

Managing Habitats for
Migrating Land Birds
in the Western Lake Erie Basin
A Guide to Landscaping and Land Management



Gerard M. Anderson © DTE Energy

“Because birds such as bald eagles, peregrine falcons and great blue herons find our facilities especially important as stopover sites during migration and as year-round habitats, we support a variety of avian programs. Twelve of our facilities are certified wildlife habitats and

four of our facilities are within the Detroit River International Wildlife Refuge. We are committed to our role as environmental stewards. It’s our responsibility and it’s the right thing to do.”

– **Gerard M. Anderson**, President & COO, DTE Energy

CRITICAL HABITAT FOR MIGRATORY BIRDS



Scarlet Tanager © Peter S. Weber/On Silent Wings

This is a practical guide describing how private landowners and managers of corporate lands, city parks and other public areas can manage habitats to assist birds as they migrate through the Great Lakes region, especially around Lake Erie. Protecting habitat in the Lake Erie watershed will fill critical stopover needs of migratory birds because little of the natural landscape remains in this region.

This guide focuses on land birds because populations of many species are declining, yet millions of birds travel through the western Lake Erie basin during spring and fall. We encourage you to adopt these landscaping and land management suggestions so that the birds have safe harbor and can pass successfully through the Lake Erie region. Latin and common names of plant species are listed on page 16.

This information complements existing bird habitat management guidelines:

- Migrating waterfowl (U.S. Geological Survey publications)
- Shorebirds—Management for breeding and migrating shorebirds in the Midwest (USFWS)
- Species Management Abstract—North American shorebirds (The Nature Conservancy) (conserveonline.org/2001/07/m/en/noamshor.doc).

COMMON QUESTIONS ABOUT BIRD MIGRATION AND LAND MANAGEMENT



Rose-breasted Grosbeak © Betty Darling Cottrille

What is a Migratory Bird?

Migratory land birds, which include birds as diverse as hawks, owls, hummingbirds, flycatchers, warblers and finches, regularly migrate between summer breeding grounds and non-breeding wintering areas. During migration, they must stop to feed and rest at what are known as stopover sites, the bird equivalent of overnight stays at motels on long road trips. Migratory birds, many weighing less than half an ounce, travel hundreds to thousands of miles between breeding and wintering areas and must use several stopover sites along the way. Scientists estimate that it takes birds 20-40 days or more, depending on weather, to travel 1,500 miles during spring migration. Peak spring movement of land birds in the Lake Erie watershed is April and May. In the fall, large numbers of migrating birds pass through from late August through October.

Migration is a stressful and hazardous undertaking. Many birds die during storms, collide with buildings or towers, are lost to predators, or even starve during abnormally cold weather. Some scientists have suggested that many more birds die during migration than during the breeding or wintering seasons. Hazards birds encounter during migration are a leading cause of death. Yet, in spite of the great difficulties of long-distance travel, birds must migrate south to escape winters in the Great Lakes when food is scarce or covered by ice and snow. If a bird survives until spring migration, it will once again expose itself to the hazards of migration and fly north to breed where there is a flush of food to raise its young.

Which Bird Species Migrate Through the Great Lakes Region?

The Great Lakes region, and particularly the western Lake Erie basin, is an important stopover area for all groups of migratory birds—millions of waterfowl, shorebirds, water birds (herons, rails, and cranes) and land birds on both their northbound

and southbound journeys. The high diversity of migrating birds can be attributed to the area's many different habitats, ranging from open waters of the Great Lakes to mudflats and marshes to grasslands and forests. These habitats produce many different types of food, and provide cover and roosting areas, thus attracting an abundant and wide variety of migrant birds.

Indeed, the Great Lakes region hosts some of the most spectacular concentrations of migrating birds in North America. Approximately 225 species of land birds regularly use this region during migration, including 15 species of raptors, 37 species of warblers and 21 species of sparrows. A complete list of bird species occurring in this region can be found in the book *Birds of the Toledo Area*.

Why is the Great Lakes Region So Important to Migrating Land Birds?

The Great Lakes present an obstacle to migratory birds, forcing many to concentrate in near-shore habitats. During migration and especially in spring, land birds, many of which

Migratory Land Birds of Special Concern in the Western Lake Erie Basin

Grasslands: Short-eared Owl, Henslow's Sparrow, Dickcissel

Shrublands: Red-headed Woodpecker, Willow Flycatcher,
Golden-winged Warbler, Blue-winged Warbler, Prairie
Warbler, Kirtland's Warbler



Dickcissel © Peter S. Weber/On Silent Wings

Forests: Olive-sided
Flycatcher, Wood Thrush,
Bay-breasted Warbler,
Cerulean Warbler,
Prothonotary Warbler,
Worm-eating Warbler,
Kentucky Warbler,
Canada Warbler,
Rusty Blackbird

migrate at night, accumulate in habitat patches along the shores of Lake Erie, in riparian corridors and in isolated patches of habitat, including woodlots, fields and wetlands.

The few remaining near-shore forests, shrublands, grasslands, and marshes of the western Lake Erie region, as well as coastal waters, provide a rich bounty of food that sustains migrating birds. It is here where some of the largest numbers of land birds can be found during migration. They find whatever food they can and prefer a diverse set of native plant species that provide shelter from weather and predators and a menu of foods, such as insects, fruits and seeds. Because habitats are in limited supply in the western Lake Erie region, open spaces including everything from small yards, large parks, forests, or corporate lands, can help the birds on their migratory journey.

Why Protect or Create Stopover Habitat?

Migratory birds need food-rich stopover sites with adequate shelter. Thus, providing good resting and refueling stops for migrating birds should improve their chances for a successful migration. That means more birds controlling insect populations, better bird-watching opportunities, greater potential for tourism and the satisfaction of knowing that landscaping for migratory birds benefits our environment as a whole.

What's good for the birds is good for us!



© Tim Daniel/Ohio Division of Wildlife

“The western basin of Lake Erie—with its wetlands, riparian and upland forests, and associated grasslands—has been globally recognized for its importance to migratory birds. The Ohio Division of Wildlife actively manages habitats in this region and partners with other agencies, conservation organizations and private landowners to meet the needs of migratory birds and other wildlife over their life cycles.”

David M. Graham,
Chief, Ohio Division of Wildlife

HOW TO CREATE, ENHANCE OR PROTECT STOPOVER HABITATS

Because each group of birds, and indeed, each species, may have different habitat requirements during migration, no single prescription fits all. Here we provide recommendations for managing habitats that will benefit the greatest number of land birds during migration. Managing habitats on your land can benefit birds regardless of where you live, but managing for land birds will be especially important for landowners with land 1) within five miles of Lake Erie, 2) along rivers, or near lakes or marshes, or 3) in urban or agricultural areas. The birds will benefit from your habitat management efforts and you will be rewarded by visits from a wide array of fine-feathered travelers.

Forest Habitats

In the western basin of Lake Erie, the landscape is dominated by agricultural land and urban areas, with forest habitats accounting for 5-10 percent of the land area. Forest

habitats fall into four main categories: beach ridge forest (along the immediate shoreline), wet forest, upland forest and shrub-sapling habitat. In most mature wet forests and upland forests, canopies are dense with occasional canopy gaps and less shrubby vegetation. Beach ridge forests have more canopy gaps and a well-developed understory.

Common Species of Native Trees and Shrubs in Lake Erie's Western Basin Include:

American elm	Cottonwood
Slippery elm	Boxelder
Hackberry	Red maple
Basswood	Sugar maple
Honey locust	Silver maple
White oak	Green ash
Northern Red oak	White ash
Pin oak	Hawthorn
Swamp white oak	Dogwood shrubs
Shagbark hickory	Willow shrubs

The Importance of Forests and Forest Succession to Migratory Land Birds.

Forests provide birds with the food, water, and cover they need to rest and replenish their resources prior to the next leg of their journey. Much of the difference seen in bird use of different woodlots (small patches of forest)—such as tree species and forest structure (height and density of vegetation)—relates to the successional stage of the woodlot.

As a general rule, shrub-sapling and mature forests will harbor the highest diversity and abundance of migrating (and breeding) birds. However, it is worth noting that different species are often found in these two forest types. Thus, managing for habitat diversity on your property will likely support the highest diversity of migrating (and breeding) birds. For migrating birds, it is best to encourage habitat diversity—both habitat structure and the variety of plant species present.

Succession refers to a change in the plant species and structure (height and density) of vegetation in a habitat over time. For example, in forest succession, a weedy field or cut forest slowly changes to become a mature forest. Following farm abandonment or forest cutting activities, grasses and herbaceous plants proliferate and provide land birds such as sparrows with insects, seeds and shelter. As succession continues, shrubs and tree seedlings colonize by seed or resprout from tree stumps. These areas provide shelter and food—insects, seeds and berries that songbirds such as catbirds, thrushes, vireos and warblers often consume.

The shrub-sapling forests develop into dense stands of small trees that shade-out other plants, creating an open understory layer. These young forest stands generally have fewer species and lower abundance of birds because they lack many features found in mature forests. As a forest matures, and becomes more diverse, it will receive heavier use by migratory and resident birds, due in part to the variety of available resources. Mature forests have a more diverse forest understory and canopy, high diversity of native trees, fruits in late summer and fall, trees that produce edible fruits and nuts, trees with cavities and openings created by dying, old trees.

CREATING HABITAT DIVERSITY IN FORESTS AND STREAM CORRIDORS



Indigo Bunting © Peter S. Weber/On Silent Wings

Important Trees and Shrubs

Certain tree species are especially attractive to migrant forest birds. In spring migration, oaks of a wide variety—willows, honey locust, elms and ashes—are favored by migratory birds foraging for insect prey. During southbound migration in late summer and fall, trees and shrubs that bear small fruits including dogwood shrubs, black cherry, sassafras and vines

such as grape and Virginia creeper are especially important for many migratory songbirds. Large trees have high potential for fruit production and fruiting trees along woodland edges are especially valuable because migrating birds are often concentrated at habitat edges. Trees that produce acorns and nuts, such as oaks, hickories and American beech, provide an important fall and winter food source for many birds such as Blue Jays and Red-headed Woodpeckers.

Enhancements to Layering Within Forests

Pay attention to the sizes of trees and shrubs and retain individuals in a variety of size classes for each species of native tree and shrub in your forest. This will tend to produce a multilayered forest with understory trees and shrubs, pole-sized trees that reach midstory or subcanopy layers and mature large diameter trees that form the forest

canopy. Increasing the number of layers in the forest should attract more species because some bird species prefer to feed in low shrubs (Gray Catbirds) or on the ground (Forest Thrushes, Ovenbirds), while others, such as Blackburnian and Tennessee Warblers, prefer to forage high in the forest canopy during migration.

Enhancing Forest Edge Habitats

Forest edges are often associated with increased diversity and abundance of birds and other wildlife, but can have negative impacts on some breeding birds. Abrupt edges are between very different habitats, such as between a mature forest and agricultural land, and may not be favored by birds. In contrast to straight edges, gradual edges are more structurally complex and seem to be favored by most migratory birds. Gradual forest edges can be made by allowing shrubs, saplings, and some canopy trees to remain at the boundary of a forest or woodlot, especially when adjacent to agricultural areas. Edges can be “feathered” by retaining more trees closer to the forest interior and gradually fewer trees closer to the

edge. If your forest management includes harvesting trees, you can create these types of edges during forest cutting or by planting shrubs and small trees along existing edges.

Retaining Streamside Buffers and Habitat Corridors

Riparian habitats (habitat adjacent to streams and rivers) support a rich diversity of flora and fauna and serve important ecological functions. Harvesting trees in the near vicinity of streams destroys riparian habitat for migrant birds and can harm aquatic life by increasing water temperature and sedimentation. To reduce negative impacts, leave buffer strips (preferably at least 50 to 100 feet wide) of unharvested trees along both sides of streams. Keep roads at least 50 feet away from stream edges and ponds and minimize the number of stream crossings. Create or retain corridors of shrubs and trees between woodlands and other native habitats so migrants can safely feed as they travel from place to place in search of the best “restaurants.”

Forest Management and Migrant Birds

In some areas, landowners may have an interest in harvesting timber and this will alter the habitats available for migrating land birds. There are two main approaches to forest management: even-aged and uneven-aged management.

Even-aged methods, such as clear-cutting, remove all or nearly all canopy trees resulting in forests dominated by trees of similar size and age. Uneven-aged management (cutting scattered individual trees or small groups of trees) creates forest stands with trees of a variety of sizes and ages.

Even-aged and uneven-aged approaches differ in which birds are favored because they promote either young shrub-sapling habitat or structurally diverse forest habitats. The best approach depends on the availability of nearby habitat and whether sensitive forest interior species occur in your area. For example, if you have one of the only large tracts of forest within several miles, which may be the case in the western Lake Erie basin, then forest birds may rely heavily on your land to meet habitat needs, and an uneven-aged approach may be

best. Uneven-aged management also may be appropriate within small woodlands if landowners want to sell some timber, but also maintain forest habitat for migrant land birds or other wildlife.

Forest Habitats and Their Distance from Lake Erie

Migratory birds concentrate along the shoreline of Lake Erie in both spring and fall. Recent research has shown that the occurrence of migratory land birds in mature forest patches declined by 30 percent with each mile inland from the Lake Erie shoreline. As a result, lands that are located closest to Lake Erie are likely to be most valuable for conserving migratory birds and therefore most important for habitat management and restoration. Beach ridge forests should be conserved, restored or created to establish a forest corridor along the lake shore wherever possible. This should be coupled with connectivity via rows of trees or shrubs to forest habitats located just inland from the lakeshore. This would increase habitat for many migrant birds and their ability to move within the landscape.

CORPORATE LANDS, BACKYARDS AND OTHER URBAN HABITATS

Habitat restoration is important in urban landscapes, where development has eliminated most natural areas for migrating birds. Restored urban habitats provide important refuges for migrating birds and landowners can play a key role by managing their properties in ways that can benefit migrant birds. Whatever your interests and however large or small your property or land available for management, you have the opportunity to attract migrating songbirds. Here are some ways that you can make your property more attractive to migratory birds:

Increase Habitat Structure

Convert as much of your property as possible to natural cover by creating patches of woody habitats. A 50 percent increase in the density of shrubs and trees creates a 50 percent increase in the number of land birds! Plant native tree and shrub species of different sizes to provide habitat



© Michael David-Lorne Jordan/DLP



Erie Marsh Preserve © Richard Baumer

for birds that feed at different heights. Cluster plantings to maximize cover and shelter and to promote natural reseeding in your bird haven. Leave the leaves—Hermit Thrushes, White-throated Sparrows, Ovenbirds and other ground foraging species will search the leaf litter for insects (and you'll have less raking to do!).

Reduce Lawn Area and Leave Corners Uncut

Lawns have little value to birds and are costly to maintain. Where possible, replace lawn with more natural habitats that

include trees, shrubs and native grasses. In addition to attracting wildlife, reducing the size of your lawn will accrue added benefits, including reduced maintenance costs (less mowing, conserve water, increase energy efficiency), reduced air pollution, and decreased runoff of fertilizers and pesticides. Even uncut lawn grasses such as non-native fescue, bluegrass and rye can provide meadow-like habitat for birds such as sparrows. This will add habitat diversity to your land. Check with local officials to see whether regulations require maintaining mowed lawns in your area.

Plant Native Trees and Shrubs

Plants offer a wide variety of resources for migratory songbirds, including flowers (nectar), fleshy fruits, hard mast (acorns, nuts), seeds and the insects that are found on plants. Native plants that bear fleshy fruits are important to migratory birds, especially during late summer and fall, when birds use fruits to meet energy requirements necessary for migration. By offering a variety of fruiting plants, you will attract a wider variety of bird species. If possible, select

plants that fruit at different times during the season to ensure that fruits and flowers are available throughout the migratory period. In addition, fruits that are available in winter months will be important for winter resident birds. *The Ohio State Extension* (Bulletin 865) provides a list of plants beneficial to migratory birds.

FORBS AND FLOWERS. Many native flowering herbaceous plants attract birds. Wild columbine, cardinal flower, wild currant and beebalm provide nectar for migrating hummingbirds, while seed-eating birds will feast on the seeds of sunflowers, purple coneflower, goldenrods and asters in fall.

VINES AND SHRUBS. Creating lush growth in a few places will simulate a natural environment. Birds prefer using areas of dense cover for nesting, perching and escaping from predators. You can plant or grow vines and shrubs along your house or a fence. Another benefit from the cover is additional privacy in your backyard. Vine and shrub species, especially those with small, fleshy fruits, are favored by

migratory birds. These species include wild grape, hawthorn, blueberry, blackberry, serviceberry (thrushes, jays, waxwings); dogwoods such as flowering, red-osier and gray dogwoods (a favorite of thrushes, catbirds, robins, vireos, and even some warblers in the fall); common elderberry; maple leafed viburnum; arrowwood; Virginia creeper; American bittersweet and sumacs. Species which fruit from August through October will be best as that is the principal time of land bird migration. This includes many species of dogwood, viburnum, hawthorn and wild grape.

TREES. Native trees that are favored by birds as foraging sites often support many insects and other important bird food during migration, including fruits and nuts. Among the preferred deciduous species are oaks, American beech, hickories, elms, willows, northern hackberry, red mulberry and black cherry. Conifers or evergreens, such as eastern red cedar, also attract migratory birds, as do white pine and eastern hemlock, all of which are native to northern Ohio and to Michigan. For deciduous trees and evergreens, both

foliage and seeds (acorns, seeds in pine cones) are dinner plates and shelter for birds. Some tree species, such as black locust, basswood and silver maple, do not attract birds and contribute only marginally to a bird-friendly yard. More subtly, the inconspicuous flowers and associated insects on trees, such as willows, oaks, elms and birches can provide important food, especially when insects are scarce elsewhere due to cold weather or a late-arriving spring.

It is best to cluster plantings to maximize shelter. Trees which are tall at maturity, such as oaks, black cherry and white pine, should be planted well away from homes and other structures while trees that reach only short heights, such as red cedar, can be planted closer to a structure or house. Avoid putting dense shrubs and trees near large windows—fewer birds will hit the windows and you will preserve your view.

Control Invasive Plants

Avoid planting pesky invasives such as autumn or Russian olive, glossy or common buckthorn, multiflora rose and non-native honeysuckles (Japanese and bush honeysuckle), which may outcompete valued native species. Remember that it will take far more work to control their spread than the time it took to plant them. An excellent resource for more information on controlling and removing aggressive non-native plant species is *Invasive Plants of the Upper Midwest: An illustrated guide to their identification and control* by Elizabeth J. Czarapata (University of Wisconsin Press).

Retain Dead Trees or Dead Limbs Whenever Possible

Decaying trees and their cavities provide shelter, nest sites, and foraging sites for woodpeckers, nuthatches, chickadees, titmice, and other bird species. So if they aren't a threat to safety, you can leave dead trees or limbs for the birds.

Provide a Water Source

Water sources like birdbaths, small ponds and streams will attract migrating and resident birds. Running water can be attractive, especially during drier periods. Locating the water near shrubs, trees or other cover will encourage birds to use water resources.

Reduce or Eliminate the Use of Pesticides and Herbicides

Insecticides, fungicides and herbicides can reduce soil and water quality on your property and can directly or indirectly harm migratory birds. Whenever possible, use organic techniques for gardening or lawn care. Encourage natural control agents such as ladybird beetles, some wasps, and birds. If you must use pesticides, avoid highly toxic or broad-spectrum chemicals that kill a wide variety of invertebrates. Always follow the manufacturer's instructions on the product label for proper use and disposal of pesticides.



Baltimore Oriole © iStock

Benefits of a bird-friendly yard or woodlot:

- Cost savings on fertilizers, water and air-conditioning
- Reduced flooding and soil erosion
- Improved quality of ground water, streams and Lake Erie
- Greater noise buffer
- Less yard work

COMMON AND LATIN NAMES OF PLANT SPECIES NOTED IN THE TEXT

American beech (<i>Fagus grandifolia</i>)	Dogwood, red-osier (<i>Cornus stolonifera</i>)	Mulberry, red (<i>Morus rubra</i>)
Ash, green (<i>Fraxinus pennsylvanica</i>)	Elderberry, common (<i>Sambucus canadensis</i>)	Oak, white (<i>Quercus alba</i>)
Ash, white (<i>Fraxinus americana</i>)	Elm (<i>Ulmus</i> spp)	Oak, northern red (<i>Quercus rubra</i>)
Aster (<i>Aster</i> spp)	Elm, American (<i>Ulmus americana</i>)	Oak, pin (<i>Quercus palustris</i>)
Basswood (<i>Tilia americana</i>)	Elm, slippery (<i>Ulmus rubra</i>)	Oak, swamp white (<i>Quercus bicolor</i>)
Beebalm (<i>Monarda fistulosa</i>)	Fescue (<i>Festuca</i> spp)	Olive*, autumn (<i>Eleagnus umbellata</i>)
Bittersweet, American (<i>Celastrus scandens</i>)	Goldenrod (<i>Solidago</i> spp)	Olive*, Russian (<i>Eleagnus angustifolia</i>)
Blackberry (<i>Rubus</i> spp)	Hackberry, northern (<i>Celtis occidentalis</i>)	Pine, white (<i>Pinus strobus</i>)
Black cherry (<i>Prunus serotina</i>)	Hawthorn (<i>Crataegus</i> spp)	Redcedar, Eastern (<i>Juniperus virginiana</i>)
Blueberry (<i>Vaccinium</i> spp)	Hemlock, eastern (<i>Tsuga canadensis</i>)	Rose*, multiflora (<i>Rosa multiflora</i>)
Bluegrass (<i>Poa</i> spp)	Hickory (<i>Carya</i> spp)	Ryegrass (<i>Lolium</i> spp)
Boxelder (<i>Acer negundo</i>)	Hickory, shagbark (<i>Carya ovata</i>)	Sassafras (<i>Sassafras albidum</i>)
Buckthorn*, common (<i>Rhamnus cathartica</i>)	Honeylocust (<i>Gleditsia triacanthos</i>)	Serviceberry (<i>Amelanchier</i> spp)
Buckthorn*, glossy (<i>Rhamnus frangula</i>)	Honeysuckle*, Bush (<i>Lonicera morrowii</i> , <i>Lonicera tatarica</i> , <i>Lonicera X bella</i>)	Sumac (<i>Rhus</i> spp)
Cardinal flower (<i>Lobelia cardinalis</i>)	Honeysuckle*, Japanese (<i>Lonicera japonica</i>)	Viburnum, arrow-wood (<i>Viburnum dentatum</i>)
Coneflower, purple (<i>Echinacea purpurea</i>)	Locust, black (<i>Robinia pseudoacacia</i>)	Viburnum, maple-leaved (<i>Viburnum acerifolia</i>)
Cottonwood, eastern (<i>Populus deltoides</i>)	Maple, red (<i>Acer rubrum</i>)	Virginia creeper (<i>Parthenocissus quinquefolia</i>)
Currant, wild (<i>Ribes americanum</i>)	Maple, silver (<i>Acer saccharinum</i>)	Wild columbine (<i>Aquilegia canadensis</i>)
Dogwood, flowering (<i>Cornus florida</i>)	Maple, sugar (<i>Acer saccharum</i>)	Wild grape (<i>Vitis</i> spp)
Dogwood, gray (<i>Cornus racemosa</i>)		Willow (<i>Salix</i> spp)

* These plants species are considered invasive.

FOR MORE INFORMATION ON CREATING HABITATS FOR BIRDS:

Agard, K. *Migrant songbirds along Lake Ontario's shore*. (Central and Western New York Chapter of The Nature Conservancy, 1995).

Anderson, M., E. Durbin, T. Kemp, S. Lauer and E. Tramer. *Birds of the Toledo area*. (Ohio Biological Survey, 2002).

Black Swamp Bird Observatory, bsbobird.org.

Brooklyn Botanical Garden, bbg.org/gar2/topics/wildlife/.

Chicago, City of and Audubon Chicago Region. *A habitat guide for Chicago landowners: enhancing your property for birds*. (Department of Environment, City of Chicago and Audubon Chicago Region, 2007).

Cornell Lab of Ornithology, birds.cornell.edu.

Cunningham. *Great garden companions*. (Rodale, 1998).

Henderson, L. *Landscaping for wildlife*. (Diane Books, 1994).

Kress. *The Audubon Society guide to attracting birds: creating natural habitats for properties large and small*. (Second edition, Cornell University Press, Ithaca, New York).

Kress, W. and R. Peterson. *The bird garden*. (Home Gardener's Library, 1995).

National Audubon Society, audubon.org.

The Natural Resources Conservation Service. Provides conservation planning assistance to individuals, groups, and units of government who implement conservation plans to conserve natural resources (soil, water, air, plants, animals).

National Wildlife Federation, nwf.org/gardenforwildlife/. Provides information on how you can create a Certified Wildlife Habitat right in your own backyard.

Nowak, Mariette. *Birdscaping in the Midwest: A guide to gardening with native plants to attract birds*. (Itchy Cat Press, 2007).

Ohio Department of Natural Resources–Division of Wildlife (1-800-WILDLIFE), dnr.state.oh.us/Home/wild_resourcessubhomepage/PublicationsRepository/tabid/10532/default.aspx. Information brochures on managing habitats for backyard wildlife.

Ottawa National Wildlife Refuge, fws.gov/midwest/Ottawa/.

Rodewald, A. D. and M. C. Brittingham. *Incorporating wildlife needs into forest management plans*. (Ohio State University Extension 2001. Fact Sheet W-1-2001, Columbus, Ohio). ohioline.osu.edu/w-fact/0001.html.

Terres, J. K. *Songbirds in your garden*. (Third edition, Hawthorn Books, Inc., 1977).

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OHIO BIRD



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