Agricultural Practices That Conserve Grassland Birds

Grassland Bird Habitat

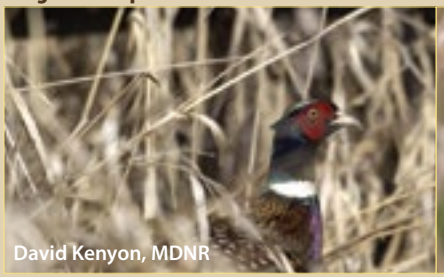
There is substantial diversity in the types and sizes of habitats selected by grassland birds during different stages of their life cycles. Thus, it is impossible to support all grassland bird species in a single field in one breeding season.

It can be fascinating to learn which birds are using farms and pastures when taking early morning spring and summer walks. It is especially helpful to learn the songs of grassland birds, consult a field guide or gain the assistance of an experienced birdwatcher.

The following table highlights a few important habitat variables and preferences of a variety of grassland birds.

Species	Vegetation Height	Leaf Litter	Standing Vegetation	Woody Vegetation	Minimum Area in Acres
Bobolink	6-14 in	med	med	none	25-250 ac.
Eastern Meadowlark	6-14 in	high	med	low	<25 ac.
Grasshopper Sparrow	<6 in	med	med	none	25-250 ac.
Henslow's Sparrow	14-24 in	high	high	none	>250 ac.
Northern Bobwhite	variable	med	med- high	med	25-250 ac.
Northern Harrier	14-24 in	med	med	low	>250 ac.
Ring-necked Pheasant	14-24 in	med?	high	low?	variable
Sharp-tailed Grouse	Variable	med?	high?	med	>250 ac.
Upland Sandpiper	6-14 in	med	med	none	25-250 ac.
After Sample and Mossman 1997, ? - indicates data were lacking or inconclusive.					

Ring-necked pheasant


David Kenyon, MDNR

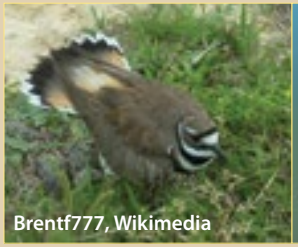
Henslow's sparrow


Dominic Sherony

Some species, including ring-necked pheasant and Henslow's sparrow, need the cover of dead standing grasses in spring.

Shortgrass Species: 6 inches or less

Killdeer


Brentf777, Wikimedia

Common nighthawk


Gary- Kramer, USFWS

Horned lark

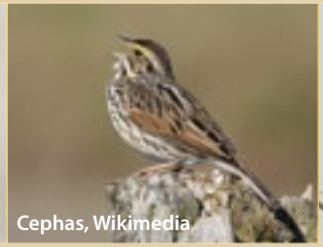

Tim Bowman, USFWS

Midgrass Species: 6-14 inches

Eastern meadowlark


Dominic Sherony

Savanna sparrow


Cephas, Wikimedia

Bobolink


D. G. E. Robertson

Tallgrass Species: 14-24 inches or more

Henslow's sparrow


Dominic Sherony

Dickcissel

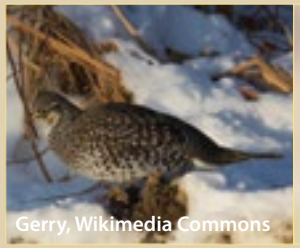

Patti McNeal

Red-winged blackbird


Walter Siegmund

Species that Require Large Areas (>250 acres)

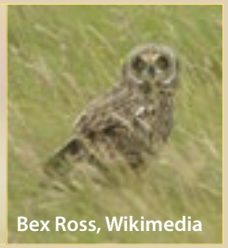
Sharptail grouse


Gerry, Wikimedia Commons

Northern harrier


Dan Pancamo, Wikimedia Commons

Short-eared owl


Bex Ross, Wikimedia

"Bird Friendly" Agricultural Practices

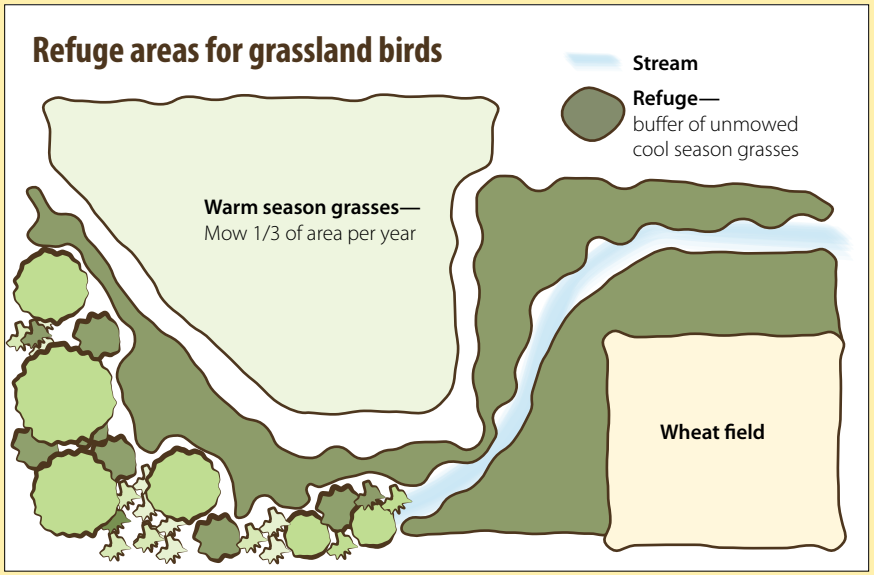
The following discussion provides an overview of "bird friendly" practices with input from Michigan farmers that have used them. Although not all of these techniques are practical for every agricultural operation, farmers are encouraged to incorporate those practices that they can in order to help conserve grassland birds while maintaining profitable agriculture. Many of the suggestions that follow are taken from *Managing Habitat for Grassland Birds: A Guide for Wisconsin*. See the References section for a link to this publication.

Refuge Areas

Provide patches of uncultivated land as refuges. These areas provide cover for birds, allow nesting to occur and ensure that some standing grasses will be available for cover the following spring. When chosen strategically, they can also prevent soil erosion and filter storm water runoff.

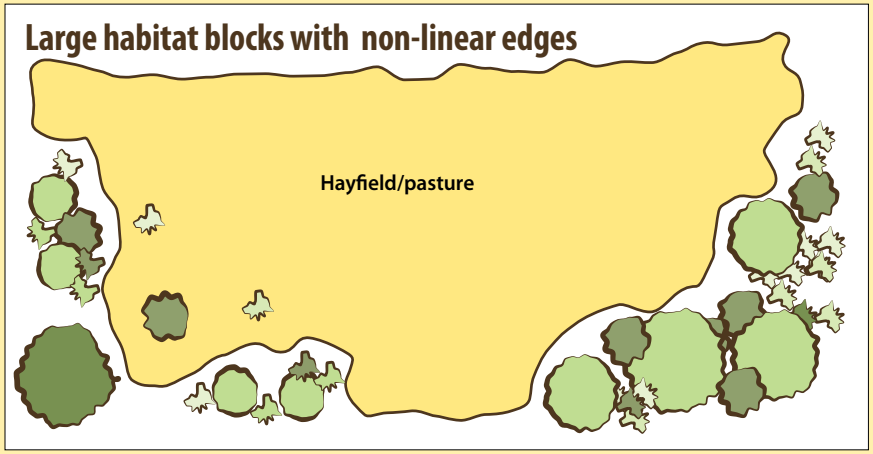
A grassland refuge surrounded by a mix of pastures, old fields and small grains (e.g wheat, barley, oats, rye and canola) has greater habitat value than a grassland of similar size surrounded by row crops (e.g. corn and soybeans), woodlots and residential areas.

- If managing multiple fields, leave some cover undisturbed each year.
- Only manage a portion of a field in a given season.
- Use rotational mowing and grazing among subunits of a grassland block to limit the impact of the disturbance.



Minimize Habitat Fragmentation

Larger grassland blocks (preferably 80-250 acres or more) that are not fragmented by woodlots and woody fencelines are beneficial for many grassland birds. They contain a diversity of conditions that can provide habitat for a greater number of bird species, reduce predator efficiency and decrease nest parasitism. Square and rounded plots are usually better than long, narrow, rectangular blocks for grassland birds. Woodlots and fencerows with irregular shrubby edges are preferred over abrupt linear edges. Narrow hedgerows can create travel lanes for predators while wide (>30 feet) and irregular field borders can provide habitat for grassland birds that require some woody vegetation.



Nest parasitism is higher in edge habitats

Brown headed cowbirds are brood parasites. They live in edge habitats and lay their eggs in other songbird's nests. The young cowbird is fed by the host parents at the expense of their own young.

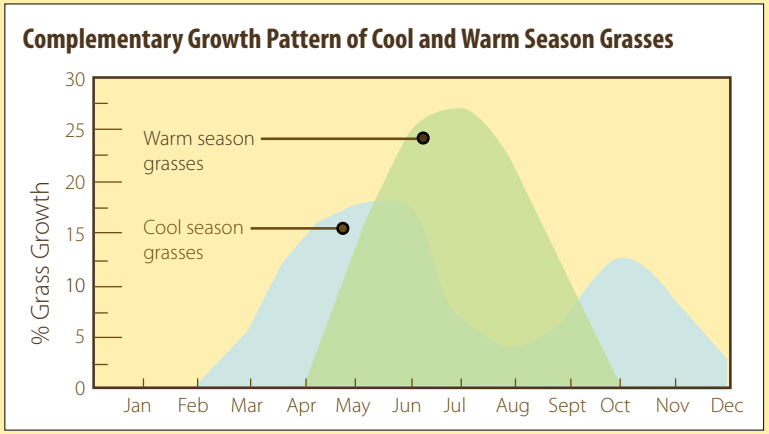
Brown-headed cowbird

Phoebe nest with cowbird egg

Plant Warm Season Grasses

Many farmers and producers have found that although the initial cost of establishing warm season grasses may be higher, it usually pays for itself in the long run. Pasture efficiency may be improved by converting one-fourth to one-third of a cool season field or pasture to warm season grasses. Cool season grasses are mowed or grazed in the early parts of the season while warm season grasses are utilized in mid-summer, providing a more uniform forage supply throughout the year and provide an important resource in drought years.

Warm season grasses are typically harvested in midsummer, providing valuable grassland bird nesting habitat in spring. Hay is generally cut in the late-boot to early-seedhead stage since fiber increases after that point, reducing the crude protein levels and digestibility of the hay.



Warm season grasses:
Pros:

- Deep roots improve soil infiltration of water/nutrient uptake
- Drought tolerant
- Long-lived, tolerate low fertility conditions
- Have similar nutritional value to cool season grasses when harvested prior to the emergence of seed heads
- Mature after grassland birds have fledged
- Provide superior wildlife habitat

Cons:

- Initially more expensive to establish
- Slower to establish

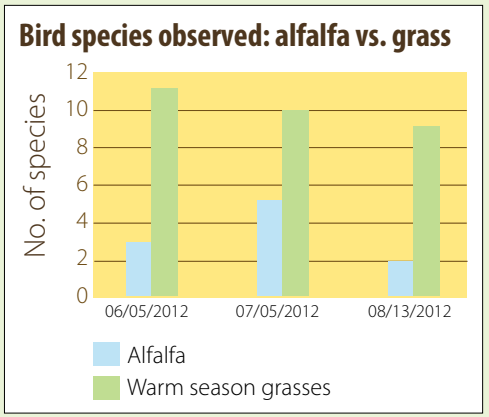
Experiences of Farmers growing warm season grasses

The DNR Wildlife Division provided cost share to five farmers in Eaton, Missaukee, Sanilac and Tuscola counties in 2010 to establish warm season grasses on a portion of their fields and to delay harvest or grazing until July 1st for a period of four years. The goal of this demonstration project was to show that warm season grass hay can be a nutritious and palatable alternative to alfalfa hay for cattle, goats, horses and sheep, while providing quality grassland bird habitat.

Most of the fields planted to warm season grasses took two years to establish and it was necessary to treat the competing weeds effectively with herbicide. One farmer noted that in 2012 his big bluestem field tolerated the drought better than adjacent alfalfa fields. Another reported that his confined goat herd readily ate the big bluestem hay that he fed them, while not surprisingly, those that he pastured seemed to prefer the weeds.

DNR Wildlife staff will continue to monitor the results of these plantings to better assess the benefits of this practice and determine if further management is needed. A warm season grass trial conducted in Wooster, Ohio demonstrated that yields from two harvests of switch grass were nearly equal to that of four harvests of orchard grass and tall fescue.

Grassland birds appear to benefit from warm season grass plantings, even while they are still becoming established. In 2011, a 35 acre field in Sanilac County was planted with big bluestem and native wildflowers. The graph below depicts the number of bird species detected in the planted field and a nearby 20 acre alfalfa field during three monitoring visits in 2012. Numerous birds including bobolinks, eastern meadowlarks, pheasants, savanna sparrows and dickcissels were documented in the big bluestem field while considerably fewer birds were recorded in the alfalfa field.



Savanna sparrow

Cephas, Wikimedia

Establishing Warm Season Grasses

Native warm season grass plantings provide many benefits but there are several things to consider before beginnning a new project. What is the present condition of the land? What are your goals? Improved wildlife habitat? A drought hardy species mix for hay?

If the land is presently planted in cool season pasture grasses, it may already be harboring abundant wildlife, including rare grassland bird species. Altering other aspects of management including delayed mowing and rotational mowing may actually provide comparable benefits for wildlife with less effort.

Before planting warm season grasses, there are several factors that should be considered:

- What sort of soils are present? Sand? Loam? Heavy clays? A mixture?
- What is the moisture availability? Are soils droughty? Low and wet?
- Are invasive species such as spotted knapweed already present?
- Are resources for long-term management available?

It may take several years for grasses to grow large enough to be harvested, depending on the weather conditions at the time. While most warm season grasses are drought hardy, some are better suited to the driest conditions. Information on the most commonly planted warm season grasses is on the facing page. On the wettest sites, other native grasses such as the cool season bluejoint grass can be considered.

Invasive species management

Hayland and pastureland are vulnerable to invasion by species such as leafy spurge, spotted knapweed or Canada thistle, that will diminish wildlife value and hay quality. Ideally, invasive species control should begin BEFORE planting and should be continued indefinitely.

Leafy spurge

Chris Evans, Illinois Wildlife Action Plan

Spotted knapweed

Leslie J. Mehrhoff, U-Conn, Bugwood.org

Warm Season Grasses

Big bluestem is a three to six foot tall grass whose seed ripens in September or October. It is palatable to livestock when hayed prior to the emergence of seedheads and when pastured during the growing season. It grows best on well-drained upland sites with loamy sands and sandy loams but will also grow on poorly drained soils and in wet areas.

Little bluestem grows from two to three feet tall. It is widely tolerant of drought and low-nutrient soils and is a reliable producer of native hay and forage. It has an extensive root system that reaches five to eight feet in depth and is helpful in preventing erosion on steep slopes. It grows in sturdy clumps that persist throughout the entire winter, providing valuable wildlife cover

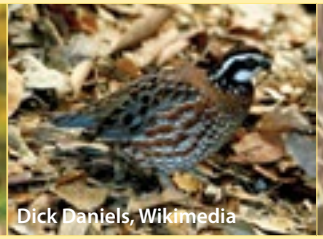
Indian grass is a three to six foot tall grass. It grows best on well-drained loamy sands or sandy loams, although it can survive on wetter, heavier soils. It produces excellent quality hay for ruminants. It should not be grazed in the spring before first growth is 16 inches tall or after a killing frost as it can contain dangerous prussic acid concentrations that are toxic to livestock.

Switch grass grows from four to eight feet tall and is adaptable to a wide range of soil conditions on both uplands and lowlands. It is easy to plant and establish, matures in September and produces abundant good-quality hay and pasture. It is not suitable forage for horses since it contains the chemical diosgenin which is toxic to non-ruminants.

Wild turkey

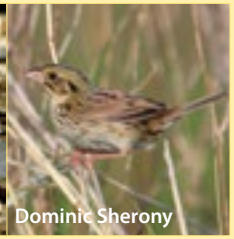
Dimus, Wikimedia

Northern bobwhite



Dick Daniels, Wikimedia

Henslow's sparrow



Dominic Sherony

Wild turkeys, ring-neck pheasant, northern bobwhite quail and many songbirds prefer to nest at the base of native prairie bunch-grasses which provide cover from residual standing vegetation from the previous year.

"Bird Friendly" Mowing Practices

A variety of practices can be incorporated on hayfields to reduce the mortality of grassland birds from mowing. There are a number of factors (e.g. field type, size of operation, equipment used and field configuration) that farmers must assess to determine which practices they can use while maintaining economic profitability. Simple changes may be beneficial on many sites. Nesting birds do not react in time to avoid high-speed harvesters and will not flush at night.

- Lower the mower speed, especially where birds have been observed.
- Avoid nighttime mowing.

a. Delay mowing

Most grassland species in Michigan begin nesting by late May or early June. It takes about 5-6 weeks for grassland birds to build a nest, hatch the eggs and raise their young. Some birds will re-nest in the same year. Although it is difficult to completely avoid wildlife impacts, by delaying mowing, ideally until July 15th, birds can complete at least one nesting cycle, and rabbits and fawns will have a greater chance of surviving.

Daria Hyde, MNFI

Experiences with delayed mowing

The MDNR Wildlife Division provided cost share funds to five farmers in Huron, Missaukee and Tuscola counties in 2010 to delay mowing their hayfields (alfalfa and cool season grasses) until July 1st, for a period of four years. Most farmers were able to get one or two cuttings each year.

New research shows that hay cut after birds have fledged in June had only a small amount of crude protein loss (3.5% loss) but increased levels of phosphorous and calcium. This later cut hay may not be acceptable for calving dairy cows but may be fine for other livestock that can tolerate moderately lower nutritive values.

- If forage quality is of primary importance, an early cut (before June 1st) followed by a 65-day rest period will give birds time to re-nest.

"Even without cost share I would still delay cutting as long as possible since I have seen more pheasants and rabbits and am thrilled to see more wildlife."

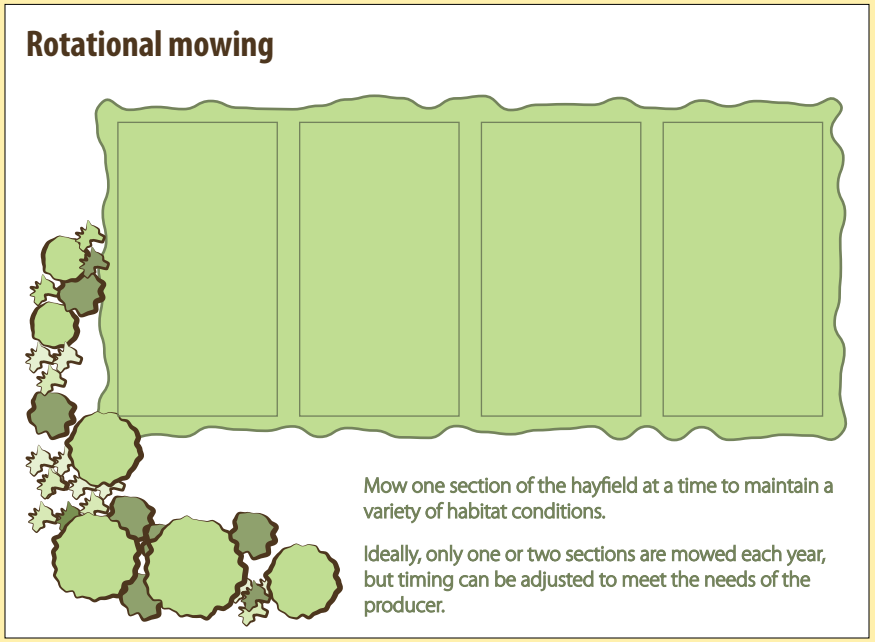
Gary Hunt, Huron County Farmer

David Kenyon, Michigan Department of Natural Resources

b. Use rotational mowing

Hayfield management rotation for grassland birds involves rotating which hayfields get cut early, late or rested entirely for a year or two. Rotational mowing can be used to maintain grassland communities in various stages of growth and vegetative diversity. Farmer's goals or rental agreements and easements will inform how this rotation is done and local NRCS staff, DNR biologists, and other agricultural specialists can help with planning. For example an early mowing (before grassland birds nest) could rotate with later mowing (after the breeding season) the following year. Farmers are encouraged to weigh the benefits of later mowing (better drying conditions) with the disadvantages (potential reduction in hay quality) and explore alternative markets for their hay.

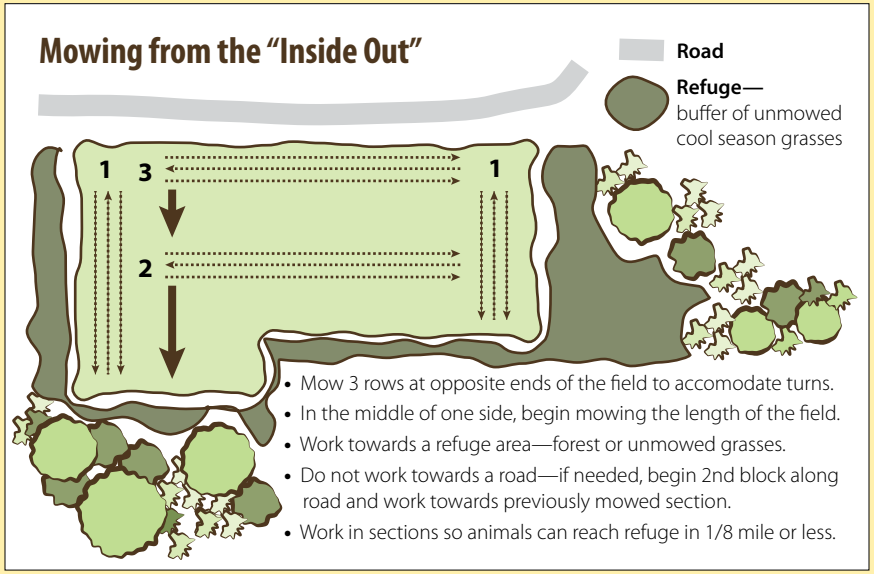
- Identify fields not critical for early mowing or those that are usually too wet for early mowing. These fields can provide excellent grassland bird habitat.
- Keep alert for nesting birds. Mowing around areas where birds are frequently seen or leaving small patches unmowed can protect many nesting birds and provide suitable cover and feeding areas for the rest of the summer.
- Raising the mower blade to six inches or more may avoid crushing some nests and young, although this will decrease the overall yield.



c. Mow "from the inside out"

The typical practice of mowing a field from the perimeter towards the center forces birds into a continually smaller space as they try to avoid the harvester. Instead, farmers have found that harvesting the field from the center and gradually working towards the edges can encourage grassland nesting birds and other animals to scatter outward towards cover. This practice compares favorably with traditional methods in terms of time and resources on fields larger than 10 acres.

Consider starting with the part of the field that is less likely to support nesting birds; next to hedgerows or farm structures. Alternatively, start mowing further from uncut pastures and work towards them so birds can fly to these refuge areas.



"There is no increased cost on the larger fields and no extra time or frustration. I think the practice does work as we see less small animal mortality. I will likely continue this practice even without cost share.

Dale Thorne, Jackson County Farmer

d. Use flushing bars

Wildlife are frequently killed by hay mowing equipment. Young fawns and breeding birds are particularly at risk. Flushing bars are simple tools that drag chains ahead of hay mowers to scare wildlife out of harms way. It is important to note that birds that are flushed will not be able to nest successfully in these fields but may be able to re-nest elsewhere, depending on the time of year. Flushing bars were promoted and used by farmers in the 1930's as a way to conserve wildlife. Ducks Unlimited Canada has developed a flushing bar design for mowers drawn by tractors.

In 2012 five farmers in southwest Michigan tried out a new generation of these old tools with support from the Allegan Conservation District. Flushing bars were constructed to attach to front end loaders using quick attach plates or fork pockets. Both the original design and details on modifications are available online at:

www.theflushingbarproject.net

In 2006, agricultural producers in Minnesota designed flushing bars to fit different types of harvesting equipment. Some were mounted to the tractor so they could be alternated from side to side and others were designed for pull-behind harvesting. Several participants reported remarkable success in the survival of pheasants, ducks and deer and indicated that they would continue this practice. Information on this project is availabile online at:

http://www.mn.nrcs.usda.gov/technical/ecs/wild/flushingbar.pdf

Mark Ludwig, Allegan Conservation District

2012 flushing bar mounted on a JD type quick attach plate. Note the two chains on the mast which keep the bar centered while allowing it to swing away in a collision.

What Farmers Say About Flushing Bars...

Paul Grant, Hamilton MI

"It works pretty well, it's handy. You would think it could get in your way, but it don't.

I jumped up a (pheasant) hen, rooster and six little ones. Once the chain hit them and they jumped up and I could see them, I could stop and let them go. Works pretty good."

Mark Ludwig, Allegan Conservation District

Mark Ludwig, Allegan Conservation District

Dave VanAntwerp, Otsego MI

"When we put the flushing bar on the tractor I was skeptical it would work, but it actually did. It's the first year I can remember we didn't have turkeys and deer in the hay bales.

Song birds were moving well. We normally have hawks and vultures circling the fields looking for fresh kills. We didn't have any of that this year."

Rheo Gomber, Bloomingdale MI

"It's a good project, it worked well."

"Any farmer has got the skills to build this….probably from scrap materials they have laying around.

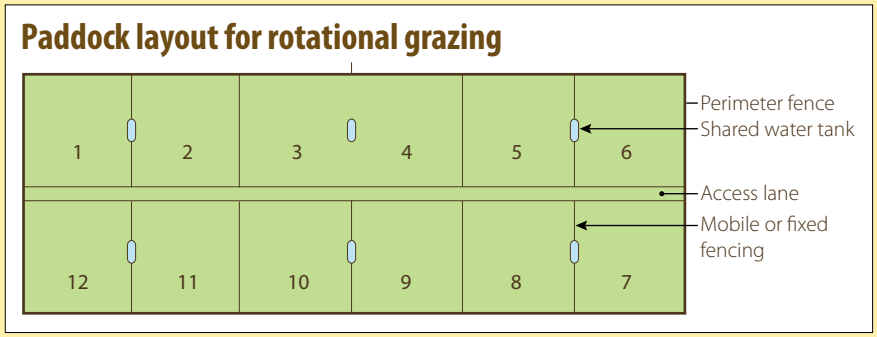
It eased my conscience, the fact that I was making an effort to do something. I think most small farmers have a concern with what they're doing when mowing and what not."

Mark Ludwig, Allegan Conservation District

"Bird Friendly" Grazing Practices

a. Use rotational grazing

Rotational grazing involves moving livestock into pastures subdivided into paddocks and allowing them to graze each paddock for a limited amount of time while resting the other areas. This system can increase pasture productivity and result in improved soil health and higher quality forage, even in drought years. Rotational grazing can enhance grassland bird habitat while providing sound economic benefits to the grazier. Grasses (especially warm season grasses, which aren't grazed until midsummer) are prime nesting habitat for a variety of gamebirds and songbirds, and grazing usually results in less damage to nests than haying.



b. Avoid heavy grazing until July 1st

Delaying grazing allows birds time to complete their nesting cycle. While it is not always feasible to keep livestock out of pastures this long, graziers can adopt practices to reduce damage to nests. The University of Wisconsin and Cornell University Cooperative Extension provide these guidelines.

- If using continual grazing, maintain stocking rate so pasture grasses are lightly to moderately grazed in spring through mid-summer; at least 50% of the grass should be 10 inches or higher.
- If using rotational grazing, livestock spend 3-5 days of light to moderate grazing in each paddock leaving at least 4 inches of growth to protect nests, speed plant recovery and increase yield.
- Graze alternate paddocks across a pasture when possible, rather than grazing sequentially.
- Leave refuge areas or defer grazing in paddocks which have the most birds and the best habitat. An ideal refuge is surrounded by pastures and is not grazed between May 15 and July 1st.


Bob Nichols, NRCS

Maintain Open Habitat

Grasslands that occur in landscapes with large expanses of open grass cover are much more likely to attract and support grassland birds than isolated grassland parcels fragmented by woody vegetation. Area-sensitive birds such as sharp-tailed grouse and short-eared owl benefit from large open grasslands that are larger than 250 acres, with few invading shrubs and trees. Although bigger is better, even 40-80 acres of quality grasslands are beneficial.

The DNR Wildlife Division assisted three landowners in Chippewa County with clearing brush and trees from their grasslands. A diversity and abundance of birds were recorded in a 90 acre field where invading willow was removed. Photo points were set up to monitor the condition of the grassland and it is expected that follow up treatment with herbicide or prescribed burns will be needed to treat the re-growth. At another farm, Scotch pine and other invasive species were removed and native grasses and forbs were planted to create grassland bird habitat. The landowner is pleased that short-eared owl, sharp-tailed grouse, hawks and songbirds are using this grassland.

"Bird Friendly" Practices in Row Crops

Although small grain and row crops do not provide ideal habitat for most grassland birds, some birds will forage for waste grain in these fields. Birds such as the ring-necked pheasant, killdeer, horned lark and vesper sparrow will nest in or near these fields, unfortunately success is often low due to the frequency of disturbance during the nesting season. The use of wide (>30 feet) linear or nonlinear field borders are recommended when possible to provide early successional habitat for birds such as northern bobwhite and vesper sparrows and to reduce predation. The following recommendations are adapted from NRCS guidelines and the Wisconsin Bird Conservation Plan to improve habitat quality for grassland birds in crop fields and to minimize negative impacts to nesting birds.

- Use conservation tillage practices to provide residual cover and food resources for wildlife. Minimize the number of equipment passes and allow 35-40 days between passes to improve nesting productivity.
- Reduce pesticide and synthetic fertilizer input. Institute both Integrated Pest Management practices and crop rotations that provide a source of nitrogen such as alfalfa, clover, soybeans.
- Explore alternative crops and cropping practices such as perennial herbaceous biofuel crops and intercropping practices.
- Establish grassy conservation buffers (>30 feet wide) along waterways and field borders to reduce runoff and provide wildlife habitat and delay mowing until after the breeding season..
- Make use of conservation programs that idle sensitive cropland and establish and maintain high quality cover consisting of a diversity of native grasses and forbs.

Tim McCabe, NRCS

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