Wildlife Habitat Management Institute

WILDLIFE HABITAT COUNCIL

Grassland Birds

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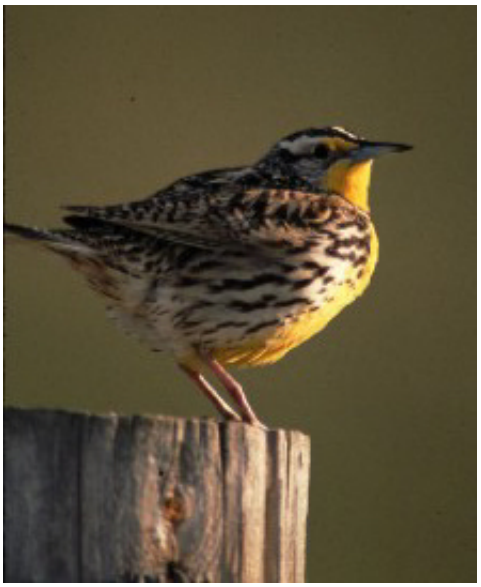


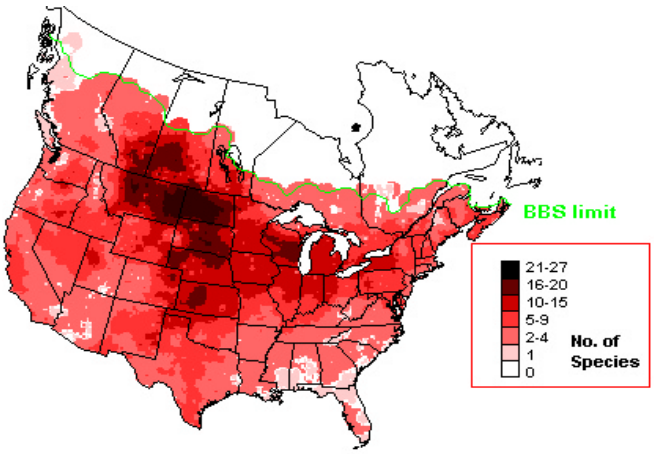
General Information

Grassland birds, or those birds that rely on grassland habitats for nesting, are found in each of the 50 United States and worldwide. Various species of waterfowl, raptors, shorebirds, upland gamebirds and songbirds rely on grasslands for nesting and other habitat functions. Historical population fluctuations in grassland-nesting bird species have coincided with changes in land uses and agricultural practices. Many North American grassland-nesting birds species have experienced marked population reductions in recent decades. Continued nationwide declines in some grassland-nesting bird species have increased awareness for the need to preserve, manage, and restore grassland habitat in order to recover and maintain viable grassland-nesting bird populations.

This leaflet is designed to serve as an introduction to the habitat requirements of grassland birds and to assist landowners and managers in developing comprehensive grassland bird management plans for their properties. The success of grassland bird management in a given area requires that managers consider the present habitat conditions in the area and the surrounding landscape and identify management actions to enhance habitat quality for local grassland birds.

Grasslands of the United States

Native grasslands in the United States have experienced many changes since the arrival of Europeans to North America. There is little doubt that the predominately forested northeastern United States originally contained parcels of open grasslands, including those cleared by native Americans. These grassland areas undoubtedly supported populations of grassland birds. By the 1800s, grasslands were widespread in the northeast due to the forest clearing activity of European settlers to create pastures and hayfields. The establishment of these agricultural grasslands was associated with increases in some grassland bird species populations. In the Midwest and Great Plains regions, settlers found vast expanses of native grassland that had covered much of the landscape. Most of these grasslands were converted to agricultural fields and livestock pastures in the late 1800' s and early 1900' s as farmsteads and European settlement expanded westward.



The 1900s also brought major changes to the character of grasslands in both eastern and midwestern/Great Plains regions. Changes in agricultural practices with the advancement of

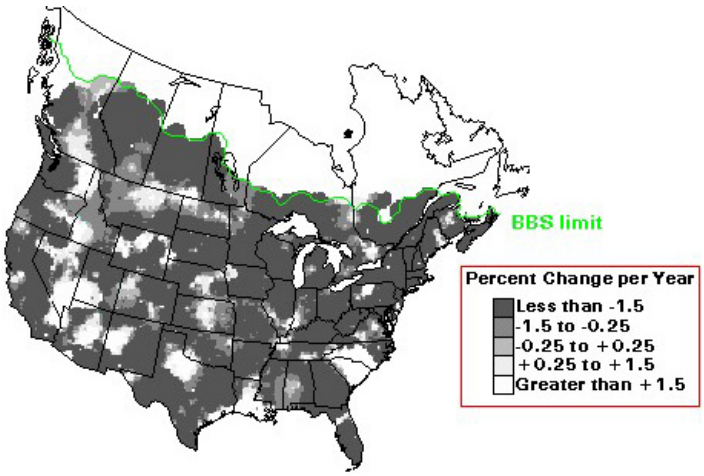
modern machinery and an increasing demand for agricultural products continued to reduce native grassland acreage in the west. Plowing of fields, removal of native grazers (bison), loss of wetlands, implementation of plantation forestry practices, and invasion of woody vegetation resulting from fire suppression have all contributed to significant losses of native grassland habitats. As farms moved westward, many once-large expanses of eastern grasslands became fragmented and began to disappear as idle farmland reverted back to old field and second-growth forest. Development of large farming operations in the Midwest and Great Plains has significantly changed the composition of grasslands; intensively managed crop fields and improved pastures have largely displaced native grasslands on most of the agricultural landscape. In the Midwest, pasture and hayland is also being replaced by more intensively-managed row crops. On the high plains and other areas of the west, a larger percentage of the landscape remains grassland habitat. Many of these rangelands are used extensively for grazing livestock.

Declines in Grassland Bird Populations

Breeding Bird Surveys (BBS) conducted by the Biological Resources Division of the U.S. Geological Survey and volunteers throughout the country reveal that grassland birds, as a group, have declined more than other groups, such as forest and wetland birds. There are many examples of population decline in grassland birds, most notably the extinction of the heath hen from the northeastern United States. Over the 25-year period 1966-1991, New England upland sandpiper and eastern meadowlark populations declined by 84 and 97 percent, respectively. The greater prairie-chicken has experienced an average annual rate of decline of over 10 percent during this same 25-year period. These examples and others illustrate the decline in grassland birds on a continental scale.

The figure at the right illustrates how widespread the decline in grassland birds has been in recent decades. Only 23 percent of the species tracked showed an average annual positive trend in population size, while the remainder either had no change or declined. As the figure illustrates, most areas have experienced long-term declines in grassland bird populations.

While loss of grassland breeding habitat is likely the largest factor contributing to the decline in many grassland bird species, other factors have played a role. Brood parasitism by brown-headed cowbirds, increased use of pesticides and other agricultural chemicals toxic to birds, mortality during migration, and loss of wintering habitats may have contributed to population declines in many species.



Average annual population changes in 28 grassland bird species from 1966 to 1996.

Habitat Requirements

General

Each grassland-nesting bird species has a unique set of habitat requirements. Table 1 illustrates some of the habitat preferences of many grassland-nesting bird species. While there are similarities among many species habitat requirements, habitat management to meet the specific needs of one species may or may not benefit other species. It is beyond the scope of this leaflet to identify detailed habitat requirements for each individual grassland-nesting bird species inhabiting various regions throughout the United States. However, generalizations can be made for the grassland-nesting bird habitat guild, and broad concepts can be addressed and considered in developing habitat management plans for grassland-nesting birds.

Grassland birds are naturally adapted to native grasslands and prairie ecosystems throughout North America. While these communities offer some of the highest quality nesting habitats, they are now extremely rare, especially east of the Great Plains. Fortunately, many grassland birds do not require native vegetation for breeding habitat. "Surrogate grasslands" on agricultural landscapes, in the form of hayfields, small grains, fallow and old fields, pastures, and idled croplands provide most of the important nesting habitats for grassland-nesting birds. Strip habitats such as right-of ways for utility lines, highways, railroads, and secondary roads; and field borders, grassed waterways, filter strips and similar linear habitats maintained in early successional communities provide valuable nesting and foraging habitats as well. On landscapes where intensive row crop agriculture is the dominant land use, these strip habitats are extremely important habitats for grassland birds and other wildlife. Grassland bird assemblages vary with the physical habitat structure, disturbance patterns and other factors. For each species or group of species, these habitats provide protective cover for nesting and brood-rearing activities. Adequate cover of undisturbed grassland is among the greatest factors affecting grassland bird populations, and the continued loss and conversion of grassland breeding and nesting habitat remains the largest threat to the future of many grassland bird species. Preserving and properly managing grassland communities can help maintain and increase local grassland bird populations, as well as populations of other wildlife species that use these habitats.

Table 1. Habitat preferences of common grassland nesting birds.

Species	Preferred grassland growth form			Avoids woody vegetation[1]
	Short	Med.	Tall	
Upland Sandpiper	X	X		X
Long-billed Curlew	X			
Mountain Plover	X			
Greater Prairie-chicken	X	X		X
Sharp-tailed Grouse	X			
Ring-necked pheasant		X	X	
Northern Harrier			X	X
Ferruginous Hawk	X	X		
Common Barn Owl	X	X	X	X
Short-eared Owl		X		X
Horned Lark	X			X
Sedge Wren			X	
Sprague's Pipit		X		
Bobolink		X		X
Eastern Meadowlark		X		
Western Meadowlark	X			X
Chestnut-collared longspur	X	X		
McCown's longspur	X			
Vesper Sparrow	X			
Savannah Sparrow	X	X		X
Baird's Sparrow		X	X	
Grasshopper Sparrow	X			X
Henslow's Sparrow		X	X	X
Le Conte's sparrow			X	X
Dickcissel		X	X	
Lark Bunting	X	X		

[1] While species marked avoid areas with woody vegetation, most can tolerate some woody vegetation within areas dominated by grassland.

Food Resources

The foods eaten by grassland birds are as diverse as the types of birds that inhabit grassland ecosystems. While insects are likely the most common food source, a wide variety of plant and animal matter is consumed. The box below lists some of the many food items of grassland birds.

Important grassland-nesting bird food items.

Insects and other invertebrates: grasshoppers, crickets, beetles, dragonflies, caterpillars, ants, katydids, alfalfa weevils, cutworms, wasps, spiders, snails, earthworms, sow bugs, others.

Raptor prey items: mice, gophers, voles, shrews, moles, prairie dogs, rabbits, snakes, lizards, songbirds, others.

Fruits, seeds and cultivated crops: wild berries, seeds of sedges, weed seeds, tame grass seeds, corn, oats, wheat, barley, other small grains

Native grass seeds: big bluestem, little bluestem, switchgrass, Indiangrass, green needlegrass, western wheatgrass, side-oats grama.

The Importance of Grassland Cover

While all grassland birds rely on herbaceous cover for nesting or foraging, there are many differences in cover requirements among individual species and groups of species. In addition, some species are area-sensitive, requiring large blocks of unbroken grassland habitat for nesting (see minimum habitat area section below). Some species, such as the barn owl, require woody vegetation or other non-grassland structures in which to nest (e.g., tree cavities or nest boxes), while the presence of woody vegetation can be detrimental to other species. Some species require the presence of nearby water or wetlands. Both the vegetation density and growth form – short, medium height, or tall grass – as well as surrounding land use also influences the assemblage of birds that may occur in a given area. In general, where large blocks of undisturbed grassland occur, grassland birds are able to fulfill most courtship, nesting, brood-rearing, feeding, escape, and loafing cover requirements during the nesting season. For many bird species, these habitats provide winter and migration cover as well.

Grasslands in eastern North America provide habitat for grassland-nesting birds within a predominantly forested landscape.

In agricultural landscapes, pastures and crop fields provide cover attractive to many grassland birds. However, in many situations, cultural practices and harvesting operations may destroy nests and adults that attempt to nest in these areas. Although these impacts are unavoidable in many instances, measures discussed in this leaflet can be taken to minimize impacts to nesting birds during field operations.

Landscape Factors

Habitat value for grassland birds is greatly affected by the condition of the landscape in the area and surrounding land uses. Small, isolated parcels of grasslands in landscapes that are heavily wooded have limited potential to support grassland birds. On the other hand, blocks of grassland habitat that occur within landscapes dominated by open grass cover are much more likely to attract and support grassland birds. Interspersion of various types of grassland can maximize habitat quality for some species. However, interspersion of grassland habitat with woody vegetation and other land uses that fragment grassland habitats may be detrimental. Some area-sensitive obligate grassland species (and also some habitat specialists) require large unbroken blocks of grassland habitat with little or no interspersion with other habitat types. For this reason, it is crucial to consider landowner objectives, local landscape features and management potential, and area-wide population goals of target grassland species in the area when planning management actions for grassland birds. Consultation with state and Federal wildlife agencies and review of established grassland bird priorities for the region (e.g., Partners in Flight Bird Conservation Plans – see *www.partnersinflight.org*) can assist in this process.

The greater the variety of grassland growth forms available and successional growth stages that occur within grassland landscapes, the greater the number of grassland bird species they can support. In addition, the more grassland that is available in an area, particularly in large unbroken blocks, the greater the number of area-sensitive grassland birds the area is able to support.

Area-sensitivity and Minimum Habitat Area

Many "area-sensitive" grassland bird species require a certain amount of habitat to be present, usually in contiguous patches or unbroken blocks, before individuals will use a given site. Estimates of the minimum size of suitable nesting and breeding habitat required to support breeding populations of grassland birds vary greatly among species. Species-specific area requirements may also vary among geographic regions and landscape characteristics. For example, the size of habitat patches needed to attract individuals of a given species may be smaller in landscapes that contain a large amount of grassland and open habitats compared to areas with little grassland habitat.

In order to support an array of grassland-nesting bird species within an area, contiguous grassland blocks of at least 500 acres provide the greatest potential. However, smaller grassland blocks provide viable habitat patches for many grassland bird species. A general rule may be to maximize the size and interconnectedness of grassland habitat patches available, while conducting management actions that maximize the habitat quality within these habitat patches.

Grassland and Rangeland Management for Grassland Birds

Grassland bird habitats in existing grasslands, whether unbroken native prairie, retired farmlands, improved pasture, or other grassland systems, can be maintained and improved through various management actions.

***Rotational mowing*:** Rotational mowing can be used to maintain grassland communities in various stages of growth and vegetation diversity. This management practice is conducted by dividing an area into 15 to 25-foot wide strips (depending on the area' s size) that are separated from one another by 50 to 85 feet (see Fig. 1). Wider strips can be established to provide larger habitat blocks as well. A single strip is mown to a height of four to eight inches either once or twice a year depending on the species of grassland-nesting birds present in the area. Smaller areas can be divided into three strips; mow one strip in early spring (mid-March to mid-April, depending on the region) before grassland birds commence nesting activities, and again in late summer after nesting activities are completed. The following year, the second strip would be mowed in the same months. The third strip would be mowed in year three, and the process begins again in year four. Larger areas evenly divided into six or more strips can be rotationally mown in pairs, so that strip one is worked with strip three, strip two with strip four, strip three with strip six, and so forth. Note: Landowners should work closely with local NRCS field officers, state department of natural resource officers, and other wildlife professionals when planning grassland management to determine mowing dates and techniques that minimize impacts to nesting birds. Knowing the types and habits of species for which an area is managed will also help to determine whether or not residual cover should be provided for nesting birds, and thus whether or not the area should be mowed a second time within the same year in late fall.

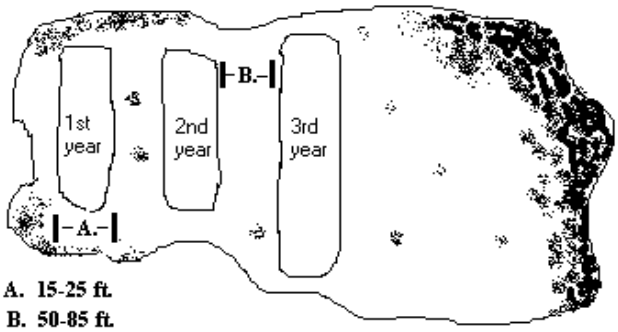
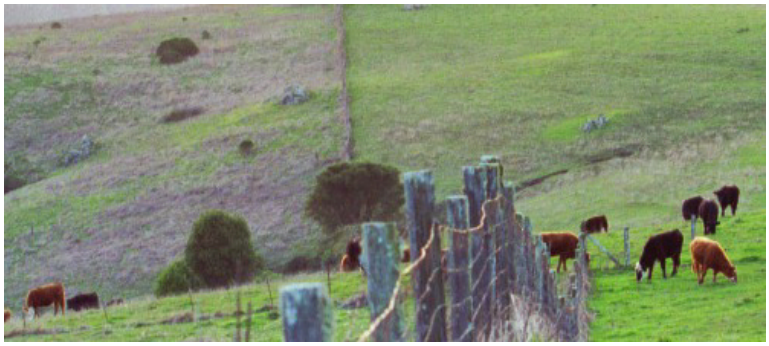


Fig. 1. Rotational mowing configuration to provide various grassland growth forms for grassland birds.

Prescribed grazing: Rotational, deferred, or continuous gazing can be conducted to benefit both forage quality and grassland bird habitat. Grazing by bison in the west was once a natural means of grassland management, and grassland birds may benefit today from controlled livestock grazing in many areas. Depending on the region, grassland composition, and the bird species managed for, grazing types and practices may vary. Rangelands can be maintained in good condition, providing quality forage and suitable grassland bird habitat for many species by one or more of the following measures:



- Provide 30 to 50 days of rest between grazing periods in each paddock .
- Defer grazing in some nesting areas until late in the nesting season.
- Restrict livestock from sensitive nesting areas.
- Graze the entire pasture at a light rate (allowing grass height to be maintained at least 10 inches tall) all summer and put the entire herd on just one half of the pasture during the late season.

- Avoid heavy continuous grazing.
- Rotationally graze cool season grasses in spring and fall and warm season grasses in mid-summer to maximize productivity while minimizing habitat disturbance.

Prescribed burning: Prescribed burning is used to maintain grassland communities in various stages of growth and vegetation diversity similar to rotational mowing and managed grazing. Burning returns valuable nutrients to the soil and maintains grasslands as open habitat, thus preventing conversion of grasslands to wooded communities through invasion or natural plant succession. Most native grasslands benefit from fire. The suppression of natural wildfires in the United States has reduced the quality of many remaining grassland communities. Although beneficial, prescribed burning is a highly regulated technique and should only be conducted in compliance with all state and local laws and with appropriate technical assistance. Agencies and qualified individuals can help develop burn plans and provide necessary tools, equipment, and supervision, and can assist in obtaining required burning permits. Prescribed burns should be conducted on a three- to five-year rotational basis, but shorter rotations may be used to benefit some species. Most prescribed burning should be done in the early spring (March-April, depending on the region), but late-summer and fall burns may also be appropriate in some circumstances. Dividing the burn area into strips or plots is important in order to leave undisturbed nesting habitat adjacent to burned plots. Adequate firebreaks should be planned for prescribed burn areas.

Woody vegetation removal: In areas managed for birds that are intolerant of woody vegetation, grassland management through prescribed burning, mowing and grazing can help maintain grassland habitats. Manual removal of trees and shrubs may be necessary where these practices have not been conducted or where scattered trees and shrubs become established in odd areas. However, some species of grassland birds are benefited by scattered trees, shrubs, and woody fencerows (e.g., loggerhead shrike, Bell' s vireo, field sparrow, clay-colored sparrow, and vesper sparrow, as well as savanna birds such as red-headed woodpecker and orchard oriole). In addition, in some areas, birds that use scrub habitats (e.g., yellow-breasted chat, indigo bunting) may be in greater decline than grassland birds, making maintenance of some scrub habitats (non-forest) a priority. Linear woody cover that fragments large blocks of grassland habitat may be more detrimental to grassland birds than scattered patches, due to their use as travel corridors by nest predators. Landowners and managers should carefully consider bird species habitat objectives before proceeding with woody vegetation removal actions.

Cropland Management for Grassland Birds

Hay fields: Ideally, hay mowing activities should be delayed until mid-July or early August to allow grassland birds to complete most nesting activities. However, in many instances this is not feasible for farmers who need to harvest high quality forage. In these circumstances, birds may be drawn to nest in the cover provided by the hay crop only to lose the nest or be killed by hay mowing operations. However, the following measures can be taken to minimize impacts on birds nesting in production hay fields.

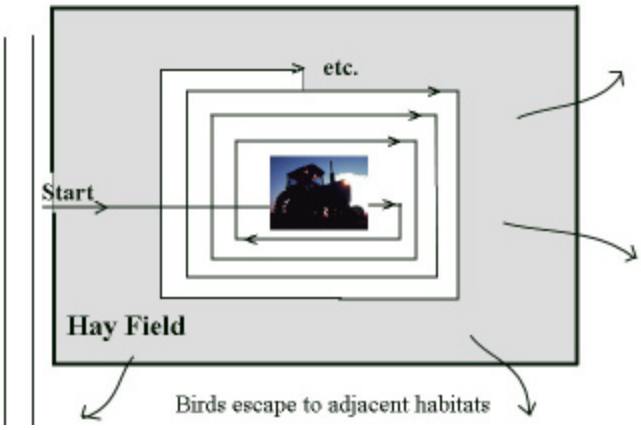


Fig. 2. Hay fields should be mowed from the center outward to allow birds to escape to adjacent habitats.

1) Hay fields should be mowed from the field center outward to provide cover that allows fledgling birds to escape to the edge of the field (see Fig. 2).
2) Fields can be broken into sub-units and mowed on a rotational basis to allow for some useable habitat to be available at all times.
3) Adult nesting birds and roosting individuals are less likely to flush from cover during the night. Therefore, night mowing should be avoided to prevent adult bird mortality.
4) Flushing bars should be mounted on harvesting equipment to minimize bird mortality during mowing operations.

5) Strip cover and similar herbaceous cover should be left undisturbed until well after the nesting season (mid to late August) to allow birds that failed to successfully nest in active hayfields the opportunity to successfully re-nest in these alternative adjacent habitats.

Small grains and row crops: Small grain and row crop fields provide surrogate grassland habitat structure for some grassland birds. While some species nest in conventionally-tilled row crop fields (see Table 2), nest success is generally low due to the frequency of disturbance during the nesting season. Small grain fields, which are typically harvested later in the nesting season, provide more productive nesting habitats for some species. Measures can be taken to improve grassland bird habitat quality in crop fields and to minimize impacts to nesting birds.

1) Use no-till practices to provide residual nesting cover and waste grain availability for winter food.
2) Minimize the number of equipment passes through conservation tillage practices. Allow 35 to 40 days if possible between equipment passes to allow for complete nesting cycles.
3) Use contour buffer strips and strip cropping practices to provide some undisturbed habitat adjacent to crop fields that are disturbed by equipment passes.
4) Reduce the use of pesticides and inorganic fertilizers through Integrated Pest Management practices.
5) Explore use of alternative crops and cropping practices such as native grass biomass crops and inter-cropping practices.
6) Make use of set-aside programs that idle sensitive cropland and establish and maintain high-quality cover consisting of a diversity of native grasses and forbs.

Table 2. Bird species found to nest in conventionally-tilled (T) and no-till (NT) corn and soybean fields[1] (from Best 1986).

Species	Corn		Soybeans	
	T	NT	T	NT
Ring-necked pheasant		x	x	x
Killdeer	x	x		
Mourning dove	x	x	x	x
Horned lark	x		x	
American robin		x		
Common yellowthroat		x		
Bobolink		x		
Eastern meadowlark		x		
Western meadowlark		x		x
Red-winged blackbird	x	x		
Brown-headed cowbird	x	x	x	x
Dickcissel		x	x	
Savannah sparrow		x		
Grasshopper sparrow		x		
Vesper sparrow	x	x	x	x
Field sparrow		x		x

[1] Some NT fields were pastures treated with a burn-down herbicide.

Grassland-nesting Birds Habitat Requirements Summary Table.

Habitat Component	Habitat Requirements
General	• Grasslands, crop/grassland/forb-mixed communities, prairies, meadows, hayfields, grazed pastures and rangelands, reverted agricultural fields, idle pastures and old fields, utility and roadway right-of-ways and other strip habitats, coastal grasslands, and other open herbaceous habitats.
Food	• Insects and other invertebrates • Fruits, seeds and cultivated crops: wild berries, weed seeds, exotic grass seeds, seeds of sedges, corn, oats, wheat, barley, other small grain crops • Native grasses seeds: big bluestem, little bluestem, switchgrass, Indiangrass, green needlegrass, western wheatgrass, side-oats grama
Interspersion – grassland obligate species	• Mixture of short, medium, and tall grass areas in large, unbroken grassland blocks with less than 5% woody vegetation cover. Native grasses provide optimal conditions, but introduced cool season grasses may also provide suitable habitats for many grassland birds.
Interspersion – species requiring woody vegetation	• Grassland communities adjacent to woodlands, savannas, wetlands, shrubland, old field communities, overgrown fencerows and shelterbelts. Individual bird species requirements must be considered in determining woody vegetation requirements.
Minimum Habitat Size	• Minimum size of suitable nesting and breeding habitat required to support a breeding population of grassland birds varies among species. Depending on species habitat objectives, minimum habitat size may range from as little as 10 acres to as much as 500 acres or more. For grassland bird management, at least 40 acres of grassland should be available unless adjacent to larger grass habitat blocks.

Habitat Inventory and Assessment

Managing habitats for grassland birds relies on assessing the management potential of each area within the surrounding landscape and deciding which species or groups of grassland birds should be targeted. For planning purposes, use the table below to inventory the site to subjectively rate the availability, quality, and potential of grasslands and surrounding habitats, as well as their proximity to one another, based on the above narrative habitat requirement descriptions. Keep in mind that site conditions may provide good habitat conditions for some species and poor habitat for others. For example, habitat quality for species that rely on large unbroken expanses of grassland such as the northern harrier, greater prairie chicken, upland sandpiper, and grasshopper sparrow may be limited in areas with high interspersion with woody habitat types. However, species that tolerate or require some woody vegetation such as the eastern bluebird, loggerhead shrike and field sparrow benefit from high interspersion among grassland and woody habitat types. Therefore, grassland bird community objectives must be considered in determining limiting factors and management objectives for an area.

Habitat Component	**Availability/Quality/Potential**			
	High	**Medium**	**Low**	**Absent**
Nesting cover:				
Short grass nesting species				
Medium grass height nesting species				
Tall grass nesting species				
Food				
Diversity of surrounding habitat				
Interspersion:				
Large grassland blocks available (circle one)	>250 ac.	25-250 ac.	<25 ac.	
Grassland fragmented by forest/other land uses				

Management Prescriptions

Management treatments should be designed to match the planning area with grassland bird habitat conditions and objectives for the local landscape and address the habitat components that are determined to be limiting habitat potential for the target grassland bird species. For planning purposes, select among the possible action items listed below to raise the quality or availability of each habitat component determined to be limiting. NRCS Conservation Practices and various programs that may provide financial or technical assistance to carry out specific management practices are listed where applicable.

U. S. Fish and Wildlife Service

Savannah sparrow

Habitat Component	Management options for increasing Habitat quality or availability	Cons. Practices & Assistance Programs
Food	• Preserve and maintain grassland/forb communities by conducting prescribed burning, rotational mowing, and prescribed grazing (especially during drought) when and where appropriate. Encourage a forb component in grasslands.	327, 338, 528A, 645, 647 WHIP, EQIP, PFW, CRP
	• Plant native warm season grasses adapted to the site such as big bluestem, little bluestem, switchgrass, eastern gama, and Indiangrass, and native cool season grassses such as green needlegrass, western wheatgrass, and side-oats grama.	327, 390, 643, 645, 647 WHIP, EQIP, PFW, CRP
	• In areas where fragmentation of large grassland blocks is not a concern, preserve overgrown fence-, tree-, and establish hedgerows that provide a diversity of plant and insect life and wild fruits and seeds.	380, 391, 422, 650 WHIP
	• Leave waste corn, oats, wheat, barley, rye, sorghum, and other small grain crops on ground after harvest activities. Avoid fall tillage.	329
	• Limit herbicide and insecticide use on range- and other grasslands to small areas or use mechanical means so as to reduce reduction of forbs, invertebrates (insects), or mast (seeds) used as food.	329
Nesting cover	• Preserve and maintain grassland/forb communities by conducting prescribed burning, rotational mowing, and prescribed grazing (especially during drought) when and where appropriate. Encourage a forb component in grasslands.	327, 338, 528A, 645, 647 WHIP, EQIP, PFW, CRP
	• Plant native warm season grasses adapted to the site such as big bluestem, little bluestem, switchgrass, eastern gama, and Indiangrass, and native cool season grassses such as green needlegrass, western wheatgrass, and side-oats grama.	327, 390, 643, 645, 647 WHIP, EQIP, PFW, CRP
	• Restore hydrology and vegetation in herbaceous wetlands and establish adjacent grassland buffers	657 PFW, WRP
	• Establish field borders, hedgerows, shelterbelts, and other habitat corridors on agricultural land (may harm some area-sensitive species while benefiting other species). This can conflict with management for open grassland species by fragmenting open grassland; the exception may be in row crop-dominated systems.	380, 386, 390, 391, 422 WHIP, EQIP. PFW. CRP
	• Conduct haying activities in a manner that minimizes bird mortality and allows for some nesting success where feasible.	
	• Reduce herbicide use when application results in loss of nesting and winter cover provided by grasses and forbs.	
Interspersion & minimum habitat size	• Combine above prescriptions to increase interspersion of habitat components or amount of suitable grassland bird habitat. • Provide large (500 acres if possible), diverse grassland blocks or connect smaller grassland blocks with adjacent grassland areas.	

NRCS Conservation Practices that may be useful in undertaking the above management actions.

Conservation Practice	Code	Conservation Practice	Code
Conservation Cover	327	Hedgerow Planting	422
Residue Management	329	Prescribed Grazing	528A
Prescribed Burning	338	Restoration of Declining Habitats	643
Windbreak/Shelterbelt Establishment	380	Upland Wildlife Habitat Management	645
Field Border	386	Early Successional Habitat Development	647
Riparian Herbaceous Cover	390	Windbreak/Shelterbelt Renovation	650
Riparian Forest Buffer	391A	Wetland Restoration	657

Available Assistance

Landowners interested in making their individual efforts more valuable to the community can work with WHC and NRCS to involve school, scout, and community groups and their families in habitat projects when possible. On-site education programs demonstrating the necessity of grassland-nesting bird habitat management can greatly increase the value of your individual management project as well. Corporate-owned land should encourage interested employees to become involved. Involving federal, state and non-profit conservation agencies and organizations in the planning and operation of a grassland-nesting bird management plan can greatly improve the project' s success. Assistance programs available through various sources are listed below.

Programs that provide technical and financial assistance to develop habitat on private lands.

Program	Land Eligibility	Type of Assistance	Contact
Conservation Reserve Program (CRP)	Highly erodible land, wetland, and certain other lands with cropping history. Streamside areas in pasture land	50% cost-share for establishing permanent cover and conservation practices, and annual rental payments for land enrolled in 10 to 15-year contracts. Additional financial incentives are available for some practices	NRCS or FSA State or local Office
Environmental Quality Incentives Program (EQIP)	Cropland, range, grazing land & other agricultural land in need of treatment	Up to 75% cost-share for conservation practices in accordance with 5 to 10-year contracts. Incentive payments for certain management practices	NRCS State or local Office
Partners for Fish and Wildlife Program (PFW)	Most degraded fish and/or wildlife habitat	Up to 100% financial and technical assistance to restore wildlife habitat under minimum 10-year cooperative agreements	Local office of the U.S. Fish and Wildlife Service
Waterways for Wildlife	Private land	Technical and program development assistance to coalesce habitat efforts of corporations and private landowners to meet common watershed level goals	Wildlife Habitat Council (301-588-8994)
Wetlands Reserve Program (WRP)	Previously degraded wetland and adjacent upland buffer, with limited amount of natural wetland, and existing or restorable riparian areas.	75% cost-share for wetland restoration under 10-year contracts and 30-year easements, and 100% cost share on restoration under permanent easements. Payments for purchase of 30-year or permanent conservation easements.	NRCS State or local Office
Wildlife at Work	Corporate land	Technical assistance on developing habitat projects into a program that will allow companies to involve employees and the community	Wildlife Habitat Council (301-588-8994)
Wildlife Habitat Incentives Program (WHIP)	High-priority fish and wildlife habitats	Up to 75% cost-share for conservation practices under 5 to 10-year contracts	NRCS State or local Office
State fish and wildlife agencies and private groups such as Pheasants Forever and Prairie Grouse Technical Council may have assistance programs or other useful tools in your state.			State or local contacts

References and Suggested Readings

Askins, R. A. 1994. History of grasslands in the northeastern United States: Implications for bird conservation. Pages 119-136 *in* P. D. Vickery and P. W. Dunwiddle, *eds*. Grasslands of Northeastern North America: Ecology and conservation of native and agricultural landscapes. Mass. Audubon Soc.

Best, L. B. 1986. Conservation tillage: Ecological traps for nesting birds. Wildl. Soc. Bull. 14:308-317.

Best, L. B., K. E. Freemark, J. .J. Dinsmore, and M. Camp. 1995. A review and synthesis of bird habitat use in agricultural landscapes of Iowa. Am. Midl.Nat. 134:1-29.

Castrale, J. S. 1985. Responses of wildlife to various tillage conditions. Trans. N. Am. Wildl. and Nat. Resour. Conf. 50:142-156.

George, R. R., A. L. Farris, C. C. Schwartz, D. D. Humburg, and J. C. Coffey. 1979. Native prairie grass pastures as nest

cover for upland birds. Wildl. Soc. Bull. 7:4-9.

Herkert, J. R., D. W. Sample, and R. E. Warner. 1996. Management of midwestern grassland landscapes for the conservation of migratory birds. Pages 89-116 *in* F. R. Thompson III, ed., Management of midwestern landscapes for the conservation of neotropical migratory birds, USDA For. Serv. North Central Forest Exper. Stat. Gen. Tech. Rep. NC-187, St. Paul, MN.

Herkert, J. R., R. E. Szafoni, V. M. Kleen, and J. E. Schwegman. 1993. Habitat establishment, enhancement and management for forest and grassland birds in Illinois. Ill. Dep. Conserv., Natural Heritage Tech. Pub. 1. 20 pp.

Higgins, K. F., T. W. Arnold, and R. M. Barta. 1984. Breeding bird community colonization of sown stands of native grasses in North Dakota. Prairie Nat. 16:177-182.

Jones, A. J. and P. D. Vickery. 1997. Conserving grassland birds: Managing large grasslands including conservation lands, airports, and landfills over 75 acres for grassland birds. Mass. Audobon Soc. 17pp.

Jones, A. J. and P. D. Vickery. 1997. Conserving grassland birds: Managing small grasslands including conservation lands, corporate headquarters, recreation fields, and small landfills for grassland birds. Mass. Audobon Soc. 16pp.

Jones, A. J. and P. D. Vickery. 1997. Conserving grassland birds: Managing agricultural lands including hayfields, crop fields, and pastures for grassland birds. Mass. Audobon Soc. 15pp.

Knopf, F. L. 1994. Avian assemblages on altered grasslands. Studies in Avian Biol. 15:247-257.

Koford, R. R., and L. B. Best. 1996. Management of agricultural landscapes for the conservation of neotropical migratory birds. Pages 68-88 *in* F. R. Thompson III, ed., Management of midwestern landscapes for the conservation of neotropical migratory birds, USDA For. Serv. North Central Forest Experiment Station Gen. Tech. Rep. NC-187, St. Paul, MN.

Rodenhouse, N. L., L. B. Best, R. .J. O' Connor, and E. K. Bollinger. 1995. Effects of agricultural practices and farmland structures. Pages 269-293 *in* T. E. Martin and D. M. Finch, eds. Ecology and management of neotropical migratory birds. Oxford University Press, New York. 489 pp.

Ryan, M. R. 1986. Nongame management in grassland and agricultural ecosystems. Pages 117-136 *in* J. B. Hale, L. B. Best, and R. L. Clawson, eds. Management of nongame wildlife in the Midwest: a developing art. North Central Section, The Wildlife Society. 171 pp.

Sample, D. W., and M. J. Mossman. 1997. Managing habitat for grassland birds: A guide for Wisconsin. Wis. Dep. Nat. Resour. PUBL-SS-925-97. 154 pp.

Sauer, J. R., J. E. Hines, I. Thomas, J. Fallon, and G. Gough. 2000. The North American Breeding Bird Survey, results and analysis 1966-1999. Version 98.1, USGS Patuxent Wildlife Research Center,*Laurel, MD*.

Swanson, D. A. 1996. Nesting ecology and nesting habitat requirements of Ohio' s grassland-nesting birds: a literature review. Ohio Dep. Nat. Resour. , Ohio Fish and Wildlife Report 13. 60 pp.

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