Research on deer ecology, management and environmental impacts

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Early population influences

- Native American hunting
- Fur trade
- Logging
- Settlement
- Market hunting

Dahlberg and Guettinger 1956

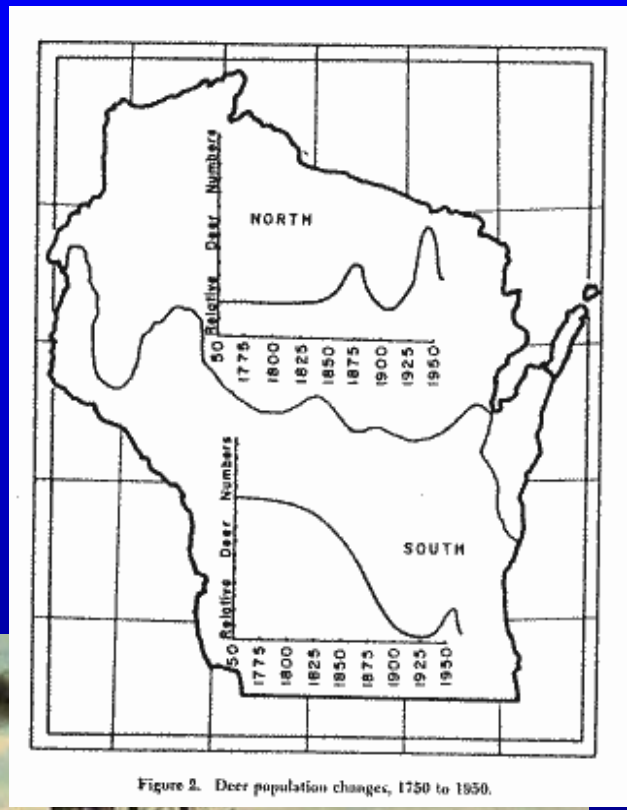
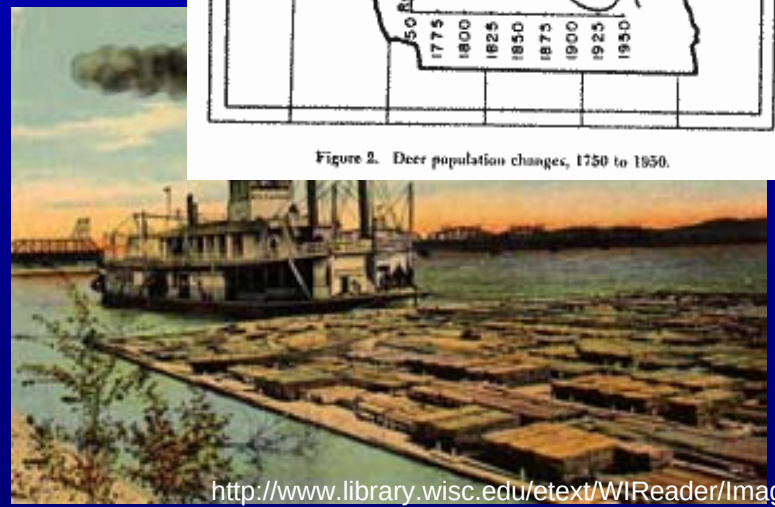
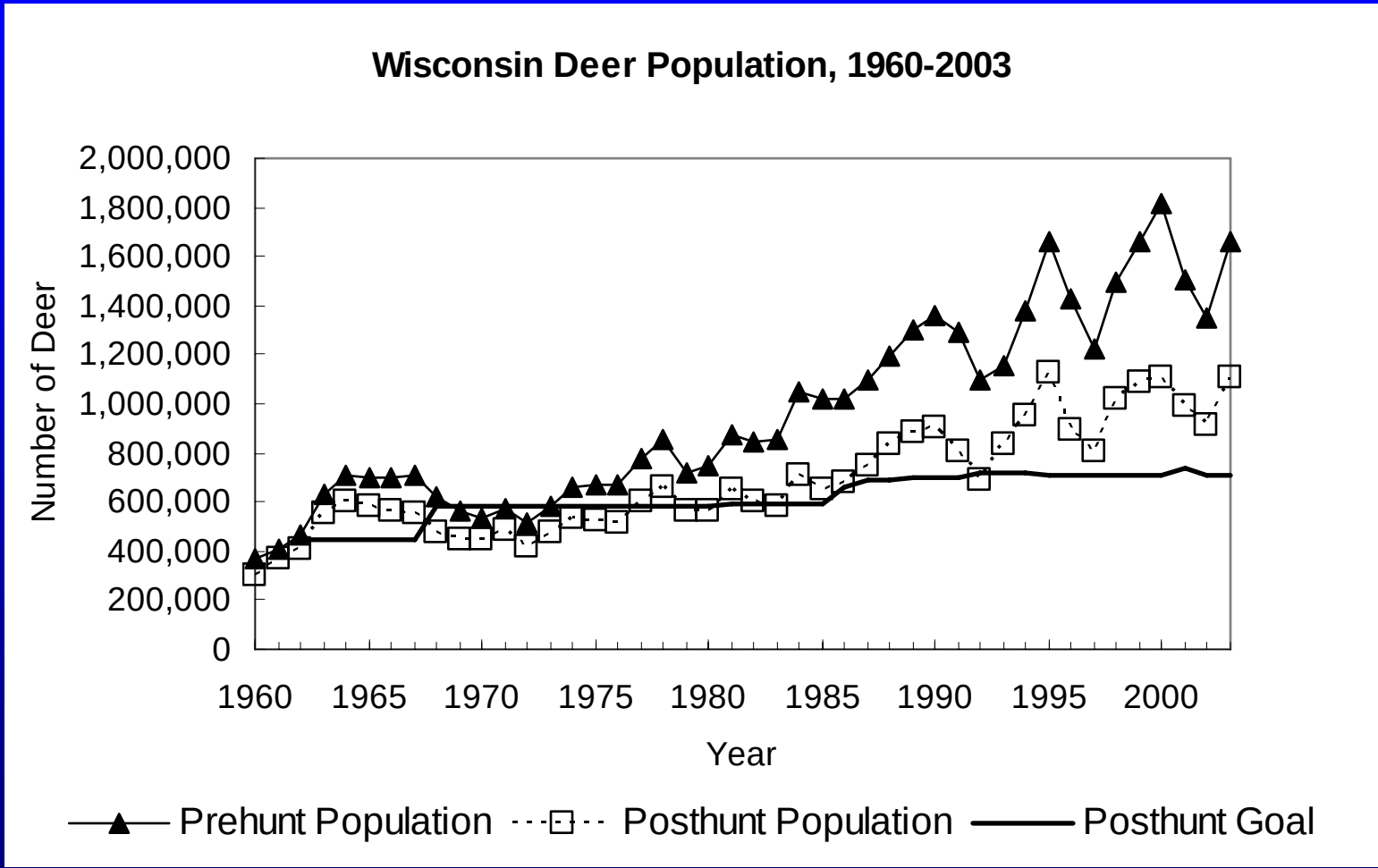


Figure 2. Deer population changes, 1750 to 1950.



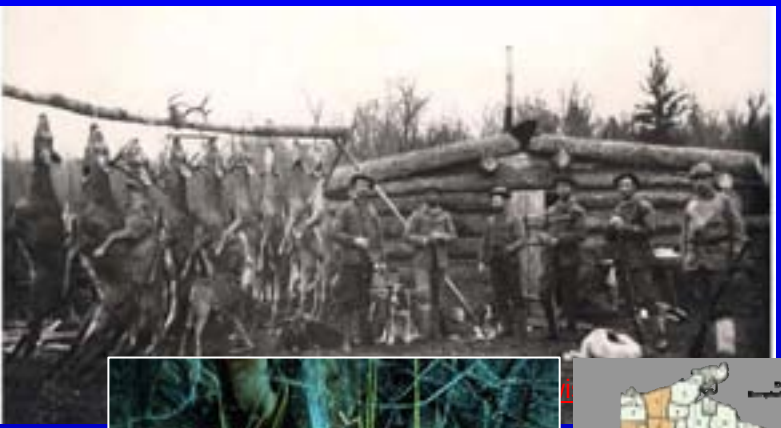
http://www.library.wisc.edu/etext/WIReader/Images/WER0978.htm

Recent population trend



R. Rolley WI DNR

20th Century population influences



- Increasing regulation
- Ecologically meaningful DMUs
- Variable quotas
- Feeding
- Agriculture
- Forestry
  - Magnitude
  - Pattern
  - Rotation

Impacts to forests

Field experiments and deer impacts: the exclosure

No deer

deer

Deer population histories

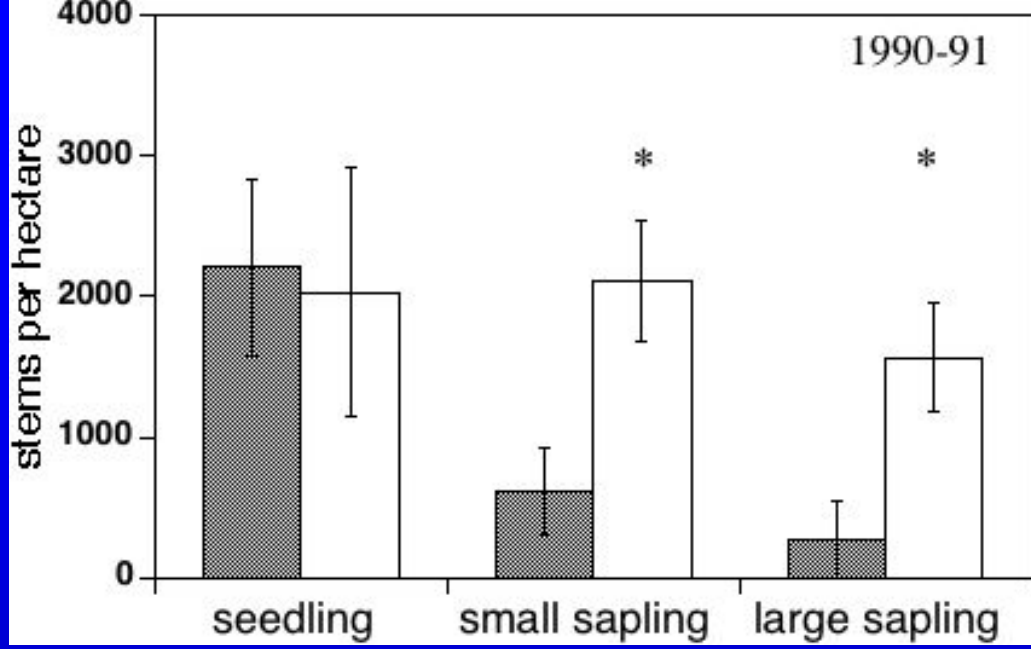
Low deer: Lac du Flambeau & Menominee tribal lands (extended hunting), deer-free Apostle Islands

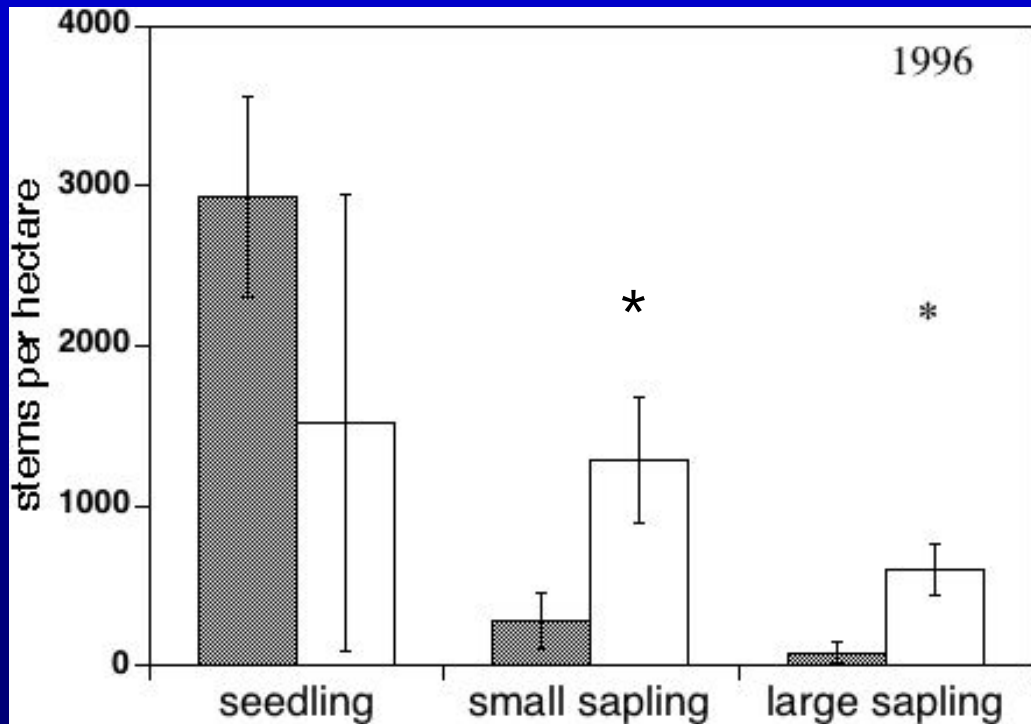
High deer: Rest of landscape

77 sites

shaded = high deer

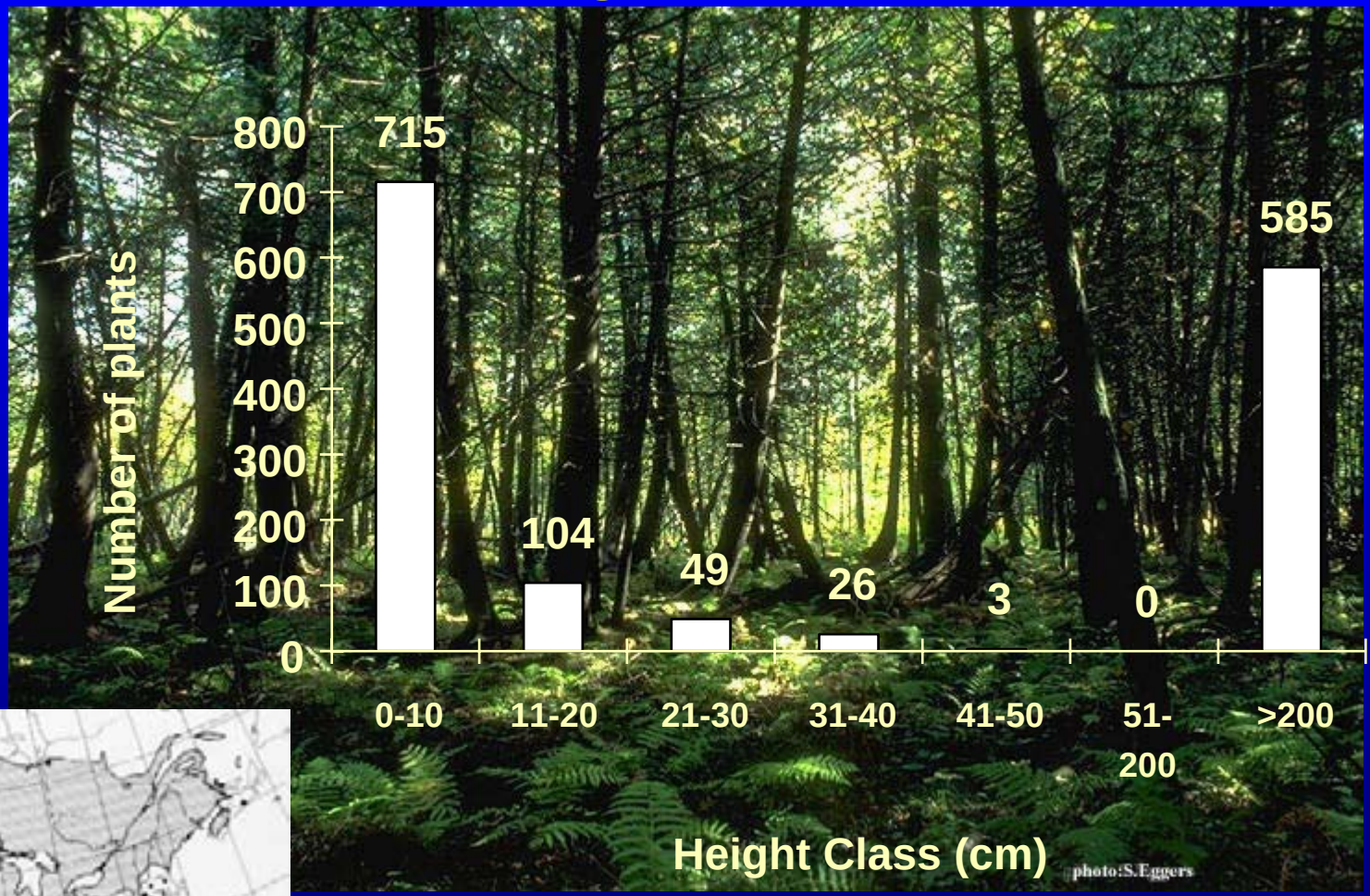
white = low deer

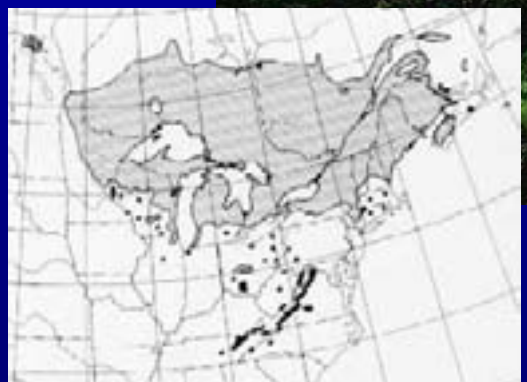




Rooney et al. 2002.
For. Ecol. Manage.

Northern white cedar in the Great Lakes region





http://www.mnwetlands.umn.edu/tour/anoka.html

Van Deelen 1999, Natural Areas Journal

No Hunting
Shifts in ferns, graminoids

	Relative abundance	
	1950	2000
Brunet Island SP	22%	91%
Gogebic SP	23%	61%

Rooney & Waller 2003. For. Ecol. Manage.

Broad Trends-Northern Mesic Forest (62 sites)

Sites are losing native species

average site: 18% decline over 50 yrs

~25 species (1950) per 20 sq. m.
~20 species (2000) per 20 sq. m.

Rooney et al. (2004) Conservation Biology 18: 787-798

Rates of change: species richness

Not related to succession

Higher in areas without deer hunting

(-0.59 vs. -0.13)

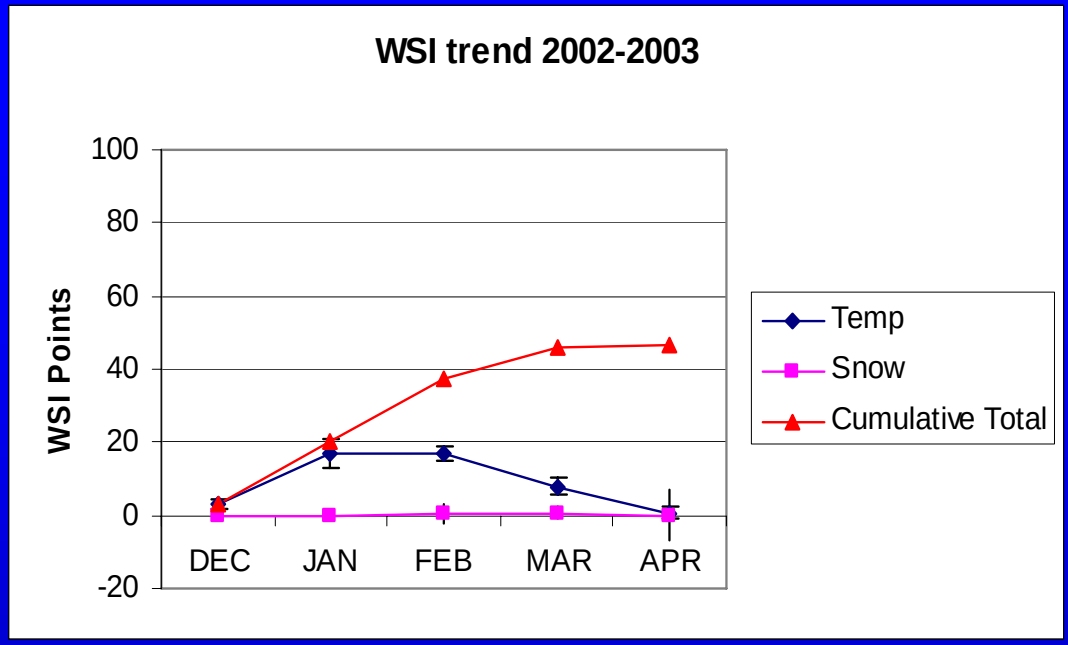
Ecological impacts

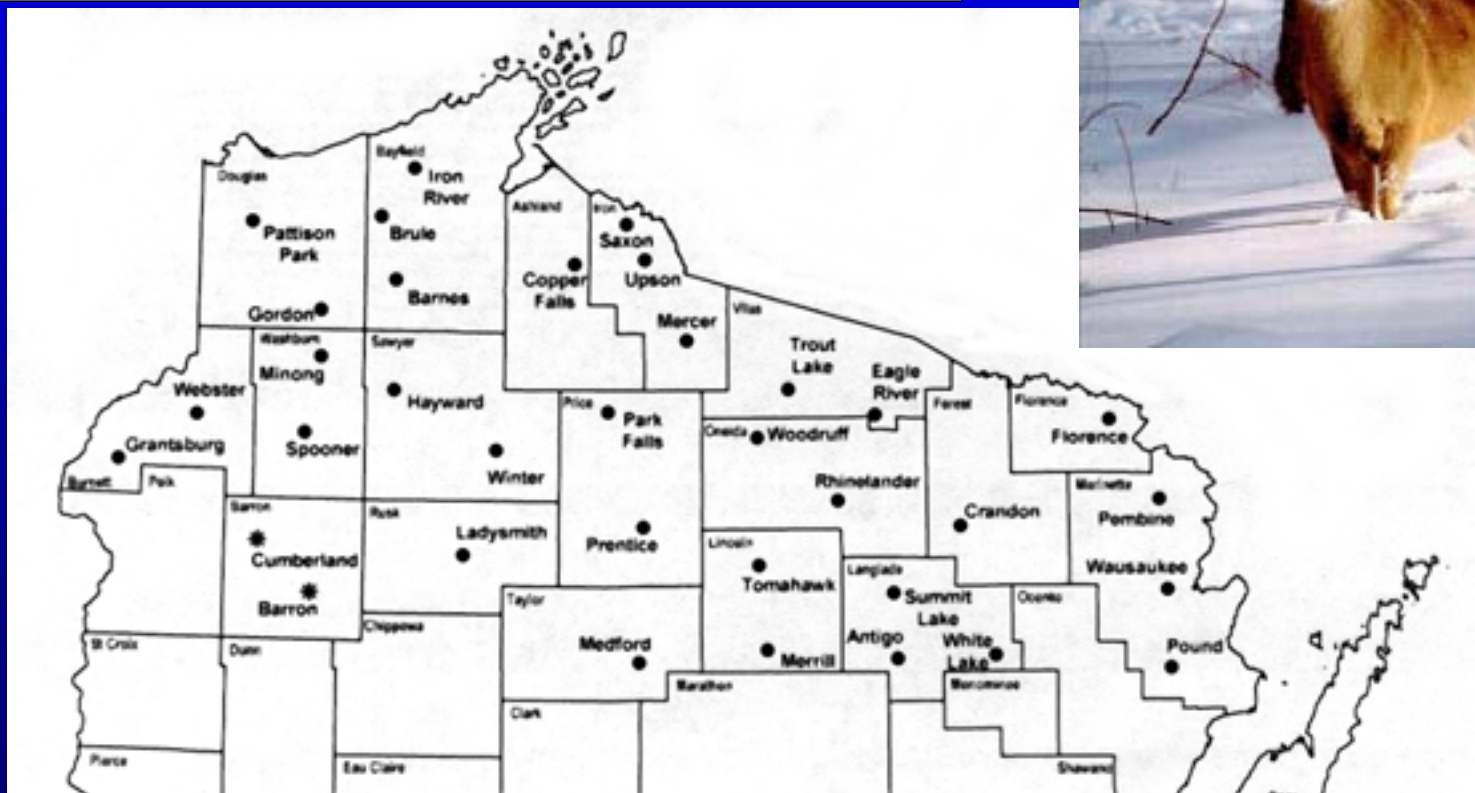
- Reduced abundance and diversity of forbs
- Reduced regeneration and altered composition of woody plants
- Vegetation-mediated effects on insects, birds, small mammals
- Displacement of moose
- Support for wolves

Vander Zouwen and Warnke 1995

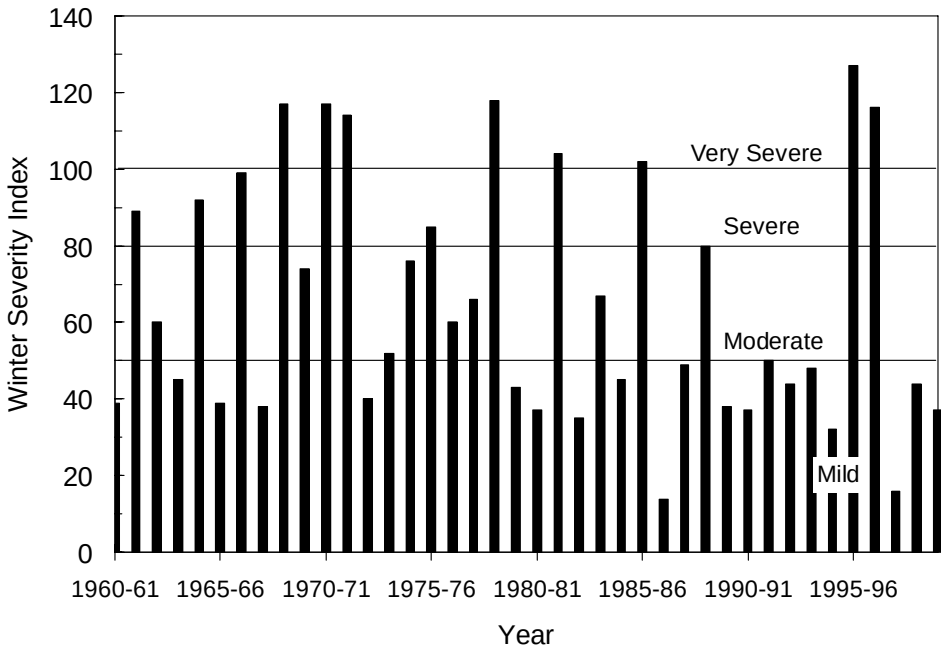
Determinants of deer population size

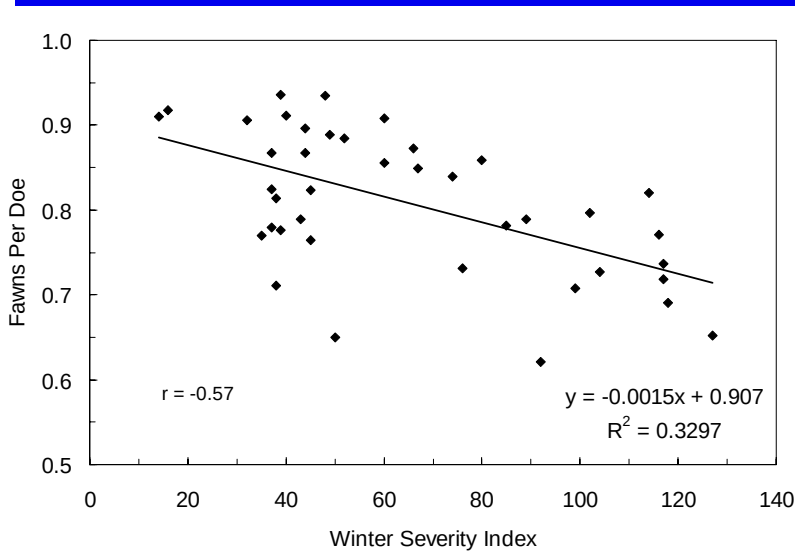
Winter


WSI trend 2002-2003
WSI Points
100
80
60
40
20
0
-20
DEC
JAN
FEB
MAR
APR
Temp
Snow
Cumulative Total


Iron River
Pattison Park
Brule
Barnes
Gordon
Webster
Minong
Grantsburg
Spooner
Hayward
Winter
Cumberland
Barron
Ladysmith
Saxon
Upson
Copper Falls
Mercer
Park Falls
Prentice
Trout Lake
Eagle River
Woodruff
Rhinelander
Florence
Crandon
Pembine
Wausaukee
Pound
Tomahawk
Summit Lake
Antigo
White Lake
Merrill
Medford

Winter

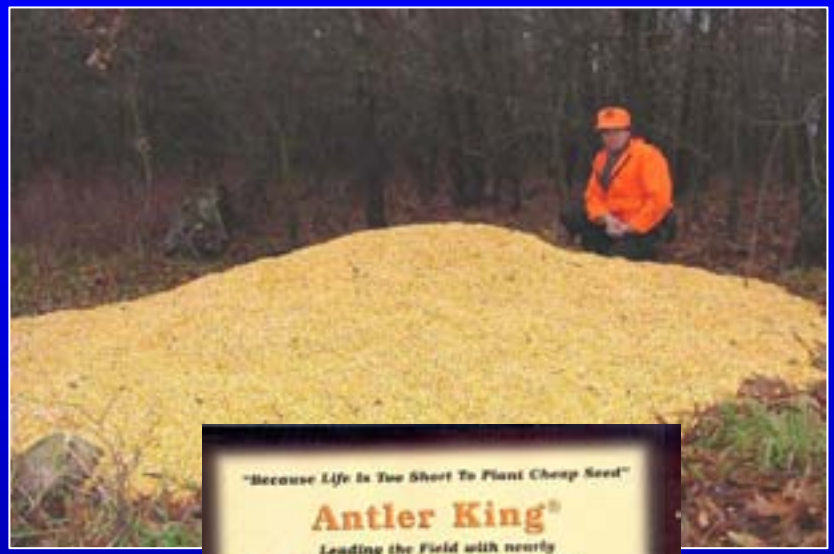




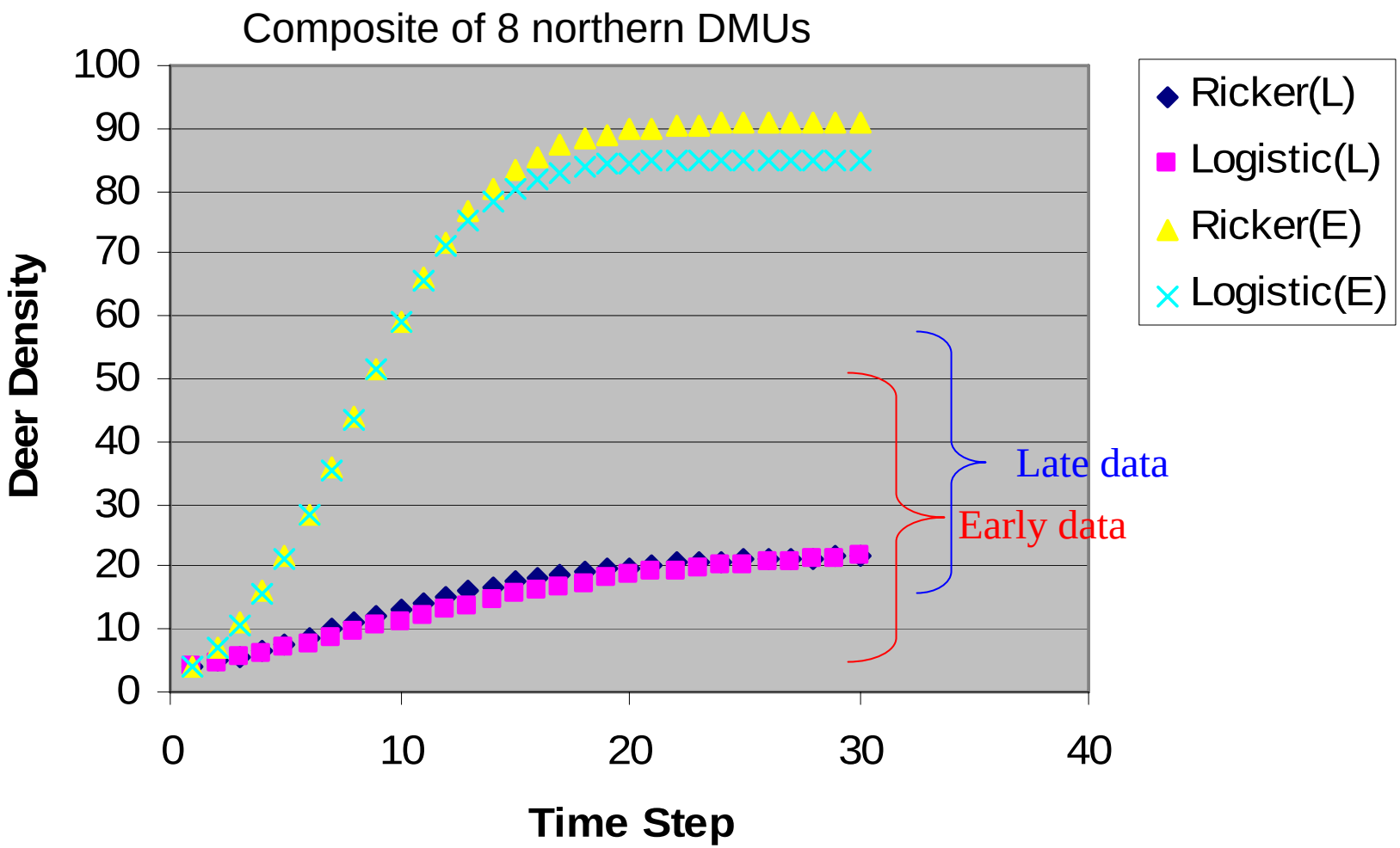
Mild winters are associated with more fawns per doe

Data from Wisconsin DNR deer harvest data base

Baiting and feeding impacts



Early ('81-'90) vrs Late ('91-'01) Growth Simulations



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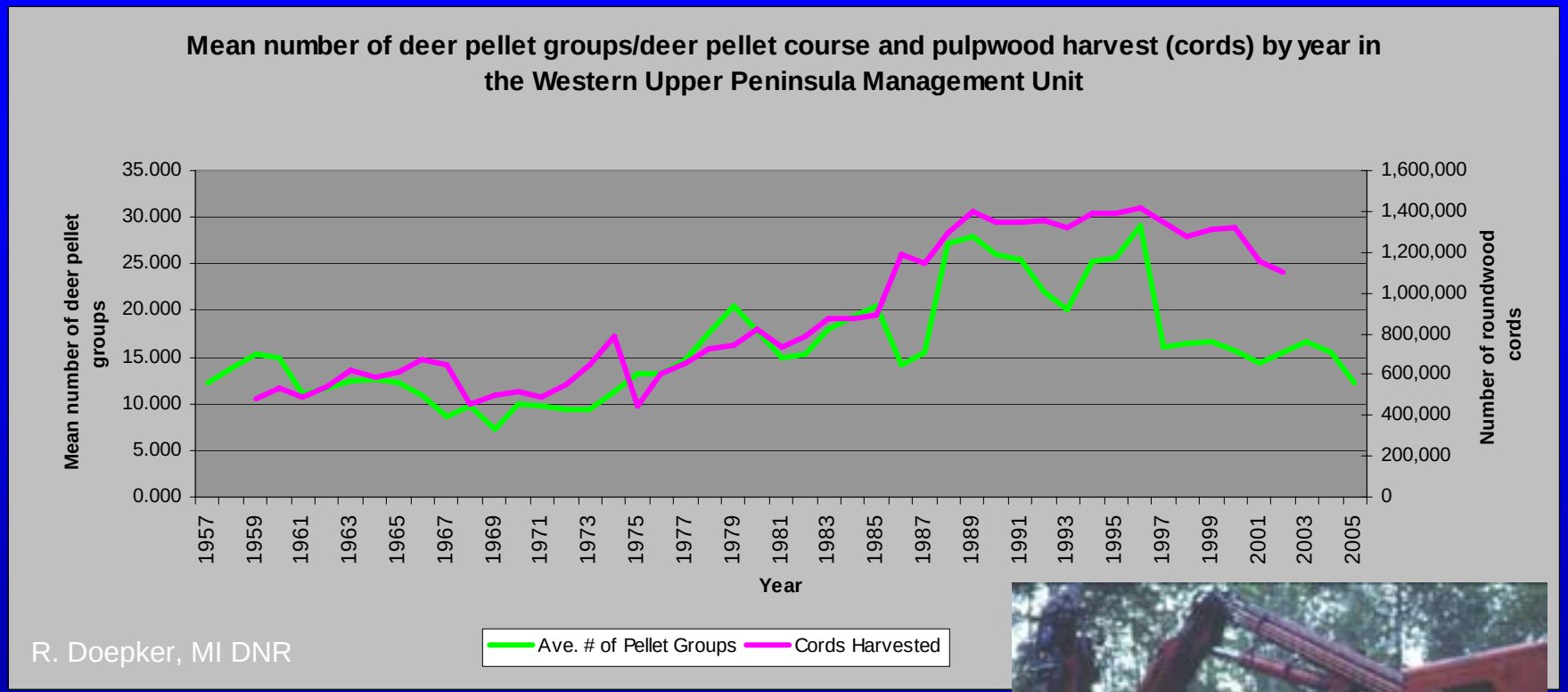
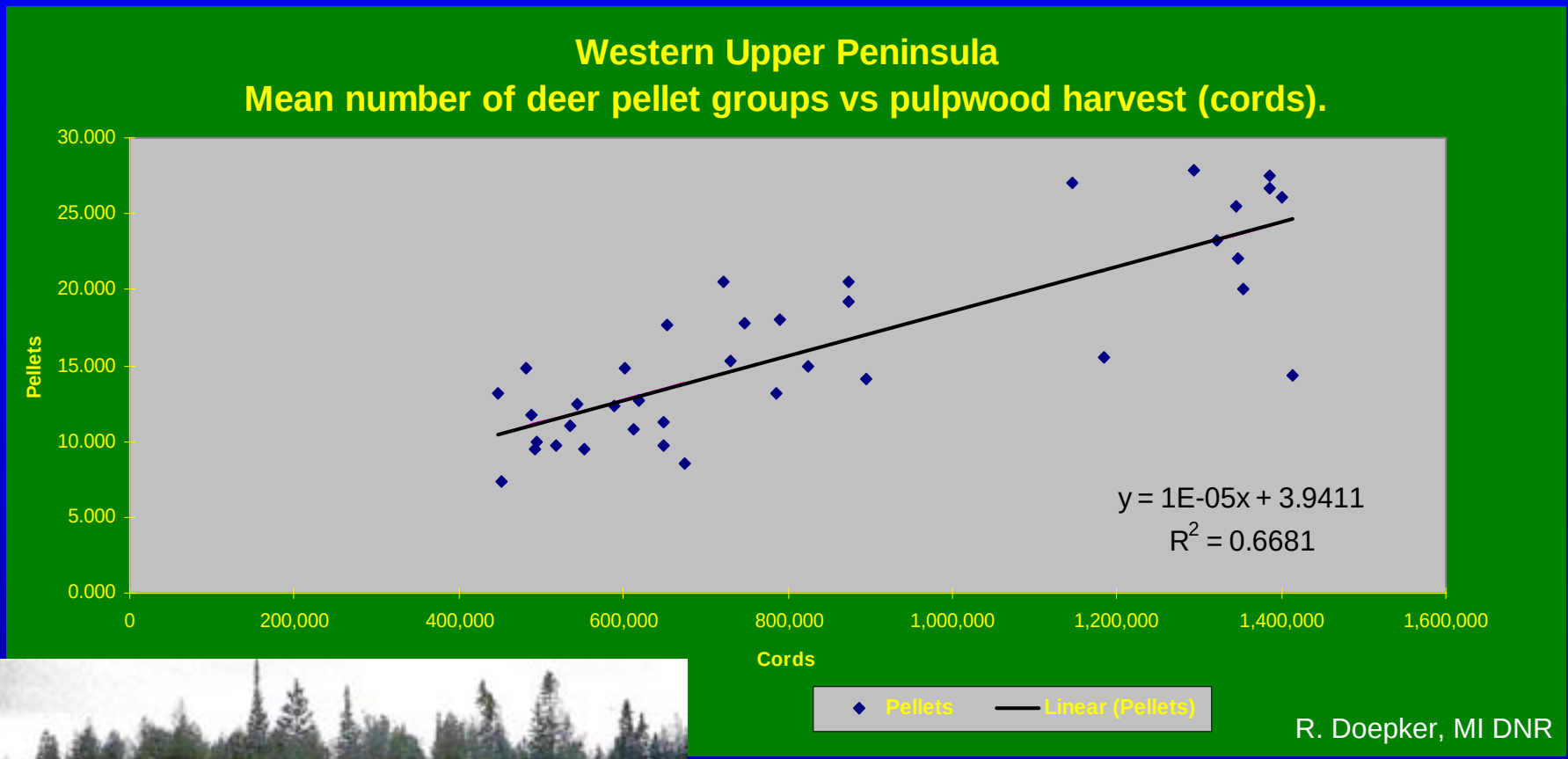


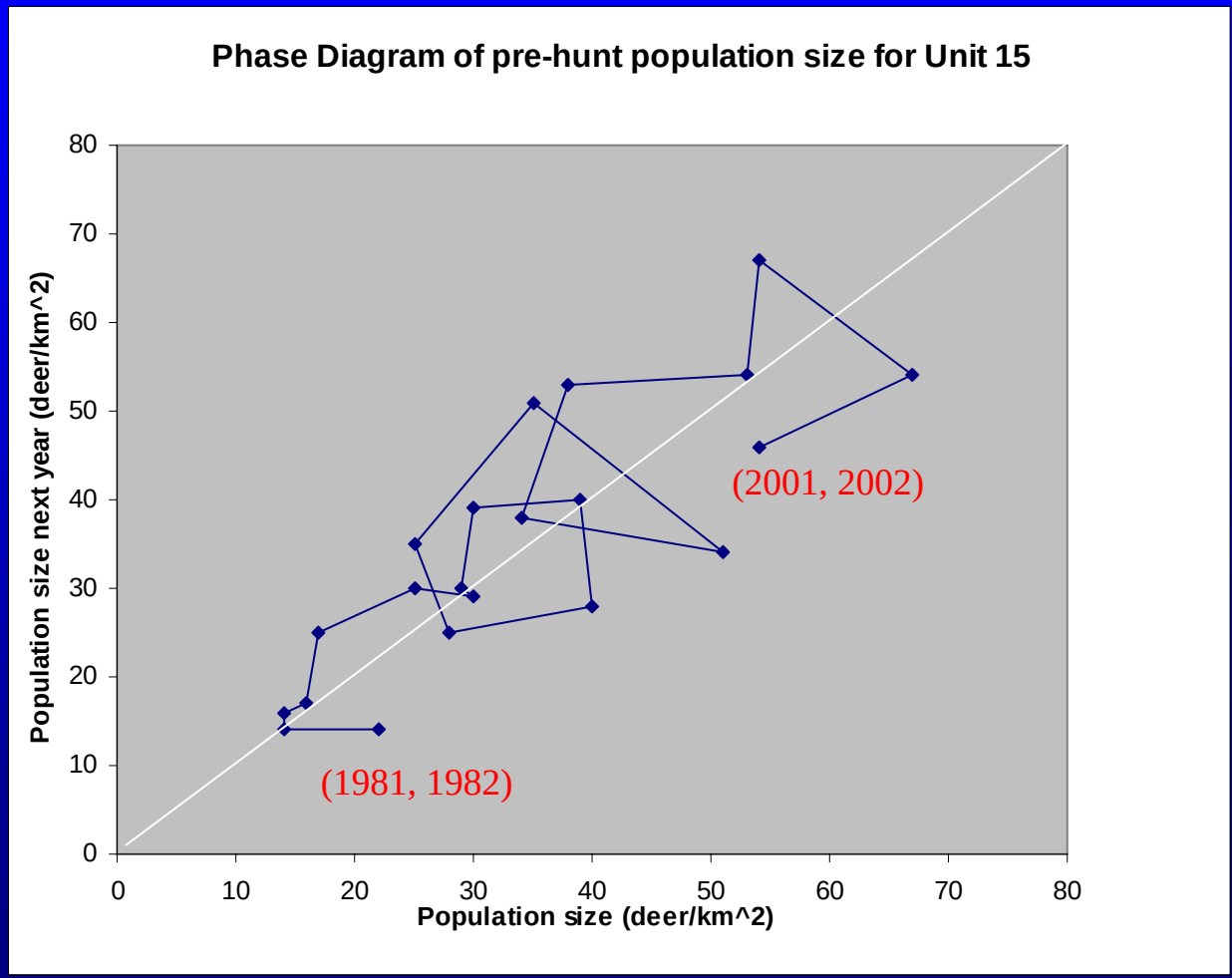
Forestry impacts



R. Doepker, MI DNR

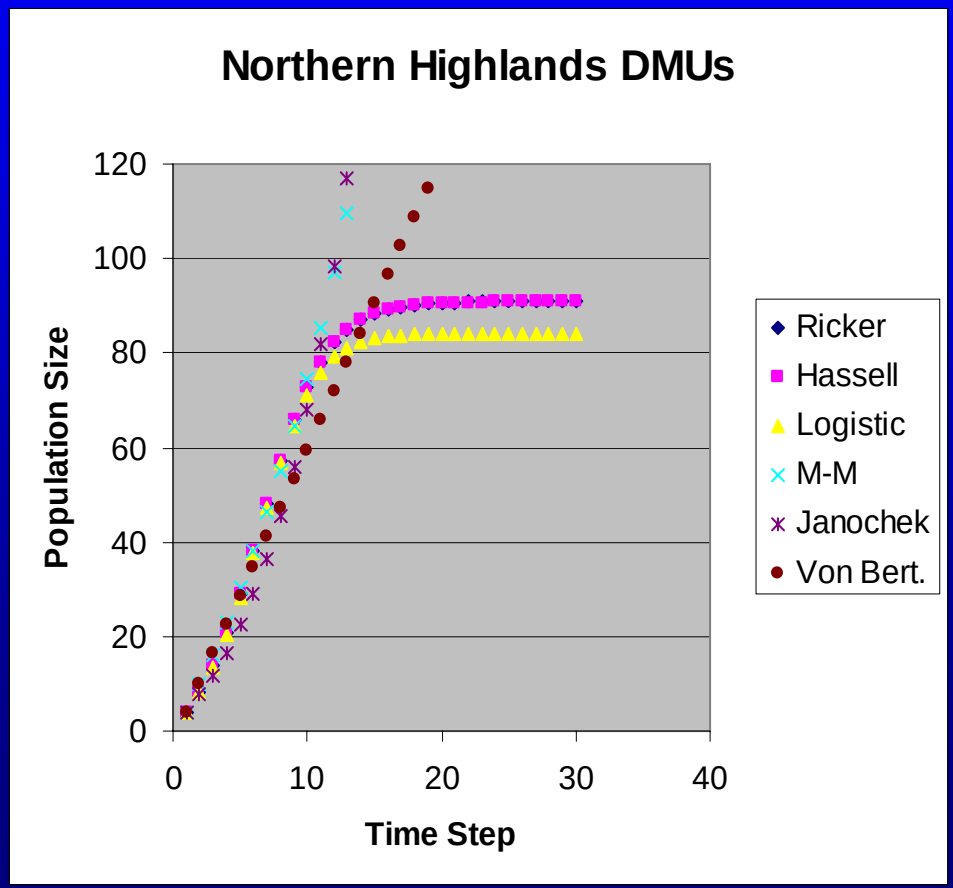
Higher pulpwood harvest is associated with more deer

Change in carrying capacity



Data from Wisconsin DNR deer harvest data base

Unit Group A (Northern Highland)								
Units		**Inherently D-I models**		**D-D w/o Equilibrium**		**D-D w/ Equilibrium**		
Requested	**Grouped**	**Name**	**%**	**Name**	**%**	**Name**	**%**	**Equilibrium**
29B	29B, 36,37	Random	0.06	M-M	0	Ricker	0.29	91
		Exponential	0.03	Janochek	0.03	Hassell*	0.09	91
				Von Bert.**	0	Logistic	0.5	84
	Totals		0.09		0.03		0.88	
			Estimated K as a weighted average of equilibrium densitie					**87.0**

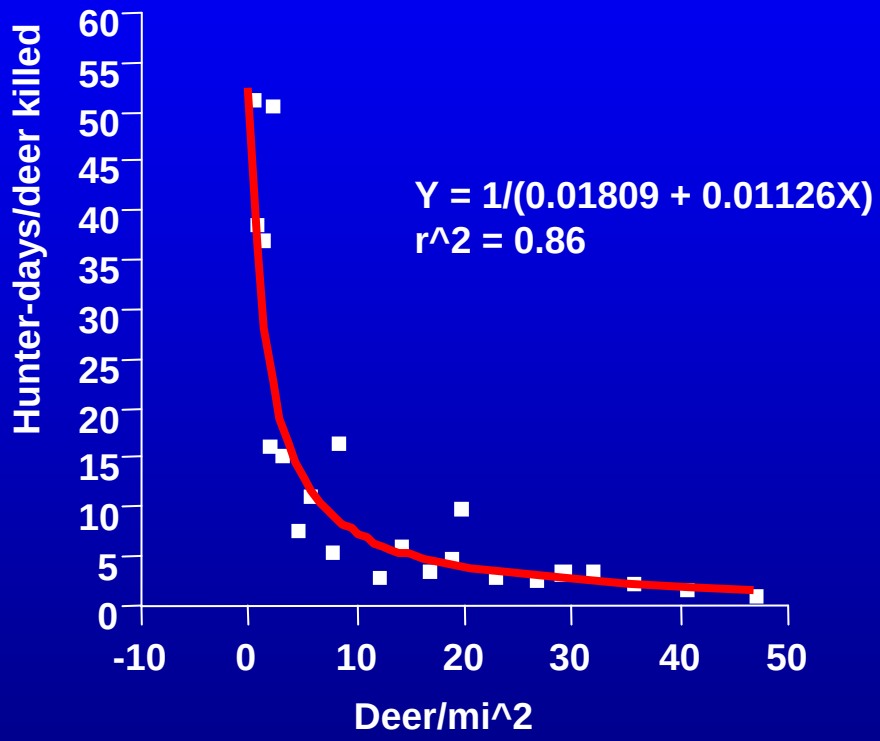


* = Bounded
** = Convergence Problem

Data from Wisconsin DNR deer harvest data base

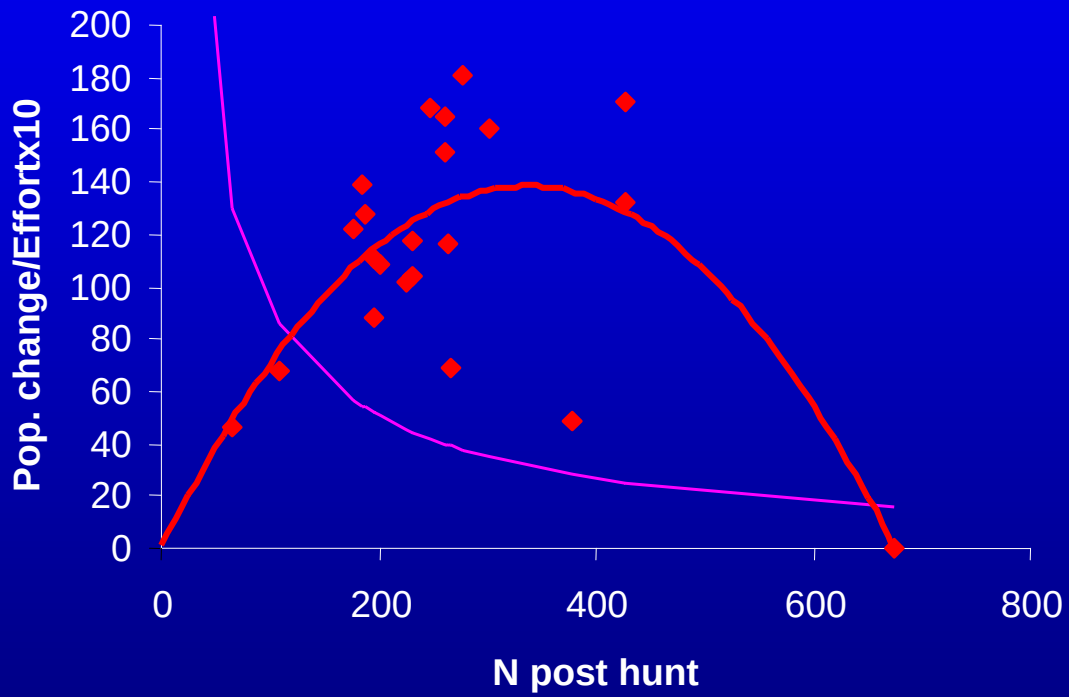
Efficiency of hunting

Hunter effort at Sandhill WRA



Data from: Creed, W. A. 2001. The total removal hunt. Pp. 53-66 in J.F. Kubisiak et al. Sandhill whitetails: providing new perspective for deer management. Wisconsin DNR.

Sandhill SY curve and hunter effort



Data from: Creed, W. A. 2001. The total removal hunt. Pp. 53-66 in J.F. Kubisiak et al. Sandhill whitetails: providing new perspective for deer management. Wisconsin DNR.

Conclusion

- Deer populations and forests jointly impact each other
- Management of both may be converging on a situation where:
  - Regeneration of commercially valuable species is impractical
  - Forest biodiversity is lost
  - Deer population are beyond the control of recreational hunting
- Imperatives for:
  - Forest and wildlife managers to cooperate on designing sustainable management
  - Research on the deer-forest-management connection as an integrated system