

# Transforming Fields into Grassland Bird Habitat

Rural landowners are often surprised to learn that leaving large open fields to grow into brushy forests can actually ruin a very special type of habitat in New York State.

Private landowners and public land managers who are seeking to enhance wildlife habitats in a meaningful way should consider the value of restoring open grasslands for bird habitat in New York. With a combination of planning, selected vegetation removal, mowing, and reseeded, landowners can convert older fields into lively grasslands that might support an increasingly uncommon group of birds, called grassland birds. This is especially important in large fields of 12 to 15 acres or more.

Grassland birds are species that require distinct grassland habitats during their breeding cycles, nesting, and feeding. In New York, species of



particular interest include Upland Sandpiper, several grassland sparrows (Vesper, Savannah, Grasshopper, and Henslow's Sparrows), Bobolink, and Eastern Meadowlark. Many other birds use grasslands during some portion of their life cycle, but the term "grassland birds" usually refers to birds constrained to large, grass-dominated ecosystems throughout their lives.

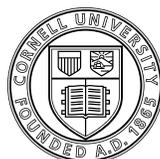
Unfortunately, grassland birds are declining significantly in the Northeast and across the continent. Just within the last 30 years, the populations of many of these birds have declined 70 to 90 percent. Historically, grassland birds used grassy clearings as habitat. Such clearings could have resulted from the effects of fires, floods, infertile or shallow soils, storm damage, or beaver activities. Their habitat increased during the 1800's, induced by widespread deforestation created by ubiquitous family farms and associated hayfields and pastures.

With farmland loss, natural reforestation, increasing row cropping, and changes in hayfield management in recent decades, grassland bird breeding habitat has declined greatly in the Northeast. Compounding the problem is the loss of wintering habitat in southern climates. Many landowners, including rural residents, farmers, and conservation land managers, are aware of these losses and are striving to play a role in grassland bird conservation, hoping to bring the familiar sight of these birds back to their communities.

This bulletin explains how landowners can change open fields in New York into more suitable habitat for grassland birds. The potential to expand high-quality grassland habitat is significant and can stabilize or even increase the permanence of these birds in

## Grassland Birds of Management Concern in New York State

Northern Harrier (*Circus cyaneus*)  
Upland Sandpiper (*Bartramia longicauda*)  
Horned Lark (*Eremophila alpestris*)  
Sedge Wren (*Cistothorus platensis*)  
Eastern Bluebird (*Sialia sialis*)  
Clay-colored Sparrow (*Spizella pallida*)  
Vesper Sparrow (*Poocetes gramineus*)  
Savannah Sparrow (*Passerculus sandwichensis*)  
Grasshopper Sparrow (*Ammodramus savannarum*)  
Henslow's Sparrow (*Ammodramus henslowii*)  
Dickcissel (*Spiza americana*)  
Bobolink (*Dolichonyx oryzivorus*)  
Eastern Meadowlark (*Sturnella magna*)



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the state. In addition, populations of butterflies, dragonflies, mammals, and other wildlife benefit from increased grassland habitats. Whether on abandoned farmland, around a county park, or on other private and public lands, the techniques explained below will benefit grassland biodiversity in the Northeast United States.

### Grassland birds need an early successional stage of field growth

Grassland bird populations have declined in part because landowners usually treat their fields with benign neglect. It is easy to let a field just grow into brush, avoiding intervening in natural succession. Unfortunately, grassland birds can only breed in natural areas in an “early successional stage.” This means that grassy vegetation is dominant; thick weeds or woody plants have not yet grown in or are controlled by soil conditions, mowing, or prescribed burning. Most old fields already provide good general songbird habitat; however, they are less suitable for birds that require grasslands. Even though a particular field looks grassy to the owner, it may not have the critical grass structure required by grassland bird species.



In the Northeast, true grassland habitats are somewhat artificial in that they require repeated disturbance to keep a dominant grassy structure. Dairy cow pastures and active hayfields are examples of land maintained in an early successional stage. These fields are full of orchardgrass, bluegrass, timothy, fescues, sweet vernal grass, and include some

legumes like clover. They look unmistakably grassy, as though being maintained as a rather large and unruly turf lawn. These grasslands are just the type of habitat birds like Bobolinks, Meadowlarks, and grassland sparrows seek.

There is a big difference between old meadows and true grasslands. Driving through the countryside, you will see many old meadows - fields covered in weeds and wildflowers, even with small bushes and trees scattered about. These are old crop fields, or land left fallow and open for various reasons. The weeds and wildflowers are known technically as "forbs" and include thistle, goldenrod, teasel, daisies and asters, buttercup, knapweed, bedstraw, and many other leafy plants. Grassland birds can tolerate a moderate forb content; however, if forbs equal or outnumber grasses, the habitat is far less attractive to them. In addition, many old fields are covered in brush and saplings. Clumps of brambles, small pine trees, pin cherry, aspen, and dogwood shrubs make for good habitat for many birds, but not grassland birds.

Research has shown that in addition to a significant grass proportion, grassland birds benefit from varying grass heights. Taller grasses (20+ inches) should be interspersed with shorter grasses (5 to 10 inches) to provide good insect foraging, nest construction materials, and protective cover. Grassland birds are less active in fields where all grasses are of uniform height. Bare soil or gravel beds enhance the habitat diversity further, and provide nesting sites for Killdeer and Horned Lark.

Normally, the grass species found in New York fields are "cool season," meaning most of the growth occurs in spring and fall. Some fields contain remnants of "warm season" grasses; these are usually taller and

### Sites suitable for grassland bird habitat development

- Old hayfields and overgrown cropland
- Parks, land trust property, nature centers, and wildlife refuges
- Periphery of large sports field complexes and corporate parks
- Vacant and abandoned industrial yards
- Land enrolled in the NRCS Conservation Reserve Program and other conservation programs
- Flood control areas (large earthen dam slopes and adjacent fields) and dry detention basins
- Highway median strips and airport fringes, avoiding high-traffic areas



*This large, grass-dominated field is a goal of grassland bird habitat management.*

coarsely-stemmed, putting on most of their growth through the summer. Grassland birds tend to do best in very large fields with a mix of grass species, rather than a monoculture of one species. This mix may include both cool and warm season grasses, but in New York, cool season grasses usually overwhelm warm season grasses after a few years.

### Cool season grass species

Kentucky bluegrass (*Poa pratensis*)  
 Red fescue (*Festuca rubra*)  
 Quackgrass (*Agropyron repens*)  
 Timothy (*Phleum pratense*)  
 Orchardgrass (*Dactylis glomerata*)  
 Redtop (*Agrostis alba*)

### Warm season grass species

Little bluestem (*Schizachyrium scoparium*)  
 Indiangrass (*Sorghastrum nutans*)  
 Poverty grass (*Danthonia spicata*)  
 Big bluegrass (*Andropogon gerardii*)

## Grassland bird habitat development

There are many types of fields suitable for grassland bird habitat development, such as conservation lands, old hayfields, parks, commercial grounds, or abandoned industrial lands. Some property owners may be restricted due to access to equipment, site limitations, availability of labor, and expectations of other land users or adjacent property owners. For example, the manager of a nature center may not have access to field mowing equipment or personnel in late summer when mowing is necessary. Likewise, an old rail yard may have too much ground clutter to allow for operation of mowing equipment. Although the results may not be ideal, most grassland birds are moderately flexible in what habitat they will tolerate. Strive for a close approximation to good grassland habitat and monitor the bird populations to gauge overall use.

Many other animals will benefit from large grasslands developed for conservation, including non-migratory birds like Ring-necked pheasant, Wild Turkey, and Red-tail Hawks. Alpine birds like Snowy Owl, Rough-legged Hawk, Common Redpoll, and Snow Bunting seek open grasslands during New York winters. Foxes, woodchucks, deer, and many species of butterflies and dragonflies will use the habitat as well.



*Public parks, large rural estates, and business centers can convert mown turf into good grassland habitat with lower maintenance costs.*

Lands that are currently landscaped as large expanses of closely mown turf (such as around business parks) can be managed for grassland birds as a conservation-minded alternative. The site should be designated as a permanent, pesticide-free habitat before management begins. Grassland bird habitat is an ecologically aesthetic landscape component for such sites; plus, owners often find that expenses like labor for frequent mowing, fertilizer costs, pesticide application fees,

fuel, and other payments are reduced or eliminated where grassland habitat is cultivated.

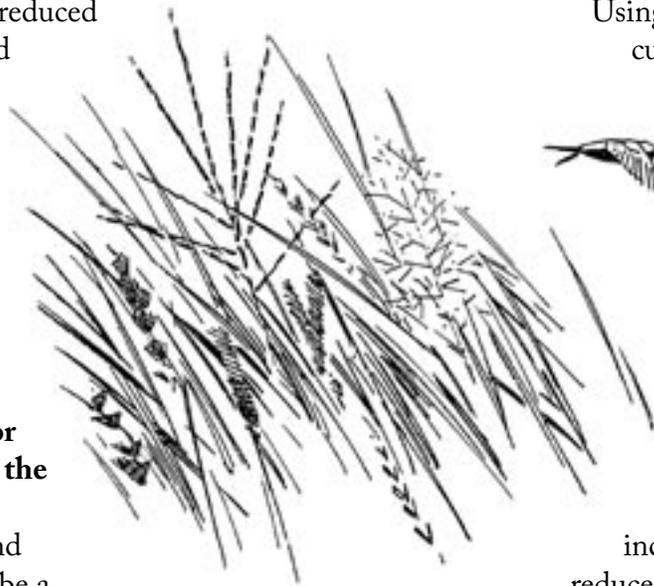
The following steps will guide the decisions land managers will make regarding grassland habitat development:

**Step 1: Make a deliberate decision to manage a field for grassland habitat and assess the suitability of the site.**

The establishment of grassland bird habitat in a field should be a planned activity that will be maintained for years to come with little economic incentive. It will take years for grassland birds to find and fully use the site for feeding and nesting activities. The ideal site will be at least 10 acres of continuous open fields, but preferably more than 15 acres. Some grassland birds will use a smaller site; larger fields are much more suitable. This acreage includes surrounding land uses, like hayfields, adjacent meadows, and pastures. Field managers will need access to mowing equipment and labor during late summer and may need to rejuvenate the site by seeding diverse grass species every few years. Depending on the site, some woody vegetation may need to be removed first.

**Step 2: Begin habitat development by removing woody vegetation and completing a full field mowing.**

Although cutting out brambles, honeysuckle, autumn olive, and pine and hardwood seedlings is time-consuming, it is a good way to start the grassland habitat conversion. Begin removing invasive exotic shrubs like honeysuckle, autumn olive, and buckthorn by cutting them down at the base, flush with the ground. A few widely scattered saplings, shrubs, or fence posts should be left as territorial song perches. If the woody vegetation is currently rather dense, it is probably not worthwhile to attempt making it into a grassland field; focus efforts on overgrown fields, rather than young forests.



Using a brush mower designed to cut heavy stems (also called a brush hog), mow the entire field once after mid-summer (ideally around August 15) to establish a base grassland field. This mowing will encourage the development of grasses and reduce undesirable leafy vegetation like goldenrod. In subsequent years, a late-summer mowing will continue the process of increasing grass composition, and reduce invasive and woody vegetation.

It is not necessary to use broad-leaf herbicides in this process.

Field burning is used in some places to replicate natural wildfires and cultivation fires set by Native Americans, but is impractical for most people now to clear overgrown fields. A controlled burn requires vast amounts of labor, careful timing, state licensing, and safety protocols that most landowners cannot meet. Unless supervised by experienced personnel in close cooperation with local fire officials, do not attempt to burn off old vegetation; brush mowing will accomplish much the same effect.

**Step 3: Mow annually or bi-annually in mid-to late summer.**

The most critical step in grassland habitat management is the periodic disturbance of mowing or burning in a designated field. These disturbances reset the successional progress of a field to a point favored by grassland birds across a large area. In other words, you are trying to keep the field in an early successional stage, dominated by grasses.

To maximize the effect of mowing for grassy habitat, wait until the field has grown up for the season and breeding birds have fledged. In many places, you only need to mow once after August 1. The ideal time will usually be the weeks just after August 10. Use a mower or brush hog attachment on a tractor or ATV, cutting the field completely from 4 - 6 inches high. A sickle bar mower can be used, but it leaves many

longer stems that will be slow to decompose. After mowing, the grasses will thicken and regrow through the fall, providing new, long stems in the spring. An autumn mowing (after mid- September) risks spreading seeds from plants that are undesirable in a true grassland, so hold off mowing until the following year if your plans get delayed.



*Mowing portions of a field in August helps diversify grassland habitat.*

Another effective mowing strategy is to mow only a portion of one large field in any given year in mid- to late August. For example, you can mow one-third of a field each year for three years. This rotational schedule adds considerable grass structure diversity, leaving old grass stems in place for a few years, which is preferred by some grassland bird species, like Henslow's Sparrow.

On poor soils or when grasses are fully dominant, it may be necessary to mow the whole field only once every three years. It is appropriate to leave some areas of grass standing, or to lower the mower height in patches. Take a year or two off occasionally to allow dead grassy debris to accumulate as a habitat component. These variations will help achieve a more diverse grassland habitat structure. Some landowners find it helpful to write down their intended field mowing schedule for the next 6 - 10 years, to remind themselves and for subsequent owners of the fields.

When an old or fallow field has been converted into a successful grassland, it has a certain "look" that the land manager should maintain for years. The field will be clearly dominated by grasses, only being mown

### Why mowing in mid- to late summer?

Grasses are unique in that the growth tissue is located at the base of the plant, rather than the tip. When grass is clipped or grazed by animals, it grows by pushing up from the base. Other field plants grow from the tip and are very slow to grow back when clipped.

Mowing in late summer usually leads to a more grassy field. If everything is clipped around the same time in August, grasses will easily rebound by early autumn, whereas competing forbs will slowly decline. Over several years of late-summer mowings, the grasses will come to dominate. An occasional early-season mowing (before May) will also stimulate grass growth and reduce the build-up of thatch, though it is not necessary.

once each year or every two or three years. It will have very little woody vegetation and wildflowers will be scattered.

### Step 4: Refrain from intrusive activity in the grassland field during the breeding season.

To be considered good habitat for grassland birds, a field needs to remain unmown through the bird breeding season, which begins in early May and ends after mid-July over most of New York State. During this time, open fields grow vigorously, providing shelter, nesting areas among the grass stems, and a source of insects that comprise bird diets. Any significant disturbance, like mowing or motorized activities, will likely cause nests to fail.

In New York, breeding grassland birds will begin identifying territories from late April through May. Nest building and egg laying occur through early June and young birds tend to hatch by mid- to late-June. The ability to fly for cover and feeding (called "fledging") develops by early July. Some birds have a faster breeding cycle and can produce two broods of young in one breeding season. Depending on location, these activities may take place a week or more earlier or later, contingent on the season's weather. Depending on climate, some birds will continue nesting and fledging a second brood through July.

### Step 5: Monitor grassland bird activity through auditory surveys.

Some birds that use grasslands, like Eastern Meadowlark, Eastern Bluebird, Bobolink, and Tree and Barn Swallows, are conspicuous due to their easily-recognizable size and markings, clear songs, and tendency to perch and fly in full view. However, many grassland-obligate bird species are much less noticeable and rather unfamiliar. Their small size, brown colorings, and reclusive nature make them hard to detect, even to an experienced birder.



*Savannah Sparrow*

Fortunately, the songs of all grassland birds are distinct enough to provide important clues to their identity. Landowners curious to know which birds are already using their fields should solicit the assistance of a knowledgeable birdwatcher, study the mnemonic phrases that imitate the actual song, or obtain an audio guide to bird songs of the Eastern United States. In the spring and early summer, birds will be singing in the habitat daily. It is best to walk slowly through a meadow in the morning, listening carefully and taking note of the different songs. The songs are high-pitched and often come from unseen birds. Binoculars can help to observe field marks on some birds, but they should not be necessary in many cases. Repeat a walk-through in the late afternoon or evening to hear songs of birds like Vesper Sparrow, which often sings later in the day.

**Step 6: Reduce controllable predators in the area.** Because they nest near the ground, eggs and unfledged grassland birds are prey to raccoons, opossum, snakes, and coyotes. Equally destructive to wildlife, house cats and feral cats should be controlled by conscientious owners. Keep cats indoors and discourage them from hunting in bird breeding areas. Domestic cats will kill prey whether or not they are well-fed and have become a big problem for vulnerable wildlife across North America.

### Step 7: Erect nest boxes for cavity-nesting grassland birds.

Nest boxes designed for use by Eastern Bluebird, Tree Swallow, and House Wren will provide added breeding site diversity at the edges of grassland fields. The entry hole size (usually 1.5 inches) and location of the box are very important. Once a box is set on a pole, protect the nest box with predator guards and monitor them to minimize House Sparrow breeding (remove scrappy nests constructed of debris each

#### Learn Bird Songs by Their Phrasings:

**Bobolink:** plink, plink or a complex song: “Pu-puck pi deedla ehah eeee-ew d-t-d-t dee”

**Clay-colored sparrow:** zzzzzgd zzzzzgd zzzzzgd (harsh & artificial-sounding)

**Dickcissel:** ziek, ziek ziek, zid-zid-zzz

**Eastern meadowlark:** eas-tern mead-ow-lark (musical) or “spring-of-the-year”

**Field sparrow:** notes like a ping-pong ball dropped onto a table – increasing in rate and pitch

**Grasshopper sparrow:** pee-trip-treee (last syllable a raspy trill)

**Henslow’s sparrow:** tsip-a-tik (non-musical, repeated occasionally)

**Horned lark:** high pitched – tee-seep

**Savannah sparrow:** zit-zit-zit-zeeee-zaaay (burry-raspy)

**Sedge Wren:** chip, chip or chip, chip, chrrrrr-rrr

**Upland sandpiper:** wolf-whistle (long, drawn-out)

**Vesper sparrow:** listen to my evening sing-ing-ing-ing (slow and melodic)

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*Nest boxes attract cavity-nesting birds that also thrive in grasslands.*

week). Consult the updated nest box pamphlets from the Cornell Birdhouse Network for construction, placement, and monitoring instructions; use the Internet web site: <http://www.birds.cornell.edu/birdhouse/>

## Joining other efforts

Restoring habitat for grassland birds can be as rewarding as it is challenging. Efforts made by many landowners in one region or community will eventually attract potentially significant populations of grassland birds. The transforming steps described above will augment efforts being made at local farms, on pastures, at wildlife refuges, and on conservation land. Before long, grassland bird abundance and diversity may increase across the Northeast. New York landowners will play an important role if grassland birds and other grassland wildlife are to live on in the coming years.



## References and Additional Reading

Brown, L. 1979. *Grasses: An Identification Guide*. Houghton Mifflin: New York, NY

Bull, J.L. 1998. *Bull's Birds of New York State*. Cornell University Press: Ithaca, NY

Decker, D., J. Kelley, G. Goff, and T. Parker. 1998. *Enhancement of wildlife habitat on private lands*. Ithaca, NY: Cornell University Media Services

Henderson, C.L. 1992. *Woodworking for wildlife: Homes for birds and mammals*. Nongame Wildlife Program, Department of Natural Resources: St. Paul, MN

Jones, A.L., and P.D. Vickery. 1997. *Conserving grassland birds: Managing agricultural lands including hayfields, crop fields, and pastures for grassland birds*. Massachusetts Audubon Society, Lincoln, MA.

Jones, A.L., and P.D. Vickery. 1997. *Conserving grassland birds: Managing large grasslands including conservation lands, airports, and landfills over 75 acres for grassland birds*. Massachusetts Audubon Society, Lincoln, MA.

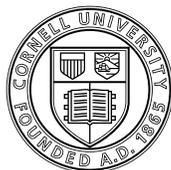
Jones, A.L., and P.D. Vickery. 1997. *Conserving grassland birds: Managing small grasslands including conservation lands, corporate headquarters, recreation fields, and small landfills for grassland birds*. Massachusetts Audubon Society, Lincoln, MA.

Mitchell, L.R., C.R. Smith, and R.A. Malecki. 2000. *Ecology of grassland breeding birds in the Northeastern United States: A literature review with recommendations for management*. USGS, Biological Resources Division, New York Cooperative Fish and Wildlife Research Unit, Cornell University, Ithaca, NY.

Natural Resource Conservation Service Wildlife Habitat Management Institute. 1999. *Grassland Birds: Fish and Wildlife Habitat Management Leaflet Number 8*. Wildlife Habitat Management Institute: Madison, MS.

Sample, D. W. and Mossman, M. J. 1997. *Managing habitat for grassland birds: a guide for Wisconsin*. Wisconsin Department of Natural Resources Publication No. SS-925-97.

Vernegaard, L., R. Hopping, and D. Reid. 1998. *Ecological management of grasslands: guidelines for managers*. The Trustees of Reservations, Massachusetts.



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