

Population biology, abundance, and management history of Michigan white-tailed deer

Forests and Whitetails – Striving for Balance
Michigan Society of American Foresters
9th June 2005

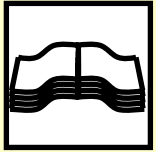


Brent Rudolph, Wildlife Research Specialist



**Michigan Department of Natural Resources
Wildlife Division**

Presentation Overview



“History Lessons”



“Nuts and Bolts”



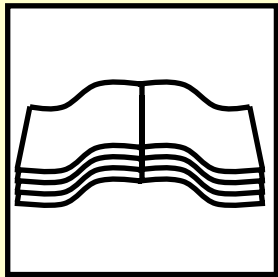
“Brain Surgery and Baseball”



“Plotting the Course”

History Lessons

History of Deer and Deer Management in Michigan



Langenau
(1994)

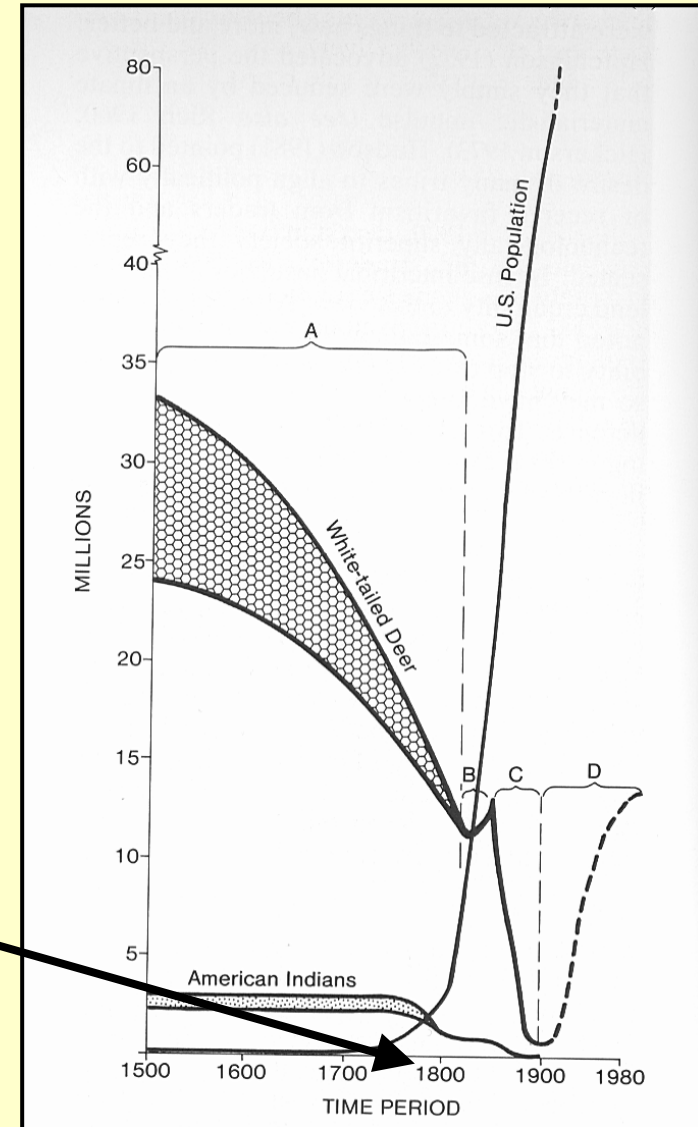
White-Tailed Deer Abundance



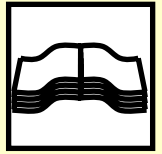
Recent phenomenon?

1800

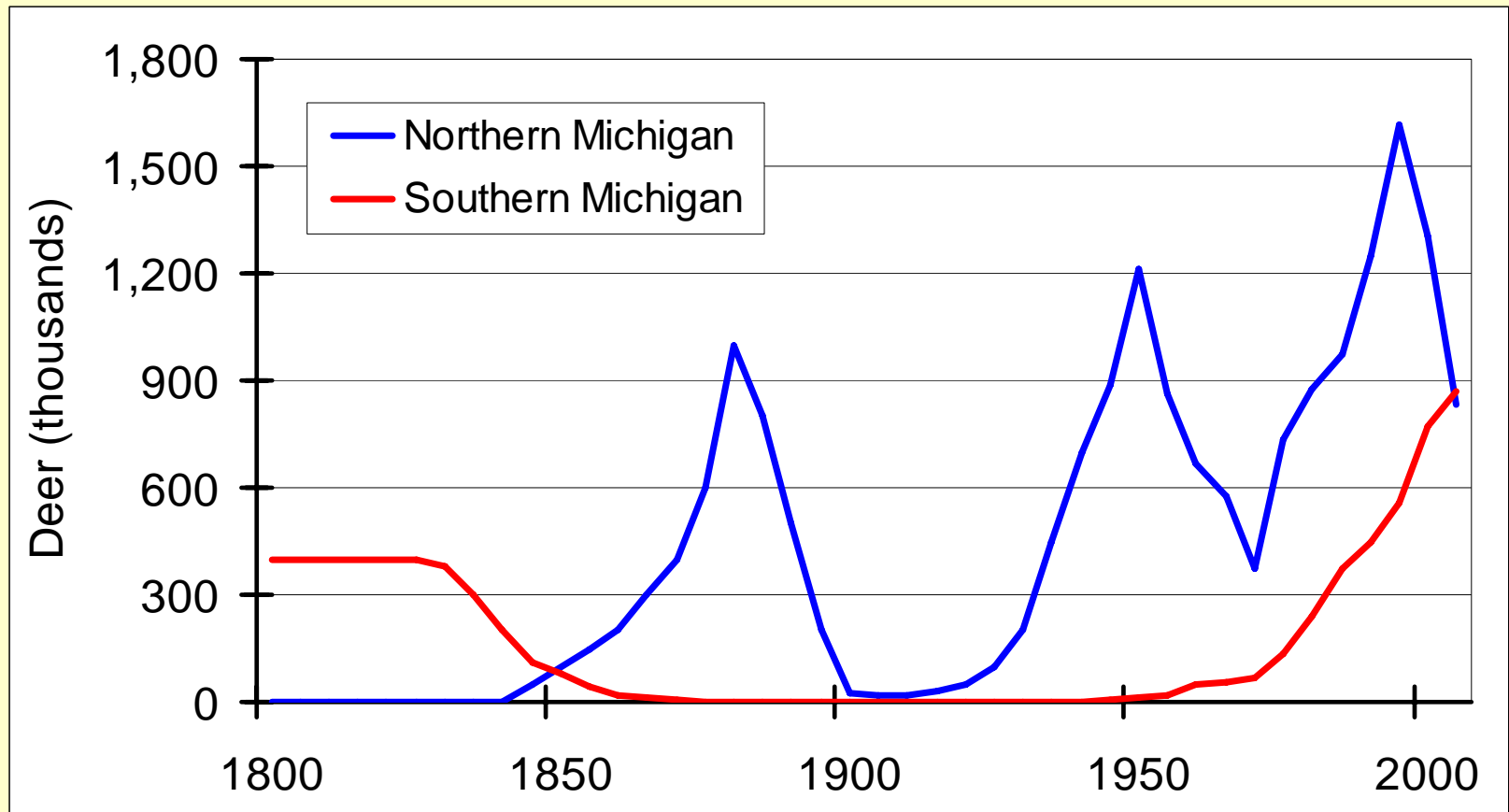
McCabe and McCabe
(1984 and 1997)



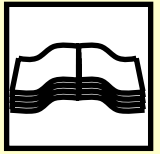
Michigan White-Tailed Deer Abundance



Fluctuations with habitat alteration...



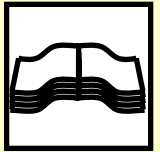
Michigan Statehood



1837: Land cleared, unregulated hunting



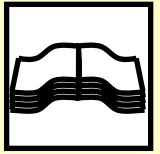
Early Michigan Timber Industry



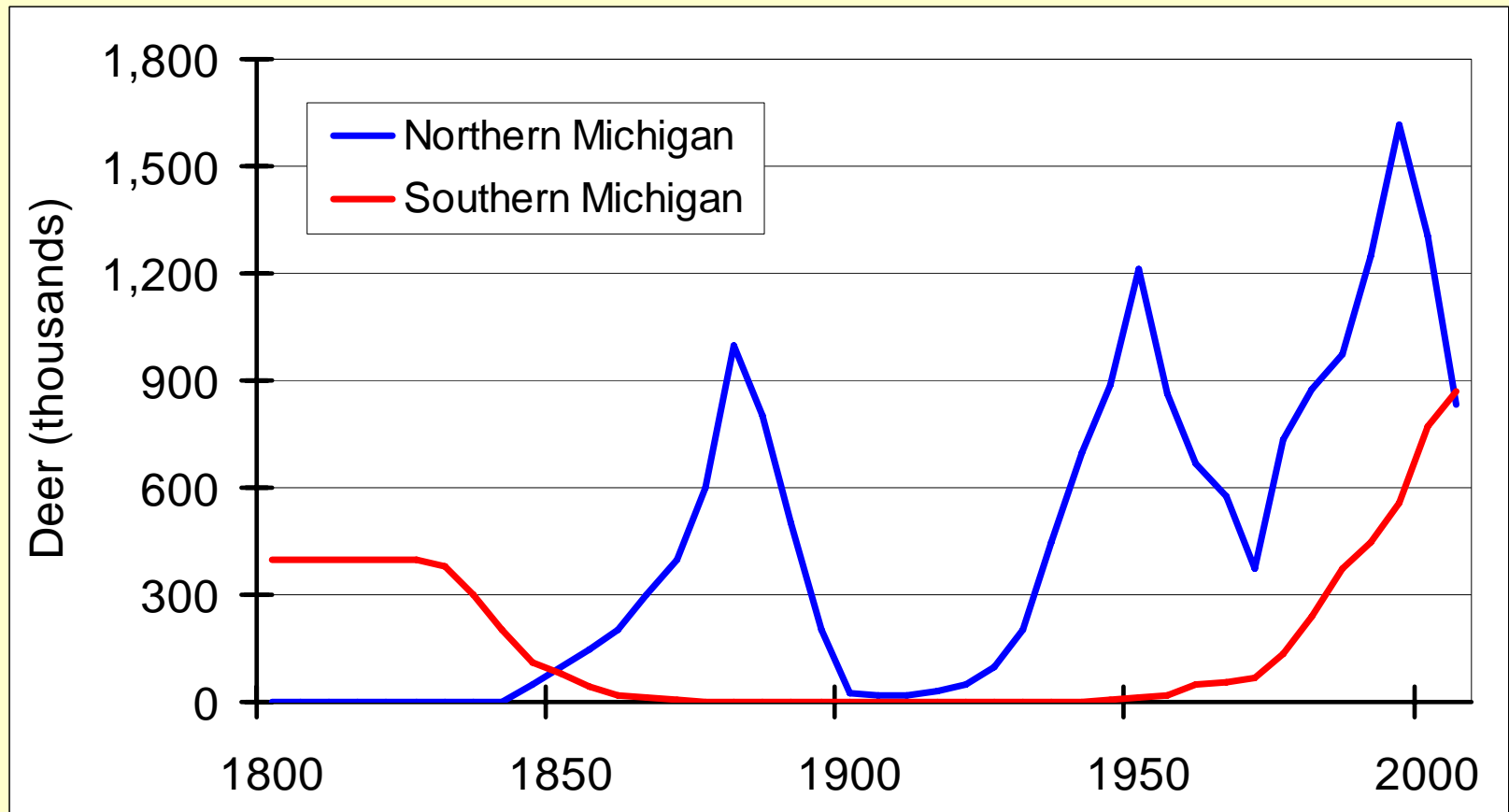
1850: Canopy opened to understory



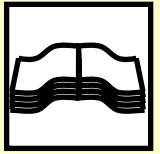
Michigan's First Deer Legislation



1859: 7 month season established



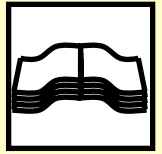
Expanding Logging and Transportation



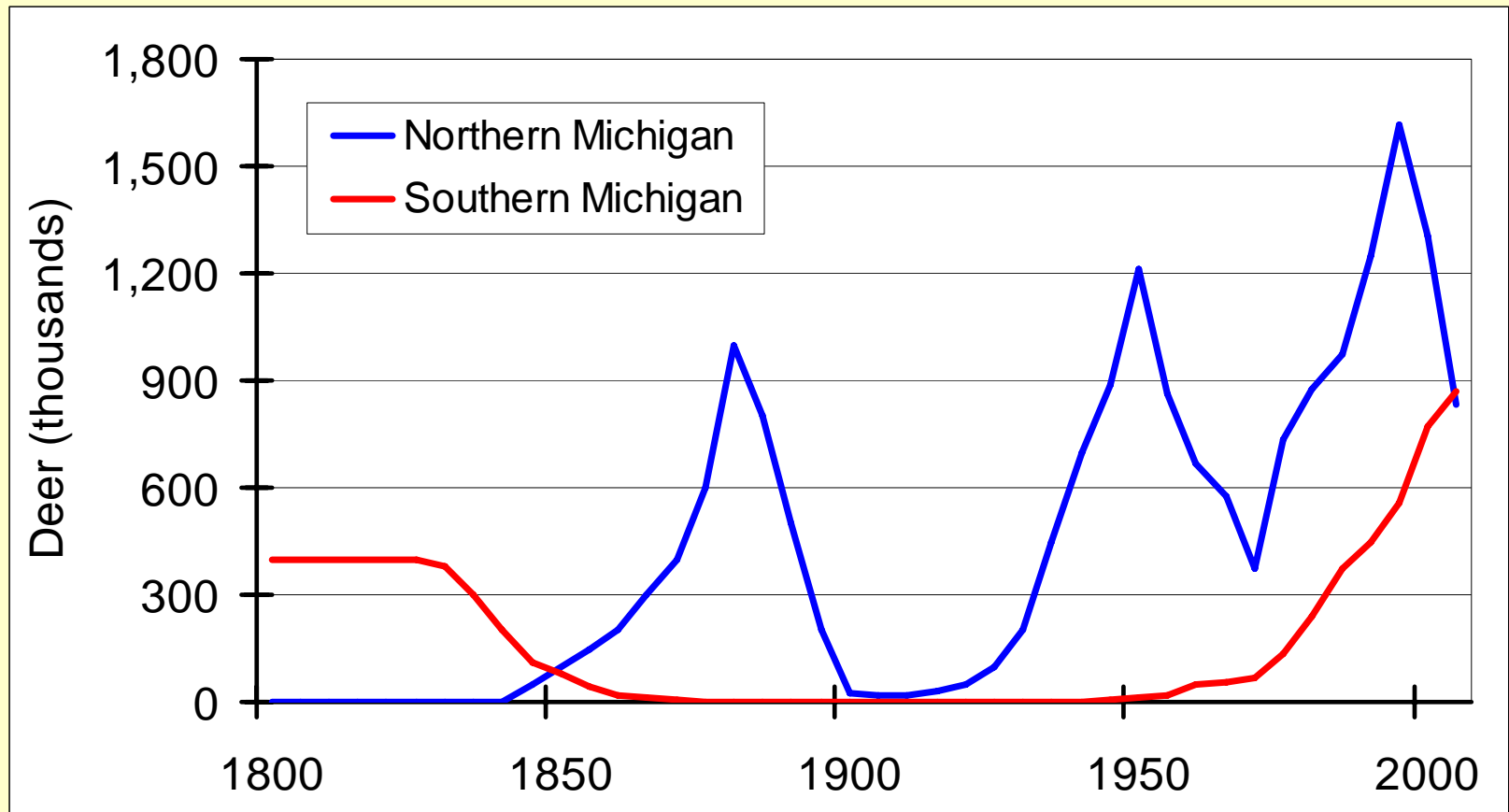
1880s: Deer taken in north, shipped south



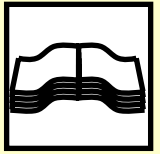
Evolving Michigan Deer Regulations



Late 1800s: 1st Game Warden, deer license



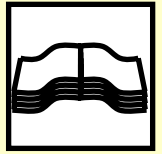
Professional Resource Management



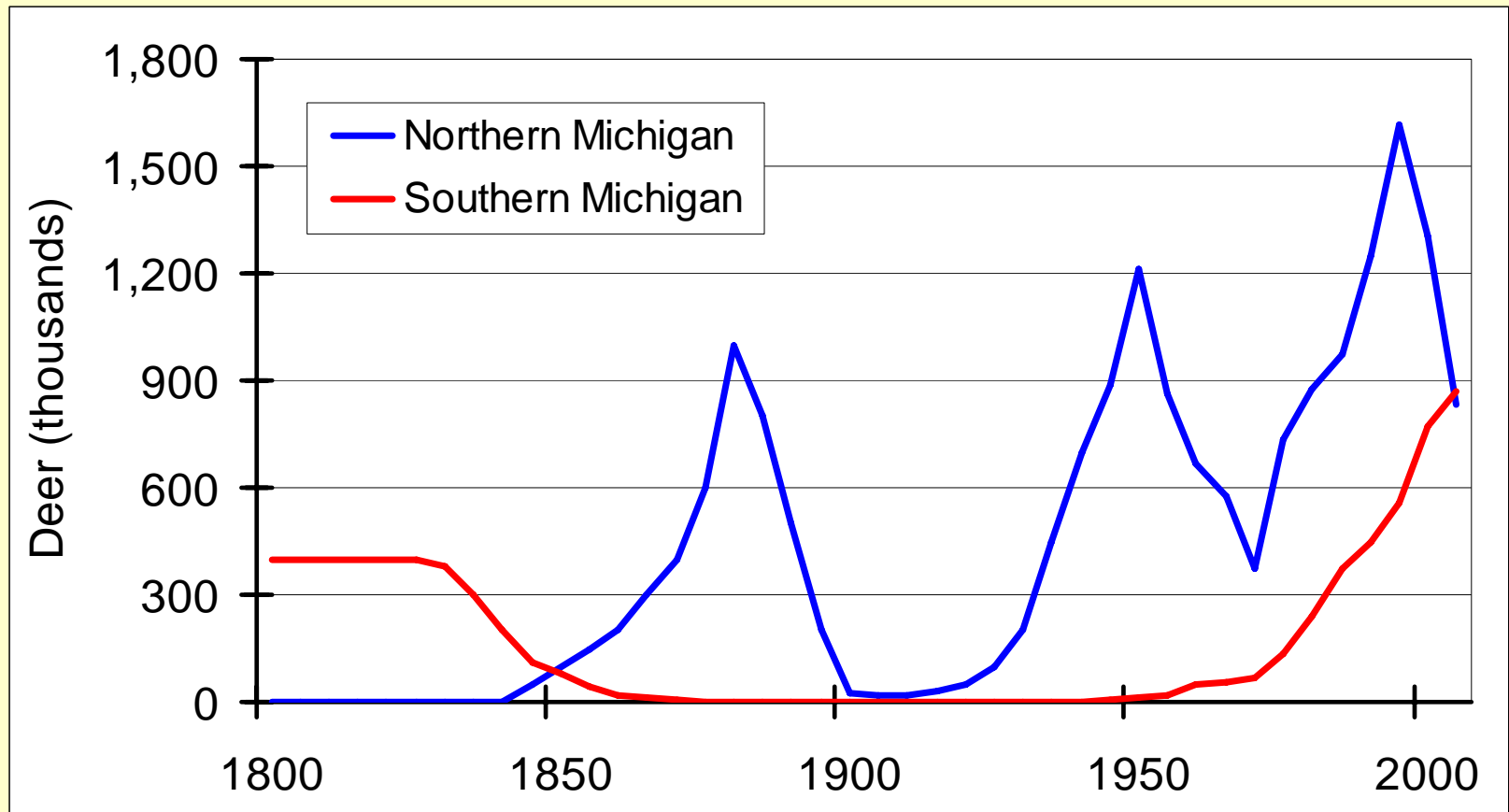
Early 1900s: Fire control, agencies, funds



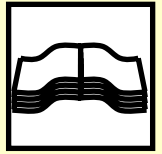
Michigan Deer Peak and Decline (Again)



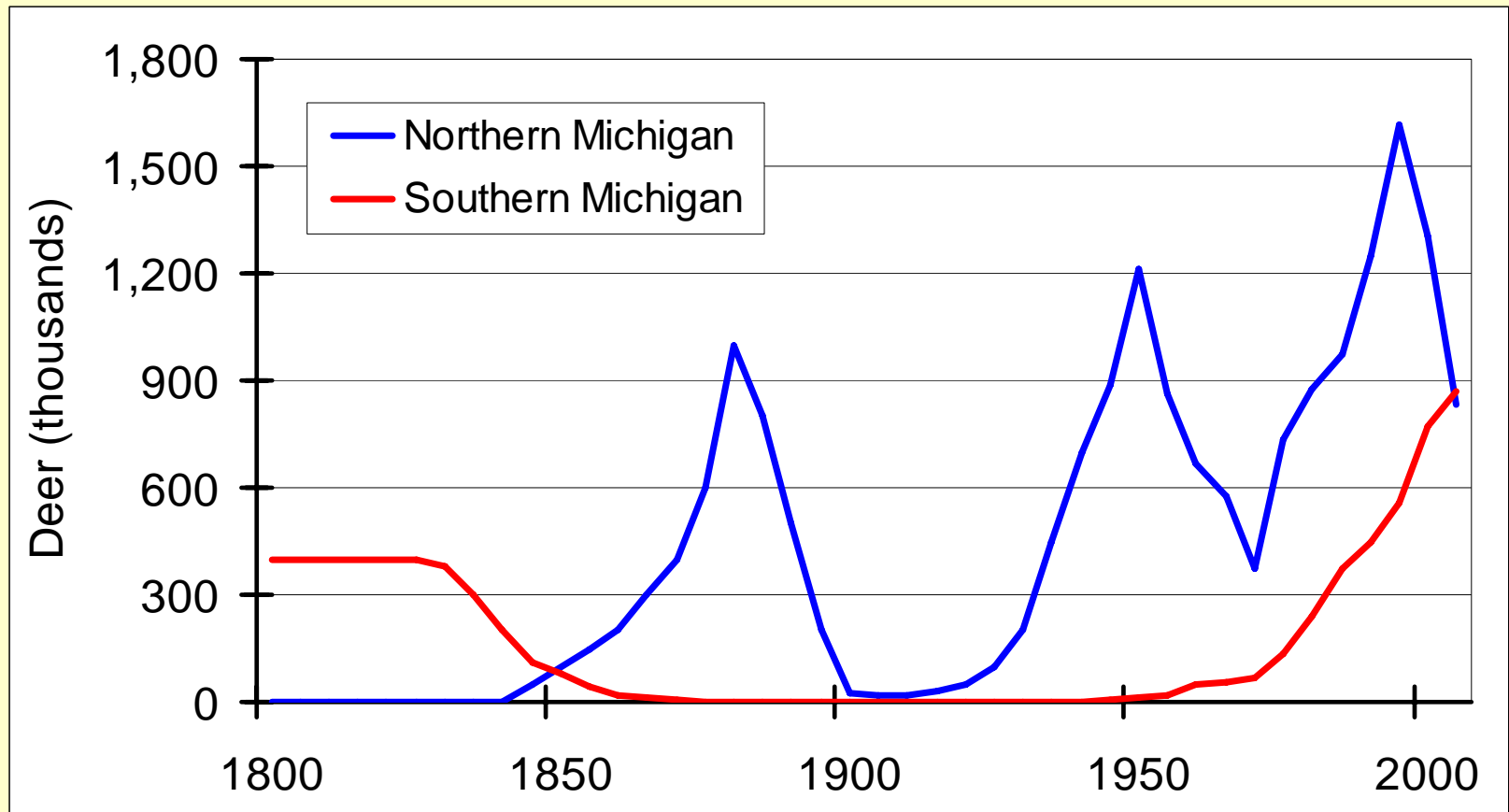
1940s: Antlerless deer hunting (crop damage)



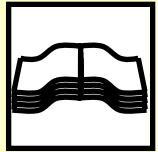
Michigan Deer Peak and Decline (Again)



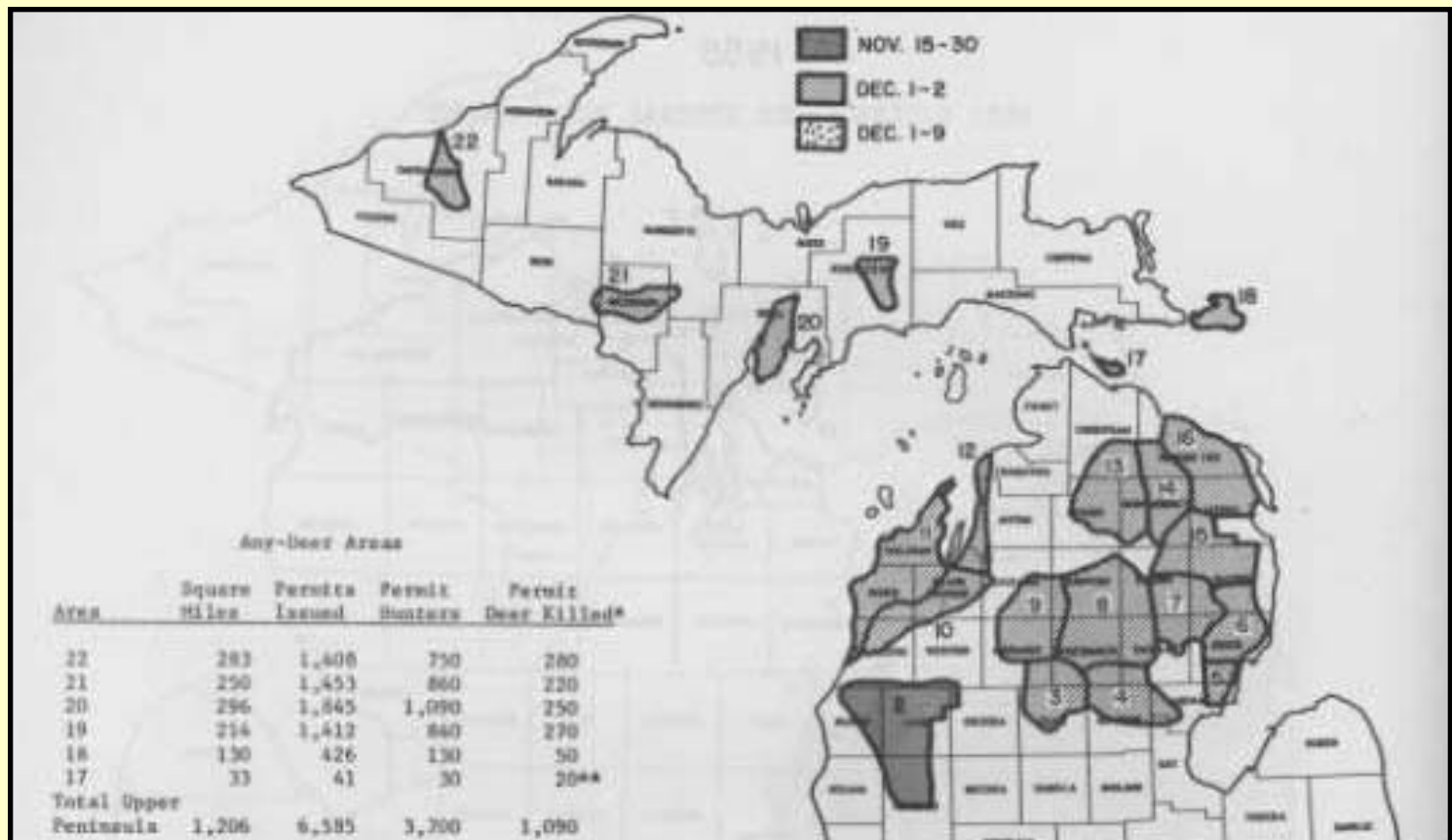
1950s and 60s: Browsed and mature forest



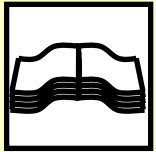
Antlerless Deer Harvest – Area and Quota



1956: First in UP since the “Buck Law”



Michigan Antlerless Deer Harvests

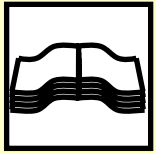


1966: Director MacMullan address...

“The popular way is not always the right way... Michigan deer seasons... must include as a basic principle the harvest of some antlerless deer every year. To do otherwise would mean... a tragic waste of a valuable resource but also... accelerated deterioration of the winter range and fewer deer for the future.”

MacMullan
(1966)

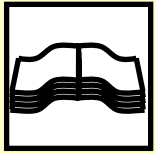
Michigan Deer Habitat Management



1971: Deer Range Improvement Program
\$1.50 per license, growing timber market

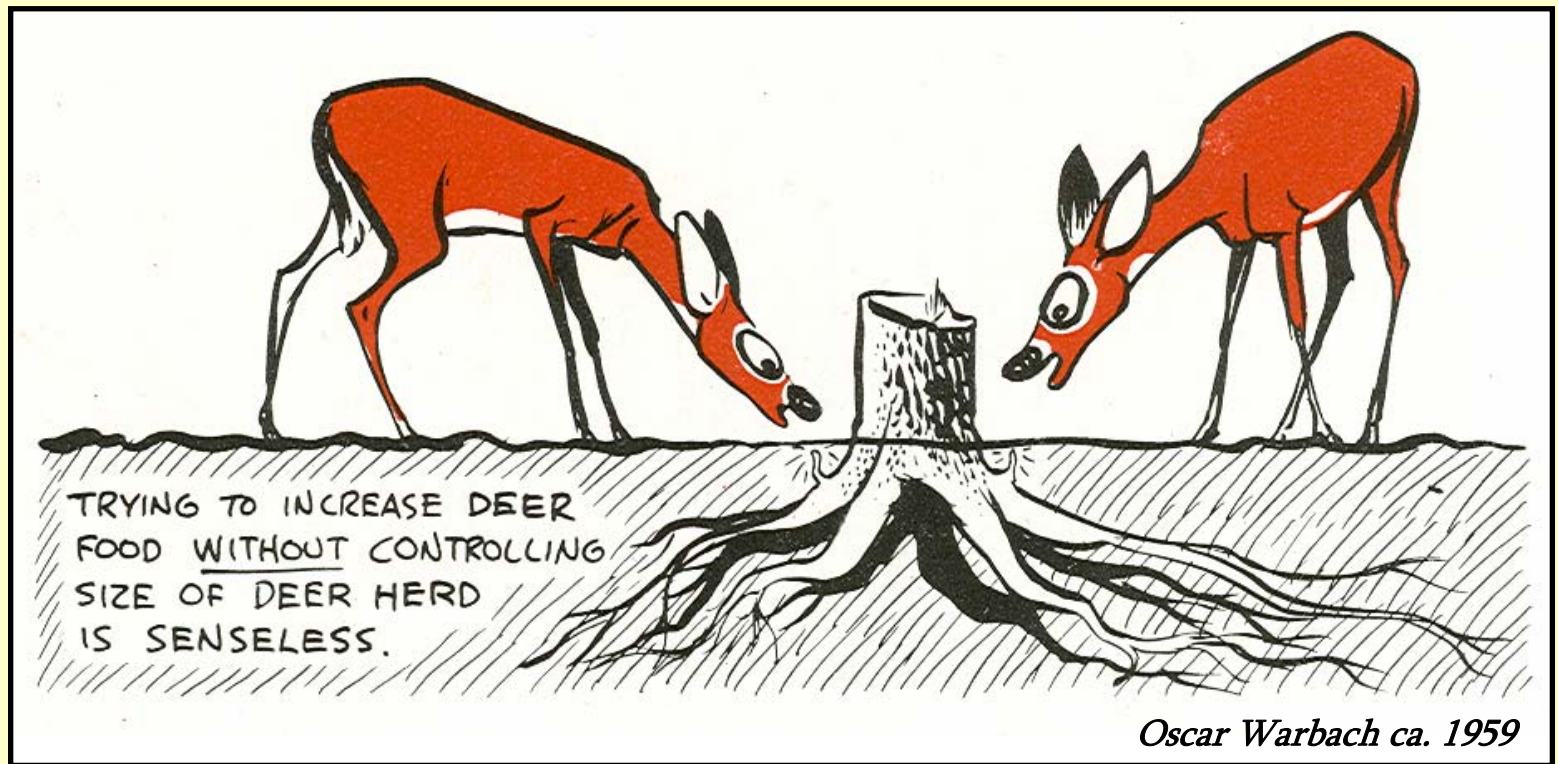


Michigan White-Tailed Deer Abundance

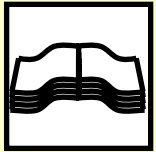


Modern (continuing) challenge:

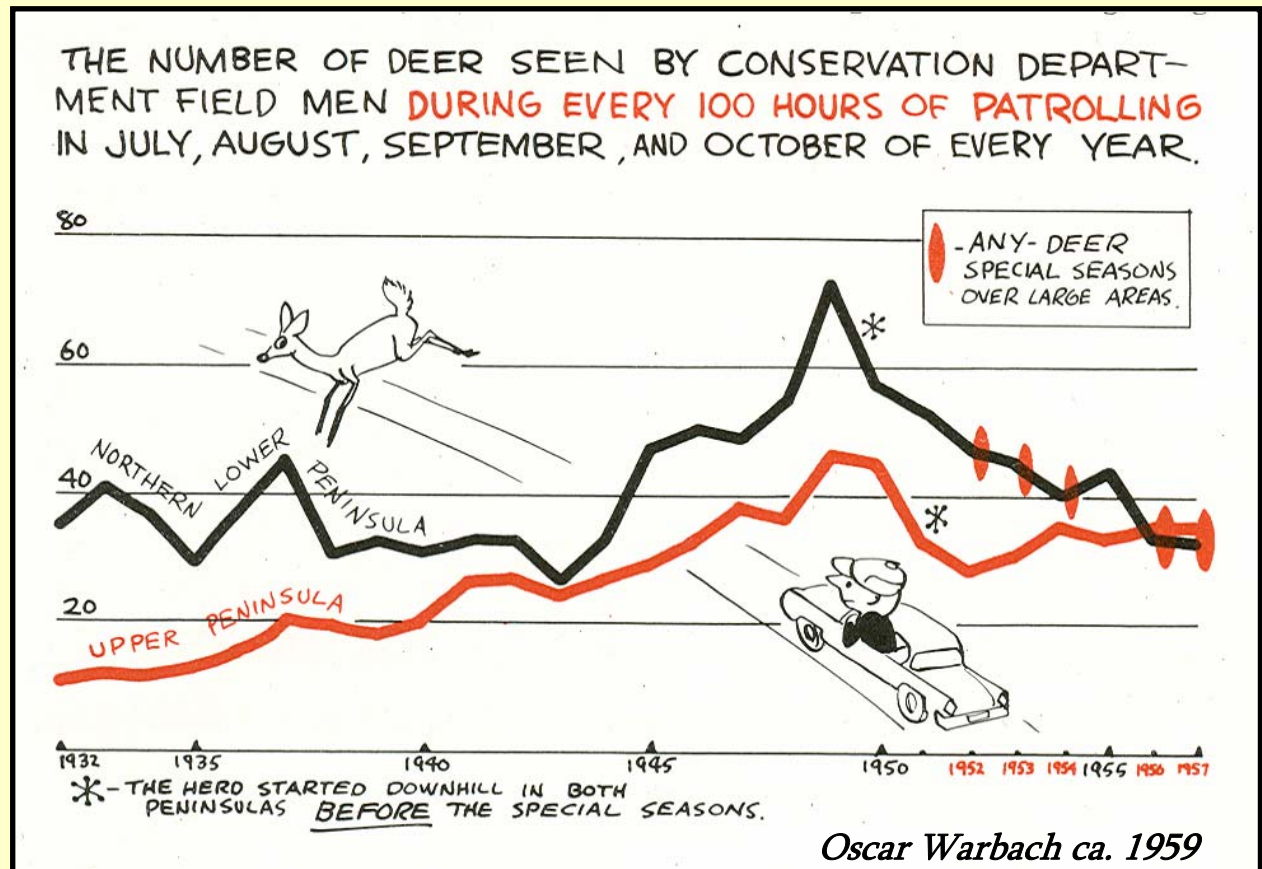
Habitat and population management



White-Tailed Deer Booms and Busts

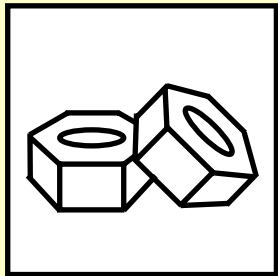


Slow action, crashes and confusion...

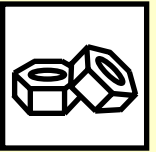


Nuts and Bolts

The Deer Management System in Michigan



Establishing Michigan Deer Regulations



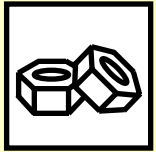
Act 451 (1994) - NREPA

- Identifies game species
- Establishes licenses and fees
- Gives DNR authority for method of take

Natural Resources Commission (NRC)

- 7 Governor-appointed members
- Establish policies, hire Director
- Proposal G (1996) - authority to regulate taking of game

Michigan Deer Management Policy



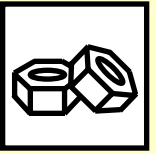
Manage deer using practices based on scientific research to address:

- Deer health, dictated by carrying capacity
- Effects on native plant communities, agricultural, horticultural, and silvicultural crops, public safety
- An active public information program
- Public education on methods of deer management, conditions needed to maintain a healthy, vigorous herd



(NRC Policy 2007, 1994)

Michigan Deer Population Trends

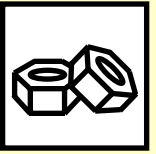


Multiple estimates/indicators:

- Harvest-based reconstruction (SAK)
- Deer-vehicle collisions
- Buck harvest (survey)
- Check station data
- Pellet counts



Sex-Age-Kill (SAK)



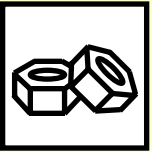
Generates estimates of...

- Bucks – harvest survey
- Antlerless – check station data
 - Buck:Doe (adjusted)
 - Fawn:Doe (direct)



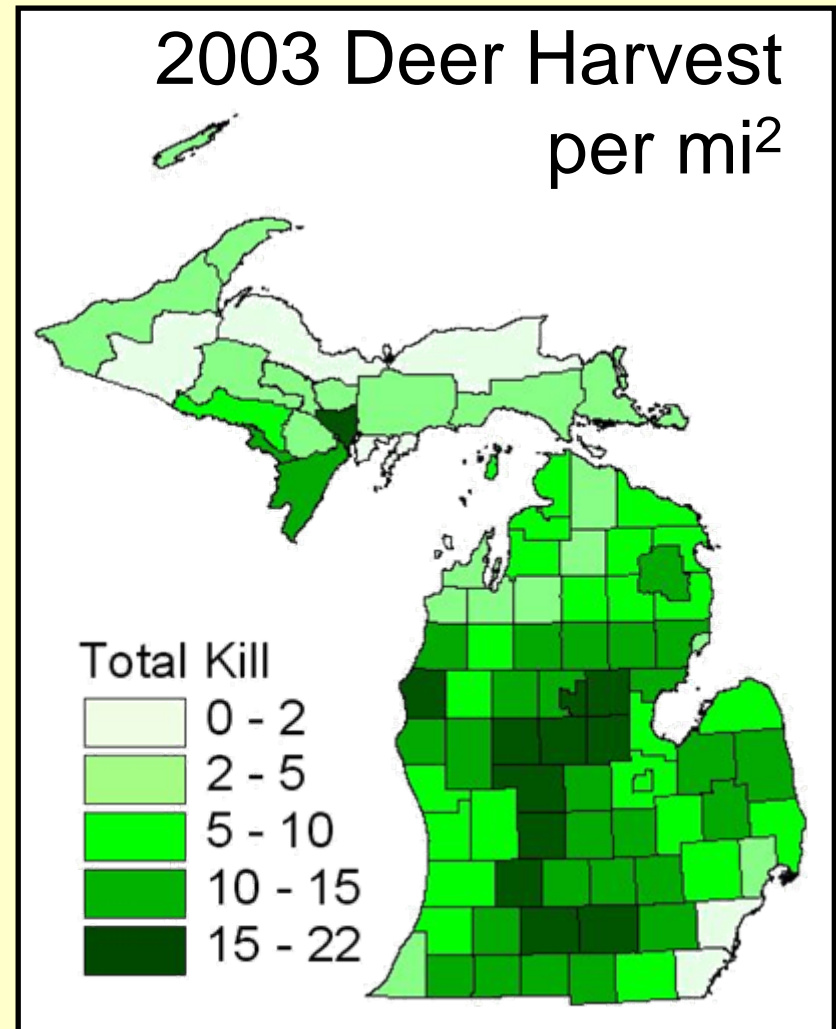
Creed et al. (1984)

Deer Management Units (DMUs)



2000-2001 DMU review

- Scale for data reliability
- Action plan to achieve policy objectives
- Boundaries clear to hunters, landowners, general public
- Ecologically associated

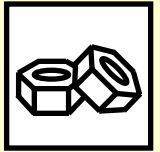


Midwestern DMUs (2000)



State/Province	Unit	Number	Mean Size (mi²)
MI (2000)	DMU	159	360
IN	County	92	390
WI	DMU	118	460
OH	County	88	470
IL	County	102	550
MI (2001)	County/DMU	90	640
MN	DMU	121	650
SD	DMU	75	1,000
MO	DMU	59	1,200
ND	DMU	41	1,700
IA	DMU	20	2,800
KS	DMU	18	4,100
ONT	DMU	95	4,300
NE	DMU	17	4,500

Deer Regulation Recommendations

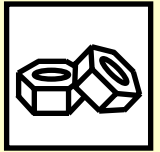


Successive stages:

- Specialists provide general considerations
- Habitat biologists initiate recommendations
- Review justification and consistency
 - MU Supervisor
 - Specialists
 - Section Supervisors/Chief

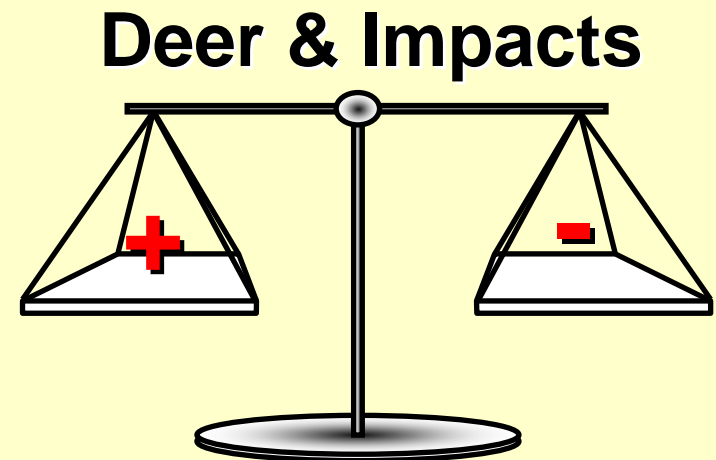


Michigan Deer Population Goals

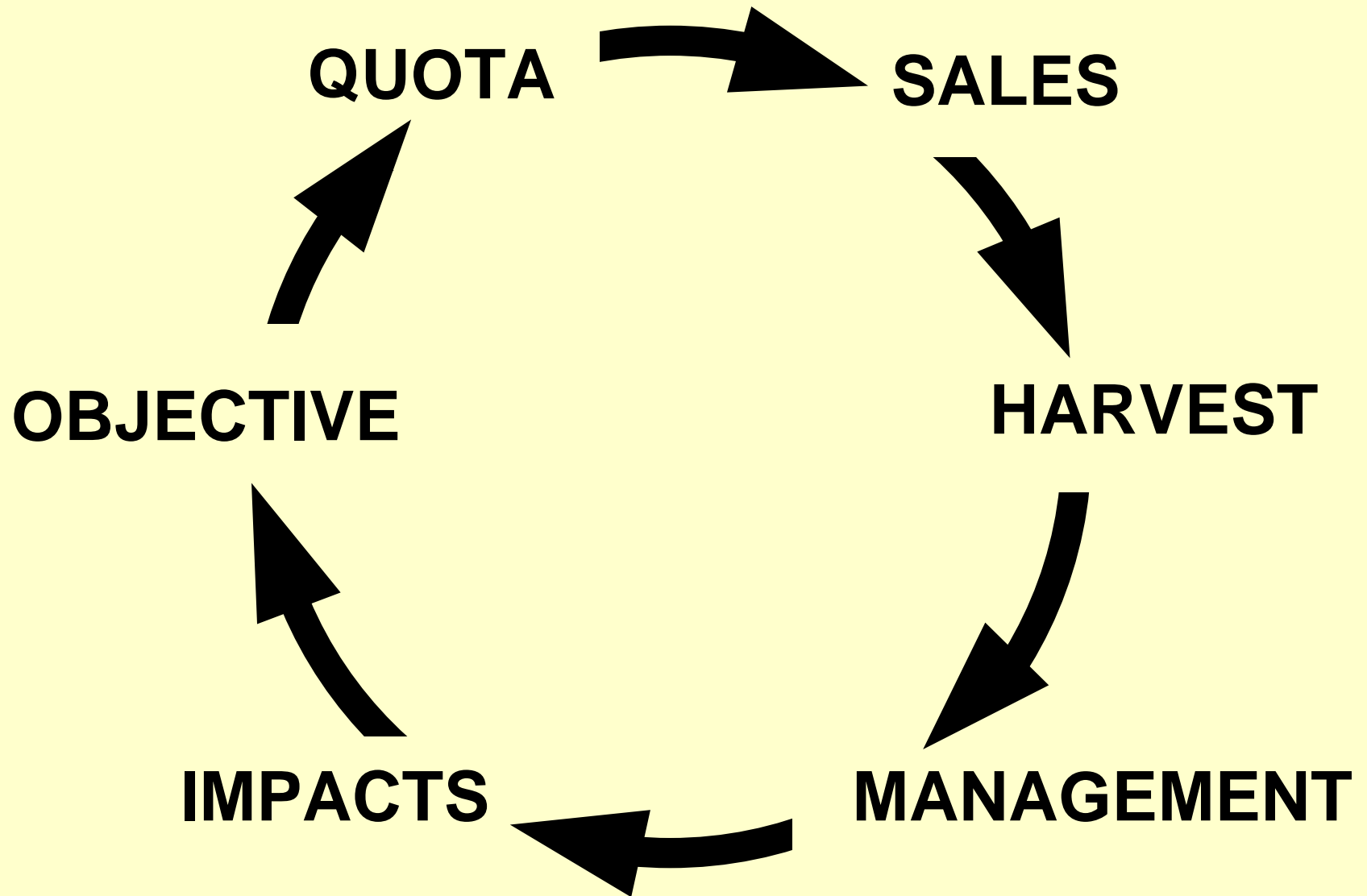
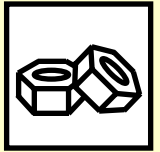


2006-2010 goal development:

- Management Unit & Division staff
 - Identify impacts and stakeholders
 - Discuss data/monitoring needs
- October NRC
- Public comment

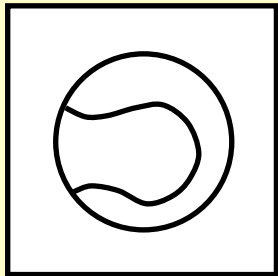


Deer Harvest and Population Management



Brain Surgery and Baseball

Challenges to Deer Management in Michigan

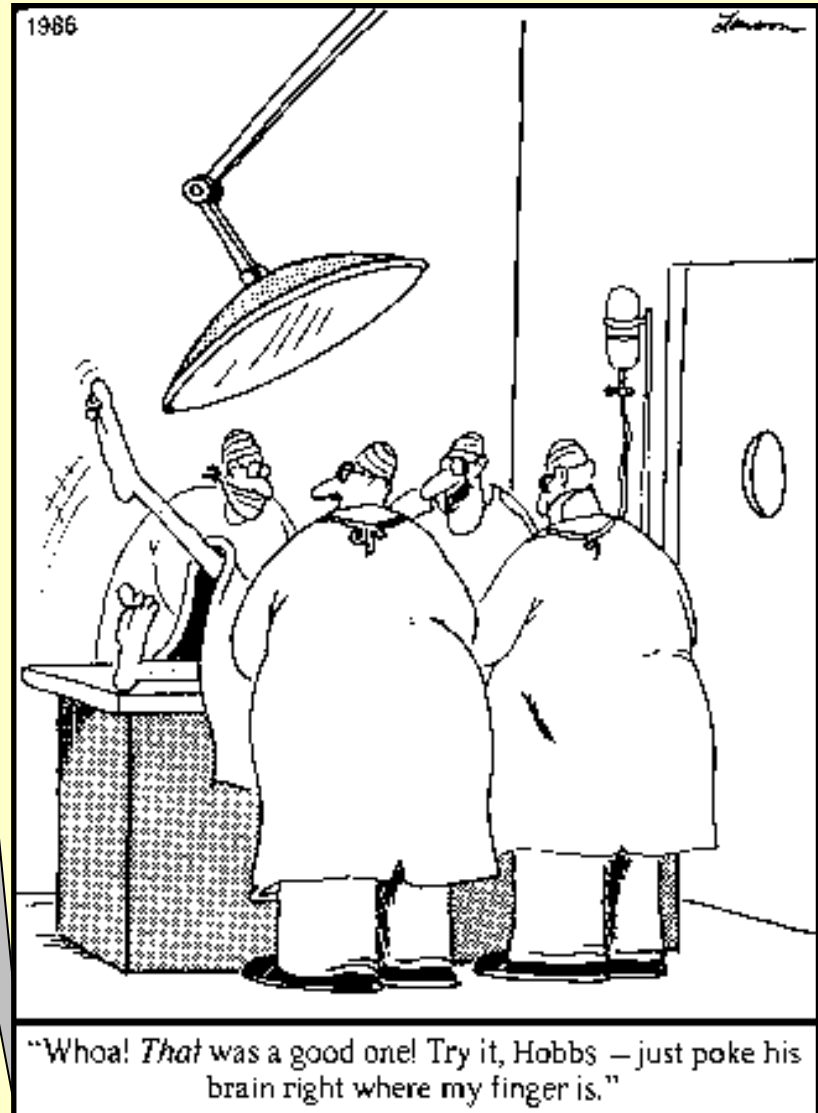


Deer Management isn't Brain Surgery...



...it's harder!

“Whoa! *That* was a good one! Try it, Hobbs – just poke his brain right where my finger is.”

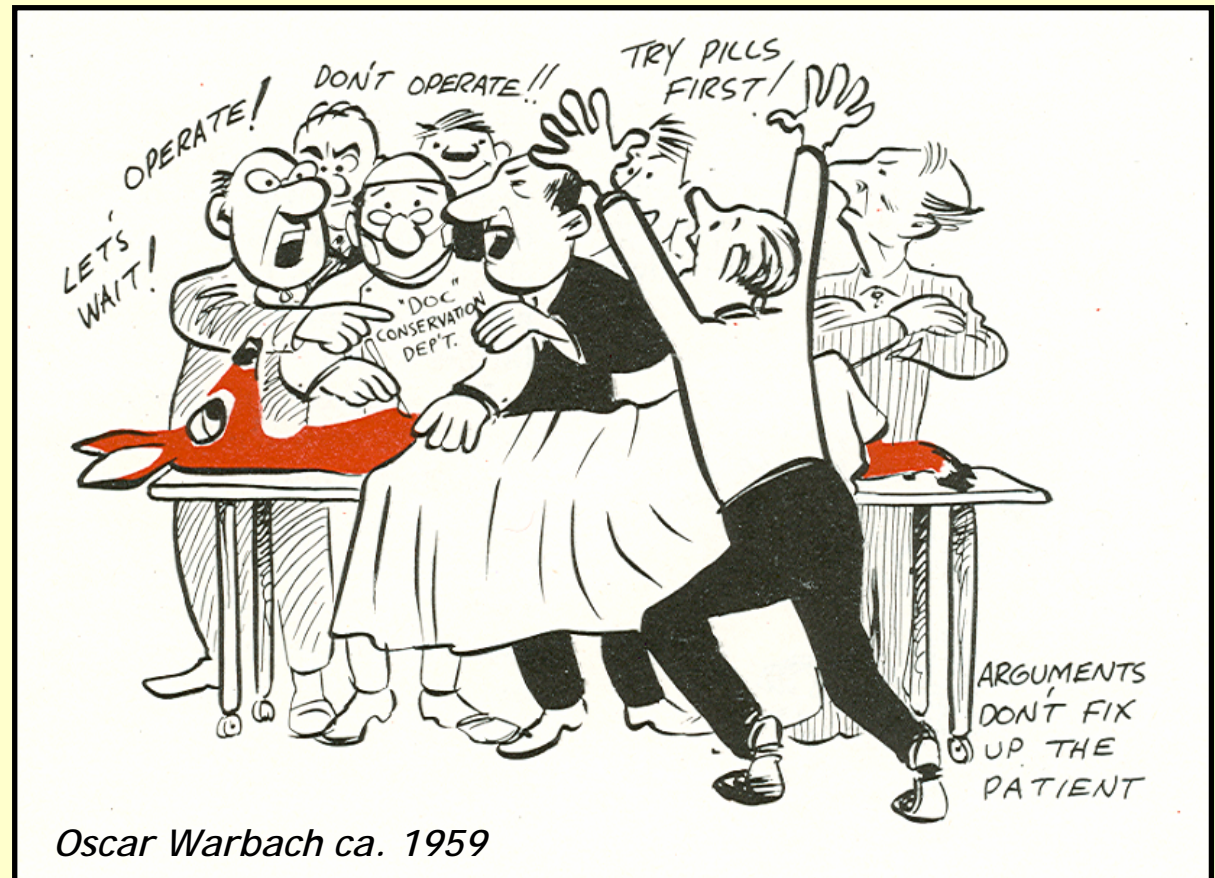


Deer Management isn't Brain Surgery...



...it's harder!

Not because
it's more
complex,
but because
it's more
controversial.



White-Tailed Deer in Michigan



- Widely hunted
 - ~800,000 licensees
 - ~750,000 hunters (90% of all)
 - ~10.5 million hunter days
- Frequently observed
 - Perhaps 45% of residents

Frawley (2004a), US Dept. Interior (1998), Mertig and Koval (2001)

Southern Michigan Muzzleloading



2005: season opens 7 days earlier

- 70% of harvest is antlerless
- <10% of total antlerless harvest



Frawley (2004*b*)

Southern Michigan Muzzleloading



Michigan Sportsman Forum

“Wiped ’em out [up] north. Now it is time to do the same in the Southern part of the state.”

“I agree... until we have a year where there are zero car/deer accidents and no crop damage reports, the insurance lobbyists will keep the checkbook open.”

www.michigan-sportsman.com/forum - Michigan
Whitetail Deer Hunting (4/17/05)

Southern Michigan Muzzleloading



Michigan Sportsman Forum

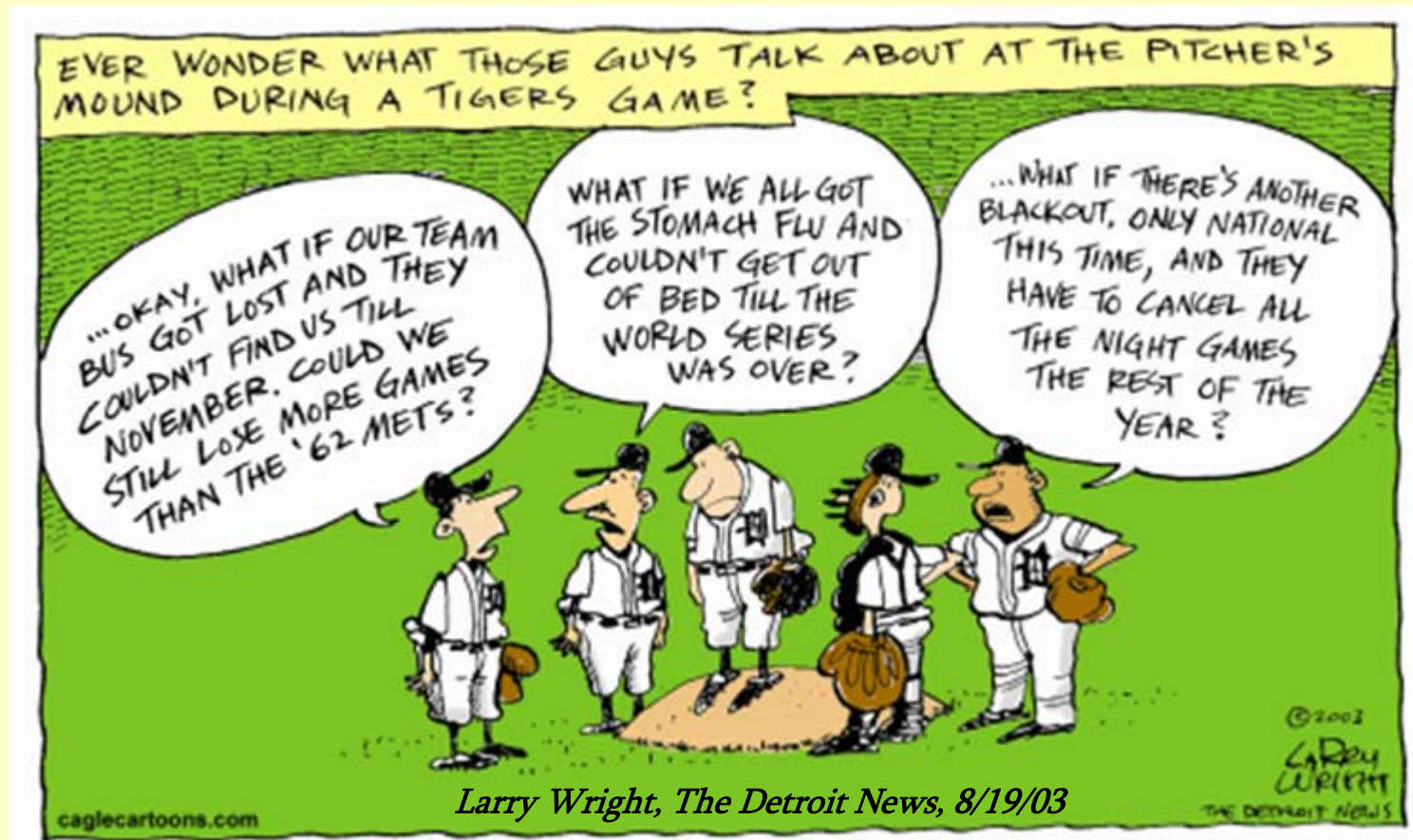
“In [southern Michigan], it should be one buck, eight points or better, and one antlerless. Accidental button buck kills would require use of the buck tag... Mandatory deer check-in within 24 hours of kill... You wanna see big bucks... wait until a few seasons of these rules kick in.”

www.michigan-sportsman.com/forum - Michigan
Whitetail Deer Hunting (4/17/05)

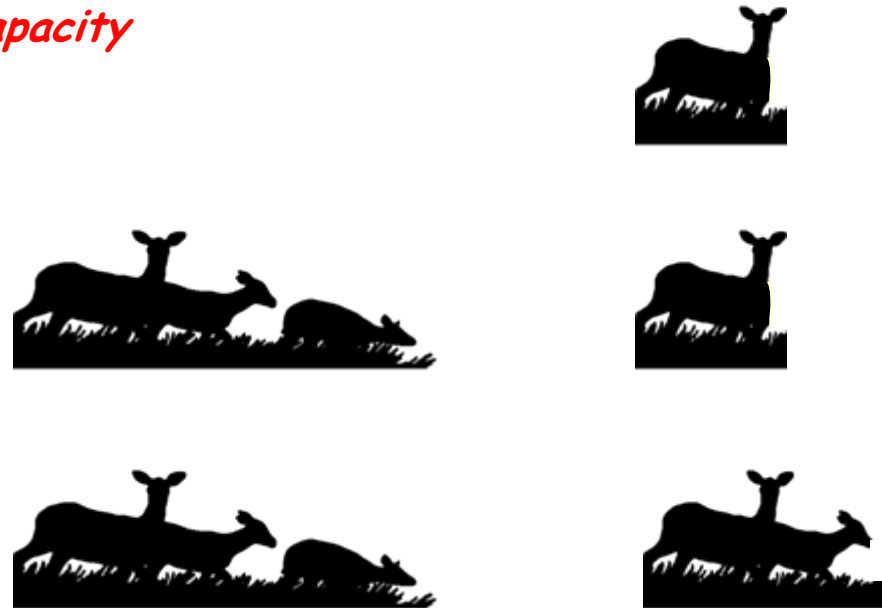
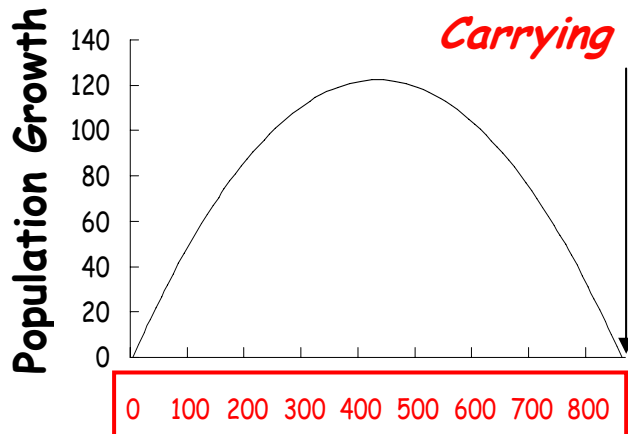
Deer Talk and Sports Talk



Criticism based on personal experience



White-Tailed Deer Population Growth



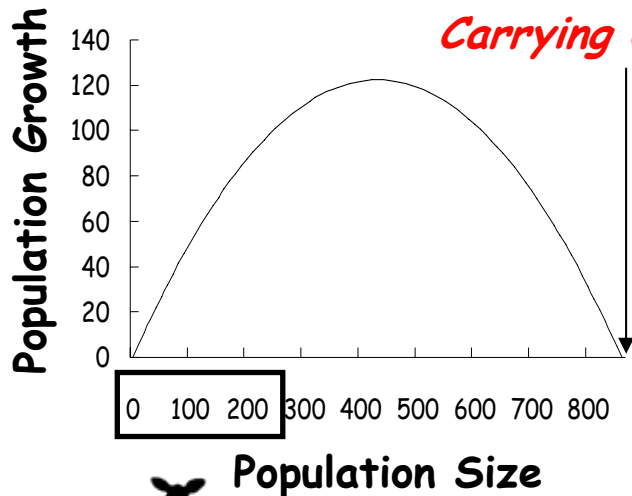
Nutrition High:

- All females breed
- 2-3 fawns per female
- Mortality low

Nutrition Low:

- Young females do not breed
- 0-1 fawns per female
- Mortality high

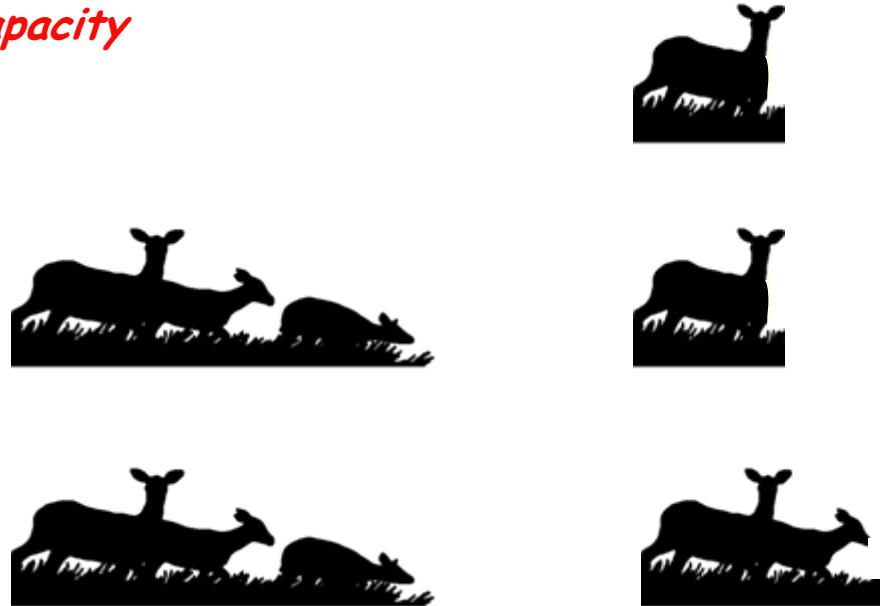
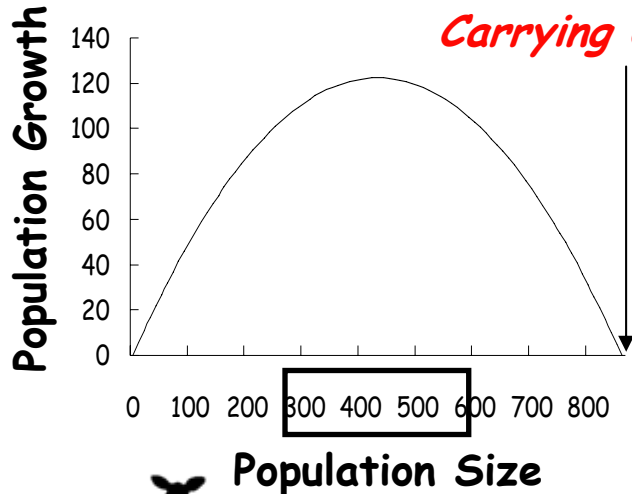
White-Tailed Deer Population Growth



Population Growth by Population Size:

Few females X high individual productivity = low growth

White-Tailed Deer Population Growth

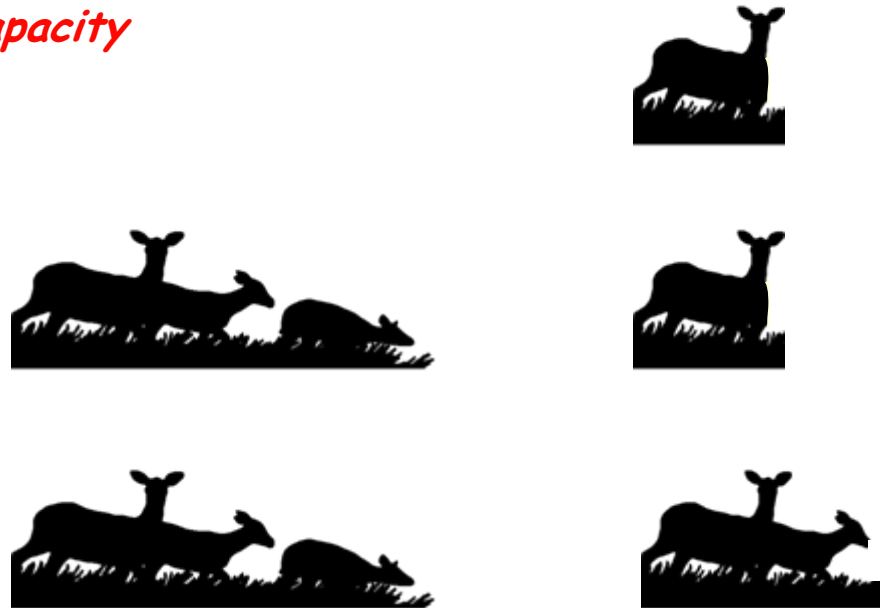
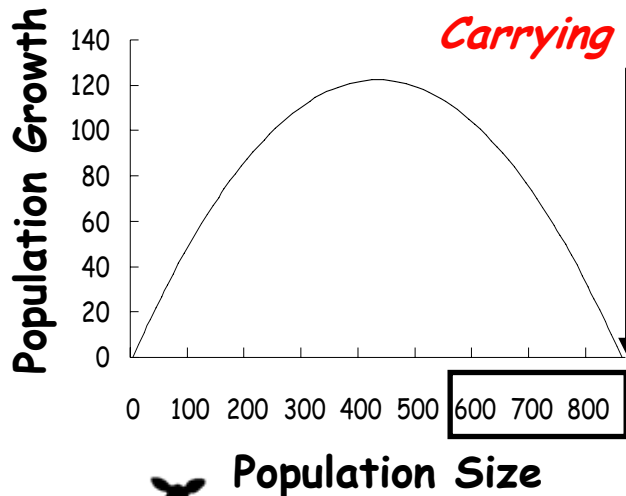


Population Growth by Population Size:

Few females X high individual productivity = low growth

More females X high individual productivity = high growth

White-Tailed Deer Population Growth



Population Growth by Population Size:

Few females X high individual productivity = low growth

More females X high individual productivity = high growth

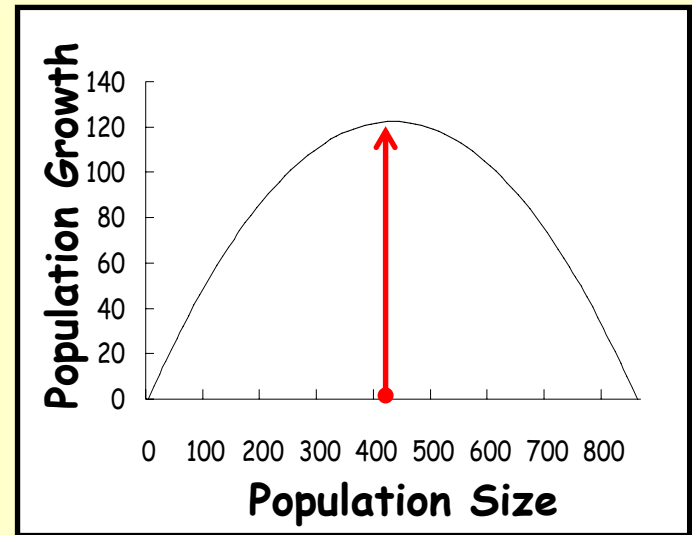
Many females X low individual productivity = low growth

White-Tailed Deer Population Growth



Reduced densities:

- Higher growth
 - Replace higher harvest
- Healthy, productive deer
- Reduced browsing damage
- Reduced buck dispersal
- Improved antler development

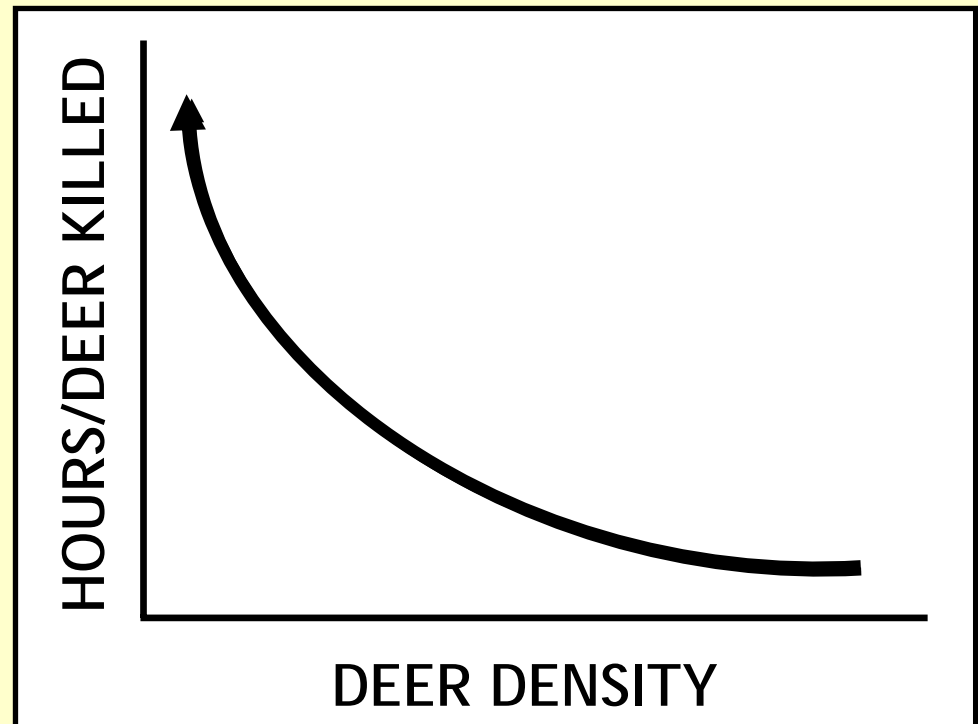


White-Tailed Deer Booms and Busts



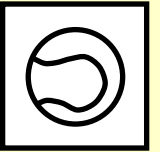
Reduced densities:

- Reduced sighting & harvest rates



VanDeelen and Etter
(2003)

Herbivory and Regeneration



Single factors failed to explain

- Herbivory
- Lighting regimes
- Site conditions

Sage et al. (2003)



Deer Talk and Sports Talk



Significant difference...



Hunting as a Deer Management Tool



Complications:

- Access
- Hunter and deer distribution
- Hunter behavior

Brown et al. (2000), Conner et al. (2001), Vieira et al. (2003), Giles and Findlay (2004), Stedman et al. (2004)



Hunter Choices and Behavior



Social norms and individual beliefs:

- What is desirable
 - Keeping up with the... Gateses
- What is attainable
 - Recent abundance = luxury of choice

Steinhauer (2005),
Clancy (2000)

What Makes the
'EXPERTS'
So Successful?

It takes enormous dedication to become a consistently successful big-buck hunter, but you don't have to be a fanatic to learn more about deer and deer hunting. The author reveals the secrets of eight of the country's best deer hunters. Don't be surprised if their names aren't familiar. They shouldn't be, because these hunters are working-class deer enthusiasts.



LEE LAKOSKY

KEVIN SMITH

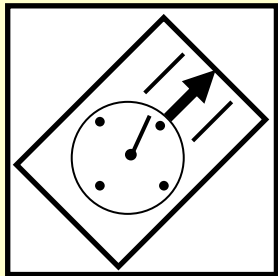
TOM INDREBO

118 DEER & DEER HUNTING

NOVEMBER 2000

Plotting the Course

The Future of Deer Management in Michigan



Hunters as Managers



Stewardship... probably not...

“A thing is right when it tends to maintain the integrity, stability, and beauty of the biotic community, it is wrong when it tends otherwise.”

Aldo Leopold,

A Sand County Almanac (p. 266)



Holsman (2000)

Hunters as Managers



Management... potentially...

Frequent antlerless license buyers survey

- NOT IMPORTANT...
reduce the population = 46%
- VERY IMPORTANT/IMPORTANT...
balance buck:doe = 61%

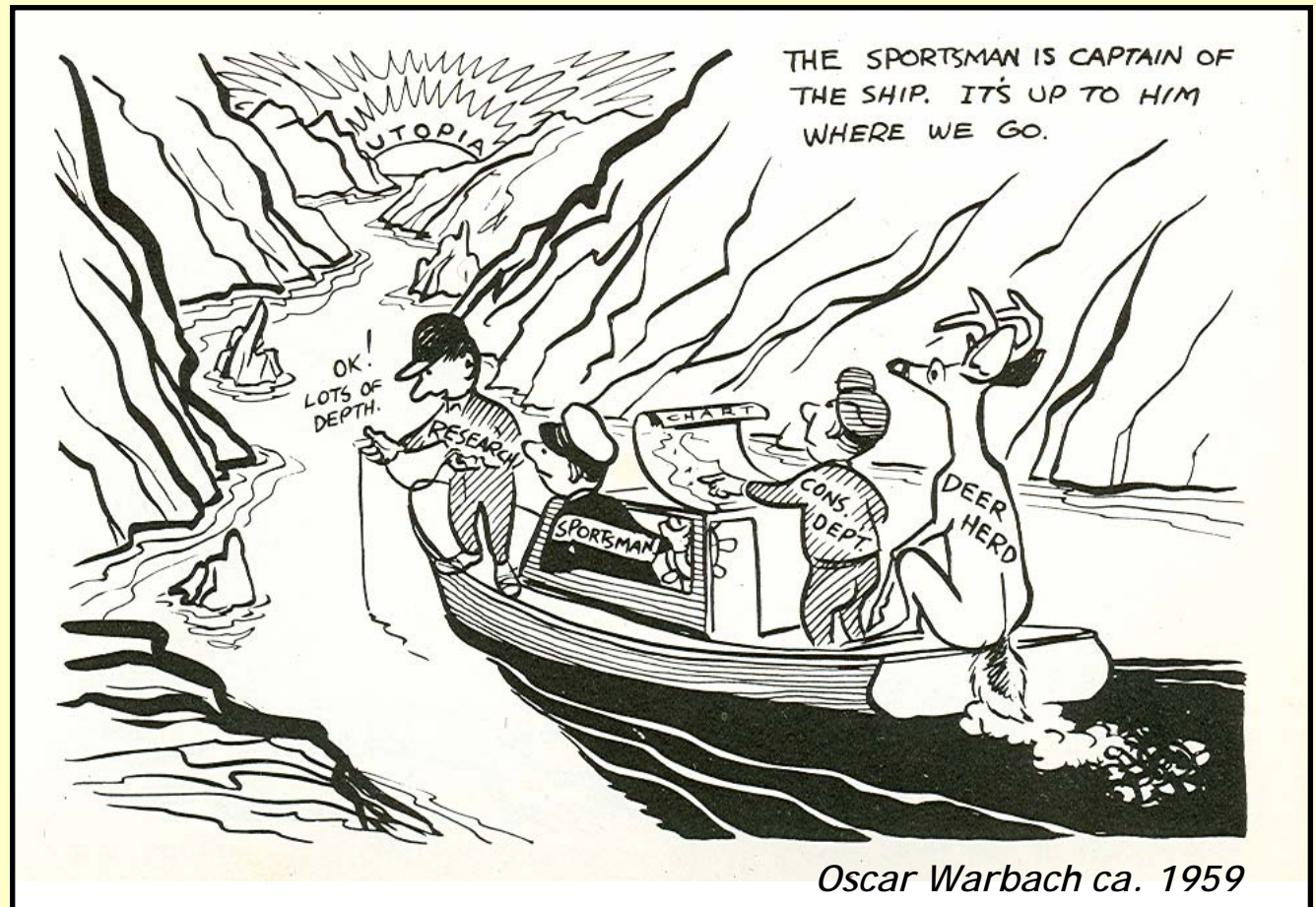
Michigan DNR
(unpublished data)



Historical Perspective



Remember our past...



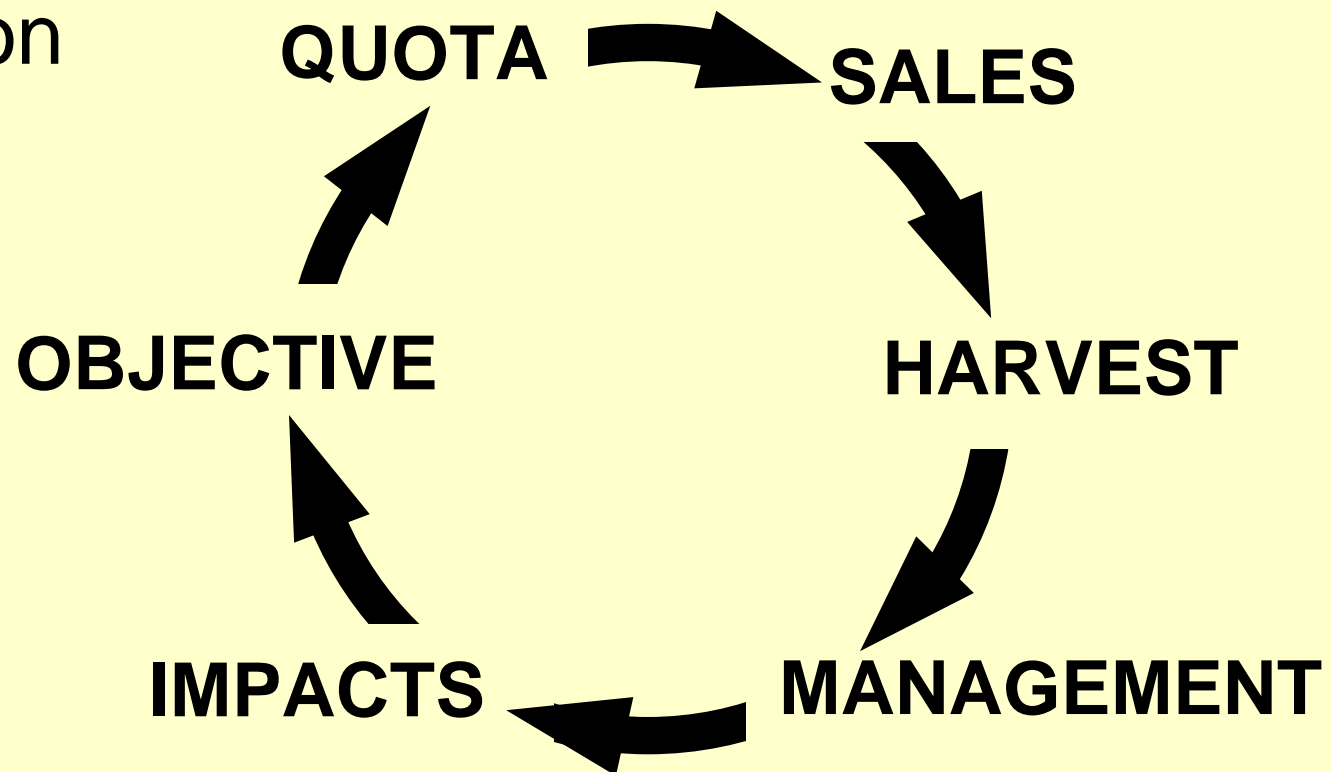
Woolf and
Roseberry
(1998)

Deer Harvest and Population Management



Use simple models...

- Abstraction of system
- Think usefully about a problem



Starfield and
Bleloch (1991)

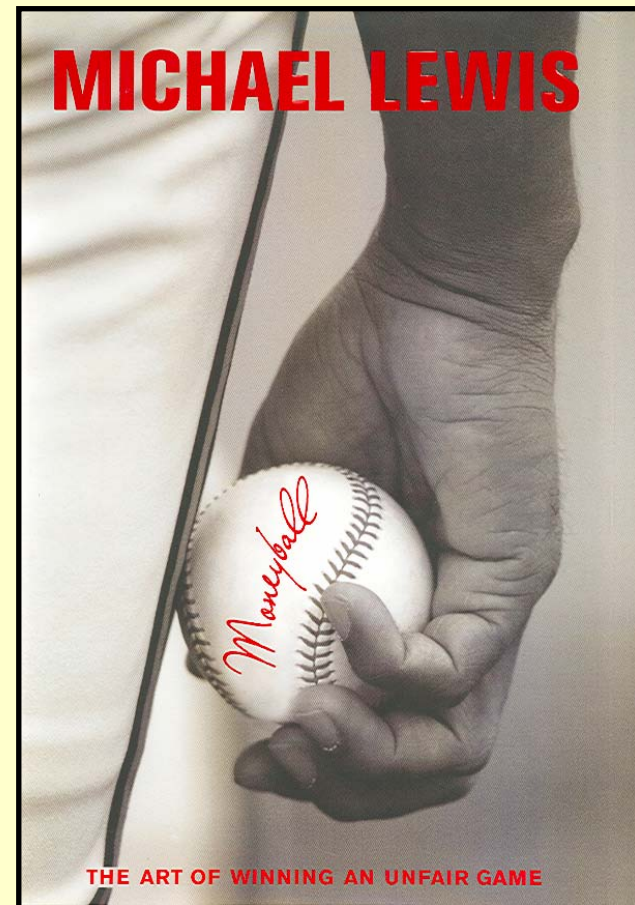
Deer Harvest and Population Management



Question basic assumptions...

- Don't generalize from own experience
- Make full use of information at hand

Lewis (2003)



Hunters as Stakeholders



Hunter segmentation

- Identify audiences and messages
- Targeted outreach, education, marketing

Decker and Connelly (1989)



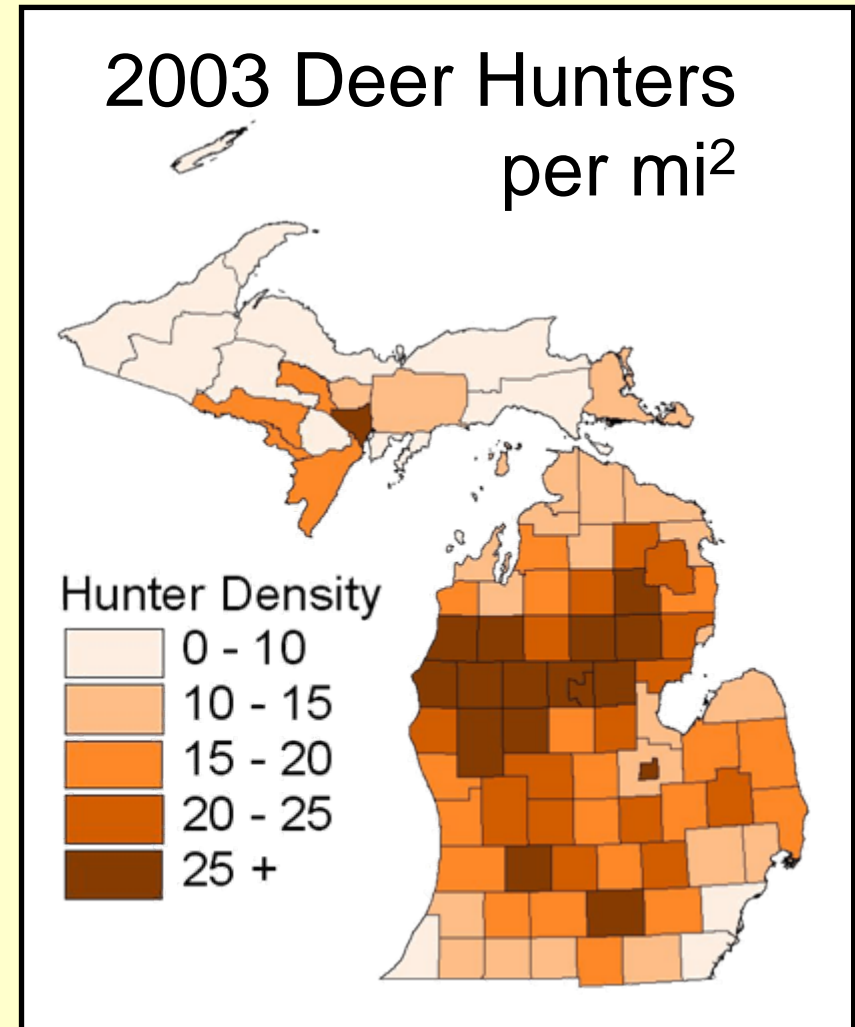
Scale of Management



Issue segmentation

- Identify areas with greatest need
- Consider intensity of alternatives - localized management?

Porter et al. (1991), McNulty et al. (1997), Oyer and Porter (2004), Comer et al. (2005)

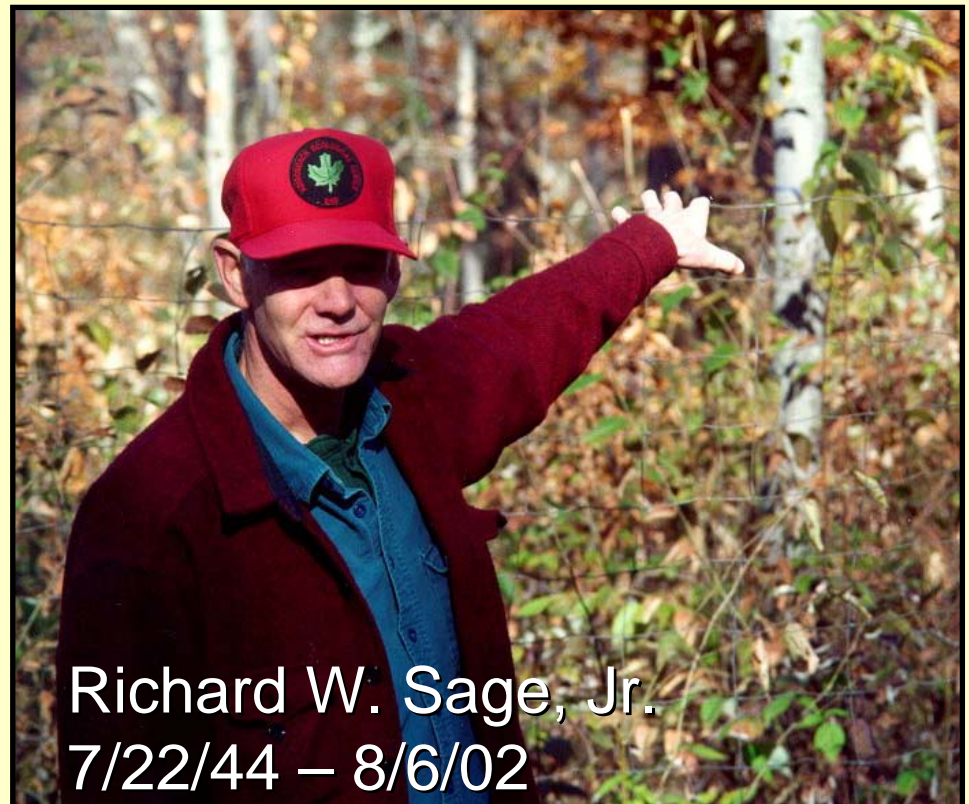


Embrace Ecosystem Management



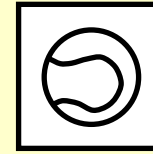
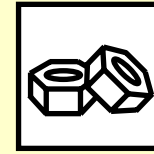
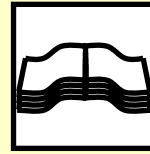
Commitment to...

- Better understanding of impacts
- Collaboration of multiple disciplines



Richard W. Sage, Jr.
7/22/44 – 8/6/02

QUESTIONS?



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rudolphb@michigan.gov**



References: 1 of 3

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