Wild Turkeys in North Carolina

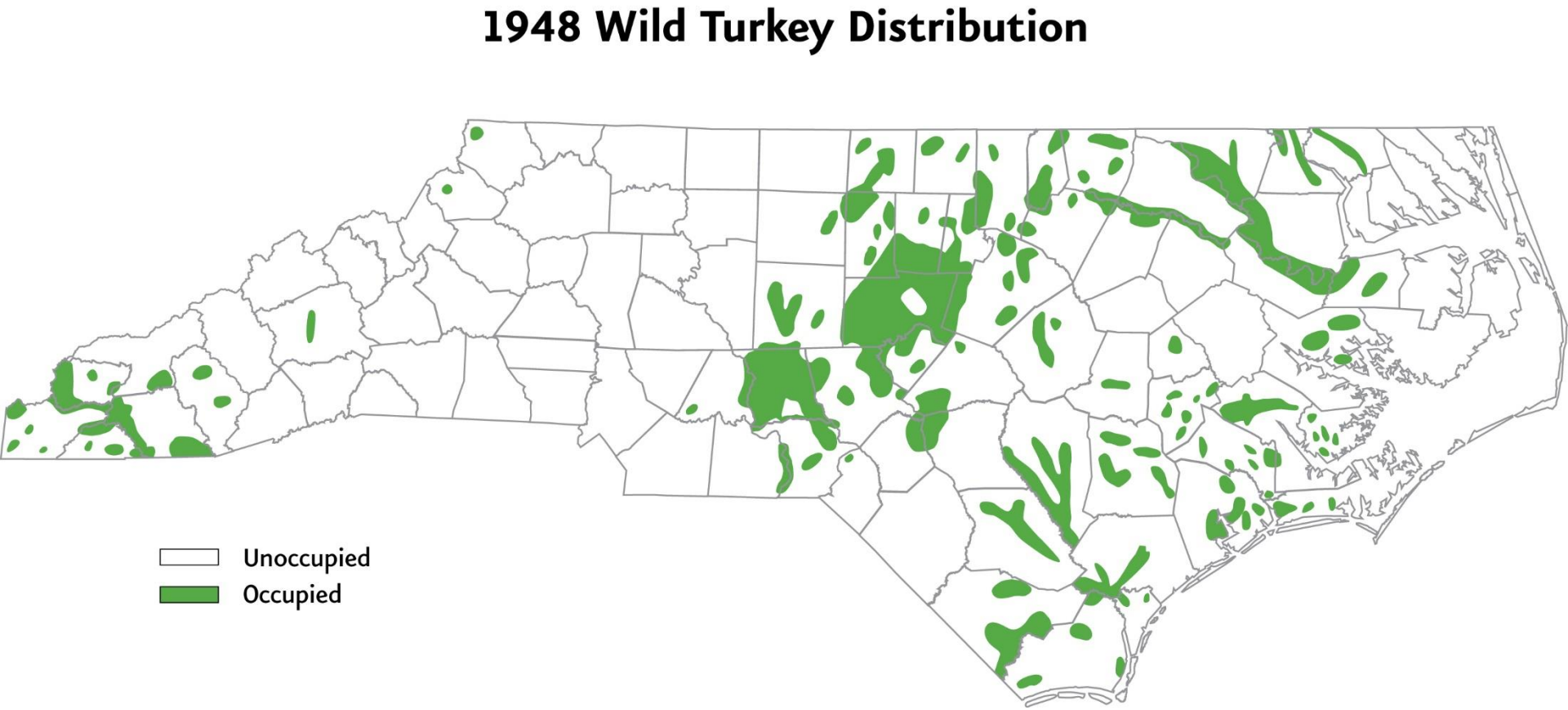
An update on research, harvest, and habitat

Hannah Plumpton
Upland Game Bird Biologist

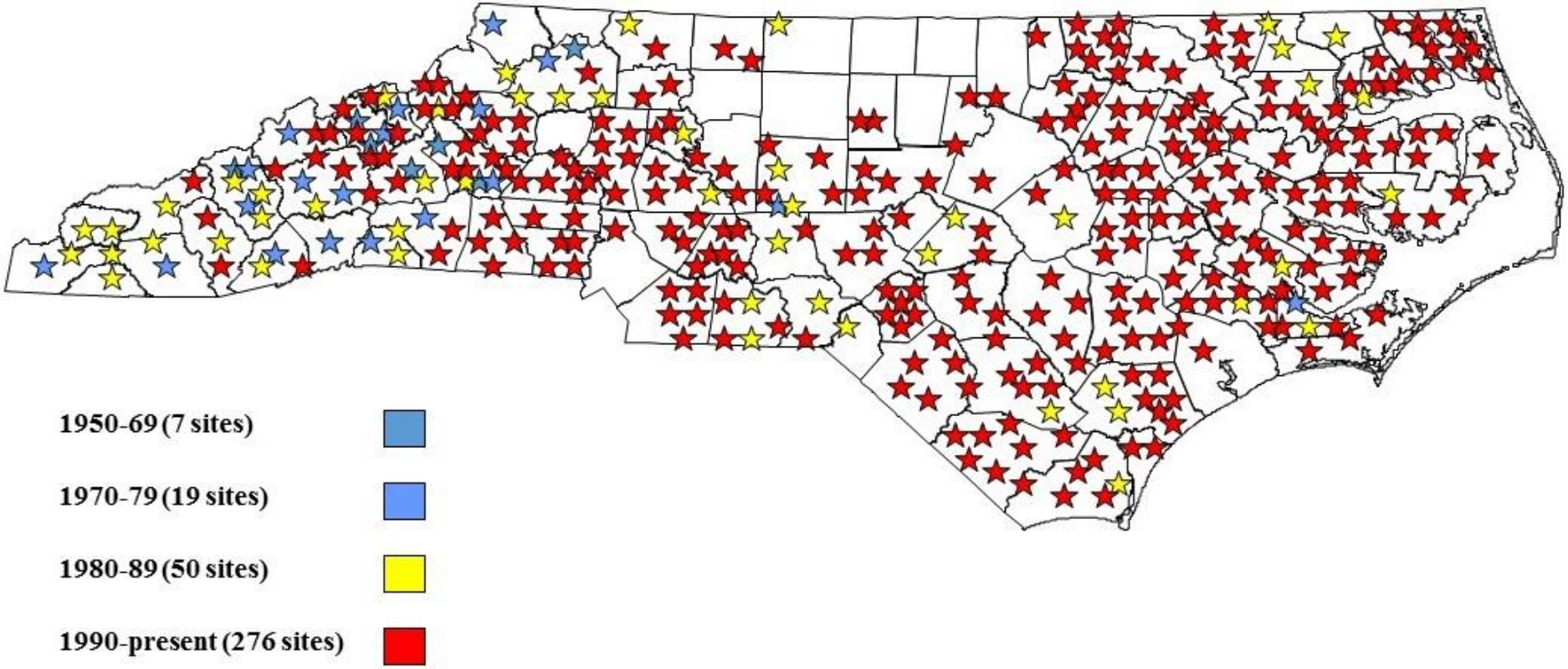
Monitoring Wild Turkeys In North Carolina

Wild Turkey Restoration 1953 - 2005

- 1948 – estimate 10,000 wild turkeys in NC
- 2020 – estimate 270,000 wild turkeys in NC



Wild Turkey Restoration Sites
1950-present



Monitoring Methods

- Reported harvest numbers
- Harvest per huntable square mile
- Hunter success rates
- Summer turkey survey
- Deer hunter observation survey

Reported Turkey Harvest

What does this survey tell us?

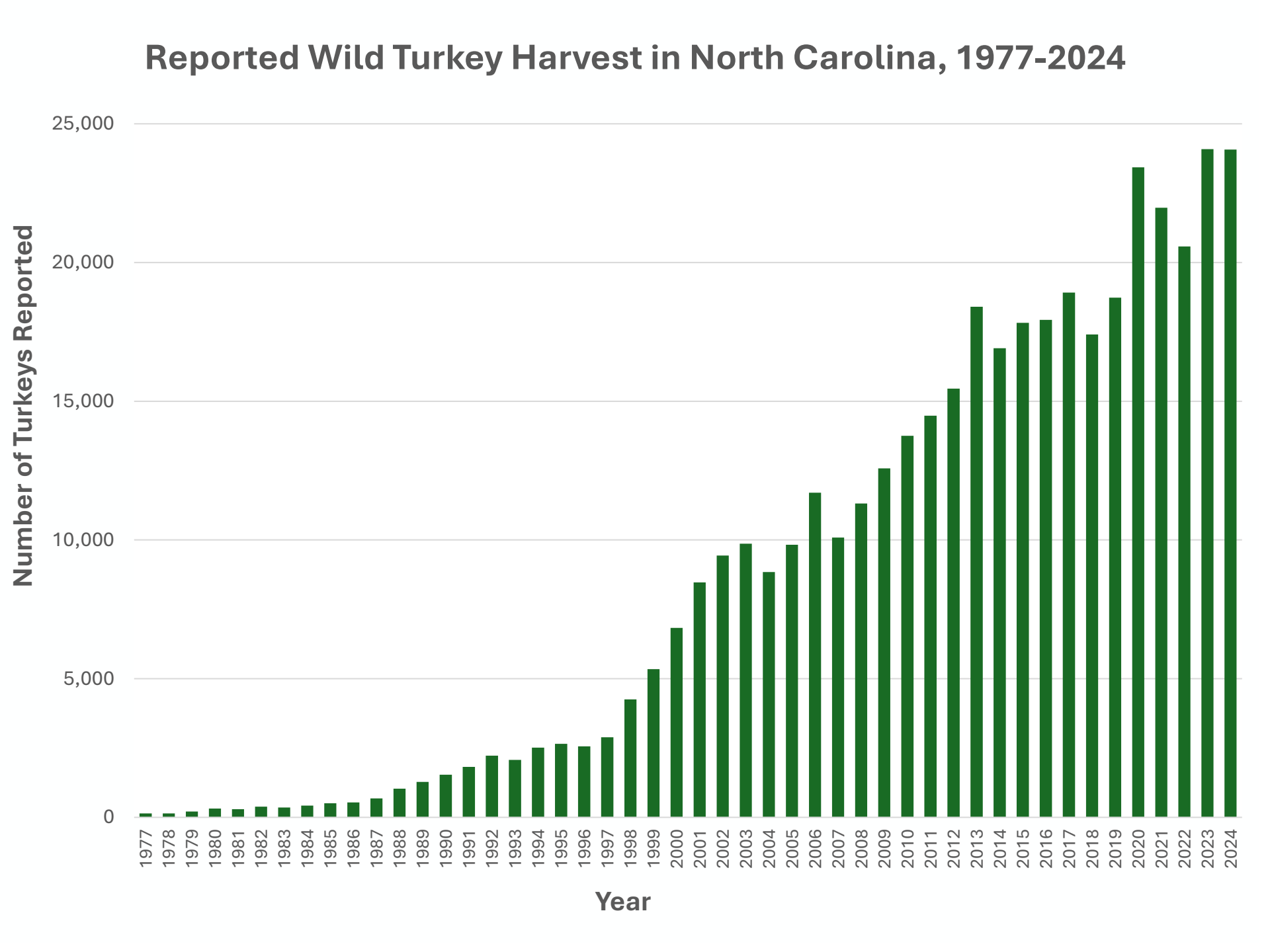
- The number of turkeys hunters report

What are the limitations?

- Incomplete reporting
- Doesn’t account for hunter effort

What does this mean?

- Minimum number of turkeys harvested
- Population trends


Reported Wild Turkey Harvest in North Carolina, 1977-2024
Number of Turkeys Reported
25,000
20,000
15,000
10,000
5,000
0
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
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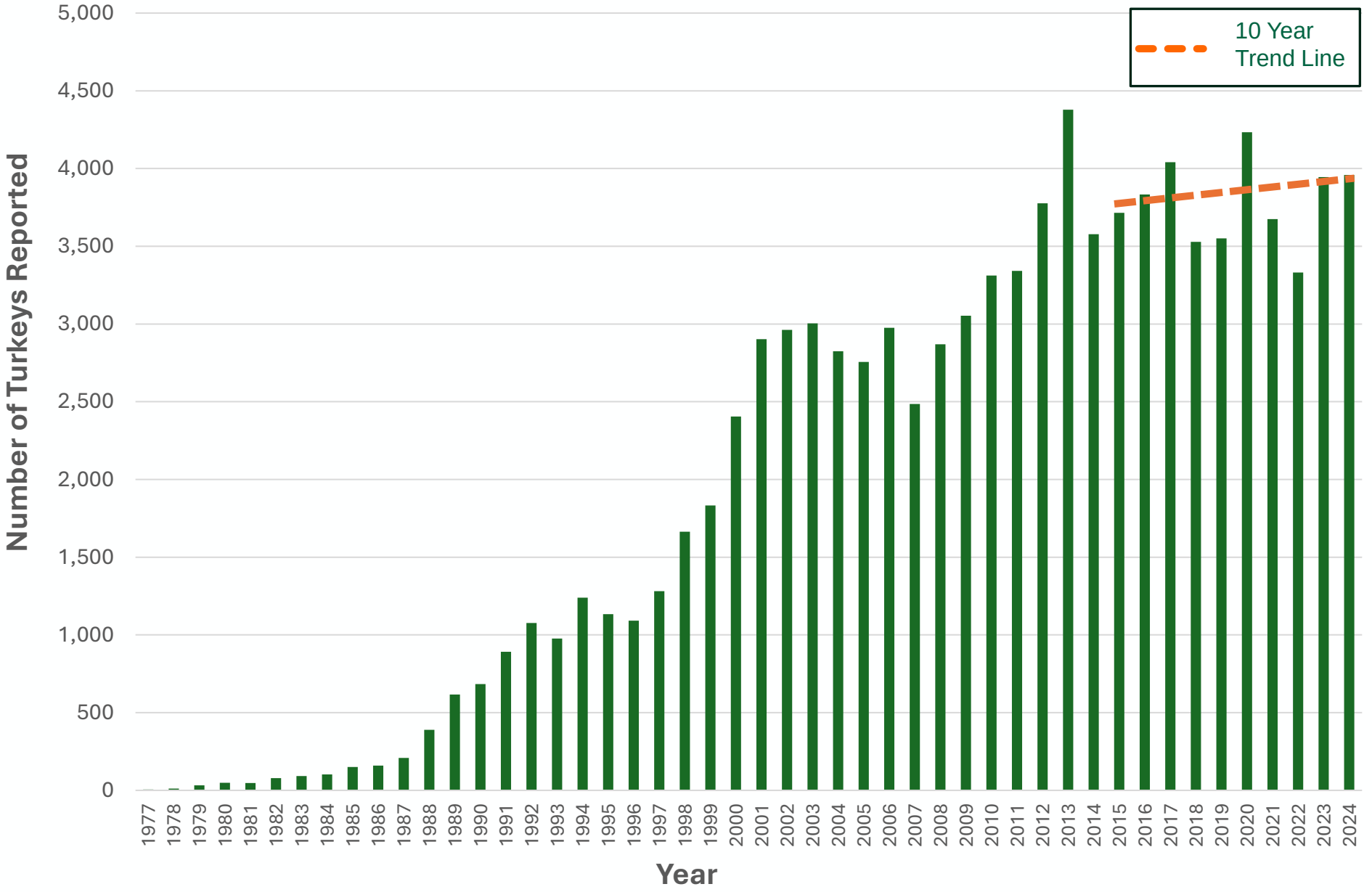
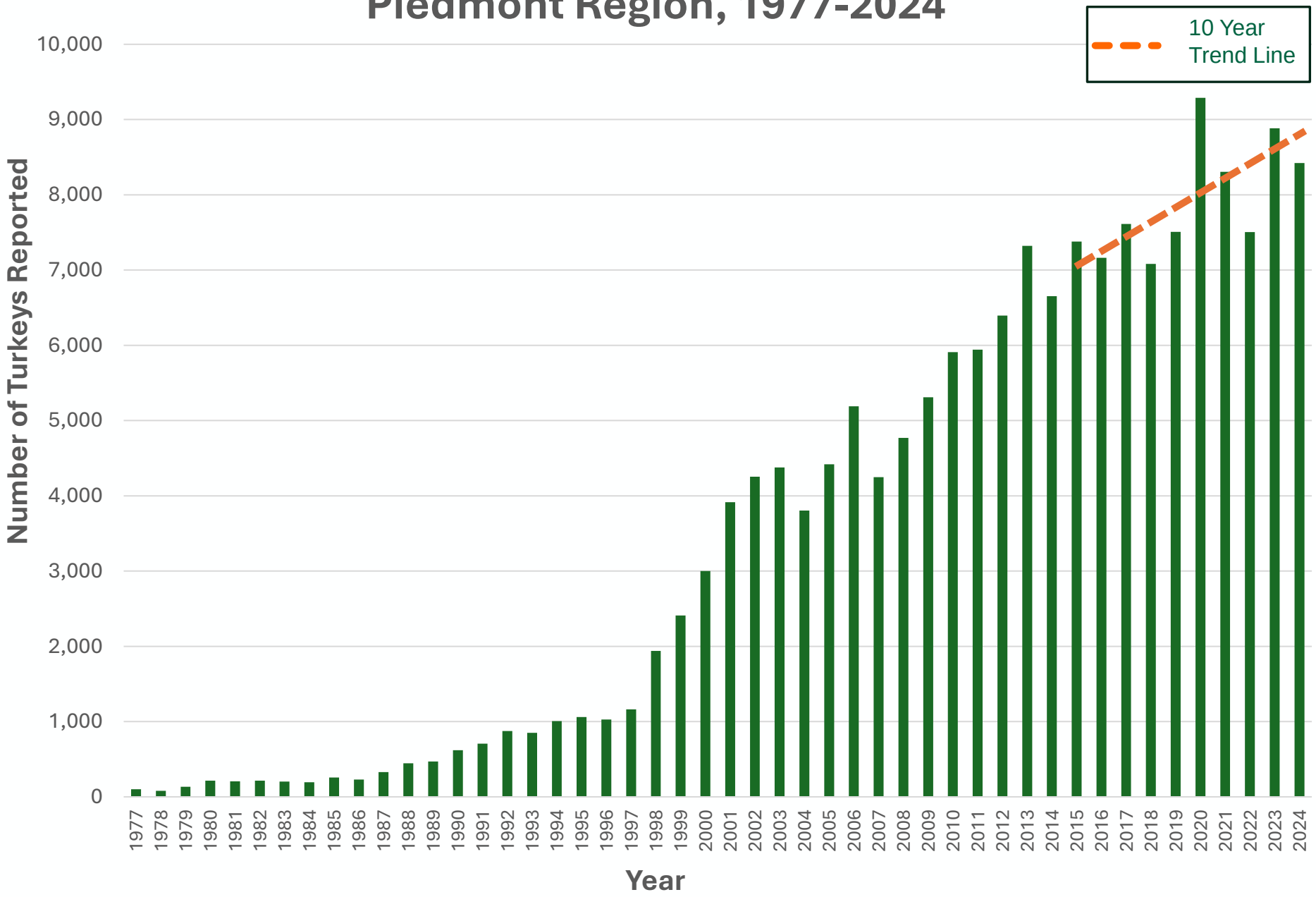
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year

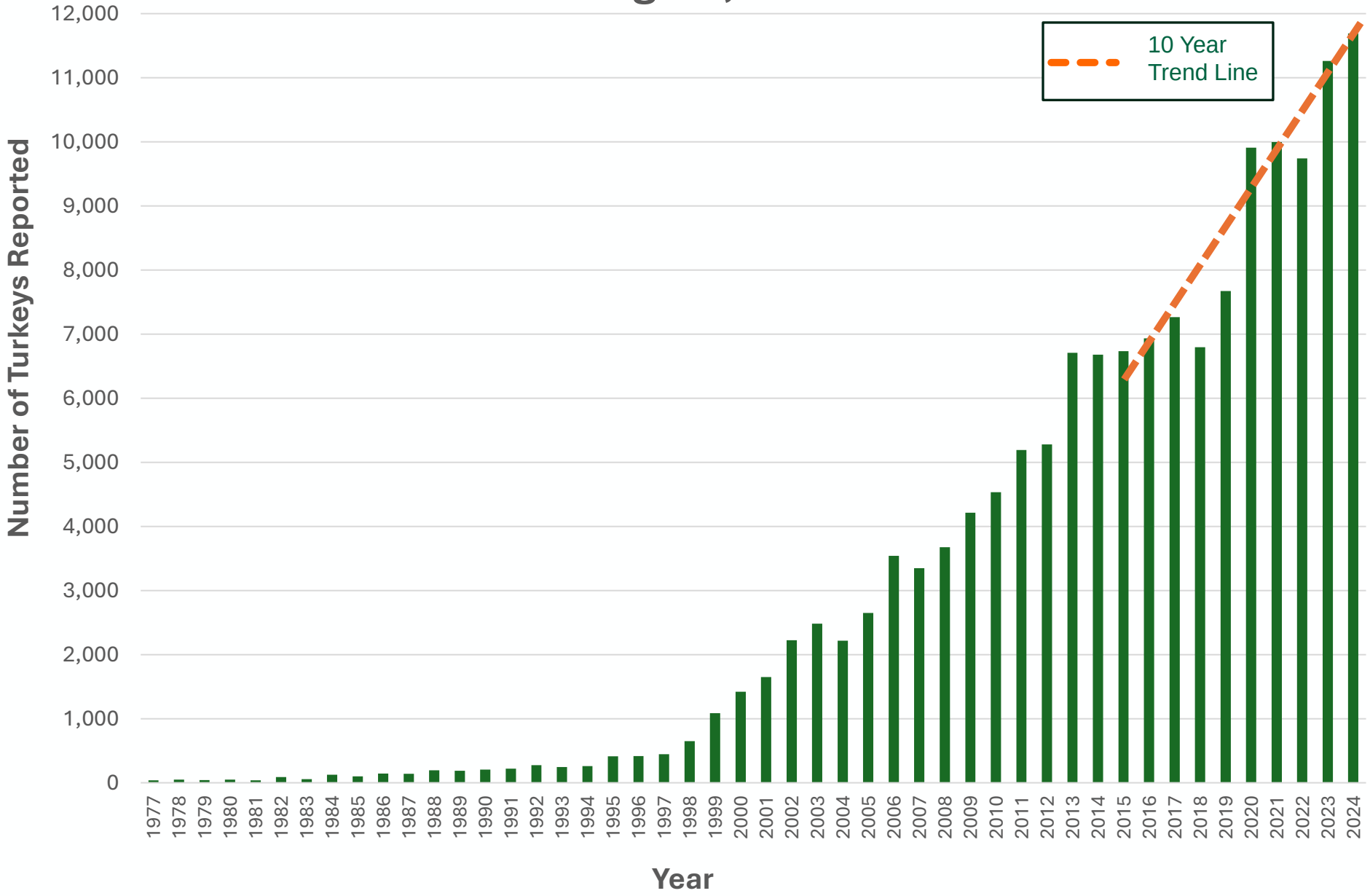
Reported Wild Turkey Harvest in North Carolina Mountain Region, 1977-2024



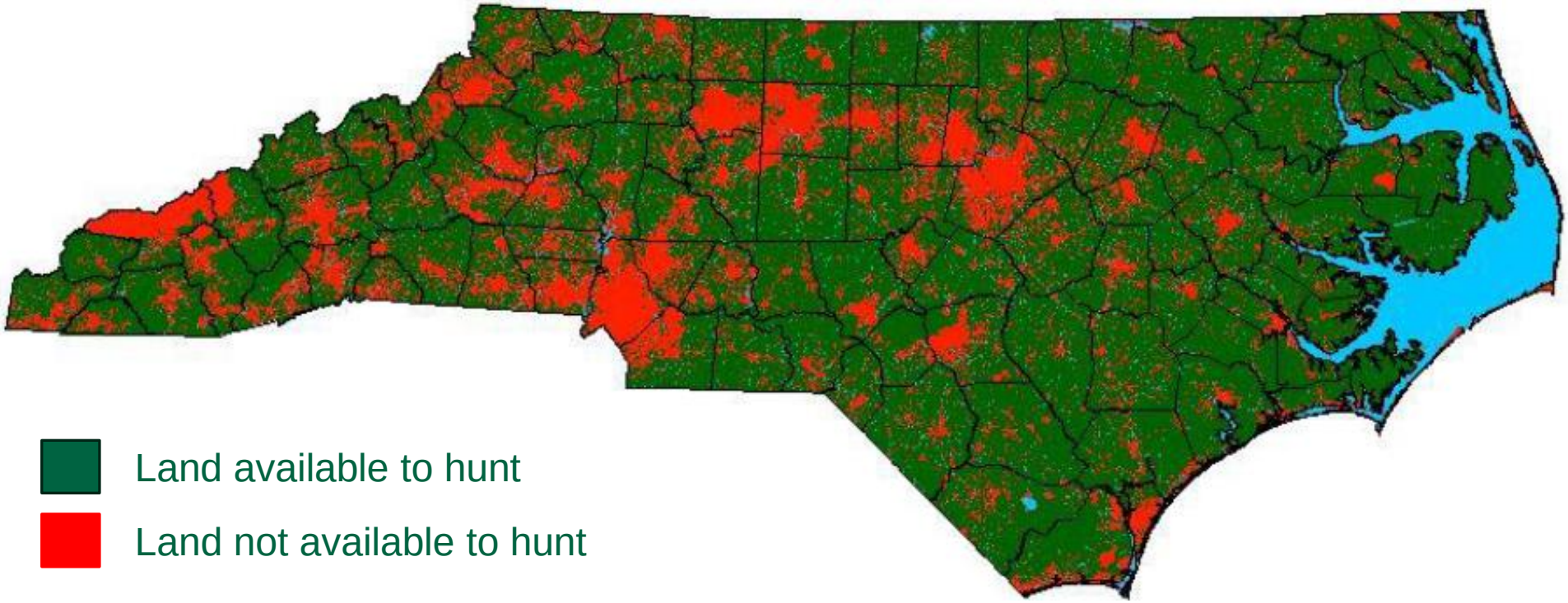
Reported Wild Turkey Harvest in North Carolina Piedmont Region, 1977-2024



Reported Wild Turkey Harvest in North Carolina Coastal Region, 1977-2024



Available Huntable Lands



Land available to hunt

Land not available to hunt

*Available hunting lands as of 2017

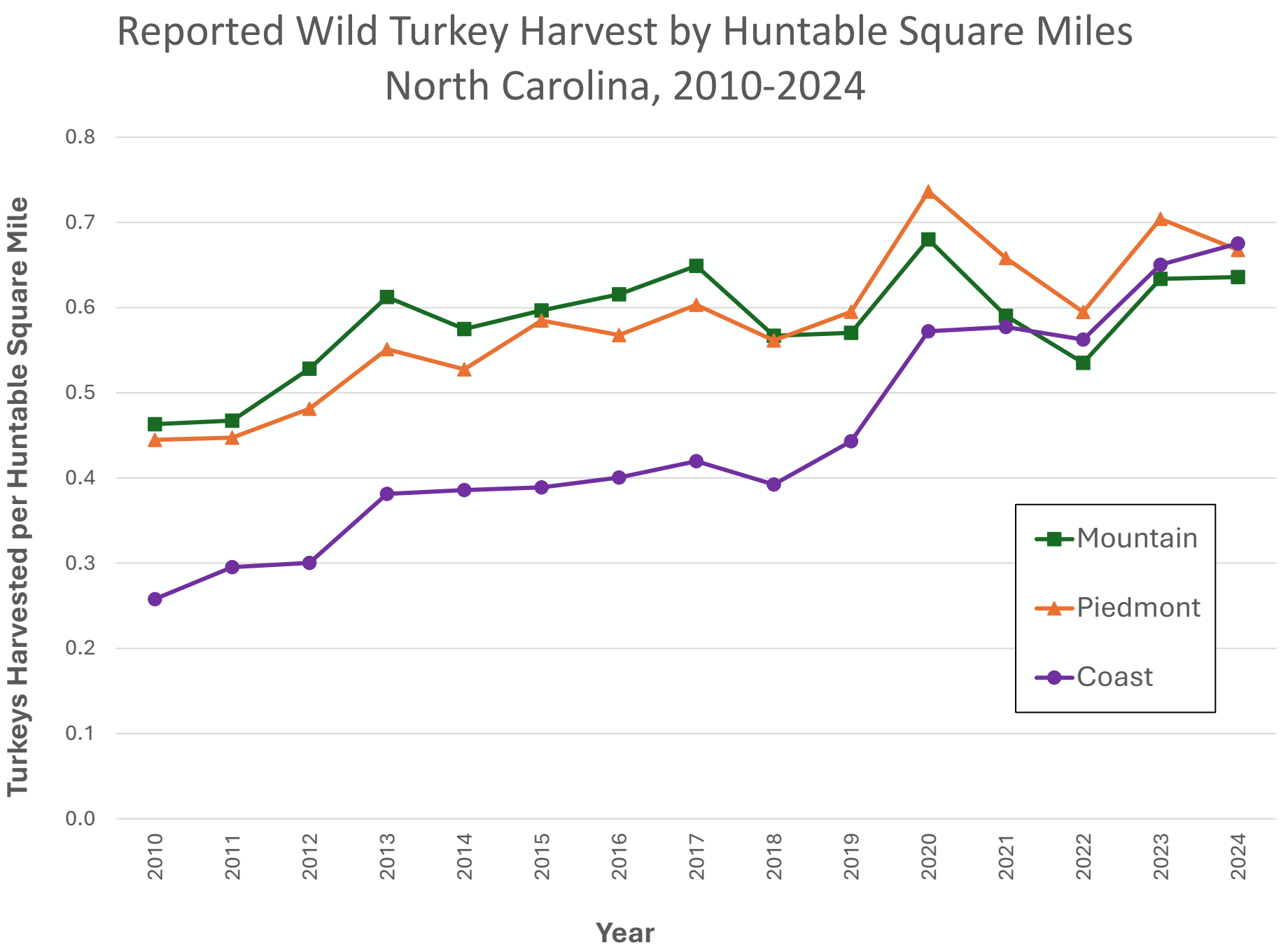
Harvest by Huntable Square Mile

What does this survey tell us?

- Gives a standardized way to compared turkey harvest across the state

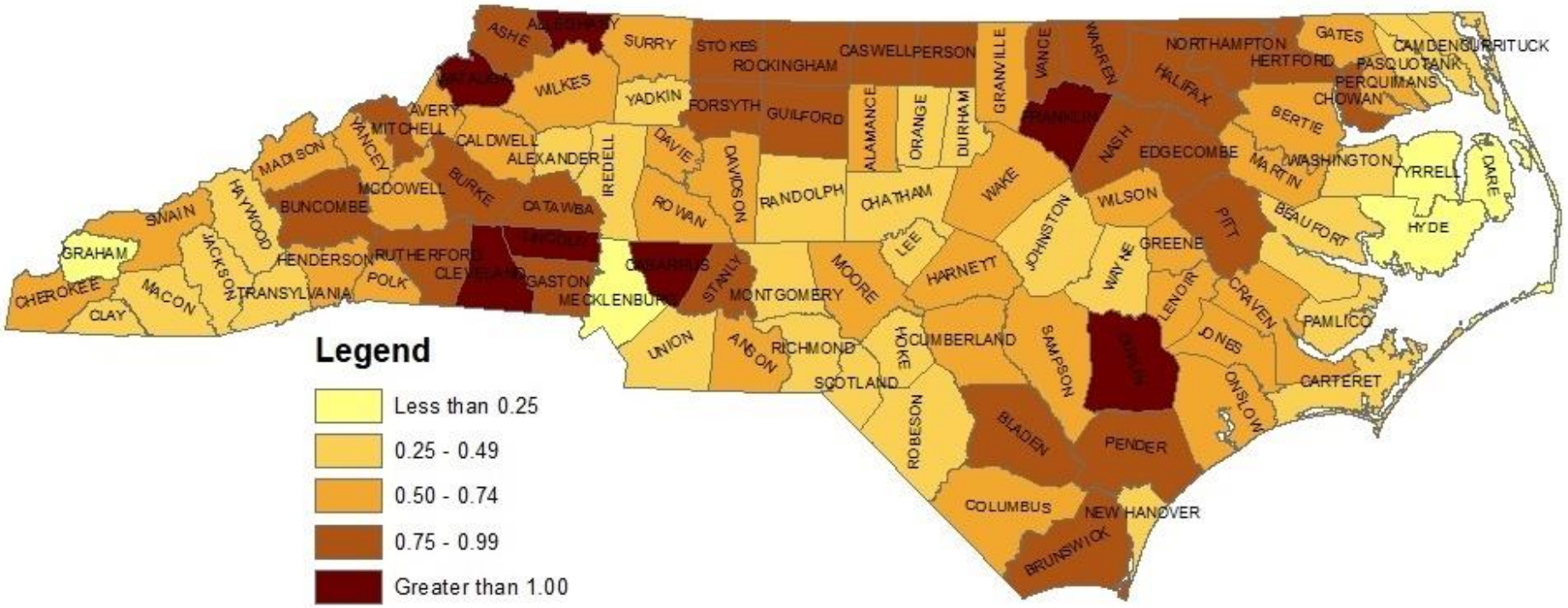
What does this mean?

- Shows where turkey populations and hunting are highest


Reported Wild Turkey Harvest by Huntable Square Miles
North Carolina, 2010-2024
Turkeys Harvested per Huntable Square Mile
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
Mountain
Piedmont
Coast

Harvest by Huntable Square Mile

Average Spring Turkey Harvest Per Huntable Square Mile
2022-2024



Hunter Success

		Number of Turkeys Harvested (Percentage)		
Year	**Number of Hunters**	**0 Turkeys**	**1 Turkey**	**2 Turkeys**
2020	75,428	74.1%	20.7%	5.2%
2021	75,820	76.1%	18.8%	5.1%
2022	74,755	77.0%	18.5%	4.5%
2023	73,365	73.2%	20.8%	6.0%
Average (2020-23)	**74,842**	**75.1%**	**19.7%**	**5.2%**

Hunter Success

What does this survey tell us?

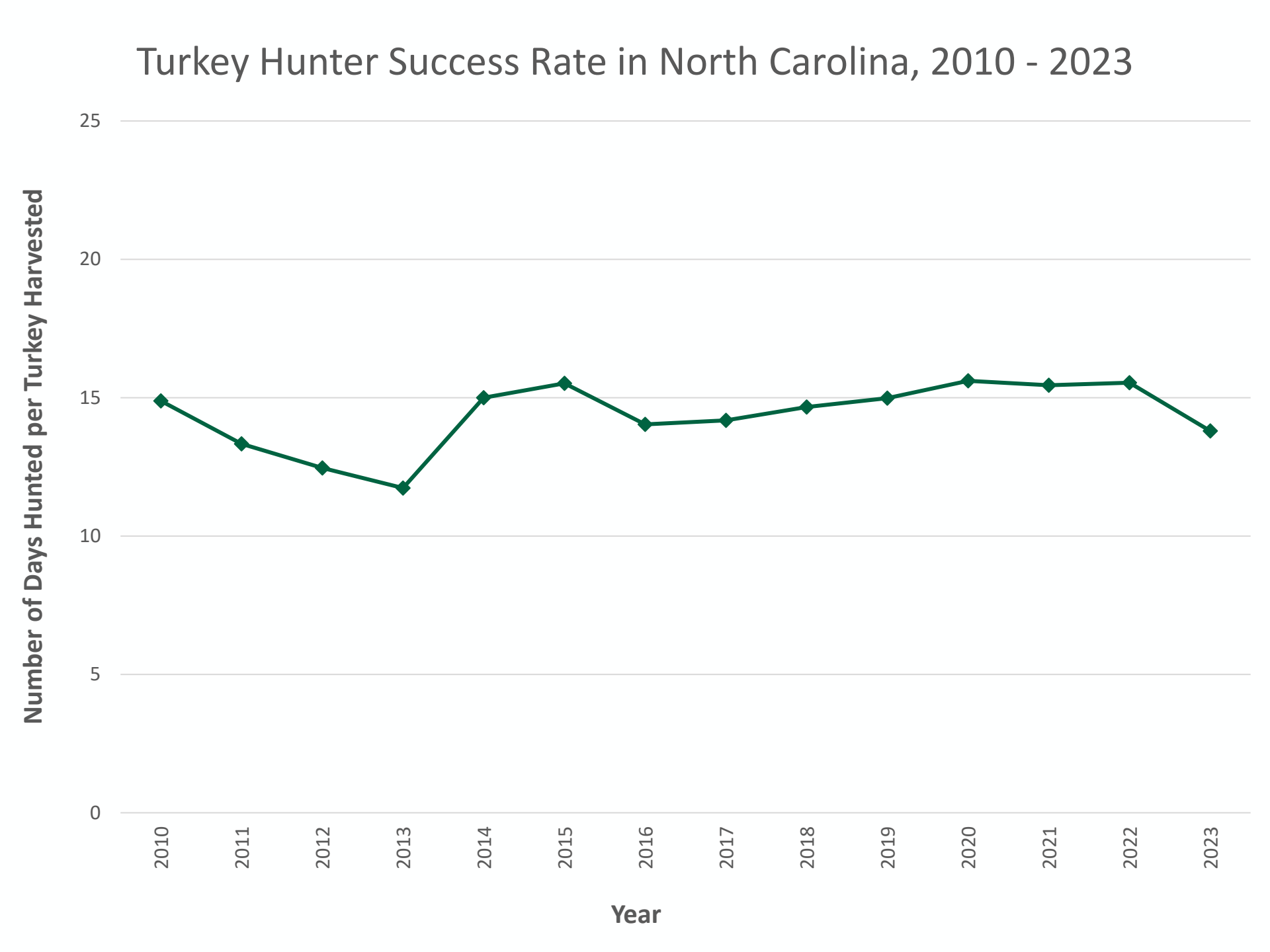
- Effort made per turkey harvested

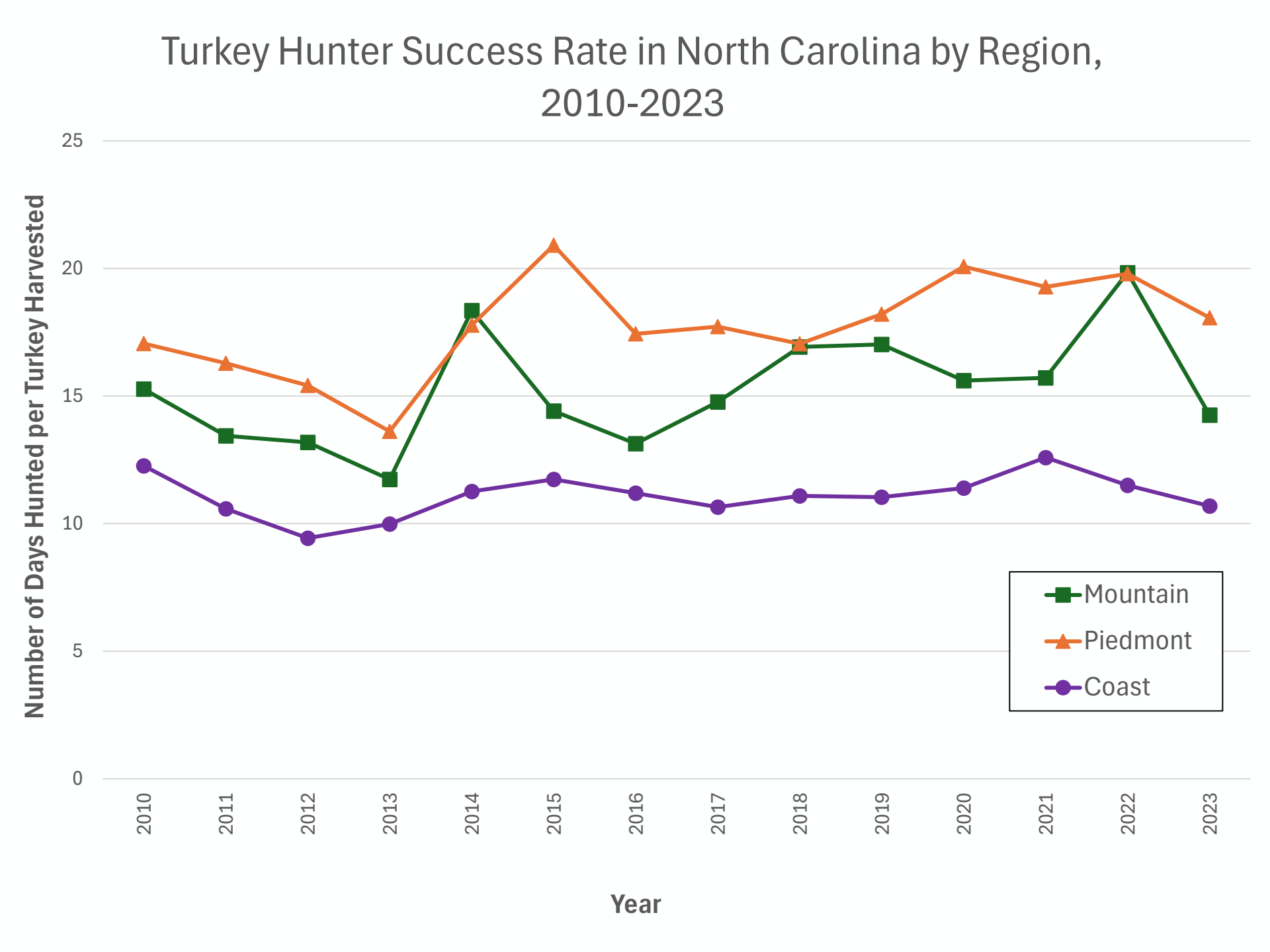
What are the limitations?

- Differences in experienced versus beginning hunters

What does this mean?

- Could indicate population trends
- Could reflect changes in hunting techniques and equipment


Turkey Hunter Success Rate in North Carolina, 2010 - 2023
Number of Days Hunted per Turkey Harvested
25
20
15
10
5
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year


Turkey Hunter Success Rate in North Carolina by Region, 2010-2023
Number of Days Hunted per Turkey Harvested
25
20
15
10
5
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year
Mountain
Piedmont
Coast

Summer Turkey Survey

What does this survey tell us?

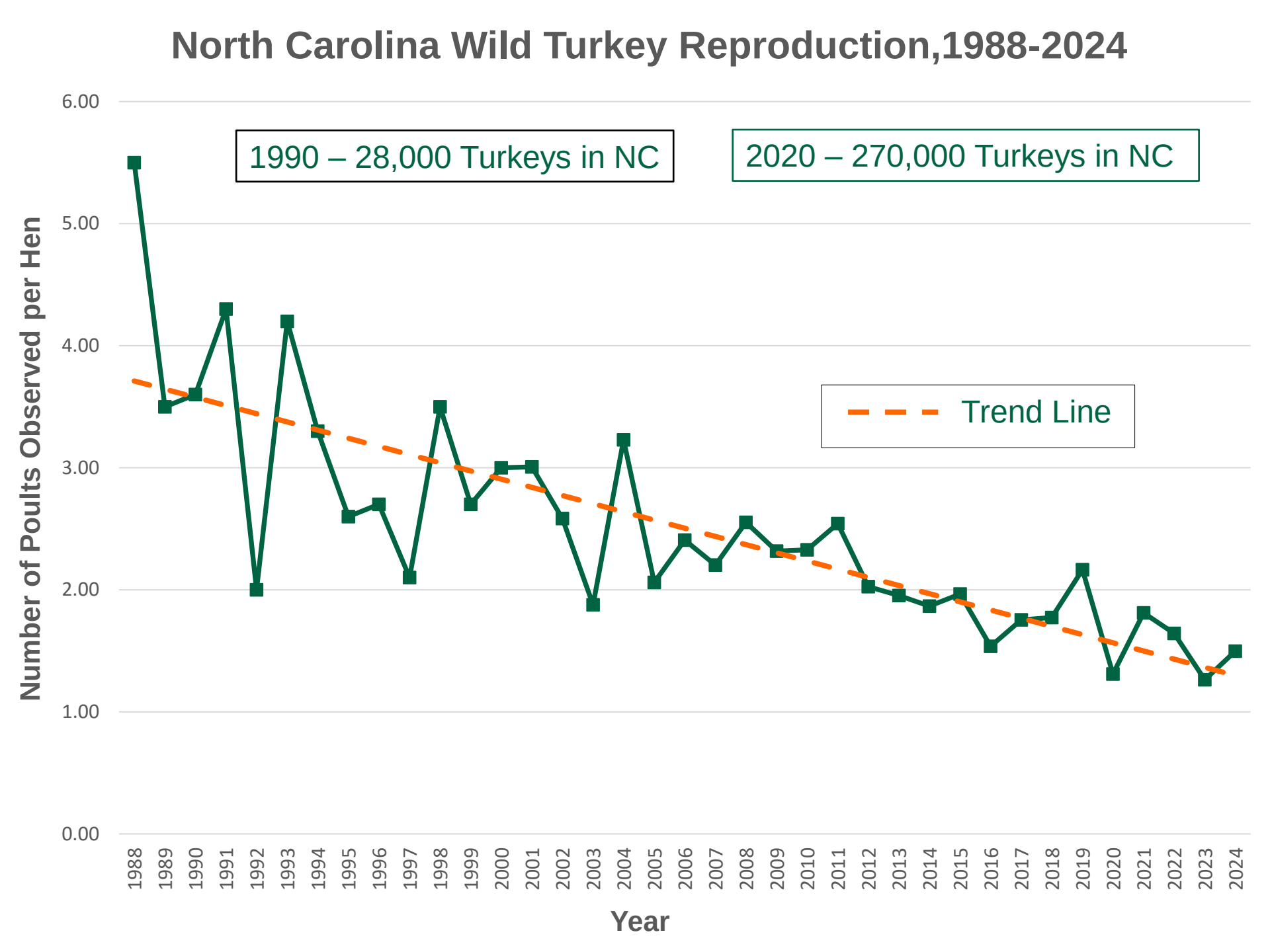
- Estimate of annual reproduction

What are the limitations?

- It's an index, not a complete count

What does this mean?

- Predicts population trends


North Carolina Wild Turkey Reproduction,1988-2024
1990 – 28,000 Turkeys in NC
2020 – 270,000 Turkeys in NC
Trend Line
Number of Poults Observed per Hen
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year

Deer Hunter Observation Survey

<u>What does this survey tell us?</u>

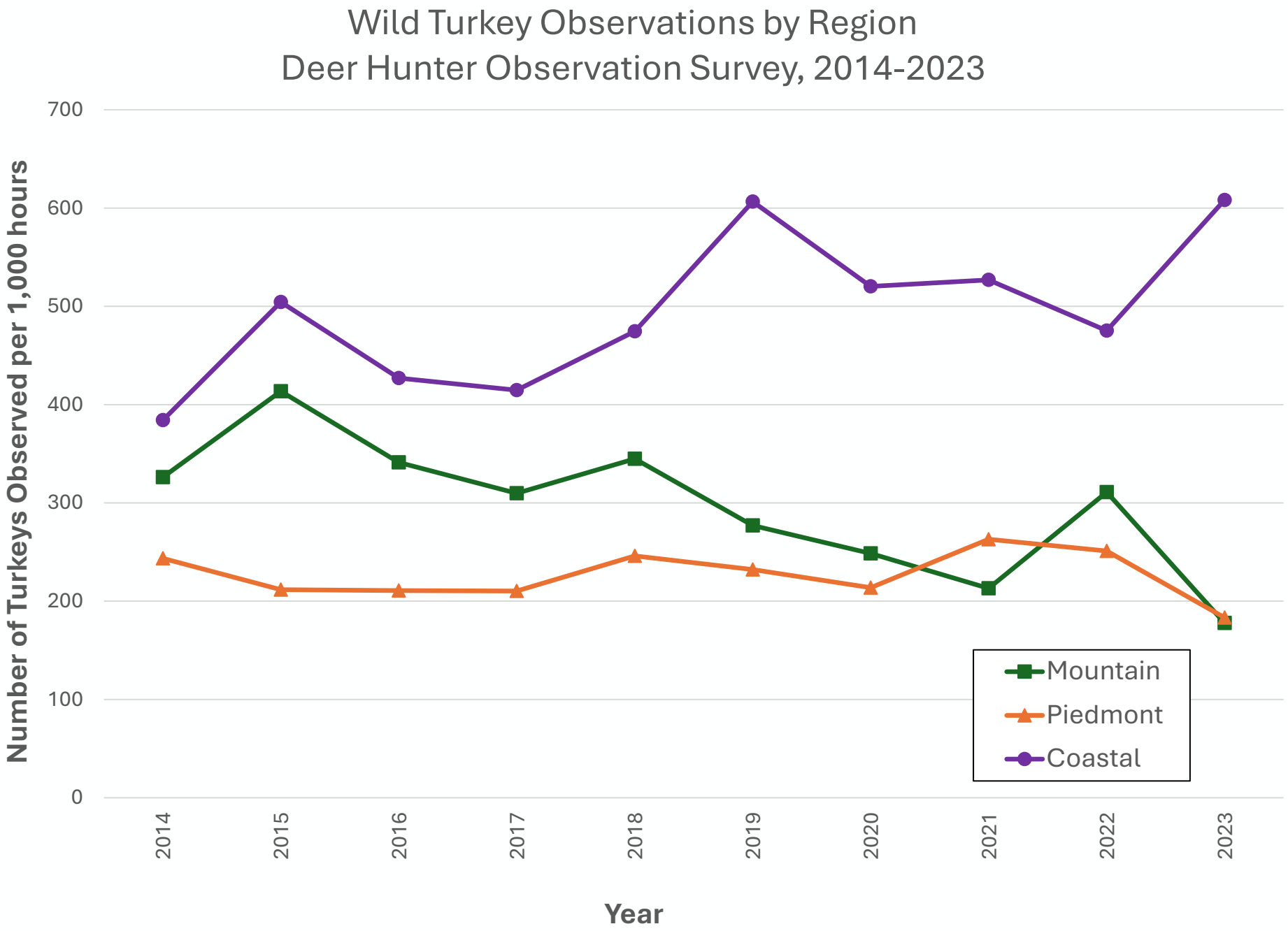
- How many turkeys are seen in the fall

<u>What are the limitations?</u>

- Need enough participating hunters
- Differences in visibility (fields vs forest)

<u>What does this mean?</u>

- Can show changes in populations over time
- Can show regional differences in turkey populations


Wild Turkey Observations by Region
Deer Hunter Observation Survey, 2014-2023
Number of Turkeys Observed per 1,000 hours
700
600
500
400
300
200
100
0
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Year
Mountain
Piedmont
Coastal

Why Do Multiple Surveys?

What do these survey tell us?

- Turkey population and harvest trends from various sources

What does this mean?

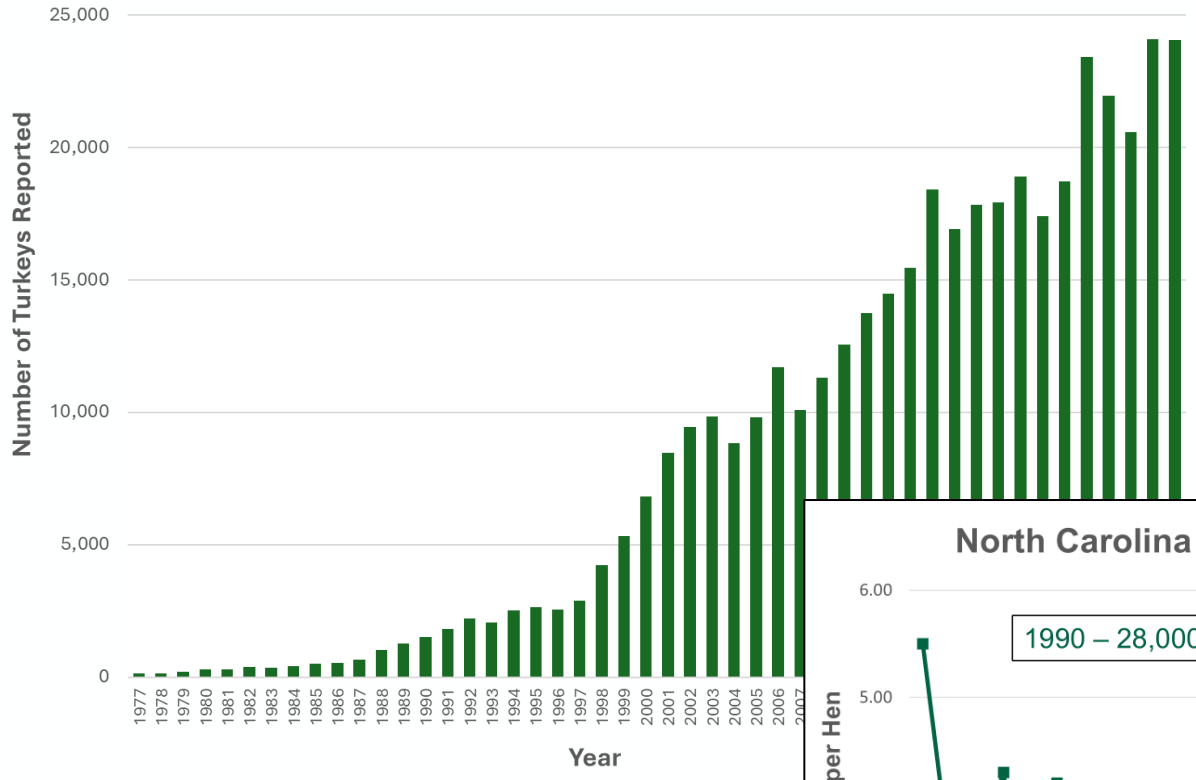
- When multiple surveys results are similar, we have more confidence in making management decisions

- When survey results are different, proceed cautiously!

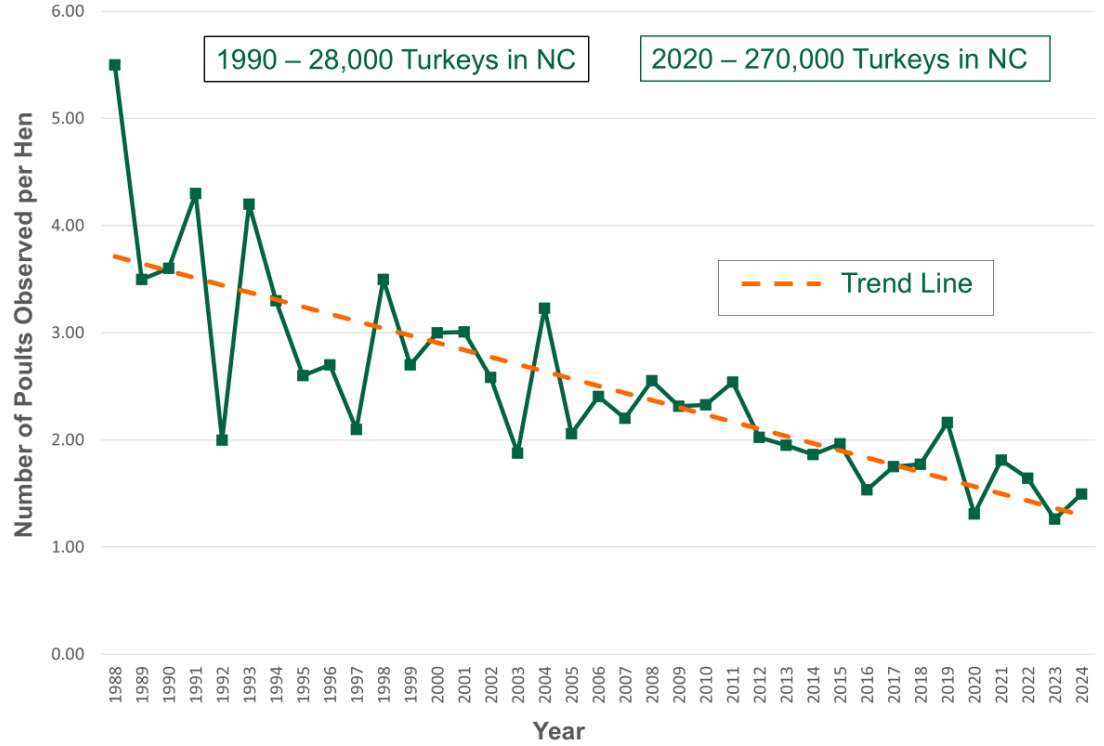
North Carolina Wild Turkey Ecology Project 2020 - 2024

Photo: NWTF

Reported Wild Turkey Harvest in North Carolina, 1977-2024



North Carolina Wild Turkey Reproduction,1988-2024



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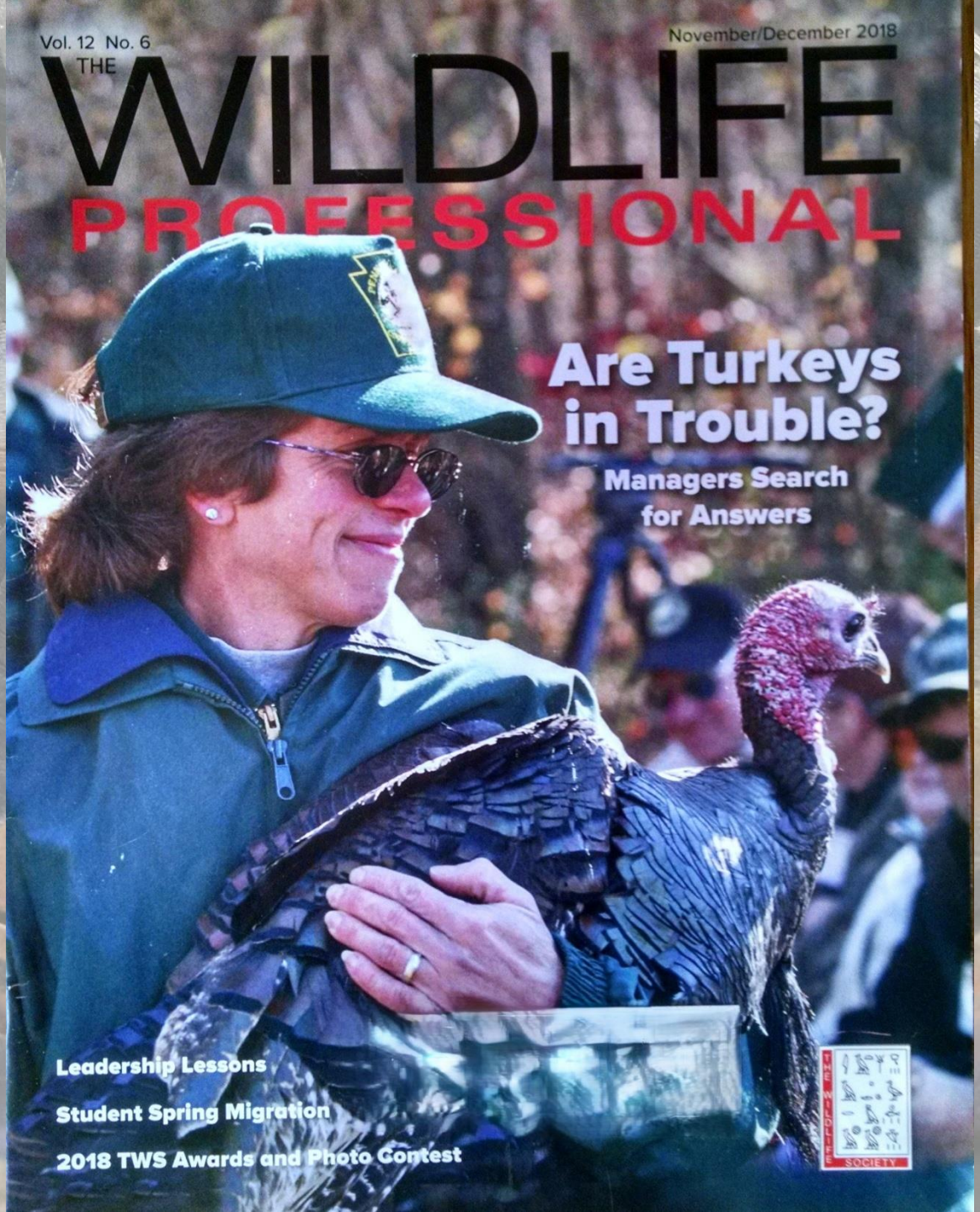


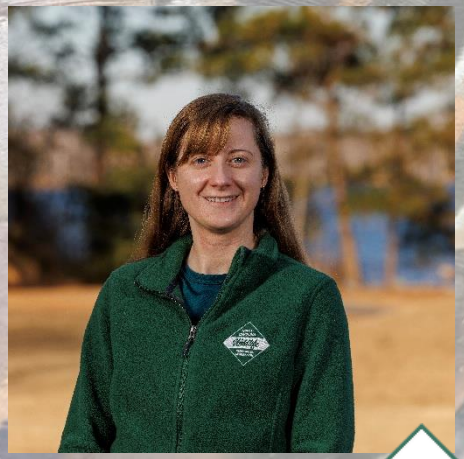
Are Turkeys in Trouble?

Managers Search for Answers

Leadership Lessons

Student Spring Migration

2018 TWS Awards and Photo Contest



NC STATE UNIVERSITY

LSU
LOUISIANA STATE UNIVERSITY

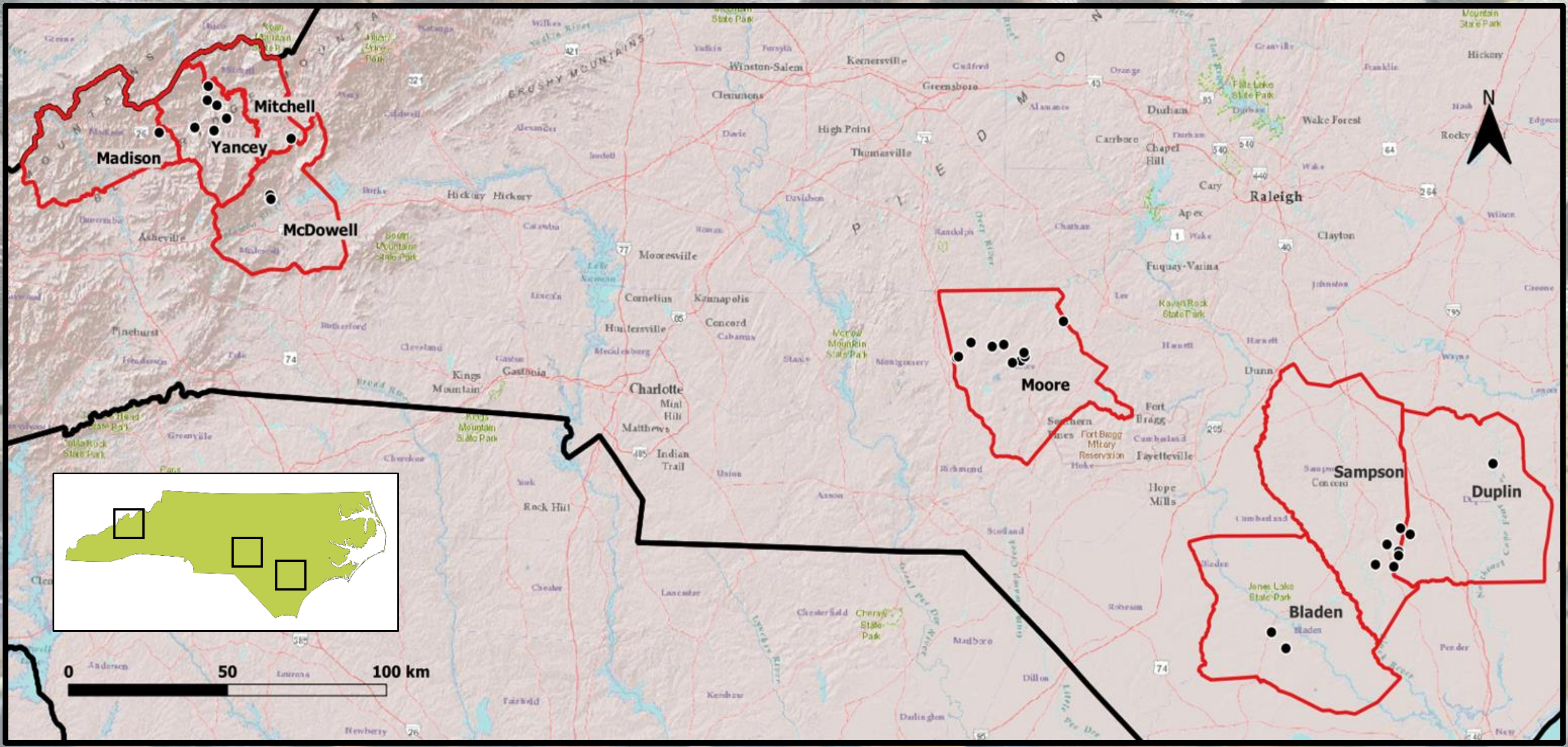
NWTF
Conserve. Hunt. Share.

NORTH CAROLINA Wildlife RESOURCES COMMISSION

Objectives

- Nesting Chronology
- Nesting Success
- Brood Survival
- Hunter Harvest Rates
- Survival Rates
- Gobbling Chronology
- Diseases/Parasites

Study Areas



Madison
Yancey
Mitchell
McDowell
Moore
Sampson
Duplin
Bladen
N
0
50
100 km
Charlotte
Raleigh


2020-03-02 8:24:15 AM M 3/3
35°F
Photo: NCWRC
F
RECONYX


2020-03-02 8:25:05 AM M 1/3
35°F
Photo: NCWRC
RECONYX

Photo: NCWRC

Photo: NCSU

Photo: NCSU


Photo: NCSU


Primary Support Provided by
U.S. Forest Service
SFI Sustainable Forestry Initiative
NATIONAL WILD TURKEY FEDERATION

Photo: NWTF

Photo: NWTF

Photo: NCSU

Summary Statistics (2020-2022)

- Captured 708 turkeys: 468 female, 240 males
- Transmittered 328 adults, 87 juvenile females
- Transmittered 145 adults, 59 juvenile males
- Located 420 nests
- Tracked 105 broods
- 63,456 gobbles from autonomous recorders
- 2,340 disease samples tested

Nesting Chronology

- Average date of start of egg laying: April 11
- Average date of incubation: April 24
- Timing similar across regions and years

Photo: Joe Mickey

Nesting Success

- 25% of nests hatched, 75% failed
- Predation was primary cause of failure
- Nest success related to habitat quality

Photo: NCSU

Broods

- 30% of broods had at least one poult survive to 28 days of age
- Brood and poult survival rates were consistent across regions and years

Photo: Joe Mickey

Adult Gobbler Harvest

- 30% or less across all regions and years

Photo: NWTF

Photo: NCSU

Jake Harvest

- Approximately 5% of jakes are harvested, though they make up about 15% of the total harvest

Photo: NWTF

Photo: NCSU

Hen Survival

- Annual survival was 71%
- Survival lower during incubation
- Survival lower in piedmont

Photo: NWTF

Photo: NCSU

Gobbling Activity

- Gobbling continued through hunting season
- Not consistently related to nest timing
- Similar across regions


North Carolina
Wild Turkey Ecology Project
2020 - 2024
WTF

Wild Turkey Habitat Management:

Meeting turkey habitat requirements at all times of the year– What can we do?

Chris Turner, Game Birds and Wildlife Health Supervisor
Game and Furbearer Program, Division of Wildlife Management

WHAT DO TURKEYS NEED, YEAR-ROUND?

- Wildlife Habitat requirements- food, water, shelter, space– in a suitable arrangement!
- Turkey habitat?
  - Seasonal needs (Fall-Winter)
  - Providing food resources?
    - Hard mast, soft mast, seeds, openings!
    - Food plots= typical approach to helping turkey flocks during winter-fall periods.
- What about the rest of the year: Spring-Summer?


Photo by Gordon Robertson

SEASONAL HABITAT REQUIREMENTS- SPRING AND SUMMER!

- Hens/poults have very specific needs:
  - Nesting- Incubation period (April-July)
  - Brood (poult) rearing period (May-August)
- Optimal summer habitat can–
  - Increase hen survival and nest success
  - Increase poult survival (poults per hen measure)
- Promotes annual productivity (more turkeys)
- Turkey flock resilience

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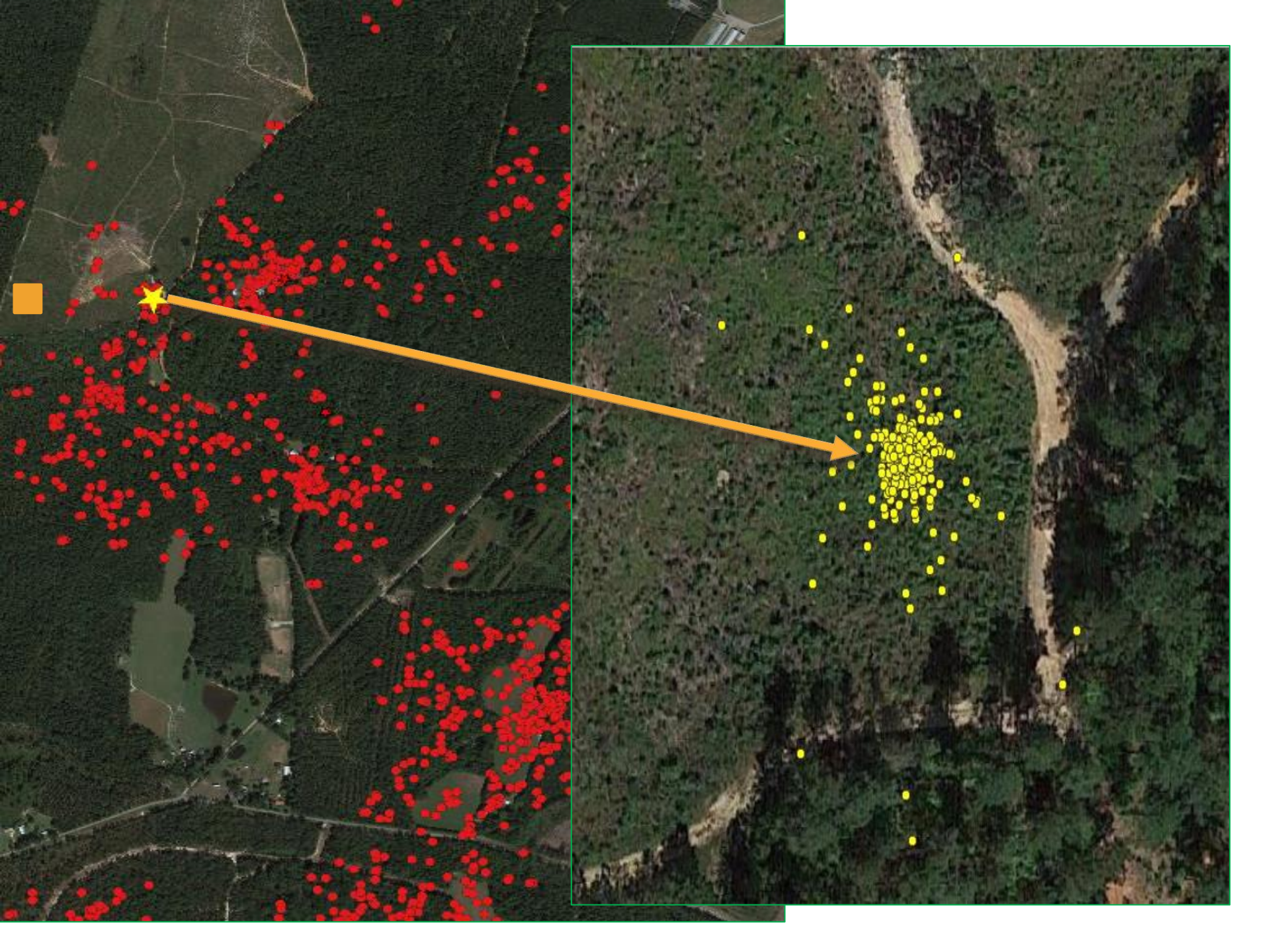
WHAT DOES NESTING HABITAT LOOK LIKE?

- Sunlight to the ground…
- Non-woody mix of shrubland and herbaceous vegetation composing ground cover in openings/forest understories.
- High vegetative diversity– many species of vegetation with different heights (structure).

- Key needs: Concealing, protective vegetation that still allows nesting hens to see what is moving around them… mixed with good brood cover.
- Greater bare ground near nest sites is linked to failures.



WHAT DOES BROODING HABITAT LOOK LIKE?

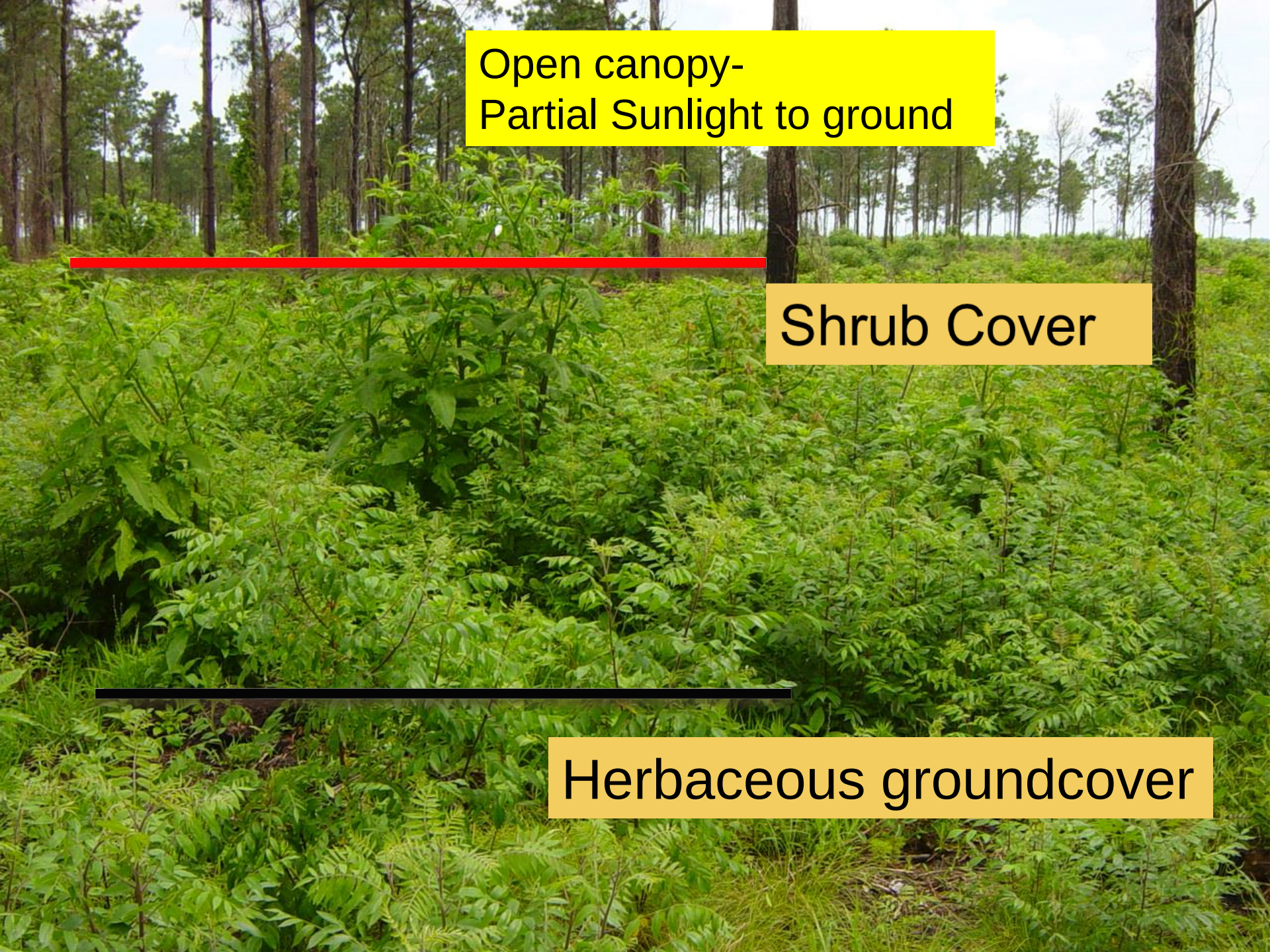
- Sunlight to the ground…
- Non-woody vegetation is optimal (bunch grasses, native forbs/wildflowers, “weeds”).
- Lush, herbaceous vegetation 1.5-2 feet high.

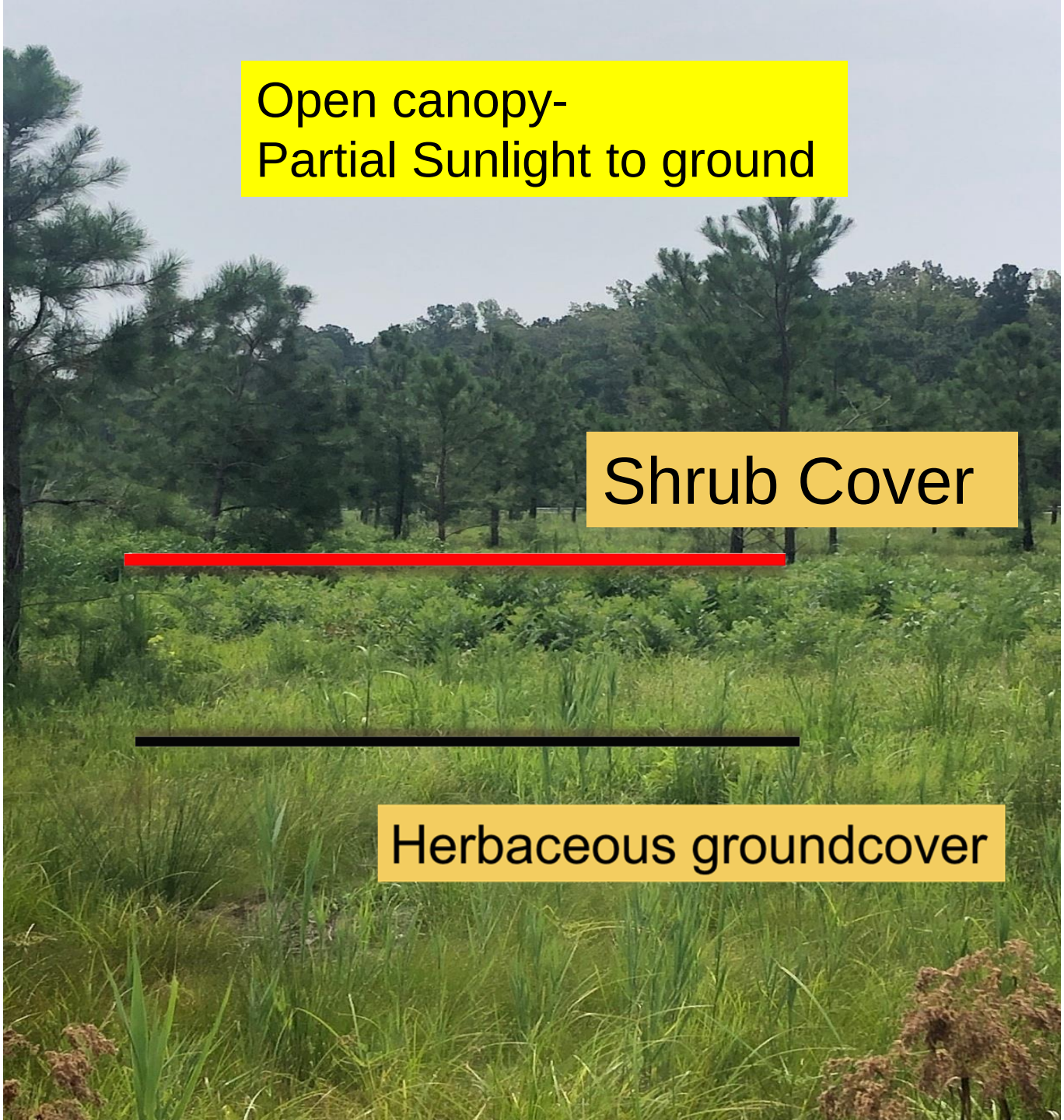
- Key needs: Low, overhead cover that protects poults while allowing the hen to see over it…. must produce LOTS of INSECTS/spiders!
- Invertebrates= ~90% of poult diet for 1st 2 weeks!

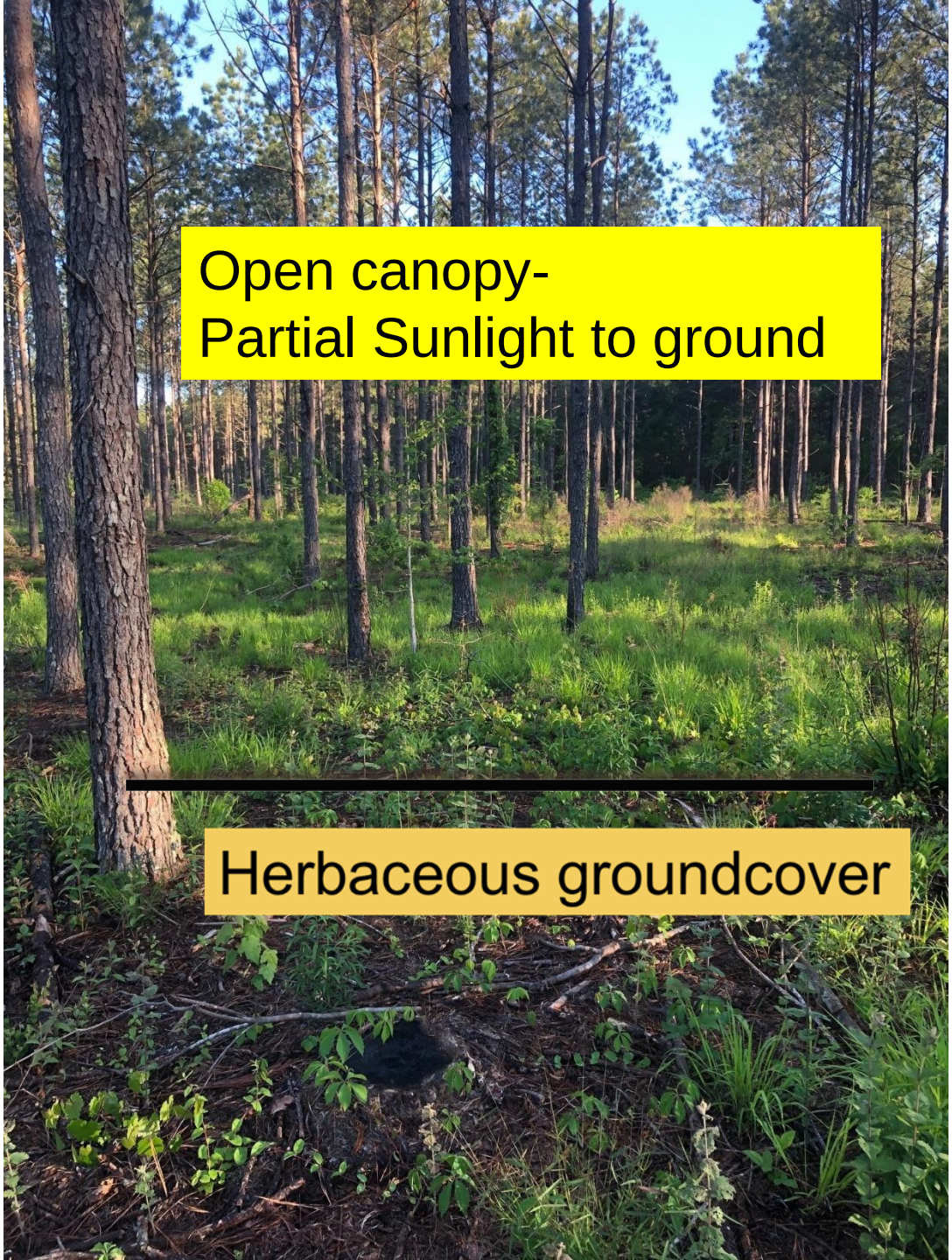
Quiz time!

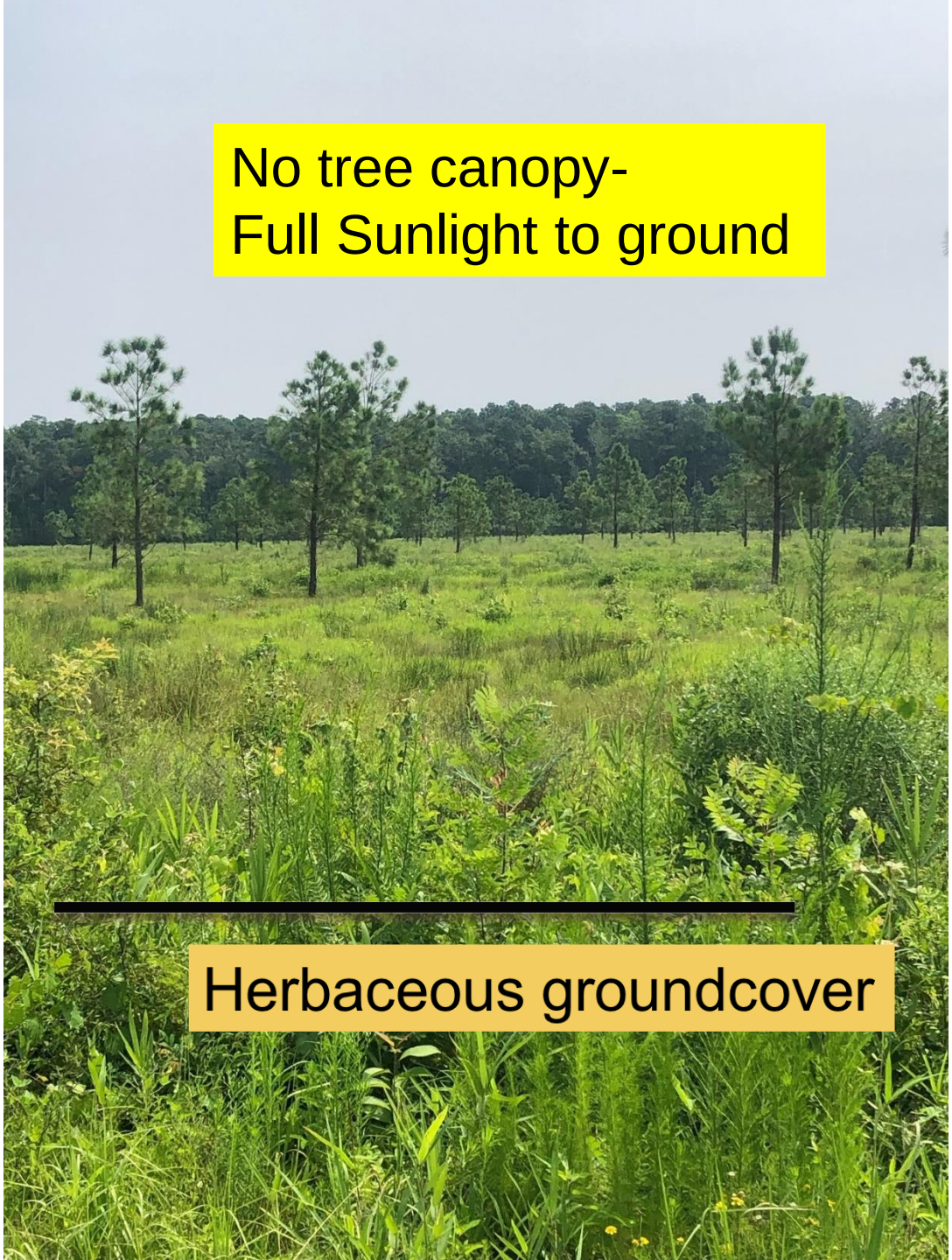
Good Nesting and Brooding habitat or Not So Good?

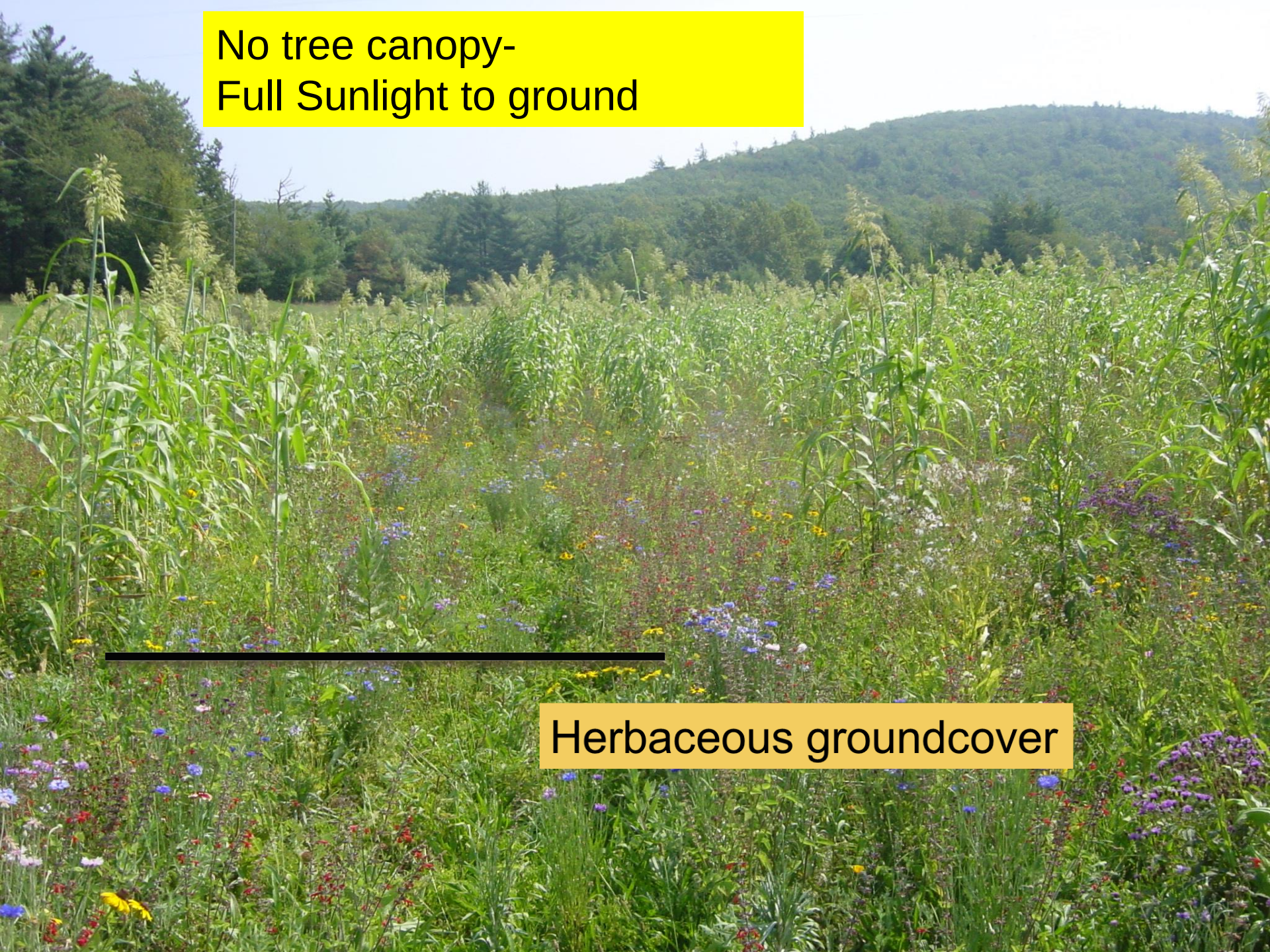

10/08/2012


Open canopy-
Partial Sunlight to ground
Shrub Cover
Herbaceous groundcover


Open canopy-
Partial Sunlight to ground
Shrub Cover
Herbaceous groundcover


Open canopy-
Partial Sunlight to ground
Herbaceous groundcover


No tree canopy-
Full Sunlight to ground
Herbaceous groundcover


No tree canopy-
Full Sunlight to ground
Herbaceous groundcover

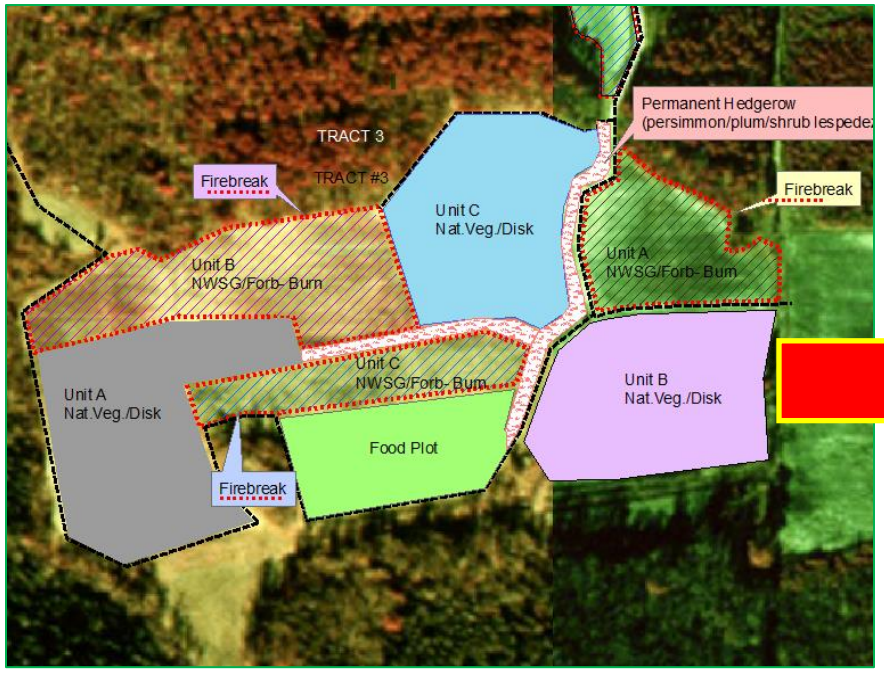

5-foot Dense Woody understory/midstory


POSTED

HOW DO WE PROVIDE OPTIMAL HABITAT?

Have a plan!

- Inventory- property, soils, current habitat conditions
- Habitat toolbox for disturbance? Equipment?
  - "Ax (chainsaw, selective herbicides, timber harvest), plow/cow (tractor/disk), and fire (FIRE!)"– what is in your toolbox?
- Habitat planning– "What can I do?"
- Technical guidance and assistance!



CREATING AND MAINTAINING ANNUAL NESTING AND BROOD HABITAT– FORESTS

Forest management is wildlife management!

1. Promote multiple age-classes of timber
   - Apply both short and long pine timber rotations
   - Manage for diverse pine and hardwood forests
2. Manage for sunlight!
   - Thin early, thin heavy—every 5-8 years
   - Create forest openings, daylight roads!
3. Implement a prescribed fire rotation
   - Typical Winter burn, 2-4 year rotation
   - Set it back!

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Thin early!


Thinned year 1


Brood habitat:
2 years after thinning


Nesting habitat:
3 years after thinning


4 years after thinning
03/14/2012

Thin and burn….

….to create and maintain brooding habitat!

CREATING AND MAINTAINING ANNUAL NESTING AND BROOD HABITAT– ROADSIDES, RIGHT-OF-WAYS, OPENINGS

Maintain old-field vegetation: native grasses-forbs, shrubs

Periodic disturbance…. Set it back!

1. Create diverse, old-field (fallow) conditions
   - Divide openings. Rotate disking/fire (1-3 year disturbances)
2. Manage for sunlight and insects– keep the trees OUT!
   - Soil disturbance stimulates the seed-bank
   - Use prescribed fire, light disking over annual mowing
3. Don't mow or disk between 1 April and 15 September
   - Protect nesting wildlife!

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A Favorite technique– Winter wheat and Volunteer Native Vegetation

ESTABLISH WILDFLOWER (POLLINATOR)-NATIVE WARM-SEASON GRASS PLOTS!

CREATING AND MAINTAINING ANNUAL NESTING AND BROOD HABITAT– AGRICULTURAL FIELDS- PASTURES

Edge management with periodic disturbance….

Think “weeds”, think (beneficial) insects!

1. Manage volunteer native vegetation
   - Maintain grassy, weedy field and ditch borders
   - Edge-feathering– push back field edges, soft-mast/fruits
2. Selective herbicides and reduced pesticide use?
   - Weedy beans, weedy corn?
3. How about no-till agriculture?
   - Plant grains, legumes, seed-producing crops

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WHAT CAN I DO?

Include nesting/brooding habitat as part of your annual turkey management:

1. Maintain sunlight on the ground in openings and forests.
2. Promote diverse plant and insect communities.
3. Set it back– focus on disking and prescribed fire on 1-3 year rotations.
4. Have a plan– use your technical guidance resources—NCWRC field staff contacts!

Program and other Cost-share options?

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WHAT WILL YOU DO TO IMPROVE SUMMER TURKEY HABITAT ON LANDS YOU MANAGE?