

LANDSCAPING FOR INSECTIVOROUS BIRDS IN ILLINOIS

By Randy Schietzelt

Migratory bird populations have been declining for several decades. Rain forest clearing and degradation reduce the area and diminish the quality of the winter habitat of Neotropical migrants, while the same factors in the boreal forest reduce their populations due to destruction of their breeding habitat. None of these factors is easy for us to mitigate in Illinois. But we can help migrants and some of our local breeding bird species while they are here. We can control the species of plants in our yards, and hence, the available food to help sustain bird populations. Fifty percent of migrants typically do not survive migration. By providing good stopover locations we can help tilt that percentage toward higher survivorship. A traditional hypothesis in animal ecology is the Red Queen Hypothesis. This idea is that, like the Red Queen in Alice in Wonderland, most organisms are running as fast as they can to maintain their current life. How can we keep birds in the game during their most stressful time of the year? How can we get our yards to become part of their food web?

There are plenty of articles on landscaping with native plants for wildlife, although most focus on producing berries. Berries are typically more important in the Fall when they provide important calories (sugars) to fuel long migrations. In the Spring there is an additional need of protein in bird foods. Proteins help to build up tissues in breeding adults, eggs and hatchlings. A good example might be northern cardinals and cedar waxwings. What do they eat? We have all seen cardinals with their large beaks crush big seeds at feeders. And of course cedar waxwings are easiest to find in berry trees where they collect in large numbers. But when their eggs hatch, cardinals switch to 95% insects for their young and cedar waxwings to 100% insects. The large protein content in booming insect populations in May fuels the growth of these next generations. Do you put oranges out for orioles in May? If so, you may have noticed that they attract orioles for a couple of weeks, but then they stop coming overnight. Oranges have nice sugars for a treat, but I suspect orioles give up on oranges when their young hatch. Insects then become their preoccupation to nourish their young with protein.

So how do we landscape to attract insectivorous birds? We have all watched feeding flocks choose to linger in some trees, and quickly pass through others. Birds obviously make choices. An excellent book on this subject is "Bringing Nature Home" by Douglas Tallamy. He makes the case for food web plantings, where he provides many examples of native plants that attract insects which can then feed vertebrates. Figure 1 shows leaves with differential feeding by insects. This article is designed to refine that idea by specifying the trees and bushes that will optimize insects for birds during migration, breeding, and nesting in Illinois. That is, increasing the ecosystem productivity of our yards to help bird populations.

Producing a list of species to provide insects for bird food is tricky. It is very tough to know which species are actually available for birds to find when they need them. Insects may hide under cover, be inedible, or become active

when birds are not. For example, grasshoppers are excellent bird food which is most abundant in August and September after most bird breeding has ended. However, many breeding bird studies over the years have consistently turned up one insect group as the basis of breeding bird diets. These are the caterpillars of butterflies and moths. Caterpillars are soft, protein packed, and they are available on plants in huge numbers during the breeding period. Dick and Jean Graber, who are important to the history of the Illinois Audubon Society, had a classic paper on warbler diets in Southern Illinois. They found 75-98% of warbler diets were based on inchworm caterpillars. Birds that found enough caterpillars were able to both rest up and bulk up for their push north to their breeding grounds. Caterpillars have frequently been termed the breeding currency that will determine bird breeding success.

Does the species of caterpillar matter? Some caterpillars have hairs and spines to make themselves unpleasant to eat. Others sport bright colors to advertise poisons they accumulated from plants. The remainder are highly palatable to birds. They can be identified by their mimicry or cryptic coloration. Figure 2 shows an assortment of these defensive color patterns in caterpillars. The cryptically colored species seem to be particularly important since they have no defenses once they are found, and they are highly edible. One reason you may have trouble following many Neotropical migrants through the forest is their hyperactive flitting to catch these caterpillars before they "freeze" and resemble bark or leaves. The most important groups of caterpillars for bird diets are the inchworms (*Geometridae*), leafrollers (*Tortricidae*), and owlet moths (*Noctuoidea*).

An extensive survey of caterpillar host plants by Robinson (*Hostplants of the Moth and Butterfly Caterpillars of America North of Mexico*) allows a listing of which plants produce the most caterpillar species. I have tried to look for patterns in the above families of butterflies and moths, but ultimately a total listing of all caterpillar species produces the same list of host plants as any specific caterpillar family. So Table 1 lists the total number of caterpillar species found on trees and bushes in Illinois ordering them by those with the most caterpillar species and those with the least. This should be useful, since birds need huge numbers of caterpillars each day to feed their young. Carolina chickadees need between 390 and 570 caterpillars per day to be successful with their hatchlings. Having a larger number of caterpillar species will help mitigate yearly fluctuations in population sizes. A bad year for one species can be offset by another species with a big flush of offspring. In addition, bird niches will be separated by feeding methods. Many species of caterpillars will help make sure each bird species has available food. A small number of caterpillar species is risky over time. One bad year for a limited number of species could mean very little food available up the food chain. Choosing plants with many caterpillar species is more likely to support successful bird ecosystems.

Table 1 points out some obvious conclusions on plant choices to support insectivorous birds. All of the invasive plant species fall on the least caterpillars' side of Table 1. Figure 1 points out the often stated difference in insect feeding between native and invasive plants. The non-natives in the most caterpillar column are either northern species not naturally found in Illinois, or apple trees which

TABLE 1: The top and bottom quarters of Illinois trees and bushes by the numbers of caterpillar species they host.

Illinois Tree & Bush Species with the Most Caterpillars (Caterpillar #s)	Illinois Tree & Bush Species with the Least Caterpillars (Caterpillar #s)
Quacking Aspen (312)	Fragrant Sumac (3)
Paper Birch (311)	Hercules's Club (3)
Apple (239)	Illinois Rose (3)
Choke Cherry (185)	Iowa Crab (3)
White Spruce (183)	Japanese Honeysuckle (3) (Invasive!)
Black Cherry (178)	Lance-leaved Buckthorn (3)
Balsam Poplar (172)	Russian Olive (3) (Invasive!)
Red Oak (162)	Shumard's Oak (3)
White Oak (160)	Swamp Red Currant (3)
Speckled Alder (141)	Trailing Juniper (3)
Balsam Fir (129)	Autumn Olive (2) (Invasive!)
American Elm (126)	Bladdernut (2)
Yellow Birch (124)	Blue Ash (2)
Tamarack (121)	Bog Willow (2)
Jack Pine (115)	Cockspur Hawthorn (2)
Basswood (115)	Crack Willow (2) (Invasive!)
Red Maple (110)	Dwarf Honeysuckle (2)
Sugar Maple (109)	Heart-leaved Willow (2)
Pin Cherry (108)	Hoary Willow (2)
Boxelder (91)	Kentucky Coffee Tree (2)
Bur Oak (91)	Red Honeysuckle (2)
Black Spruce (85)	Red Mulberry (2)
Black Walnut (85)	Swamp Chestnut Oak (2)
Ironwood/Hop Hornbeam (85)	Swamp Cottonwood (2)
White Pine (85)	Swamp Holly (2)
Beech (79)	White Mulberry (2) (Invasive!)
Red Pine (78)	Winged Elm (2)
Gray Birch (74)	Allegheny Shadblow (1)
American Chestnut (73)	American Fly Honeysuckle (1)
Big-toothed Aspen (73)	Autumn Willow (1)
Pecan (65)	Burning Bush (1)
White Ash (63)	Cherrybark Oak (1)
Hemlock (60)	Dotted Hawthorn (1)
Silver Maple (60)	European Spindle Tree (1)
Scotch Pine (60)	Frosted Hawthorn (1)
Black Oak (51)	Japanese Barberry (1) (Invasive!)
Wild Plum (51)	Japanese Crab (1)
Late Low Blueberry (50)	Multiflora Rose (1) (Invasive!)
Cottonwood (48) 1	Overcup Oak (1)
Blue Beech/Musclewood (46)	Peach-leaved Willow (1)
Green/Red Ash (46)	Pumpkin Ash (1)
Honey Locust (44)	Rough-leaved Dogwood (1)
White Cedar (43)	Round-leaved Serviceberry (1)
White Walnut/Butternut (43)	Silky Willow (1)
Red-osier Dogwood (40)	Swamp Rose (1)
Shagbark Hickory (39)	Wild Hydrangea (1)
Witch Hazel (37)	Glossy Buckthorn (0) (Invasive!)

Red: Non-native species

Invasive! = Aggressive, non-native species that degrade natural areas



Figure 1: August leaves of an oak (top left) eaten by a caterpillar and bush honeysuckle (right) with no insect damage. Bush honey-suckles are well known invasive species in Illinois that degrade habitat, while oaks are excellent wildlife trees.

support many insects, but are not invasive. Non-natives that are invasive easily reduce the habitat quality for bird life. Common buckthorn is a notable invasive that has no native insects utilizing it. Native species that tend to be the dominant species in historical forest assemblages are also the most likely to support large insect populations. This is to be expected since herbivores will adapt themselves to eating the common local species.

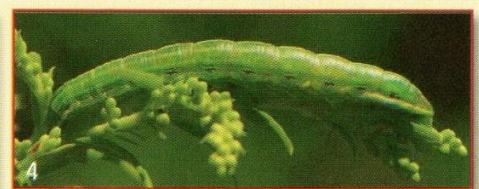
The birds then learn to rely on those species. This should also be true with all the other Illinois wildlife groups.

Another observation from Table 1 is the discrepancy between northern oak species and the more southern types. Oaks are often listed as one of the best tree species for wildlife. They produce many insects, acorns, cavities, and leaves and twigs for food and shelter. So why would the more southern species have


fewer caterpillars? I would suspect the differences in the length of the growing season and the harshness of winter weather make a difference. Southern species have to deal with insect herbivores for a longer period of time, and therefore, produce more chemicals to dissuade feeding. Northern species all leaf out quickly in May to complete their life cycle before the frost in the Fall. Thus the bugs respond by coming out in huge numbers to take advantage of this instant bounty. Birds have adapted their migrations to take advantage of this abundance. This happens to an even greater extreme in trees and bushes up North, which is why many Neotropical birds continue right on through Illinois. The non-native species in Table 1 from farther north all have very large numbers of caterpillars utilizing them.

Some work in restoration ecology might seem to contradict the results of this article. Restoration ecology for animals usually focuses on the structure of an ecosystem rather than the specific plant species present. A proper size and configuration of trees and bushes will be the selection point

Figure 2: Species of caterpillars showing different defensive strategies — A buckeye caterpillar (photo 1) with spines to dissuade predators. A monarch caterpillar (photo 2) advertising the poisons it picked up from milkweeds. A tiger swallowtail (photo 3) caterpillar with eye spots to resemble a snake. The last two pictures show asteroid moth (photo 4) and tufted bird-dropping moth (photo 5) caterpillars using cryptic coloration.



for many nesting species. A variety of different tree and bush species will work for supporting bird populations within this structure. But it is also probably important to have species that are productive. Animal territories vary in size depending on the amount of food and other resources available. Higher food producing trees should increase bird populations by allowing smaller territories. This will allow more territories and increase bird populations. Choosing to plant trees and bushes from the higher caterpillar column of Table 1 should pay big dividends. A forest structure empty of food is not going to be successful. Restoration over time should help promote more birds because it promotes the dominant historical trees that contain more caterpillars, which will then support nesting success.

In conclusion, planting a variety of trees and bushes that are good caterpillar producers should make sure food is available right when bird energy needs are highest and that a diversity of bird species can succeed. Our yards will be more alive, all birds will be more successful, and we will get to see more birds. Think of it like trying to get a table at a restaurant on a Saturday night. Everyone wants the best meal for the least expenditure. Like diners, birds will choose the best spots with the most food for the least amount of energy expended. If we choose the right trees, over time our yards can become the "in" place for wildlife. 



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MOUSE-CATCHING BY BIRDS

By J.W. Lippencott

Excerpted from "Notes from Field and Study"
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The very best mouse-catcher I ever saw was a pet crow. One can talk of the work of owls and hawks, but must allow to the crow credit for a certain kind of thoroughness which should accomplish a great good wherever the short-tailed meadow mouse can thrive. Tame ducks and chickens also destroy mice, but let me first tell of what I have seen crows do.

Every winter an army of crows arrives with thawing weather. Frost and snow have beaten down the meadow grass, leaving the mouse paths beneath plainly visible and rendering easily found the conical mass of grass that forms each warm bed in which the mice live. The hungry crows walk over nearly every likely foot of the meadows and pull to pieces nests on every side. They also pick loose bark from stumps and dead trees, pry under brush piles and roots, in fact act the part of very able terriers. Of course it is not always mice they are after.

My pet crow, Toby, would instantly catch and kill every mouse I let out of a trap. This was apparently his greatest diversion. He also watched for rats by the hour, though never daring to descend from a safely remote perch. When a large one scurried out to the garbage, Toby would shuffle about in utmost excitement, ruffling his feathers and shaking his head, as if saying, "That one's too much for me." Perhaps, poor fellow, he foresaw his fate, for he was caught one night by the very rats he used to watch.

Muscovy ducks soon acquire the habit of following the plow. I once saw four partly grown field mice turned up in a furrow and eaten by these ducks which happened to be in search of earthworms at the time. On another occasion, I saw a Muscovy catch and swallow a full-grown house mouse. This mouse lived regularly in a large corn crib under the box for shelled corn, and when disturbed it would dash into the pile of ears and escape.

Traps failed to catch this wily little creature and, although he had lost half a tail, he lived there nearly a year and met his death only through a duck. I tried an experiment of blocking his path to the corn and then would call the chickens and ducks which were used to being fed at the crib. Rather than climb over the board I had placed there, he ran along it until he ran into the chickens. He dodged among them and was almost at the barn when he found the Muscovy duck in his path and slowed up. Instantly the duck seized him, waddled a step or two with the mouse in his bill, and then deftly swallowed it.

Hens twice caught mice for me at the same crib, but they invariably grabbed the mouse by the tail and carried it around in that unstable fashion for a long time, the whole yard of chickens in pursuit. The mouse would escape by climbing up and pinching the hen's neck, but would then be picked up by another hen until it was too tired to escape further. It would then be finished off with a few pecks and eaten with great relish. Owls and hawks have allies when it comes to keeping down rodent numbers on the farm.