

# Birds on the Farm



## A Stewardship Guide

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**"In New England they once thought blackbirds useless and mischievous to the corn. They made efforts to destroy them. The consequence was, the blackbirds were diminished; but a kind of worm, which devoured their grass, and which the blackbirds used to feed on, increased prodigiously . . . they wished again for their blackbirds."**  
Benjamin Franklin, 1749

People who live much of their life outside are very aware of birds, perhaps more so than any other life form. We notice the noisy return of killdeer in the early spring, the clear sweet song of a meadowlark from a fence post in the early summer, or the clamour of gulls following the tractor on a warm summer evening. Old timers will tell you that the birds are different now. The fact is that the numbers and types of birds around us are always changing in response to how we use and manage the land and water.

**I**n Southern Ontario, two trends have meant bad news for many species of birds:

1. the countryside is increasingly becoming urbanized, and
2. the remaining farmland is being farmed increasingly intensively.

For example, between 1966 and 1986, agricultural use of land declined from 68% to 54% in Southern Ontario as a result of urbanization. During the same period, the percentage of forest on agricultural land dropped from 12% to 5.5%. Most counties and townships now have less than 15% forest cover, and some have less than 5% (Riley & Mohr, 1994).

At the same time, the proportion of small family farms declined relative to large corporate farms. A nation-wide trend, Canadian farms are increasing in size and decreasing in number, with the average farm size having increased from 50 hectares in 1990 to 250 hectares in the mid-1990s (Wildlife Habitat Canada, 2001).

Larger farms mean less diversified farming and more row-cropping. As pasture is converted to cropland, sometimes hedgerows are removed to increase field

size, and fields are ploughed to their edges, eliminating grassy buffer strips. Equipment is getting larger, and hedgerows are taken out to facilitate the movement of equipment between fields. Overall, this trend toward more intensive agriculture is resulting in a simplified and constantly disturbed landscape, often more reliant on chemical inputs. Impacts include ground-water contamination, declining surface water quality, and the degradation and loss of wildlife habitat.

According to many researchers, the intensification and specialization of farms in Ontario is contributing to the population declines of many species of birds (Friesen, 1994). For example, more than 90% of grassland birds declined in eastern North America between 1966 and 1989; two species affected, the Henslow's sparrow and loggerhead shrike, are now listed as Endangered (Austen et al., 1994). Similarly, the clearing of forests has resulted in declines of forest-dependent species such as the whip-poor-will, scarlet tanager and ovenbird (Austen et al., 1994).

**I**f we have the ability to make the landscape worse for birds, then surely we also have the ability to improve it. And that is what this guide book is about: improving habitat around the farm for birds. There are many

good reasons to do so, some economic, some ecological and some more personal.

Starting with the more personal reasons, it is probably fair to say that most people enjoy looking at and listening to birds. It would be hard to imagine a silent spring, without the chorus of bird song greeting us when we step out of the house in the morning. Through their song, movement, and comings and goings, birds connect us to the natural world and remind us that we are part of a living planet.

It is up to each of us to ensure that bird populations remain healthy. While the individual actions of landowners may appear to have little effect on the big picture, collectively their impact is profound. Hence, as one small farm after another is affected by more intensive agricultural practices, we witness declines in entire groups of species such as grasslands birds.

Ironically, when birds disappear from the countryside because the habitat is no longer suitable, it is the landowners who may lose out, especially financially. On a farm that is managed consciously to benefit birds, the birds themselves can be of considerable benefit to the farmer. Consider:

- In Alberta, a pair of savannah sparrows (one of the





most common breeding birds in mixed farming regions in Ontario) was found to consume over five kilograms of insects and spiders during a breeding season. This would amount to about 3.7 kilograms or 149,000 grasshoppers per season.

- In one study, birds removed 64% of over-wintering corn borers in one year and 82% in another year.
- In Ohio, white-breasted nuthatch, brown creeper and downy woodpecker reduce codling moth larvae by over 90%.
- In pecan groves, a tufted titmouse was found to eat 2,100 case bearer larvae, saving pecan growers an estimated 52,000 nuts.
- Birds have a strong preference for pests: they eat 16 times more pest insects than beneficial insects.
- Birds cause 72% mortality of spruce budworm larvae and pupae.
- In one study, evening grosbeaks ate 3,036,000 spruce budworms per square kilometre at one site and 8,900,000 per square kilometre at another. The financial benefits were estimated at \$1,820 per square kilometre (1995 dollar value).

## Bird-Friendly Farming

In most intensively farmed

areas, there are opportunities to improve bird habitat while meeting farm business objectives. Modern farming techniques such as conservation



tillage, riparian buffer strips, and integrated pest management play important roles in enhancing and creating bird-friendly habitat on farms, and can result in significant savings for farmers. Incorporating ecological management techniques such as those outlined in this book has many benefits for individual landowners, the environment and society at large:

- Crop residues left on land in combination with no-till cropping can reduce soil erosion by 80% and improve water quality.
- Fencerows slow wind speeds by 15%, lowering associated erosion rates, saving valuable top soil and acting as living snow fences.
- Shelterbelts can lower energy needs by 10-30% while offering livestock shade in summer and shelter in the rain and cold.
- Woodlots can provide fire-

wood as well as building materials, nuts and maple syrup to supplement farm income.

- Buffer strips protect ground and stream water quality and filter nutrients, particularly nitrates, from runoff.
- Herd health is improved when livestock is kept out of waterways.
- Enhancing farmland for birds results in better insect and rodent control.

## *What this guide book is about*

As a general rule, almost any practice that reduces soil erosion, improves water quality, reduces pesticide use and diversifies farming operations will likely benefit birds (Best, 1990).

Throughout this guide book, we have highlighted some of the most readily available ecological management techniques that help protect birds and their habitat. Each technique is briefly outlined, as are the economic, environmental and/or social benefits of their implementation.

Various bird species that may benefit from your actions are named in the descriptions of the management techniques. In addition, each section features one to three profiles of particular bird species to give you a better idea of the birds that can benefit from the implementation of the management techniques described.

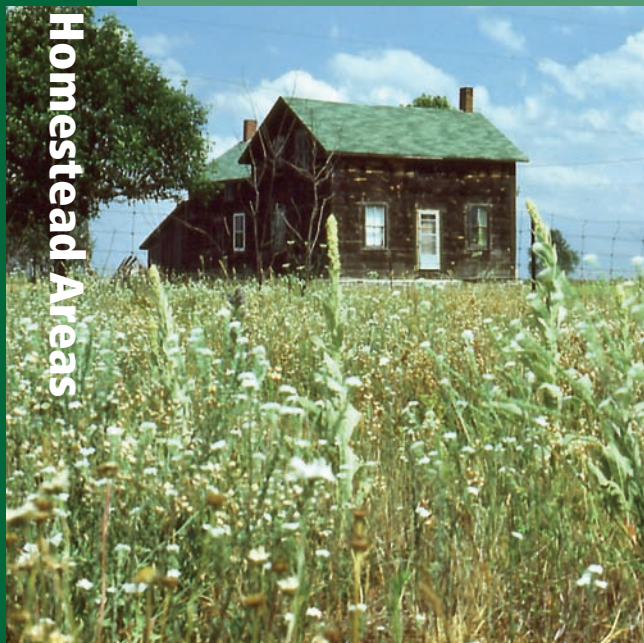
At the back of the book you will find a listing of publications and websites where you can obtain additional information on the featured management techniques. There is also a comprehensive listing of organizations that can provide advice on farming and conservation topics, including a summary of some financial assistance programs to help offset up-front costs of implementing ecological farming methods.

Good land stewardship involves developing an understanding of the birds that use your farm, their habitat needs and the techniques to manage that habitat for the good of both birds and the farm. We hope that this guide book demonstrates that bird-friendly farming and sound farm management can support and benefit each other, and that together these approaches can result in economic savings and ecological benefits for farmers.





## Homestead Areas



**Imagine being able to watch birds** in their natural habitat and admire them from the comfort of the kitchen table or the porch. By enhancing the area around a farm homestead so that it is attractive to birds, you can create year-round bird watching opportunities for you and your family. Installing nesting structures for birds and planting trees and shrubs that provide food and cover for birds are two of the most readily accessible ways of creating a bird-friendly homestead.



## Boxes and Tunnels

**N**esting boxes are inexpensive to build, easy to maintain, and provide important nesting areas for many species of cavity-nesting birds. Some of these birds, such as eastern bluebirds, purple martins, tree swallows and American kestrels can help control insects and small mammals on the farm! Wood ducks will also use nesting boxes, while other waterfowl, such as mallards, will use nesting tunnels. Keep in mind that it may take a few years after the nesting structure is installed before it is inhabited.



Below are a few guidelines to follow when building or installing nesting boxes for birds:

- Use weather-resistant wood such as cedar, pine or hemlock for nesting boxes, if possible. Do not use pressure-treated lumber, since the chemicals could harm nesting birds and chicks.
- Match the size of the nesting box opening to the species of bird you would like to attract. (Otherwise you may encourage house

sparrows and European starlings.)

- Place the box in habitat that is suitable for the desired species and where it will be relatively undisturbed for the entire nesting season.
- Install the box so that the opening is protected from the prevailing direction of wind and rain and so that it is protected from direct sunlight.
- Protect nesting boxes from predators. Ensure that boxes are placed at an adequate height and install them on poles away from shrubs and trees. Include a baffle or guard on the pole to prevent raccoon or cat predation.
- Clean nesting boxes in early spring before the birds return. Waiting until early spring will allow beneficial wasps, which pupate in nesting materials, to emerge and kill nesting box parasites (AAFC, 1996).

Organizations including Ducks Unlimited, Bird Studies Canada, Canadian Wildlife Federation, Ontario Nature – Federation of Ontario Naturalists, and the Ontario Federation of Anglers and Hunters have building plans and advice for nesting box construction.



## Planting Native Vegetation

**P**lanting native vegetation around the farm homestead provides many benefits, including shelter, shade, erosion control and water filtration. Enhancing the homestead with native trees, shrubs, vines and grasses can also attract many species of migratory or resident birds and provide year-round nature appreciation opportunities. Plantings improve bird habitat by providing readily available food sources, cover and nesting materials. Once plants are established, watch for species that tend to thrive around homestead areas including the eastern phoebe, white-breasted nuthatch, northern cardinal, black-capped chickadee, eastern kingbird and house wren.

Tree and shrub species, such as nannyberry, serviceberry, pin cherry, choke cherry, birches and staghorn sumach, are excellent choices for feeding birds. White spruce and eastern white cedar trees provide

shelter for many bird species. Low-maintenance plants such as native grasses or creeping groundcovers are much more valuable to birds than conventional lawn grasses. In fact, habitat can be improved simply by eliminating lawn pesticides and mowing the lawn less frequently, thereby reducing disturbances to birds. (Note also that setting the mower blades higher results in a healthier lawn that requires less watering.)

### Native + Local = Best

Throughout this guide book, all of the plant species suggested for wildlife habitat enhancement are native to Ontario. Many of the plant species growing around homes and settlements in southern Ontario are exotics (that is, not originally growing there). Unfortunately, these species, whether introduced deliberately or unintentionally, can often crowd out native plants. When an exotic plant such as common buckthorn becomes established, it can take over habitat, prevent the growth of

native food sources and cover required by local wildlife, and change the ecological make-up of an area. Purple loosestrife is a prime example of the way in which exotics can become quickly established and choke out native species.

Exotic species, including many animals, are a growing concern. For instance, European starlings, which take over the nesting cavities preferred by the native eastern bluebird, have had a significant impact on their populations. The recent arrival of the emerald ash-borer and the Asian long-horned beetle (insects that threaten to devastate ash, maple and other hardwood species in Ontario) provides another example of the harm that can be caused by invasive exotic species.

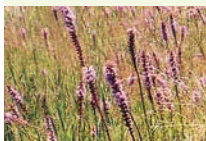
By planting native species that are adapted to local conditions, you will help to maintain or restore healthy communities of plants and animals and to prevent the potential disruptions caused by exotics. At the plant or tree nursery ask for native species. Avoid cultivars, and watch out for inappropriate substitutions - for example, European highbush cranberry (*Viburnum opulus*) instead of native highbush cranberry (*Viburnum trilobum*).

At the nursery, it also pays to

make sure that the plants you are buying have been grown from local seed sources. Such plants will be adapted to local climatic and ecological site conditions. How local is local? The Ministry of Natural Resources has divided Ontario into tree seed zones. Using plants that originated in the same seed zone as your planting site will ensure that the plants are adapted to the local conditions and therefore have a better chance of survival.

### A Note About Cats

Cats play an important role in keeping vermin down in and around barns. It must be recognized, however, that they can also pose a real threat to birds. Outdoor cats have been known to kill an average of 12-14 birds per year, resulting over time in the loss of millions of birds (American Bird Conservancy, 2003).





## Ontario Barn Owl Recovery Project

The barn owl is a medium-sized owl with dark eyes set in a distinctive heart-shaped face. Barn owls hunt in wet grassy meadows, old farm fields, tallgrass prairie and vegetated ditches. From both a conservation and pest control standpoint, barn owls are a valuable component of the rural landscape. A family of eight barn owls can consume over 1,000 mice, voles and shrews in just one breeding season (Ingels, 1992).

Rare in Ontario, the eastern population of the barn owl has been formally recognized as Endangered. In 1997, when barn owl numbers were very low, a group of interested people in Haldimand-Norfolk initiated the Ontario Barn Owl Recovery Project. One of the components of this project is to erect nesting boxes on farms that have suitable habitat for the bird, such as old fields, wetlands, barns and silos. Nesting boxes have been installed on dozens of farms along the north shore of Lake Erie with the hope of encouraging the barn owl's recovery.



## Cedar Waxwing

*Bombycilla cedrorum*

Cedar waxwings are common summer residents and can be easily attracted to your homestead by native berry-producing trees and shrubs. They breed late in the spring, a habit which ensures that berry crops are ready when nestlings need to be fed in the later

summer. Cedar waxwings have a remarkable ability to digest nearly any type of berry, including ones that are poisonous to humans. They will even consume fermented berries, a practice which causes them to show definite signs of tipsiness!

Rarely seen alone, these handsome birds move erratically among food crops, feeding on berries in large flocks. Cedar waxwings in a flock tend to cooperate. When one bird has had its fill of berries, it will pass berries on to its neighbour, who will eat the berry or continue to pass it along in a sort of berry bucket brigade, until a hungry bird snatches it up. Listen for the faint, high pitched 'tsee' calls of cedar waxwings throughout the summer.

Cedar waxwings are sleek, crested birds with a black mask and a yellow band on the tip of the tail. A little smaller than a robin, these birds frequent open, wooded areas as well as parks, gardens and overgrown fields.





### Conservation Tillage

**C**reatures large and small benefit from last year's crop residue on the soil surface of the field before and during planting operations. Conservation tillage is a technique that helps farmers meet production goals, conserve soil and water resources, and enhance bird habitat at the same time. The Conservation Technology Information Center defines this technique as "any tillage or planting system that maintains at least 30% of the soil surface covered by residue after planting" (CTIC, 1994). Conservation tillage is a general term that can include several different systems such as no-till, mulch tillage, minimum till or reduced till.

#### The Birds Will Thank You

**B**irds are attracted to fields that are managed with conservation tillage for a number of reasons. By

leaving crop residue on the field during the cold winter months as well as through the spring, farmers provide seeds and other food, elevated song perches and cover for birds.

Waste grains and weed seeds are important fall food sources for migrating and resident birds such as the savannah sparrow, song sparrow, snow bunting and winter songbirds. Consider making a good situation even better by leaving a few rows or a small area of crop standing as a food source for birds.

Reduced tillage, particularly in the spring, translates into fewer disturbances to birds nesting in fields. Some of these birds include the horned lark, killdeer and vesper sparrow. Fall-planted crops such as winter wheat provide habitat that is superior to spring-seeded crops because there is no disturbance during the nesting season. A study in North Dakota showed that nesting success for waterfowl in no-till winter wheat was two to three times higher than in conventionally farmed areas (Duebber, 1987). No-till winter wheat, particularly when planted in corn or soybean stubble, has shown great potential for benefiting songbirds and ground-nesting birds (Foy, no date).

### Your Pocketbook and Your Environment Will Thank You

Among other benefits, conser-

vation tillage can save money, topsoil and time.

- **Water Quality:** Leaving crop residue on the soil surface allows water to collect and infiltrate the soil, improving soil moisture levels and reducing wind and water erosion as well as the risk of associated chemical runoff.
- **Erosion:** Crop residue on fields can reduce wind erosion by up to 80%, saving valuable topsoil.
- **Time:** Reducing the number of tillage trips results in reduced labour and fuel costs. Taking fewer trips on a tractor also reduces carbon dioxide emissions.
- **Soil Improvement:** Crop residue improves the organic content of the soil over the long term, and less tillage means less soil compaction.
- **Weed Control:** Eliminating tillage means that fewer dormant annual weed seeds are brought to the surface to germinate. Eliminating tillage also means that perennial weed rhizomes are not cut and brought to the surface, infesting a larger area. Generally, reducing tillage results in less perennial weed pressure over the long term (AAFC, no date).





### Careful Pesticide Use Is Important

Enhancing wildlife habitat also means that when pesticides are used, they must be carefully selected and applied. Informed decisions are needed to balance weed and pest control in crop production with the possible risks to wildlife and wildlife habitat. Insecticides may have a direct toxic effect on some birds, particularly ducks, and both insecticides and herbicides can harm wildlife food sources (AAFC, 1996). Many pesticide labels note toxicity to wildlife. Careful pesticide selection and application in strict accordance with label directions will ensure maximum wildlife benefits from your conservation tillage system.

Also remember that wells are affected by what is put on fields. Some herbicides such as 2,4-D remain for a long time in ground water and have been linked to increased health risks among farm workers.



### Voracious Visitors

Throughout this guide book, the advantages of attracting birds to the farm have been emphasized. There are, however, some situations where farmers are finding it difficult to co-exist with birds. Depending on the type of farm operation, location and the populations of certain species, birds which feed on fruit and other crops are a growing concern for producers in Ontario.

### Resident Canada Geese

Due to the widespread hunting of local game for food and sport in the 18<sup>th</sup> and 19<sup>th</sup> centuries, the Canada goose had virtually disappeared from nearly all of its former breeding range in southern Ontario. In the 1960s, the Ministry of Natural Resources and some local groups re-introduced the Canada goose to southern Ontario. Since that time, goose numbers have not only rebounded, but in many cases are increasing exponentially due to suitable habitat and low predator numbers in the province. The Canadian Wildlife Service estimates that there are more than 400,000 resident Canada geese that breed and live in southern Ontario year-round (OSCIA, 2002).

Until recently, the familiar honking V-shaped formations of Canada geese were welcomed by farmers. For farmers working hard to make a living from their crops, however, large numbers of resident geese and goslings grazing on emergent crops are not a welcome sight. The expanding goose population is causing significant crop damage in some agricultural areas (OSCIA, 2002).

### Management Options

Canada Geese are protected under the Migratory Birds Convention Act, which requires a permit for hunting within open seasons. Where geese are causing serious crop damage, several options exist to control them (CWS, 1997).

#### *Modify breeding habitat*

Breeding females look for open areas with clear visibility, low predator numbers and nearby water. Create natural barriers of brush and shrubs around water areas to discourage geese from selecting a breeding site on the farm. Focus efforts on the habitat between open cropland and wetlands. This will also create habitat for songbirds such as the common yellowthroat.

#### *Use scare techniques*

As soon as geese arrive, use sirens, strobe lights, propane cannons and bird-call distress tapes to scare birds away

and encourage them to nest elsewhere. Vary the patterns of sounds or lights. Implementing a combination of scare tactics works best.

### *Erect barriers*

To deter geese from entering cropland for food, place strands of 'Bird Scare Flash Tape' or other shiny, fluttery materials at goose and gosling height levels between waterways and crops. Although adult geese could fly over these barriers, they will not leave their flightless goslings.

### *Contact the Canadian Wildlife Service*

The Canadian Wildlife Service as well as Ducks Unlimited Canada and the Ontario Soil and Crop Improvement Association have been involved in researching various control methods to prevent severe crop damage. Permits are required to hunt or scare geese with a firearm or to attempt other more invasive control methods and may be obtained from the Canadian Wildlife Service.



## Vesper Sparrow

*Pooecetes gramineus*

The vesper sparrow is a bird little known to most casual observers. Its rich, musical song, which begins with two sets of unforgettable, double notes, 'here-here! there-there!', is commonly heard on rolling farmlands in Ontario. It is absent, however, from intensively farmed areas. The vesper sparrow favours 'messy' crops, showing a clear preference for foraging in fields with lots of crop residue (Rodenhouse & Best, 1994). The abundance of insects in conservation tillage fields attracts these birds, which eat insects throughout the breeding season and switch to seeds for the rest of the year.

Vesper sparrows are found on the ground in well-drained or dry grassland areas. During the springtime, males will hop onto a perch or a high tree branch to sing. The white outer tail feathers of the vesper sparrow are a distinctive mark when this little grayish, streaked bird takes off in flight from farm fields. Other distinguishing marks include a narrow white eye ring and a small patch of chestnut on the bend of its wing.

Vesper sparrow nests hold four to six white eggs that are heavily spotted with brown. The nest itself is a loosely-woven grass and rootlet cup, concealed on the ground in grass.





**W**hile conservation tillage is one of the most bird-friendly farming techniques, several other cropland techniques offer particular advantages to birds of all shapes and sizes.

### Crop Rotation

**W**hen crops are changed from year to year in a planned sequence, diversity is added to a farm operation. A greater variety of migrant and nesting birds will visit a farm that provides several types of food and nesting habitat over the seasons. Crop rotation is also a large component of sustainable agriculture, with many benefits including:

- reduced populations of pests and weeds specific to one crop;
- reduced soil erosion and run-off;
- reduced crop inputs;
- increased yields compared to continuous cropping.

### Strip Cropping and Grassy Borders

Alternating strips of forage or small grain with strips of row crop in large fields provides numerous field edges for bird habitat (USDA, 1994). The variety of habitats in strip cropped fields, from tall corn crops to low clover legumes, for example, provides the protection, food and nesting areas required by many birds. Timing

the harvest of various strips allows farmers to spread work out over the growing season. Leaving a strip of unplowed and unmowed cropland until mid-July would ensure that an area exists for birds such as horned larks, bobolinks and killdeer to successfully raise their young.

Grassy borders around fields are an integral part of any strip cropping operation (USDA, 1994). Used in place of end rows, these borders of grass or legumes provide turning and access lanes for each strip and help to control erosion and promote runoff filtration. Grassy borders can provide prime bird habitat if these areas are kept free of chemical inputs and if mowing is delayed until after the breeding season (USDA, 1994). Birds such as the American woodcock prefer open grassy areas for courtship displays and will benefit from grassy borders.

### Cover Crops

Planting a 'blanket' or cover crop such as red clover or cereal rye will help protect bare soils from wind and water erosion during the winter and early spring months. In addi-

tion, cover crops can suppress weed growth, add organic matter, improve soil structure, provide nitrogen for the next crop depending on the cover species, hold soluble nutrients and prevent leaching (AAFC, no date).

Cover crops are particularly important for birds, since they provide food supplies for over-

wintering and migrant species. The northern bobwhite, for example is dependent on green material such as clover to satisfy its winter food requirements.



### Northern Bobwhite

*Colinus virginianus*

Difficult to glimpse amongst dense, tangled vegetation, the northern bobwhite can be identified by its unmistakable whistle, singing a rising 'bob, bob-white' throughout the spring. The patterned facial markings of the bobwhite set it apart in the field: these patterns are black and white in males and buff and white in females.

The northern bobwhite is the only native quail in eastern North America. In Ontario, it only survives in southwestern reaches of the province where winters are less severe. This species needs grassland for breeding, woody or brushy cover for shelter, and cropland for forage, all in close proximity. As a result, farmers using conservation tillage, strip cropping and cover crops can provide important food and habitat diversity for the bobwhite. In a North Carolina



study, researchers found that bobwhite chicks met their daily nutritional requirements in less than six hours of foraging in no-till soybeans planted with wheat, compared to more than twenty hours of foraging in tilled soybean fields (Palmer and Lane, 1999). Vitamin A is a particular requirement of this species, hence cover crops such as clover and grass are critical resources for this bird throughout the winter.

Northern bobwhite nests hold 10 to 15 eggs in a grass-lined hollow concealed in weeds or grass near open or cultivated land. Outside the breeding season, bobwhites gather in coveys of approximately two dozen birds, huddling together in the cold and vigorously defending their territory.

The range of northern bobwhites in Ontario dropped following a series of severe winters in the 1970s, and numbers remain low. Intensive farming methods that tend to limit on-farm diversity have reduced habitat quantity and quality for this species. Given the small, localized populations of this species and the threats to its habitat, the northern bobwhite is now listed as Endangered in Ontario. Consider implementing some of the techniques mentioned in this book to help this species recover.







**P**est and weed management is an essential component of food production. Farmers must contend with European corn borers, Colorado potato beetles, alfalfa weevils, rusts, aphids, mites and many, many other pests in order to produce the food that people need. Conventionally, these pests have been countered with synthetic pesticides, including insecticides, herbicides and fungicides. Increasingly, though, consumers and producers are investigating or employing integrated pest management or organic alternatives.

### Trends in Pesticide Use

**B**etween 1983 and 1998, total usage of pesticides in Ontario decreased by 40.7%, and the amount of pesticide applied per hectare of crop land decreased by 35.7% (AG Care, no date). These figures reflect reduced pesticide applications as well as changes in the type of crops grown, increased crop rotation and the availability of newer, more effective pesticides which can be applied less frequently and at lower rates (AG Care, no date). In addition, pesticide-free organic agricultural operations have also been increasing. Statistics from 2001 show that there are over 400 certified organic farms in Ontario, representing a total of 30,000 hectares (75,000 acres) of the province's farmland. While still a relatively small portion of the agricultural land base, organic produc-

tion is growing at a yearly rate of roughly 20%, and in many cases represents a viable alternative to conventional farming practices (OMAF, 2001).

Fish and wildlife, particularly birds, have much to gain from this positive trend towards decreased pesticide use and a focus on organic practices. The use of pesticides has been proven to have harmful impacts on birds.

### Reducing Exposure to Pesticides

Birds are exposed to agricultural chemicals when their skin and feathers touch treated foliage, when they preen their residue-covered feathers, and when they forage and ingest pesticide granules or affected insects, seeds and vegetation (Brenner, 1991). Some of the most common pesticides, particularly organophosphate

insecticides like diazinon and parathion, have been shown to directly poison birds nesting and feeding in farm fields (CWS, 2002). More restrictive and careful use of selective, low residual pesticides, as well as a greater emphasis on integrated pest management techniques are making agricultural lands safer places for birds and other animals, including people, to live.

### **Integrated Pest Management**

Integrated pest management (IPM) focuses on identifying and monitoring pests, choosing a threshold of acceptable pest damage, and selecting from a variety of targeted control practices. IPM is both economically and environmentally sound in that it minimizes crop damage as well as pesticide use and lowers the risk of developing pesticide-resistant pest populations. IPM also reduces the risks of harmful effects on human health and the environment, since pesticides are the last resort in an IPM program (AAFC, 1996<sup>b</sup>).

Listed below are suggested techniques to reduce agricultural chemical use and create a bird-friendly farm, based primarily on IPM (AAFC, 1996<sup>b</sup>):

- Grow crops aggressively to compete with weeds.

Increased planting densities and narrow row spaces leave little room for unwanted vegetation.

- Use biological control methods such as cover and companion crops to fight weeds. Rye, for example, inhibits weed establishment and growth.
- Monitor your fields regularly. Catching problems early may ease control efforts, and an awareness of pest life cycles helps determine the most effective timing for control.
- Rotate crops to break pest cycles. Maintain a low pesticide load in the soil by including crops that require little or no pesticides, like pasture grasses, in the rotation. (Note that hay fields provide habitat for several bird species such as savannah sparrow, vesper sparrow, bobolink and meadowlark.)
- Rotate the family of chemicals used for pesticides annually. This will help reduce the incidence of pesticide-resistant pests.
- Consider delineating an economic threshold of control. Eliminating every weed in a field may prove to be less efficient in terms of cost and time than simply allowing some controlled growth. Late season weeds do not significant-

- ly reduce crop yield.
- Calibrate pesticide application machinery carefully to control chemical drift.
- Keep records of your pest control successes and challenges. Notes that are specific to your fields will help you determine the effectiveness of various control methods.

### **Agriculture is for the Birds!**

Many of the techniques profiled in this guide book are common practices in organic farming, including the planting of cover crops, crop rotation and a preventative and targeted approach to pest management. Comparative studies have demonstrated that organic farming is truly bird-friendly. Research in both Saskatchewan and Ontario has shown that birds prefer organic farms to conventional models. Bird diversity and species richness are much higher on Ontario organic farms than on conventional farms, just as bird densities are significantly greater on

Saskatchewan organic farms than on conventional farms (Freemark & Kirk, 2001; Shutler, 2000). No pesticides and, generally, a greater percentage of non-crop habitats help to make organic farms more attractive to birds (Robinson, 1991).

The Canadian Organic Growers is a national membership-based education and networking organization representing hundreds of farmers, gardeners and consumers. For a provincial focus, the Ecological Farming Association of Ontario is a volunteer group dedicated to educating farmers about ecological methods of farming. They are committed to agricultural practices that enhance the health of soil, crops, livestock and the farm community through the understanding of ecological principles. Contact them to meet other farmers who share this interest.



## Birds Can Help Prevent Your Pest Problems

Increasing habitat for birds by putting into practice the techniques mentioned in this guide book can benefit your pest management systems, and ultimately your crop yields.

Birds eat insect pests in vast quantities and provide other important services. In many cases, as noted below, farmers are reaping the benefits.

- Eastern bluebirds and swallows can control flies in pastures and other grazing areas, reducing the incidence of pink eye in livestock.
- Bluebirds and swallows are also welcome participants in the biological control of insects on cherry farms (Brenner, 1991).
- American kestrels, great crested flycatchers and other insect-eating birds can help control crop losses by insects such as grasshoppers, weevils and aphids (Ingels, 1992).
- Red-tailed hawks, northern harriers, short- and long-eared owls and great horned owls are important rodent controllers. These birds of prey can help control moles and mice, reducing silage and crop losses (Ingels, 1992).
- Vesper sparrows forage extensively in fields for grasshoppers, beetles and cutworms, while migratory songbirds consume enormous numbers of insects in farm woodlots and hedgerows (Rodenhouse & Best, 1994.).



## Grasslands



**P**astures, hayfields, small grain fields and meadows on your farm are examples of agricultural grassland habitat. Take a walk through these areas and you may see grassland birds, which are those that require open, grassy areas during the breeding season. The loggerhead shrike and Henslow's sparrow, both listed as Endangered in Canada, depend on grassland areas for their survival. Songbirds such as the field sparrow, grasshopper sparrow, eastern meadowlark and bobolink build nests on the ground and raise their young in grasslands. Other birds depend on grassy areas for only a part of their habitat. The red-tailed hawk frequently hunts in grasslands, for example, but breeds elsewhere.

## Grasslands – A Disappearing Act

**C**hanging agricultural practices have resulted in decreases in the amount of land being used for pasture and hayfields. For example, while cropland in Ontario has increased by more than 111,000 hectares (274,000 acres) since 1996, pasture areas have decreased by over 237,000 hectares (586,000 acres), and hay and fodder crops by approximately 4,000 hectares (10,000 acres) (Statistics Canada, 2001). Many grassland birds have been experiencing serious declines, likely in part as a result of habitat loss. Among these species are the loggerhead shrike, Henslow's sparrow, northern bobwhite, vesper sparrow and upland sandpiper (Cadman, 2004).

Farms provide much of the habitat for grassland birds in Ontario. While regenerating meadows provide grassland habitat for birds, the management techniques in this section

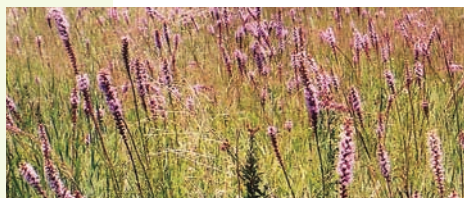
ing techniques that help ensure adequate habitat for grassland species can have equally positive effects on farm production.

### Rotational Grazing

Rotational grazing is gaining popularity as a management technique that helps farmers manage pasture lands *and* helps to increase populations of grassland birds. Rotational grazing involves dividing a pasture into several paddocks with fencing. Cattle, horses or sheep are then moved among the paddocks on a pre-arranged schedule based on forage quantity and quality.

Rotationally grazed pastures attract a greater number and variety of birds than continuously grazed pastures and row crop fields. Some of the reasons and ways that rotational grazing benefits birds are outlined below:

- Rotation schedules can be planned so that one paddock in the rotation is grazed early and then acts as a refuge for breeding birds by not being grazed during the grassland bird breeding season (mid-May to mid-July). This grazing system ensures that birds can build a nest, hatch eggs and raise their young without being disturbed (Undersander et al., 2000).



focus on more intensively used grassland areas, namely pastures and hayfields. Many of the farm-

- Longer intervals between grazing periods in active paddocks improve overall nesting success. The more time the paddocks can approximate natural undisturbed habitat while still providing forage for livestock, the better. Finding a balance between these two goals depends on the farm land base and the operation's needs. Short grazing periods (one to two days) also result in lower levels of trampling damage.
- Leaving a minimum of four inches of growth following grazing increases bird nesting success by helping to hide nests from predators. This length also speeds the rate of plant recovery and boosts yield (Undersander et al., 2000).

Not only does rotational grazing help increase local habitat diversity and aid in grassland bird conservation, it also provides many benefits to farmers. Associated environmental benefits include decreased soil erosion and reduced risk of manure runoff. Other benefits include:

- **Reduced costs:** Grazing reduces the cost of feed, fuel, fertilizer, pesticide, labour and equipment.
- **Time Savings:** Rotational grazing lets nature do the

work – livestock eat their food on the fields and deposit manure where it is needed most. Moving livestock between paddocks takes less time than feeding animals in a confinement system. With rotational grazing, you only need to operate a confinement system during the winter, and as a result, you spend less money producing livestock food and less time on a tractor harvesting fodder (Undersander et al., 2000).

- **Increased Productivity:** Rotational grazing has been shown to increase pasture productivity by as much as 50% since it favours species with continuously high yield (Kyle, no date). More and higher quality forage has been produced in rotationally grazed fields than in continuously grazed ones, and this translates into greater milk or meat production.

Many grassland birds tolerate and benefit from the diversity of grass heights created when pastures are grazed. Since grassland birds select their nesting and foraging habitat based on grass length, this diversity means that a number of different bird species will be attracted to the farm.





## Pasture and Hayfield Species

The type of cover that is grown in pastures and hayfields, and the resulting management implications, can have significant influences on bird populations.

### *Grasses or Legumes?*

Depending on the species, grassland birds have marked preferences for the type of cover in which they nest and forage. Particularly attractive are mixed grass and broadleaf herbaceous covers as opposed to the more traditional legume crops. In one study, fields with predominant timothy and red clover cover supported over 15 times more bobolinks than fields with mostly alfalfa cover (Bollinger & Gavin, 1992). Since timothy and red clover are a late-cut hay crop, bobolinks likely prefer them because they can complete their nesting cycles without being disturbed by a tractor. This advantage applies to many other grassland birds as well. In fact, bobolink abundance is positively related to the abundance of other birds like the grasshopper sparrow, Henslow's sparrow and upland sandpiper.

### *Warm or Cool Season Grasses?*

Planting both warm and cool season grasses can facilitate rotation schedules and hay cutting intervals to the advantage

of both birds and livestock. As cool season grasses (orchardgrass, timothy, brome grass, perennial ryegrass) go into dormancy in the summer months, native warm season grasses (eastern gamagrass, switchgrass, Indian grass, little bluestem, big bluestem) are producing forage through the dry season. Growing warm season grasses in some areas of the pasture or hayfield makes delayed grazing or cutting more profitable, and makes a farm operation more bird-friendly. By delaying the grazing of certain paddocks and harvesting different areas of your hayfields throughout the season, refuge areas can be left for grassland birds.

Planting warm season grasses ensures that at harvest time the forage will be of higher quality than cool season grasses left late in the season. Indeed, studies have shown that substantial increases in weight gain can be achieved for livestock fed on a rotation of cool and warm season grasses versus animals fed solely on cool season grasses (Moore, 1998). Recent research on eastern gamagrass has shown that it is highly palatable and has tremendous protein regrowth potential (Quail Unlimited, no date).

Native warm season grasses are adapted to local climatic



conditions and are therefore able to withstand snow pack and remain upright in the spring, providing a diverse, long-lived, easily managed cover that is attractive to birds. Usually they are more drought-resistant and nutritious late in the season, making the pasture or hayfield an all-season producer.

Although establishing native warm season grasses requires dedication and patience - it takes approximately two years before positive benefits begin to take effect - these grasses can improve farm productivity and bird habitat in many ways that are worth considering.

## Haying

Mowing is central to many farming operations and is critical for the conservation of grassland habitats. The timing and frequency of hay harvesting in traditional agricultural operations, however, can pose problems for some nesting birds, often destroying the nests of species like the grasshopper sparrow, savannah sparrow, eastern meadowlark and Henslow's sparrow. The following techniques can help you reach your hay production goals while improving bird habitat in your hayfields (Massachusetts Audubon Society, 1998). Some are easy to implement, while others

may require further research to determine their feasibility for your operation:

- **Delay haying.** Landowners can help increase the success rate of nesting birds simply by delaying the mowing of hay. Traditional cutting intervals are too short to allow complete nesting cycles for birds. By delaying spring mowing until mid-July to allow birds to raise their broods, bird breeding success will be boosted. Consider dividing fields into sections that are mowed earlier (e.g. hay for fodder alongside waterways and wetlands) and later in the season.
- **Avoid nighttime mowing.** This simple action will reduce injuries to birds that are roosting on the ground at night.
- **Use a flushing bar** on haying equipment. A flushing bar warns birds of approaching equipment and helps to move birds hiding in the grass away from machinery. Flushing bars are useful for all hayfields, but are most critical in areas adjacent to wetlands where ducks nest. A study comparing duck mortality rates with and without the use of a flushing bar found that a mower with no bar killed



48% of the female ducks observed. In contrast, where a flushing bar was used, 100% of the ducks observed were flushed from their nests on fields (Henkes, no date).

- Raise mower blades to six inches or more to help avoid crushing bird nests.

The best tool for ensuring grassland bird survival in hay-

fields is careful observation. If the location of bird nests and the type of birds using the field are known, it is possible to approximate when the birds will have successfully raised their young. Leaving small patches of unmowed hay where birds are nesting for protection and cover is also a good option if the techniques noted above are not feasible in your operation.



## Loggerhead Shrike

*Lanius ludovicianus*

The loggerhead shrike is a predatory songbird that hunts like a small hawk. Unlike hawks, however, shrikes do not have strong talons to hold onto their prey as they eat it. To compensate, these birds ingeniously impale their prey on barbed wire or thorny trees, a practice that has earned

them the name 'butcherbird.' Impaling prey serves a number of different purposes: holding prey, storing food for later, or attracting a mate by demonstrating a male's hunting competence.

The loggerhead shrike has a heavy hooked beak, well suited to its hunting habits. From a perch on a utility pole or fencepost, shrikes engage in fast direct flights or swoop down to catch insects, rodents, small snakes or amphibians.

The loggerhead shrike is a trim, handsome bird, with a black tail and wings, grey crown and back and white underparts. It has a characteristic black mask that extends above the hooked bill onto the forehead.

The loggerhead shrike was once quite common in agricultural southern Ontario, where it thrived on grazed grasslands with scattered low trees and thorny shrubs. As farming practices changed and more cash crops and confinement livestock systems were emphasized, shrike habitat dwindled. Other possible factors in its decline include pesticides and collisions with motor vehicles. Today, the loggerhead shrike is listed as Endangered. Only two dozen pairs are known to still breed in Ontario. These birds are nesting in areas where shallow soils overlie limestone bedrock, areas which tend to be marginal farmland that is being used as pasture for livestock (Long Point Bird Observatory, 1997). In Ontario, shrikes breed almost entirely in two core areas: the Carden Plain and the Napanee Plain.

The fate of the loggerhead shrike lies mainly in the hands of individual landowners and with positive stewardship efforts. There are several ways in which habitat can be enhanced and managed for loggerhead shrikes (Long Point Bird Observatory, 1997):

- Shrikes are sensitive to disturbances during the breeding season, so leaving a refuge area around nests during the breeding season is essential.
- Leaving brush piles on cleared land provides nesting materials.
- Trees, especially hawthorn and red cedars, provide

habitat for perching, nesting and impaling prey. These can be planted in prime shrike habitat locations.

- Shrikes prefer short grasslands with scattered trees, so ensuring that pastures are grazed enhances their habitat. Rotational grazing helps to maximize the amount of habitat available for shrikes.

### ***Case Study: Rotational Grazing***

#### **Bruce Community Pasture**

**A**lthough the Ontario Land CARE funding program is no longer available through Ducks Unlimited, the positive environmental results of work done through the program are still apparent. Take the Bruce Community Pasture, for example. At this location, Ducks Unlimited Canada provided advice and funding to erect fencing around a wetland on the pasture property, effectively reducing the 60 hectare (150 acre) pasture to 28 hectares (70 acres). The challenge before the farmers was to maintain the weight of their cattle on 46% less acreage. To achieve this, a mid-intensity rotational grazing system was initiated and three paddocks were created.

With a rotational grazing sys-

tem in place, the farmers at the Bruce Community Pasture now report substantial benefits in productivity, herd health, time savings, herd control and water quality, not to mention bird abundance. Not only are the Bruce County farmers able to maintain the weight of their cattle on less acreage in a rotational grazing system, they also report that forage quality is consistently high enough at times to exceed past weight gains on the 60 hectares of land previously pastured. In addition, it now takes only half an hour to check on the herd, as opposed to the hour or more required when cattle were spread out over 60 hectares of lower quality forage.

To further enhance bird habitat at the community pasture, over 40 tree swallow and eastern bluebird nesting boxes have been installed. These insect-eating birds have helped

reduce the incidence of pink-eye and unrest caused by flies. And they play a role in controlling mosquitoes that could carry the West Nile Virus.

Project participants advise that rotational grazing is a technique that requires dedication and a willingness on the part of the farmer to follow

through with the planning and management of the system. They cite the benefits achieved by farmers at the Bruce Community Pasture as proof that the technique really works for the good of livestock, farmers' pocketbooks, birds and the environment (Ducks Unlimited Canada, no date; Wells, 2003).



## Bobolink

*Dolichonyx oryzivorus*

The bobolink's striking black and white markings, long, clear burbling song and aerial displays make it an easily recognizable bird in rural Ontario. This member of the blackbird family is a long-distance traveler, making its way from northern Argentina to breed in Canada and the United States. During migration, bobolinks can be found in large groups in wet meadows.

Bobolinks prefer habitats of medium-height grasslands and favour hayfields and lightly grazed pastures. Bobolinks, like many of the species discussed in this book, once benefited from increased agriculture in Ontario, with hay production providing ready habitat. In fact, range maps show a clear link between agricultural areas and bobolink abundance, and where there is no hay production, there are generally no bobolinks (Cadman et al, 1987).

Recent reports show that bobolink numbers are declining, a phe-

nomenon which may be related to the widespread use of alfalfa as a hay crop, the harvesting of hay early in the season, and the declining acreage of pastures and hayfield in Ontario (Statistics Canada, 2001; Bollinger & Gavin, 1992).

Female bobolinks are drably coloured with brown and buff streaks. They lay four to seven gray eggs that are spotted with red-brown and lavender and which they incubate for 11– 13 days. Bobolink nests are a cup of grass, stems and rootlets on the ground. To help protect the nest site, females behave in a cryptic manner, rarely carrying nesting materials and food directly to their nests, but landing and then walking through the fields to the nest. Similarly, they travel some distance from the nest before flushing.

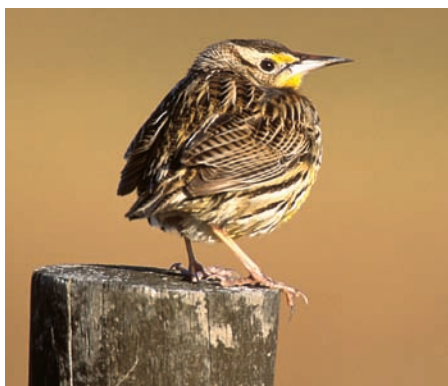
## Eastern Meadowlark

*Sturnella magna*

Eastern meadowlarks sing the trademark tune of rural Ontario, boisterously calling ‘*See-you at school-today*’ throughout the spring. Their voices ring out from fenceposts and powerlines wherever grassy meadows, hayfields and pastures are found.

You will recognize an eastern meadowlark from the male’s black v-shaped ‘necklace,’ bright yellow throat and chest, and white outer tail feathers. Its sides and flanks are white with brown streaking.

Meadowlarks are artful builders, creating a domed grass nest with a side door in a depression or scrape on the ground. The nest is delicately woven into the surrounding vegetation. The female lays three to seven white eggs that are heavily spotted with brown and lavender, incubating them for 13-15 days.





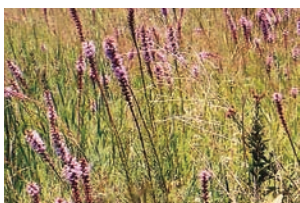
## Upland Sandpiper

*Bartramia longicauda*

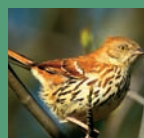
Upon hearing the 'wolf whistle' song of this species, you may turn around to see who is calling! Look for a graceful bird with long yellowish legs, a slender neck, lightly streaked breast and mottled brownish upper parts. Upland sandpipers frequently call from conspicuous fenceposts, and breeding males will sometimes launch into the air to perform a courtship flight.

Once common in hayfields, grassy wet meadows, pastures and abandoned fields, this bird was commercially hunted for its meat in the late 1880s. Its numbers have recovered somewhat, but are still low (and possibly declining again) in Ontario.

These sandpipers build their grassy nests in depressions within pastures or hayfields. The female lays four pinkish-buff eggs with brown spots, and after an incubation period of 22–27 days, both adults tend the young.



## Marginal Farmland



**F**armland management is more economically and environmentally sound if it respects the productive capacity of the land base (AAFC, 1996). When land is not suited to intensive row crop agriculture, it should be retired to pasture or natural cover such as woodland or grassland. Some examples of marginal farmland include:

- steeply sloping croplands that are vulnerable to soil erosion;
- stony fields that are not profitable to farm;
- poorly drained areas of cropland that habitually cannot be farmed;
- fragile shorelines along lakes, ponds and water-courses which are prone to compaction, flooding and erosion;
- any area on the farm that is not economically viable when yield and crop inputs are compared.

Marginal farmland that is retired acts as a transitional area between cropland and other natural areas.

Establishing and maintaining native trees, shrubs, wildflowers and grasses in these marginal areas provides habitat for birds.

## Deciding to Retire Your Land

Taking land out of production is a difficult decision that must be weighed against the economics of the farm operation. While it may be hard to justify permanently retiring some marginal areas, the decision may prove to be cost effective.

A cost analysis comparing the average gross production with the average fixed costs of a crop on five typical southern Ontario farms found that three of the five farms had sections of fields in which gross margins were lower than the fixed cost of farming that piece of land. In other words, low production sections of a field were actually costing more to be farmed than if they had been simply abandoned or enhanced for wildlife habitat. In such cases, retiring farmland can improve the efficiency of the farm operation and allow farmers to concentrate on more productive lands (Brethour et al., 2001).

Alternatively, some lands are simply too fragile to farm. Thin or stony soils are not suitable for cultivation, nor are lands on

steep slopes or areas adjacent to wetlands or streams (AAFC, 1996). Weighing the environmental impacts of farming unproductive, erodible, and fragile lands generally results in a decision to retire these marginal areas.

## Retired Farmland is for the Birds

Retiring farmland and converting it to wildlife habitat boosts the diversity of bird life on the farm by increasing habitat diversity. As a retired area of farmland regenerates, different bird species will make use of it. In the early years, birds that prefer grassland cover will inhabit the area, including the eastern meadowlark. Later, when scattered trees and shrubs make their appearance, the area will appeal to birds such as the brown thrasher, eastern towhee, black-billed cuckoo or field sparrow.

Some suggestions for managing marginal farmlands for bird habitat are listed below.

- Consider the soil, surrounding landscape and geographical range of unique habitats such as savanna and tallgrass prairie in Ontario. Depending on where your property is located in the province, managing the land as a grassland may be



more advantageous for native species of birds than reforesting the area. Native grasses such as switchgrass and big bluestem provide cover for nesting birds.

- Where retired farmland currently exists as shrubby re-growth, ensure that native species are the most common plants. If possible, remove exotic species such as common buckthorn and autumn olive as they compete with more desirable native species.
- Where reforestation or forest enhancement is the goal, plant native trees, shrubs and vines. Shrubs and vines such as serviceberry, cherries, elderberry and wild grape are well suited to marginal farmlands and provide food for birds such as the eastern towhee.
- Plant a diversity of native deciduous and coniferous trees on marginal lands to provide shelter and cover for birds. Planting groups of trees in a field will help to establish 'pods' of woody growth that will seed into other areas of the abandoned field and speed natural regeneration from field to forest.
- Create piles of stone and brush for cover and nesting materials for low-brush nesting songbirds such as the gray catbird. These types of structures are especially useful where marginal land abuts woodland habitat (AAFC, 1996).
- Provide nesting structures to enhance suitable nesting habitat. Boxes for tree swallows or eastern bluebirds are available for purchase and are easy to make.



## Brown Thrasher

*Toxostoma rufum*

Brown thrashers have one of the most extensive vocal repertoires of any North American bird, with an estimated 3,000 various combinations of musical phrases! Most commonly, you will hear them sing a complex chorus of twice-repeated phrases.

Brown thrashers have vivid reddish-brown upper parts and are white below with dark brown streaks. Their large, curved beak, long tail and yellow eye no doubt strike fear into their main prey source – grubs and caterpillars. These birds also toss leaves aside to eat berries and seeds.

Despite the fact that brown thrashers are larger than a robin, they often go unnoticed since they are relatively secretive. They spend most of their time skulking about in thickets, field edges and overgrown pastures, especially those with hawthorns. Thrashers favour abandoned farmland, and often prefer areas away from human habitation. The twig and leaf nests of brown thrashers are usually constructed within the protected confines of hawthorn trees or raspberry bushes for added predator protection.



## Eastern Towhee

*Pipilo erythrophthalmus*

The eastern towhee can sometimes be heard energetically tossing leaves as it scratches the leaf litter looking for insects and seeds. While this ground-dwelling bird generally prefers dense brush and tangles, the male can be heard singing its signature tune from elevated tree perches. Listen for two accented introductory notes followed by a quavering trill likened to '*drink your tea-ea-ea.*'

The eastern towhee is a bird of striking patterns and colours, especially the male with its black back, hood and tail, white belly and rufous sides.

The cup-shaped nest of the eastern towhee is made of leaves, grass, twigs and rootlets, often lined with fine grass or hair and located in a scratched depression. The female lays three to four grayish to creamy-white eggs with brown spots. During egg-laying and incubation, the birds are very secretive. Once the eggs hatch, both the male and female help to raise the young.

Unfortunately, the eastern towhee is a frequent host of the brown-headed cowbird, a nest-parasite described in the following section.





## Strip Habitat



**S**trip habitat has nothing to do with bareness, and everything to do with vegetative cover! Strip cover refers to permanent corridors of vegetation such as fencerows, shelterbelts, windbreaks and grassy roadsides. Farms generally have significant amounts of strip habitat, which are configured in strips along the edges of fields or roadsides. These types of natural or planted corridors have long been recognized as beneficial on farms. Benefits include:

- providing habitat for bird species that control pests;
- reducing soil erosion from water and wind;
- moderating soil and air temperatures, increasing relative humidity and reducing rates of evaporation on fields;
- providing refuge (and increased productivity) for livestock, which often seek the shelter provided by habitat strips;
- shading and protecting farmhouses, reducing energy bills and acting as a sound barrier;
- providing timber, fruits, nuts or maple syrup,



depending on the species planted;

- increasing the aesthetic value of the farm (Baldwin & Johnston, no date).

## Strip Habitat is Critical for Birds

Strip cover is extremely valuable habitat for many birds, providing food sources, cover, singing perches and nesting areas for a variety of species. Farm landscapes that offer strip habitat, particularly fencerows, have been shown to contain more than six times as many bird species as farmland without such features (Best, 1983). A study that compared nest densities in plots of cropland versus strip cover found only 13 nests per 40 hectares in row cropland compared to 142 nests per 40 hectares in strip cover (Wooley et al., 1985). Migratory songbirds also make extensive use of strip habitat for feeding during their spring and autumn migrations, and depend on the fruits and seeds found in fencerows for sustenance (Friesen, 1994).

Recommendations for strip cover design and management vary depending on which species are desired and what farm operation benefits are important. Most of the birds that use strip cover are generalist species, well adapted to

foraging and nesting in human-dominated landscapes. The following section focuses on maintaining, enhancing and creating habitat for generalist species such as the red-tailed hawk, northern mockingbird, gray catbird, eastern towhee, song sparrow, yellow warbler, indigo bunting and eastern kingbird.

## Strip Cover Design Tips

- Where strip cover currently exists, try to maintain it. Allow strip cover to mature, as older strip cover contains greater plant and animal diversity. Be aware of tree root systems when cultivating fields, and try to give trees room to survive as healthy components of the farm. Water trees and shrubs during drought periods, and replace dead trees with young ones to maintain cover.
- To reduce nest losses, maintain roadside grassy areas by mowing them early in the spring or late in August, that is, before or after the breeding season (Best, 1983). Vesper sparrows, brown thrashers, eastern meadowlarks and red-winged blackbirds all actively use roadside shoulder habitat.
- Connect wildlife habitats when designing a wind-



break, shelterbelt or fencerow planting. Linking wetland areas and woodlands with strip cover on your farm will allow birds and other wildlife to move freely between these habitat types.

- Aim to provide diverse habitat. A mixture of herbaceous and woody cover is recommended. Bird species diversity is highest in strip cover with woody shrubs and trees, as opposed to herbaceous cover (Best, 1983; Brenner, 1991; Shalaway, 1985).
- Plant trees that serve the dual purpose of providing food and shelter. Raspberry can be used to create a living fence, and provides excellent food and cover for birds like the indigo bunting. Junipers reduce wind and soil erosion while producing berries for hungry migratory birds.
- Design strip cover to be as wide as possible. Work in Michigan suggests that fencerows should be more than three metres wide to reduce nest predation (Shalaway, 1985). Shelterbelts should be established eight rows wide and planted with a diversity of trees (Yahner,

1983). If you currently have strip habitat, design your planting to widen it and expand natural areas on your property.

- As long as they do not present safety hazards, keep old dead trees in strip habitats. These provide important resting and nesting resources for birds like the American kestrel, eastern screech-owl and black-capped chickadee.
- Establish nesting boxes for birds like the eastern bluebird along strip cover areas to help boost bird habitat on the farm.
- Fence livestock out of strip cover. Cattle may trample or feed on the understorey and ground cover, eliminating bird nesting, foraging and cover sources (Friesen, 1994).
- Control weeds without herbicides by using tree shelters, mulches and cover crops. Many pesticides kill the insect and/or vegetation species that birds depend on for food and cover, and may have negative effects on the birds themselves. Herbicides also stunt trees in strip cover, making them less healthy and able to cope with disease or drought.



## Strip Cover Specifics

- Windbreaks are one to five rows wide. Designed to control erosion, they are generally composed of coniferous species like white cedar or white spruce.
- Shelterbelts are five or more rows wide. Their main purpose is to reduce heat loss by wind. They are composed of both deciduous and coniferous trees.
- Fencerows are strips of trees and shrubs three to ten metres wide. They are often composed of deciduous trees, and may be planted or naturally established from adjacent lands.
- Roadsides are areas next to the road which may also serve as ditches.

## Cowbird Parasitism and Yellow Warblers

The brown-headed cowbird once followed bison herds in western Canada. As the cowbirds' range expanded eastward into Ontario, they began to inhabit areas where cattle were raised. Perhaps because of their nomadic lifestyle, cowbirds do not build a nest and rear their young. Instead, these birds have evolved as 'nest parasites,' laying their eggs in other birds' nests. From the cowbird's perspective, this parasitic strategy is a great way to let the host species do all of the work incubating and raising cowbird chicks. Indeed, cowbirds have been so successful that they now parasitize the nests of over 140 species of birds in North America.

Hosts of cowbird parasitism are generally smaller than the cowbird. The host female expends considerable energy incubating the unusually large egg in her nest, but her work truly begins once the egg hatches. Cowbird eggs generally hatch earlier than their fellow eggs, and the nestlings develop much more quickly than their nestmates. As cowbird chicks grow, they demand significant food resources from their host mothers. They are often fed at the expense of the legitimate offspring, who typically starve or are pushed out of the nest by the young cowbird.

The brown-headed cowbird is now common in Ontario. From elevated perches in strip habitat or along the edge of wood-

lands, it locates and monitors the nests of potential hosts. Unfortunately, its 'nesting' strategy is a contributing factor to the decline of some North American songbirds. It has been estimated that nest parasitism, mainly from the brown-headed cowbird, is the single leading cause of nest failures across a wide range of species, habitats and locations, accounting for 80% of nest losses (Martin, 1993).

Yellow warblers are among the most frequent targets of cowbird parasitism. Unlike many other birds, however, yellow warblers can recognize the eggs of brown-headed cowbirds when they find them in their nests. When this happens, the warblers will either abandon their nest or build a new nest on top of the old one and lay a new clutch of eggs. In an attempt to succeed against the persistence of cowbirds, yellow warblers have been known to stack more than five nests on top of one another! With this skill, and the bird's generalist habitat requirements, it is not surprising that the yellow warbler is one of the most common warblers in North America.



## Indigo Bunting

*Passerina cyanea*

Upon first glance, the male indigo bunting may appear almost black. When the sunlight diffracts on the bird's feathers, however, the brilliant blue colour for which the indigo bunting is named will shine forth. In contrast, the female indigo bunting is soft brown overall, with brown streaks on her breast and a whitish throat.

The indigo bunting is a tireless singer with a variable song of paired, accented notes likened to '*fire-fire, where-where, here-here, see-it, see-it*'.

Related to grosbeaks, the indigo bunting has a stout dark bill, which it uses to eat grasshoppers, beetles, grubs and weed seeds. It is a true strip habitat or 'edge' species, inhabiting orchards, shrubby fields, hedgerows, woodland edges and regenerating forest clearings. Raspberry thickets are one of its favourite haunts. Raspberry thorns protect its nest while it feeds concealed among the thickets.

## Eastern Kingbird

*Tyrannus tyrannus*

Eastern kingbirds look like they are ready for a black tie party. Their upper parts are uniformly dark gray to black and their under parts are bright white. The most distinguishing feature on these birds is the white band on the tip of their black tail. Their upright head feathers give them a somewhat pointy-headed silhouette.

Noisy and conspicuous, the eastern kingbird has been known to attack crows, hawks and humans intruding on its territory. The fearlessness and aggression of this bird doubtless earned it its common name of 'kingbird.'

In late summer or early fall, eastern kingbirds flock and feed on berries and insects, both of which they deftly snatch while on the wing. They prefer rural areas and woodland edge habitat, and are relatively easy to spot perched on utility wires and fenceposts along roadsides.





**F**or birds and other wildlife in southern Ontario, it is vitally important that rural woodlands be maintained and restored. To fully appreciate the situation, consider the fact that prior to the arrival of European settlers, forests once covered about 90% of the region. The vast majority of these forests have since been cleared for agricultural, residential and urban development. Today less than 0.07% of southern Ontario remains in old growth forests, and in some places even young or mature woodlands are uncommon (FON 2003<sup>c</sup>; FON, 2003<sup>b</sup>). Many of the remaining woodlands are isolated patches of forest, vulnerable to roads and other human disturbances that threaten their ability to maintain viable populations of plant and animal species over the long term.



Protecting and enhancing the farm woodlands that remain is key to preserving habitat for many birds. Farmlands near Ottawa with at least 20% forest cover have retained about 90% of the plants and animals found in large forest ecosystems, illustrating that agricultural systems and nature protection can be compatible (Middleton & Merriam, 1983).

### **Interior Forest Habitat**

In rural Ontario, some bird species are dependent upon relatively large remnant patches of forest. That is because larger patches of forest have what is called 'interior' forest habitat, that is, habitat that is 100 metres or more from the forest edge. Interior forest habitat offers many advantages that are critical for some bird species, including a reduced risk of predation or nest parasitism, reduced levels of competition, more hospitable temperatures and moisture conditions, and less susceptibility to human disturbances (FON, 2003). As a result, birds have much higher rates of nest success in larger forests (Friesen, 1994). Unfortunately, such forests are scarce or even absent in parts of southern Ontario, and in these areas many specialist migratory songbirds that depend on interior habitat such as the scarlet tanager,

veery, and ovenbird are declining (Francis & Austen, 1999).

Interior forest species have different needs than generalist species such as the eastern kingbird, brown-headed cowbird and yellow warbler. These generalists are well served by the strip and woodland edge habitats that are common in farmland areas. Also well served are many predators, parasites and competitors that make this habitat unsuitable for interior forest species.

### **Bigger is Better**

Both the regional and on-farm diversity of wildlife species will be maximized if larger patches of woodland habitat are retained or enhanced. If a farm has a woodlot that is greater than 200 metres in diameter, it may already have at least some interior habitat. Even if the woodlot is not sizeable enough to have interior habitat, the larger it is, the more species it will support. Conservation biology has shown that one large forest area will support a larger diversity of species than two or more smaller forest areas of the same total size. In other words, bigger is better!

The best way to manage woodlands for birds is to protect forests where they exist, and enhance them where possible. Below are some suggest-



ed woodland management techniques to improve bird habitat:

- Expand your woodland by planting around it or planting to connect it to adjacent woodlands. Forest edges that are densely vegetated provide greater protection to the forest interior and may contribute to higher nesting success (Martin, 1993).
- Plant native trees and control invasive exotic species such as autumn olive, common buckthorn, and tree of heaven. These species can invade and compete with the native vegetation upon which birds and other wildlife depend.
- Aim to increase interior habitat in your woodland. If you own a tract of forest with a field or gap in it, consider reforestation or retiring this field. Round or square designs have more interior forest than do long, narrow woodland strips. Where possible, work with neighbours to protect larger blocks of forest.
- Place roads and paths as close to the edge as possible (or outside) to maximize the interior undisturbed area of the forest (Harker et al. 1993).
- Fence woodlands or use thorny shrubs to keep livestock out. Trampling kills groundcover and saplings, increases the potential for introducing non-native seeds, compacts the soil and exposes root systems.
- Leave snags in the forest - standing dead trees are homes for the northern flicker, pileated woodpecker, black-capped chickadee and white-breasted nuthatch. They also serve as perches for birds of prey and food sources for insect-eating birds. More than 50 bird and mammal species in Ontario depend on cavity trees for nesting, roosting, feeding, storing food or finding cover. For every hectare of forest, a minimum of 12 small snags (less than 50 centimetres in diameter) and six large snags (more than 50 centimetres in diameter) is recommended (Lompart et al., 1997).
- Resist the urge to 'tidy up' the woodlot. Brush piles, dead logs and fallen woody material on the forest floor provide important habitat for birds. Ruffed grouse use logs to stand on for drumming rituals; other birds roost and nest in brush piles; and the insects living in decomposing material are food for ovenbirds, wood



thrush, wrens and nuthatches (MVCA, 1993).

- Feed the birds by maintaining or planting nut or 'mast' producing trees such as hickory, oak, cherry, butternut, maple and beech.
- If the woodland is being harvested, consult a professional forest ecologist and use a selection harvesting system where mature trees are selected based on size, spacing and income potential. Harvest in the winter or late summer to minimize disturbance during the critical nesting and breeding periods (AAFC, 1996). It is recommended that logging operations maintain five to ten percent of older, mature trees.

## Naturalizing Tree Plantations

Many farm woodlands are plantations consisting of even-aged trees of one or two species. Plantations are often not favoured by many bird species since they can lack desirable native habitat features and diversity. Nonetheless, conifer planta-

tions play an important role in reducing soil erosion and the water cycle. They can also be considered 'nurse' crops for forest regeneration if they are allowed to undergo succession to a diverse mature forest of mixed hardwood and conifer species. Giving this regeneration process a helping hand can be a general objective in managing a plantation. It can offer increased farm income from marketable wood products, while enhancing habitat for birds.

One approach to speeding up forest regeneration is to create canopy gaps where sunlight can reach the forest floor. Cut openings in about two to five percent of the plantation in addition to trees taken in regular thinnings. Gaps six to ten metres in diameter will create growing conditions favourable to the natural regeneration of species such as ash, maple and beech. If gaps are cut in the vicinity of a stand of these species, seeding may take place naturally. Otherwise, it may be necessary to plant the gap areas with suitable trees (Lompart et al., 1997).





## Scarlet Tanager

*Piranga olivacea*

In Central and South America there are over 200 brightly coloured tanager species, but here in Ontario, the only nesting tanager is the scarlet version of this vast bird clan. Preferring extensive mature woodlands, scarlet tanagers feed and nest in the tallest reaches of the forest.

Despite their brilliant red plumage, scarlet tanagers are surprisingly difficult to see as they dart and flit in the canopy in search of insect prey. During poor weather conditions when insects move lower in elevation, you may be lucky enough to see a tanager at eye level. Look for the black wings and tail and pale bill of the male and female birds. Breeding males have brilliant red bodies whereas non-breeding males and females are olive coloured above and yellow below. Listen for them in large patches of deciduous or mixed forest cover. They sing a series of four to five whistled phrases, like a robin, but raspier - as if the robin had a sore throat.

Scarlet tanagers need interior forest habitat. They are very sensitive to the phenomenon known as forest fragmentation (when forests are cut up into smaller, more isolated patches by roads, urbanization, agriculture, etc.). They are one of the migratory bird species most sensitive to losses of forest cover in southern Ontario (Cadman, 1999; Villard, 1999).

## Red-eyed Vireo

*Vireo olivaceus*

Chances are you have heard a red-eyed vireo singing in the canopy or understorey of a woodland before. Male red-eyed vireos sing continuously through the day in the spring and summer, long after most other songbirds have finished their courtship performances. The woodlands seem to ring with their repetitive phrases, 'Here I am! Where are you? Over here! Here I am!' Indeed, red-eyed vireos are capable of delivering more than 20,000 songs per day!

Red-eyed vireos are best identified by their white eyebrow topped by their gray crown, olive green upper parts, white or pale gray underparts and lack of wing bars.

One of the most common and widespread birds in Ontario, red-eyed vireos are found in high concentrations in large deciduous woodlands with a shrubby understorey. Red-eyed vireos will inhabit smaller forests than the scarlet tanager and will even nest in well wooded residential areas, with up to approximately one pair per half hectare in ideal habitat (Villard, 1999).





**F**resh water resources are a precious commodity around the world, and are especially important on the farm. Recent events such as prolonged droughts, low water levels in the Great Lakes and water quality issues like the Walkerton tragedy have brought concerns about water quality and quantity to the fore. Humans in rural areas and towns depend on farmers to be good stewards of water resources. So do livestock, wildlife and birds, particularly waterfowl. Often reliant on ground water, farmers are especially aware of the need for careful stewardship of the wetlands, ponds, tile drainage outlets, lakes, streams and drainage channels on their properties.



### If It Isn't Broken...

Water resources and the lands that surround them provide incredibly productive habitat for birds like the least bittern, osprey, great blue heron and a variety of waterfowl. These aquatic systems also provide ready sources of water for irrigation and other on-farm tasks. The best way to protect their quality and quantity for humans and birds alike is to leave them alone. This means avoiding, wherever possible, either draining, damming or cultivating near wetlands, streams, and other water bodies. It also means managing the surrounding landscape wisely so that functioning systems are not impaired. Integrated pest management and conservation tillage, for example, can help maintain

the natural productivity of these systems (AAFC, 1996).

Two additional techniques, creating buffer strips and restricting livestock access to waterways, are described below. Each provides an effective way of managing water quality and quantity for the benefit of humans, livestock and birds.

### Buffer Strips

Buffer strips are living filters that separate natural areas from intensive agricultural activity. They are strips of land maintained in permanent vegetation, designed to intercept agricultural runoff, including pesticides, nutrients and animal wastes. Buffer strips are generally established in areas adjacent to water sources that provide low yields and are diffi-

cult to farm due to slopes, erosion, or high soil moisture content. (AAFC, 1997). Buffer strips are common sense conservation, and can provide a host of associated benefits that counteract serious environmental problems:

- **Water pollution.** Buffer strips slow the flow of water. When water is slowed, soil particles carrying pollutants like phosphorus are trapped. Some pollutants can then be assimilated by plants. Slower water also means increased infiltration of dissolved pollutants into the soil. Rainwater trapped in buffer strips helps to dilute pollutants before they reach waterways (CTIC, 2002).
- **Flooding.** Tree roots and vegetation in buffers reduce floodwater velocity and erosive force, preventing the erosion of valuable cropland during storm events. Roots also hold stream bank soils in place while vegetation blocks stream debris from entering cropland (LandOwner Resource Center, 2000).
- **Erosion and sedimentation.** Properly designed buffer strips enhance sheet flow of water over an area of vegetation, slowing water velocity and encouraging sedimenta-

tion. Less sediment in streams and wetlands means a healthier aquatic ecosystem. On the land, slower water movement reduces the erosion of fertile topsoil and creates fewer gullies (CTIC, 2002).

- **Biodiversity loss.** Buffer strips of grass, shrubs and trees provide nesting cover, travel corridors and food sources for a variety of wildlife. Birds are often found in buffer strips, which act as habitat hideaways for nesting waterfowl as well as hunting grounds for marshland birds like great blue herons.

## Buffers for What?

While farm run-off is best controlled at the source by good cropland management including conservation tillage, buffer strips provide one last line of defence. Because buffer strips are a management technique that is often used to accomplish a number of purposes, a corresponding number of designs or types of buffers exists. Below are some of the most common types of buffer strips (LandOwner Resource Center, 2000):

### *Filter Strips*

The workhorses of the buffer strips, these bands of grass are generally planted beside a crop



or livestock area to help filter sediments, nutrients and pesticides in runoff before they reach wetlands, streams or ponds.

#### *Grassed Waterways*

These are strips of grass in cropland that are positioned in areas where water concentrates as it runs off a field. Used primarily to control gully erosion, grassed waterways can be designed or combined to work with filter strips (LandOwner Resource Center, 2000).

#### *Riparian Buffers*

Trees, shrubs and grasses that line the edge of a stream or river are called riparian buffers. These buffer strips contain more woody species than filter strips. As a result, riparian buffers have an increased ability to mitigate streambank erosion, shade waterways for fish, and provide cover for birds and other wildlife that breed, feed or live near water.

#### *Shallow Water Buffers*

Placed primarily around wetland areas such as ponds, swamps or wet spots in fields, these buffer plantings are designed more for habitat than filtration, although they perform many of the same functions as do the types of buffer strips previously mentioned.

#### **Birds Benefit from Buffers**

In agricultural areas dominated by row crops, buffer strips are a welcome haven for species such as mallards, common yellowthroats, song sparrows and red-winged blackbirds. Some considerations for enhancing buffer strips for birds are noted below.

#### *Buffer Strip Plant Species*

The plant species included in a buffer strip will vary depending on the purpose of the buffer. The table below compares the benefits of grass, shrub or tree species in buffer plantings.

#### ***Relative effectiveness of different vegetation types for providing specific benefits in buffer strips.***

Benefit	Vegetation type		
	Grass	Shrub	Tree
Stabilize bank erosion	Low	High	High
Filter Sediment	High	Low	Low
Filter nutrients, pesticides, microbes			
Sediment-bound	High	Low	Low
Wildlife Habitat			
Range/pasture/prairie wildlife	High	Medium	Low
Forest wildlife	Low	Medium	High
Economic products	Medium	Low	Medium
Visual diversity	Low	Medium	High
Flood protection	Low	Medium	High

(Dosskey et al 1997)

Note that the bird species using a buffer strip will vary depending on the vegetation planted. If grassland birds are your focus, aim to plant native warm season grasses. Their ability to withstand drought conditions and their low requirements for maintenance make them the ideal cover for filter strips and grassed waterways as well as a suitable component of riparian buffer strips.

To maximize the utility of your buffer strip for birds in general, focus on planting the widest, most species-diverse buffer that you can afford. While grasses trap sediments and pollutants, woody vegetation can remove nitrates from sub-surface ground water flowing beyond the reach of grass roots (CTIC, 2002). The general rule in species selection for buffer strips is that the more natural the buffer strip – the more native plants there are – the less maintenance it will require (Livestock Manure Pollution and Prevention Project, 2000).

## *Habitat Width*

Wider buffer strips are more attractive to birds. Research also indicates a positive relationship between the diversity of bird species and the width of vegetation strips adjacent to water bodies (Stauffer & Best, 1980). While even a few

metres can provide some benefit, wider buffers are better. For maximum wildlife benefit, buffers should be 50 metres wide or more (AAFC, 1996). Significantly more migratory songbirds have been found in buffers that are wider than 25 metres than in those that are narrower, due to the lower frequency of disturbance (Croonquist & Brooks, 1993). Many species of birds, notably ducks, nest in areas up to one kilometre from a stream, marsh or wetland, and mallards commonly nest up to 300 metres from wetland edges.



## **Livestock and Waterways Don't Mix**

For years, pasture managers selected grazing areas that included a creek or river as a water source for livestock (McCormack, 1998). Direct access was an inexpensive means of providing water for



the animals. Concerns about water quality and wildlife habitat, however, are calling this practice into question.

Depending on the grazing intensity and the physical characteristics of the site, the impact of allowing livestock to access water from streams, ponds and wetlands can range from small to very significant. Generally, livestock have detrimental impacts on the water quality and bank vegetation of a waterway, and excluding them from water sources is becoming a common land stewardship technique (AAFC, 1996). In a waterway, unrestricted livestock can:

- contract foot rot, mastitis and waterborne diseases by wallowing in water and muck;
- increase the costs of drain maintenance and dredging to farmers through trampling and subsequent erosion;
- trample the banks of waterways causing erosion and sedimentation that negatively affect water quality and the aquatic ecosystem;
- compact the soil along the banks of waterways, killing vegetation;
- deposit manure in or near waterways, causing water pollution and threatening the health of humans and livestock downstream;

- disturb or destroy important bird and wildlife habitat adjacent to waterways.

### The Multiple Benefits of Exclusion

Excluding livestock from waterways can result in many benefits, including improved herd health, healthier bank vegetation, reduced erosion, reduced drain maintenance costs, improved drinking water quality and better bird habitat (DUC, no date). These benefits will be felt both on the farm and beyond. As streams or creeks flow across private and public lands on their way to larger rivers or lakes, actions that affect them at any point will have an impact on all the life downstream.

For example, sedimentation from erosion is the primary threat to fish in many Ontario waterways. Sediments from farming activities can smother fish eggs and alter the amount of light reaching aquatic plants. While conservation tillage and buffer strips help to limit the impacts of erosion from farm fields, excluding livestock from waterways further reduces sedimentation downstream. Healthy aquatic ecosystems, in turn, can help to support healthy bird populations, providing food for great blue herons, ospreys, belted

kingfishers and spotted sandpipers.

### Exclusion Fencing

The multiple benefits of livestock exclusion are prompting many Ontario farmers to fence their ponds, streams and wetlands and to provide alternate watering sources for their herds. The most cost-effective and common method of fencing a waterway is to erect a two-strand electric fence around the waterway. A recent study by OMAF shows that high-tensile electric fencing is one quarter the cost of nine strand page wire and one third the cost of double strand barbed wire (DUC, no date). One strand of wire placed 75 centimetres (30 inches) from the soil will control cows, yearling heifers and horses, but two strands, one at 45 centimetres (18 inches) and one at 90 centimetres (36 inches), are often used (DUC no date).

Creating living fences along waterways is another method of restricting livestock access. Densely planted trees and shrubs will, in time, effectively fence an area and provide cover and habitat for birds (AAFC, 1997). Complementing a living fence with a temporary fence while plants become established is essential to ensuring plant survival. Raspberry and hawthorn

species are good choices for living fences and for bird habitat, as they provide food, cover and nesting spaces for many birds. Living fences physically and visually protect stream, pond and wetland bank vegetation and limit stream crossings, making these sites more suitable for marsh birds, nesting waterfowl and other species sensitive to disturbance.

### Alternate Watering Systems

Once cattle are excluded from a waterway, an alternate watering system is required. Alternate watering systems provide improved water quality and quantity for livestock. If they are given clean and readily available water, livestock will consume their required water intake and be more productive (McCormack, 1998). Many options are available for these systems, including solar powered pumps that also supply power to remote electric fencing, gravity-fed ram pumps or nose-pumps that are operated by the cattle themselves.





## Common Yellowthroat

*Geothlypis trichas*

This masked songster is a common visitor to wetlands across Ontario. The common yellowthroat belongs to the wood-warbler family. While its bright colouration seems in line with its kin, its preference for wet overgrown meadows and cattail marshes sets it apart from other wood-warblers.

Male common yellowthroats visit preferred singing perches in rotation and fiercely guard them from other males. From these spots, they sing their distinctive 'witchity-witchity-witchity-witch' song.

Common yellowthroats do, indeed, have a yellow throat, as well as a yellow breast and undertail coverts. Males also have a black mask with a white upper border. Their olive-green upper parts and dingy white belly contrast with their bright yellow throat. Female yellowthroats do not have the distinctive mask, but do have a white belly and may show a faint eye ring.

Common yellowthroats nest on or near the ground among emergent aquatic vegetation such as cattails and eat insects, including dragonflies and beetles, and spiders. Their nesting habits and food and cover preferences make them direct beneficiaries of buffer strips.

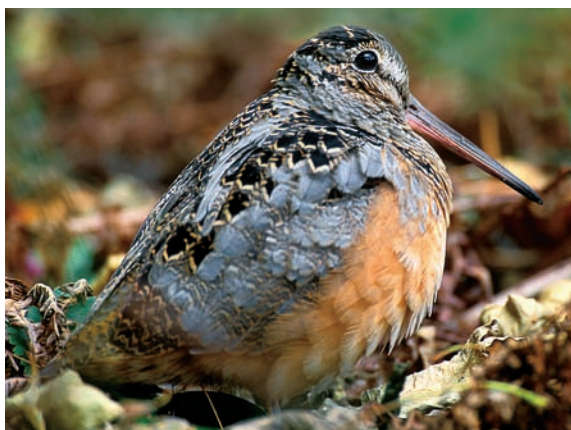
## American Woodcock

*Scolopax minor*

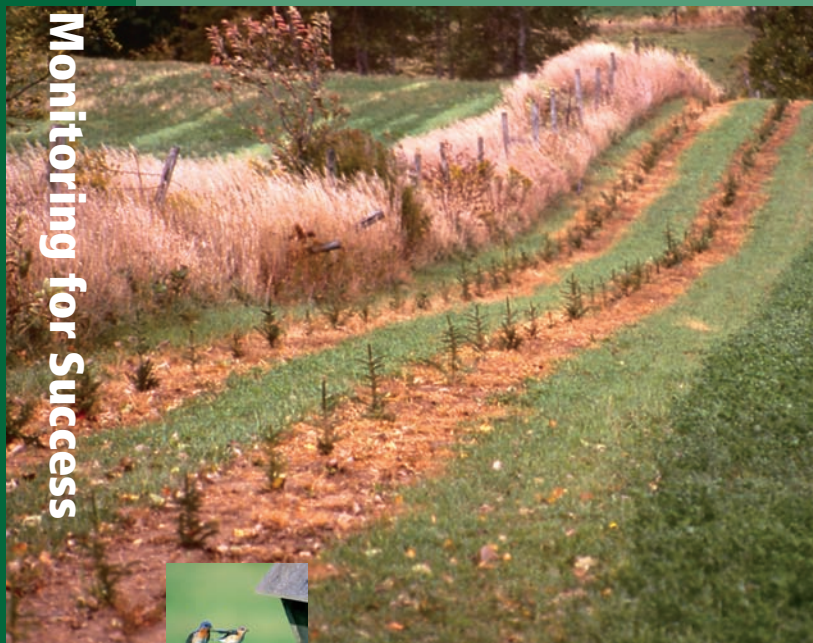
These chunky little birds put on a springtime show that is worth the wait! In early evening, where open grassy areas abut wetlands, you may find an American woodcock wrapped up in his courtship displays. These birds strut or turn on the spot, stopping every quarter turn or so to call a loud 'peeent' in a nasal voice. After a number of vocalizations, the woodcock twitters through the air in a circular flight display, and then plummets to the ground, zigzagging like a falling leaf. It is the woodcock's rounded wings that make the noises you hear as the bird flies up and falls down in its display.

Other than during the breeding season American woodcocks are shy and inconspicuous birds. Their camouflaged plumage helps keep them well hidden in the moist woodlands and damp thickets adjacent to grassy areas where they live.

The woodcock's long sturdy bill helps it to probe in soft soil for earthworms and insect larvae and to pinch snails, millipedes and seeds from plant material. The American woodcock has short legs and a short neck, and unusually large, dark eyes. Its most distinctive field marks are the light coloured bars on its otherwise black crown. These are arranged perpendicular to the direction of its bill, a feature that helps to distinguish it from the common snipe, which has facial and head stripes parallel to its bill. In addition, the woodcock's brown or buff breast colourations differ from the snipe's whiter breast plumage.







**M**onitoring the numbers and species of birds seen at the farm will help you to realize the impact of the farm management techniques included in this book on bird populations.

Joining a local nature group is a great way to share and learn from like-minded people. Ontario Nature's Nature Network represents over 130 member groups across the province, and can help you join or organize a group in your area. Local nature groups often sponsor bird appreciation activities, and can help you get involved in bird monitoring programs that focus on your farm or that have a continent-wide scale. Some of the activities open to volunteers include the annual Christmas Bird Count, the Ontario Nest Record Scheme, Project Feeder Watch and the Ontario Breeding Bird Atlas.



## Christmas Bird Count

**T**he Christmas Bird Count (CBC) is coordinated by Bird Studies Canada in partnership with the Audubon Society. The yearly birding events that take place for this monitoring program are organized by individual field naturalist groups or private individuals. Local rivalries and the long history of this survey have made the CBC one of the biggest social and sporting events in the birding world. Now in its second century, the CBC draws over 50,000 counters from across Canada, the United States and Latin America for a one day event within a two-week window during the Christmas season. During that one day, all of the birds seen in a 24 kilometre diameter circle are identified, counted and recorded. The results of each group's count are then compiled and added to the CBC database. Each counter's findings, rated on a birds-per-person-hour scale, can then be compared to findings from as far back as 1900 to determine trends in bird numbers and distributions.

## Ontario Nest Record Scheme

As the name suggests, this program tracks the health of Ontario's bird populations by maintaining records of nesting success and nest distribution.

Volunteers fill out a data card for each nest they find and monitor, and data is submitted to the Royal Ontario Museum, which coordinates this program. Data gathered may be used to study breeding bird distributions, clutch size and hatchling success, the impacts of brown-headed cowbirds and nest predators, as well as changes in nesting dates. Among important data gathered are egg laying dates, which can then be used to help identify safe periods for management activities such as harvesting hay or timber. Farmers with bird nests in their fields are ideal observers for this program.

## Project FeederWatch

Project FeederWatch involves thousands of ordinary people in the business of observing their winter bird feeders and recording the results in the interest of science. The program is active continent-wide and is managed by Bird Studies Canada and the Cornell Laboratory of Ornithology with additional support from the Canadian Nature Federation and National Audubon Society. On two consecutive days every two weeks between November and April, observers take note of weather conditions and mark down the greatest numbers of each species seen at one time at the feeder. The information collected helps to

track changes in the abundance and distribution of bird species that use feeders in the winter. For a \$25 registration fee, participants receive a poster of common winter birds, a bird calendar, the Bird - Watch Canada newsletter, and instructions about the program. Project FeederWatch is a great way to learn more about the birds that visit your bird feeder and your farm throughout the winter.

### **Ontario Breeding Bird Atlas**

The second Ontario Breeding Bird Atlas is a volunteer-based

project to gather data on the distribution and abundance of bird species breeding in Ontario. Data for the second atlas is being collected over a five year period, from 2001 – 2005. Volunteers look for evidence of breeding and abundance for as many species as possible. The data provide information on the distribution of birds throughout the province, including range expansions and population changes since the first atlas was conducted in 1981-1985.

**Visit: [birdsontario.org](http://birdsontario.org)**





**T**his section of the **guide book** is designed to put landowners in touch with organizations that act as clearinghouses for conservation information, environmental farming techniques as well as networking resources. Some of the organizations listed may offer financial programs to assist individual farmers in the implementation of the techniques noted in the book. Funding programs and project eligibility vary from year to year. It is recommended that contact be made prior to planning a project for which financial assistance is required.

## Ontario Nature

Ontario Nature protects and restores nature through research, education and conservation action. Ontario Nature champions woodlands, wetlands and wildlife, and preserves essential habitat through its own system of nature reserves. It is a charitable organization representing 30,000 members and over 140 member groups across the province, connecting individuals and communities to nature.

Contact Ontario Nature to network with local naturalist groups, to find out more about protecting bird habitat through conservation easements and land donations, or to inquire about the (2001-2005) Ontario Breeding Bird Atlas.

Ontario Nature  
366 Adelaide St. West, Suite 201  
Toronto, ON  
M5V 1R9  
1-800-440-2366 or (416) 444-8419  
E-mail: [info@ontarionature.org](mailto:info@ontarionature.org)  
Website: [www.ontarionature.org](http://www.ontarionature.org)

## Nature Canada

Nature Canada is the national voice of naturalists in Canada. It represents more than forty thousand individual members and supporters in every province and territory, together with over one hundred affiliated organizations, including local and provincial naturalist groups. Nature Canada's mission is to protect nature, its diversity and the processes that sustain it. As the Canadian BirdLife International co-partner with Bird Studies Canada, Nature Canada is involved in a global effort to improve the quality of life for birds, other wildlife and people. Together they have identified a network of Important Bird Areas across the country, and are working to safeguard these essential sites for Canada's birds.

85 Albert St, Suite 900  
Ottawa, Ontario  
K1P 6A4

Phone: 1-800-267-4088  
or 613-562-3447  
Fax: 613-562-3371  
Email: [info@naturecanada.ca](mailto:info@naturecanada.ca)  
[www.naturecanada.ca](http://www.naturecanada.ca)

## Bird Studies Canada

Bird Studies Canada (BSC) is recognized as a leading conservation organization dedicated to advancing the understanding, appreciation and conservation of wild birds and their habitats in Canada and elsewhere. BSC coordinates programs on regional, national and international scales, including many of the bird monitoring programs mentioned in this guide book. BSC is also one of the Canadian BirdLife International co-partners and is involved in a global effort to protect essential bird habitat through the delivery of the Canadian Important Bird Areas Program. Contact BSC to find out more about Project Feeder Watch, the Ontario Nest Record Scheme and the Christmas Bird Count, or to find out more about birds and bird conservation in your area.

Bird Studies Canada  
P.O. Box 160  
Port Rowan, ON  
N0E 1M0  
1-888-448-BIRD  
E-mail: [generalinfo@bsc-eoc.org](mailto:generalinfo@bsc-eoc.org)  
Website: [www.bsc-eoc.org](http://www.bsc-eoc.org)

## Canadian Organic Growers

Canadian Organic Growers (COG) is a national information network for organic farmers, gardeners and consumers. COG's mission is to be a leading organic information and networking resource for Canada, promoting the methods and techniques of organic growing along with the associated environmental, health and social benefits.

Canadian Organic Growers  
National Office  
323 Chapel Street  
Ottawa, Ontario  
K1N 7Z2  
Tel: 613-216-0741

Toll-free: 1-888-375-7383  
 Fax: 613-236-0743  
 Email: [office-at-cog.ca](mailto:office-at-cog.ca)  
 Website: [www.cog.ca](http://www.cog.ca)

### **Canadian Wildlife Federation**

The Canadian Wildlife Federation (CWF) is dedicated to fostering awareness and appreciation of our natural world. By spreading knowledge of human impacts on the environment, sponsoring research, promoting the sustainable use of natural resources, recommending legislative changes, and cooperating with like-minded partners, CWF encourages a future in which Canadians live in harmony with nature.

Canadian Wildlife Federation  
 350 Michael Cowpland Drive  
 Kanata, ON  
 K2M 2W1  
 1-800-563-WILD  
 Email: [info@cwf-fcf.org](mailto:info@cwf-fcf.org)  
 Website: [www.cwf-fcf.org](http://www.cwf-fcf.org)

### **Canadian Wildlife Service**

The Canadian Wildlife Service (CWS) is Canada's national wildlife agency, handling wildlife issues that are the responsibility of the federal government. CWS is involved in the protection of migratory birds, wildlife habitat, endangered species, and research on nationally important wildlife issues, among other program areas.

Canadian Wildlife Service – Environment Canada  
 351 St. Joseph Boulevard  
 Hull, QC  
 K1A 0H3  
 (819) 997-1095  
 Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)  
 Website: [www.cws-scf.ec.gc.ca](http://www.cws-scf.ec.gc.ca)

### **Conservation Ontario**

*Local Conservation Authority Programs*  
 Members of Ontario's 36 Conservation Authorities are working individually to ensure clean water, prevent flooding, reduce erosion, preserve wildlife, and provide local conservation and recre-

ational spaces in the province. Through the development and delivery of programs to restore and manage Ontario's water resources, Conservation Authorities are closely linked to local stewardship activities. Some of the projects likely to be supported by a local Conservation Authority include restricting livestock from waterways, and planting buffer strips and strip habitat. Conservation Authorities serve individual landowners, providing stewardship advice and, in some cases, funds related to waterway protection and restoration.

Individual Conservation Authorities develop programs to protect the urban and rural lands that form part of the watershed under their jurisdiction. To find out if there is a funding program related to an ecological farm management technique noted in this book, contact Conservation Ontario and have them put you in touch with your local Conservation Authority.

Conservation Ontario  
 P.O. Box 11  
 120 Bayview Parkway  
 Newmarket, ON  
 L3Y 4W3  
 E-mail: [info@conservation-ontario.on.ca](mailto:info@conservation-ontario.on.ca)  
 Website: [www.conservation-ontario.on.ca](http://www.conservation-ontario.on.ca)

### **Ducks Unlimited Canada**

Ducks Unlimited Canada conserves, restores and manages wetlands and associated habitats for North America's waterfowl and other wildlife. As a result, this organization is active in rural Ontario and, in the past, has offered funding programs such as Ontario Land Care and the Rural Conservation Club Program. These funding initiatives featured partnerships with local farmers and community pasture managers to implement ecological agricultural management techniques. Their past experience in ecological farming techniques makes Ducks Unlimited staff a valuable resource for advice and help with conservation initiatives on farms, as are the

organization's wetland related publications and profiles of past projects. Ducks Unlimited does provide some financial assistance for agricultural projects, particularly those involved in wetland management.

Ducks Unlimited Canada  
566 Welham Road  
Barrie, ON  
L4N 8Z2  
(705) 721-4444  
Email: [du\\_barrie@ducks.ca](mailto:du_barrie@ducks.ca)  
Website: [www.ducks.ca](http://www.ducks.ca)

### **Environmental Farm Plan Incentive Fund**

The Environmental Farm Plan is a voluntary educational program for farmers and their families. Currently, over 26,000 farm families have been engaged in the EFP program, which is delivered locally by the Ontario Soil Crop and Improvement Association on behalf of the Ontario Farm Environmental Coalition. The EFP program involves workshops to help participants work through the process of conducting an environmental risk assessment and developing an EFP. Once a plan has been prepared, the program offers financial incentives to assist farmers making positive environmental changes and implementing new management practices. (See OSCIA, p.71.)

### **Ontario Federation of Anglers and Hunters**

#### *Local Habitat Restoration Programs*

Individual Ontario Federation of Anglers and Hunters (OFAH) club members participate in any number of local and provincially significant habitat restoration projects. Members of the OFAH have been planting trees, creating stream buffers, installing wood duck nesting boxes and protecting wetlands and woodlands to provide better habitat for wildlife. Locally based clubs sometimes have funds to disperse for habitat enhancement. For more information about current funding opportunities, contact:

Ontario Federation of Anglers and

Hunters  
P.O. Box 2800  
Peterborough, ON  
K9J 8L5  
(705) 748-6324  
Email: [ofah@ofah.org](mailto:ofah@ofah.org)  
Website: [www.ofah.org](http://www.ofah.org)

### **Ontario Ministry of Agriculture and Food and Agriculture and Agri-Food Canada**

These agencies maintain exhaustive information databases on their websites, and it is well worth a browse through for additional information, specialist contact information and ideas about ecological farm management techniques. While the majority of funding from these organizations is administered through other programs like the EFP, funding may be available for individual farmland enhancement projects.

Ministry of Agriculture, Food and Rural Affairs  
1 Stone Road West  
Guelph, ON N1G 4Y2  
Telephone: (519) 826-3100  
Toll Free: 1-888-466-2372  
Toll Free: 1-877-424-1300  
Local: (519) 826-4047  
Email: [ag.info.omafra@ontario.ca](mailto:ag.info.omafra@ontario.ca)  
<http://www.omafra.gov.on.ca>

Agriculture and Agri-Food Canada  
Sir John Carling Building  
930 Carling Ave  
Ottawa, Ontario  
K1A 0C7  
Telephone: 613-759-1000  
Fax: 613-759-7977  
Email: [info@agr.gc.ca](mailto:info@agr.gc.ca)  
<http://www.agr.gc.ca>

### **Ontario Ministry of Natural Resources**

If a farm woodlot is four hectares (10 acres) or more in size, tax savings may be gained by enrolling that land in the Managed Forest Tax Incentive Program, administered by the Ministry of Natural Resources. Other funding programs may be available through the MNR for fish



and wildlife habitat enhancement. The LandOwner Resource Centre is a unique extension service of the MNR and provides a suite of publications relating to restoration and land management, many of which are directly applicable to farmland.

MNR Southern Region  
300 Water Street,  
4th Floor, South Tower,  
P.O. Box 7000  
Peterborough, ON  
K9J 8M5  
(705) 755-2000  
Website: [www.mnr.gov.on.ca](http://www.mnr.gov.on.ca)

LandOwner Resource Centre  
P.O. Box 599, 5524 Dickinson Street  
Mantiock, ON  
K4M 1A5  
(613) 692-2390  
1-800-387-5304  
E-mail: [info@lrconline.com](mailto:info@lrconline.com)  
Website: [www.lrconline.com](http://www.lrconline.com)

### **Ontario Soil and Crop Improvement Association (OSCIA)**

The Ontario Soil and Crop Improvement Association (OSCIA) is dedicated to communicating and facilitating responsible, economic management of soil, water, air and crops. Their membership represents virtually all commodity groups across the province and is a credible, active grassroots voice on agricultural issues. OSCIA has 55 local county/district branches across the province and is a significant presence in all the major agricultural areas of Ontario.

Ontario Soil and Crop Improvement Association  
1 Stone Road W.  
Guelph, ON  
N1G 4Y2  
(519) 826-4124  
1-800-265-9751  
E-mail: [oscia@ontariosoilcrop.org](mailto:oscia@ontariosoilcrop.org)  
Website: [www.ontariosoilcrop.org](http://www.ontariosoilcrop.org)

### **Ontario Stewardship**

The Ministry of Natural Resources' Ontario Stewardship program is a community-based initiative that brings together landowners, associations, resource agencies and individuals who share an interest in responsible land care and sustainable resource use. The program advocates stewardship as a tool for land management.

Participants in the program are encouraged to work together to develop an ecosystem-approach for improving local stewardship and to create collaborative resource management tools. Local stewardship councils can assist in ecological farm management and can link farmers to other information sources for assistance with farm enhancement initiatives.

To become involved in the program, contact your local stewardship council or visit our website at:  
[www.ontariostewardship.com](http://www.ontariostewardship.com)

Mitch R. Baldwin MSc.  
Provincial Stewardship Coordinator,  
Ontario Stewardship Program  
Ontario Ministry of Natural Resources  
Southern Region Office  
300 Water Street 4th floor, South Tower  
Peterborough, Ontario, Canada  
P.O. Box 7000  
K9J 8M5  
Phone: 705-755-3278  
Email: [mitch.baldwin@ontario.ca](mailto:mitch.baldwin@ontario.ca)  
[www.ontariostewardship.org](http://www.ontariostewardship.org)

### **Society for Ecological Restoration**

Up-to-date information about invasive exotic species and native plants is available from the Society for Ecological Restoration, by mail or through their website.

SER Ontario Chapter  
(519) 888-4567 ext. 5616  
Email: [info@serontario.org](mailto:info@serontario.org)  
Website: [www.serontario.org](http://www.serontario.org)

### **Tallgrass Ontario**

This organization's strength lies in its focus on native tallgrass prairies in



Ontario. If you are interested in finding out more about warm season native grasses, or would like to find out whether restoring an old field on your property to a prairie ecosystem is suitable for your land, contact Tallgrass Ontario.

Tallgrass Ontario  
659 Exeter Road  
London, ON  
N5Y 2R7  
(519) 873-4631  
E-mail: [info@tallgrassontario.org](mailto:info@tallgrassontario.org)  
Website: [www.tallgrassontario.org](http://www.tallgrassontario.org)

### Wildlife Habitat Canada

#### *Wetland Habitat Fund*

Water quality and erosion projects, including buffer strips, native vegetation planting and restricted livestock access may be funded by the Wetland Habitat Fund (WHF). This fund provides private landowners with financial assistance for projects that improve the ecological integrity of wetland habitats. The WHF is directly supported by Wildlife Habitat Canada. The fund program favours projects that address local wetland and wildlife habitat issues, such as those initiated by farmers. Habitat projects that conform to WHF's criteria may be eligible for funds up to a maximum of 50% of the project cost or \$5,000 (whichever is less). To apply, contact the Program Manager to determine the WHF representative in your area, or visit <http://www.wetlandfund.com/whfcontacts.htm>.

1750 Courtwood Crescent, Suite 310  
Ottawa, ON  
K2C 2B5  
Phone: (613) 722-2090  
Toll-free: 1-800-669-7919  
Fax: (613) 722-3318  
Website: <http://www.whc.org>

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