Creating Wildlife Habitat on Great Plains Ranches

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Across the Great Plains, grazing by large ruminants is a critically important part of grassland ecology. Grazing regulates habitat structure for wildlife and creates a broad range of growing conditions for plants. Chronic overgrazing can degrade plant communities and reduce habitat quality, but a well-managed ranch can foster healthy wildlife populations while optimizing livestock production.

Cattle feed selectively, preferring grasses, but also utilize broad-leaved plants as smaller but vital parts of their diets. That grazing selectivity creates important habitat structure for many wildlife species and if well managed, can also sustain very high plant diversity. That plant diversity supports a resilient and productive grassland for both wildlife and livestock.

What Does Good Wildlife Habitat Look Like on a Ranch?

A common perception among ranchers is that creating wildlife habitat means grazing a pasture less than they otherwise would to leave extra grass behind. Patches of tall grass certainly do provide important habitat for some animals, but many species have very different habitat needs. Meeting the habitat requirements for a diversity of wildlife means creating a diversity of habitats across a ranch.

Relatively tall/dense vegetation is valuable for some nesting bird species, including song birds like sedge wrens and Henslow's sparrows, as well as game birds like northern bobwhite, prairie chickens, sharp-tailed grouse, and ring-necked pheasants. Some of those birds prefer very dense vegetation for nesting, but most do best when patches of dense grass are broken up by somewhat shorter vegetation around them. In addition, game birds (and some others) need to have other types of habitat structure nearby, for courtship and brood-rearing activities. Other wildlife species also use taller grass, including some that live in or beneath the dense canopy and some – like deer – that just use it as temporary protective cover.

Deer often feed in the open but rely on more dense cover to sleep and to hide their fawns.

Some wildlife species do really well in a moderately-grazed pasture, in which there is plenty of litter covering the ground, but vegetation is kept relatively short. Western meadowlarks and grasshopper sparrows, for example, thrive in that kind of habitat structure, along with many small mammal and reptile species. This is a pretty common habitat type across most ranches. Other habitat types (see below) are much less common, however, and that can restrict the wildlife and plant species a ranch can support.

Western meadowlarks are often found in high abundances in pastures with lots of litter but relatively short vegetation height.

Many small mammals, such as this deer mouse, can be found in a variety of habitat structure types, including moderately-grazed pastures. Others, like prairie voles, prefer relatively dense grass, through which they build protected tunnels for traveling around. Kangaroo rats, on the flip side, prefer very sparse habitat with lots of bare ground.

Intensive grazing that creates very short vegetation height and exposes some bare soil sometimes gets a bad reputation because repeated (for many years in a row) overgrazing can lead to negative impacts on grasses, soils, and water quality. However, prairie wildlife and plant communities are well adapted to periodic bouts of very intensive grazing, even when that grazing extends over a growing season or two. As long as grasses and other plants are given plenty of time to recover in between periods of intense grazing, plant communities, soils, and water quality can fare very well.

Intensive grazing that crops vegetation short and exposes soil can cause degradation and soil erosion if it happens year after year, but for shorter periods (up to a growing season or two), it creates valuable habitat for many plants and animals. As long as sites like this are then allowed sufficient rest from grazing to fully recover, grasses and other perennial plants suffer no long-term consequences.

In fact, a number of wildlife species rely on the habitat created under season-long intensive grazing. Those include bird species like horned larks, upland sandpipers, and others, as well as kangaroo rats, earless lizards, along with lots of insects, including many bee species, which require bare ground for nesting habitat. Wildlife that favor habitats created by strong disturbance tend to be well-adapted to moving around the landscape to find those habitats. When a short-cropped pasture is shifted into a long period of rest from grazing, those wildlife species leave the area in search of new patches of heavy grazing.

Horned larks favor very short vegetation with lots of exposed bare soil for nesting habitat. In fact, they are often seen attempting to nest in crop fields – where they are at risk from farm equipment and other threats. Pastures grazed heavily enough to maintain short habitat structure through the breeding season are ideal habitat for these and other bird species.

Earless lizards are found in abundance in the Nebraska Sandhills in places where there is abundant bare ground for them to hunt. They use scattered patches of vegetation to hide from predators and the hot sun, but forage out in the open on large numbers of insects that are drawn to the same habitats.

Grasslands can fully recover from being grazed as long as rest periods are sufficiently long. In fact, grazing rotations that graze a pasture intensively, but only for a short period, often recover fast enough that habitat value is limited. Intensive grazing for several months or more usually leads to a recovery period of about the same amount of time, during which that recovering prairie provides unique and valuable habitat for a number of plant and animal species.

These annual sunflowers are responding to sunlight, moisture, and nitrogen that isn't being fully used by the grazed grass plants around them. Sunflowers produce very nutritious pollen and seeds for insects and other animals, as well as important habitat structure. As grasses recover, these sunflowers and other short-lived plants quickly disappear.

When a grass plant is repeatedly grazed close to the ground, the size of its belowground root mass shrinks. That temporarily opens up space for other plants to fill. Those opportunistic plants include short-lived species that germinate from seed as well as longer-lived plants that can simply expand their aboveground footprint. As grasses recover from being grazed, they slowly retake their lost territory and the temporary flush of other species recedes.

In the Nebraska Sandhills, fourpoint evening primrose (a biennial) can become very abundant a year or two after a site is intensively grazed. It can germinate when nearby grasses are cropped short and then blooms during the next year as those grasses are starting to recover. The habitat structure of short/sparse grasses and tall wildflowers is fantastic habitat for many wildlife species.

Long periods of intensive grazing (a few months or more) followed by similar periods of rest can provide unique and important habitat for many wildlife species. However, that kind of grazing/rest can be valuable for some plant species too, especially those that don't normally compete with with dominant grasses. Those plants may have a chance to bloom and produce seeds and other reproductive structures (underground rhizomes and buds) in a way they can't when surrounded by robust grass plants. Repeated cycles of grazing and rest can help ensure that plants with a wide variety of competitive strategies can all sustain themselves in the plant community.

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(Above) Sometimes, the wildflowers that flush in abundance after a long bout of intensive grazing provide lots of color and resources for pollinators and other insects. In this photo, grasses are present, but still short from grazing during the previous season. A year after this photo was taken, those grasses had recovered, were thick and tall, and flower abundance decreased dramatically.

Northern bobwhites, along with grouse, pheasants, upland sandpipers, and other birds utilize patches of grassland with short-cropped grasses and tall 'weedy' wildflowers as brood-rearing cover. Their chicks can move easily along the ground because of the low-density vegetation, but are still protected by overhead cover. Insect abundances are typically very high under these conditions too, which provides abundant food for the birds.

Sometimes, the 'weedy' recovery phase after intensive grazing is dominated by plants like western ragweed, that don't have showy flowers. Ragweed, however, produces seeds that are extremely valuable to wildlife such as northern bobwhite. The habitat structure of tall ragweed and other broad-leaf plants with an understory of short grasses is also ideal for brood-rearing birds, as well as many other wildlife species. This pasture was full of tall grasses again just a year after this photo was taken.

This area has fully-recovered from a season of intensive grazing a few years before this photo was taken. As grazing shifted elsewhere, grasses were able to quickly regrow and retake territory temporarily held by opportunistic wildflowers.

Pastures that are cropped short, recovering from intensive grazing, and well-rested each provide habitat for a different suite of animals – and also favor different plant species. However, there are countless variations on the habitat theme in grasslands. The ability of a rancher to vary the stocking rate, timing, and duration of grazing across numerous pastures allows for a wide variety of habitats to be provided, each of which is important.

Cattle and bison are both highly selective in their diet choices, when given that opportunity, and their preferences change constantly as plants become available and reach different levels of maturity. That diet selectivity means that cattle will focus on grazing some plants more than others, creating patchy habitat structure as they do so. Short-term moderate grazing, for example, might lead to animals focusing mostly on a few grass species, and maybe nipping the tops off a few wildflowers.

Grasshopper sparrows and many other grassland nesting birds hunt for insects, which are often abundant and easy to find in open patches created by large grazers.

The longer animals stay in a pasture (and the higher the density of animals), the more species of plants they'll graze, increasing the number and size of openings within the vegetation. Animals use those openings to help regulate temperature (gain access to sun/shade), travel through the prairie, and forage for either plants or animals. Providing pastures with varying levels of patchy vegetation structure gives wildlife numerous options and helps support a high diversity of wildlife species.

This kind of habitat structure can only be created by selective grazers, which have eaten most of the grasses in this pasture (and some of the wildflowers) but have left enough tall structure behind to provide excellent cover for many animals, including the mobile chicks of grouse, bobwhite and other birds. It also leaves plenty of flowers for pollinators and other important invertebrates.

Low intensity grazing can leave many plants, including blooming wildflowers, untouched, while still creating openings and reducing the density of the vegetation. This makes great habitat for wildlife that need somewhat dense grass, but also provides some lower density areas for travel, feeding, and other behaviors.

In addition to the kinds of habitat created through various grazing strategies, ranchers can provide crucial habitat in other ways as well. For example, many wildlife rely on small scattered habitat patches that might include a colony of shrubs or an area of consistent bare ground. Some animals live completely within those small patches, but others utilize them as temporary cover, feeding areas, or places to loaf and regulate their temperature. Ranchers can add a lot of habitat value to their ranch by simply being tolerant of these small habitat anomalies within a pasture rather than trying to ensure homogenous grass across every part of every pasture.

Small patches of shrubs can provide invaluable habitat for wildlife, but also tend to provide crucial early spring flowers for pollinators too – along with fruits for wildlife food later in the season. However, too many shrubs and trees can be counterproductive, both for wildlife and livestock production. A few scattered trees can quickly multiply into many more, often without being noticed by land managers who see them every day. That doesn't mean all trees and shrubs should be eliminated to prevent problems. It just means they should be carefully monitored to keep them from becoming overly abundant.

Small patches of open soil, shrubs, weedy plants, and other habitat features can provide a lot of value to a wide range of plants and animals. Sometimes these are created automatically around water sources and other places livestock concentrate. Other times, they are facilitated by topography or other natural features.

Eastern redcedar is an example of a tree species that can quickly spread from a few scattered trees to an abundance that reduces livestock forage availability and significantly alters wildlife habitat structure. Once trees get big enough to start producing fruits/seeds, they can multiply very quickly.

Providing a Shifting Mosaic of Habitats

While each of the habitat types mentioned here is important, the way those habitats are arranged across the landscape also matters. Ideally, every ranch should contain a 'shifting mosaic' of habitat patches. A mosaic of habitat types means that wildlife can move around the landscape to find their ideal habitat. Many animals will need access to various habitats throughout the year, or even throughout their day, in order to fulfill all their requirements.

Prairie chickens, for example, might seek out very short grass for courtship, tall grass for nesting, and a pasture with lots of 'weedy' vegetation for brood-rearing, before heading back to tall grass for cover during the winter. Deer might travel through several pastures, each with different habitat structure, during the course of a single day – using different areas for feeding, loafing, and caring for offspring.

A diverse community of wildlife and plants requires a diversity of habitat patches spread across the landscape. Some species will spend all their time in one kind of habitat or another, while others will move back and forth between patch types.

The 'shifting' part of the 'shifting mosaic' of habitats is also important. Farmers and gardeners rotate crops through various locations to avoid building up pests and diseases in any particular place. Similarly, rangelands thrive best when every management unit receives different treatments year to year. When a pasture is managed the same way each year, certain plants, predators, and disease organisms (those most favored by that management) become dominant, to the detriment of others. Over long periods of time, some wildlife and plant species can disappear from those areas.

When habitat conditions change in a certain location, many wildlife species travel elsewhere to find their preferred habitat. Others may experience population declines but hang on until better conditions return. Plant species can also weather unfavorable conditions in some years as long as they are provided good opportunities to flourish in others. A shifting mosaic of habitats helps ensure diverse and vibrant populations of both wildlife and plant species. That diversity helps make grasslands resilient – able to maintain productivity and health through droughts, wet periods, and whatever else is thrown at them.

This set of pastures is providing a broad mixture of habitat types, including tall and dense in the top right, mostly short in the bottom right, patchy vegetation in the bottom left, and 'weedy' recovery in the top left. Each of those treatments and habitat types will be in a different location next year.

Evaluating your Habitat

How do you know if your ranch is supporting diverse and healthy plant and animal communities? If you're providing a shifting mosaic of habitats, you're probably ok, but here are a few ways to further see how well you're doing.

•There should be parts of your ranch where you can throw a football five or ten feet away and not see it after it lands. This can indicate that you've got good habitat for those wildlife that require tall dense vegetation for nesting or protective cover. At the same time, there should be other places where you can throw a tennis ball the same distance and still see it. That habitat will accommodate a whole different suite of plants and animals. Of course, the places where you can or can't see a football or tennis ball should vary from year to year.

•You should be able to stand just about anywhere on your ranch, anytime during the growing season, and spot several kinds of blooming plants nearby. If you can do that consistently through the season, you're probably providing resources for a healthy pollinator community. Bees and other pollinators need a constant supply of flowers all season, and most pollinators are unable to use all flower types, so a diversity of flowers is very important. A healthy pollinator community means a healthy wildflower community. Even though wildflowers might be a small part of a cow's diet, they provide important supplementary nutrients. More importantly, they are crucial to maintaining healthy soils and other ecosystem functions that support strong grass growth.

•Wayne Copp, a Kansas rancher, might have come up with the best description of what a healthy grassland is like. He says every prairie should have color, movement, and noise. While that is obviously a subjective measure, it is also pretty descriptive and fits what most of us would want around us where we live.

What Grazing System Is Best?

The best grazing system is the one that best meets the needs of an individual rancher, their preferred lifestyle, class of animals, availability of labor, and site conditions. You don't have to follow one particular pasture rotation scheme or another to create good habitat either. There are some grazing approaches that were built specifically to facilitate a shifting mosaic of habitats, including patch-burn grazing and open gate rotational grazing, but those are far from the only ways to make good habitat.

If you're already using some kind of rotational grazing, there are a few ways you could consider tweaking your approach to improve habitat quality. First, of course, be sure you're starting the rotation in a different place each year (shifting mosaic). Second, if possible, allow some pastures to rest long enough that all flowering plant species have an opportunity to bloom and produce seed every few years. Third, consider staying a little longer in some pastures and resting others a little longer than you normally do. This can help create more long-lasting short habitat structure and also create a better 'weedy' recovery patch type during the time the pasture is resting from that grazing.

You might also consider allowing cattle to 'graze backward' in a rotation. This means that when you open the gate to a new paddock, you can leave that gate open, allowing cattle to graze both the new forage as well as the regrowth of what they were previously grazing. This is another way to achieve longer grazing bouts (which will need longer rest periods, of course) while still providing cattle with lots of choice and the ability to manage their own forage intake.

The short grass in the foreground and right side of this photo covers two paddocks that have been grazed for most of the season (one more than the other) but will be rested for most or all of next year. The paddock at the bottom left was opened up (and left open) late in the summer, which allowed cattle to move in and selectively graze, while still grazing the regrowth in the previous paddocks. The result was a nice mixture of habitat structure types, especially with the addition of the area to the left of the pond, which was rested all year after being grazed intensively most of the previous year.

By keeping gates open to previously-grazed pastures, you can also slow a rotation, using fewer pastures (harder) each year, which allows other pastures more time to rest. The result is a greater contrast of habitat conditions from pasture to pasture across your ranch. It can also mean that you have more areas with ungrazed grass, which can be helpful when a drought pops up, or if you're trying to build fuel for a prescribed fire.

If you're using more of a season-long continuous grazing approach, there are also some possible adjustments you might consider to create more or different habitat. Continuous grazing tends to create excellent patchiness of vegetation structure across an entire pasture (assuming an appropriate stocking rate). Normally, though, grazed and ungrazed patches tend to be in the same places year after year, which has the potential to cause problems for wildlife and plant diversity.

Anything you can do to encourage livestock to focus their grazing in different locations year to year can be helpful. That can include shifting the location of mineral feeders, turning various water sources on or off, or temporarily fencing out favorite shade/loafing areas to encourage the use of others. Prescribed fire can also be helpful if there are areas that are chronically underutilized by livestock. Burning those areas of taller grass will encourage livestock to use those areas more heavily, giving other areas a rest.

Cattle grazing can create excellent wildlife habitat and sustain diverse populations of wildflowers and grasses. There are numerous ways to do that successfully, depending upon a rancher's situation.

Regardless of what grazing strategy you're employing, the key is to recognize the wide range of habitat types that are valuable to both plants and animals. Then you can explore ways to create as many of those habitat types as possible and shift their location around the ranch from year to year. Depending upon your other priorities, and limitations of topography, infrastructure, etc., it might not be logistically feasible to create the full range of habitat possibilities. In that case, anything you can do to broaden the habitats you can make available will be helpful to wildlife on your ranch.

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