

Native Prairie Hay Meadows

A Landowner's Management Guide





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Introduction

Tallgrass prairie once covered 140 million acres of North America, but today less than 4 percent remains – and two-thirds of that is in Kansas. The largest swath of remaining tallgrass prairie is in the Flint Hills; it survived because the soil was too rocky to plow and it made good pasture for cattle. But tallgrass prairie also covered the rolling land east of the Flint Hills, where the soil is deeper and annual rainfall is higher. Today, only small remnants of these prairies remain, dotted among the farm fields, forests, cities, and towns of eastern Kansas.

The best of these remaining prairies are hay meadows; it turns out that managing a prairie for hay can be the surest way to maintain its ecological value. At the same time, a hay meadow provides income for the landowner — a true win/win situation. Despite the importance of native hay meadows, little information has been published about owning and managing them. This booklet is an attempt to address that lack of information.

Prairies require thoughtful management. At the least, they deserve recognition and appreciation so that they are not inadvertently destroyed by people who are not familiar with their importance.

The Kansas Natural Heritage Inventory, a program based at the Kansas Biological Survey at the University of Kansas, is working to identify remnant native prairies in the eastern part of the state. For several summers, we have sent biologists and students out into the countryside with maps and aerial photographs to search for tallgrass prairies. When we find one, we look up the landowner in the county directory and call to ask permission to visit the prairie. Once we have permission, we send a team of two people who walk across the land and make a list of all the plant species found there for the landowner and for our own research on prairie biodiversity.

On some prairies, we find more than 100 species of plants. We have been impressed with this diversity from an ecological perspective. We also feel privileged to have visited these beautiful pieces of land in early summer, when the green meadows are splashed with the brilliant colors of wildflowers, looking like a vast garden. With every prairie we visit, we are reminded anew of the beauty of the Kansas landscape.



In this booklet, you will find information about managing, restoring, and preserving native prairies. It is written for the broadest possible audience, from those who have recently purchased or inherited their land, to those who have spent their lifetimes working and enjoying their prairies. Whatever your level of prairie expertise, we hope you will find this collection of information valuable. Please feel free to contact the Kansas Natural Heritage Inventory staff with any questions or comments.

1. Healthy prairies



Diversity and types of plants are indicators of quality

Native prairie, by definition, is land that has never been plowed or otherwise severely altered. Most of the prairies in eastern Kansas are referred to as “remnant prairies” because they are just small pieces of the 140 million acres of tallgrass prairie that covered the Midwest before European settlement. Today, tallgrass prairie is the most imperiled terrestrial ecosystem in North America.

The most obvious threats to native prairies are suburban development and conversion to cropland, because these uses destroy prairies. Once a prairie is plowed or paved over, it’s gone for good; the

complex prairie ecosystem of soils, plants, and animals can never be restored to its original pristine state. Many landowners who have tried to convert crop fields to prairie have found that they may be able to establish native grasses and a few wildflowers, but they cannot reclaim the former beauty and biodiversity of native prairie.

Even native prairies that have never been plowed or developed can be degraded by ongoing, subtle factors. Overgrazing, the use of fertilizers and herbicides, burning, and other land-use practices can

Photo above: A prairie in Anderson County, Kansas, is speckled with Topeka purple coneflower (*Echinacea atrorubens*) in June.

harm the native prairie ecosystem. On most prairies, some level of management is needed to ensure that the ecosystem can survive in today's world, without the historic forces of free-ranging bison or landscape-scale wildfires. Appropriate management also can restore the health of prairies that have been degraded over time.

In Chapter 3, you'll read more about management practices for prairie hay meadows. But first, consider the current condition of your prairie. Here are the four factors that biologists consider in assessing the health of prairies:

- Biodiversity, which is the number of species of plants, animals and other living organisms present on the land;
- The presence of certain species that usually are found only on healthy natural prairies;
- The number of invasive species, which are plants that crowd out native vegetation and reduce the number of species on a prairie;
- The size of the prairie and conditions on adjacent parcels of land.

Prairie plant terminology

Grasses are members of the large plant family *Poaceae*, usually characterized by hollow and jointed stems, narrow sheathing leaves, petalless flowers, and fruits that are seedlike grain. They include native grasses such as big bluestem, exotic grasses such as fescue, and the cereal grains such as barley, corn, oats, rice, rye, and wheat.

Herbaceous plants have leaves and stems that die down to the soil level at the end of the growing season. They can be annuals, which live only for one year, or perennials, which come back from their roots two or more years.

Forbs are herbaceous, broad-leaved plants (excluding grasses), such as prairie wildflowers.



Some of the wildflowers that are usually found only in healthy native prairies include: top photo, Culver's root (*Veronicastrum virginicum*); and lead plant (*Amorpha canescens*).



Conservative species that are particularly rare include Mead's milkweed (*Asclepias meadii*), above; and the western prairie fringed orchid (*Platanthera praeclara*), right.

Mead's milkweed is one of 22 milkweed species known in Kansas. It is a slender, erect perennial that grows to 2 feet tall and is easily overlooked among the prairie grasses. A single, nodding cluster of 10 to 20 greenish or cream-colored flowers is produced at the end of each flowering stem in late May. Slender, erect pods mature from mid-June to October. Eastern Kansas is home to the largest remaining populations of this plant anywhere in the world.

Western prairie fringed orchid, once common, is now known to occur on only four sites in Kansas. It is a perennial with a solitary, unbranched stem that grows 3 to 4 feet tall. The flowers are large and showy, creamy white with fringed petals. It flowers in June.



Biodiversity

Prairie hay meadows may have more than 40 species of grasses and several hundred species of forbs, depending on the size of the meadow. The total number of potential species varies by location, but usually, the more diversity, the healthier the prairie.

A healthy prairie is home to a wide variety of animals, including birds, mammals, reptiles, amphibians, and insects. Ground-nesting birds depend on the thick thatch of prairie grasses and forbs to conceal them from predators. Prairie birds in eastern Kansas include eastern meadowlark, greater prairie chicken, grasshopper sparrow, dickcissel, scissortail flycatcher, and upland sandpiper. Eastern box turtles and crawfish frogs are often found on prairies. The regal fritillary butterfly thrives on native prairies, where its main food sources, prairie violet leaves and milkweed flowers, are available.

Species composition

In assessing the health of prairies, plant ecologists use an objective system called the Index of Conservatism. Native plant species are assigned a number from 0 to 10 based on their affinity for undisturbed habitats. Plants with lower numbers can live just about anywhere, and those with the highest numbers can live only in natural communities such as native prairies.

Ragweed, for example, is a 0 because it can grow on just about any kind of land, even a rubble-strewn urban lot. The Kansas state flower, the annual sunflower, also is a 0 on the scale.

Plants that usually are found only on healthy prairies have numbers 7-10 and include many of our most beautiful wildflowers, such as prairie phlox and gayfeather. These plants are called *conservative species*. The presence of a large number of conservative species is an indicator of a healthy native prairie.

Some animals also need prairies for habitat. Greater prairie chickens and Henslow's sparrows, for example, were once common in eastern Kansas but

their numbers have been drastically reduced by loss of prairie. The prairie mole cricket is a burrowing insect that is found *only* on prairies and so is an indicator of prairie health.

Invasive species

Remnant prairies are surrounded by plants that will move in and take over at any opportunity. They can be big and easy-to-spot invaders such as dogwoods. Or they can be persistent invaders such as fescue grass, which might go unnoticed to the untrained eye. They can be native species or exotic species. Invasive species are those that can overpower native species with vigorous growth. Broadleaf and woody plants take soil, nutrients, and water and over time can crowd out natives. Dogwoods shade the ground and weaken the sun-loving native grasses; the bare soil left when grasses die becomes a seedbed for

even more trees and shrubs. Left on its own, a prairie can become a woodland over a few decades.

Invasive species in eastern Kansas include the noxious weeds sericea lespedeza and musk thistle. Other examples of invasives are Eastern red cedar, Osage orange, poison ivy, red clover, hop clover, sweet clover, mullein, and even white daisies.

Prairie management involves controlling invasive species by employing practices that give the advantage to native prairie species.

Size and surrounding land

Before the settlement of the Midwest by people of European origin in the 1800s, more than 80 percent of eastern Kansas was tallgrass prairie broken only by forests along the rivers and streams. But as the

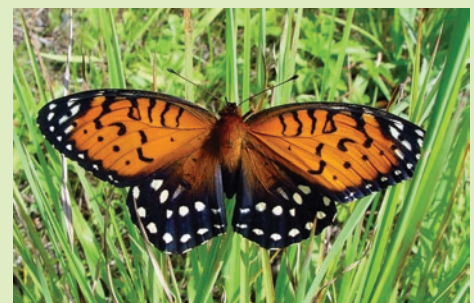
Regal fritillary butterflies and prairie violets

The regal fritillary butterfly (*Speyeria idalia*) is found in the central United States only on wet meadows and tallgrass prairies, where the caterpillars can find the violets they depend on for survival. As prairies have disappeared throughout the United States, so has the regal fritillary.

Kansas still has healthy populations of this eye-catching butterfly on prairies in the eastern part of the state. It's not uncommon to see numerous regals feeding on the nectar of milkweed flowers in summer and females fluttering up and down among the prairie plants in search of a place to lay eggs.

The regal fritillary is an orange and black butterfly with a wingspan of up to 4 inches. It is easily distinguished from the all-orange monarch butterfly by its dark lower wings.

The caterpillars of regals, as is true of most fritillary butterflies, eat only violets. Regals prefer the birdsfoot violet (*Viola pedata*) and prairie violet (*Viola pedatifida*). In mid-summer, the butterflies mate, and it's common to see them flying in attached pairs across the prairie. In late summer, the fertilized females fly across the prairie, dropping to the ground every 30 feet or so in search of soil near violet plants where they can deposit their eggs. The eggs hatch in fall and tiny caterpillars overwinter on leaf litter until spring, when they begin feeding on the violet plants. After pupation, the adults emerge in early summer and feed on nectar from milkweeds, thistles, ironweed, and other prairie flowers. Only one generation of regal fritillary butterflies appears per year.



Prairie Mole Crickets: Music on the prairie



Male prairie mole cricket, above, and closeup, right, of the cricket's spade-like front legs that it uses to dig tunnels. Photo above by Thomas J. Walker and at right by Lucinda Treadwell, University of Florida.



Not many people have seen the prairie mole cricket (*Gryllotalpa major*) because it spends most of its life burrowing beneath the prairie sod. But if you have been near a prairie hay meadow at dusk on a warm spring evening, you may have heard the loud chorus of male prairie mole crickets singing to attract females.

Prairie mole crickets, unlike most crickets, do not have powerful hind legs for jumping; instead, they have broad, spade-like front legs used for digging through the thick tangle of roots in the prairie soil. They are among the largest insects on the prairie, growing to 2.5 inches long.

In early spring, males mature and move to the surface, where they congregate on one part of the prairie and dig shallow, Y-shaped tunnels. In April and May, sitting in their tunnels, they call synchronously by rubbing their wings together, emitting a loud, raspy, buzzing sound that can be heard by humans from as far as a half-mile away. Female mole crickets fly to the site and enter the tunnels to mate. After breeding, the female searches for a place to dig her own tunnel in which she lays her eggs, tending them until they hatch.

Historically, prairie mole crickets occurred widely in the tallgrass prairie in much of Kansas, Oklahoma, southwest Missouri, and portions of Arkansas. Thought for a time to have gone extinct, recent surveys reveal that the cricket persists on remnant prairies scattered throughout most of its former range. Often found on only the highest quality prairie remnants, it is considered an indicator species for healthy prairie.

flattest land was broken out for cropland, prairies became fragmented into ever smaller and more isolated pieces of land. Fragmentation prevents the natural flow of seeds, animals and fire from one prairie to another. Eventually, each remnant prairie becomes an island unto itself.

Smaller prairies are more at risk to invasive species, especially where bordered by woody and non-native vegetation. Smaller remnants require vigilance and more management to prevent their degradation.

Restoring health

Many of the prairies in eastern Kansas are in excellent health, thanks to skillful management. Those that have been degraded are not lost. Through good stewardship, the damage can usually be reversed and the ecological values of the prairie restored. Chapter 3 provides recommendations for managing healthy prairies and improving those that have been degraded.

Ground-nesting birds depend on prairie hay meadows



Photo © Bob Gress

The prairie hay meadows of eastern Kansas provide important habitat for a seasonally changing array of birds. In winter, the prairie becomes a hunting ground for species that move down from the frozen North. In spring, many species migrate from as far as South America to their summer breeding range in the Great Plains.

Many of the breeding species are ground-nesting grassland birds, including the three species pictured at left. They depend on the cover provided by prairie grasses and forbs to protect their nests from predators. As prairies have disappeared from the American landscape, populations of these birds have suffered. Their survival depends on their ability to nest in less-than-pristine grasslands.

The eastern meadowlark, top photo, is a good example. The beautiful song (often described as “Spring is here!”) is familiar to most Kansans because the species has been successful at breeding in areas other than its original grassland habitat. (The eastern meadowlark is similar in appearance to the western meadowlark, the Kansas State



Photo © Judd Patterson

Bird, but they are different species.) The eastern meadowlark can nest in Conservation Reserve Program (CRP) ground, no-till farmland, grassed waterways, and pastures. Nests are dome-shaped with a side entrance. The females lay three to seven eggs that are pale pink with brown and lavender spots. Eastern meadowlarks are year-round residents.

Another familiar hay meadow bird is the grasshopper sparrow, center photo. It has a brown or buff head, and a weak, buzzing song that sounds like an insect. It will nest on prairie that was hayed or burned the previous year. The females lay three to six eggs that are creamy white with spots or flecks of reddish brown. It winters in the southern United States and Mexico.

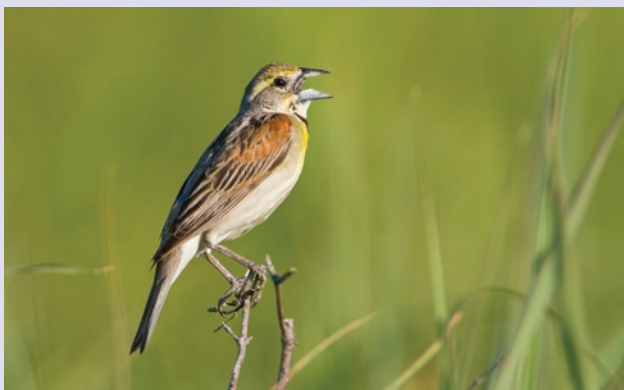


Photo © Judd Patterson

The dickcissel, bottom photo, is bigger and stockier than a sparrow. It has a yellow breast with a black V-shaped bib. It is named for its song, which sounds like “dick-dick-dick-cissel.” Females lay three to five pale blue eggs. It winters in South America.

All three of these prairie birds forage on the ground and eat a wide variety of insects and seeds. They are most visible when they perch on fence posts or tall plants to sing.

In early summer, the prairie sparkles with wildflowers



June is the peak of wildflower season on Kansas' native hay meadows. This column, top, blue wild indigo (*Baptisia australis*) and, bottom, rose vervain (*Glandularia canadensis*). Right column, top to bottom, spiderwort (*Tradescantia ohioensis*), purple prairie-clover (*Dalea purpurea*), and Sullivant's milkweed (*Asclepias sullivantii*).

In mid-summer, as grasses get tall, bold flowers steal the show



As summer progresses, tall flowers and bright colors stand out among the verdant grasses. This column, top, false dragonhead (*Physostegia angustifolia*), and bottom, butterfly milkweed (*Asclepias tuberosa*). Right column, top, black-eyed Susan (*Rudbeckia hirta*) and bottom, grayhead prairie coneflower (*Ratibida pinnata*).

The tallest of the prairie grasses, these species reach 3 to 8 feet



Big bluestem (*Andropogon gerardii*) sometimes called “turkey foot” for the shape of the seed head.



Indian grass (*Sorghastrum nutans*) produces abundant seeds that are an important food source for birds and small mammals.



Switchgrass (*Panicum virgatum*) provides food and cover for birds and mammals.

Photo by Jeff McMillian @ USDA-NRCS PLANTS Database.



Prairie cordgrass (*Spartina pectinata*) is found on wet soils.



Eastern gamma grass (*Tripsacum dactyloides*) is related to corn.

Photo by Jeff McMillian @ USDA-NRCS PLANTS Database.



Little bluestem (*Schizachyrium scoparium*) turns red-orange in fall; prairies where it is abundant are a glowing shade of bronze all winter.

2. Why prairies matter



Grasslands serve many important functions

With our current understanding of natural ecosystems, it's difficult to believe that tallgrass prairie was ever considered worthless. Yet the history of the past two centuries is one of disregard for the prairie landscape.

When Major Stephen Long published his map of the Great Plains in 1822, he labeled the entire prairie region "The Great American Desert." From his New England perspective, the absence of trees suggested an absence of value. Westward-bound settlers were awed by the sea of grass they traveled through,

but few truly appreciated its beauty. When the first Euro-Americans settled on the plains, they converted prairie to cropland with little thought about what they were destroying. One of the most extensive and important ecosystems in North America almost vanished.

Fortunately, people have come to recognize the ecological, economic, and cultural values of prairie

Photo above: the yellow blooms of bigflower coreopsis (*Coreopsis grandiflora*) decorate a Kansas prairie in summer.

in time to stop its complete eradication. Today, throughout North America, numerous organizations, governments, and individual citizens are working to conserve the small parcels of native prairie that remain.

The biodiversity of a native prairie is highly valued by scientists, though they may differ on the reasons biodiversity is important. One school of thought holds that biodiversity has intrinsic value that is worth protecting regardless of its value to people. Another emphasizes the utilitarian value of biodiversity, such as the possibility that a medical drug could be derived from a prairie plant in the future. From either perspective, native prairies are valuable on many levels.

Ecological importance

An ecosystem is defined as a dynamic complex of plants, animals, and microorganisms and their physical environment interacting as a functional unit. That means that all parts of the ecosystem – plants, birds, insects, mammals, soils, topography, and climate – are interrelated and dependent upon one another. Disruption of one element may affect others, either immediately or in the future, as the repercussions spread, like ripples from a pebble

thrown into a pond. For example, consider the action of spraying broadleaf herbicides on a native prairie. The immediate effect is to kill broadleaf plants, which include invasive species but also desirable wildflowers. Reducing wildflower populations means reducing the food supply for insects. Those insects are food for many birds, which can be adversely affected. People are part of the ecosystem, too. To take the preceding example even further, consider one possible outcome of declining bird populations: insects that harm crops, such as grasshoppers, can proliferate.

When viewed from an ecological perspective, it's easy to see how one action can upset the balance among many forms of life – and may lead to unforeseen consequences for people as well as wildlife.

A healthy prairie benefits humans in many direct ways as well by providing what are often called “ecological services.” For example, the prairie’s thick cover of grasses and forbs acts like a filter, absorbing and purifying rainwater before it reaches our drinking water supplies. Prairie vegetation also slows rainwater runoff, preventing flooding and soil erosion downstream. Plants transfer moisture to the air, a crucial part of the hydrologic cycle. The deep roots of prairie plants help store carbon,



A century ago, most of eastern Kansas was covered with tallgrass prairie, but the landscape has largely been converted to crop fields and woodlands. Remnants such as this hilltop prairie in Anderson County serve as reservoirs of biodiversity, providing habitat for hundreds of species of plants and animals.

offsetting atmospheric carbon dioxide. Breaking out native prairie and converting it to cropland would cause stored carbon in the soil to be released into the atmosphere, exacerbating the problem of global warming.

Prairies serve as refuges for native pollinators, which are viewed as the possible saviors of agriculture in the face of declining honey bee populations. The health of pollinators directly affects our food supply: at least one-third of the American diet is dependent, directly or indirectly, on insect-pollinated plants. This figure includes many fruits, nuts, and vegetables that require insect pollination, plus the oil seeds that provide necessary fats in our diet. It also includes meat and dairy products that are produced from animals fed alfalfa and clover, crops that require insect pollination for seed production.

Recent research shows that fields with native flowering plants host more than twice as many native bees as fields with non-native grasses. And yet the native pollinators are also declining, primarily because of habitat loss and pesticide use. A healthy prairie may provide the immediate benefit of harboring native pollinators that will increase yields in nearby crop fields and gardens. And it will provide the long-term benefit of improving the chance of survival for a pollinator species.

Scientists often describe native prairies as “reservoirs of biodiversity” because they are places that harbor a great number of species. Like reservoirs that hold water for future needs, prairies preserve forms of life that may serve us in the future.

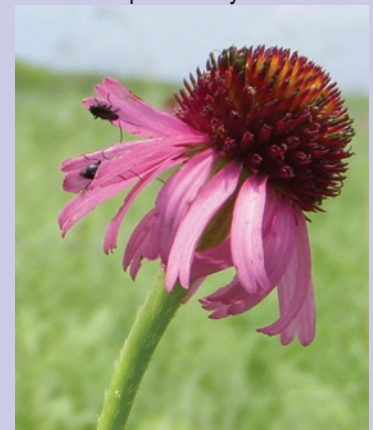
The hundreds of plant species found in a prairie could hold the genetic material that will provide tomorrow’s foods or medicines. Scientists are currently using prairie plants to try to breed drought resistance and heat tolerance into food crops that otherwise are likely to fail as the earth warms. Similarly, researchers continue to identify medicinal compounds in prairie plants that could become the basis of tomorrow’s cures for diseases. Plants have a long history of providing medicines: Of the top 150 medicinal drugs used in the world, about half



The genus *Echinacea* is known for its immunity-boosting properties. The most desirable species as an herbal supplement is purple coneflower (*E. angustifolia*), top photo, found on hay meadows in central Kansas and farther west.

Pale purple coneflower (*E. pallida*), center, is commonly found on eastern Kansas prairie hay meadows.

Topeka purple coneflower (*E. atrorubens*), right, is less common and is usually found only on high-quality prairies. It is found only in Kansas, Oklahoma, and Texas.





originated from plants. The best-known example is aspirin, which was derived from a willow tree. In Kansas, *Echinacea* species (coneflowers) have been studied for their immune-system benefits. And there are many other research projects under way on traditional healing plants to find the active ingredients that might relieve pain or provide other health benefits.

Economic benefits

One of the best economic uses of native prairie is for hay. Native prairie hay is a crop that requires few inputs; most experts agree that there is nothing to be gained by fertilizing native grass because the value of any increase in yield is negated by the cost of fertilizer. Fertilizers may also increase certain less-desirable plant species. Research shows that diversity increases productivity; that is, plant

communities with more species accumulate more biomass over the growing season, probably because their different characteristics allow them to use all the available resources. In contrast, a monoculture of cool-season grass, such as brome or fescue, requires fertilizers and herbicides to produce similar yields. Because the price per ton is about the same for prairie hay and brome hay, the net return from prairie hay is greater.

The economics help explain why so many landowners value their native hay meadows so

Photo above: A graduate student at the University of Kansas records the plant species found on a prairie in Linn County, Kansas, during the summer of 2008. The bright splashes of orange are butterfly milkweed (*Asclepias tuberosa*). The clumps of deeply lobed leaves in the foreground are compass plant (*Silphium laciniatum*).

highly. But there is also a scheduling aspect to consider. On most farms, the job of haying a prairie fits in well with the other tasks of the season. In eastern Kansas, prairies are mowed in July, in the lull between planting and harvest. Often the work of cutting, baling, and even moving the hay can be hired out to custom hayers.

Maintaining a hay meadow is a low-cost diversification strategy. Native hay can be used as forage for a farm's own livestock, or as a cash crop that can be sold to other livestock owners. The market for prairie hay is strong from several quarters: Some thoroughbred horse breeders pay premium prices for native prairie hay because they believe that the mixed grasses and forbs provide health benefits for their animals. Dairies are also becoming more interested in feeding prairie hay for

the same reason. And feedlots like to start calves on prairie hay. Currently, the highest price for prairie hay is for small square bales, which weigh 60 to 65 pounds each and can be sold to feed stores and horse farmers. Round bales, which weigh 800 to 1,200 pounds, also sell well.

Haying provides insurance against late-summer drought or harsh winter weather. Many regions of the U.S. in recent years have suffered hay shortages because of bad weather. Some experts fear that land recently planted in alfalfa, clover, and lespedeza hay is being converted to corn production because of the biofuels boom. The market for prairie hay will only increase if that trend continues.

Prairie grasses are showing promise for ethanol production. The use of corn and soybeans for ethanol



Prairie hay is valued by some horse and cattle owners who think the mixture of plants, including many with known medicinal qualities such as *Echinacea*, may have health benefits for livestock.

has created numerous problems including food shortages elsewhere in the world and rising food prices here in the United States. Also, the energy required to grow those crops has greatly reduced the net benefit of ethanol production. In response, industry and university scientists are working to develop cellulosic ethanol production, which could use grasses as a feedstock.

A cultural touchstone

Originally one of the largest landscapes on the continent, the prairie is an integral part of the American story. The earliest Native Americans lived on the prairie, hunting bison, gathering fruits, and growing gardens. European explorers and traders traveled back and forth across the prairie in search of knowledge and wealth. Settlers crossed it in their canvas-covered wagons. How can we appreciate the vastness of the landscape, the richness of Native American cultures, or the determination of those who traveled the Oregon Trail, unless we have seen the prairie? How can we comprehend the American spirit?

The beauty of our native prairies is likewise part of our story. In the eyes of many, the prairies are just as beautiful—or more so—than mountains and forests. The poet Walt Whitman wrote in 1879: “While I know the standard claim is that Yosemite, Niagara Falls, the Upper Yellowstone and the like afford the greatest natural shows, I am not so sure but the prairies and plains, while less stunning at first sight, last longer, fill the esthetic sense fuller, precede all the rest, and make North America’s characteristic landscape.”

Whitman, a native of New York, was not the first or last artist to savor the beauty of the prairie. Many writers, painters and

photographers have been inspired by the rippling grasses, colorful flowers, glowing sunsets, towering clouds and fierce storms of the prairie landscape.

But it’s not just artists who enjoy the beauty of the prairie. Every person, at every age, benefits from contact with nature. And in Kansas, a native prairie is nature in its purest form, unchanged by time or human intervention. Some prairie areas are already seeing a boom in eco-tourism, as people learn to enjoy the gentle beauty of grasslands.

Who knows what’s ahead?

As the human quest for knowledge continues, we continually learn more about the values of natural communities. Two centuries ago, who would have guessed that a poisonous substance from the wildflower foxglove would become one of the most common medicines for heart disease? A few decades ago, who imagined that switchgrass might be used to fuel our vehicles? It’s entirely possible that natural communities such as prairies may be called upon to provide food, energy, medicines, or other essentials in the years to come.



Scarlet Indian paintbrush (*Castilleja coccinea*) is generally confined to the southeast part of Kansas.

3. Managing native prairies



Haying and burning can be part of a management plan

The remnant prairies of eastern Kansas are unique habitats that require specific management strategies. In general, hay meadow management simulates conditions before European settlement, when tallgrass prairie covered most of the mid-section of North America. Fire and grazing were the two most important influences on native prairies because they prevented the establishment of woody species and eventual succession to woodlands. Fires sparked by lightning and deliberately set by Native Americans raged sporadically across prairies, killing young woody plants and adding nutrients to the soil that benefited the prairie grasses and forbs. Bison and other herbivores damaged trees and shrubs by trampling,

gnawing, browsing and rubbing. Today, mowing and haying are the primary management tools for hay meadows. Grazing is generally not recommended for hay meadows except in a few carefully monitored situations that will be covered in detail below. This chapter covers recommendations for three different situations:

- Managing a healthy prairie for hay, biodiversity, and wildlife habitat.
- Managing a prairie to control minor problems such as cool-season grasses on the edges.
- Restoring a prairie that has been degraded by overgrazing or seriously encroached upon by invasive species.

Photo above: A hay meadow in late summer. Photo by NRCS.

Managing a healthy prairie

The best economic use for eastern Kansas native prairies is hay production. Fortunately, managing a prairie for hay is also one of the best ways to maintain its biodiversity and ecological value. For that reason, landowners are encouraged to continue haying their prairies. But other management practices can be helpful. Here are recommendations for managing a hay meadow that is currently in good condition.

When to mow

Harvest date is the most important factor in hay meadow management. Timing of the hay cutting will affect protein content, yield, and re-growth. Nutritional quality peaks early in the growing season and then drops off rapidly after the first week of July. However, at the time of peak nutritional quality, yield is lowest. It then increases as the warm-season grasses put on their maximum growth in June and July. The best compromise between quality and yield is to harvest in early July in southern Kansas and mid July in northern Kansas. Delaying harvest into August or September does increase yield, but the forage quality will be much lower and the plants will be weakened going into winter, reducing yields as much as 50% the following year. Native prairies should not be cut twice in one season, no matter how much the vegetation re-grows after the first cutting, because a second cutting will reduce yield the following year.

These comments about mowing time are really just broad guidelines for best management practices. In reality, a prairie is tolerant of variations in the timing and intensity of disturbances.

Mowing height

Cutting height is also important to long-term hay yields. In a normal year, prairies should be cut at a height of three to four inches, which leaves sufficient stubble for re-growth and soil cover. In a dry year, five to seven inches is more appropriate. The goal is to leave enough for the plants to rebuild carbohydrate root reserves before frost. Litter on



Eastern Kansas prairies should be cut in early to mid July for the best compromise between quality and yield. Hay should be cut to a height of three to four inches in a normal year, or five to seven inches in a drought year, to allow time for re-growth before winter.

the ground also conserves soil moisture and protects against erosion.

Fertilizers

Fertilizing is not recommended for native hay meadows. Nitrogen fertilizers may increase hay growth slightly during the year of application, but cause long-term problems. Nitrogen causes rapid growth of undesirable cool-season grasses, which can become invasive. Other weedy species can proliferate with fertilization. The desirable native grasses and forbs don't respond well to fertilization. Overall, most hay meadow managers agree that the meager benefits of fertilization do not justify the expense.

Bale storage

After a prairie is mowed and baled, the bales should not be lined up along the edge of the meadow and stored for a long period of time. They can kill the plants underneath, opening the soil to seeds of invasive species from adjacent land when they are removed later.

Wildlife

Some prairie owners manage their land for the benefit of wildlife, especially ground-nesting birds such as bobwhite quail. (The photo below shows eggs in a nest, nearly hidden by grasses, on a prairie hay meadow.)

Managing for wildlife generally involves a management plan employing all of the strategies above, except that haying is postponed until after July 15. That's when the majority of ground-nesting birds will have fledged. Several federal and state programs may compensate landowners for deferred haying.



Resting

Some ecologists recommend that at least 10% and, if possible, up to 30% of a prairie be left untouched each year. Rested areas can serve as refuges for wildlife, including ground-nesting birds. They also allow for continued seed production of native plants, which will be carried or blown onto the treated portions of the prairie, where they can re-establish. Ideally, if the prairie consists of more than one type of community, such as wet prairie and upland prairie, each type should be treated separately, with refuges on each. This is also known as rotational haying, with some portion of the meadow rested for a year, shifting across the prairie in a multi-year rotation. In the spring after a prairie has been rested, a prescribed burn can remove undesirable thatch from the next hay crop and can discourage cool-season grasses.

Managing a degraded prairie

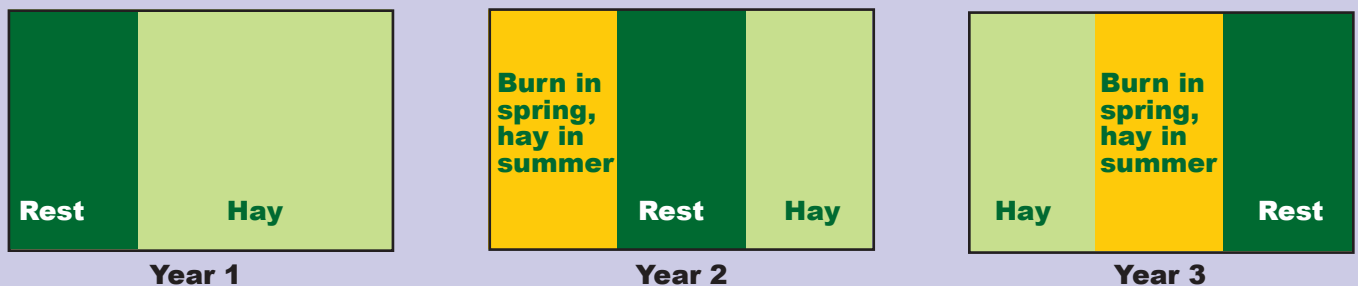
Hay meadows can be degraded by various factors and to varying degrees. Abandonment for many years can lead to widespread invasion by woody plants. Repeated herbicide use can reduce species diversity. One of the biggest threats to hay meadows is the creeping invasion of non-native species along the prairie's edges and in wet ravines that don't get mowed every year.

Mixed management benefits biodiversity

The ideal management plan for preserving biodiversity in a hay meadow is to divide it into sections and rotate the management each year. One portion should be rested to allow natural processes to continue. Ground-nesting birds can raise their young unimpeded, and native plants can go to seed.

The portion that is rested can be burned early the following spring because it will have enough fuel to carry a fire that will kill any cool-season grasses or woody plants. The burned portion can be hayed in summer.

The diagram below shows a potential rotation dividing a prairie into thirds; it could as easily be divided into smaller parcels, meaning a longer rotation, depending on the economic impact of resting a portion.



Landowners should watch for invasive species and take action early before they threaten a prairie's viability. Woody species along fencerows or in rocky or wet spots may need to be brush-hogged a couple of times a year for several years before they are killed. Wait until woody plants are fully leafed out, because then their energy stores are above ground. Don't cut in fall, when energy stores have moved to the roots, because the trees will come back more energetically the next year.

In some cases, it's easiest and cheapest just to walk through an invaded area and cut out woody plants with limb loppers or pruning shears. Well-established trees can be ringed with a chain saw in spring to cut through the cambium layer, and the tree left to die. The dead trees can be removed in winter.

Brush should not be piled up and burned on the meadow because the heat of the fire will sterilize the soil beneath it, and weeds will spring up in the area. Instead, drag the brush to a nearby disturbed area such as the edge of a crop field and leave it for wildlife cover, or burn it if necessary. When cutting trees, it's important to cut them as close to the ground as possible to avoid having stumps that will interfere with mowing. Many trees will resprout from stumps, and annual mowing or treatment with herbicides are the only ways to prevent the trees from growing back.



Problems with encroaching cool-season grasses are easy to assess in fall or early spring, when the warm-season native grasses are brown and the cool-season grasses such as brome and fescue are green. On this remnant prairie in Douglas County, fescue and trees are invading the prairie from the edges.

Herbicides

Most of the herbicide use on prairie hay meadows is the result of the mistaken belief that the prairie's broadleaf plants, or forbs, are "weeds" that need to be eradicated. In fact, most forbs are valuable plants that play an important role in the prairie ecosystem and may provide health benefits to animals that eat prairie hay.

Invasive species are the only plants that need to be controlled on a prairie. Even then, herbicides should never be broadcast-sprayed. The herbicides will harm non-target broadleaf plants, including all the showy wildflowers, and it can take decades for them to recover; some species may never return after being eliminated through indiscriminate herbicide use. Instead, spot-spray noxious weeds such as sericea lespedeza. (Be sure you really have the invasive species; there are several native, non-invasive plants that are similar in appearance. See pages 24-25 for more information.) Some woody plants may occur in ravines, along fence lines, or in other areas that don't get mowed every year, and they may require spot herbicide applications.

If you do use herbicides, apply only those labeled for the target species and for use in hay meadows. Pay particular attention to the waiting period between spraying and hay harvest. Contact your county extension agent for advice.

Burning

Fire can control many unwanted species on a prairie if there is enough fuel to carry a fire. Cool-season grasses such as fescue and brome will be suppressed if the prairie is burned early in the season when they are growing most rapidly. The best time to burn in order to control cool-season invaders is around mid April, when the new growth of big bluestem and Indian grass is 1 to 2 inches tall; the fire will not affect the native warm-season grasses, but some wildflowers will be set back temporarily. Prairies should not be burned later in spring because fire then will harm the native plants during their most active growth period.

Woody plants along edges and in ravines can be

controlled with fire early in the season, if there is enough fuel. The prairie should be rested the summer before a prescribed burn.

Grazing

For long-term hay production and biodiversity, grazing is generally not recommended for small remnant prairies. Although native herbivores such as bison were essential to maintaining the tallgrass prairie on large landscapes, the situation is different on small remnant prairies. Grazing cattle in small tracts of prairie may change the species composition and diversity over time. Overgrazing presents one of the biggest threats to the health of a prairie. Too



Prescribed fire can be useful for improving a degraded prairie. Contact your county Extension agent or Natural Resource Conservation Service office for information about how to conduct a burn. Photo by NRCS.

Sorting out the many plants called lespedeza

Several native species of bushclovers, also known as lespedezas, are among the attractive and important broadleaf plants found in hay meadow prairies of Kansas. These native lespedezas are legumes that add fertility to the soil, nourishing the grasses and other plants, and they are an important food source for bobwhite quail and other birds.

However, a closely related plant called sericea lespedeza, also known as Chinese lespedeza (*Lespedeza cuneata*), is a highly invasive exotic and noxious weed. It was introduced as a forage and erosion control plant for poor soils, but it has become a serious threat to hay meadows and rangeland in Kansas, occurring on as many as 30% of the prairies in a county. Sericea lespedeza out-competes native plants; in one study by Kansas State University, native grass production was reduced by 80% compared to non-infested prairies. It is a prolific seed producer, and the hard seeds are viable for as long as 20 years in the soil.

Because of its tendency to crowd out native plants, sericea lespedeza should be eradicated whenever it is found in prairies. Sericea is difficult to control, requiring an integrated management approach

involving burning, mowing and spot spraying of herbicides. (See resources at the end of this chapter.) The best approach is preventative: Landowners should be familiar with the plant, be on the watch for it, and take action immediately if it appears in a hay meadow.

Broadcast herbicide applications, either by ground or aerial spraying, are not recommended because of the collateral damage to desirable native plants. Also, broadcast spraying is not cost-effective, costing about six times more than spot spraying.

Before any eradication program, especially spraying herbicides, is undertaken on a native prairie, it's important not to confuse the bad lespedeza with the good ones. The photos and descriptions below should help you distinguish the desirable native species from the exotic sericea lespedeza.

Another plant commonly known as lespedeza is an annual summer legume grown for pasture, hay and soil improvement. This crop plant, grown like alfalfa and clover, is not related to the native lespedezas; in fact, it is in a different genus, *Kummerowia*.

Slender bushclover and sericea lespedeza both grow upright or somewhat slanted to a height of about 3 feet, with very closely spaced narrow leaves along the length of the stem. The desirable native, slender bushclover (*Lespedeza virginica*), below left, has purple flowers while sericea lespedeza (*Lespedeza cuneata*), below right, has mostly white flowers that may be tinged with purple. However, it is often the case that neither species is in flower at the time herbicide is applied, so more subtle features must be used to distinguish the species.



Lespedeza virginica
slender bushclover
(the good one)



Note that the leaves of slender bushclover (left) are widest near the middle while those of sericea lespedeza (right) are widest near the blunt tip of the leaf. Also, sericea lespedeza has distinct vertical grooves on its stems.

Lespedeza cuneata
sericea lespedeza
(the bad one)



many cattle over too long a season will degrade a hay meadow quickly, and it may never fully recover. Even moderate stocking rates can damage prairie diversity if practiced over time.

Restoring an abandoned prairie

A prairie that has not been hayed in many years may have become overrun with cool-season grasses, cedars, and other woody plants. It usually can be saved, but it will take significant effort. The first order of business is to remove the invasive species; the second is to employ practices that encourage the reestablishment of native species.

The words “restoration” and “reconstruction” are often used interchangeably, but there is a distinction. Restoration refers to an existing native prairie remnant that is being managed to control exotic species and restore native species. A reconstruction involves planting native species on land that has been cropland, woods, or lawn, though it may have been prairie in the distant past.

This section deals only with restoration of existing prairies. Reconstruction is beyond the scope of this booklet; landowners interested in the topic have a great resource in the book *The Tallgrass Restoration Handbook*. See Resources at the end of the chapter for more information.

Another good lespedeza

Round-headed bushclover, *Lespedeza capitata*, (right) is a common species of native prairies that can grow up to 4 feet tall. The leaves are covered with fine silky hairs that make them appear silvery in color. The small white flowers form in dense clusters in mid to late summer, and later the brown seed heads are noticeable on the tall bare stems throughout the winter.

Photo by Tom Barnes, University of Kentucky



Burning

When cool-season grasses, trees, and shrubs have encroached on native prairie, prescribed burns may be required for several years running. The prairie should not be mowed the year before the burn so that there is sufficient fuel to create a fire hot enough to kill or seriously damage trees. The fire should be scheduled for April, when the invasive plants are actively growing and most susceptible to damage by fire.

Woody plants that are not set back sufficiently by a spring burn can be clipped or mowed during the summer. The rest of the meadow should be left unhayed again to prepare for a second burn the following April.

Seeding

When a prairie has been degraded, resulting in a lack of species diversity, spreading seeds of native plants may help with the restoration. Seeds collected from healthy plants growing on nearby prairies have the best chance of succeeding on a restoration. They are known as *local ecotypes*, plants that are adapted to the specific geographic environment. Be very cautious of using seed from unknown or far-away sources.

Seed should be collected at least twice a year, in June after the spring-flowering plants have set seed, and again in September when summer-flowering plants have set seed. In general, seeds can be harvested when they have a hard seed coat. To keep the seeds separated for wider dispersal, they can be mixed 50-50 with perlite, a spongy, white natural substance used in garden planting mixes and available from nursery supply companies. Unlike crop seeds, which need clean-tilled soil for best germination, the seeds of prairie plants can establish in existing vegetation. This is the key to a practice known as interseeding, in which local ecotype seeds are spread on existing prairie. In dense grass, which is likely to shadow the ground at some point in the season, the prairie should be burned or mowed before seeding. Although there are no hard-and-fast rules about seeding rates, *The Tallgrass Restoration*

Handbook recommends that the seed/perlite mixture be spread at the rate of one kitchen garbage bag full per half-acre. In other words, you need a lot of seeds! Research shows there is little benefit from raking or harrowing the seeded meadow.

Another option is to burn the prairie in fall, then seed in early winter. The freeze-thaw cycle will disturb the bare soil enough to incorporate the seeds. After a prairie has been reseeded, it can be rested or mowed high the next year.

Resources

1. *The Tallgrass Restoration Handbook* by Cornelia Mutel and Stephen Packard, Island Press, 2005. Available from bookstores or libraries.

2. Kansas State Extension holds prescribed burning workshops throughout the state. To find out what is being offered in your area, contact your county extension agent.

3. Publications from other states available on the web:

- *Native Prairie Management Guide* by the Iowa Prairie Network. <http://www.iowaprairienetwork.org/mgmt/mgmtguide.htm>
- *Guide to Native Grassland Management in Nebraska* by The Nature Conservancy. http://www.nature.org/wherework/northamerica/states/nebraska/files/tnc_08_grassland_guide_spreads.pdf

4. Several federal and state programs provide assistance to hay meadow owners; funding depends on agriculture appropriations annually. The local NRCS office will have information on the programs marked below as USDA. The Kansas Department of Wildlife and Parks has information on those marked KDWP.

- **Conservation Security Program (CSP), USDA.** CSP funds may be used for deferred haying. CSP may not be available in some areas of the state.
- **Grassland Reserve Program (GRP) USDA.** In Kansas, GRP has been used only in the Flint Hills but could have limited future use in hay

meadows.

- **Environmental Quality Incentives Program (EQIP), USDA.** EQIP offers opportunity for cost share on tree removal, invasive species control, and deferred haying.
 - **Wildlife Habitat Incentives Program (WHIP), USDA.** WHIP offers similar cost-share practices as EQIP.
 - **Quail Initiative, KDWP.** The Quail Initiative offers cost share on many practices that may benefit hay meadow management in Allen, Bourbon, Crawford and Neosho counties.
 - **Prairie Chicken Initiative, KDWP.** The Prairie Chicken initiative offers in existing prairie chicken habitat opportunity for cost share on practices that may benefit hay meadow management.
 - **Partners for Fish and Wildlife (PFW) program, U.S. Fish and Wildlife Service.** Cost share ranging from 10-90% is available for a variety of practices that may benefit hay meadow management. Contact the office of the state coordinator, Partners for Fish and Wildlife (PFW) program, U.S. Fish and Wildlife Service, 2609 Anderson Ave., Manhattan, KS 66502; 785-539-3474 ext. 107. <http://www.fws.gov/mountain-prairie/pfw/kansas/ks2a.htm>
5. Publications on control of sericea lespedeza:
- <http://www.oznet.ksu.edu/sericea/sericeainfo/sericeadescribe/>
 - <http://www.okrangelandswest.okstate.edu/pdfFiles/OSUextPubs/F-2874.pdf>
 - <http://mdc.mo.gov/nathis/exotic/vegman/twentytw.htm>

4. Conserving valuable lands



Tax laws encourage permanent land conservation

The prairie hay meadows of eastern Kansas are ecologically important resources that merit protection. Good stewardship is the most important factor in land protection during the landowner's lifetime. But what happens when the land passes to the next generation or to new owners?

Many people who love their land worry about what will happen to it in the future. They fear that their work and care might be lost, that the land might be developed, plowed, overgrazed, or otherwise degraded. They worry that their family history or legacy will be lost, or that an ecological treasure will be inadvertently destroyed.

Those outcomes can be prevented with various conservation mechanisms that are available to landowners. Land conservation has grown tremendously in the past few decades, thanks to the support of the U.S. Congress and state Legislatures. In Kansas, the most effective conservation mechanisms are those that keep land in private hands, such as conservation easements. Other, less likely, possibilities include selling or donating land to non-profit organizations such as scouting groups, 4-H, environmental organizations, or county or state government.

Photo above: A prairie hay meadow in Linn County, Kansas

In most cases, conserving land provides significant tax benefits that make it easier to choose conservation over development. Before considering specific legal mechanisms for conserving land, it's important for each landowner to answer some general questions about goals and circumstances.

Your conservation goals

First, analyze what you want for your land after you are gone. Do you want to ensure that your prairie is never plowed? Do you want to see your farm preserved for agriculture? Do you want the land to be managed for the benefit of wildlife? Before you can choose the best conservation option, you need to have a clear vision of how you want the land to be treated by future owners.

Your financial needs

Once you have articulated your goals for the land, consider the financial ramifications. Will you be able to retire without selling your land? Are you looking for a way to reduce inheritance taxes on your estate? Do you need financial compensation for conservation, and if so, when? You may be surprised to find that there are numerous ways to protect land that still provide financial benefits for you or your heirs.

Your timeline

Finally, think about when you want to take action to conserve the land. Conservation programs that are legally binding should not be undertaken lightly or hastily. But you don't want to put it off until it's too late. When you die, your heirs will decide what to do about your land if you haven't made your wishes binding. In the worst of all scenarios, your land might become a source of conflict for family members, as some try to honor your hopes about conservation while others want to sell it. It's important to work with your family now to agree upon the best strategy for land protection in the future.

These three factors – your conservation goals, financial needs, and timeline – will determine which

type of mechanism fits your situation best. In the rest of this chapter, you'll read about the options that are available to Kansas landowners. In the Resources at the end of the chapter you can find contact information for organizations that can help you investigate these further.

Conservation easements

A conservation easement is a voluntary legal agreement between a landowner and a land trust or government agency that permanently limits uses of land in order to protect its conservation values. A conservation easement typically prohibits development and other incompatible uses of the land, but it can be written with great flexibility to accommodate the landowner's wishes. The landowner continues to own and use the land and is able to sell it or pass it on to heirs. Future owners also will be bound by the easement's terms. The land



A small strip is all that remains of what was once a prairie. The rest of the hillside was plowed and converted to cropland. Owners who want to prevent the future loss of a valued piece of land have numerous options for conserving it in perpetuity.

trust or government agency that holds the easement is responsible for making sure the easement's terms are followed on a long-term basis.

Every conservation easement is different, as it is tailored to fit the individual property and landowner's wishes. An easement may apply to just a portion of a property. Public access is not required for land protected by an easement. Two types of conservation easements are available in Kansas: donated conservation easements and, to a lesser extent, purchased conservation easements.

Donated easements

As explained above, a landowner who grants a conservation easement restricts future development and, in essence, donates the development rights to a conservation organization or government. If the donation benefits the public by permanently protecting important conservation resources, and meets other federal tax code requirements, it can qualify as a tax-deductible charitable donation. Easement values vary greatly; in general, the highest easement values result from very restrictive conservation easements on tracts of developable open space under intense development pressure.

In exchange for the donation of development rights, the landowner may be entitled to a tax deduction equal to the difference between the value of the land with development rights and without development rights. For example, if land is selling for \$10,000 an acre in a suburban area, and the owner donates a conservation easement prohibiting any future development, the value of the land may decrease to \$5,000 an acre. The \$5,000 per acre difference may be deductible as a charitable donation on the landowner's federal income taxes. The value of the easement will be determined by a certified appraiser.

Federal, state, and local laws may provide further tax incentives that make it more financially advantageous for landowners to donate conservation easements. For example, current federal law allows farmers and ranchers to deduct easement values of up to 100% of their adjusted gross income in any



A conservation easement protects a 16-acre prairie in Douglas County. The landowner, Tom Akin, donated the easement in memory of his late wife, Dorothy, who loved the abundant wildflowers that grow there.

year, for as long as 16 years if needed to recoup all the tax benefits. Other landowners may deduct up to 50% of their income. With these kinds of tax incentives, even people of modest means gain significant financial benefits from donated easements.

A conservation easement can be essential for passing undeveloped land on to the next generation. By removing the land's development potential, the easement typically lowers the property's market value, which in turn lowers potential estate tax. Whether the easement is donated during life or by will, it can make a critical difference in one's heirs' ability to keep the land intact.

Tax laws change annually, so it's important to know and understand the current tax situation before deciding whether you want to place a donated easement on your land. Check the resources section for organizations and web sites that will provide updates on current tax laws pertaining to easements.

Purchased easements

In some cases, landowners may be paid outright for the development rights to their land. Programs that pay for easements are extremely limited in Kansas at present, and eligible land tends to fit into one federal

program: The Farm and Ranch Lands Protection Program (FRPP), which provides matching funds to help purchase development rights to keep productive farm and ranch land in agricultural uses. The U.S. Department of Agriculture will pay the landowner up to 50% of the fair market easement value of a conservation easement. Other programs may be available through land trusts or governmental agencies to pay for an additional 25% of the easement value. The landowner is expected to donate at least 25% of the easement value.

In addition, some governmental agencies and non-profit organizations may have funding to purchase particularly valuable land. See the resources section for more information about organizations in Kansas that hold purchased or donated conservation easements.

Donation or bequest

You can donate land during your lifetime to a conservation-oriented partner such as a nonprofit organization or governmental agency. Or you can make a bequest of land in your will. In either case, it's essential to discuss this option with the partner organization you have in mind. Some organizations may choose not to receive ownership of land because they don't have the ability or finances to manage land. An organization also may choose to sell the land and use the proceeds for conservation work, unless both parties have agreed in advance about how the land should be used. Several strategies can be used for donation of land to a conservation organization or governmental agency:

- **Gift of a remainder interest.** In some instances, a landowner may wish to donate ownership of land to a land trust, while retaining the right to use the land until death. The act of making the donation of the land prior to death, to take effect after death, is called a gift of a "remainder interest," and the retained right of use is called a "life estate." In some instances, the combined gift of a conservation easement with a remainder interest may address the needs and desires of a landowner.

- **Land donations that establish a life income.**

With a charitable gift annuity, a landowner transfers certain property to a land trust, and the organization agrees to make regular annuity payments to specified beneficiaries for life. This gift of land usually qualifies for a charitable income tax deduction at the time of the gift, based on the value of the land less the expected value of the annuity payments.

- **A charitable remainder unitrust.** Land is placed in a trust account, with a conservation easement, if it is to be protected. The trustee sells the land and invests the proceeds of the sale. Specified beneficiaries receive annual payments for a fixed term or for life. Charitable gift annuities and charitable remainder unitrusts are most useful for highly appreciated land, the sale of which would incur high capital gains tax.

Sale of land

In some cases, land can be protected by a conservation easement and then sold. In rapidly developing areas, the sale price may be reduced significantly by the easement. But in rural areas where there is not much development pressure, there may be little financial loss to the seller – the price might be the same with the easement as without it. Buyers with a conservation interest of their own, such as neighboring farmers or urban people looking for a hunting retreat, may not be deterred by the conservation easement. In fact, there is evidence that protected land raises the value of adjacent land, a fact that can work to the seller's advantage. A final option is a bargain sale, in which you sell your land to a land trust or governmental agency for less than fair market value. This not only makes it more affordable for the conservation buyer, it also offers several benefits to you: it provides cash, avoids some capital gains tax, and entitles you to a charitable income tax deduction based on the difference between the land's fair market value and its sale price.

Everyone benefits

All of these conservation options are allowed by federal and state law. Congress and the Legislature have affirmed the value of conservation, not just for the current landowners, but for all of society. If you are fortunate enough to own ecologically valuable land such as a native prairie, you owe it to yourself and future generations to explore the possibility of protecting it permanently.

Resources

Kansas non-profit organizations that hold conservation easements:

- Kansas Land Trust, 16 E. 13th Street, Lawrence KS 66044; 785-749-3297; <http://www.klt.org>. The mission of the Kansas Land Trust is to protect and preserve lands of ecological, scenic, historic, agricultural, or recreational significance in Kansas.

- Ranchland Trust of Kansas, 6031 SW 37th St., Topeka, KS 66614; 785-273-5115; <http://www.ranchlandtrustofkansas.org>. The mission of the Ranchland Trust of Kansas is to preserve Kansas' ranching heritage and open spaces for future generations through the conservation of working landscapes.

- The Nature Conservancy in Kansas, 700 SW Jackson, Suite 804, Topeka, KS 66603; 785-233-4400; <http://www.nature.org/wherewework/northamerica/states/kansas/>. The Nature Conservancy's mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

National organizations that can provide information about land conservation:

- American Farmland Trust, 1200 18th Street NW, Suite 800, Washington, D.C. 20036; 202-331-7300; <http://www.farmland.org>.

- Land Trust Alliance, 1660 L Street, NW, Suite 1100, Washington, DC 20036; 202-638-4725; <http://www.landtrustalliance.org>.

Cover photos:

Front cover: Prairie hay meadow in Anderson County, Kansas, June 2008.

Page 2: Closeup of prairie grasses and forbs in Douglas County, Kansas, July 2008.

This page: Rural road in Anderson County, Kansas, June 2008.

Back cover: Big Bluestem in Douglas County, Kansas, September 2008.

