

Wet Meadows in the Central Platte River Valley

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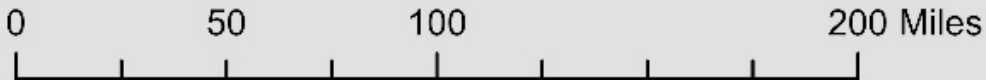
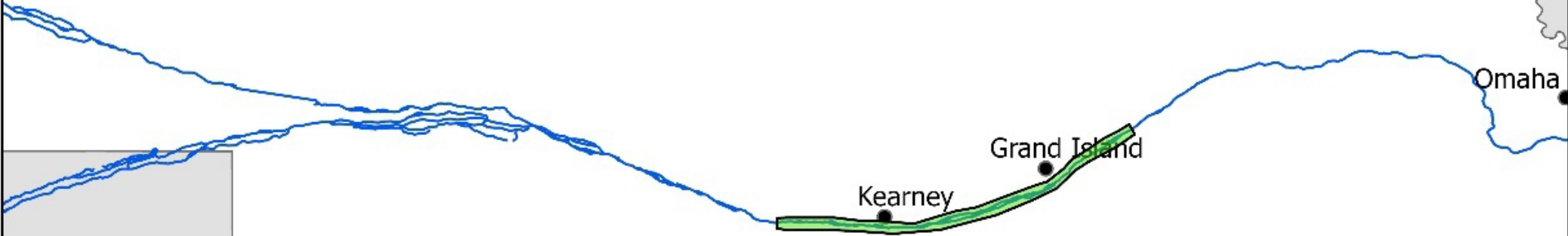
What are Wet Meadows?





Ecosystem Services of Wet Meadows

Study Area



Methods



Data Collection

- Soil moisture, depth to water
- Soil samples sent to Soil testing lab for: organic matter, total nutrients, NH_4 , texture
- Vegetative community data
 - FQI
 - WIS
- Platte River Flows



Discussion- Remnant Wet Meadows

- Greatest flows in the last 2 decades have been the result of 4 natural floods
- My results suggest that high flow events have helped maintain or even improve wet meadow condition
 - Increased biomass of invertebrates
 - Improved vegetative community quality (Caven and Weise 2022)
 - Greater channel widths and lowland grassland coverage (Caven et al. 2019)
- Low likelihood of replicating these natural high flows

Restoration

- Restoration - wet meadows that have been maintained or returned to a more natural state through tree removal, reseeding, and/or excavation



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- Reconstruction- efforts to reestablish native wet meadow plant communities within former agricultural fields that have generally been land-leveled, regularly tilled, and intensively farmed for significant periods of time
- Rehabilitation- have not been historically tilled but, as a result of incompatible land management practices, have transitioned to an undesired and alternative stable state

Discussion- Restored Wet Meadows

- Key differences in abiotic features
 - Recovery can take 30-40 years or greater
- Rehabilitated and Reconstructed sites show significantly different trajectories in terms of their vegetative community recovery
- Hydrology remains a key focus for wet meadow recovery

What does this mean?

- Management for wet meadows should focus on maintaining and improving Platte River flows
 - Hydrologic focus
- The “target” of the restoration should be considered when selecting sites to restore
 - East-West gradient

What does this mean?

- Actions that could improve remnant and restored wet meadow quality
 - Sedimentation enhancing strategies- sediment bypass systems for dams and diversions, sediment release
 - Modifications to restoration techniques- grading out of lower elevations, increased topographic variation, pumping water
 - Increased Spring pulses (unlikely)