FRIENDS OF
NACHUSA
GRASSLANDS

February 2025

Dear Friends,

This issue of *A Prairie Calling* focuses on a five-year study examining the possible influence of buffalo (bison) on plant diversity. Since this was a preliminary, short-term study, a later examination might have different results. The presence of bison on the prairie/savanna has had some influence on many aspects of Nachusa Grasslands, perhaps the most notable are the numbers of people who come to see the bison!

This scientific study was one of many that are ongoing at Nachusa that you, as a Friend, help to support. If interested in learning more, you may want to attend one of the Science Symposiums held each April.

This issue will be the last one designed by Dee Hudson. She has done an exceptional job, over many years, in making *A Prairie Calling* the beautiful publication it is. She has taken a full-time position with The Nature Conservancy at Nachusa Grasslands. Thank you, Dee! We wish you the best in your new endeavor.

With warm regards from Nachusa Grasslands,

Charles Larry

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A Prairie Calling

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FRIENDS OF NACHUSA GRASSLANDS

Photo: Dee Hudson

Five Years of Bison Grazing

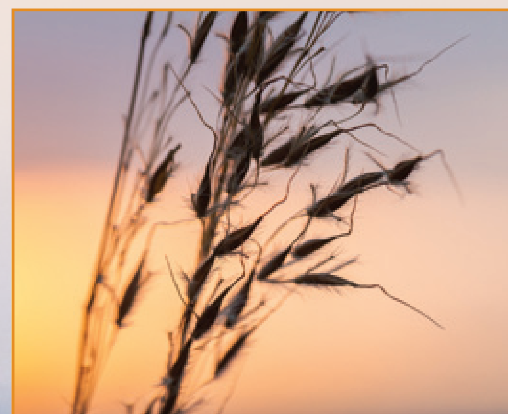
By Elizabeth Bach

Nachusa Grasslands reintroduced a herd of American buffalo (*Bison bison*) in 2014. The goal for the reintroduction was to reinstate a foundational ecological factor that shaped tallgrass prairie development in Illinois. The tallgrass prairie in Illinois assembled and evolved after glaciers receded and the climate warmed 8,000-10,000 years ago. Indigenous people were already in the region, actively hunting and using tools such as fire to live with nature. Over thousands of years, Indigenous management, regular fire, and grazing herbivores shaped the plant and animal communities of the tallgrass prairie. As Europeans displaced Indigenous communities in the 19th century, buffalo were aggressively extirpated from the state and land was actively converted to row-crop agriculture.

Bison photo: Charles Larry

Where the Buffalo Roam Once More

Restoration efforts at Nachusa Grasslands have brought back highly diverse tallgrass prairie and savanna habitat through active planting, aggressive invasive species management, and regular prescribed fire. Buffalo grazing is a factor that is best suited for large areas of habitat, as buffalo are a herd animal with intricate social dynamics. By the 2010s, Nachusa Grasslands had reached a size where it was feasible to reintroduce this long-missing ecological factor. Previous research in other areas showed that buffalo preferentially graze on warm season grasses like big bluestem and Indian grass and can promote plant community diversity by shifting competitive dynamics among plant species.



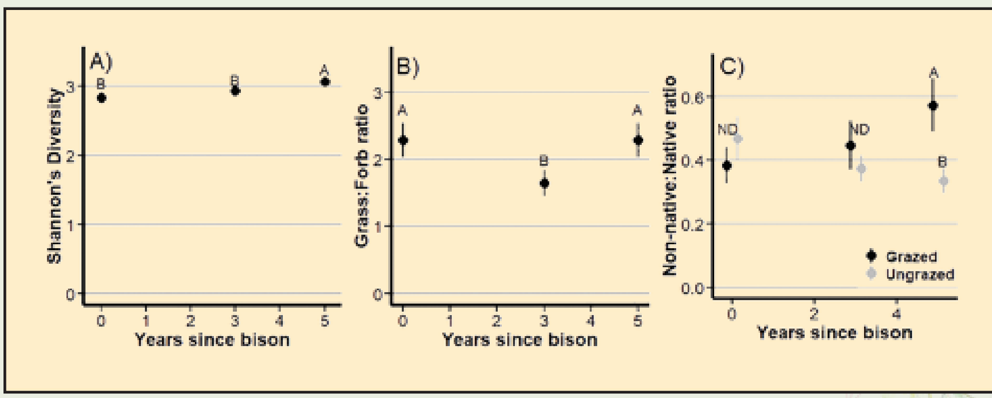
Counter clockwise: Susan Kleiman planting; Jim Patapack manages weeds; Indian grass; Big bluestem grass; Controlled burn background. Photos: Dee Hudson

Bison exclosure. Photo: Dee Hudson

Graze-free Zone

We knew it was important to monitor and study the ecosystem response to buffalo reintroduction, especially as Illinois prairies differ in some notable ways from prairies further west. Before buffalo arrived at Nachusa Grasslands, staff constructed twenty-two fenced “exclosures.” These areas prevent bison from grazing inside the fenced area. There are paired vegetation monitoring plots outside the fence where bison have free access to graze. Baseline plant community data was collected in the year before bison were reintroduced, allowing us to monitor the plant community response to bison grazing, accounting for other natural changes happening over time.

Latest Findings



Jenn Chakravorty. Photo: Dee Hudson

In December, we published the results from the first five years of plant community monitoring in these plots. The collaborative research team included graduate student Jenn Chakravorty and advisor Dr. John Harrington at University of Wisconsin-Madison in addition to Nachusa Grassland research scientist Dr. Elizabeth Bach. We found no differences in plant community diversity, composition, non-native:native species ratio, or visual obstruction readings between grazed and ungrazed plots. We did find an interaction where savanna plots had greater relative abundance of grass in grazed plots.

We observed variation in plant community structure and diversity across the habitat types represented at Nachusa Grasslands: new prairie plantings, old prairie plantings, native (unplowed) prairie, and savanna. Older plantings and native prairie had lower non-native:native plant ratio, higher grass:forb ratio, and slightly lower

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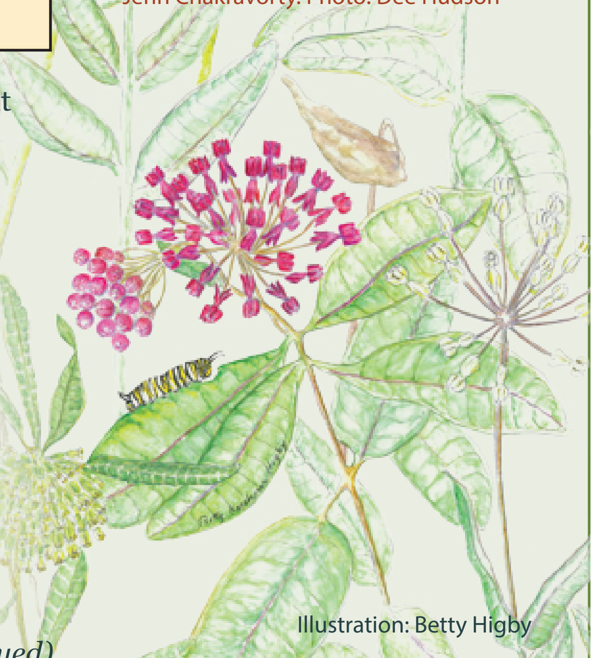

Illustration: Betty Higby

100%
Recycled

Bison photo: Charles Larry

Shannon's diversity compared with newer plantings and savannas. These plant community metrics exhibited some shifts across the five years of monitoring, and these shifts were consistent in grazed and ungrazed plots. The one exception is observed greater non-native:native ratio in grazed plots in year five.

The main take-home message from evaluating these data is that bison grazing at Nachusa Grasslands has not changed plant community diversity or structure in the first five years. However, research from other teams has shown important responses from animal communities to grazing, including increases in ground and dung beetles and changes in small mammal foraging behavior. Recently, Tony Del Valle published a study showing that bison grazing can accelerate the rate at which grassland birds like the Henslow's sparrow reinhabit areas after prescribed fire. We continue to monitor plant and animal community responses to grazing across the preserve.

Dung beetle
Photo: Dee Hudson

Read the research! This work is published open access in the *Natural Areas Journal*. Anyone can freely access it:

Chakravorty, J., Harrington, J. A., & Bach, E. M. (2024). Bison Grazing in Eastern Tallgrass Prairie Does Not Alter Plant Diversity after Five Years. *Natural Areas Journal, 44*(4), 215–222. https://doi.org/10.3375/2162-4399-44.4.215.

Photo: Dee Hudson

Dr. Elizabeth Bach

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