

# Sandhills wet meadows – a botanist's perspective

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Alkaline

- Presettlement wet meadows
- Factors impacting the meadow flora

Ditching

Seeding on non-native  
plants

Annual haying

- Present and Future Condition of  
the Meadows
- What can we do to maintain  
meadow plant diversity

Photo by Ethan Freese



Freshwater



# My background



Fair share of Nerdy botanist stuff



Have worked with a fair number of ranchers





Native prairie pastures

Lease grazing to neighbors,  
Managed for income, wildflowers  
and pheasants

Manage wife's family farm near Wagner, SD



# Presettlement Wet Meadows

- Wild, Marshy, Wet, Brushy, Diverse Communities, not suitable for haying!









# What was the vegetation like?

- We probably don't know what the meadows were like.
- Missouri River Iris Bogs
- Berg Sister Prairie in Otoe County
- Timber Hill Oak Savana near Leona, Iowa





# Historic flora





# Wet meadows



Spikerushes



Sedges



Rushes

S



Many of the rare plant species were likely common

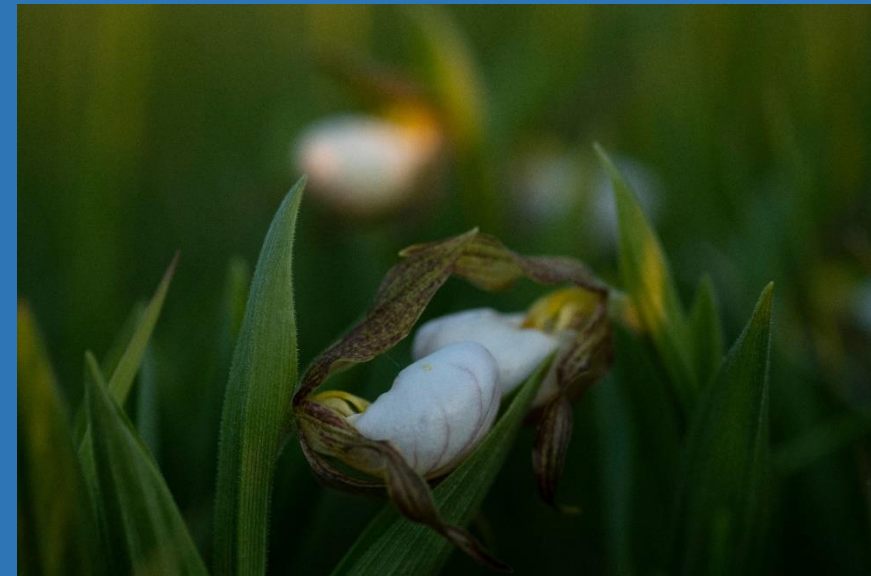


Cottongrass



Mud sedge

White lady's-slipper orchid





# Factors Impacting Meadow Flora

- Ditching
- Seeding and spread of non-native plants
- Haying
- Grazing, not covered



# A Minnechaduza Meadow ditching history –

## As told by Tom Hoffman in 1992

- First straightened and channeled around 1910 with a Martin ditcher – capstan winch, long cable, connected to V-shaped plow, horses turned the winch.
- After WWII Tom used a dragline pulled by a army surplus half-track.
- 1960s, 800 pounds of dynamite to blow 800 yards of laterals,
- 1974 dragline operators cleaned out old ditches,
- 100s of acres of willows cut with bulldozers and hydraulic rotary cutters, then soils rototilled until smooth and then seeded with exotic grasses and legumes.





# Impacts of ditching

- Reduced surface & ground water levels.
- Lose of soil organic matter??  
Wetlands.
- Lose of wetlands and humidity?



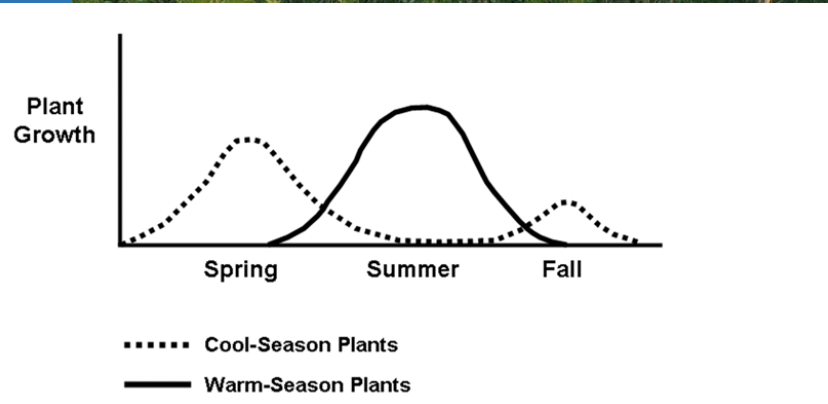
haying.





# Along with haying came the introduction of non-native cool-season grasses

- Smooth brome introduced as early as the 1890s. Species was bred up to a super brome by UNL after the Dust Bowl.
- Reed canary grass came later, was promoted the Soil Conservation Service
- Redtop, Kentucky bluegrass, Timothy, Intermediate wheatgrass, clovers





# Reed Canary Grass - “some mistakes are forever.” *anonymous botanist*





# Garrison Creeping Foxtail – the new kid on the block.

- The problems with the non-natives, they do not stay where they are planted, will move onto your neighbors land.
- Story of Garrison on the Platte
- What if your neighbor does not want these grasses, should you still plant them?





# Another invasive exotic - narrow-leaf cattail (and cattail hybrids)





# Native and non-native cattails – how to tell them apart



Non-native narrow-leaved cattail



Native broad-leaved cattail

# Impact of non-native grasses - loss of diverse native forage base



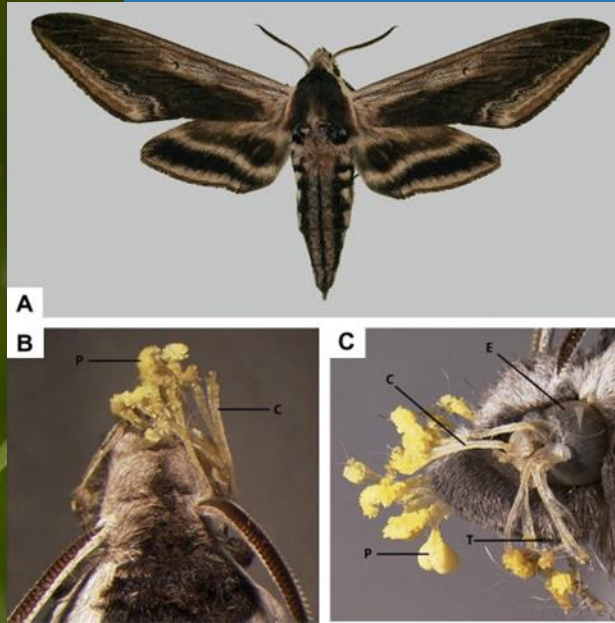
Warm- season grasses



Nebraska Sedge



# The story of the western prairie fringed orchid





# Worst case future scenario?



Reed canary and narrow-leaf cattail win the battle for meadows and marshes, while warmer and wetter springs resulting from climate change allow smooth brome and Kentucky bluegrass to spread over the dunes.



We will never get rid of the non-natives, But there  
is hope for the  
poor, depressed botanist





# A change of management can shift the vegetation – a southeast South Dakota tallgrass example,



Then



Now



There are still a some diverse, native meadows out there.

- This one managed with grazing at different intensities and timing each year, and now also with prescribed fire.



The rancher's motto – “We try to work with Nature, not against it.”

# Ranchers and ecologists need to work together



Financial incentives to change meadow management for climate change, pollinators and bio-diversity in general.



# The hydrology of a few wet meadows are being restored.



- Gordon Creeks down-cut channel was restored by a diverse group of conservation partners and ranchers.
- The project was not cheap.

The End



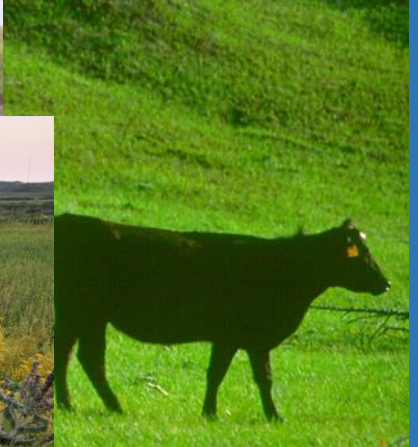




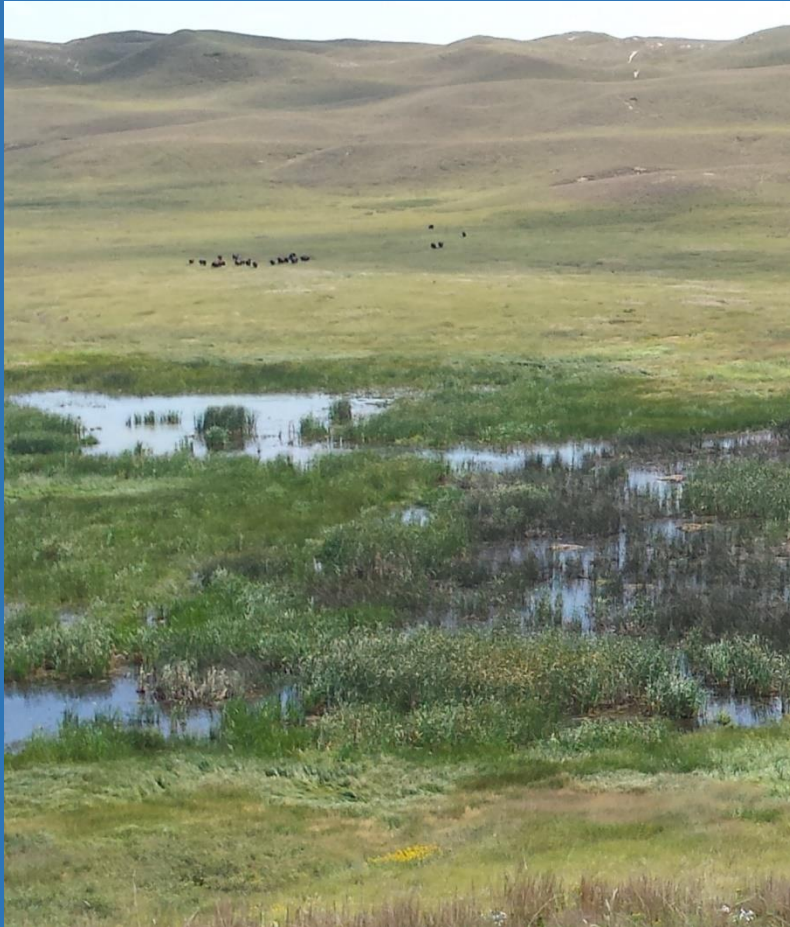
# What is the Future

- Reed Canary Grass
- Alkaloids and stemmy by mid season
- Show turner photo of un eaten reed canary, carter in dense stand

















# Palmer amaranth





# Sandhills Freshwater Lake/Marsh/Wet Meadow





# Impacts of water quality on Sandhills these species



Mule Lake (Valentine NWR)



West Long Lake (Valentine NWR)



# Narrow-leaf cattail (and hybrids)

- a non-native invader of Sandhills marshes





# Other rare meadow plants







# Work with Nature on wet meadow management rather than against it.

- My fear is that ranchers will paint themselves into a corner with exotic species and present management.
- With climate change will want to maintain a diverse forage base
- Likely will be government program to subsidize ranchers to help conserve biodiversity within their ranching systems.
- Keep water in the Sandhills.  
Swinehart. Show blowout photo  
Critical turning point on veg cover. on getting dunes to blow.

# Natural Disturbance in Sandhill Wetlands





# Settlement brought changes to wet meadow disturbance pattern





# Sandhill fens







Peat Mounds





# Sandhill fen rare disjunct plants



Marsh marigold



Bog bean



Narrow cottongrass



cottongrass



