Minnesota Forest Wildlife: Timber Resource Changes and Wildlife Populations

DNR Wildlife Presentation to the Minnesota Forest Resource Council

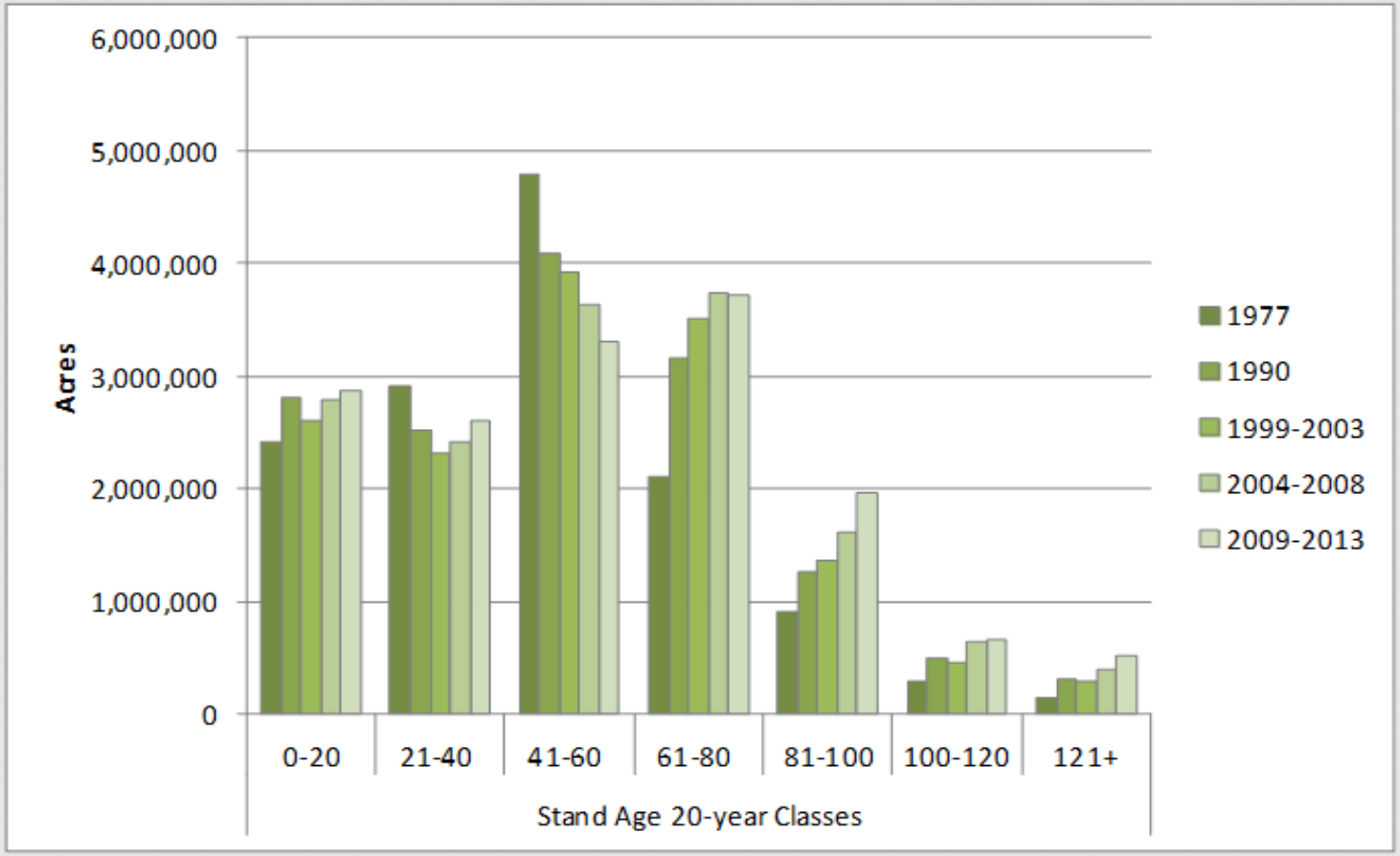
Carlos Avery WMA, March 18, 2015

Ted Dick
Forest Game Bird Coordinator

Part of the Forest Wildlife Habitat Team

How changes in timber harvesting over the past 20 years, and especially the steep declines in timber harvesting on private forestland in the past 10 years, **are likely** to have influenced populations of deer, ruffed grouse and American woodcock.

Figure 1. Age class distribution of MN's growing stock trees on timberland from 1977 to 2013 (USDA Forest Service FIA).[7]



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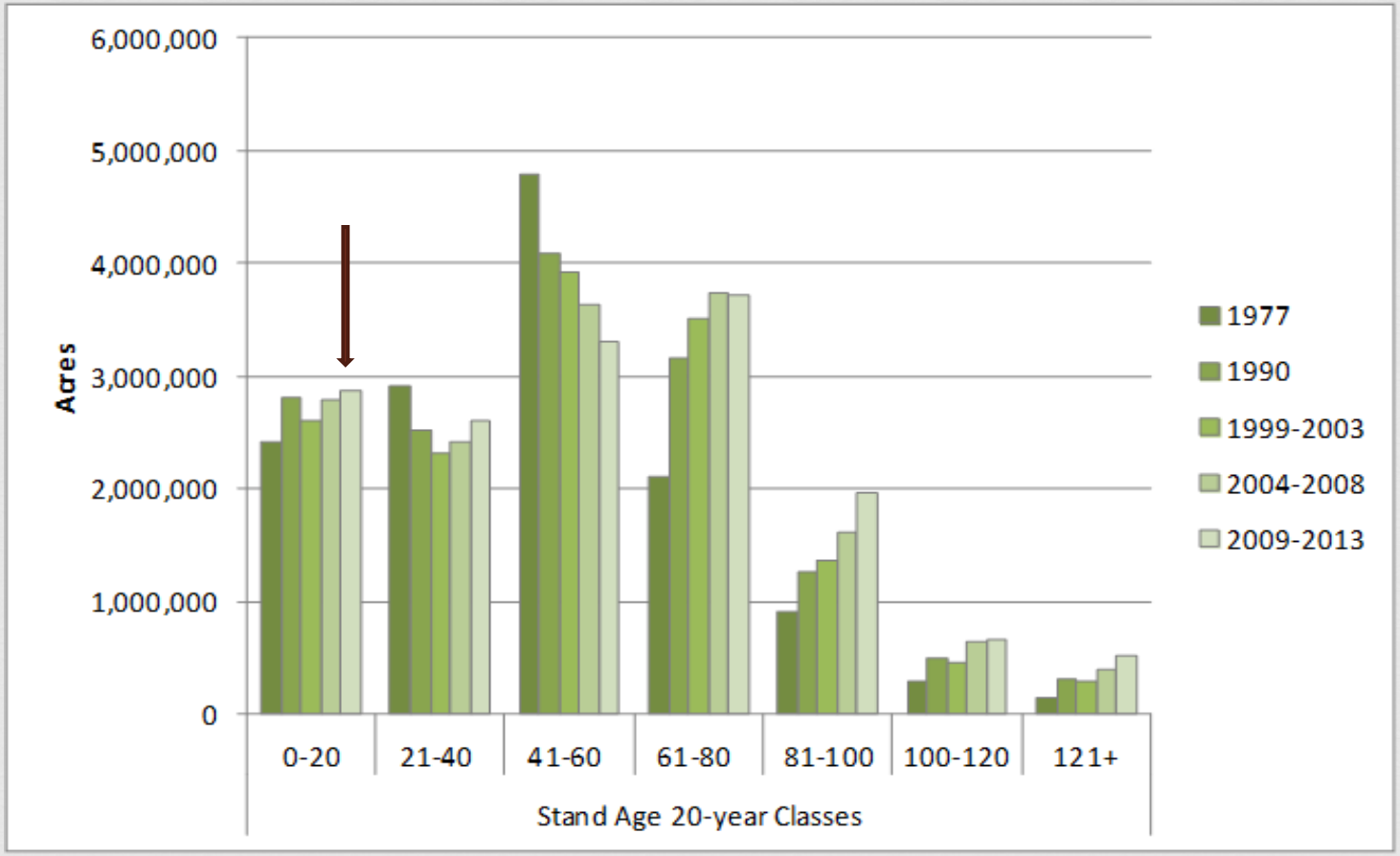

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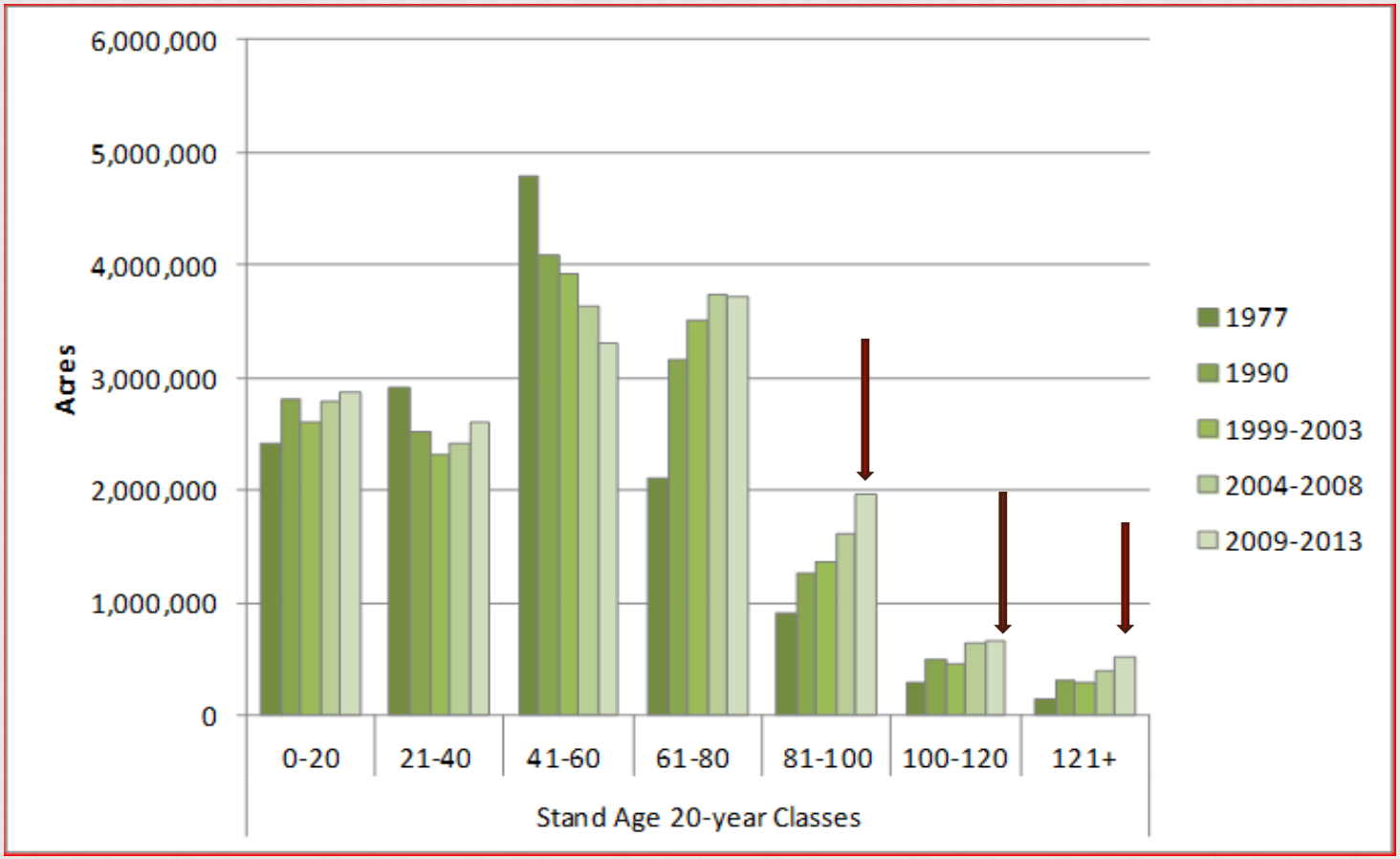

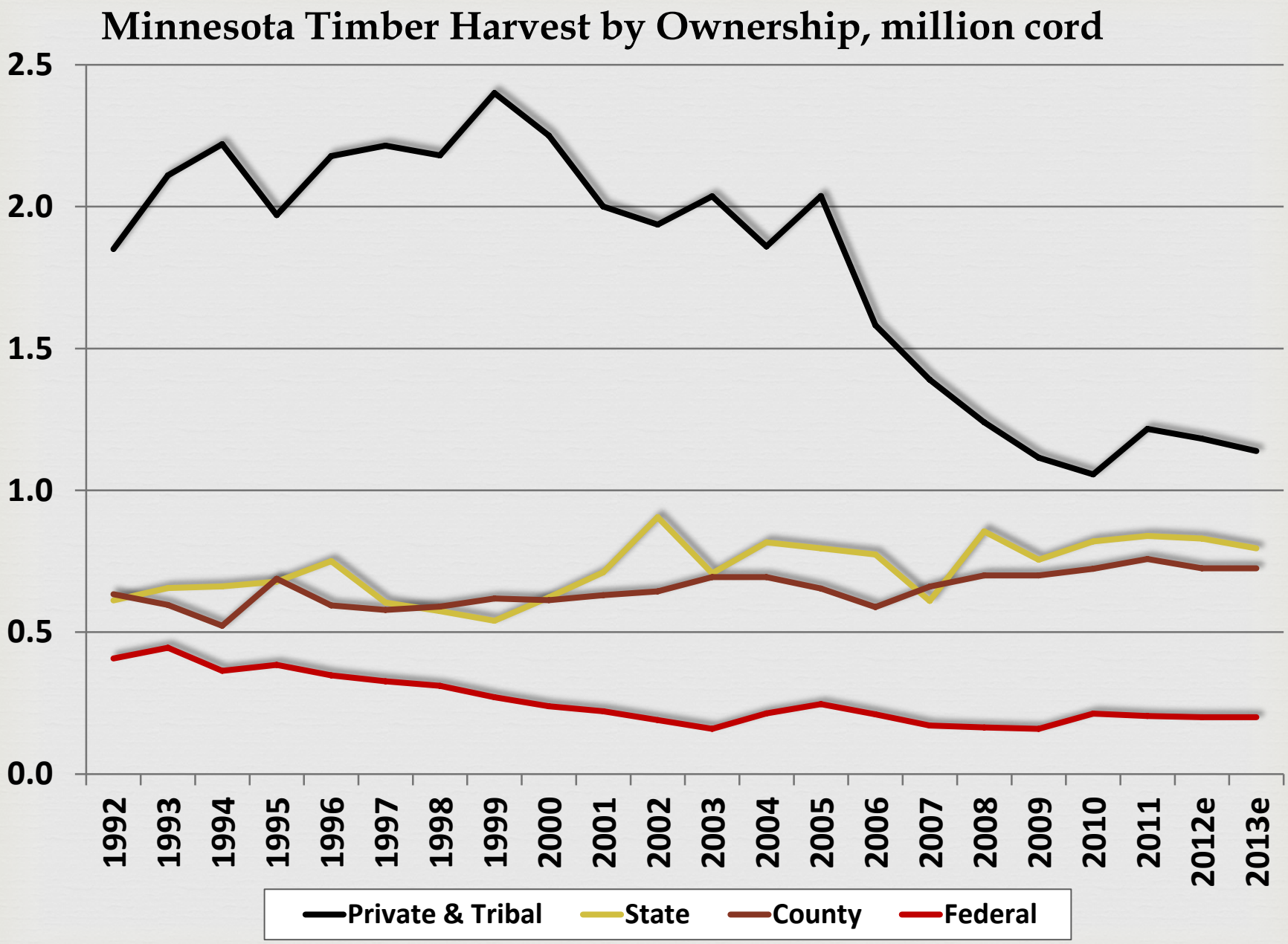
Minnesota Timber Harvest by Ownership, million cord
2.5
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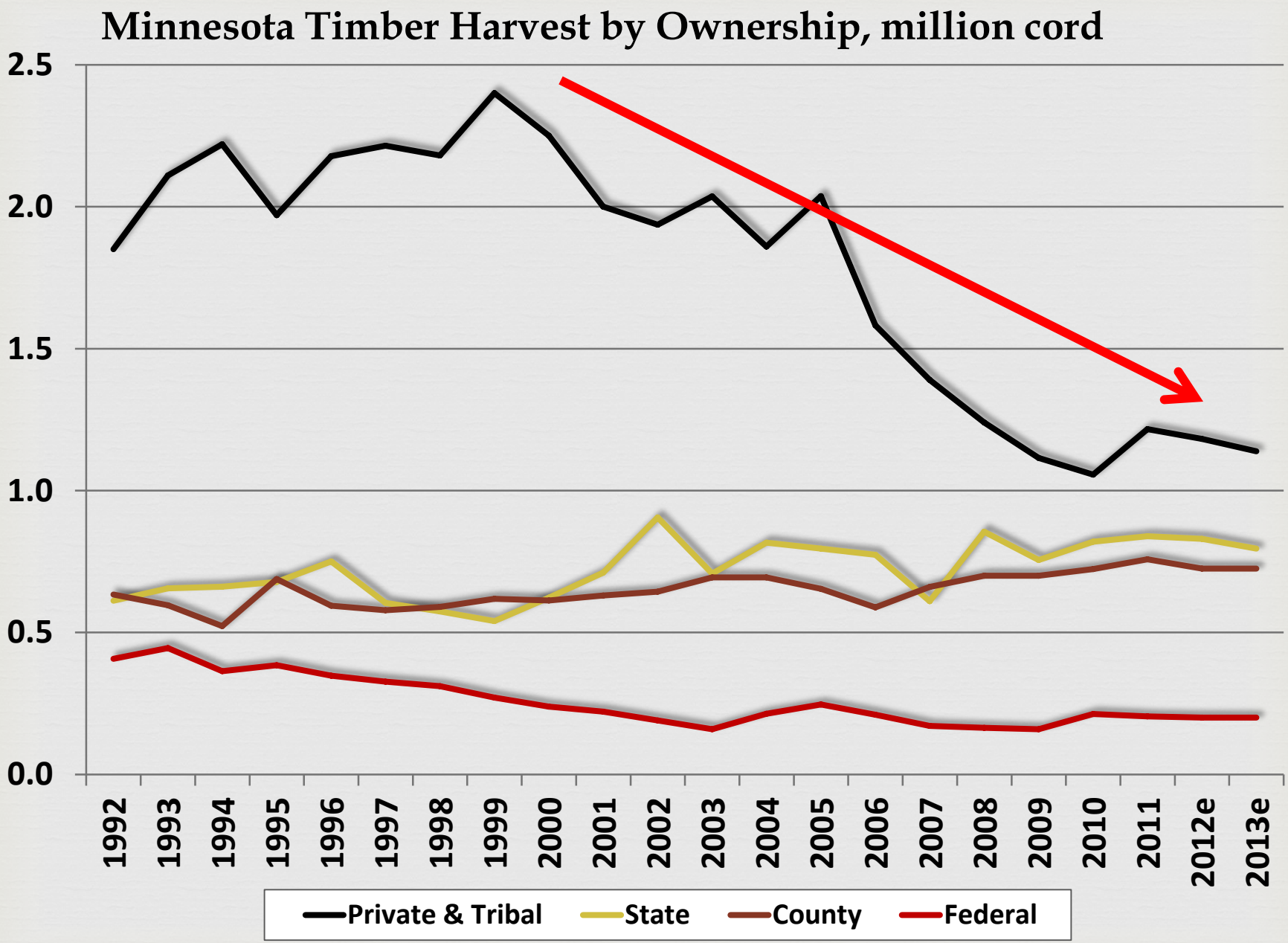
County
Federal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Private & Tribal
State
County
Federal

DNR Mission

- Work with citizens to conserve/manage state's natural resources
- Provide outdoor recreation opportunities
- Provide for commercial uses of natural resources to create sustainable quality of life

Forest Sustainability: Managing for Diversity

A Diversity of Sustainable Benefits

(“*timber; water; fish and wildlife habitat; biodiversity; recreation; soil; climate; rare and distinctive flora and fauna*…” defined in MS 89A)

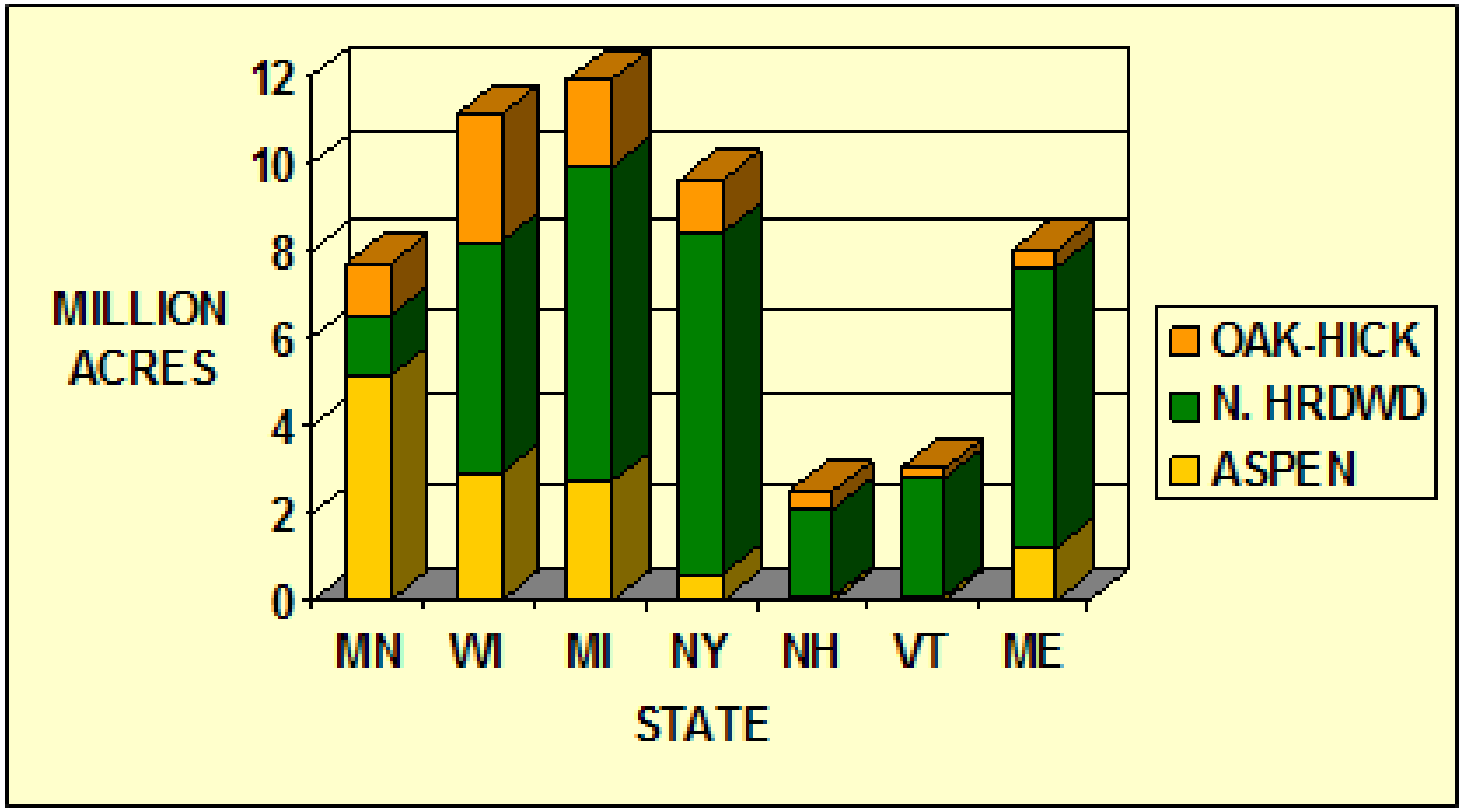
A Diversity of Forest Types and Ages

(e.g., pine, aspen, oak and others; young, mature, and old…..)

A Diversity of Silviculture Practices

(e.g., even-aged management with short and long rotations; all-aged management with selective harvest; natural and artificial regeneration……..etc.)

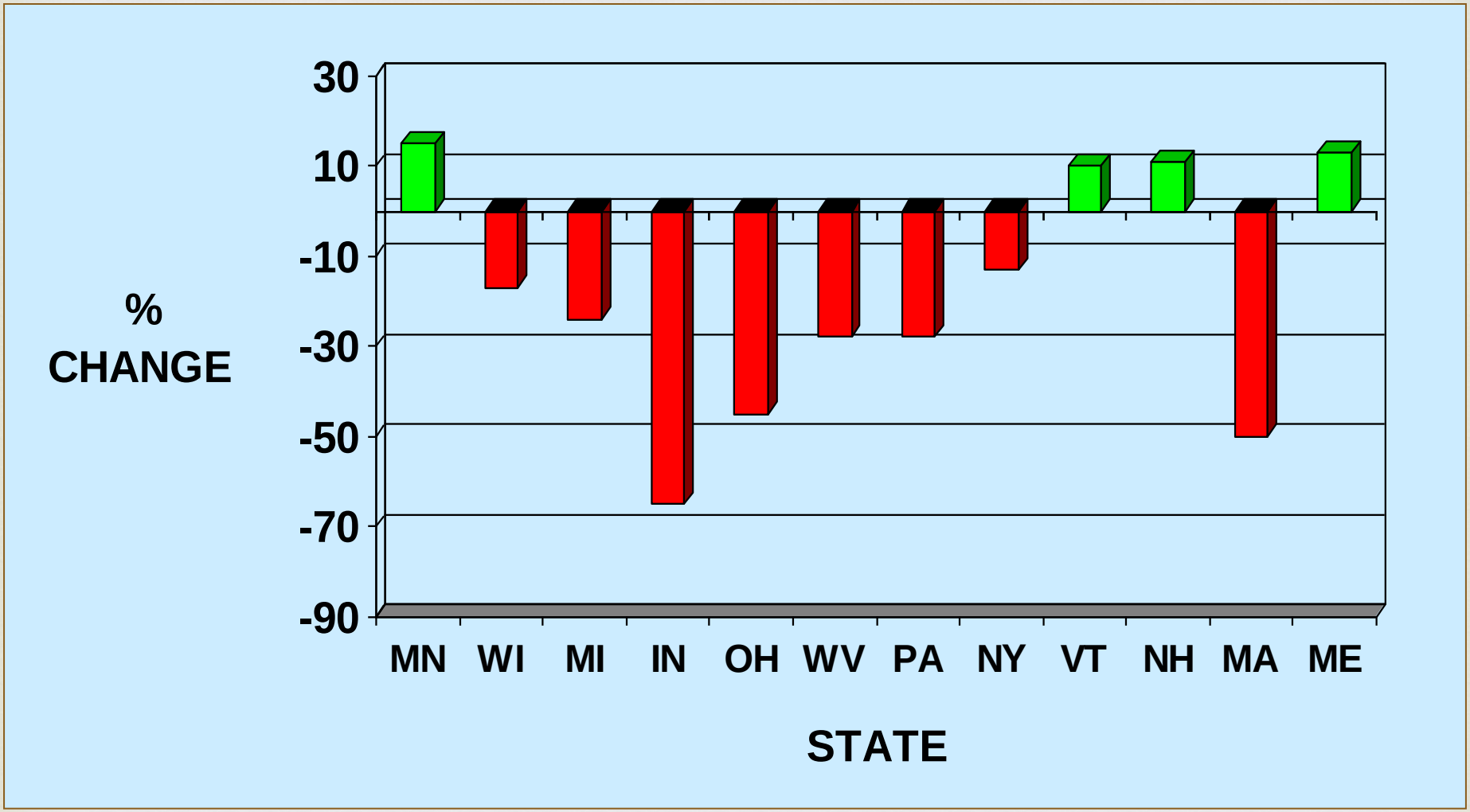
FOREST COMPOSITION - DECIDUOUS NORTHERN STATES

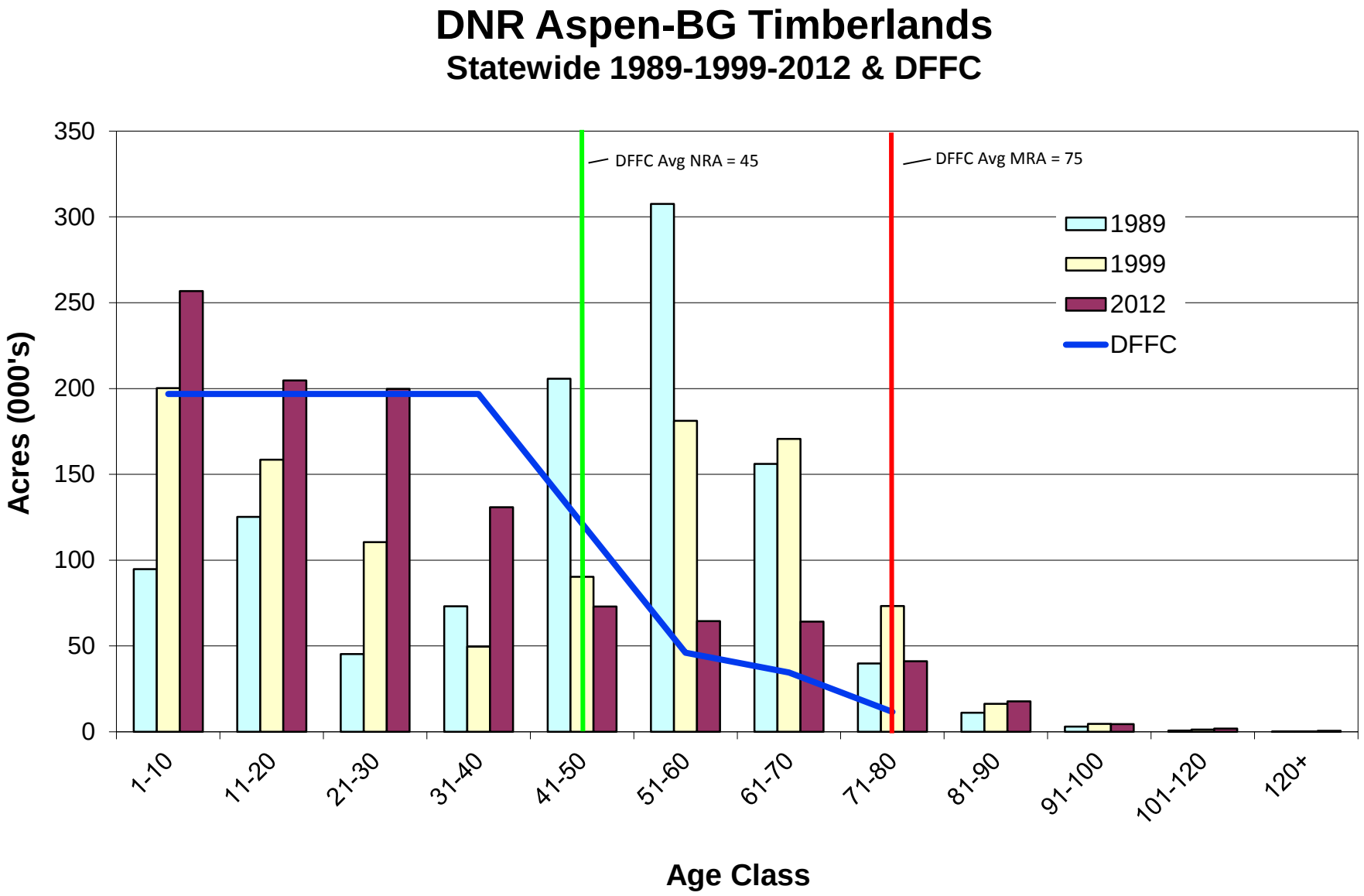


Young Aspen acres by State

Minnesota	2.7 Million acres
Michigan	1.2 Million acres
Maine	1.2 Million acres
Wisconsin	1.1 Million acres

Young Forest Habitat – 1985-2005




DNR Aspen-BG Timberlands
Statewide 1989-1999-2012 & DFFC
DFFC Avg NRA = 45
DFFC Avg MRA = 75
1989
1999
2012
DFFC
Acres (000's)
350
300
250
200
150
100
50
0
1-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81-90
91-100
101-120
120+
Age Class

So for each of the three species, I'll cover:

- Current habitat condition,
- How the populations are monitored,
- Current population status/limiting factors,
- Ways we work to improve habitat.
- Ways we can work with partners.

Ruffed Grouse

- Increasing the amount of early successsional forest habitat generally results in increases in densities of grouse and woodcock.

- But many age classes and forest types can provide grouse habitat

- Grouse utilize conifers and older aspen during all times of the year.

Current DNR Approach to Ruffed Grouse Habitat

High percentage aspen still produces the highest grouse densities,

But conifer important

Patchiness or evenness, not edge

Early successional, but not all young

Research: Meadow Kouffeld-Hanson, Rocky Gutierrez,

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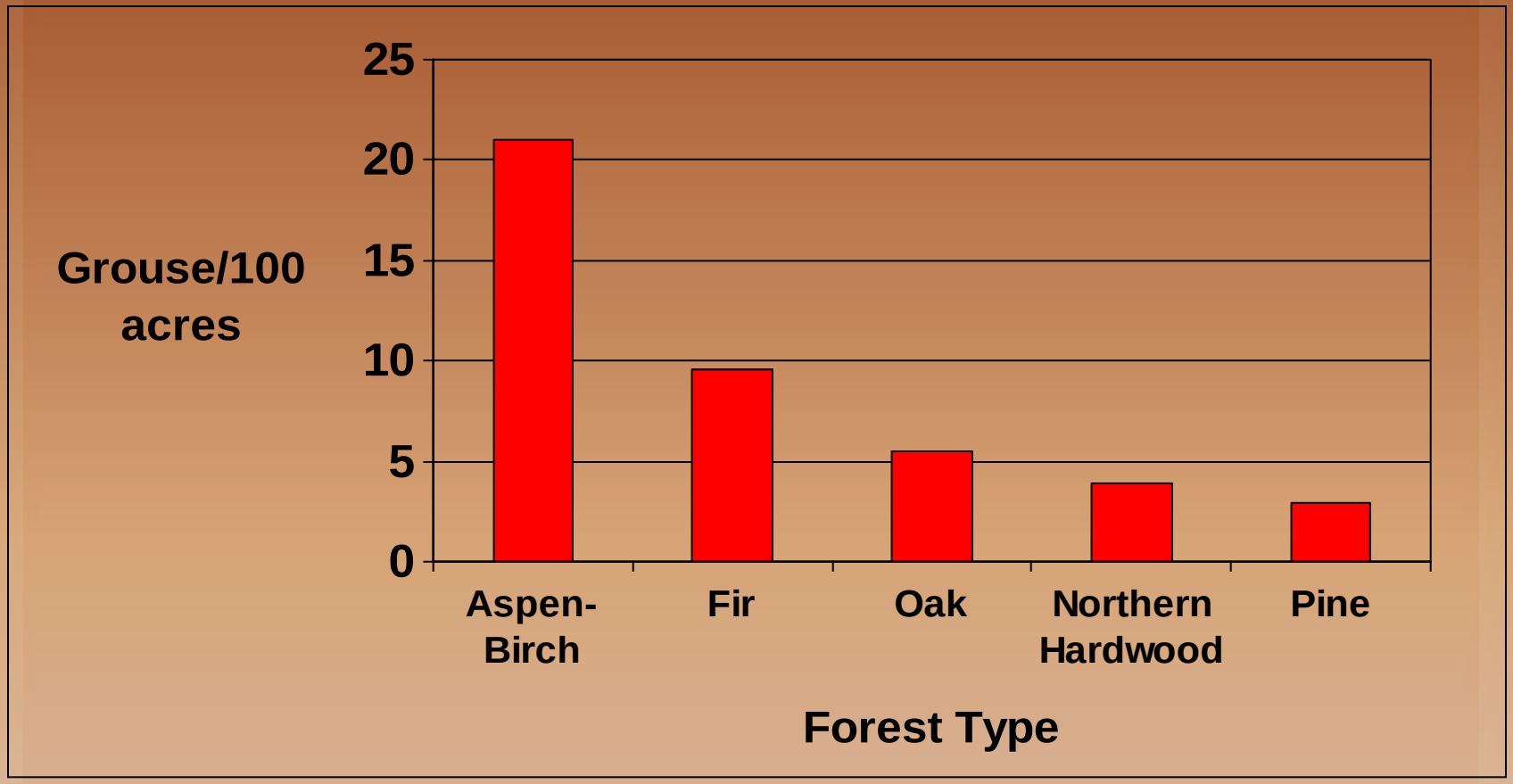
Research: Meadow Kouffeld-Hanson, Rocky Gutierrez, has been a critic of Grouse Habitat Management

Ruffed Grouse Fall Population Density by Forest Type



(Data Source: WI DNR 1985)

Grouse in Winter

Winter Cover

Formerly considered a survival hindrance, conifers are important winter cover in low snow years (like this one) for predator avoidance and thermoregulation efficiency.

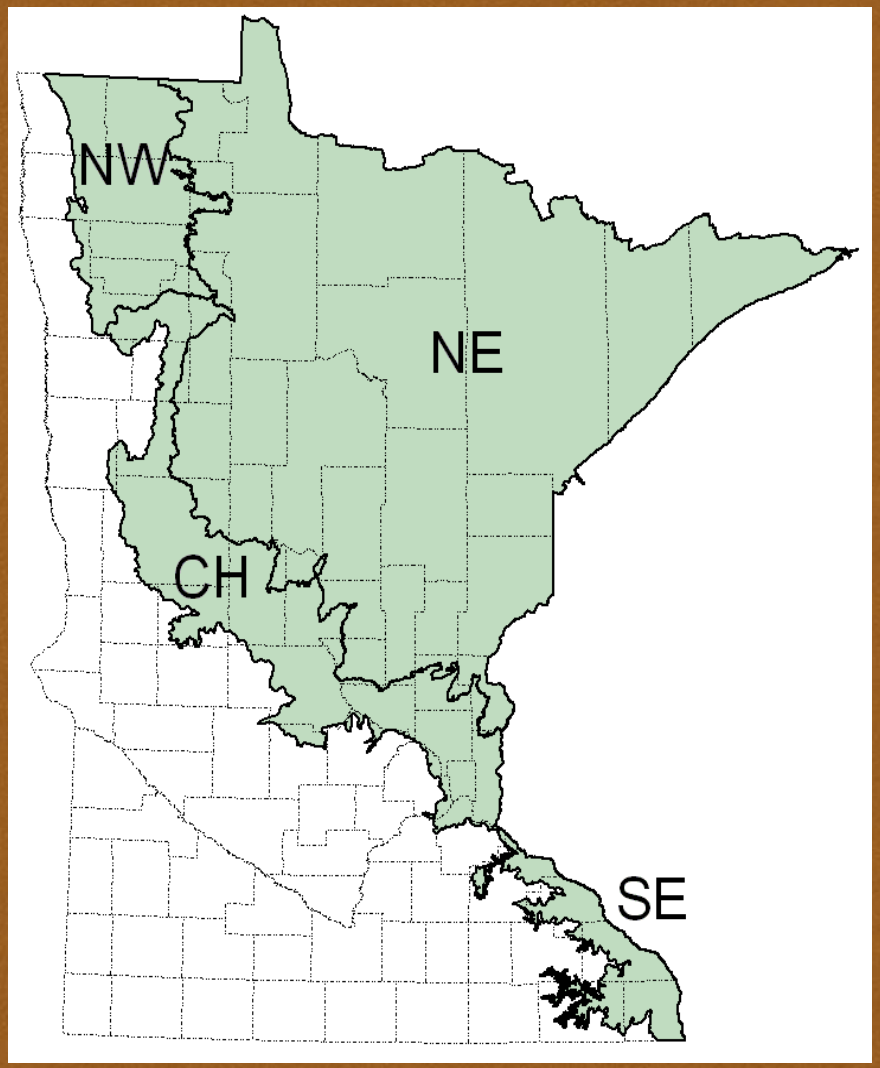
Winter Food-Male Aspen Buds/Catkins

Ruffed Grouse Habitat Mgmt

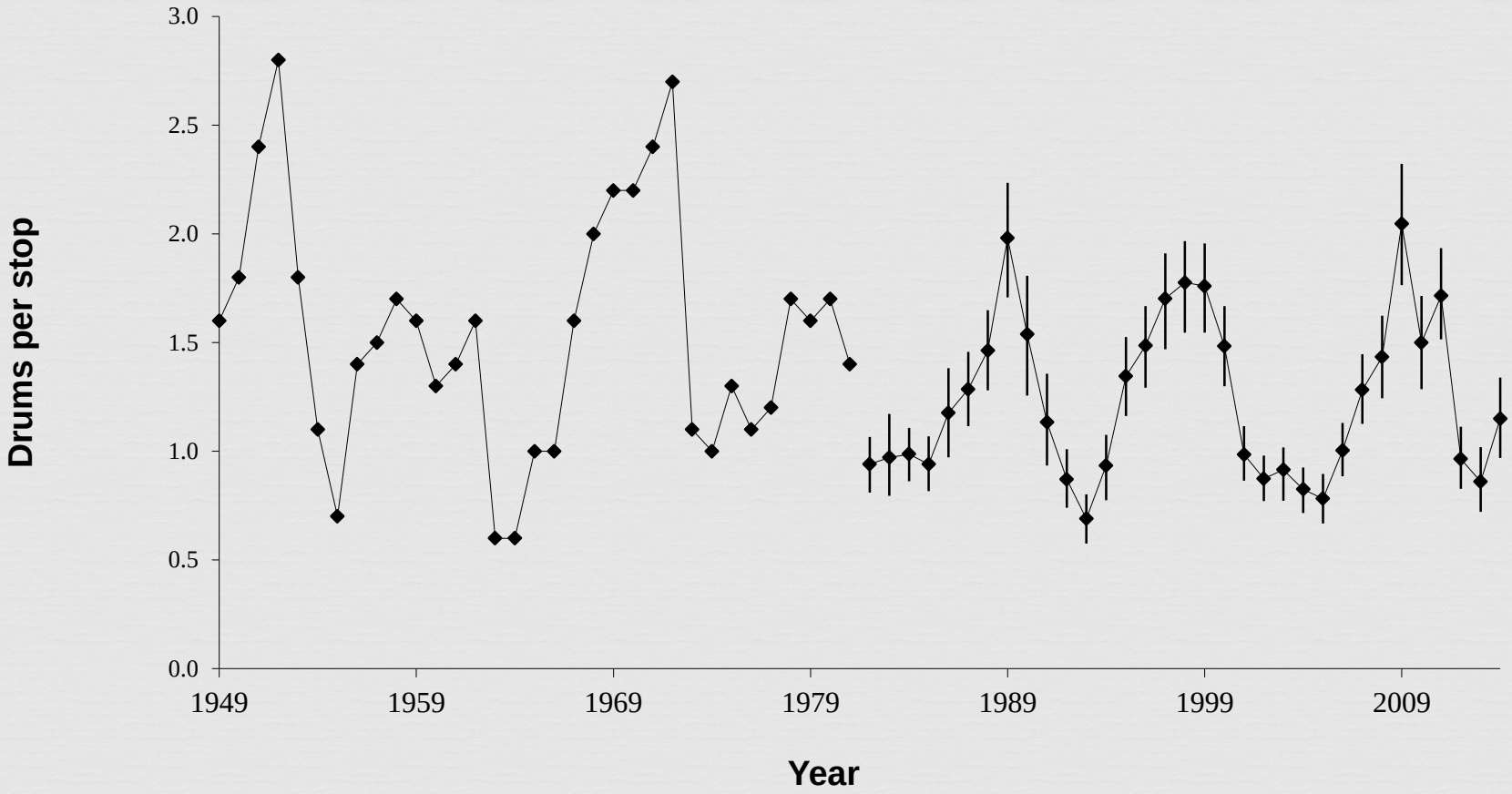
- Most ruffed grouse habitat management is accomplished in the course of routine forest management

- Managing ruffed grouse habitat via commercial logging is the most economical and efficient method, and affects the greatest amount of grouse habitat on an annual basis.

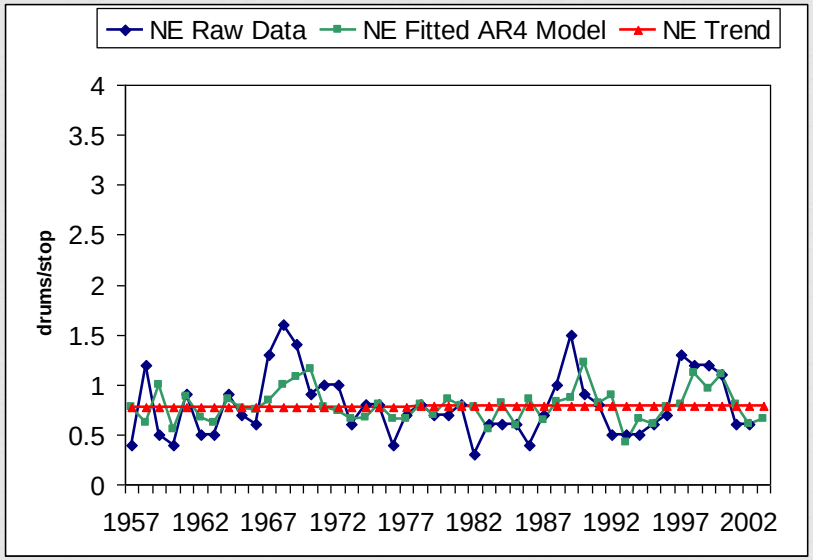
Survey Regions for Ruffed Grouse in MN



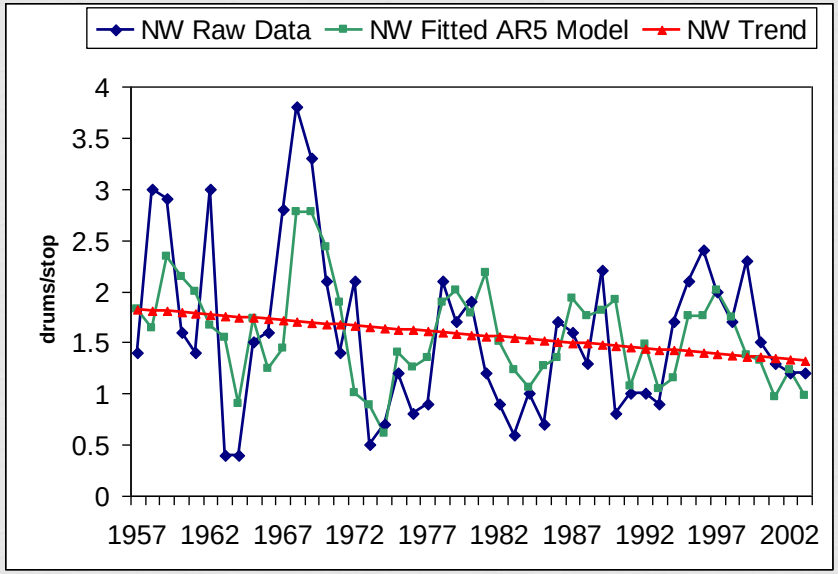
Statewide ruffed grouse population index values



NE


NE Raw Data
NE Fitted AR4 Model
NE Trend
drums/stop
4
3.5
3
2.5
2
1.5
1
0.5
0
1957 1962 1967 1972 1977 1982 1987 1992 1997 2002

NW


NW Raw Data
NW Fitted AR5 Model
NW Trend
drums/stop
4
3.5
3
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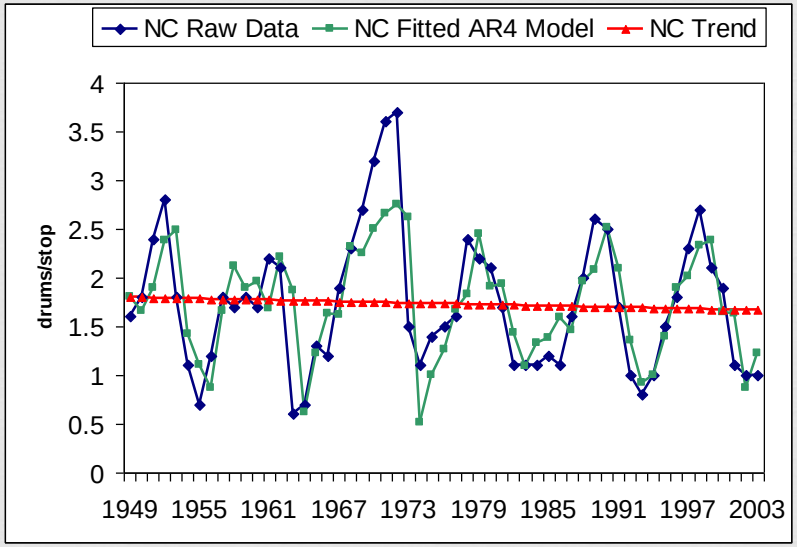
1957 1962 1967 1972 1977 1982 1987 1992 1997 2002

NC


NC Raw Data
NC Fitted AR4 Model
NC Trend
drums/stop
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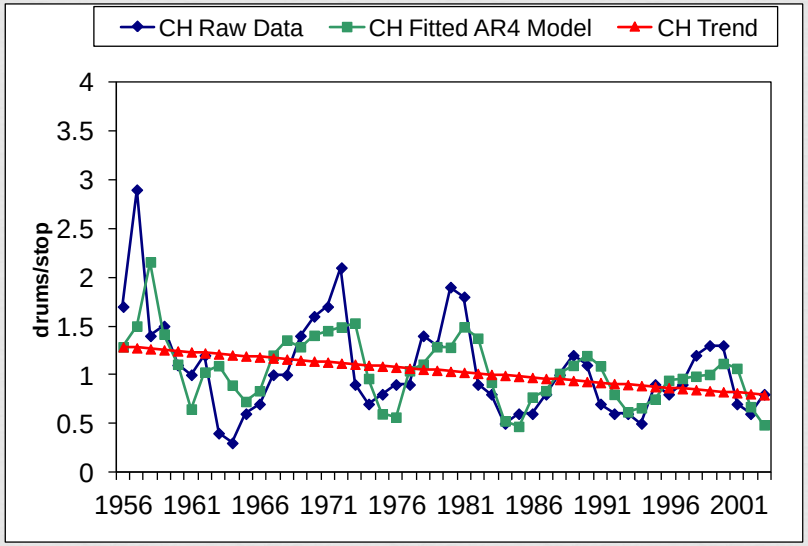
1949 1955 1961 1967 1973 1979 1985 1991 1997 2003

CH


CH Raw Data
CH Fitted AR4 Model
CH Trend
drums/stop
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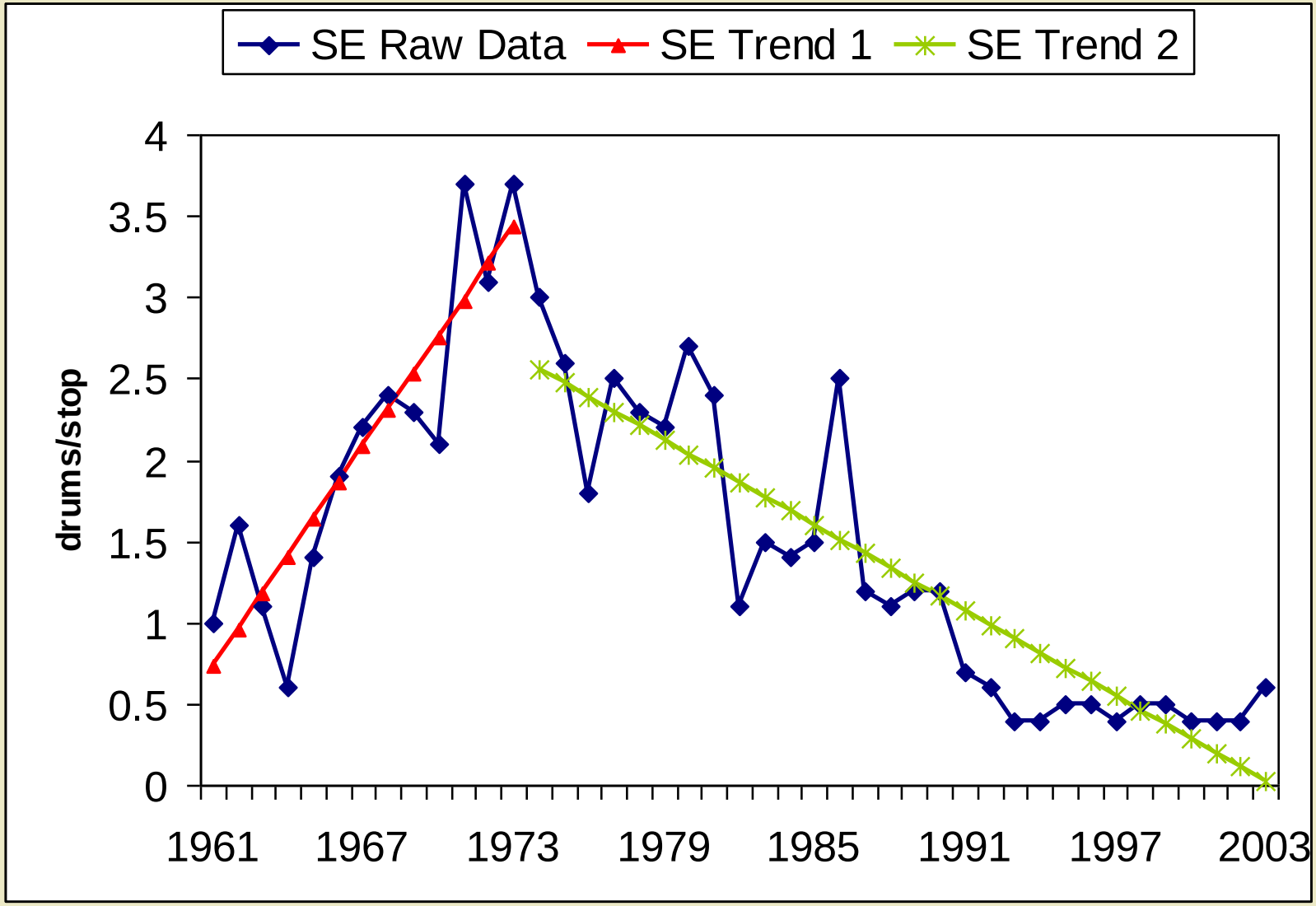
1956 1961 1966 1971 1976 1981 1986 1991 1996 2001

Southeast


SE Raw Data
SE Trend 1
SE Trend 2
drums/stop
4
3.5
3
2.5
2
1.5
1
0.5
0
1961
1967
1973
1979
1985
1991
1997
2003

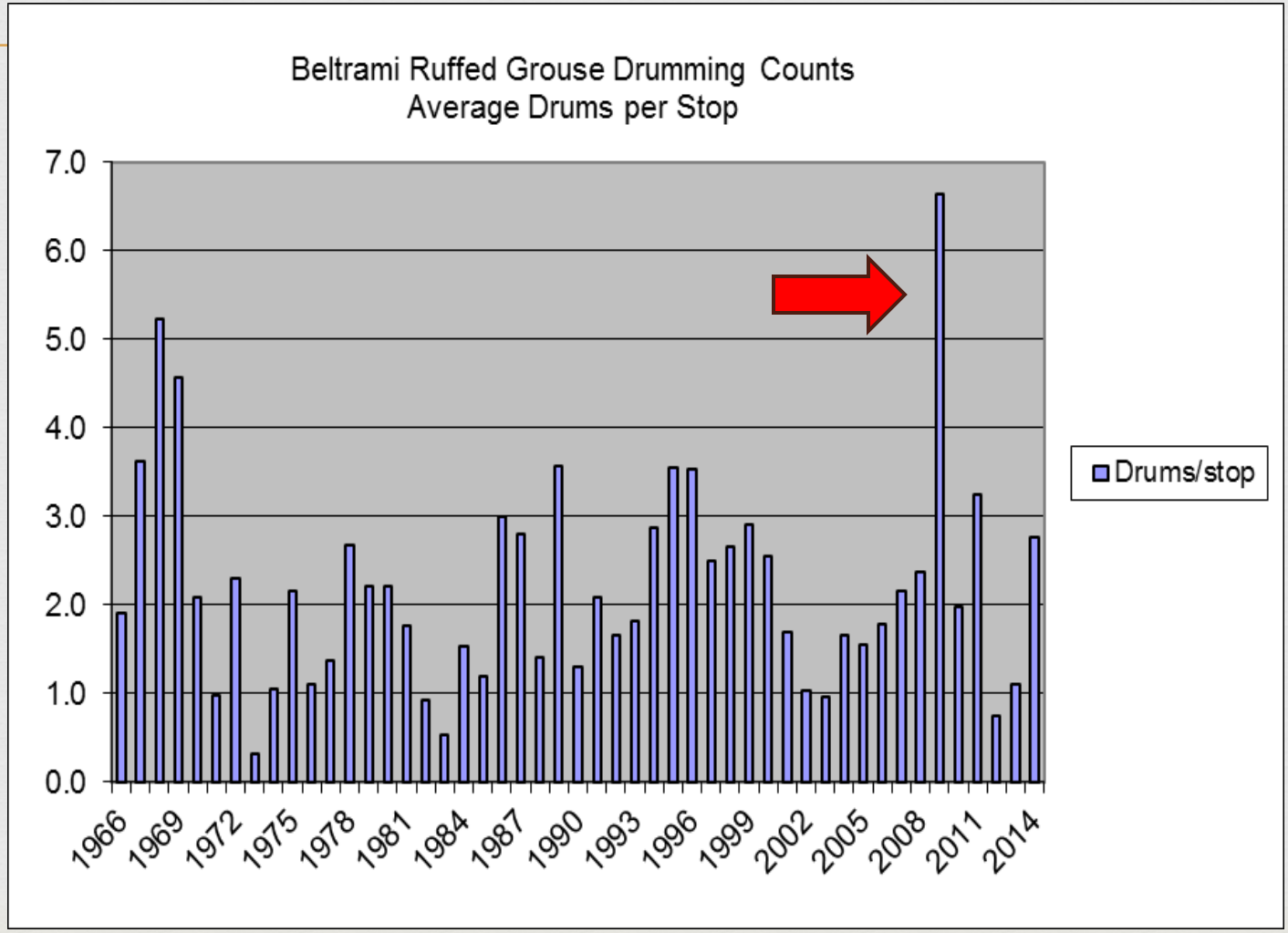
- No significant long-term trend in grouse drumming indices for any of the 3 northern grouse zones (i.e., confidence intervals include a slope of 0 (no trend));

- The trend in the Central Hardwoods is statistically significant, with indices declining, on average, about 1% (of the preceding index value) per year. Overall, drumming indices are about 30-35% lower now in the CH compared to those when the survey was initiated;

- In the Southeast, trends were significant, with indices increasing, on average, 13% (of the preceding index value) per year for the first 13 years. For the remaining 30 years, indices decreased, on average, 12% (of the preceding index value) per year. The result of the latter decline is that current indices in the SE are nearly 90% lower than the peak indices in the early 70's, though much closer to those when the survey was initiated;

- There is no significant long-term trend in grouse harvests.

Beltrami Island SF- a local example



Habitat Management Strategies:

- Apply ecologically sound silvicultural practices
- Provide managers with science-based techniques
- Continue to emphasize ruffed grouse management objectives in landscape-level management plans
- Continue to encourage other landowners to manage for ruffed grouse habitat

Management Challenges:

Economics of the timber industry (the down turn) and emerging markets (ex – biomass)

Balancing multiple forest management objectives

Landscape changes (ex – fragmentation, ownership, access)

Uncertainty of climate change impacts on forests

Suggestions for improving grouse management

Suggestions for improving grouse management

Continue to manage aspen in healthy mixed forests:
Conifers in aspen, aspen in conifers

More standing leave trees
More coarse woody debris
Less concern about edge and more patchy, even mixed stands

Suggestions for improved grouse management

Expand educational/stewardship programs

Expand MOA acreage

Better Inventory:
LiDAR
FIM

Research Needs for Ruffed Grouse

1. How do the proportions and types of conifers in aspen forest stands, and the proportions and juxtaposition of aspen and conifer cover types in the landscape affect ruffed grouse habitat and populations in Minnesota?

2. What effects do timber management decisions about individual aspen stands (e.g., dispersed residual overstory trees, mechanical thinning) have on ruffed grouse habitat and populations in Minnesota?

3. How have the quantity and quality of ruffed grouse habitat in Minnesota changed during the last 30 to 40 years, and have ruffed grouse populations responded to changes that have occurred?

4. What are the relative impacts of various management techniques for increasing the quality and quantity of ruffed grouse habitat in southeastern Minnesota?

5. What are the effects of motorized and non-motorized trails on hunters (success and satisfaction), ruffed grouse habitat, and grouse populations in Minnesota?

6. What effect is West Nile Virus having on ruffed grouse populations in Minnesota?

7. How is climate change going to affect ruffed grouse and their habitat in Minnesota?

Ruffed Grouse in Minnesota: A Long-Range Plan for Management

"Everybody knows that the autumn landscape in the north woods is the land, plus a red maple, plus a ruffed grouse."

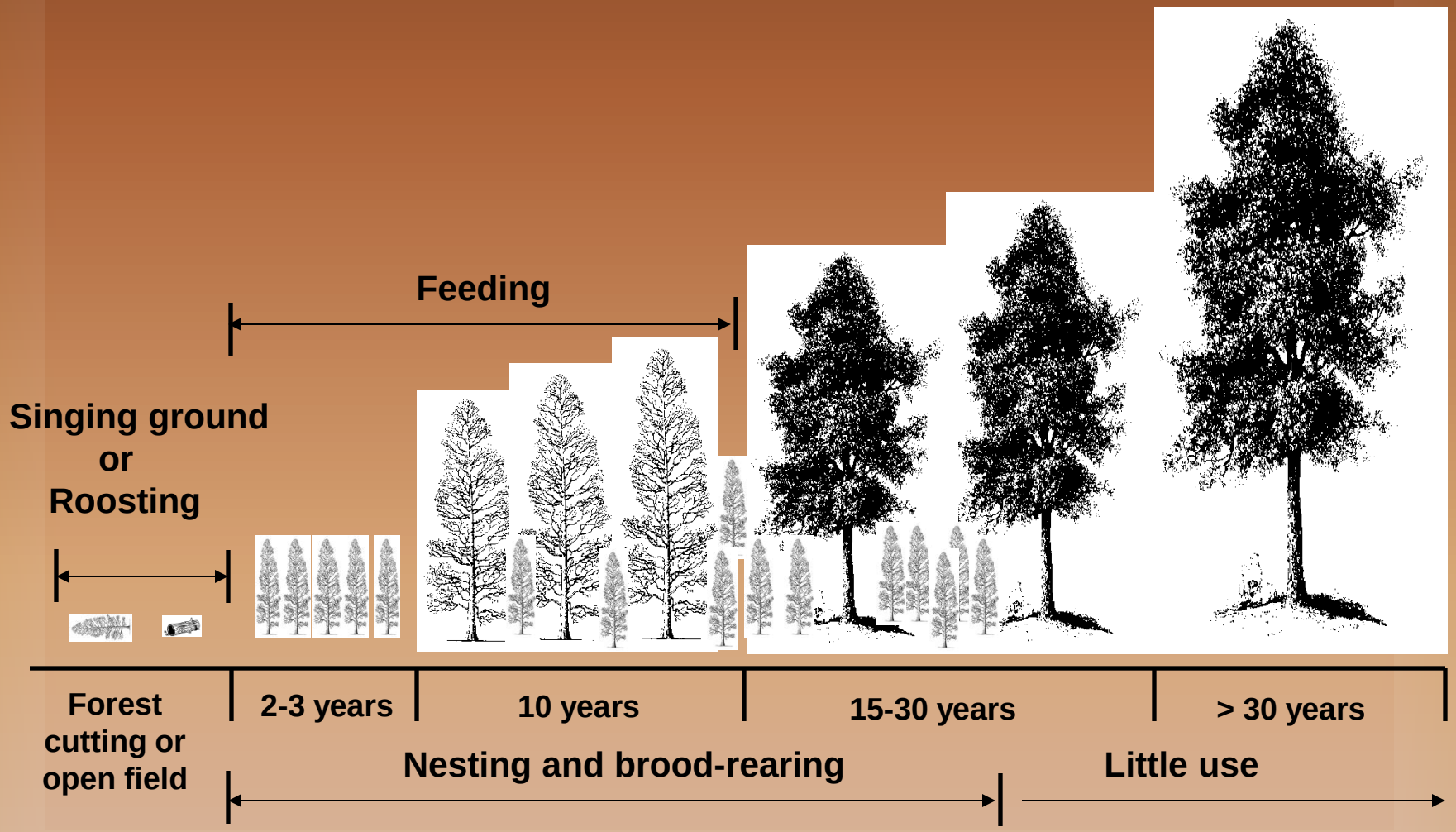
Aldo Leopold

American Woodcock

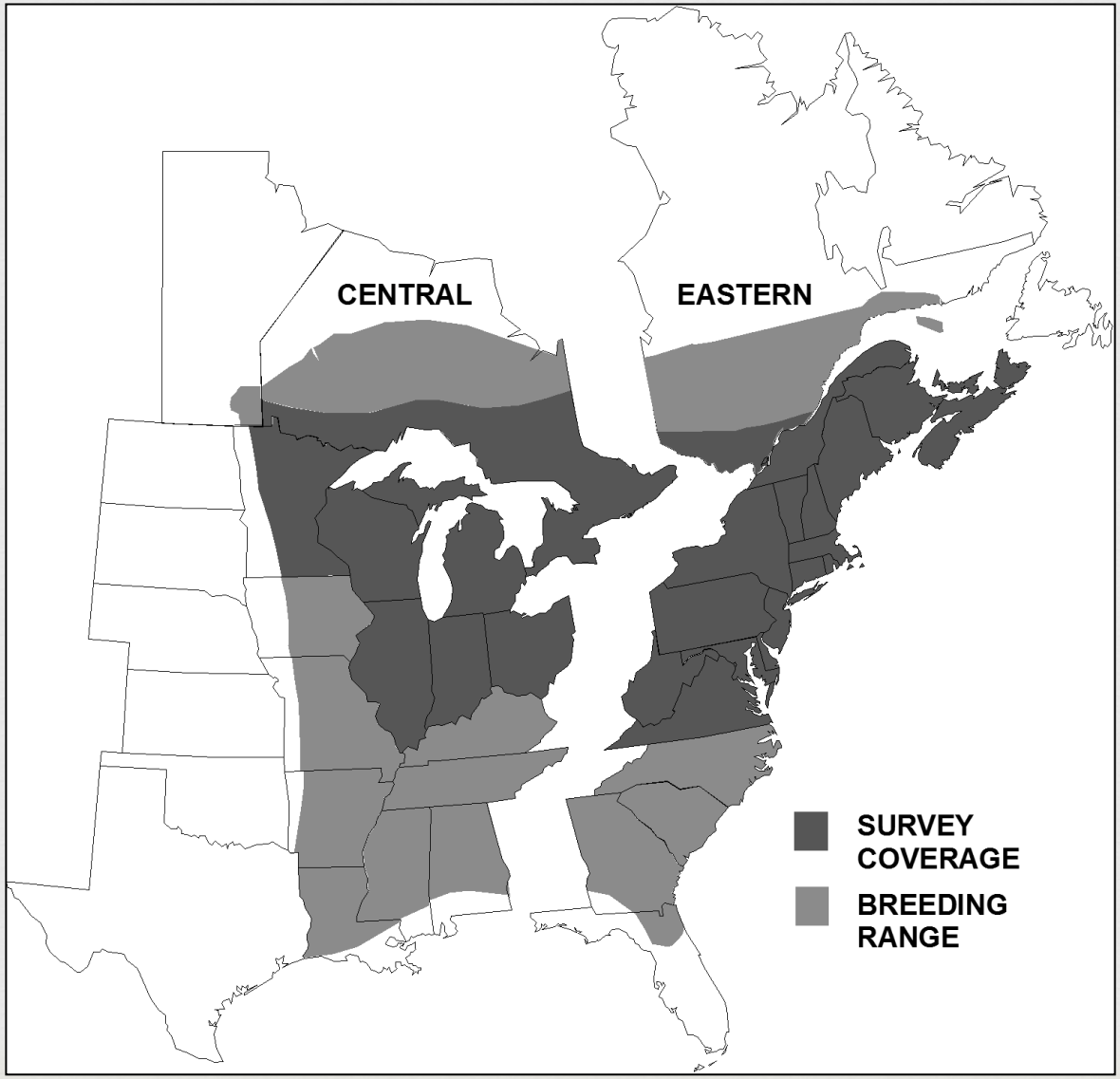
Woodcock Habitat

- Shrubs and young forests on moist soil sites for worms
- Structure for overhead protection
- Small openings for singing grounds
- Large openings for night roosting

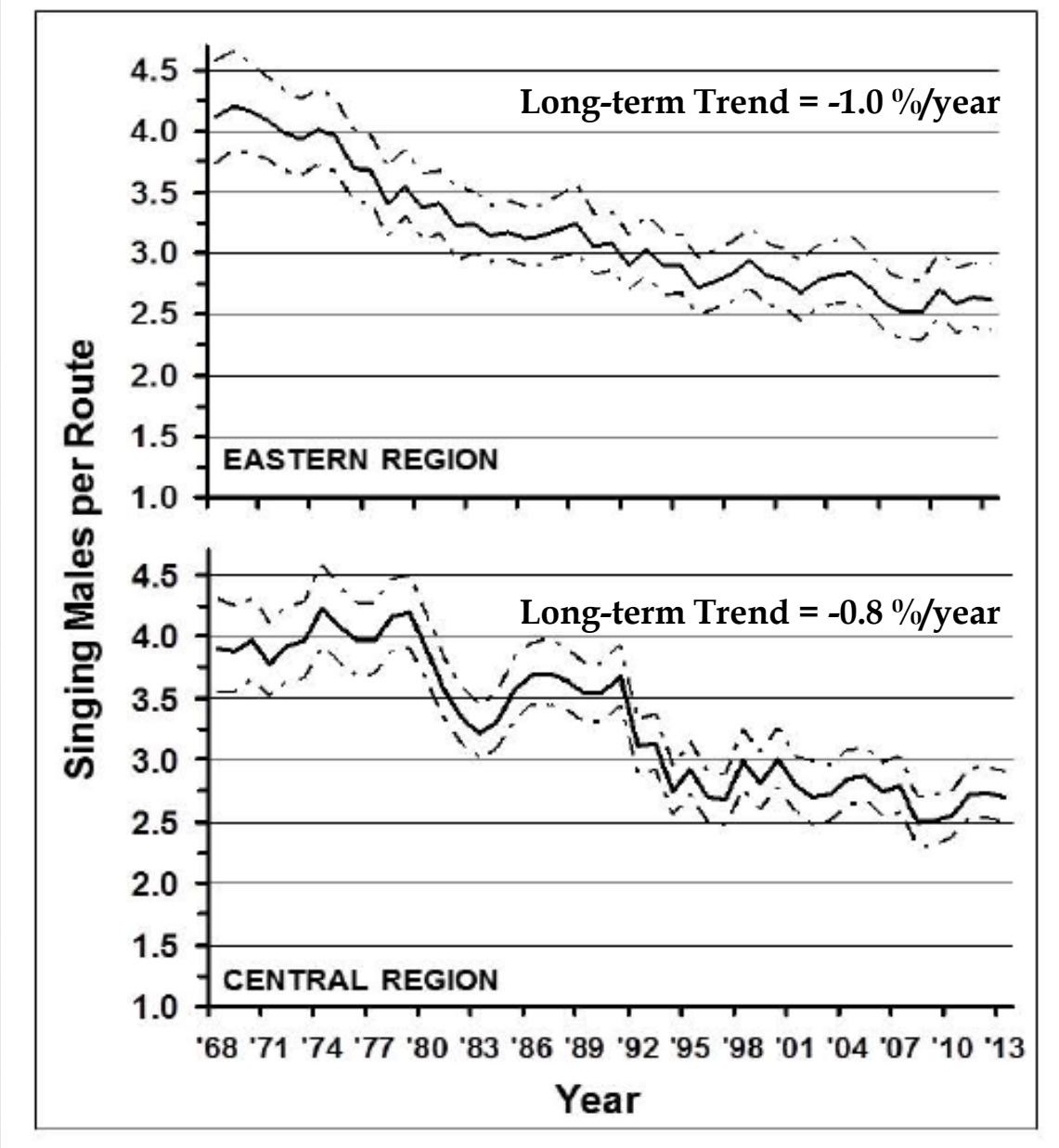
Woodcock Habitat Use in Relation to Forest Succession



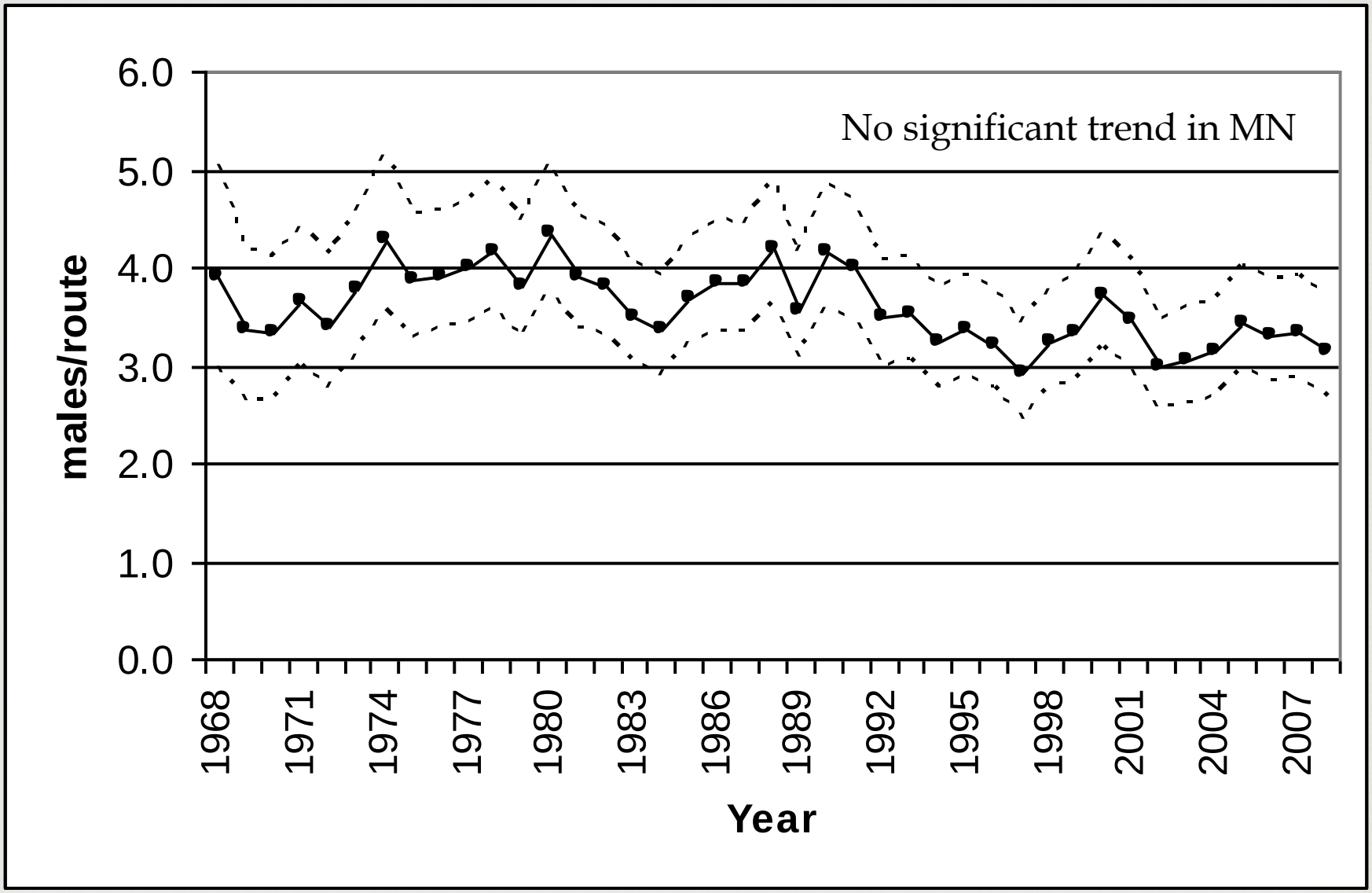
American Woodcock Range and Management Regions

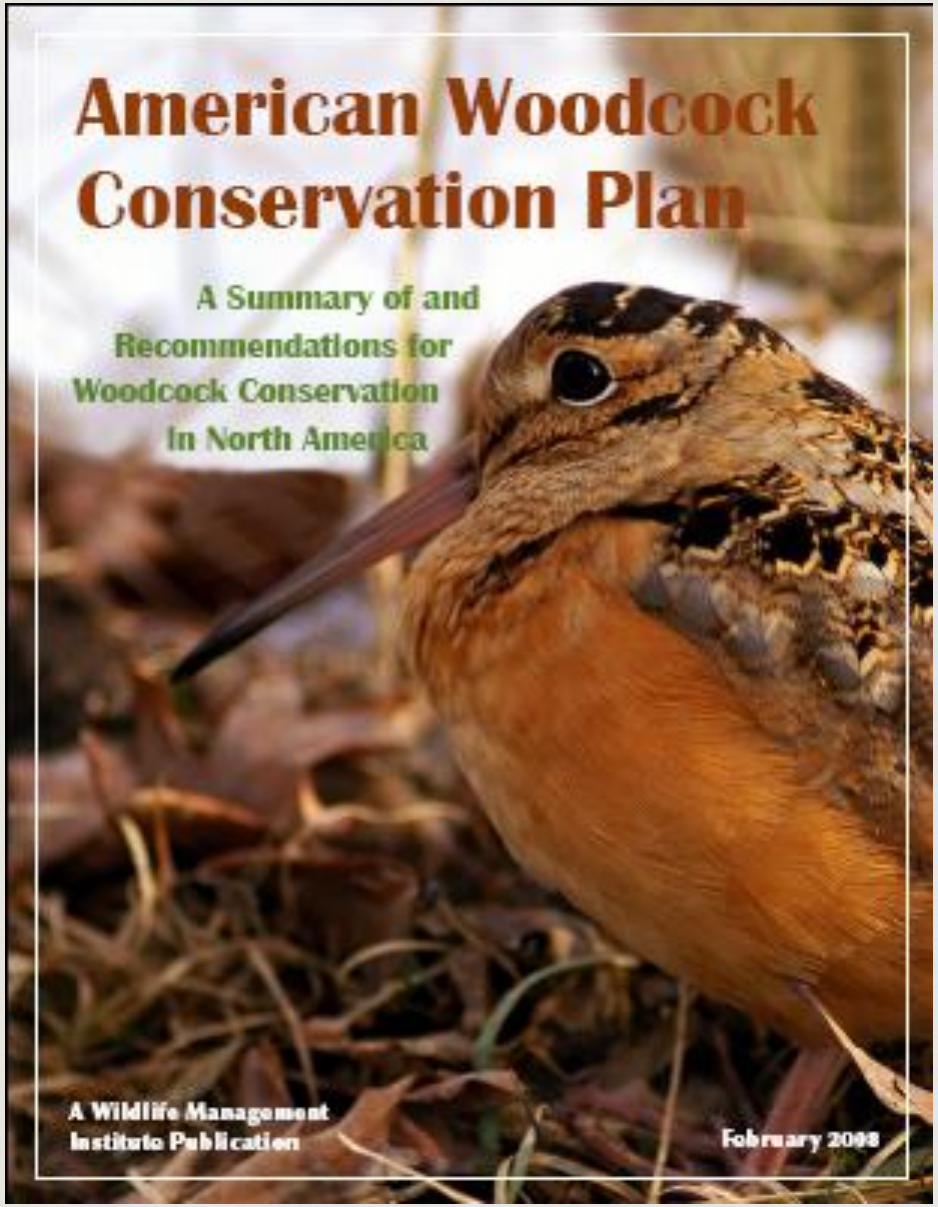


American Woodcock Population Trend



American Woodcock Population Trend - MN





Woodcock Task Force

- Task Force was organized under the Association of Fish and Wildlife Agencies' Migratory Shore and Upland Game Bird Working Group
- Plan completed in 2008
- Plan contains both population and habitat objectives,
- Implementation of plan is being led by the Wildlife Management Institute

Plan available at www.timberdoodle.org

Strip Cutting in Alder/Aspen

Diurnal Feeding Cover:

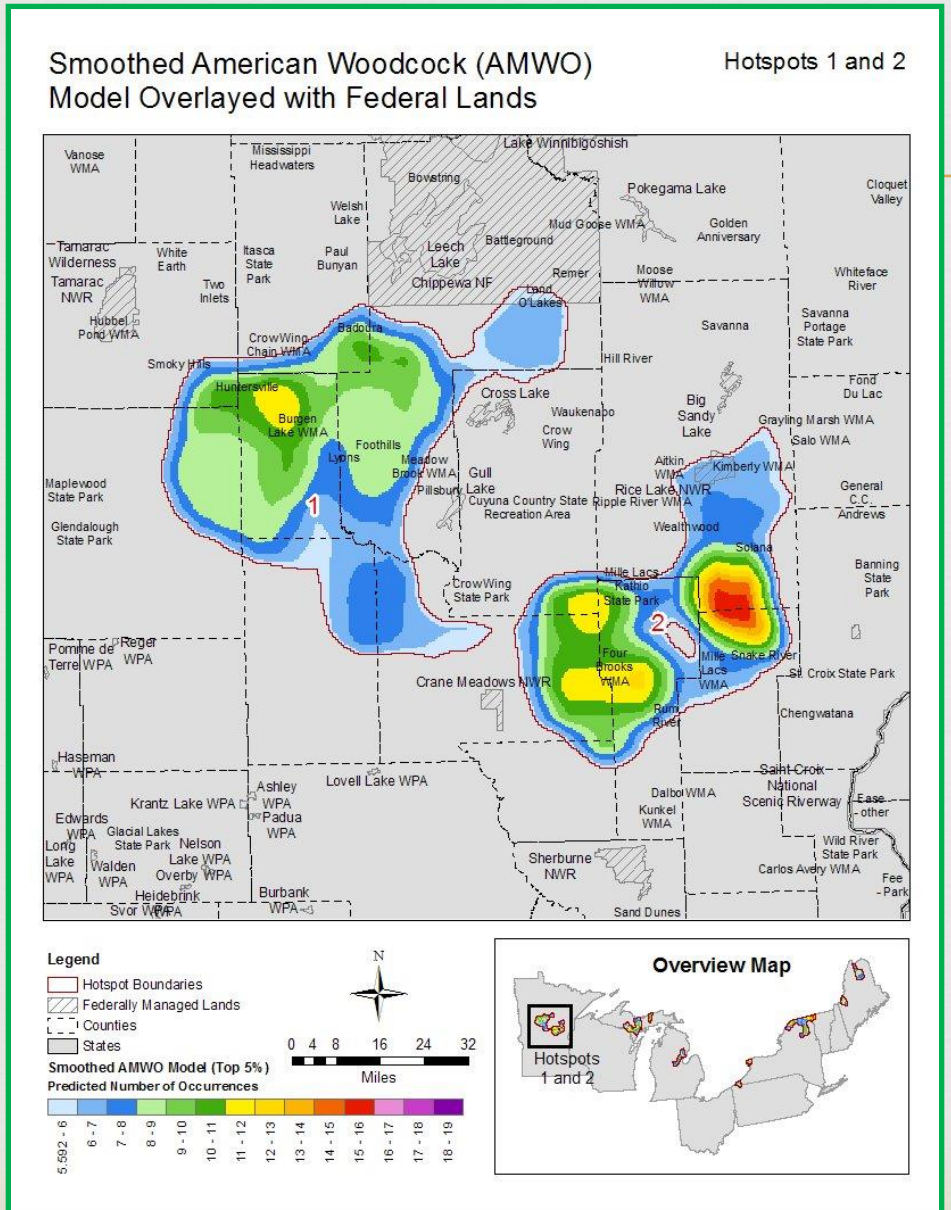
- **Cut strips in alders or dense aspen 60′-80′ wide.**
  - Leave 280 feet uncut
  - Manage on 5 yr cutting cycle
  - Slash removal is desired
  - Should be w/in 0.5 miles of brood/nesting habitat
- **Strips should be perpendicular to wetlands**
- **Abandoned ag. land ideal**

Wildlife Openings

- Important component of landscape diversity
- Nesting and roosting area for songbirds and woodcock
- Brood rearing area for grouse, high insect populations
- Spring forage area for deer and turkeys

BOWSTRING
WMA
WOODCOCK
DEER BROWSE
BRUSH
MOWING
21 ACRES
03/04/2013 13:08

American Woodcock Management



Collaborating with USFWS, USFS, Woodcock MN, Wildlife Management Institute, and the Coop Unit to:

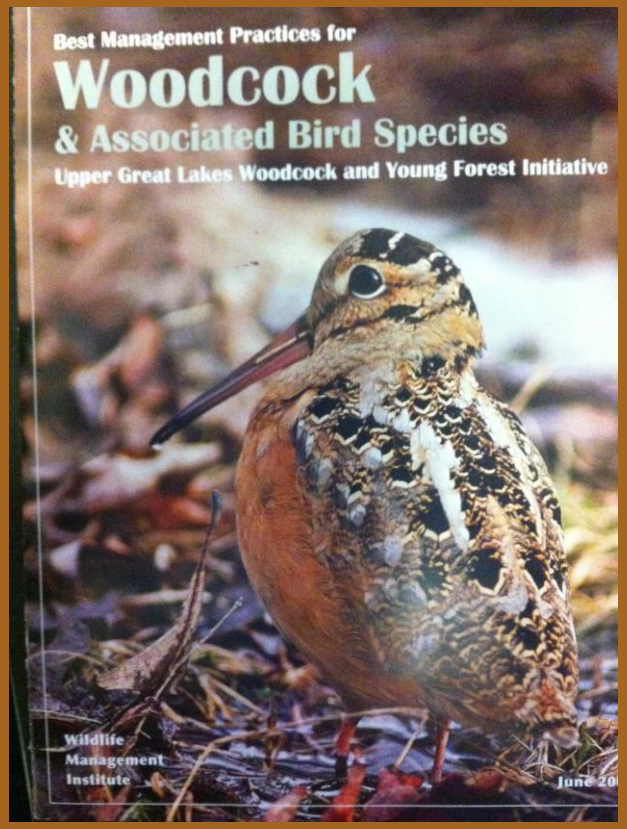
- identify priority management areas,
- define and implement BMP, and
- carry out habitat projects.
- Example: Four Brooks Wildlife Management Area.

Habitat Management for Woodcock

More aspen is not the answer for woodcock in Minnesota-USFWS

Limiting factors are more likely found along the migration route or wintering grounds.

Habitat in MN can be improved by implementing BMPs



Management for Ruffed Grouse

Currently an abundance of aspen on the landscape.

To improve densities, manage for even, patchy mixed forests of aspen with balsam, spruce and other conifers

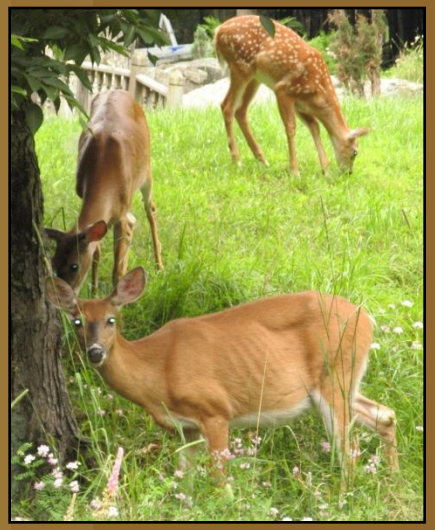
Leave more residual wood on sales-snags, live trees, CWD more brush.

BMP implementation

Questions for Discussion

White-tailed Deer

Deer Population Ecology



Food Habits
- Herbivorous Browsing Ruminants
- Prey species
- Dependent on fat reserves

Social Structure
- Doe family unit – small home ranges
- Polygamous males – larger home ranges

Annual Reproduction
- 1-3 fawns per doe in Spring

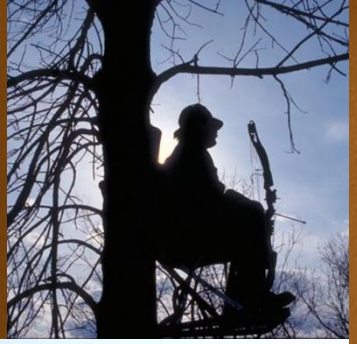
Managing Deer for the Good of Society and the Environment

www.jsonline.co

Westonnurseries.com

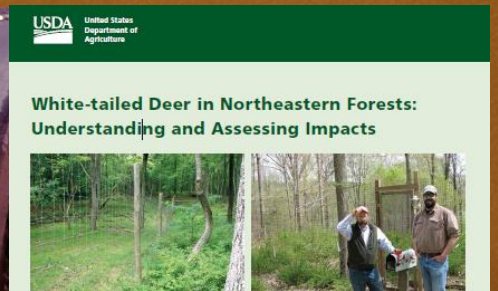
Goals:

- Provide recreational hunting
- Reduce impact of deer on:
  - Ecosystem
  - Agriculture and Industry
  - Human Health and Safety



Values/Social Factors to Consider

- Deer hunting opportunities and traditions
- Conservation $
- A charismatic native species
- Conflicts, e.g.,
  - Browsing Impacts: agriculture, habitat, forests, landscaping
  - Health concerns
  - DVCs
- Wildlife Diseases
- Interactions with other species



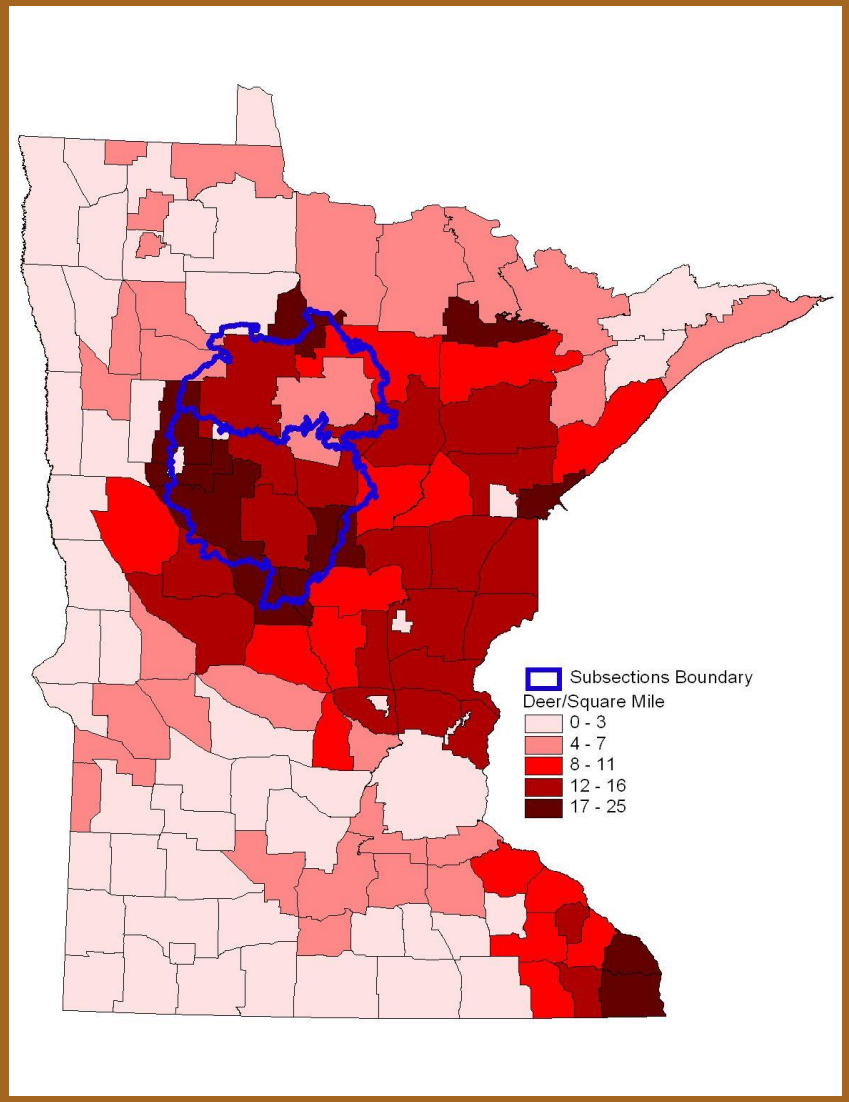
White-tailed Deer Browsing
(From MFRC Report on Competativeness)
Frelich, L.E., Ek, A.R., Zobel, J.M., and Page, K. (2013).
Zobel, J.M., and Ek, A.R. (2014).

Local deer populations can significantly affect forest health. The impacts of prolonged deer browsing include lowered regeneration success of favored browse species, many of which have commercial value (e.g., northern red oak, jack pine and eastern white pine). Eventually, these changes will alter forest composition and structure and may also reduce food sources, cover and nesting sites for other wildlife

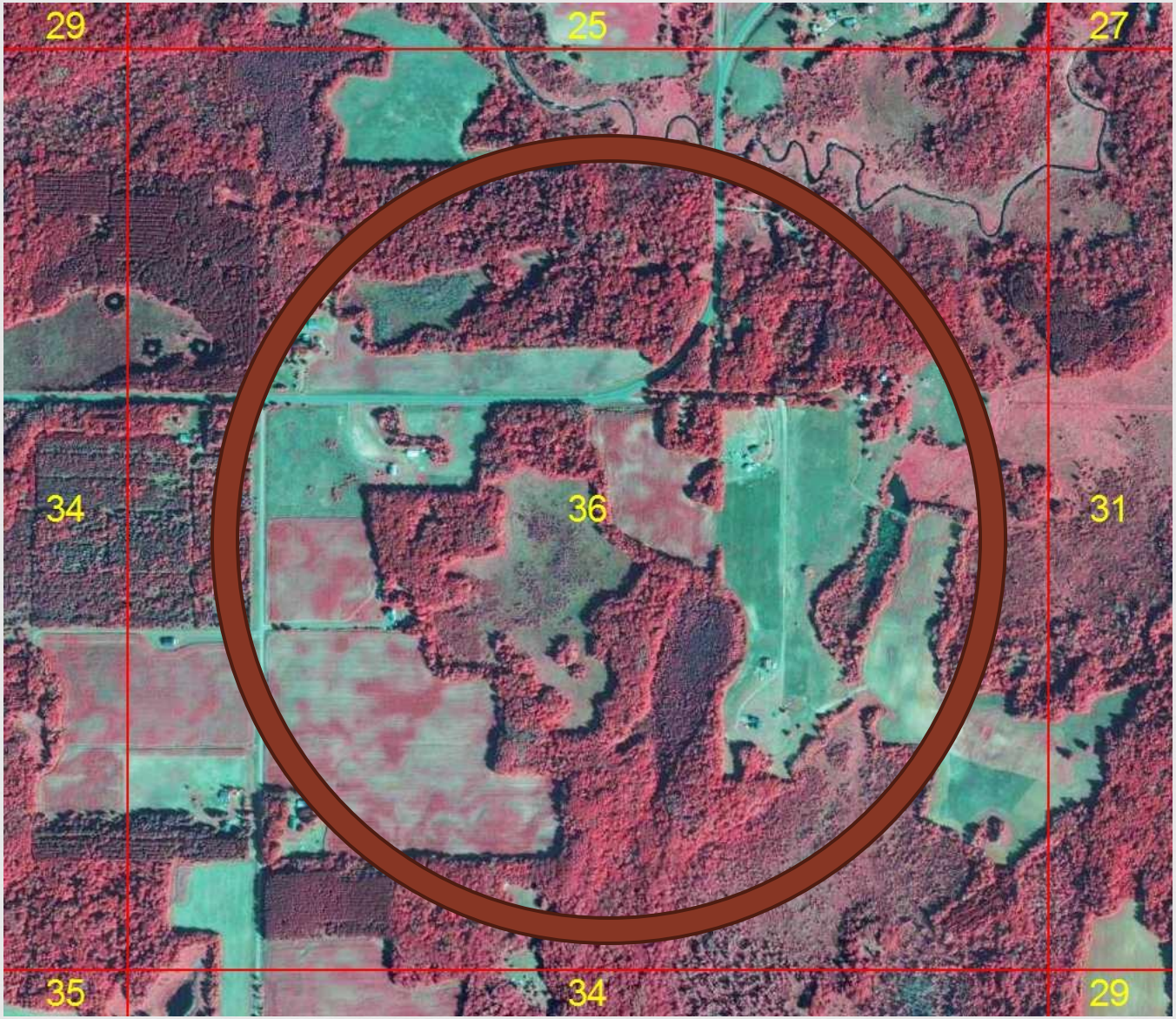
White-tailed deer, a species which prefers early successional forests, experienced a 27 percent increase in HIS.

Minnesota Deer Densities

- Deer populations are highest in diverse forest and in mixed farmland and forest landscapes.



Modeling Optimum Deer Habitat



Heavy herbicide use site

Jack Pine

- Skewed age class with little regeneration occurring in MN
- Favor natural regen with less site prep – seedtree cut, scatter slash, prescribe fire
- Lower planting densities favor the understory
- Resist red pine conversions - NPC

Paper birch can be regenerated by seed tree method

Retain 20 square feet of basal area of nicely formed birch trees within a birch cover type.

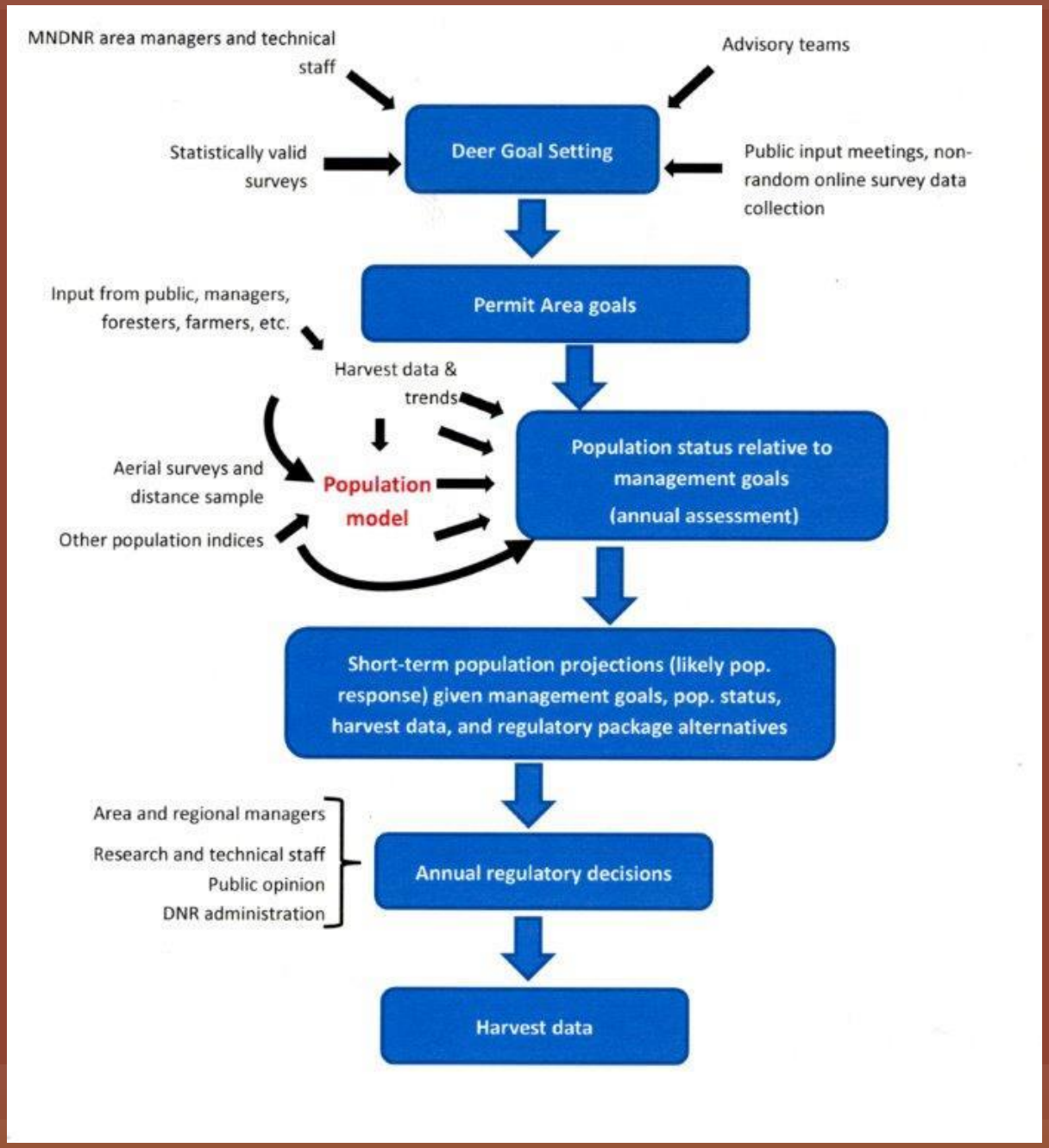
Summer harvest, full tree skid to expose mineral soil and disturb the shrub layer.

Chippewa National Forest is treating many acres using this method.

Minnesota's Deer Population and Management System

MNDNR

Minnesota's Deer Management System



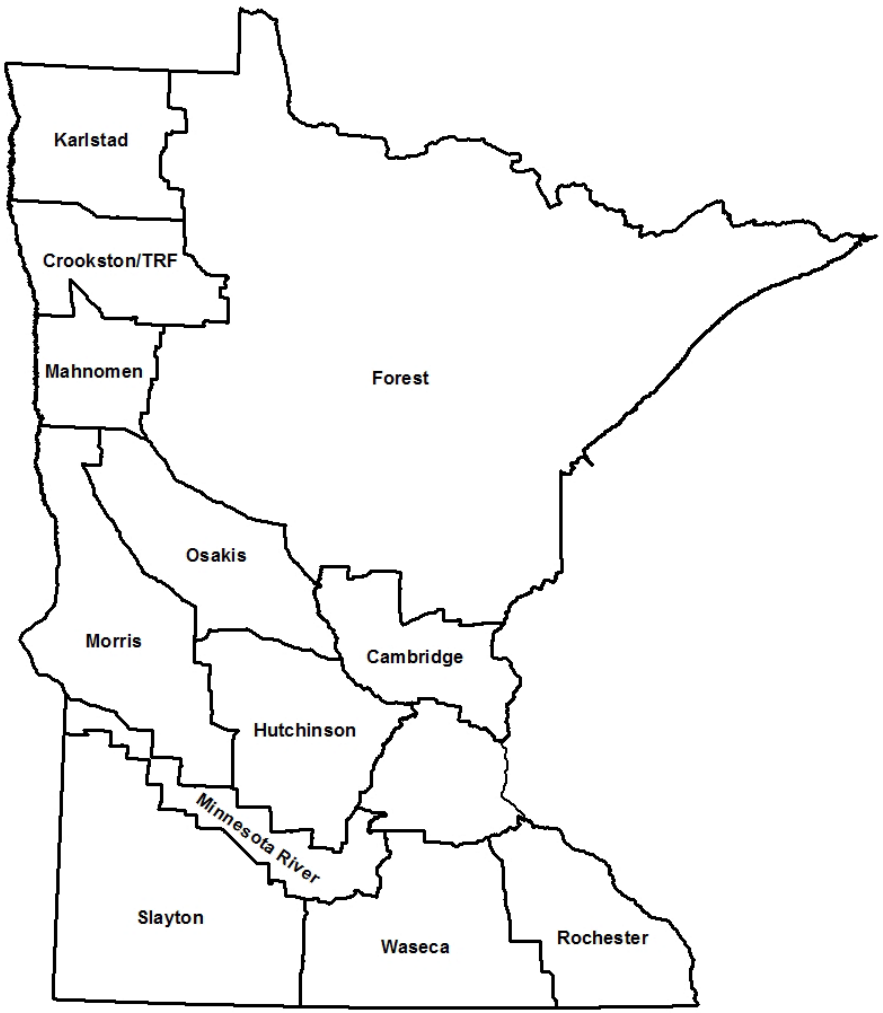


Figure 1. Deer management units in Minnesota, 2014.

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The Minnesota Department of Natural Resources (MNDNR) uses simulation modeling within 125 permit areas (PA) to estimate and track changes in white-tailed deer (*Odocoileus virginianus) abundance and, subsequently, to aid in developing harvest recommendations to manage deer populations toward goal levels. In general, model inputs include estimates of initial population size, and spatial and temporal estimates of survival and reproduction for various age and sex cohorts. Because simulated population estimates are subject to drift as model input errors accumulate over time, it is imperative to collect additional data to develop ancillary indices of changes in deer populations or to periodically recalibrate models with independent deer population estimates (Grund and Woolf 2004).*

Our objective was to use aerial surveys by helicopter to provide independent estimates of deer abundance in select deer PAs that were within 20% of the true population size with 90% confidence (Lancia et al. 1994). Estimates within these bounds

In non-forested portions of the State, simulation models are periodically recalibrated using methods such as aerial surveys.

The Disgruntled Deer Hunter

FROM NOT ENOUGH TROPHY BUCKS TO A PERCEIVED LACK OF DEER IN GENERAL, HUNTERS HAVE ADOPTED A SURLY ATTITUDE. WHY?

BY BRIAN MCCOMBIE

Call it the "season of the angry deer hunter." That could be this past season — in just about any state — during which whitetail harvests were down across much of the nation, and the collective blood pressure of deer hunters was up — way up.

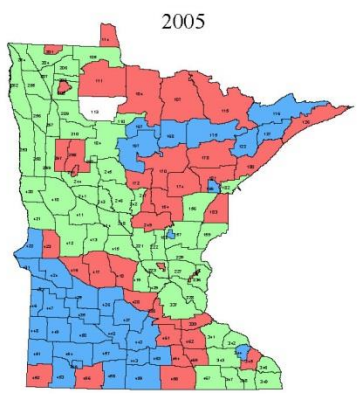
"Stop the DNR's slaughter of our deer herd!" blared the Facebook page of the group Wisconsin Deer Hunters.

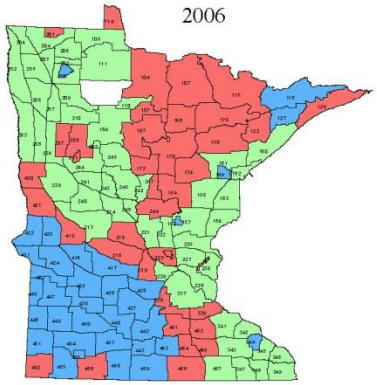
Or this, written by George Smith, then executive director of the Sportsman's Alliance of Maine: "I have been gathering [deer management] suggestions from all quarters, including groups representing landowners, sportsmen, and guides, and from sporting camp owners. ... Deer hunters are disappointed and angry. Some are very angry."

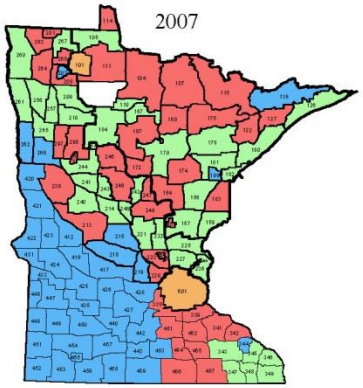
Or Michigan outdoor writer Dave Richey, writing after the season yet noting that deer hunter discontent went back a while:

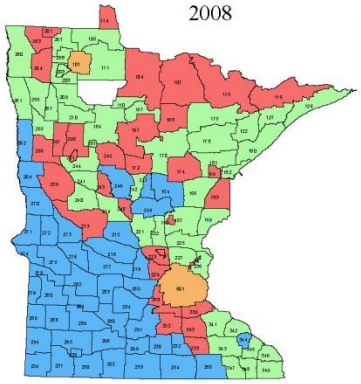
MNDNR

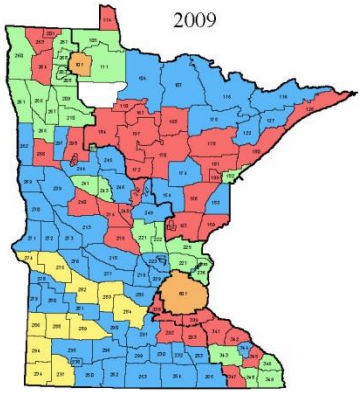
Deer Permit Area Designations 2005—2014

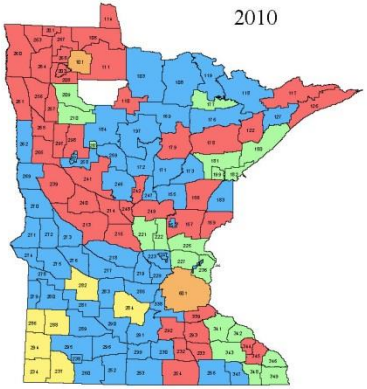


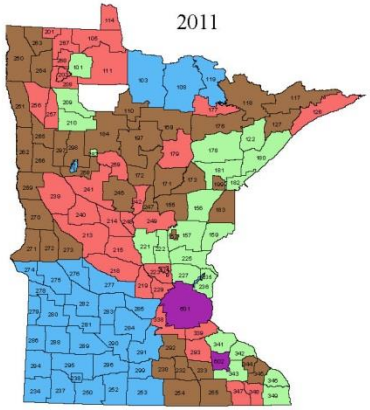


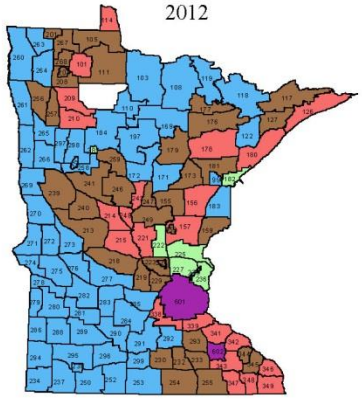


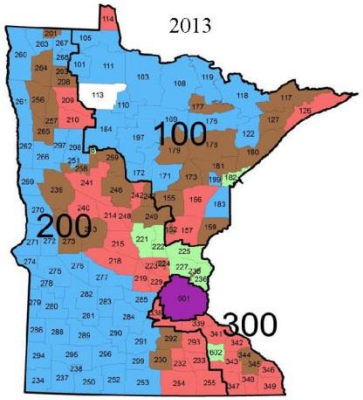


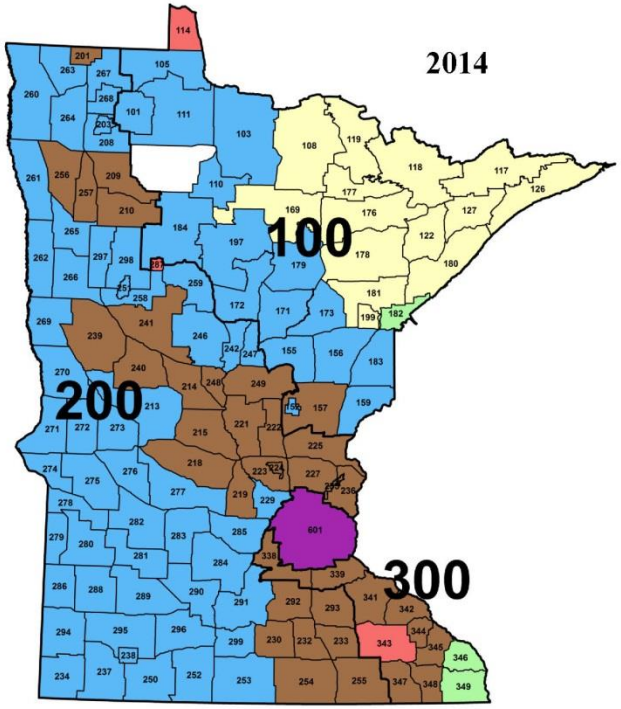


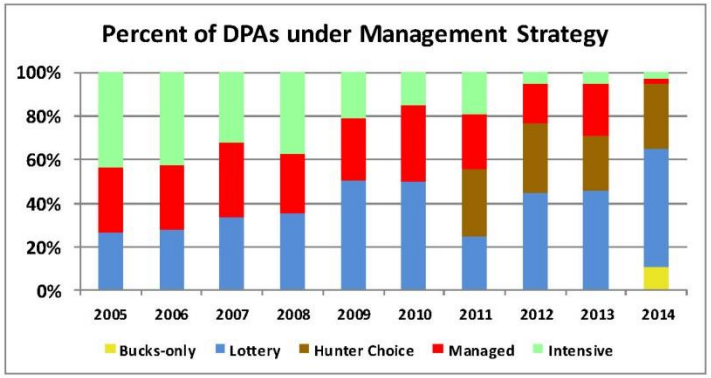




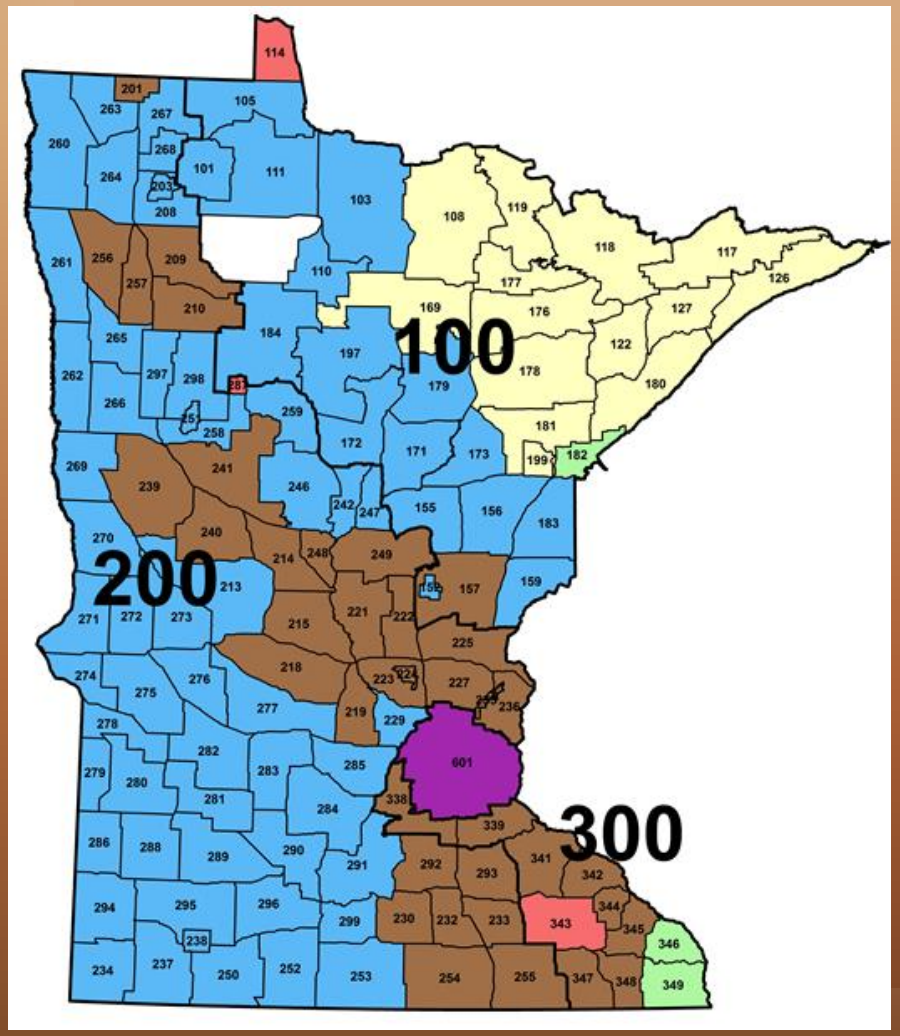








2014 Deer Season

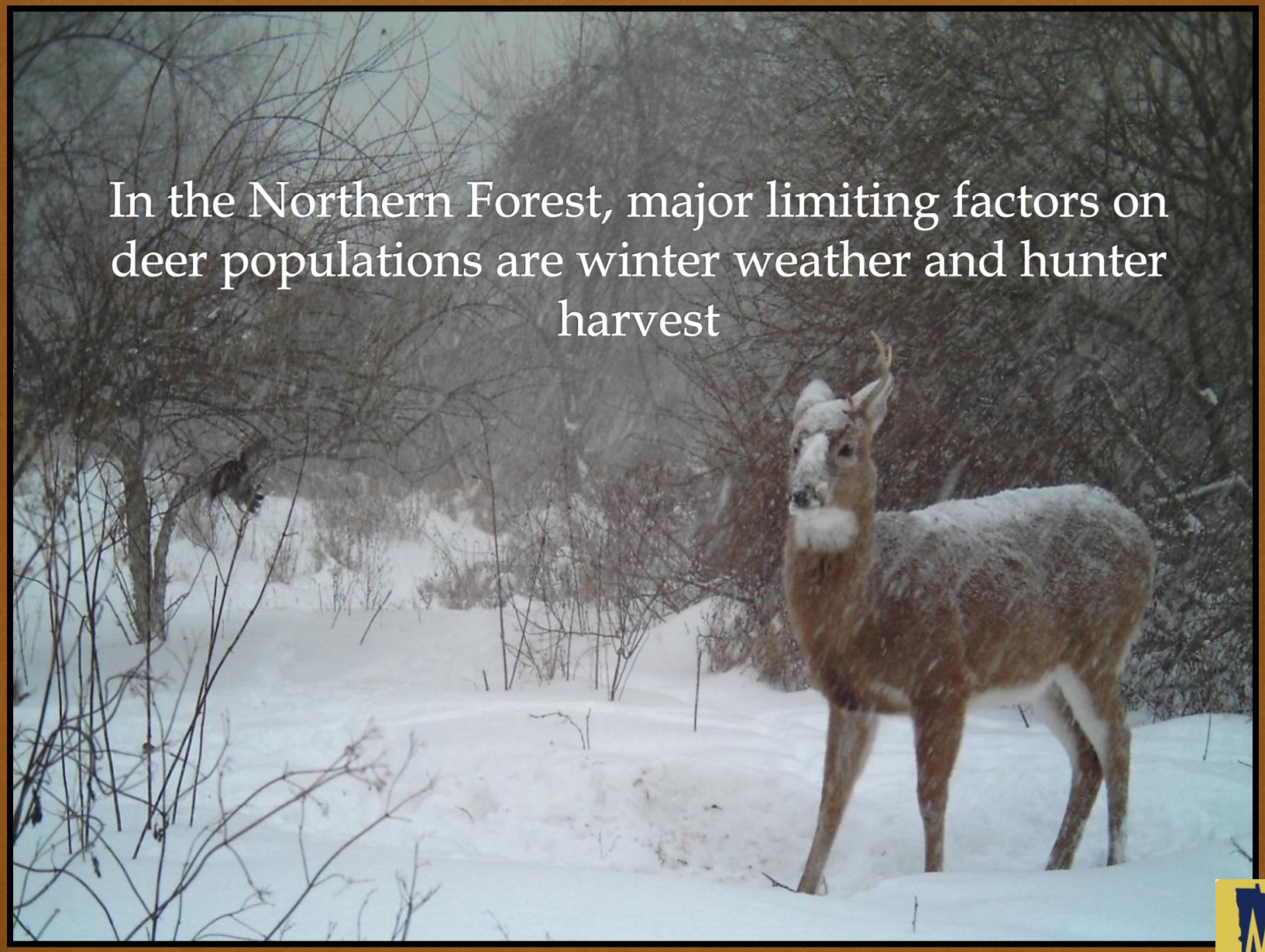


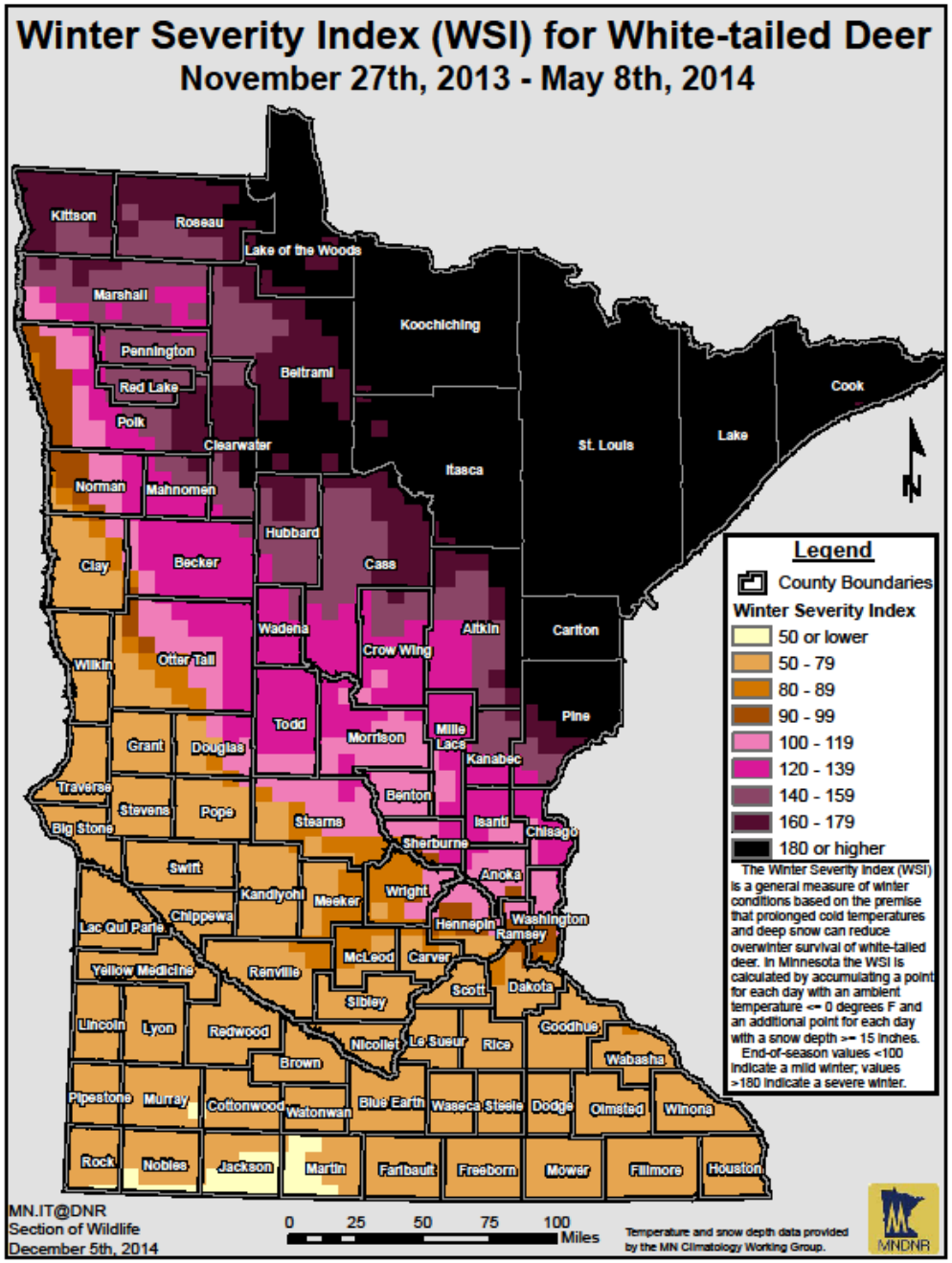
Harvest by Series (preliminary)

- 23% from 100 series
- 60% from 200 series
- 13% from 300 series
- 4% metro, special

Compared to 2013:

Series	Buck Harvest	A-less Harvest	Overall
100	-22%	-64%	-40%
200	-1%	-26%	-13%
300	+8%	-2%	+2%
State	-8%	-31%	-19%


In the Northern Forest, major limiting factors on deer populations are winter weather and hunter harvest


Winter Severity Index (WSI) for White-tailed Deer
November 27th, 2013 - May 8th, 2014
Kittson
Roseau
Lake of the Woods
Marshall
Koochiching
Pennington
Red Lake
Beltrami
Polk
Clearwater
Itasca
St. Louis
Lake
Cook
Norman
Mahnomen
Hubbard
Clay
Becker
Cass
Wadena
Aitkin
Carlton
Crow Wing
Wilkin
Otter Tail
Pine
Todd
Mille Lacs
Morrison
Grant
Douglas
Kanabec
Traverse
Benton
Stevens
Pope
Big Stone
Stearns
Isanti
Chisago
Sherburne
Swift
Anoka
Kandiyohi
Meeker
Wright
Chippewa
Hennepin
Washington
Lac Qui Parle
Ramsey
McLeod
Carver
Yellow Medicine
Renville
Scott
Dakota
Sibley
Lincoln
Lyon
Redwood
Goodhue
Nicollet
Le Sueur
Rice
Brown
Wabasha
Pipestone
Murray
Cottonwood
Watonwan
Blue Earth
Waseca
Steele
Dodge
Olmsted
Winona
Rock
Nobles
Jackson
Martin
Faribault
Freeborn
Mower
Fillmore
Houston
Legend
County Boundaries
Winter Severity Index
50 or lower
50 - 79
80 - 89
90 - 99
100 - 119
120 - 139
140 - 159
160 - 179
180 or higher
The Winter Severity Index (WSI) is a general measure of winter conditions based on the premise that prolonged cold temperatures and deep snow can reduce overwinter survival of white-tailed deer. In Minnesota the WSI is calculated by accumulating a point for each day with an ambient temperature <= 0 degrees F and an additional point for each day with a snow depth >= 15 inches.
End-of-season values <100 indicate a mild winter; values >180 indicate a severe winter.
MN.IT@DNR
Section of Wildlife
December 5th, 2014
0 25 50 75 100 Miles
Temperature and snow depth data provided by the MN Climatology Working Group.
MNDNR

Forest Unit Deer

•Populations in the forest zone have changed remarkably over the past 10 years.

•Densities and numeric harvests were high from 2004 through 2007 then deer numbers declined in most DPAs from 2007 through 2009.

•The more conservative harvest management strategies used throughout the forest zone used in 2012 and 2013 have helped offset the population declines, but winter mortality rates were very high and significantly reduced deer numbers from 2009 through 2014.

•Trends in modeled deer densities and numeric harvests were relatively stable from 2009 through 2014 in most southern forest zone DPAs (south of Park Rapids and Duluth).

•No modeled forest zone DPAs had trends that suggested an increasing deer population from 2009 through 2014.

M. Grund 2014

Deer Habitat Situation is Good

Legacy Funding for Forests and Grassland Management and Acquisition

More public land open to hunting

Timber harvest on state and county lands has been strong but private land harvest is down considerably

Nearly 3 million cords of wood harvested annually
150,000 acres of early successional habitat created annually

Forest Deer Habitat

Seasonal variation--summer/winter,

Young forest of 1996-may have accelerated rebound of herd

Importance of conifers. Mixed stands of conifer/aspen/oak typically produce the highest densities (MacCaffrey).

How much conifer is optimum is under investigation (DelGuidice)

Early successional forest is currently abundant. young, sunlit forest provides forage including browse.

Mid-age monoculture may be too dense and shaded to provide understory or browse in high quantity.

Forest Deer Habitat

As young forests mature, thick canopy limits browse and understory and forest floor forage. Stands that allow sunlight penetration through mature forest gaps may provide more sunlit and therefore more forage than intermediate even-aged stands

- Early successional habitat benefits all these species, mixed stands can be optimum for grouse and deer and even woodocock.
- Mixed stands with conifer component take longer to develop
- Woodcock use very young early succesional stands, but mixed are used also. Also use openings, brushland and nonforested areas.
- Revise the notion that is has to be only young, grouse and deer use a variety of age classes
- Private land is providing old forest values that intensified harvest on public land may not be
- DNR Wildlife supports a balanced age class distribution for the benefit of all wildlife and the maintenance of ecosystem integrity
- Protect winter conifers for deer.
- Follow the Guidelines, leave more CWD, live snags, patchy, even stands

What can we say about these populations and how they've been affected by the decline in private land timber harvest?

Increases in state and county land harvest have made up for some of the decline in private land harvest.

Private lands are providing some of the old forest values that are less prevalent on the more heavily harvested public lands.

We don't conduct forest-wide surveys or calculate density estimates at a forest-wide level.

We have multiple goals for our forests and associated wildlife populations, have we maximized deer or grouse populations?

Sustainability and diverse resilient forests are also a goal.

Are there ways DNR Wildlife can work to assist with private land timber harvest?

RGS Mission

Healthy Forests

Abundant Wildlife

Sporting Traditions

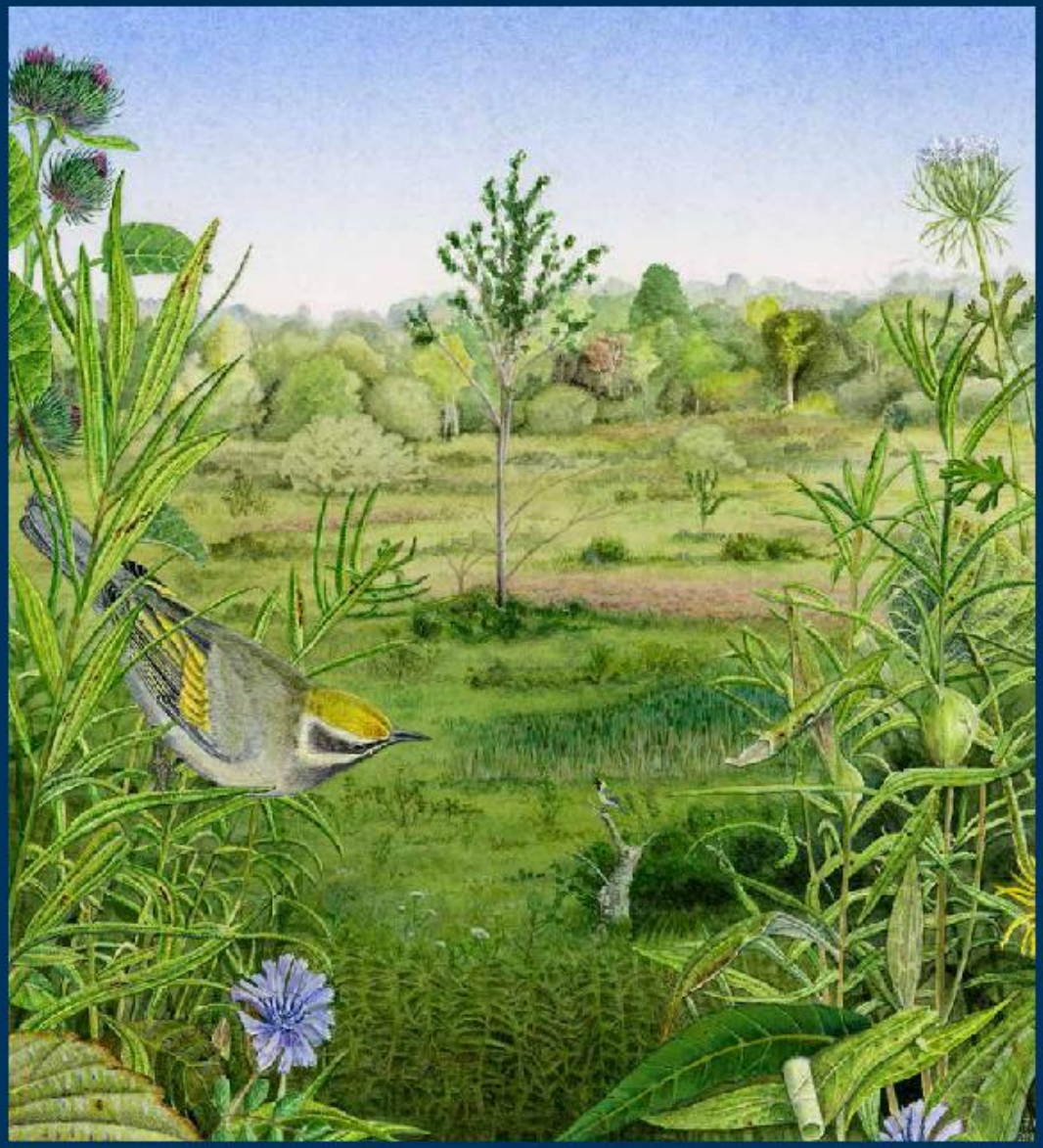
Habitat Management Strategies for Ruffed Grouse and Woodcock

A Short Course for Foresters

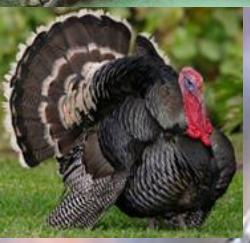
Best Management Practices For

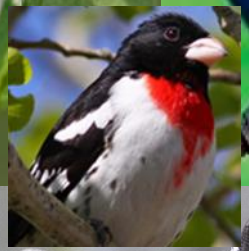
Golden-winged Warbler Habitats in the Great Lakes Region

A Guide for Land Managers and Landowners



Conservation goal is to benefit a suite of species and help promote a dynamic mosaic of forest age classes and cover types on our MN





Why should foresters consider wildlife?

National Woodland Owner Surveys show family forest owners' reasons to own forests:

- #1 Beauty and scenery
- #4 Nature protection
- #7 Hunting or fishing
- #10 Timber production

RGS Programs

Habitat Management

Outdoor Heritage

Advocacy

Education

RGS Coverts Project

A Woodland Wildlife Management Course for Private Landowners

- Initiated in 1983
- Worked with Coop Extension Services
- At peak, 11 Midwest and Northeast States involved
- Train the Trainer concept
- Over 1 million acres affected

AMERICAN BIRD CONSERVANCY

Shaping the future for birds

American Bird Conservancy
Early Successional Habitat Private Lands Forester
3 Positions Available

Position Summary:

Title: Early Successional Habitat Private Lands Forester
Locations:

1. Rhinelander, WI
2. Duluth, MN
3. Marquette, MI (Tentative)

Note: All positions are based out of Natural Resource Conservation Service (NRCS) offices.

Position Reports to: ABC's Migratory Bird Program Director
Application Deadline: March 20, 2015 (first round of interviews will be conducted the weeks of March 23 and 30th, 2015)
Term of Position: Approx. May 1, 2015 to Dec, 31, 2018

Introduction and Primary Duties:

American Bird Conservancy (ABC) is looking for three motivated individuals to work effectively with private forest landowners and local partners in Minnesota, Wisconsin and Michigan, to implement best management practices on private lands for Golden-winged Warblers (GWWA) and other wildlife associated with early successional habitat through the Regional Conservation Partnership Program

Integrated Resource Management

Fulfilling a Mutual Responsibility

While each division has different mandates and functions, they have ***mutual*** responsibility for **sustainable** forest management.

1995 SFRA Policy (M.S. 89A.02)

It is the policy of the state to pursue the sustainable management, use, and protection of the state's forest resources to achieve the state's economic, environmental, and social goals;

The Wildlife Habitat Indicator for Native Genera and Species (WHINGS): Methodology and Application

by
John M. Zobel1 and Alan R. Ek2

September 2014
Interagency Information Cooperative
and
Department of Forest Resources
College of Food, Agricultural and Natural Resource Sciences
University of Minnesota
St. Paul, Minnesota