Hayfield Management and Grassland Bird Conservation

Grass hayfields of 10 – 12 acres or more present an attractive breeding area for grassland birds. The vast expanses of medium to tall grass stems, interspersed with legumes like clover, represent nearly ideal cover for the adults and nests of birds like Bobolinks, grassland sparrows, and Eastern Meadowlarks. Unfortunately, early hay mowing in May and June — meant to increase the nutritive value of hay for livestock — frequently destroys this habitat. In fact, research shows that intense hayfield mowing is one of several reasons for the decline of grassland birds in the Northeast (Mitchell et al., 2000).

Grassland birds are declining significantly in the Northeast and across most of North America. Just within the last 30 years, the populations of many of these birds have declined 70 to 90 percent. Farmers who have plowed under hayfields to plant corn or soybeans, converted grass hay to alfalfa stands, or who start the first cutting of grass hay in late May or June, have unknowingly contributed to the loss of grassland habitat when it is most crucial for the birds. In addition, farmland conversion into brush or development is reducing grassland habitat throughout the Northeast. In some areas, as much as 95 percent of hayfields present 50 years ago have disappeared (Herkert, 1997). Many farmers 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.

Bobolink

Grassland birds are species that require distinct grassland habitats during their breeding cycles, nesting, and feeding. Many other birds use grasslands during some portion of their life cycle, but the term "grassland birds" usually refers to birds constrained to grass-dominated ecosystems throughout their lives.

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 *(Pooecetes gramineus)*
Savannah Sparrow *(Passerculus sandwichensis)*
Grasshopper Sparrow *(Ammodramus savannarum)*
Henslow's Sparrow *(Ammodramus henslowii)*
Dickcissel *(Spiza americana)*
Bobolink *(Dolichonyx oryzivorus)*
Eastern Meadowlark *(Sturnella magna)*

Managing hayfields for livestock nutrition as well as for grassland bird habitat will bring some tradeoffs, but perhaps not as severe as once thought. Farmers who would like to restore grassland bird habitat in their hayfields can adjust the timing of first cutting, use field rotation, modify mowing patterns, and take advantage of specific field characteristics to achieve this conservation goal. Excess hay acres, mulch and bedding hay harvests, and hay intended for mature livestock with good body condition (like beef, sheep, and horse), are compatible with grassland bird habitat preservation.

Before making firm decisions about managing hayfields for grassland birds, farmers should first consider how these decisions would affect overall farm operations. Hay tonnage yields are usually

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higher when cutting is delayed until just after the breeding season for grassland birds; however, later-harvested grass hay loses digestibility (due to higher fiber concentration) and nutritive value (due to lower protein). Supplements may be needed for livestock that cannot derive necessary nutrition from late harvested hay. On the other hand, the drying time for hay harvested after the grassland bird breeding season will likely be shorter due to more favorable weather conditions; thus it will retain any available dry matter and carbohydrates. Developing better grassland bird habitat on the farm begins by selecting the right fields for conservation and understanding how to balance habitat and grass hay nutrition.

Hayfields dominated by mixed grasses are also good habitat for grassland birds.

What good is grassland bird conservation for the farm?

Farmers aware of ecological relationships will appreciate how their hayfields can become home for even more diverse wildlife, especially habitat-sensitive grassland birds. These birds are known to reduce populations of potentially harmful insects like caterpillars, weevils, cutworms, beetles, and flies. Engaging in grassland bird conservation practices is convincing evidence for the public that farmers are good stewards of natural resources. Hay farmers who include appropriate bird conservation principles in their farm operations have gained an advantage when fighting to protect local farmland resources. Additionally, adoption of these practices can position farms better for the increasing availability of technical assistance and cost-share funds for grassland maintenance and habitat conservation.

Grassland bird breeding season in hayfields

To be considered good habitat for grassland birds, a grass hayfield needs to remain substantially unmown through the breeding season, which begins in early May and ends by mid-July across most of New York State. During this time, hayfields 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 manure application, will cause most nests to fail. Alfalfa hay stands are generally unsuitable for grassland birds.

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, as does hay crop development, contingent on the season's weather.

Hay farmers should monitor weather, bird behavior, and crop maturity to determine the best time to mow hay in fields pre-selected for grassland bird conservation. The earliest first cutting can take place

Hayfields best suited for grassland bird habitat

- Large (15 or more acres)
- Dominated by grasses (orchardgrass, timothy, bluegrass, smooth brome)
- Contain some legumes and other plants - up to 20%
- Located adjacent to pastures, idle fields, or other hayfields, extending the grassland habitat
- Field contains grass hay that heads later than usual due to damp soils, cooler climate, or late-maturing varieties

March

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

April

S	M	T	W	Th	F	S
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24	25	26	27	28	29

May

S	M	T	W	Th	F	S
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

June

S	M	T	W	Th	F	S
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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

July

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23/30	24/31	25	26	27	28	29

August

S	M	T	W	Th	F	S
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immediately after young birds have fledged. In many places, this will be in late June through early July. Birds will delay nesting and brood development in cooler or wetter seasons, so the first cutting should be delayed until mid-July. In any given year, a first cutting of grass hay in mid-July is sufficient to conserve grassland bird habitat. Subsequent cuttings should not have a detrimental effect on birds breeding in the current season. There is evidence that some birds, like Bobolinks, prefer a taller grass structure when selecting breeding sites early in the season. Thus, it is helpful to allow some hayfields to grow back in the autumn, letting the taller stems persist until the following spring (Nocera, J.J. pers. comm. 11-8-05).

Delaying hayfield mowing is a key element of grassland bird conservation.

Results of delayed hay cutting for grassland bird conservation

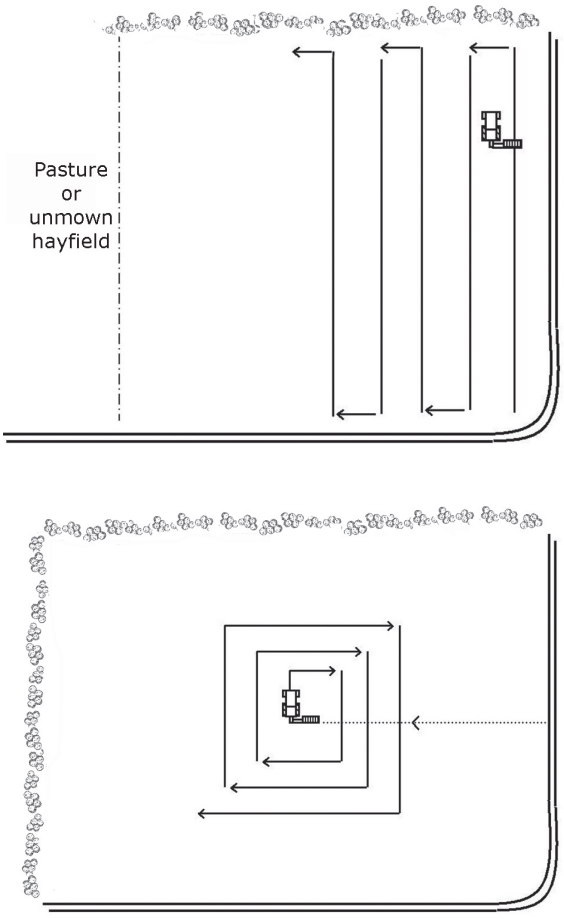
Delaying hay cutting for conservation or other reasons will compromise the optimal nutritional quality of hay. Later-cut hay has lower moisture content, lower digestibility, a higher rate of shattering, and lower protein. To maximize both yield and quality, grass hay should be cut at boot stage - just before or at head emergence; grass quality declines rapidly after heading. Delaying the cutting a week or two to allow for grassland birds to fledge will usually lead to hay that is essentially overmature, but potentially useful. Farms should make decisions about delaying cutting for conservation early in the growing season, based on expected herd nutrition needs. Nutrition loss from conservation cutting can be reduced by using late-maturing varieties of grasses when re-establishing a grass hay field.

New research shows that hay cut right after most young grassland birds have fledged in late June had lost only a small amount of crude protein (3.5% loss) but provided benefits of increased levels of calcium and phosphorous (Nocera et al., 2005). These losses will be unacceptable for livestock that require high-quality forage, such as calving dairy cows and

finishing beef cattle. Farms with animals that can tolerate moderately lower nutritive values - horse, sheep, dairy heifers, and mature beef - can often use this later-cut hay. Also, a coarse grade of hay can be beneficial to correct manure consistency problems for dairy cows on a rich feed ration.

Mowing patterns to conserve grassland birds

If an entire hayfield will be mown, the equipment operator can sometimes mow straight to the center of the hayfield and then gradually work toward the edges. This encourages grassland-nesting birds to scatter outward through cover, rather than into the open. If only part of a field will be cut, start with areas less conducive to grassland bird nesting, such as next to hedgerows or farm structures. If an unclipped pasture is adjacent to the hayfield, start farther from the pasture and work toward it, so birds can fly to the pasture as a refuge. Leave patches of standing grass in place, if possible.



Mow hay in a pattern that allows grass-nesting birds to escape to an adjacent field.

Most grassland birds will abandon hayfields that are mown during the breeding season, particularly Bobolink, Eastern Meadowlark, Henslow's Sparrow, Dickcissel, and Swamp Sparrow (Sample and Mossman, 1997). Some birds will remain in a mown hayfield to forage for insects, and some will attempt a second nest, depending on the season.

If hayfield mowing cannot be delayed or if a conservation mowing pattern is not be feasible, farmers should consider at least changing the mowing height. Raising the sicklebar or rotary blade height as much as possible (up to 5 – 6 inches) will reduce nest destruction, and provide some residual cover for birds. Also, a flushing bar is an increasingly common mower accessory used to reduce gamebird mortality in the Midwest (a flushing bar is a pipe extending horizontally over the uncut grass to the side of the hay mower; chains hang down to deter birds). They appear to be effective in deterring large gamebirds like pheasants, but probably have little conservation effect on small grassland birds; the loss of cover from mowing is mostly detrimental.

Rotating hayfields for grassland bird conservation

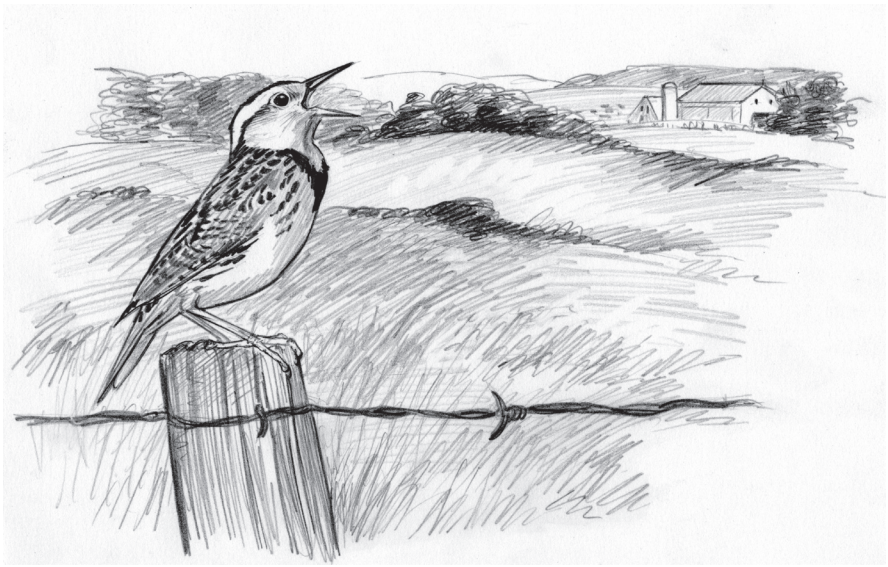
The concept of crop rotation usually means switching from annual corn or soybean crops to hay, back to annual crops in the same field on a 2 – 4 year cycle. Hayfield management rotation for grassland birds involves rotating which hayfields get cut earlier, later, or rested for a year or two. Whether or how a farm will rotate mowing in various hayfields will be particular to the goals of individual farmers, or controlled by rental agreements and easements in the NRCS Grassland Reserve Program. Such a hayfield management rotation plan for grassland bird conservation will usually restrict mowing during the breeding season for all fields, varying the timing annually. For example, an earlier mowing in one year (before grassland bird breeding) would rotate with later mowing (after grassland bird breeding) the following year.

When rotating hayfields for grassland birds, farmers should weigh the benefits (better grassy habitat, better drying conditions) with the disadvantages (hay quality loss). Hayfields cut late in the growing season produce

lower quality feed or mulch hay, but these do not have to result in economic loss. Late cut hay still has value for poultry, horse, sheep, dairy heifers, and beef fed with supplements. It can be used in some landscaping and conservation projects where weed seeds are acceptable. When grain prices are low, markets for late-cut hay are more flexible because there is less motivation to optimize nutritive value in the hay itself. Within a few years, this hay might be used for pelletized heating fuel. Farms that launch into grassland bird conservation in hayfields should also plan for long-term storage and alternative markets for their hay.

Grasshopper sparrow

Grassland bird conservation planning



Develop a plan for grassland bird conservation in your hayfields in cooperation with personnel from your county Soil and Water Conservation District, Cooperative Extension, and the regional Natural Resource Conservation Service. There are new resources and research available to meet your production goals and provide space for specialized wildlife. The following steps will lead to this balance:

1) Assess your current hayfield resources. On a map or aerial photograph, note which fields have the best potential for grassland bird habitat retention. These are fields of at least 10 acres, dominated by grasses and contain up to 20- 25% other plant species. The bigger the space, the better for grassland bird habitat. It helps if the grassy habitat is extended by adjacent pastures, idle grassy fields, other hayfields, or even mown lawns.

2) Evaluate your hay and forage needs to meet current and long-term production goals. You either have surplus hay, just enough, or never enough. This varies from year to year, so think about typical supplies, not the extremes. Consider what level of quality is best for your farm and what you need to do to make adequately nourishing hay.

3) Identify excess fields, fields that may not be critical for early hay mowing, and fields that are usually too wet for early mowing. These fields can form the base of a grassland conservation effort designed to maintain bird habitat. Late maturing

Is grassland bird conservation a stated farm goal?

No → Maintain haying procedures to optimize hay quality and yield.

Use an "inside-out" or other mowing pattern to reduce bird mortalities.

Consider use of a flushing bar.

Leave unmown strips and avoid mowing in wet areas and diversions for some bird habitat.

Reseed fields with later-maturing grasses and legumes, so hay mowing can be delayed a short time.

Yes ↓

Does the farm have fields with late-maturing hay due to soil, location, or weather conditions?

Yes → Cut late maturing hay after fledging (usually after July 10) to retain as much quality as possible.

If weather permits, periodically mow very early (before May 15) to gain nutritive content that will supplement later hay.

Use an "inside-out" or other mowing pattern to reduce bird mortalities.

Consider use of a flushing bar.

Leave unmown strips and avoid mowing in wet areas or diversions to retain bird habitat.

Reseed fields with later-maturing grasses and legumes, so hay mowing can be delayed a short time.

No ↓

Can the farm utilize or sell hay with lower digestibility and nutrient value?

Yes → Cut and bale hay after normal end of breeding season (after July 15).

Rotate late- and early-cut fields according to a conservation plan for grassland birds. This plan is specific for each farm.

Use an "inside-out" or other mowing pattern to reduce bird mortalities.

Consider use of a flushing bar.

Leave unmown strips and avoid mowing in wet areas or diversions to retain bird habitat.

No ↓

Consider idling fields that will not produce farm inputs.

Manage idle fields to maintain grassy structure with minimal woody vegetation.

Keep buffer strips in grass to increase grassland bird habitat.

varieties of hay grasses may be used to maintain better hay quality. These varieties may reach peak quality after grassland birds have fledged.

4) Observe the bird species that appear in hayfields. Farm operators curious to know which birds are already using their pastures should solicit the assistance of a knowledgeable birdwatcher, 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 around a hayfield in the morning, listening carefully and taking note of the different songs. Binoculars can help to observe field marks on some birds, but they should not be necessary in many cases.

5) Consult with conservation educators and technicians to develop a schedule of mowing and rotation to improve overall bird habitat. You can develop your own plan, but it is best to have conservation specialists review the specifics to make sure you are not overlooking important details about your farm needs. Cornell Cooperative Extension field crop specialists are located across New York State to help you make the most of your hayfields.

Joining other efforts

Grassland bird conservation in hayfields can be as rewarding as it is challenging. Efforts made by many farms in one region or community will eventually attract potentially significant populations of grassland birds. The changes in haying practices described above will augment efforts being made on non-agriculture land, public land, conservation land, corporate parks, and closed landfills. Before long, grassland bird abundance and diversity may increase across the Northeast. As knowledgeable stewards with a deep and rich tradition of conservation awareness, farmers can lead this environmental success story.

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