

Influence of Management Practices on Plant Diversity in Conservation Reserve Program Grasslands

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The Conservation Reserve Program (CRP) is the largest land restoration program in the United States, with over 23 million acres enrolled across the contiguous 48 states as of 2022. However, ecological studies of CRP lands have shown that the program does not provision biodiversity, acre-to-acre, as well as other restored grasslands and remnant prairies.

This study aims to identify the effects of restoration practices and site characteristics on biodiversity-related outcomes. The ultimate goal is to identify practicable opportunities for the Farm Service Agency and participating landowners to improve biodiversity outcomes on CRP-enrolled lands.

We sampled plant species composition and richness on 10 CRP-enrolled sites and 5 reference sites across western Minnesota and eastern North Dakota to characterize plant communities established by high- vs. low-diversity CRP practices (seed mixes) and compare these outcomes to nearby reference prairies. We worked with county Farm Service Agency offices to compile seed mixes and management history for each participating site and conducted interviews with landowners to tabulate year-to-year land management activities that were not officially reported. We applied statistical models to explain trends in biodiversity outcomes based on seed-mix diversity and management practices, while accounting for topographic heterogeneity and hydric soils as key underlying environmental factors.

We found that frequency of active management (including mowing, grazing, and fire) was positively correlated with multiple metrics of biodiversity, highlighting the importance of regular disturbance for maintaining plant diversity in grasslands. We also found that sites seeded with higher forb:grass mixes tended to have higher native forb: grass composition in the established vegetation. However, sites seeded with higher forb:grass mixes also tended to have higher relative abundance of non-native grasses, suggesting a tradeoff between establishment of native forbs vs. suppression of non-native grasses.

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