Importance of species diversity in the revegetation of Alberta's northern fescue prairies.

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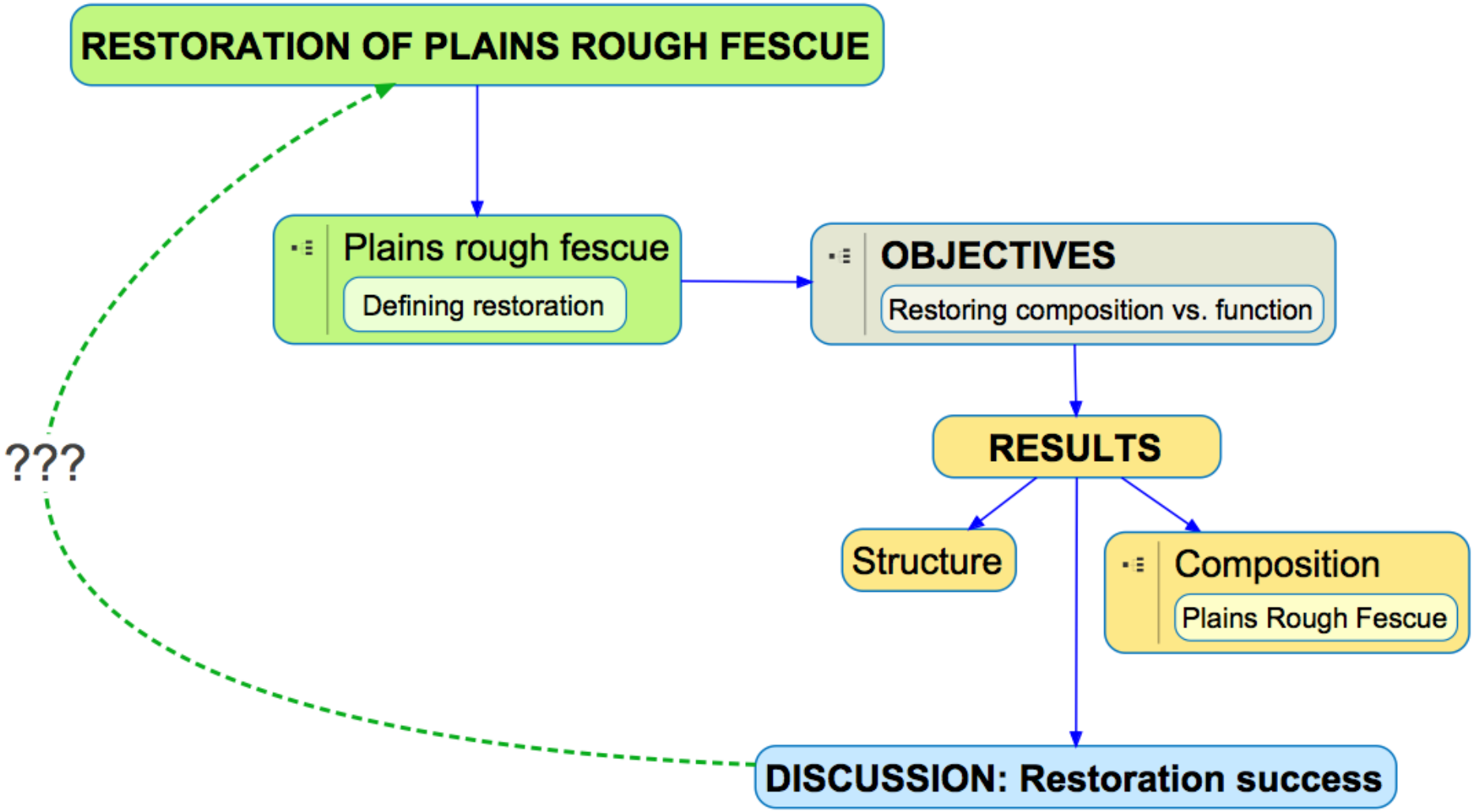


Woosaree, J.& Otfinowski, R. Biodivers Conserv (2017). https://doi.org/10.1007/s10531-017-1456-z

PLAINS ROUGH FESCUE PRAIRIE

http://pubs.usgs.gov/pp/p1650-e/wwf_maps.html

Plains rough fescue is the dominant native grass of **Aspen Parkland ecoregion:**

- transition zone along north & northwest fringes of mixed grass prairie

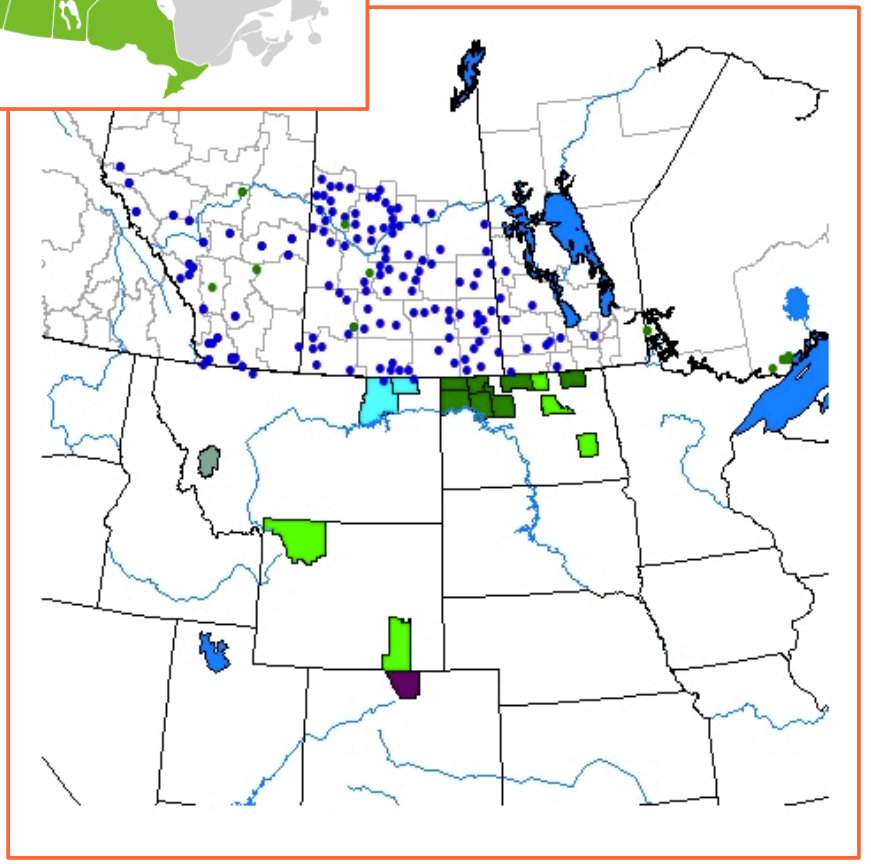
PLAINS ROUGH FESCUE

Festuca hallii (Vasey) Piper
plains rough fescue

Denver Botanic Gardens (*http://swbiodiversity.org*)

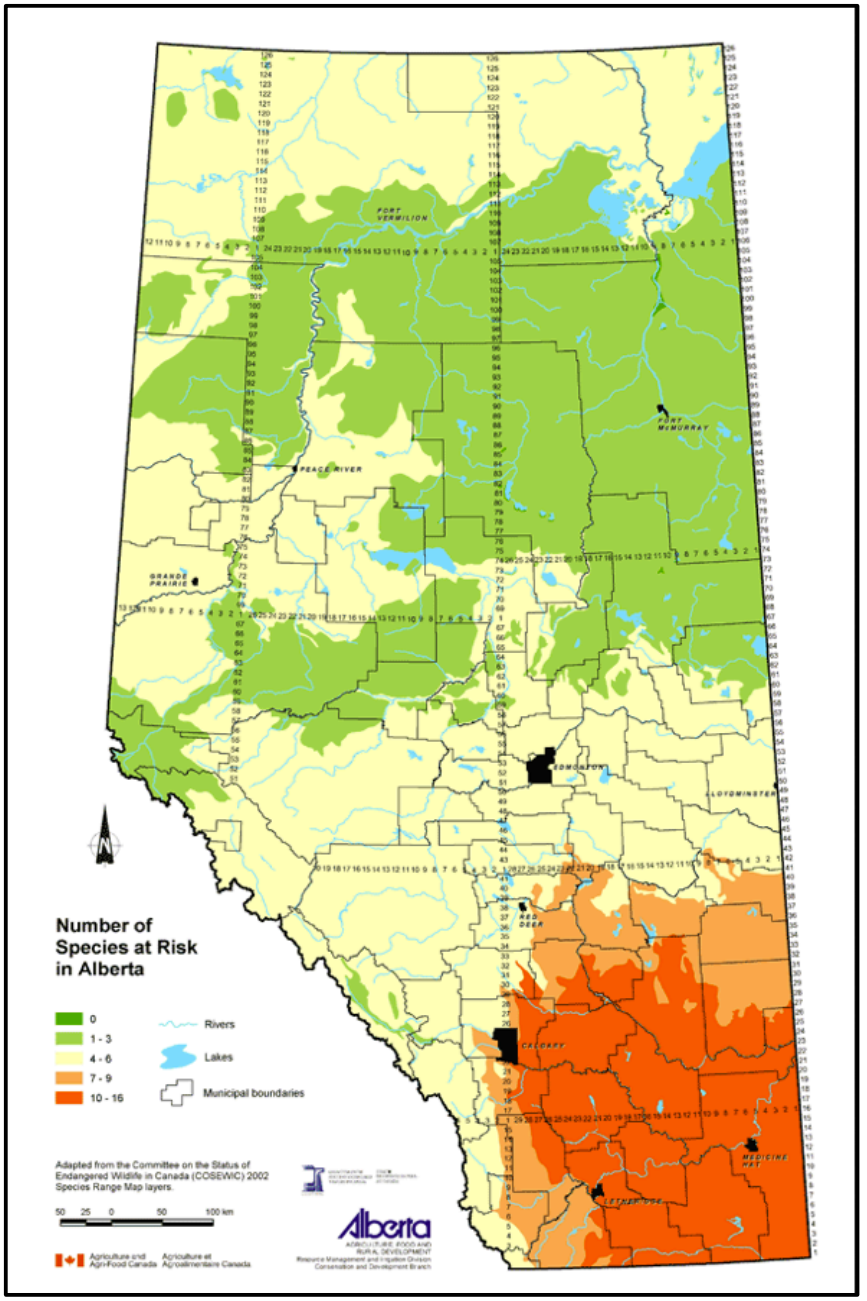
http://data.canadensys.net/vascan/

STATE FLORAS & REPORTS



http://herbarium.usu.edu/webmanual

CONSERVATION OF FESCUE PRAIRIE



90% of Plains rough fescue grasslands have been modified by livestock grazing and haying (Trottier 1986)

SPECIES AT RISK IN GRASSLANDS

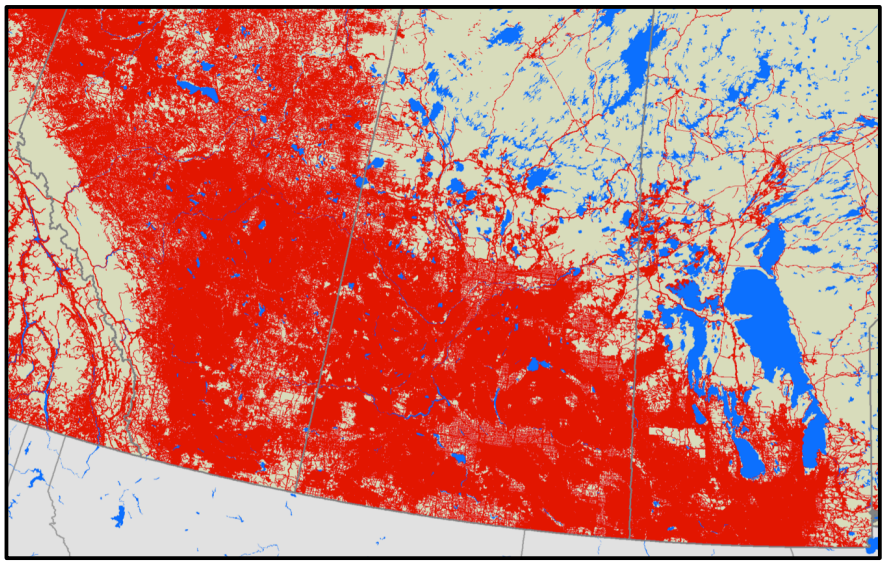
- 77% (24/31) of species at risk in AB
- 83% (25/30) of species at risk in SK
- 50% of the ecological communities found in grasslands

(Alberta Environmental Protection 1997)

RESTORATION OF FESCUE PRAIRIE

***RECLAMATION* of "tame" grasslands (e.g. hay fields, pastures)**

- smooth brome
- Alfalfa
- crested wheatgrass
- Kentucky bluegrass
- Canada bluegrass
- Timothy



Human access to landscapes
(Global Forest Watch 2010)

RECLAMATION* of native grasslands

- Desirable species > 50% of reference area.
- Desirable species must be native to subregion.
- Native species do not include weedy species.

*wellsites abandoned or reclaimed > 2010
(Government of Alberta 2011)

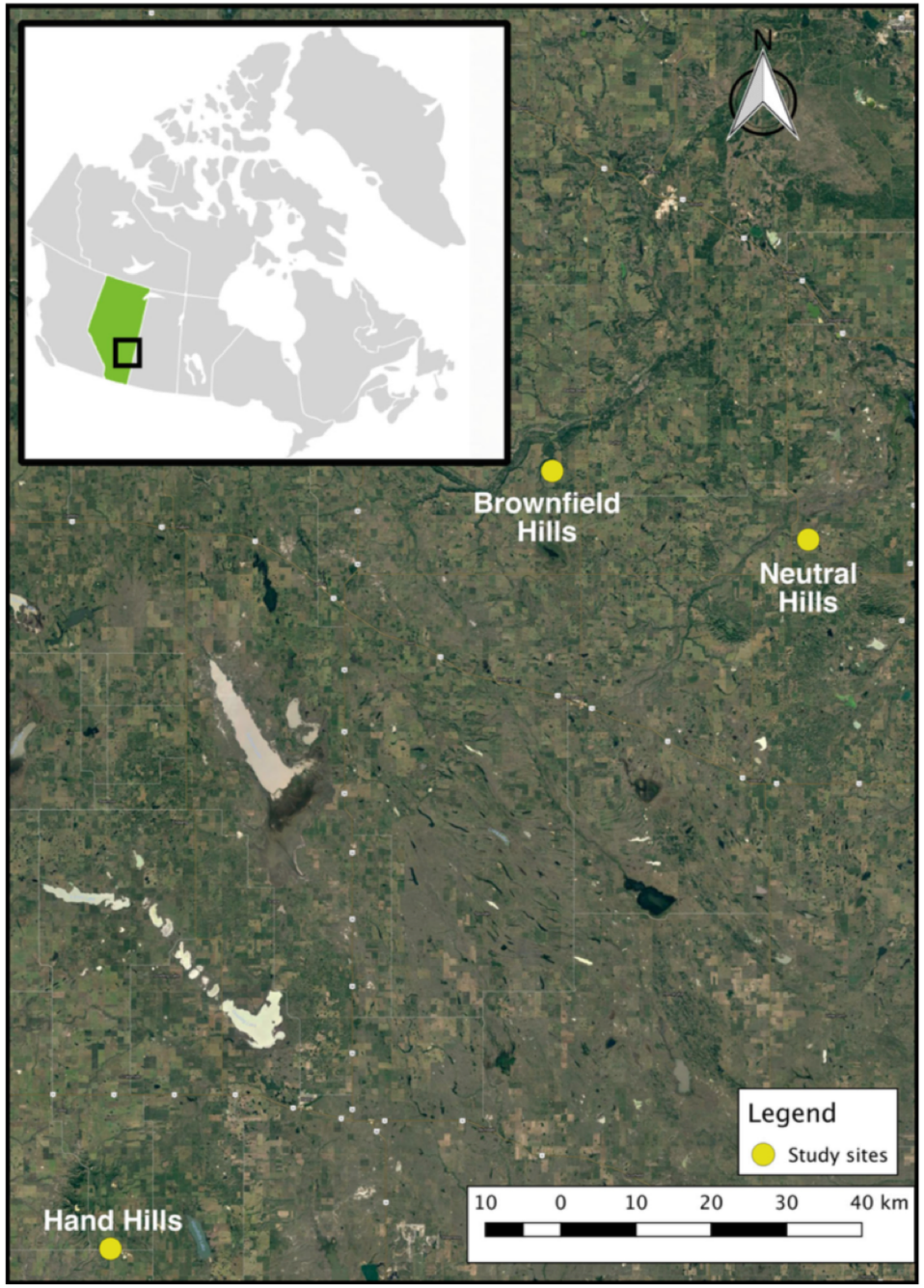
OBJECTIVES & HYPOTHESES

1. **Evaluate** long-term revegetation of abandoned wellsites in areas of northern fescue prairie.
2. **Compare** methods of revegetating wellsites using mixes of species and species diversity.

3. **Test** hypothesis that species-rich seeding mixes improve the structure, diversity, and composition of revegetated communities.

METHODS

Evaluate the revegetation of three **wellsites*** in east-central Alberta.



SEEDING MIXES

600 Pure Live Seed (PLS)/m^2 (12-18 kg/ha)

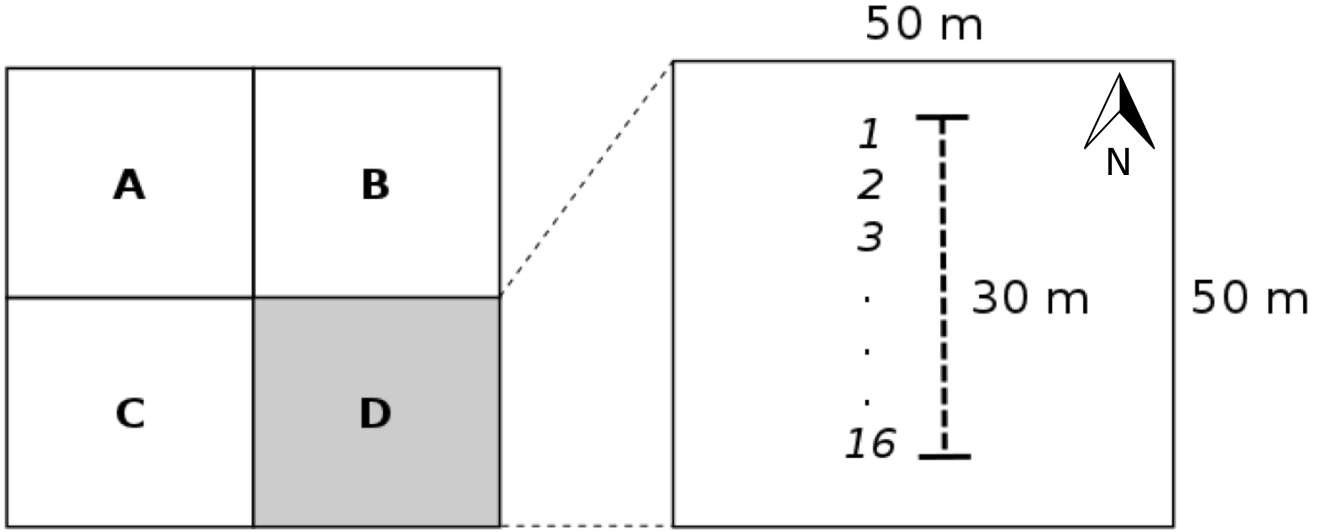
TREATMENT	DESCRIPTION
Reclamation mix	2 species
Diverse mix	15 species
Simple mix	5 dominant species
Natural recovery	Unseeded (succession)
Reference	Undisturbed

*small areas (~1ha), contain ≥ oil or gas well.

METHODS

TREATMENTS

- Reclamation mix (2 spp.)
- Simple mix (5 spp.)
- Diverse mix (18 spp.)
- Natural recovery
- Reference



VARIABLES (1997-2000, 2004, 2007-2008)

<u>Structure</u>

- Vegetative cover
- Plant litter
- Bare ground

<u>Composition</u>

- Weed cover
- Bryophyte cover
- Plains rough fescue

Daubenmire frame (20 x 50 cm, 0.1 m^2)

DISCUSSION: Restoration success?

Disturbed northern fescue prairies are able to recover their structural elements, including vegetative and ground cover and plant litter, irrespective of the species richness of seeding treatments

- Need to seed to reduce the proliferation of weeds.
- No recovery of Plains rough fescue without seeding.
- No advantage of diverse seed mix for vegetative cover or litter.
- No reclaimed community similar to reference area after five years...

DISCUSSION: Restoration success?

CHALLENGES

- Many species characteristic of fescue prairies are unavailable commercially.
- Species with high levels of seed dormancy.
- Scale of disturbances puts pressure on supply of native seed.

SIGNIFICANCE

1. Success with restoration of structural elements of northern fescue prairies
2. Differences in species composition of disturbed and undisturbed prairies illustrate that all efforts should be practiced to minimize the scale of disturbance of northern fescue prairies resulting from energy development.

THANK YOU!

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