

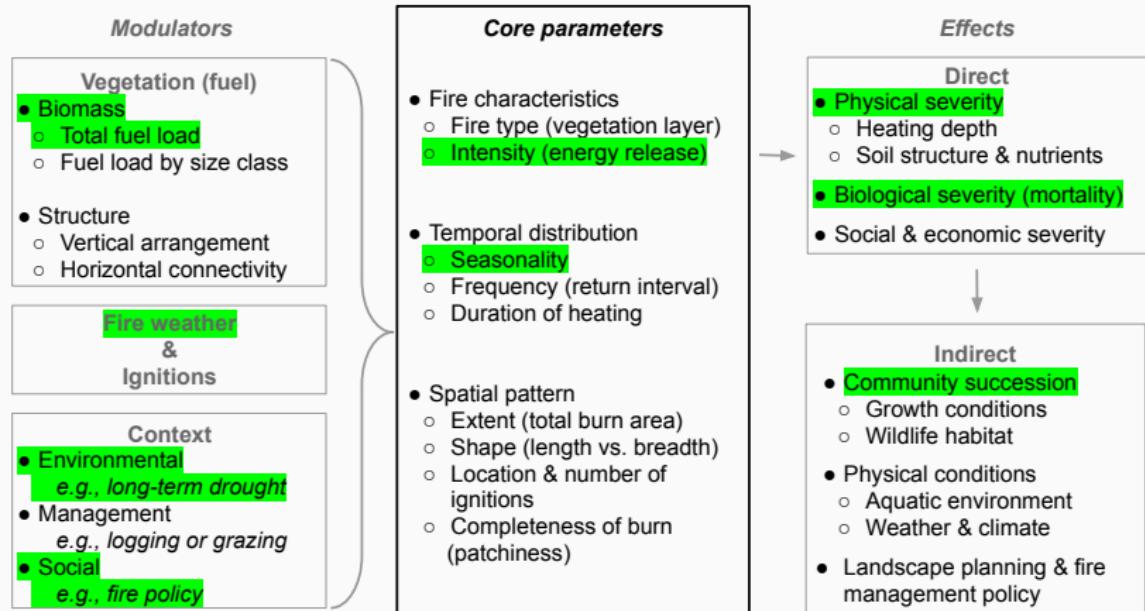
Barriers to a summer fire regime in northern prairies

Ecological, physical, and social

Devan Allen McGranahan

Research Rangeland Management Scientist—Ecologist
USDA Agricultural Research Service
Miles City, Montana

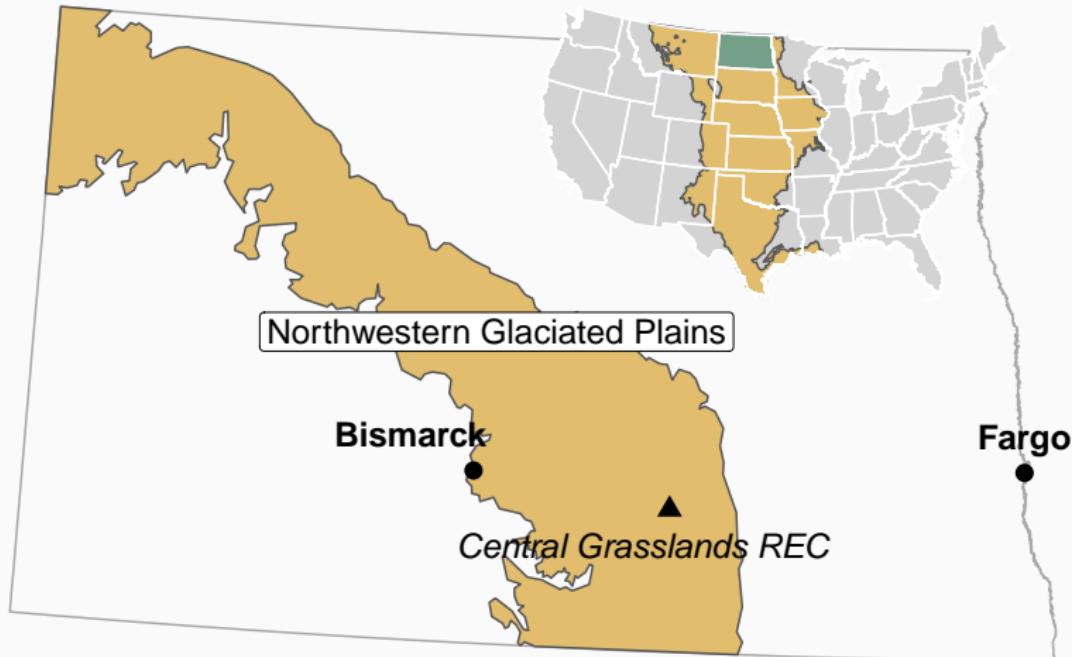
The Western fire regime concept



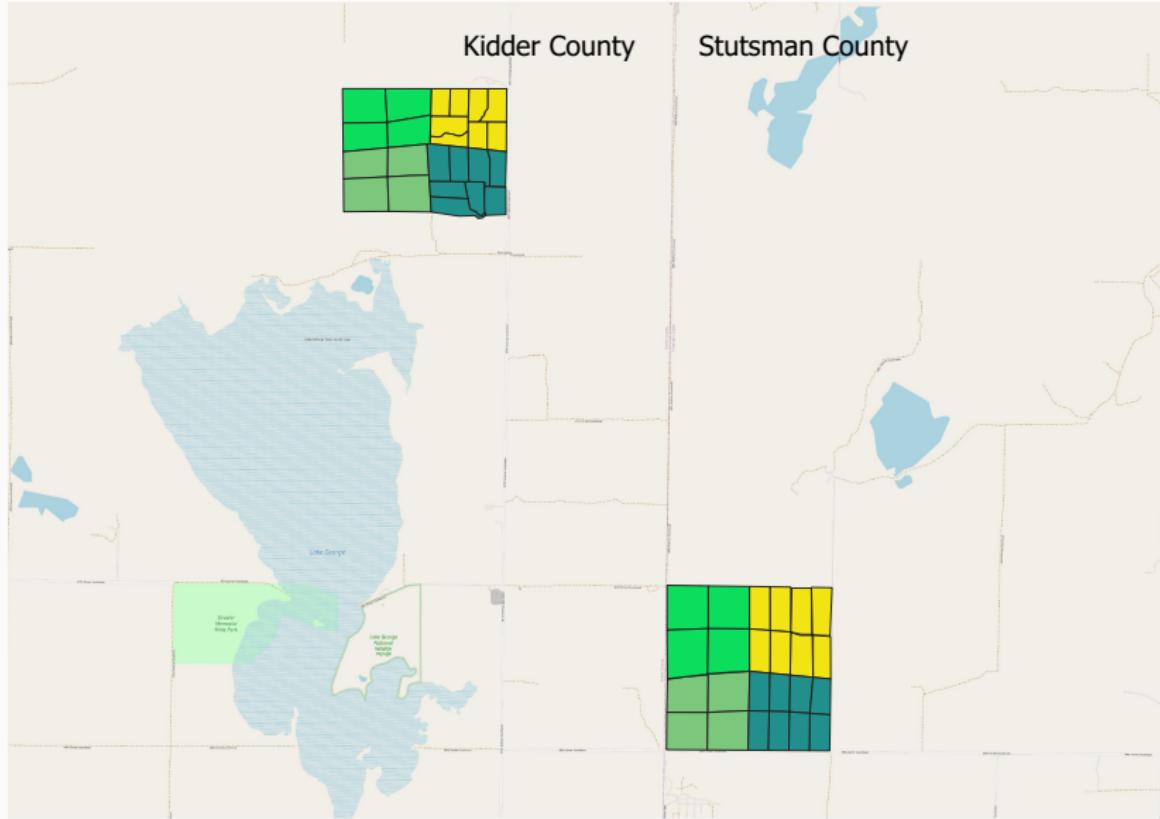
The Western fire regime concept

	Prior to burn	During burn
Biophysical	<ul style="list-style-type: none">● Rainfall/drought<ul style="list-style-type: none">○ Soil moisture○ fuel moisture● Meteorology <i>Regional humidity trends</i>	<ul style="list-style-type: none">● Meteorology<ul style="list-style-type: none">○ Fire weather○ Lightning● Plant composition<ul style="list-style-type: none">○ Flammability○ Connectivity
Social	<ul style="list-style-type: none">● Management<ul style="list-style-type: none">○ Harvesting○ Fuel reductions● Fire use policies● Anthropogenic ignitions	<ul style="list-style-type: none">● Fire suppression policies<ul style="list-style-type: none">○ Wildland fire use <i>Rx fire, let-it-burn</i>○ Defense priorities

Rx fire in the Northern Great Plains



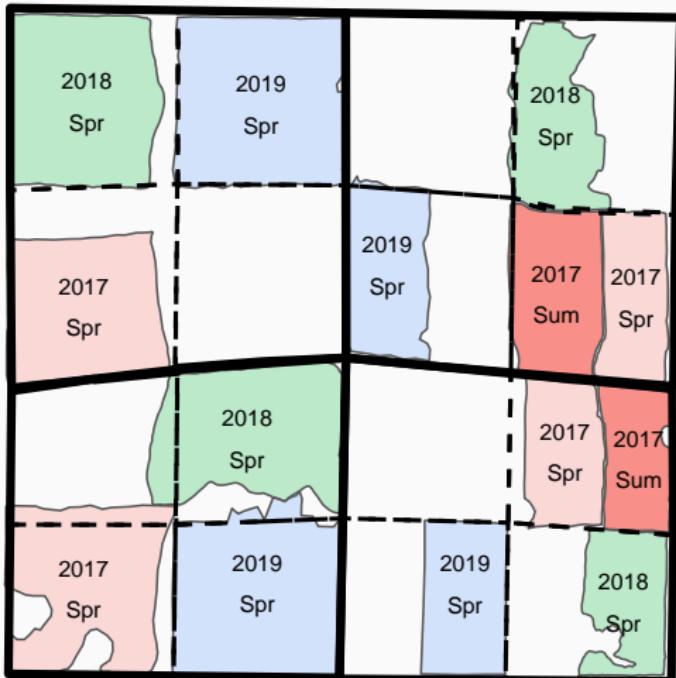
Rx fire in the Northern Great Plains



Burns visible from space



Spotty success in completing summer burns



2019 burn map for southern study block

A tale of two fires

What a difference a few days makes!



5 May 2018

Weather

Fuels

Date

Wind

RH

16 May 2018

Yes

Barriers to summer Rx fire

All opportunities and limitations fit within fire regime concept

- Biophysical

mostly, too wet

- High live moisture fuel content (*photosynthesis*)
- High dead moisture fuel content (*humidity*)
- Poor convection/smoke dispersal (*humidity*)

- Social

mostly, too dry

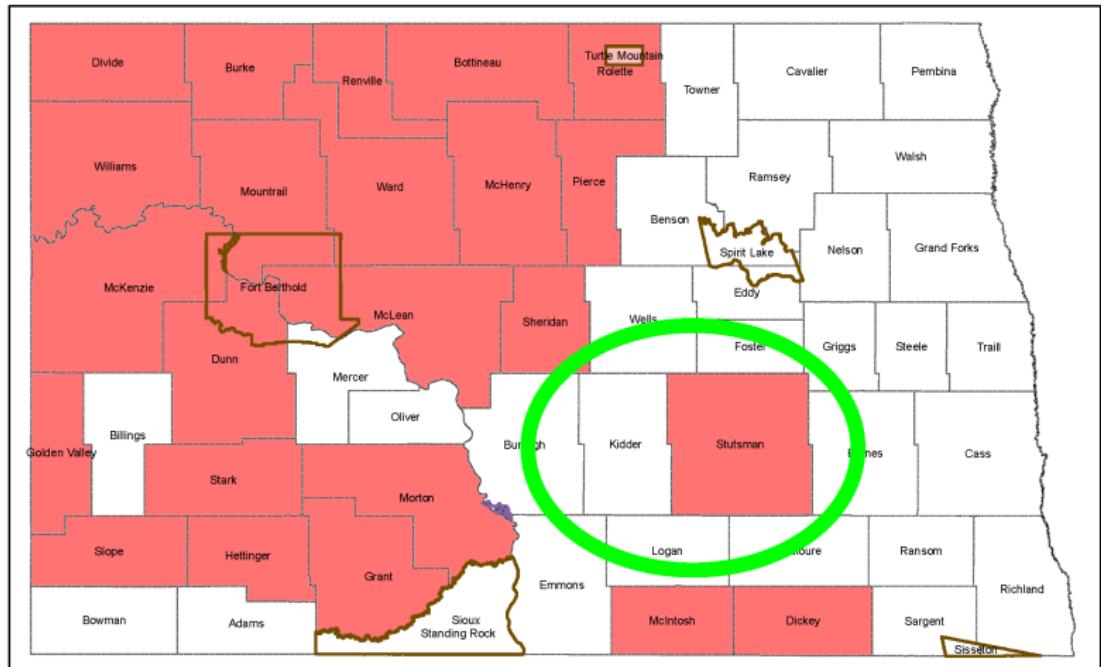
- Local burn restrictions
- Control issues

Biophysical barriers

Social barriers

County-level burn restrictions

Fire Declarations and Burn Restrictions



0 25 50 100 Miles

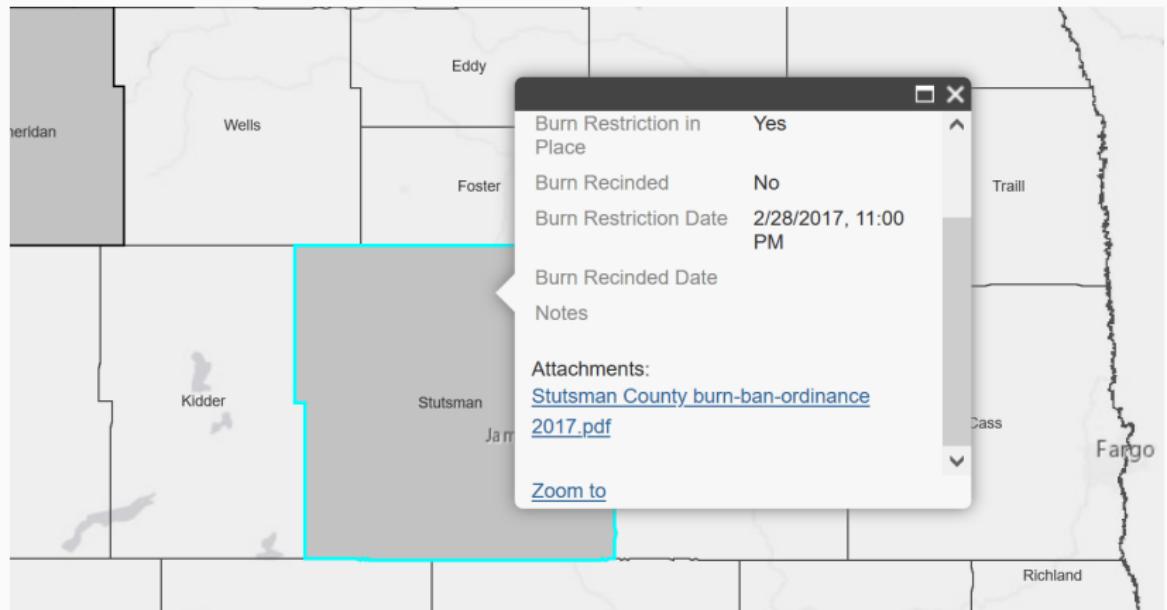


Legend

- Oahe WMA Burn Restriction
- County / Tribal Burn Restriction

State declarations include all counties and tribal nations within the state regardless if there are existing local/tribal declaration in place or not. Local/tribal restrictions may be more restrictive, but not less restrictive than the state.

County-level burn restrictions



Tying burn restrictions to real-time conditions

STUTSMAN COUNTY ORDINANCE 2017-01
PROHIBITIONS ON OPEN BURNING DURING A RED FLAG WARNING OR
WHILE THE STUTSMAN COUNTY FIRE DANGER RATING IS VERY HIGH OR
EXTREME – PENALTY

1. **Definitions**

- A. "Fire danger rating" is the risk categorization for open burning that Stutsman County publishes on the county's web site. The categories are low, moderate, high, very high, and extreme.

Fire, grazing, and the pre-European landscape

Pyric herbivory

- Recent burns have high-quality forage
- Grazers focus on burned areas
- Vegetation grows up in other areas...
 - providing habitat
 - fueling future fires

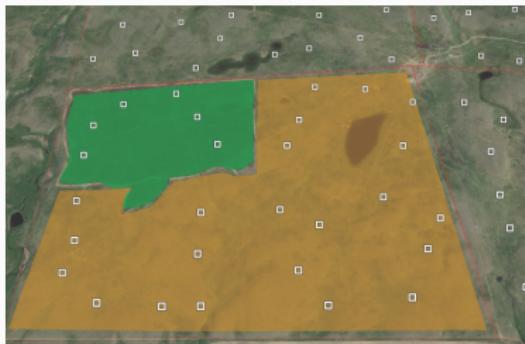


Disturbance-driven vs. inherent heterogeneity



Testing PBG 2.0 in the Northern Great Plains

- Streeter (Central Grasslands)
 - **Compares grazing systems**
 - 4 pastures x 3 systems; cattle
 - *Poa pratensis*-invaded mixed-grass prairie
 - 46 cm (18") annual rainfall
- Hettinger
 - **Compares cattle & sheep**
 - 3 x cattle, 3 x sheep PBG
 - Mostly non-native, cool-season grasses
 - post-CRP pasture stands
 - 40 cm (16") annual rainfall



Mopping up

Prescribed fire has direct benefits to livestock production

- Livestock focus grazing in recently-burned patches
- Burned areas have better forage
- Fire has positive or neutral effects on soil
- Patch-burning enhances conservation outcomes, too



Thank you!

Any questions before you all run away?

