

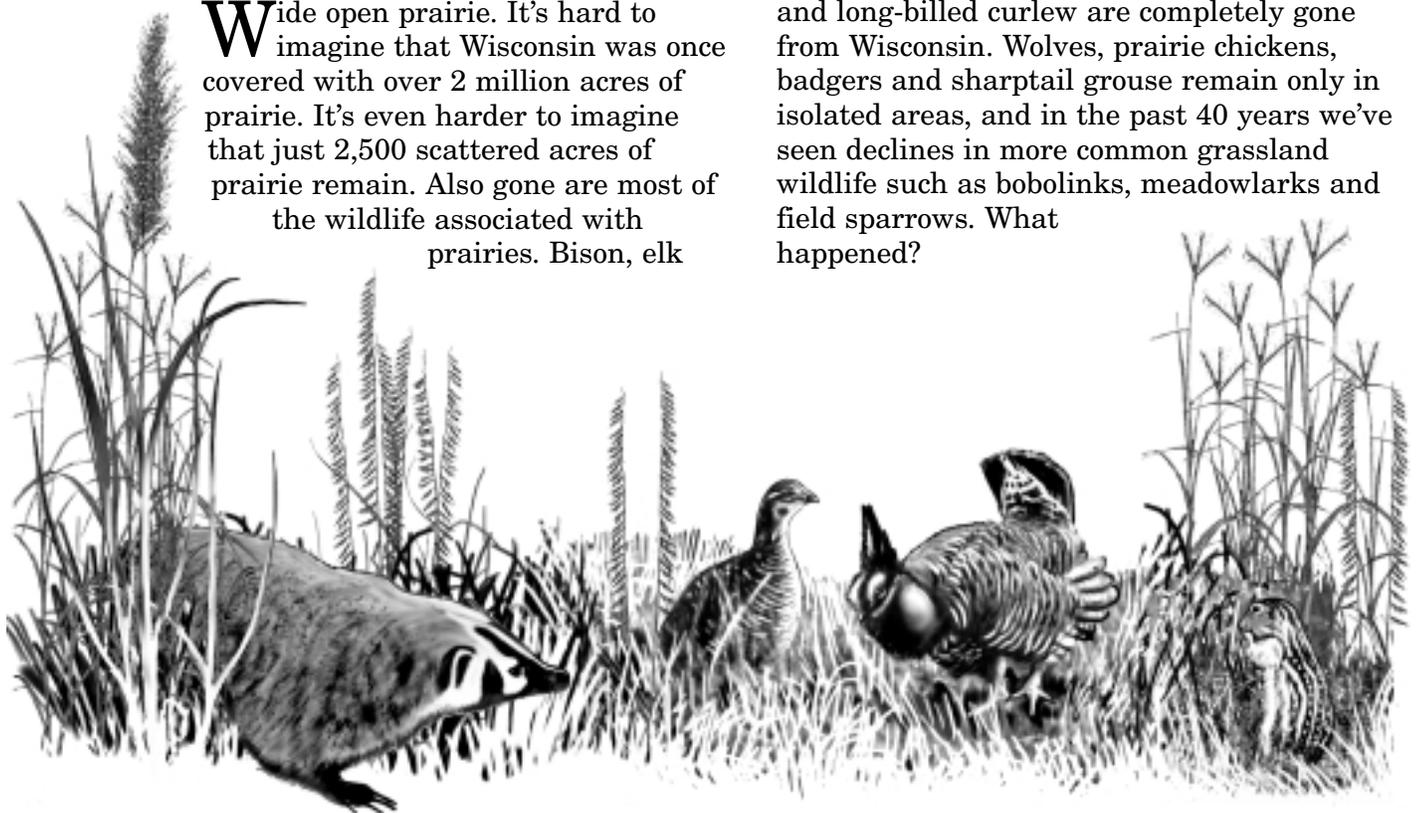
Home on the Range

Restoring and Maintaining Grasslands for Wildlife

The year is 1850. Your carriage bumps along a rutted road on what is now Interstate 94 between Madison and Milwaukee. Around you, you see clusters of bur oak trees surrounded by flowing grasses. This is oak savanna. In other places, you see tall grasses undulating in the breeze. This is the tallgrass prairie. Prairie chickens and savannah sparrows are common on this sea of colorful grasses and wildflowers. There are no trees. The lyrical calls of the dickcissel and meadowlark can be heard everywhere. Here and there, farms dot the landscape. Wisconsin has been a state for two years and settlers are discovering the value of rich prairie soils.

Wide open prairie. It's hard to imagine that Wisconsin was once covered with over 2 million acres of prairie. It's even harder to imagine that just 2,500 scattered acres of prairie remain. Also gone are most of the wildlife associated with prairies. Bison, elk

and long-billed curlew are completely gone from Wisconsin. Wolves, prairie chickens, badgers and sharptail grouse remain only in isolated areas, and in the past 40 years we've seen declines in more common grassland wildlife such as bobolinks, meadowlarks and field sparrows. What happened?

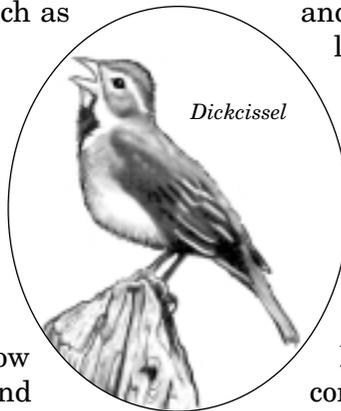


With European settlement and agricultural development, some animals adapted to the initial loss of prairie vegetation, others did not. Bison and wolves needed huge expanses of land and were pushed west and north. Although prairie chickens were common in the early 1900's, changes in agricultural practices caused their population to plummet. Other grassland wildlife, such as badgers, meadowlarks and song sparrows, adapted to the extensive acreage of grass hay, small grains and permanent pastures.

But after World War II, rural land-use changed rapidly. New technology prompted farmers to convert permanent pastures to row crops, and to cut alfalfa earlier and more often than the old grass hay. These practices eliminated habitat and destroyed many grassland bird nests and chicks before they matured. Many fence rows were removed to accommodate larger machinery, causing a loss of important wildlife food and

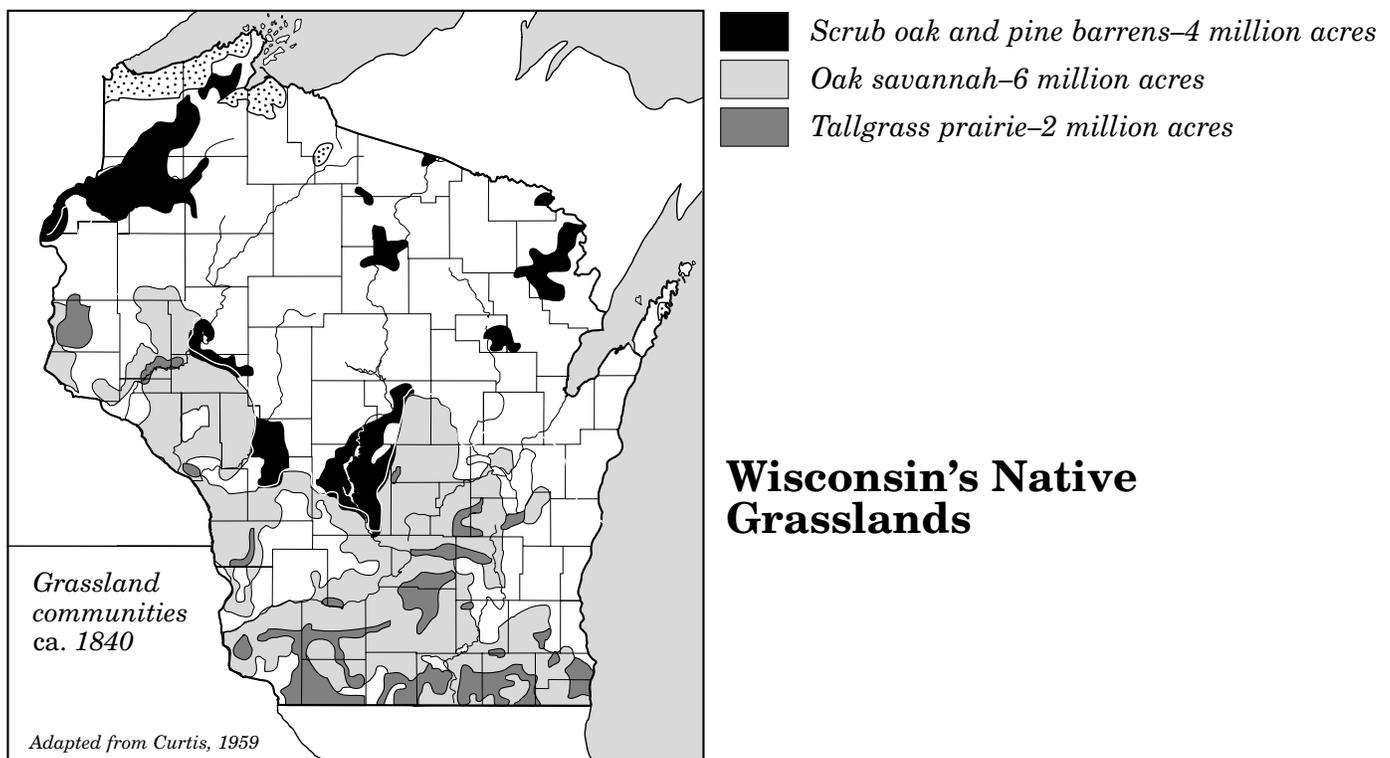
cover. Development for housing and business has further reduced grassland habitat.

As a result of all these changes, populations of Wisconsin's grassland birds, including bobolinks, meadowlarks, dickcissels and upland sandpipers, have decreased in some cases by up to 90 percent. Blue-winged teal and pheasants, which nest in grasslands near wetlands, have also declined in number. Prairie chickens survive only in a few places in central and northwestern Wisconsin and are listed as a "Threatened Species" by the Bureau of Endangered Resources.



Dickcissel

But there is good news. By converting former croplands into grasslands, we can bring back grassland wildlife. Imagine the thrill of seeing your first bobolink or hearing a pheasant crow. It *can* be done. This publication shows you how. Let's take a look at the different kinds of grasses you can plant.



The Warm and the Cool of It: Two Types of Grasslands

There are two basic types of grasses: cool-season and warm-season. Wildlife thrive in both.

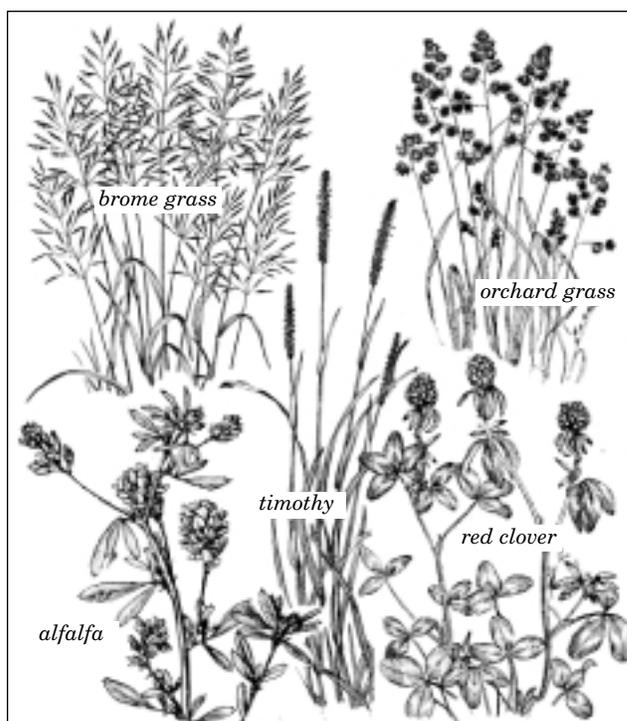
Most of the grasses you see when driving Wisconsin's rural roads are cool-season grasses. They grow best during the spring and fall, when temperatures average in the 65–75°F range. These include smooth brome grass, timothy, and orchard grass. Alfalfa and clover, though legumes, are often considered with the cool-season grasses. None are native to Wisconsin.

Warm-season grasses are often referred to as prairie grasses. They are native to our state and grow best under the heat of a late summer sun. You will most likely see them mixed with colorful native wildflowers at publicly owned prairie sites mostly in the western and southern part of the state, and occasionally along roadsides and railroad rights-of-way. In addition, more and more private landowners—like you—are planting these native prairie grasses and wildflowers

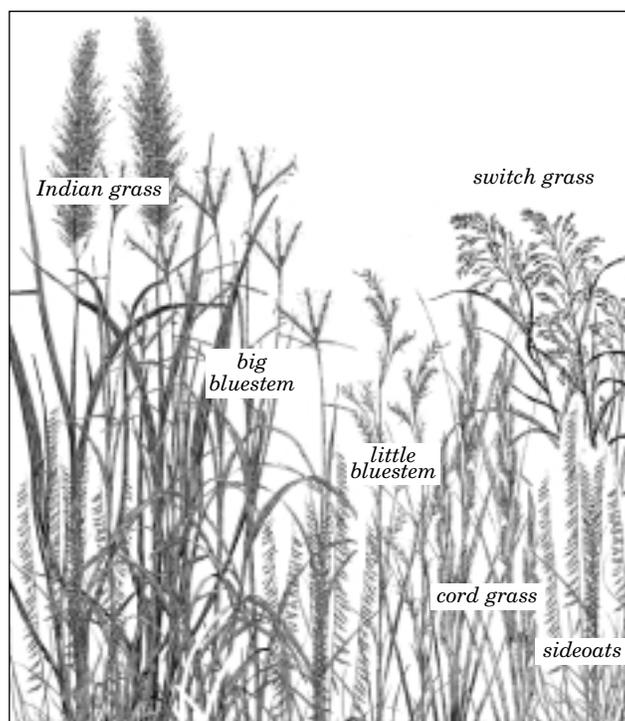
for their wildlife, aesthetic and agricultural benefits. Wisconsin's common warm-season grasses include big and little bluestem, Indian grass, sideoats grama, switch grass and prairie cord grass.

Cool-season stands are valued as wildlife cover because they are easy to establish and provide cover early in the season. Also, most landowners are familiar with these grasses, and advice on planting and equipment is easy to find. The disadvantages of cool-season grasses are that stands lose vigor over time and may need to be replanted. They also tend to matt down under rain, snow and wind.

Warm-season stands make excellent wildlife cover because they hold up better under the elements. Plus, they are aesthetically pleasing to many landowners and can make good forage. Though warm-season stands can take three to five years to establish, once they take hold, they need little attention and live indefinitely—a major benefit. The cost of some native grass seed is comparable to the non-natives, though some varieties and wildflowers cost more. Check with local seed dealers for current prices.



Cool-season grasses



Warm-season grasses

Steps Toward Establishing a Grassland

1. Know Your Land

The type of seed you plant depends on soil texture, moisture content, slope of the land, and the surrounding landscape. You will want to evaluate existing conditions and compare them to your wildlife goals. Ask yourself: what are the food, nesting and winter cover needs of the wildlife you want to attract and your land's capacity to provide these habitat components? Your local DNR wildlife manager can help you with these decisions. As you make your plans, keep in mind that a grass stand takes a few years to establish. During the first year, grass should be allowed to establish a good root system without excessive close mowing or grazing stress.



plowing or disking well in advance of seeding. Be careful not to overwork fine soils so that they dry out and become crusty. If your soil is a clay loam, plow the field in the fall and let it sit fallow over winter. If your soil is sandy or fine textured, spring plowing will reduce erosion. Before seeding, firm the soil with a cultipacker—a cylinder on wheels that you drag behind a tractor. It is very important to have good seed-to-soil contact, as air pockets will kill the new roots.

On steep slopes and sandy soils, the no-till method can reduce erosion. In this method, grass seed is sown directly into the harvested crop residue or old hay fields, using a specialized drill.

2. Prepare the Seedbed

Two basic methods of seedbed preparation are the clean seedbed method and the no-till method. The kind of seedbed preparation you choose depends on the terrain, type of seeder available, soil and the previous crop. Every field is different. What follows are general guidelines.

The clean seedbed method involves plowing and disking the soil so that it's free of the previous year's crop. It works best on flat or gently sloping land where erosion potential is minimal. In general, a sodbound hayfield may have to be plowed or disked several times. If the planting follows a row crop or small grain, one or two diskings may be adequate. The result should be a firm, well-packed seedbed, free of clods. Schedule

A Word on Herbicides and Fertilizers



If you must use herbicides to control weeds, use them only during seedbed preparation and then only use a non-residual product such as Round-up one year before planting. Follow-up in spring with light, pre-plant diskings. Chemical applications after planting tend to kill more than just weeds and should be avoided in most situations. Contact your local farm co-op for assistance.

If after a soil test, your soil needs additional fertilizers, apply them before planting, except for nitrogen because it only enhances weed growth. Nitrogen can be added later, if necessary, to cool-season stands. Native prairie grasses and wildflowers do not need fertilizers. They will only hinder the native plants.

3. Seeding Methods

You can choose from a variety of seeding methods depending on the scale of your grassland project. One of them should work for you. Check with your local co-op or DNR wildlife manager about the availability of mechanical seeders in your area.

Large-scale plantings

Drills and air seeders

Most grasslands of five acres or more in Wisconsin are planted with drills. A variety of drills are available. Some work best for cool-season grass seed while others are specially made to handle the fluffy warm-season grass seeds. Make sure you know the difference, as the warm-season seeds will clog an inappropriate drill. Plant seeds about $\frac{1}{4}$ inch deep (this may vary slightly with soil and seed type). The newer seeders are



A grassland drill such as this Truax no-till model is used for planting large fields.

equipped with rollers, but going over the field with a cultipacker after seeding provides extra assurance that your planting will have good seed-to-soil contact.

Where available, air seeding is a fast and efficient method of seeding large fields. Air seeders blow seed on top of the soil from booms rigged on a truck. The major advantage to using air seeders is that they can handle a variety of seed sizes and do not clog. Be sure to cultipack after seeding.

Small-scale plantings

For small backyard plots and fields, try broadcast or hand-seeding. Broadcasting is one of the oldest, simplest and most convenient methods of seeding warm-season grasses. This method requires a clean-tilled seedbed. Turn the soil with a spade or rototiller to prepare a smooth seedbed free of clods. Going over the soil several times with a rake should do the trick. Use a broadcast seeder with a good mixing system to ensure easy and uniform flow of chaffy, warm-season grass seeds. Although it's sometimes difficult to get proper seeding rates with this method, and some seedings will be uneven and require higher seeding rates, it remains a cost-effective, practical method.

To plant seed by hand, you'll need a clean seedbed. After the soil has been raked smooth, simply spread the seed by hand, attempting for as uniform coverage as possible. After planting, very lightly rake the seeds into the soil. As always, both broadcasting and handseeding require that you firmly pack the site with a roller or stamp it with your feet to provide good seed-to-soil contact.



4. When to Plant



In general, spring is the traditional time to plant grasses, legumes and wildflowers. Usually there's more moisture in the soil than in fall, but fall seedings of prairie grasses and wildflowers are also quite common if conditions are favorable. The following chart helps take the guess work out of planting, but as always, weather and soil will be the final factors determining when you seed. Planting at either end of the allowable range is riskier than the middle of the range.

Seeding Dates

Cool-season Grasses and Legumes

	<u>Spring</u>	<u>Late Summer</u>
Northern Wisconsin	May 1 – June 15	July 15 – August 10
Central Wisconsin	March 15 – June 1	August 1 – August 21
Southern Wisconsin	March 1 – May 15	August 7 – August 29

Warm-season Grasses

	<u>Spring</u>
Northern Wisconsin	May 15 – June 30
Central Wisconsin	May 1 – June 15
Southern Wisconsin	March 1 – June 15

5. Choose the Right Seeds: Plant for diversity

When planting a grassland, think diversity! Never plant just one grass type because it will be used by few kinds of animals and will be very vulnerable to disease and damage. Plant a mixture of at least two to six types of grasses, legumes and wildflowers. A mix provides the variety of grass heights and density for good nesting habitat, especially for waterfowl, pheasants and other birds. Stiff-stemmed legumes and wildflowers provide perching sites for meadowlarks and sparrows. In addition, the more wildflowers and legumes you plant, the more insects you will find. Insects are very important food for many birds and their young.

Literally hundreds of wildflowers, grasses and legumes and combinations thereof exist. Sometimes the choice may be overwhelming. To help you get started, we've listed the varieties that are the most easy to grow and beneficial to wildlife. As with all plantings, choose seed varieties adapted to your land's soil type and climate. Also, when using native grasses and wildflowers, make sure the seeds originate no more than 100 miles south, 100 miles north or 250 miles east or west of your property. Otherwise, the seeds may not be adapted to your climate.

Vesper sparrow



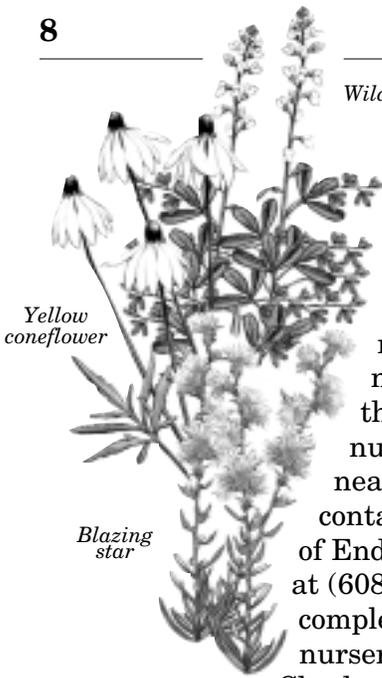
Seed Mixtures
Cool-season Grasses and Legumes

	<u>Grass/Legume Type</u>	<u>Pounds PLS*/Acre</u>	<u>pH Minimum</u>	<u>Wet Soils</u>	<u>Relative Wildlife Nesting Value</u>
1	Timothy	1	6.5	No	High for game birds
	Smooth Bromegrass	2 – 3			Medium low for non-game birds
	Alfalfa	5			
2	Timothy	1	6.5	No	High
	Orchardgrass	1/2			
	Smooth Bromegrass	1			
	Alfalfa	5			
3	Timothy	1	6.5	No	Medium/High
	Orchardgrass	1			
	Alfalfa	5			
4	Timothy	2	6.2	Yes	Medium
	Smooth Bromegrass	2			
	Red Clover	4			
	Ladino (optional)	1/2			
<p>Warm-season Grasses (For use on sandy, droughty, or excessively drained sites.)</p>					
	<u>Grass Type</u>	<u>Pounds PLS*/Acre</u>	<u>pH Minimum</u>	<u>Wet Soils</u>	<u>Relative Wildlife Nesting Value</u>
5	Big Bluestem	4	5.5	No	High
	Switchgrass	1			
6	Big Bluestem	2	5.5	No	High
	Switchgrass	1			
	Indian grass	3			
	Little Bluestem (optional)	2			

You can add diversity to your cool-season stand and increase its value to wildlife by adding a few wildflowers and legumes such as bergamot, goldenrod or round-headed bush clover. How much you plant will vary, but never exceed 8 ounces per acre of any one type.

*Pure Live Seed is defined in **How Much to Seed** on page 9 in this publication.

Adapted from NRCS guidelines for CRP lands



Wild indigo

Native Plant Nurseries

Wisconsin is fortunate to have many native plant nurseries. Look in the phone book under nurseries to find one near you. Otherwise, contact the DNR Bureau of Endangered Resources at (608) 266-7012 for a complete list of native nurseries in the state.

Check also **Getting the Help You Need** in the *Wildlife and Your Land* series for more references about prairies and how to plant them.

Seed Mixtures

Prairie Grasses and Wildflowers

Soil Type: Well Drained to Somewhat Poorly Drained Sites
(all figures reflect Pure Live Seed rates)

<u>Species</u>	<u>Seed/Acre</u>
Big Bluestem	3 pounds
Indian Grass	2 pounds
Sideoats Grama	3 pounds
Yellow Coneflower	4 ounces
Purple Prairie Clover	4 ounces
Black-eyed Susan	2 ounces

Other suggested wildflowers: Bergamot, Ox-eye, Showy sunflower, Showy goldenrod, White baptisia (wild indigo), and Stiff goldenrod

Other suggested legumes: Canada tick trefoil

Soil Type: Dry or Shallow Soil Sites

<u>Species</u>	<u>Seed/Acre</u>
Sideoats Grama	3 pounds
Little Bluestem	3 pounds
Indian Grass	1.5 pounds
Purple Prairie Clover	6 ounces
Blazing Star	4 ounces
Spiderwort	4 ounces

Other suggested wildflowers: Naked-stem sunflower, Stiff goldenrod, Black-eyed susan, Heath aster, Dyer's weed and Thimble weed

Other suggested legumes: White prairie clover, Rounded-headed bush clover and Illinois trefoil

**6. The Big Picture:
Size and placement of
grasslands**

Whether you have 5 or 100 acres you'd like to convert to grasslands, there are a few guidelines to keep in mind if you want to provide the best possible habitat for wildlife.

- ✿ To increase the value of grasslands, especially small grasslands, place them near or adjacent to other suitable habitat such as pasture, hayfields or set-aside lands. Look around you, grasslands will help wildlife the most if the landscape already has existing grasslands and grassland wildlife. If you're unsure, you may want to talk with your local wildlife manager.
- ✿ To reduce predation by edge-loving wildlife such as raccoons, brown-headed cowbirds, hawks, opossums and skunks, place grasslands at least 50 yards from hedgerows, woodlots and dead trees. Of course, the best thing you can do if you have the land and money, is to plant large grasslands of at least 20 acres in size; 40 acres and larger are better. This provides the best defense against predation.



Perched on a tree branch, a female cowbird scans the surrounding grassland for nests of other birds in which she can lay her eggs.

7. How Much to Seed

Seeding rates are based on “pure live seed” (PLS). Pure live seed refers to the actual amount of good seed in the bag you’ve purchased. There’s always some weed seed, chaff and “bad” seed mixed in. To calculate PLS for a 100-pound bag of seed, multiply germination and purity percentages—90 and 80%, respectively—listed on the seed bag and divide by 100. For example $90 \times 80 = 7200$ divided by 100 = 72% PLS. In other words, your 100 pound bag of seed actually contains 72 pounds of seed that will sprout.

Once you know the PLS rate for each type of seed, you can calculate the amount of seed needed for your field. The chart at right provides an example.

Seeding Rates				
<i>Grass Type</i>	<i>PLS</i>	<i>seeding rate</i>	<i>acres</i>	<i>seed needed</i>
Big Bluestem	72%	3 pounds/acre	20	83 pounds
Switch Grass	72%	1 pound/acre	20	28 pounds
<i>To calculate seeding rates, use the following formula:</i>				
$\frac{\text{seeding rate/acre} \times \text{total acres}}{\text{PLS}} = \text{Total seed}$				
$\frac{(3 \times 20)}{.80} = 83 \text{ pounds Big Bluestem}$				

8. Weed Control

Weeds! Runaway weed growth is a frequent cause of seeding failure, especially of native plantings which take several years to establish. If weeds are not controlled during the establishment year, development of the grass stand may be delayed two or three years, or the planting may fail completely.

Remember that during the first year of a native grass seeding, most of the growth occurs below the ground as root development; don’t be disappointed when little appears above ground, except weeds. Under favorable conditions, little bluestem develops a two- to three-inch primary root system before an above-ground shoot appears. Weeds have a lot of room to grow under these conditions.

To control weeds in a newly planted native grass stand, mow no less than 10 inches

above the seedlings after July 1 to help suppress annual weeds. Be sure to test and measure the blade height before cutting to avoid destroying the planting. Cut again if needed. A scythe or weed whip will do the job on small plots if a mower is not available or if the blades cannot be set high enough. Since most weeds are annuals, mowing before seeds set destroys the seed crop. It may be necessary to mow the second and third years after planting if weeds are persistent.

The same methods can be applied to cool-season stands. But since cool-season grasses grow rapidly after planting, they often don’t need additional weed control.

9. Maintaining Your Grassland

All grass stands need management to ensure their productivity and usefulness to wildlife. If left alone, undesirable plants and trees can invade and cool-season mixtures can become matted down and rootbound. What method you decide to use depends on your grass stand and what wildlife you are trying to attract. The methods are mowing, burning and grazing.

Mowing

Mowing has long been used to manage grasslands. Mowing keeps out invading trees and discourages the more vigorous brome grass from out-competing alfalfa. Cut between August 1 and September 1 to protect nesting birds and to allow plants to store energy before cold weather hits. This is essential for next spring's growth.

Don't mow every year! By mowing grasslands every three to four years, you will allow dead grass to accumulate. This provides important nesting habitat for a variety of early nesters, especially grassland songbirds, pheasants, quail and waterfowl. The nesting season normally begins before new grass growth is dense or tall enough to provide good cover, so the previous year's growth becomes very attractive, especially in agricultural areas where hayfields and roadsides have been cut late.

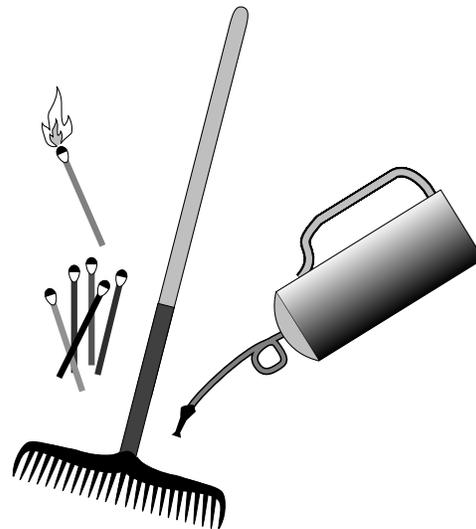
*Savannah
sparrow*



Burning

Before European settlement, fire maintained the prairie landscape and the wildlife associated with it. Today, you can duplicate these wildfires by conducting a prescribed burn. Burning is an efficient, low-cost means of managing grasslands. It increases plant diversity, promotes vigorous plant growth, and suppresses unwanted grasses and woody plants such as honey locust, black locust, red cedar, aspen, cottonwood and box elder.

The best time to burn is in early spring, but avoid burning your grasslands every year for the same reasons stated under the mowing section. Grasslands should be burned in one-third chunks. While some nests will be destroyed in any prescribed burning, in the long run, grasslands burned every three or four years have higher nesting success rates than unburned areas.



In Wisconsin, burning is typically associated with native grass stands, but it can be done on cool-season stands as well. Before conducting a prescribed burn, carefully consider your objectives. Wind direction and speed, relative humidity, grass moisture and safety requirements are all important factors. For more specific information on burning techniques and its benefits contact your DNR wildlife manager.

Grazing



Livestock can quickly destroy grassland habitat. Flat, nearly barren pastures overgrown with thistle and spotted knapweed are all too common in Wisconsin. Yet when carefully managed, pastures can be grazed and provide wildlife benefits. The key is careful management.

If done right, a rotational grazing system can allow you to feed your livestock and still provide wildlife cover. Under rotational grazing, only one section of pasture is grazed at a time while the remainder of the pasture “rests.” To accomplish this, pastures are subdivided into smaller areas, called paddocks, and livestock are moved from one paddock to another using a lightweight movable fencing system. The longer you let sections of your pasture rest, the more time the grass has to recover and provide wildlife habitat. The more intensively you graze a pasture, the less likely it will benefit wildlife. Beef cattle, dry cows and heifers often do not require as intensive grazing systems as dairy cattle.

Rotational grazing will benefit wildlife most when you convert existing crop fields into pasture. Grasslands, despite being grazed, provide greater nesting opportunities than croplands. However, you may reduce wildlife cover if you convert under-grazed pasture into an intensive rotational system. Refer to **Wisconsin Pastures for Profit**, a UW-Extension publication for a detailed discussion of rotational, grazing as referenced in **Getting the Help You Need** in the *Wildlife and Your Land Series*.

The Final Word

Grasslands are a part of Wisconsin’s natural history. Restoring and carefully managing grasses—whether native or nonnative—for wildlife is a good way to give something back to wildlife *and* to increase the appearance and value of your property.

Cost-Sharing Available

Be sure to check with your County Farm Service Agency (FSA) office for information about cost-sharing dollars available for grassland restoration on lands enrolled in the Conservation Reserve Program.



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