

MANAGEMENT OF NEBRASKA SANDHILLS WET MEADOWS: IMPACTS ON SOIL HEALTH AND BIOTIC COMMUNITIES

Researchers.

Dr. Craig Davis, Oklahoma State University
Dr. Sam Fuhlendorf, Oklahoma State University
Dr. Carter Kruse, Turner Institute of Ecoagriculture
Gerry Steinauer, Nebraska Game and Parks
Commission

Graduate student.

Nathan Moore, MS candidate

Rationale. The Nebraska Sandhills is considered the largest grass-stabilized dune system in the Western Hemisphere. A unique feature of these grasslands is the variety of wetland systems (e.g., depressions, shallow lakes, fens, and wet meadows) interspersed throughout valley bottoms between dune formations. Although these wetlands occupy approximately 10% of the land area in the Sandhills, they are critical resources that provide important ecosystem services such as flood attenuation, groundwater recharge and discharge, water filtration and storage, carbon storage, forage production for livestock, and habitat for a wide diversity of plant and animal species. Since the early 1900's, estimated wetland losses in the Sandhills have been as much as 46%, with most losses attributed to draining by surface ditches. Ditching disrupts the natural hydrology of wet meadows and can have significant impacts to the ecological integrity of wet meadows by facilitating the invasion of non-native plants, shifting the plant community composition, and increasing decomposition rates of organic matter. The Institute is interested in restoring wet meadow systems where practicable. Wet meadow restorations typically involve restoring the hydrology (i.e., re-connecting the groundwater to the hydrological cycle of wet meadows) by ditch-filling and re-establishing historic surface flow patterns, but these types of restorations can be challenging because of limited baseline data on the influence of hydrology on wet meadow plant communities, soils, and nutrient storage and cycling. Further, the role that current and past land-use (e.g., different grazing systems, prescribed fire, haying, and no disturbance) practices play in influencing vegetation communities, soil structure, and nutrient storage and cycling in wet meadows is also not well understood. Without a clearer understanding of these relationships, it is difficult to assess the condition of wet meadow restorations as well as set achievable targets for successful wet meadow restorations and guide future management and restoration strategies for wet meadows.



Species:

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Researcher: Davis, Fuhlendorf, Kruse, Steinauer, Moore

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