficult for some species to grow. Also look for signs of soil erosion and compaction that can occur after many

years of cultivation with heavy machinery. These factors can prevent the growth of many tree species.

**Are seed sources available?**

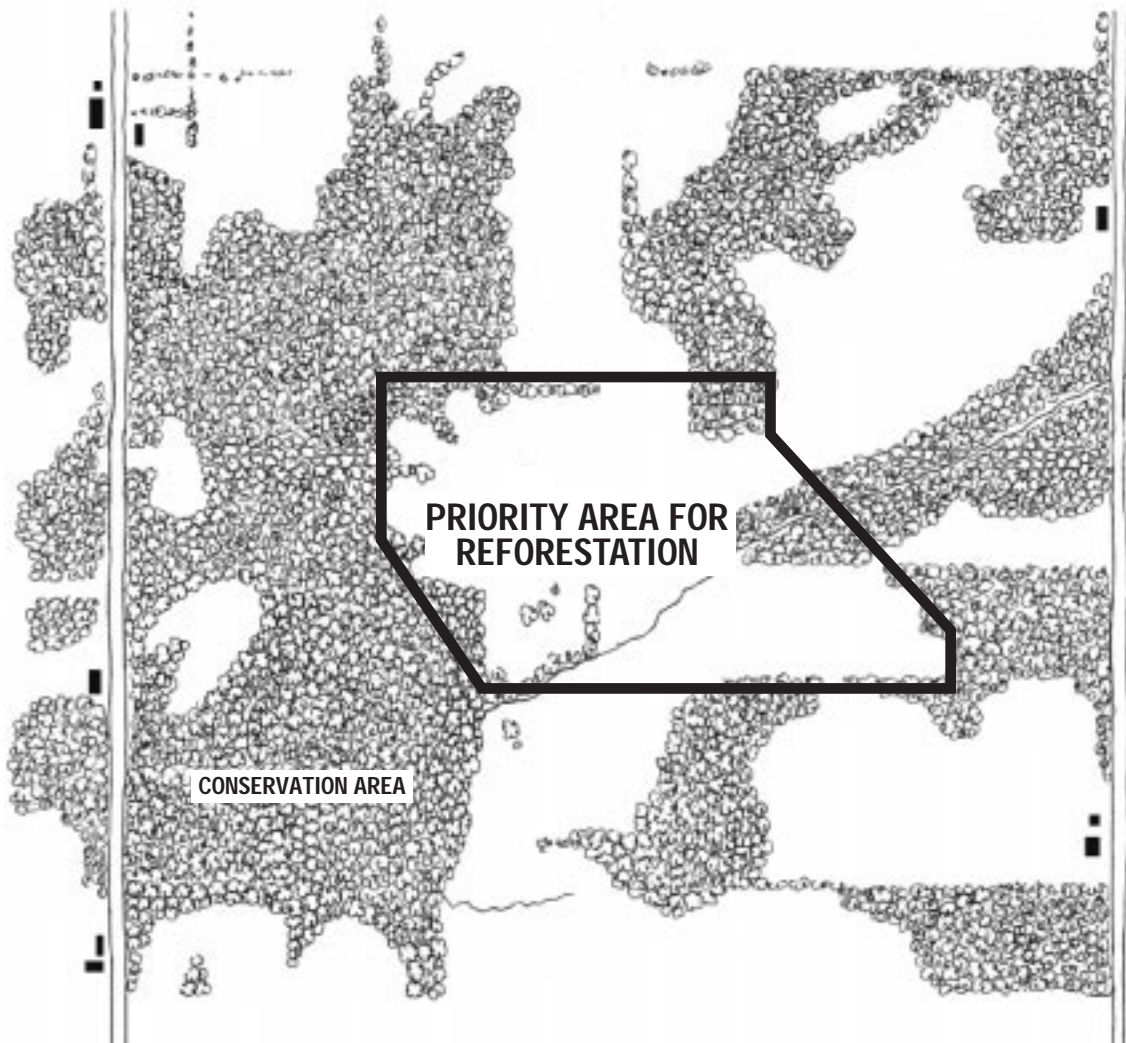
Old fields of several hectares or more are probably too large to rely solely on agents of natural seed dispersal because windblown seeds and seeds transported by birds and mammals from nearby woods and fence lines may not reach the center of larger fields. Therefore you may need to seed or plant these areas. If the field has been abandoned for a few years or more, look for tree seedlings and saplings indicating that natural seeding is occurring.

**Is the old field already in a late successional stage?**

Explore the field to see if native tree and shrub species have become established. If it’s starting to look like a

**SAMPLE TOWNSHIP**

This illustration shows a typical township of forested areas, active and abandoned fields along with human development. Forested areas and old fields can be linked through reforestation. Restoration of old fields into forested areas will provide valuable wildlife habitat.



dense woody thicket, the field is in a later state of natural succession.

#### **Is more forest cover needed in your area?**

There may be no need to encourage restoration or conversion of an old field to woodland. For example, if there are several large woodlands near you but connecting these is impossible, it may be wiser to leave the field alone. Furthermore, if forest cover is greater than 30 percent in your township and it includes most species, planting trees may not be necessary.

#### **Is there a serious problem with non-native plant species in the old field?**

Some non-native plant species are particularly undesirable because they are invasive and can rather quickly cover large open areas and choke out competing native plants. Examples of these include purple loosestrife, dog-strangling vine, common or European and glossy buckthorns. These plants are easy to identify if you use a good plant field guidebook. Ideally, they should be removed by cutting and/or use of herbicides before planting trees. However, if non-native, invasive species are well-established and dominate the old field, it may be too expensive to remove them.

To restore a forest by planting, choose tree species that are suited to the site and will benefit wildlife. For advice on

planting and tending trees consult the Extension Notes listed later in this document. As your trees grow, you may need to take the following steps to nurture a healthy forest:

- controlling weeds
- protecting trees from animal damage
- controlling insect damage
- removing non-native, invasive plant species
- thinning

#### **OPTION 4: CONVERTING TO ANOTHER USE**

Do your examinations of the previous options suggest that maintaining an old field, restoring open habitat or regenerating a woodland would provide minimal benefits? If yes, choose Option 4.

#### **Considerations**

Abandoned fields can be managed as Christmas tree, fuelwood, sawlog or pulp plantations. Before you get started, examine the site conditions to determine which trees would grow best in the field and explore local markets for forest products.

#### **Action**

Based on the site inventory and management plan for the field, you can plant and then tend the most suitable tree species, given the site conditions and your objectives. Several of the Extension Notes listed below can provide specific information about this option.

## **FACTORS THAT INFLUENCE SUCCESSION IN OLD FIELDS**

### **ALLELOPATHY**

Some plants release chemicals that inhibit the growth of other plants, e.g., goldenrods, hawkweeds.

### **COMPETITION**

Plants compete for space, light, nutrients and water. Some species are more successful at competing for these resources than others. Less successful species eventually disappear from a site.

### **NON-NATIVE SPECIES**

Species that are not native to Ontario often have fewer controlling agents than native species. They may be able to out-compete native plants for resources and impede succession to a native ecosystem.

### **PAST USE OF LAND**

The last use of a field (e.g., cultivating, grazing, or leaving grain stubble) may influence the kinds of plants that will grow. Past herbicide and fertilizer use limits the growth of some species.

### **PREDATION**

Predation by voles, mice, rabbits, deer and insects on seeds and young trees can make it difficult for tree species to become established.

### **SEED SOURCE**

New growth can come from seeds that are stored in the ground and seeds that are carried to a site by wind and animals. The shorter the distance to a forested area, and the more wooded the surrounding area is, the greater the availability of forest species seed.

### **SOIL CONDITIONS**

Soil texture, moisture and fertility help to determine the plant species that thrive on a site. Some of these factors change during succession as dead plants add to the organic layer and increase fertility and as living plants provide shade, resulting in cooler, moister soil conditions.



## WHERE TO GET MORE INFORMATION

Local residents, naturalist groups, universities, stewardship councils, Conservation Authorities, the Ontario Ministry of Natural Resources, and the Ontario Ministry of Agriculture, Food and Rural Affairs may be able to help you choose the best option for your old field.

The Ontario Tallgrass Prairie and Savanna Association may also be able to help. Tallgrass Ontario is a network of individuals and organizations who identify, conserve, manage and restore tallgrass prairie, savanna and related ecosystems in Ontario. Tallgrass Ontario can be reached at:

Tallgrass Ontario  
659 Exeter Road  
London, Ontario  
N6E 1L3  
Phone: (519) 873-4631  
Fax: (519) 873-4645  
e-mail: tallgrass@carolinian.org

Other Extension Notes that can help you to manage your old field include:

- *Planning for Tree Planting*
- *Careful Handling and Planting of Nursery Stock*
- *Clearing the Way: Preparing the Site for Tree Planting*
- *Room to Grow: Controlling the Competition*
- *Tree Shelters Help Hardwood Trees Grow Faster*
- *Mulches Help Trees Beat Weed Competition*
- *Using a Backpack Herbicide Sprayer to Control Weeds*
- *Cover Crops Help Tree Seedlings Beat Weed Competition*
- *Tree Guards Protect Your Trees*
- *Protecting Trees from Vole Damage*

## DEFINITIONS

### ALVAR

Natural area of thin soil over flat limestone rock that, due to periodic drought, supports unique drought-tolerant herbaceous and shrubby plants

### LANDSCAPE DIVERSITY

The size, shape, number, distribution and components of different landscape types, such as woodlands, fields, wetlands or shelterbelts, within a given area

### OLD FIELDS

Former agricultural lands that are no longer pastured or cultivated

### PRAIRIES

Open, treeless ecosystem dominated by native grasses on deep soils

### RESTORATION

Renewing and maintaining a more natural native plant community

### SAVANNA

Natural area dominated by grasses and scattered trees (mostly oak species)

### SUCCESSION

The natural process of change that occurs in an area over time as one community of living organisms replaces another one

### SUCCESSIONAL STAGES

The plant communities that thrive in an area as it changes over time through succession

For more information contact:

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