

Patch Burn Grazing

Information Sheet

What is Patch Burn Grazing?

Patch burn grazing is the application of prescribed fire and livestock grazing used to create a shifting mosaic of fire and grazing across a landscape that varies annually to increase the diversity and structure of the vegetation in a way to benefit wildlife and maintain livestock production. Patch burn grazing is basically rotational grazing without the use of fences where livestock are rotationally grazed among years rather than within years.

Patch burn grazing is a grassland management practice for landowners primarily interested in improving habitat for wildlife while still maintaining cattle production on their land. This management practice creates a mosaic of heavily grazed and lightly grazed areas that provide a diverse vegetative structure and increase plant diversity in the same grazing unit. From a livestock production perspective, reports from research in Kansas and Oklahoma are showing that patch burn grazing is producing weight gains competitive with cattle raised under traditional grazing management in the Flint Hills.

Fire and nomadic herbivores, such as bison and elk, played an important role in shaping and developing our native prairies. Historically, only a portion of a prairie would burn. Fires were either intentionally set by Native Americans or started by lightning. During the growing season, large herds of bison were attracted to the recently burned areas for the succulent new growth. Bison would continue to graze these sites until the herd depleted the vegetation in the area or moved to another part of the prairie. At the same time, nearby unburned areas remained relatively undisturbed.

The following season, last year's burned-and-grazed sites would produce a patchy stand of grasses and forbs with bare ground in between – ideal habitat for grassland wildlife. These areas were also less likely to burn than the undisturbed sites because there was little or no fuel available to carry a fire. However, the undisturbed portion of the prairie would burn, and now these freshly burned areas were what attracted bison and other herbivores. Over time, a patchwork of areas disturbed and undisturbed by fire and grazing were scattered across the prairie. This mosaic of plant structures and diverse species were attractive to all grassland wildlife.



The objective of a patch burn grazing system is to use fires to focus livestock grazing in scattered patches across a single grazing unit. The affect is a range of heavy grazing to virtually no grazing within the same unit, without the use of interior fencing. Grasslands under patch burn grazing have greater plant and animal diversity than grasslands that are just burned or grazed. A patch burn grazing unit may appear to be mismanaged and underutilized. However, this untidy appearance is precisely what provides habitat for grassland wildlife. And the system appears to also benefit forage, as livestock gains on patch burning systems are even with those on traditional systems.

With settlement, fires and large herbivores were eliminated from much of the prairie. At first, early pioneers plowed only parts of the prairie. This not only destroyed the native grassland but also prevented fires from consuming entire landscapes. Without fire, isolated prairies were soon invaded by woody vegetation and choked with litter from dead vegetation. Bison and elk were hunted to near extinction, or driven west in search of new grasslands and replaced with cattle. Eventually, cattle were confined to fenced grasslands that were continuously overgrazed each year. This led to further degradation of the remaining native grasslands. In less than a hundred years the complex relationship between fire and nomadic grazing were eliminated from the prairie landscape.

Today, no single management practice can recreate the plant diversity and structure that result when both fire and grazing are used together in a patch burn grazing system. Prescribed burning or traditional grazing systems, especially early intensive grazing systems, will produce a uniform stand of vegetation that is attractive to very few grassland species. Haying and mowing also create a homogeneous stand of vegetation that is similarly unattractive to grassland wildlife. The plant diversity and structure that historically occurred on the prairie landscape for thousands of years with fire and bison can best be reproduced with patch burn grazing that benefits livestock as well as wildlife

Why Patch Burn Graze?

Patch burn grazing is an alternative to traditional intensive grazing systems. Instead of depending on interior fencing to focus grazing in a portion of a unit, a manager instead uses post-fire regrowth to attract cattle to selected areas. Meantime, other portions of the unit remain open to grazing but are underutilized, thereby allowing plants to rest while food reserves build up.

Patch burn grazing benefits a wide range of wildlife species, particularly grassland birds, by providing a mosaic of different vegetation types. When grazing shifts to freshly burned patches, patches previously burned have an abundance of forbs such as ragweed, black-eyed susan and croton, which provide valuable food for grassland birds such as quail. Burned areas begin to return to grass dominance in the second year and by the third year, will be ready to be burned again, restarting the cycle. The method provides patches of dense nesting cover, open brooding areas, and escape habitat within the same field, improving the ability of grassland wildlife to nest and raise young. The diversity of structure and plants created through the combination of burning and grazing is not re-producible by either of these methods used alone; or by any other management practices with which we are familiar.



Livestock also benefit from a patch burn grazing system. Research in three on-going trials in Oklahoma has shown that cattle on patch burn-grazed native grasslands have

gains comparable to those cattle in the traditional intensive grazing system. The increased plant diversity may also be a plus for livestock health.

A patch burn grazing system has many advantages for the producer over a traditional grazing system. With patch burn grazing there may be no need for interior fences (once the system is established), only one water source may be necessary for the entire unit, and less time is spent maintaining the grazing unit and rotating animals. This ultimately leads to lower operating cost for the producer.

Where can Patch Burn Grazing Be Applied?

Most research has been completed on native grasslands in Oklahoma and Kansas. Currently patch burn grazing is included in the NRCS Prescribed Grazing (528) Standard and Specification. It is planned as a companion practice with the Prescribed Burning (338) Standard and Specification, which includes a prescribed burn plan, and is limited to areas of the state receiving more than 28 inches of rainfall.

Who Should Consider Patch Burn Grazing?

Patch burn grazing is not for everyone. The technique is best suited for landowners interested in improving wildlife habitat *and* producing cattle. Patch burn grazing is not for managers exceeding carrying capacity since proper stocking is essential for the desired response from the forage. It is important to understand that ungrazed forage is not wasted. It is more in a mode of stockpiling; or of restoring carbohydrates to the root reserves. Research has shown that cattle have similar average daily gains on a patch burn grazing system as those on an intensive management system. Due to a lower stocking rate, total gain per acre may be lower. Remember, with a patch burn grazing system cattle will have access to the entire unit but will primarily graze in only one-third to one-fourth of the unit. In intensive rotation systems, the entire unit will be grazed uniformly.



Patch burn grazing may require managers to reduce the number of animals where overstocking has been the norm. However, the comparable livestock gains cited on Oklahoma patch burn grazing trials were achieved with stocking rates that were the same as those on the traditional early intensive grazing areas. It is also important to note that the grazing unit should be stocked for the entire acreage... not just the portion that is patch burned. During the initial set-up of a system, a portion of the grazing units may need to be temporarily fenced off in July to ensure that there will be adequate regrowth to carry a burn the following spring.

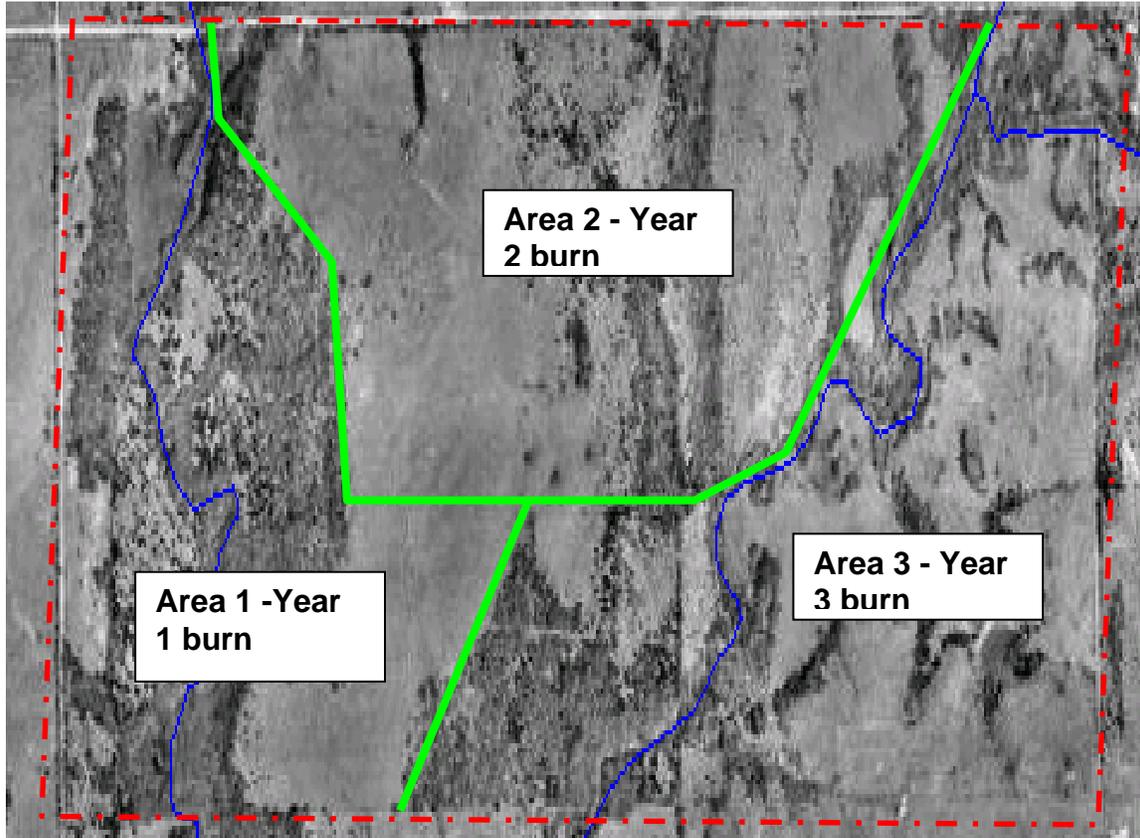
Developing a Patch Burn Grazing System

It will take a minimum of three years to complete a patch burn grazing cycle, burning one-third of the unit each year. However, wildlife and cattle will benefit the first year. Before starting the cycle, resting a portion of the unit for part of the growing season may be necessary to build-up adequate fuel loads to be burned the first year. A minimum of 30 contiguous acres to be burned might be preferred to provide ample nesting cover for grassland birds. *Before starting a patch burn grazing system, managers should evaluate their present goals and current stocking rates to determine if this type of system will work for them.* If overstocked, adequate fuel for burning may not be available and this system will not work.

Designing a Patch Burn Grazing System on Native Rangeland:

1. First, ensure proper stocking rates are in place that allow for needed fuel loads. If the grazing unit as a whole is lacking in adequate fuel, this can be a sign that stocking rate needs to be adjusted.
2. In July of each year, evaluate the current herbaceous fuel loads in the grazing unit and determine availability at time of planned prescribed burn. At least 3 - 5 inches of continuous residual plant material must be present to carry a fire at the time of the burn. If fuel will be lacking, re-evaluate stocking rate and make needed adjustments.
3. Conduct a **prescribed burn** on the excluded area of the unit in late winter to early greenup of the warm season grasses. (Usually sometime between the dates of January 1st to May 1st). Prescribed burns should be conducted at a time of the year to stimulate grass production. Consider topography, surrounding vegetation, natural and man-made firebreaks and proximity to buildings and other structures when conducting prescribed burns. ***Landowners should request an approved prescribed burn plan before conducting a burn.***
4. If currently using a continuous stocking system where livestock are not moved through multiple paddocks, livestock will remain in the burned unit at all times. Livestock will not need to be moved and forage is available to graze in other areas until greenup following the prescribed burn. At that time, grazing will shift to the recently burned area.
5. If using a multiple paddock grazing system where livestock have been traditionally rotated, livestock can be excluded from the burned area if needed until the desired time until there is adequate forage in the burned portion of the unit, generally about 6 inches or more of growth.
6. The second year, conduct a prescribed burn on another portion of the unburned area from last year. Repeat the process described above. During the second year, cattle will graze primarily in the newly burned area, while the previous year's burned area and the remaining un-burned area are only used occasionally.
7. Repeat the cycle of burning for the remaining years until each portion has been burned. Then the cycle will repeat.

EXAMPLE 1: Single grazing unit, 3 year cycle



Year 1: **Area 1** is burned. Livestock will primarily graze this unit despite having access to entire unit. Areas 2 and 3 will have some light grazing.

Year 2: **Area 2** is burned. Livestock will primarily graze in this area while Area 1 recovers from the previous years grazing. Light grazing will still occur in unburned areas. For wildlife benefit, Area 1 will provide brooding habitat and Area 3 will provide denser cover.

Year 3: **Area 3** is burned. Once again, livestock will primarily graze this area, but unburned areas will receive some light grazing. Area 2 will have some time to recover from previous years grazing and can provide some brooding habitat for wildlife. Area 1 has had two years of little use, can provide cover for wildlife and now should have adequate fuel loads to carry a fire the following year.

Year 4: Cycle repeats itself in Area 1.

Some landowners may want to implement a patch burn grazing system in a grazing unit that has previously been used in a rotation, and therefore, has existing cross fences and multiple paddocks in place. Burns will be planned which result in the one-third needed. Not all paddocks will necessarily have the same amount of area burned each year. Gates will be left open to allow livestock access between paddocks.

Other Considerations

1. Vary the boundaries of each burn unit and time of year burned to improve plant structure and diversity. Consider burning in summer or early fall to setback warm-season pastures and encourage cool-season plants and forbs.
2. To create an even patchier and diverse grazing paddock, divide each burn unit into several smaller burn units that equal no more than one-third of the total paddock.
3. Control invasive vegetation.
4. Exclude livestock or limit access to sensitive areas such as riparian corridors.
5. Have additional pastures ready in case the minimum vegetation heights within the patch burn unit are being jeopardized.

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