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## Rangeland Management: Calling on nature to sustain the future

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Most of the world's grasslands evolved with fire, whether ignited by lightning or people. For millennia, flames burned regularly though small patches and vast stretches of prairie landscapes, restoring and sustaining an enormous variety of native grassland plants. Native prairie wildlife communities – from bugs to birds to bison - relied on the mosaic of seed, sprout, stem and blade sustained by fire. Animal activity further shaped patterns of flora and fauna. Bison, pronghorn antelope, and deer nibbled, clipped, and ripped different plants at different levels, sculpting the grassland mosaic while fertilizing along the way. These natural patterns and processes created a resilient system of many moving, changing parts.

As grasslands became rangelands for livestock production, this system was dismantled. Natural patterns and processes were discarded in favor of a utilitarian paradigm which aimed to maximize livestock production. It was thought that modern goals of soil stabilization and reduction of bare soil would best be achieved by eliminating fire. Production of favored livestock forage was prioritized across vast stretches of rangeland to the detriment of the diverse community of native species. A long-term decline in native plant communities and the absence of the flames that sustained them, have been matched by decline in the rich variety of wildlife that depended on all these for survival.

### A New Paradigm:

In a recent paper in *Rangeland Ecology & Management*, Fuhlendorf and colleagues call for the return of that original system of moving, changing parts altering range science and management to protect and support the patterns and processes that sustained healthy grasslands long before the arrival of modern livestock production and rangeland management.

Fuhlendorf and colleagues make the case that future sustainability and prosperity of rangelands will require embracing a broader perspective: use the natural biodiversity and seasonal patterns and processes of grassland ecosystems as primary guiding principles. These principles hold promise at small scales to meet goals for livestock production, and at large

scales to nurture a healthy, complete variety of native plants, animals, insects, and birds.

### New Principles of Rangeland Management include:

- Large, continuous landscapes should be managed as many smaller dynamic patches—each contributing diversity to the greater landscape through large scale processes like fire and grazing.
- Although grazing 'intensity' (the quantity and density of livestock in a given area) is the primary factor affecting how grazing impacts a landscape, no single level of intensity is "right". For ecosystems that evolved with grazers, appropriate grazing intensities span a broader range than what is encouraged today.
- Utilitarian management that prioritizes a single state or use, might maximize livestock production for the short term, but lacks resilience. Shifting mosaics and variability will better support ecosystems than even-use approaches.
- Roles and contributions of all animal and plant species should be considered, as opposed to single species management approaches.
- Fire is not just a tool, but a critical component of the landscape. Skilled reintroduction of fire will be essential for sustained prosperity in the ranching profession and successful restoration of natural grassland diversity.

### What's in it for Range Managers?

Supporting a more diverse and dynamic blend of animal and plant species at small scales will support the health and stability of the landscape as whole. The conservation of pattern and process paradigm makes it possible to implement conservation and production simultaneously while remaining agile in the face of an uncertain future being shaped by climate change. Range professionals can become leaders in systems-based approaches via interagency and interdisciplinary coordination.

This dramatic shift will require a much deeper level of flexibility, planning, and monitoring sourced from a clear vision of natural design in rangeland systems. Although there are social and policy barriers to making this holistic paradigm a reality, Fuhlendorf and colleagues hope that these principles will ***“serve as a catalyst for rigorous and spirited dialogue on the...specifics of the paradigm and how to implement it on rangelands worldwide.”***

**Read more:** Fuhlendorf, S. D., D. M. Engle, R. D. Elmore, R. F. Limb, and T. G. Bidwell. 2012. Conservation of Pattern and Process: Developing an Alternative Paradigm of Rangeland Management. *Rangeland Ecology & Management*: 65:579-589.

### **We can help**

The **Great Plains Fire Science Exchange** will help landowners and managers understand the principles of rangeland biodiversity including how to implement patch burning for biodiversity. On the web at: <http://gpfirescience.org>

You also might be interested in:

***Patch Burning on Grasslands: An Alternative Approach for Rangeland Management***

[http://www.firescience.gov/projects/briefs/01-1-6-07\\_FSBrief78.pdf](http://www.firescience.gov/projects/briefs/01-1-6-07_FSBrief78.pdf)



Bison grazing in a recently burned area of the Tallgrass Prairie Preserve in Oklahoma. Photo courtesy of Stephen Winter.

For more information:  
**GPFireScience.org**