

Cheatgrass (*Bromus tectorum*) Management for High Diversity Dry Prairies in Minnesota

2010 MN WI Invasive Species Conference



Wiley Buck, Great River Greening

&

Karen Schik, Friends of the Mississippi River



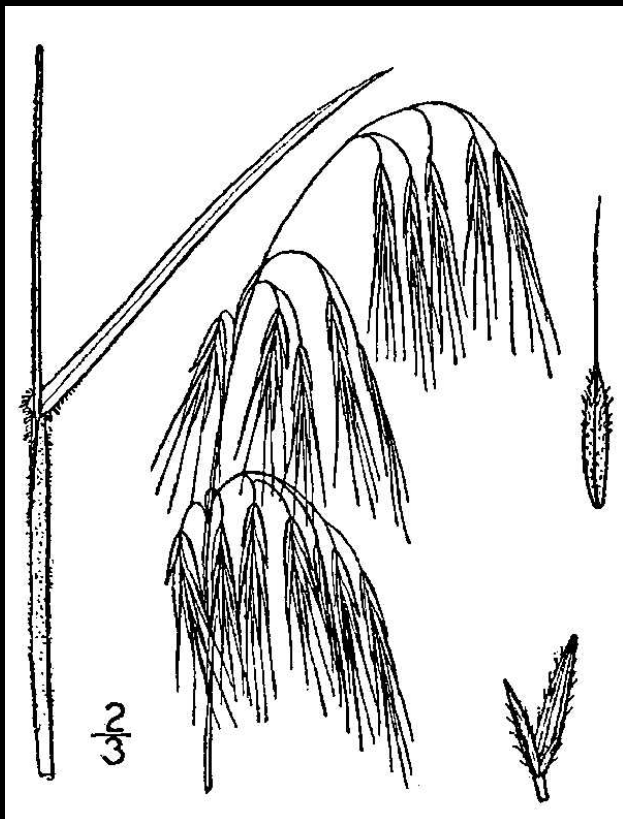
ACKNOWLEDGEMENTS

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CHEATGRASS (*Bromus tectorum*) I.D.



- Softly hairy on: blades (upper & lower), sheath (upper sheath may be smooth), and glumes
- **Inflorescence:** panicle 5-20 cm long, usually 1-sided, drooping,
- **Spikelets:** 4-8 ea, 10-20 mm long, often purplish-tinged
- **Awns:** 10-18 mm, straight, arise 1.5 mm below lemma apex.
- **Culms:** 5-90 cm, erect.
- **Sheaths:** densely and softly pubescent, upper may be smooth.
- **Auricles:** absent.
- **Ligules:** 2-3 mm, glabrous, obtuse, lacerate.
- **Blades:** up to 16 cm long, 1-6 mm wide, softly hairy both sides.

	tectorum	japonicus
Upper glume veins	1-3	3-5
Lower glume veins	3-5	5-9
Spikelet	Parallel to diverging	Parallel to converging



HABITAT

Rooftops

Parking lots

Mulch

Nurseries

Waste places

Sagebrush steppe communities of the Intermountain West



THE ISSUE

- Mostly western states: vast coverage -18 mill ac
- Rangeland: poor quality forage, displaces natives (forage spp)
- Alters frequency, extent, timing of wildfires. Fire perpetuates it.
- Outcompetes native plant seedlings for soil moisture.
- Appearing at higher quality sites - may increase with global warming.
- In MN: cheat became dominant at sand-gravel prairie under standard BMPs.



CHEATGRASS BIOLOGY

Annual

Fall germination, winter growth

Germination 0 - 40°C

Moisture opportunistic

Superior spring H₂O competitor

Prolific seed production (300/plant)

High seed viability, tolerate high temps

2-3 year seedbank

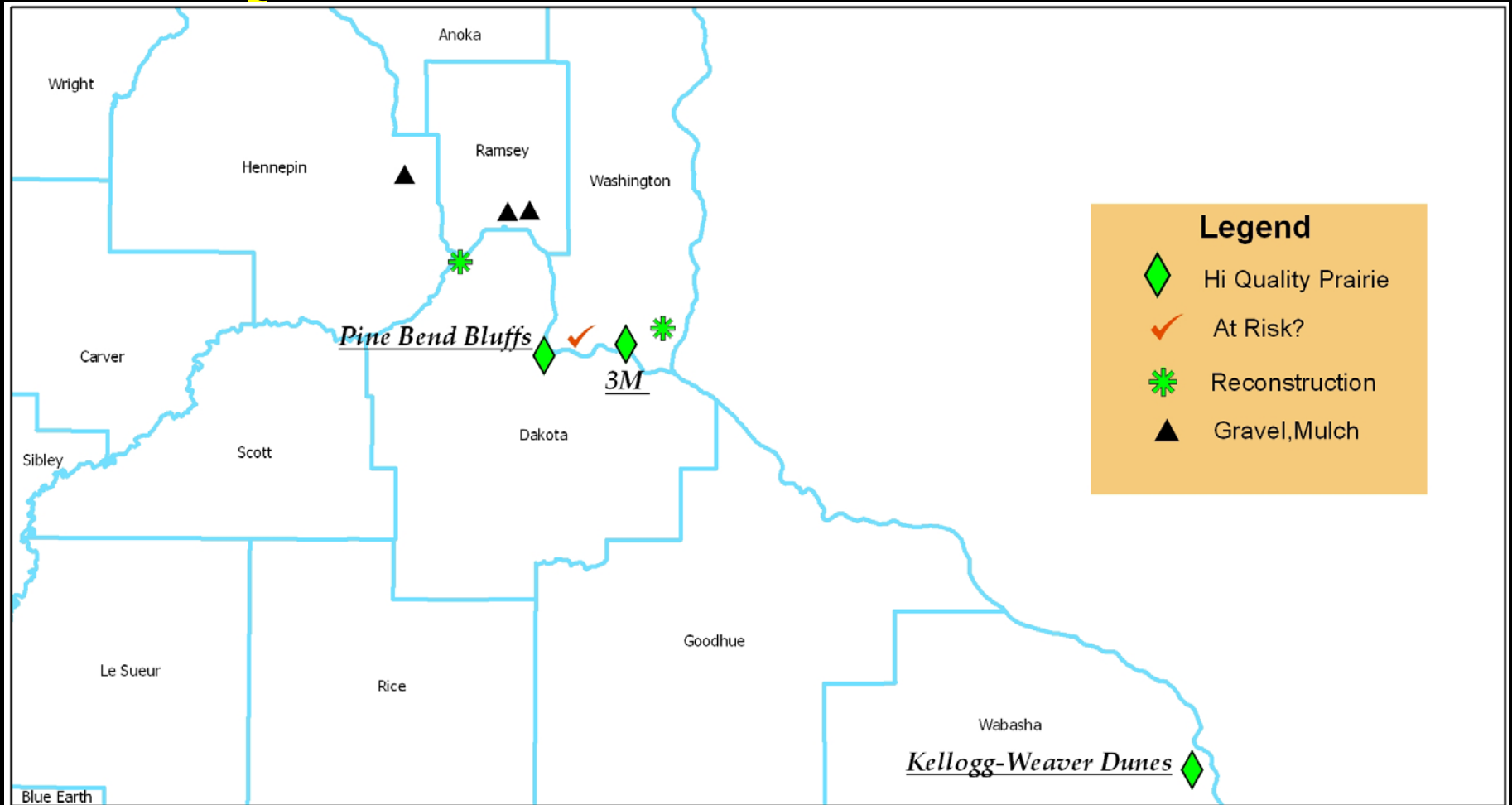
Biomass peak & crash

Origin: Eurasia. U.S. in 1861.





HIGH QUALITY SITES WITH CHEATGRASS



PINE BEND BLUFFS



STANDARD MANAGEMENT

Appropriate for very degraded sites or buffer areas

- **Herbicide (Plateau®)**
- **Burning plus herbicide**
- **Mowing within 1 week of flowering (reduce seed prod).**
- **Late fall & early spring grazing**
- **Establishment of dense native cover**



STUDY TREATMENTS

Single treatments

Roundup (broad spectrum)
Sethoxydim (grass specific)
Pre-emergent
Burn
Handpull
Very late cut

Combinations

Sethoxydim and Pre-emerg
Roundup and Pre-emerg
Torch and Pre-emerg
Preen & VLC
Seth & VLC
Seth & VLC & pre-emerg



WORKING PROTOCOL (TRIPLE PLAY)

Mar/April sethoxydim (grass specific)

Timing of application is critical, small window (warm days, cloudy (?), prior to natives, no freeze within 24 hrs)

Very Late Clearcutting (VLC) (early June - mature seed).

Remove cuttings or leave (effective in dry years only?)

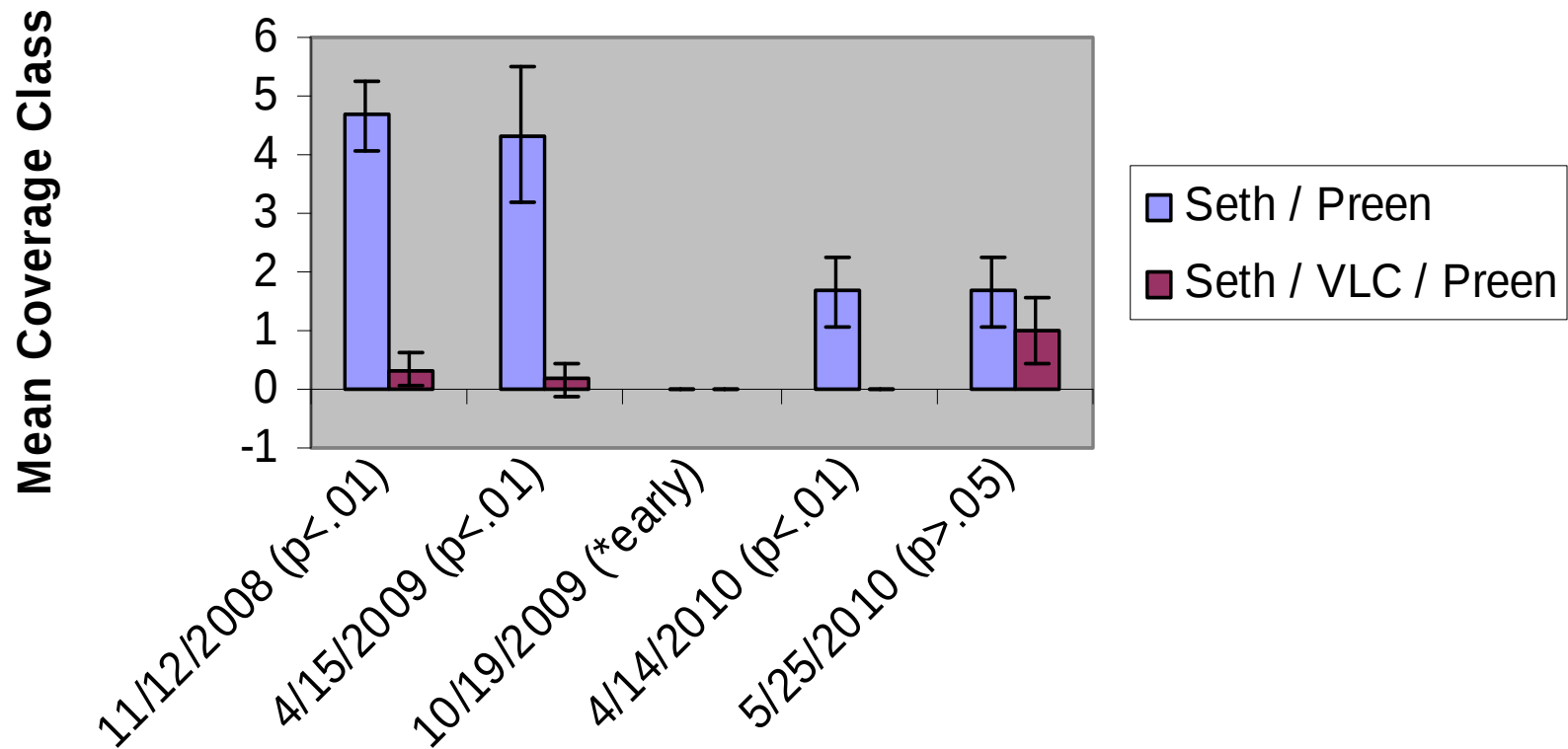
Late August/early Sept pre-emergent (seed germination inhibitor)

Repeat application depending on weather.



WORKING PROTOCOL (TRIPLE PLAY)

Triple Play effect on Cheatgrass



FLINT HILLS SP'08, STUDY PLOTS
DEAD CHEATGRASS FROM SETHOXYDIM
SAVE SPRAYED 5/9/08

4 1/2"



Effect of Sethoxydim



OTHER TOOLS

Rx burn - with follow-up mgmt

Torching – good for small scale

Handpull - good for small scale



Effect of Torching



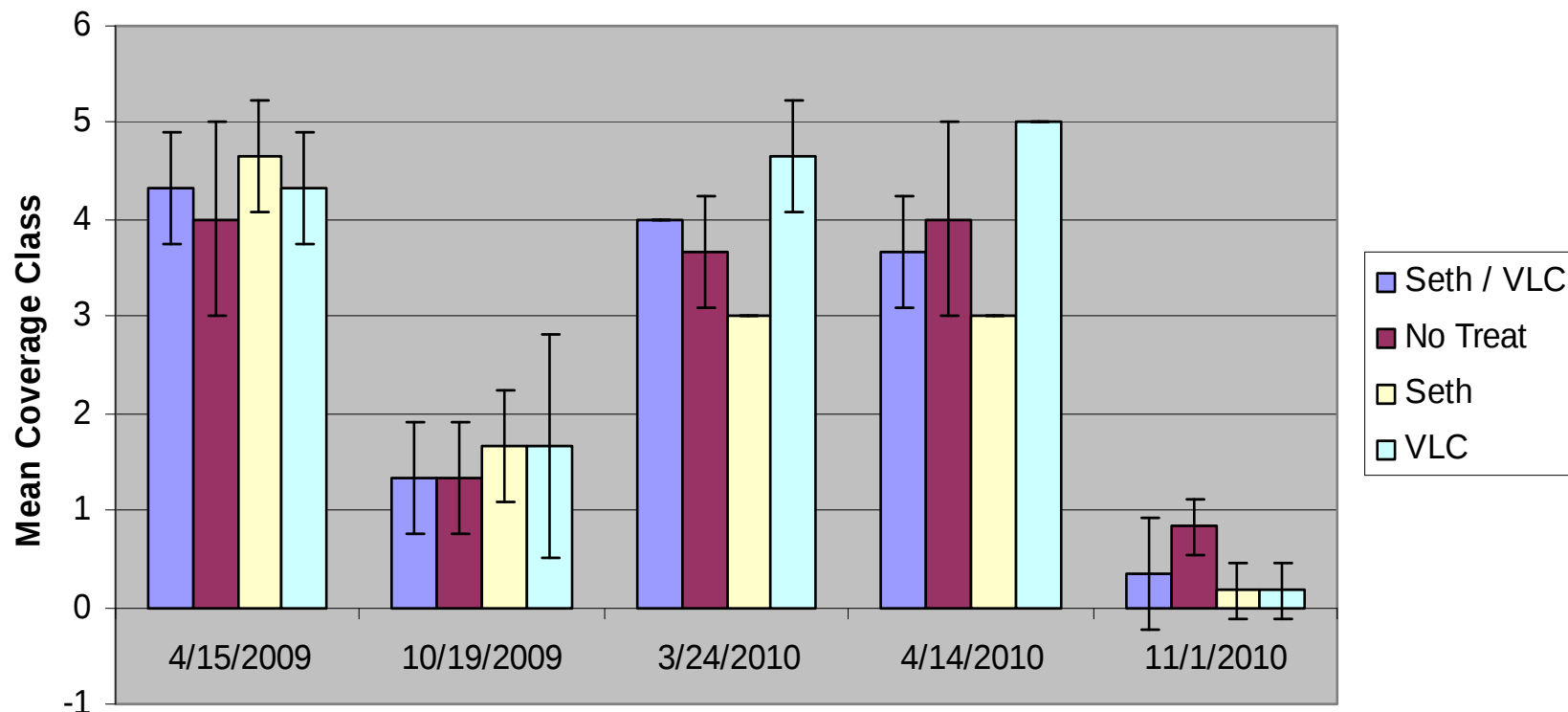
UNDERSTANDING TREATMENT EFFECTS

Treatment	Competition by Natives	Annual Growth & Seed	Soil Substrate for Germ.	Seedbank
Burning	+ -	+	-	-
Aug/Sept Preemergent	0	+	-	+
Mar/Apr Sethoxydim	+ -	+	-	0
June VLC (Very Late Clearcut)	-	0	+	+



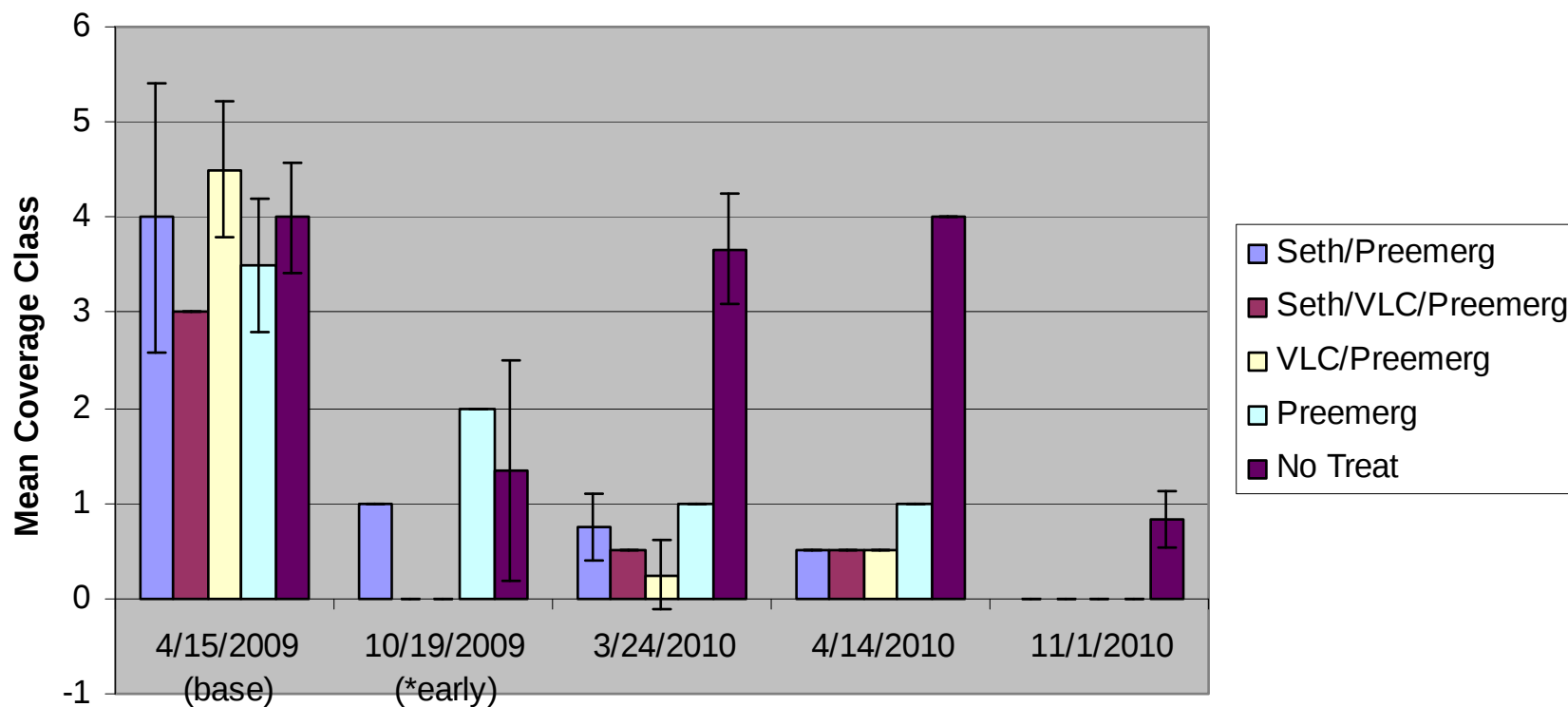
UNDERSTANDING TREATMENT EFFECTS

Live Cheat: Effect of Seth and VLC



UNDERSTANDING TREATMENT EFFECTS

Live Cheat: VLC and Preemergent



MONITORING

Monitoring is important!!

Timing - adjust date according to seasonal weather

Native species - track changes over time.

Multi-year - treatment effectiveness may differ depending on temperature and moisture, and location

Define success:

Total eradication?

Dominance of natives - how much is enough?

Self-sustaining natives population

CONCLUSIONS

**Use the Triple Play for Large Scale Infestations;
Preemergent +1 is Acceptable Alt ?**

Continue to Monitor

**Expand Monitoring for Timing; Interaction with
Mid Term Weather; Species Specific Effect on
Natives, etc.**

Is it Becoming a Regional Problem?





NEXT STEPS

Locate and track cheat at native prairie sites. Is it a problem?

Need more evaluation of:

- **Timing of cutting**
- **Second pre-emerg application**
- **Changes to native vegetation with treatments (need several seasons)**

