



**Wild Turkey Management in  
New York  
Past, Present, and Future**

New York State Department of Environmental Conservation  
Division of Fish, Wildlife & Marine Resources  
Bureau of Wildlife  
Game Management Section



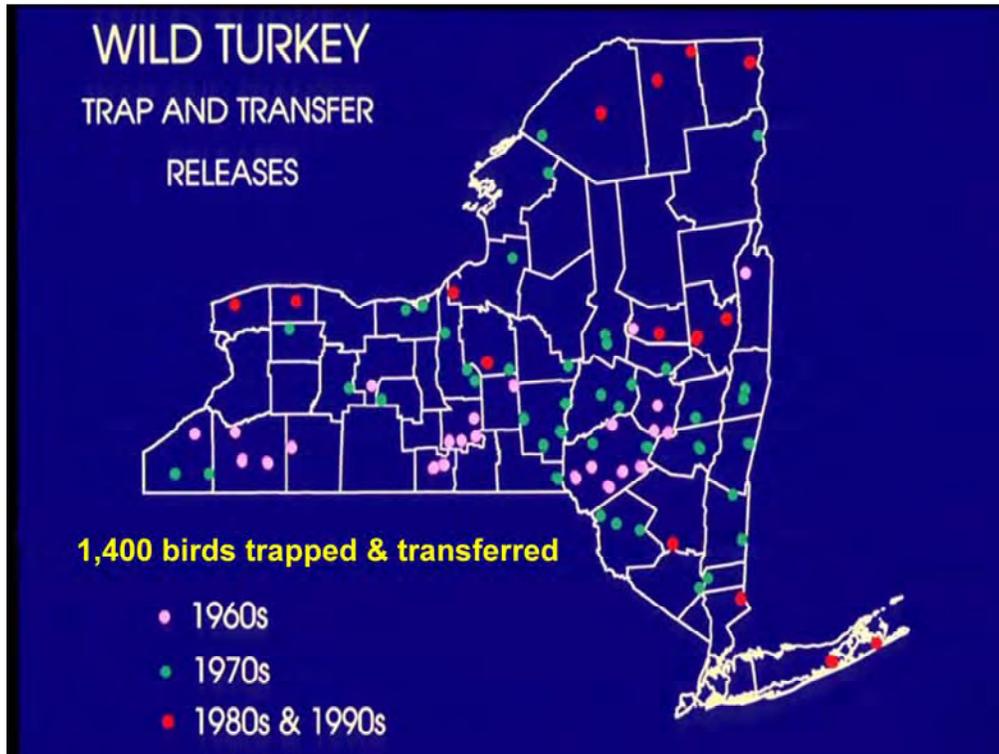
Fall 1959 Hunting Season – Allegany & Cattaraugus counties, 3-day season, 1 bird limit

Spring 1968 Hunting Season – Allegany, Cattaraugus, Chautauqua, Chemung, & Steuben counties, 6-day season, 1 bird limit

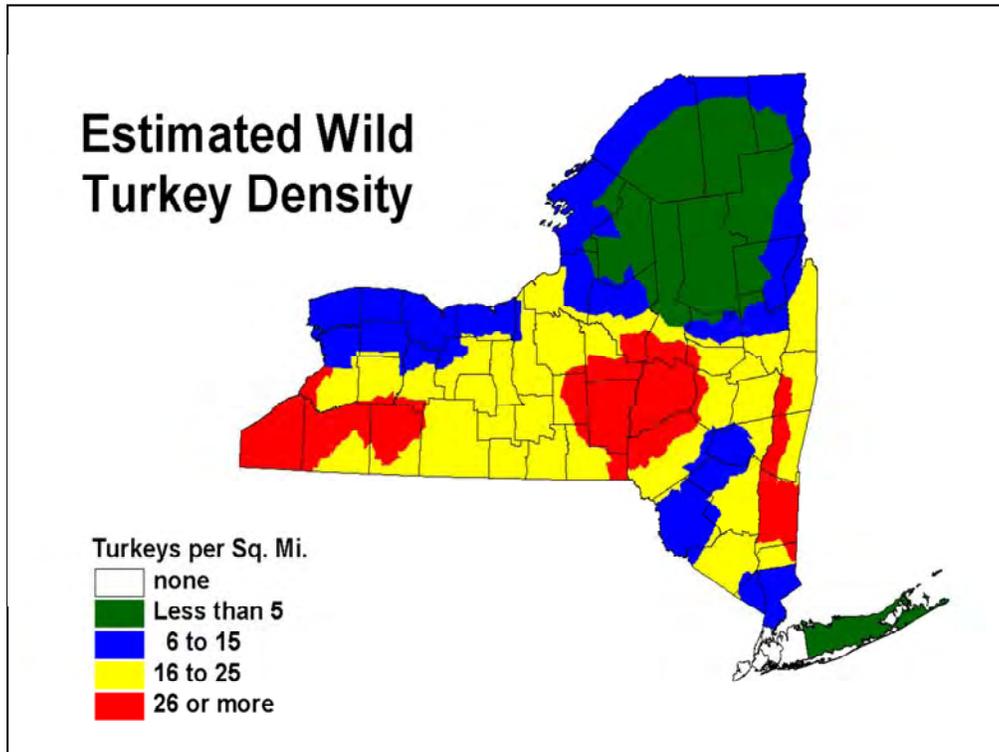


## **Wild Turkey Restoration**

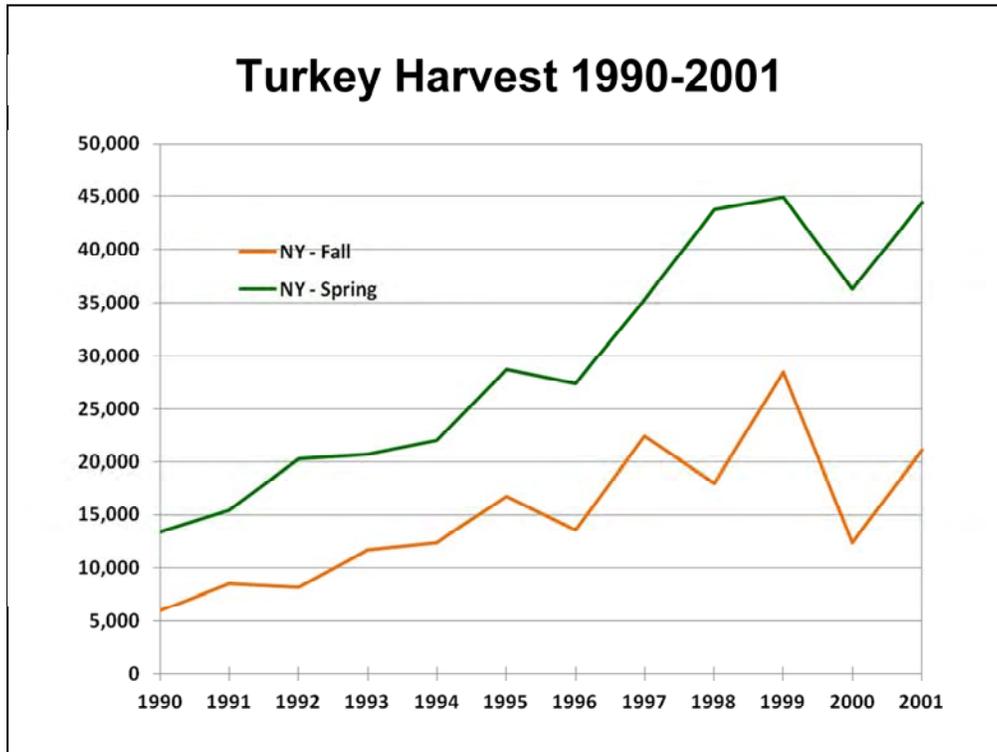
Wild turkeys were absent from NY for about 100 years. In 1948 the first wild birds were seen in western NY, the remnants of a population that crossed into Allegany County from Pennsylvania. After that population became well established, the NY Conservation Department was one of the pioneers in wild turkey restoration programs where wild birds were captured and transferred to unoccupied suitable habitats throughout the state.



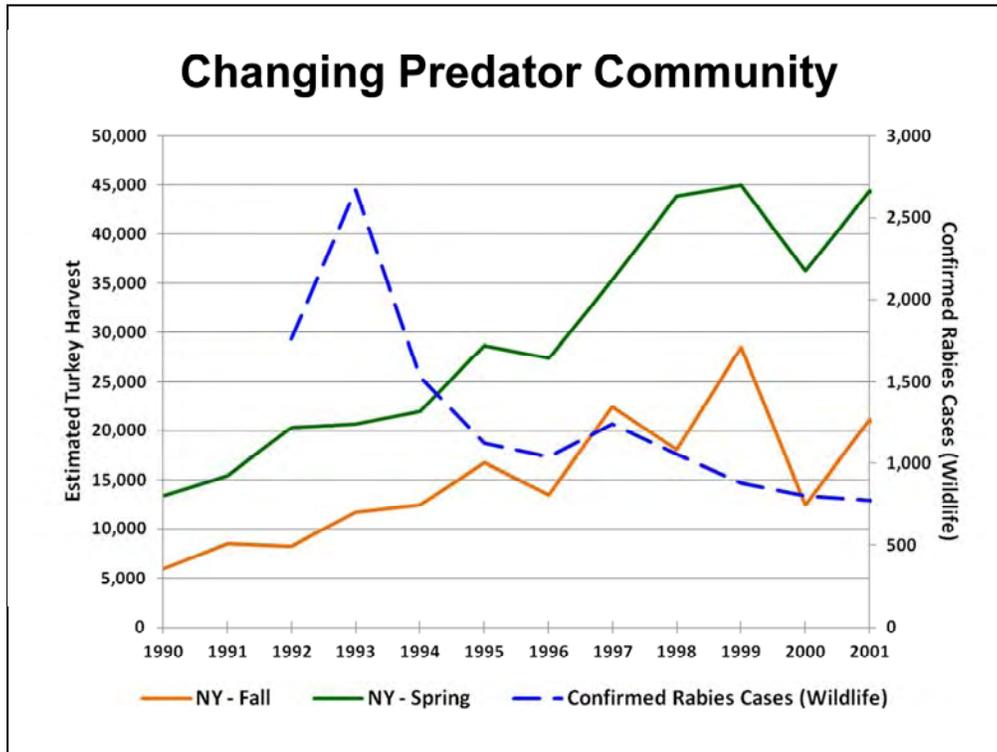
Historically, wild turkeys did not exist in northern NY (Tug Hill, Adirondacks, St. Lawrence Valley). Through restoration efforts, wild turkeys now exist throughout New York State.



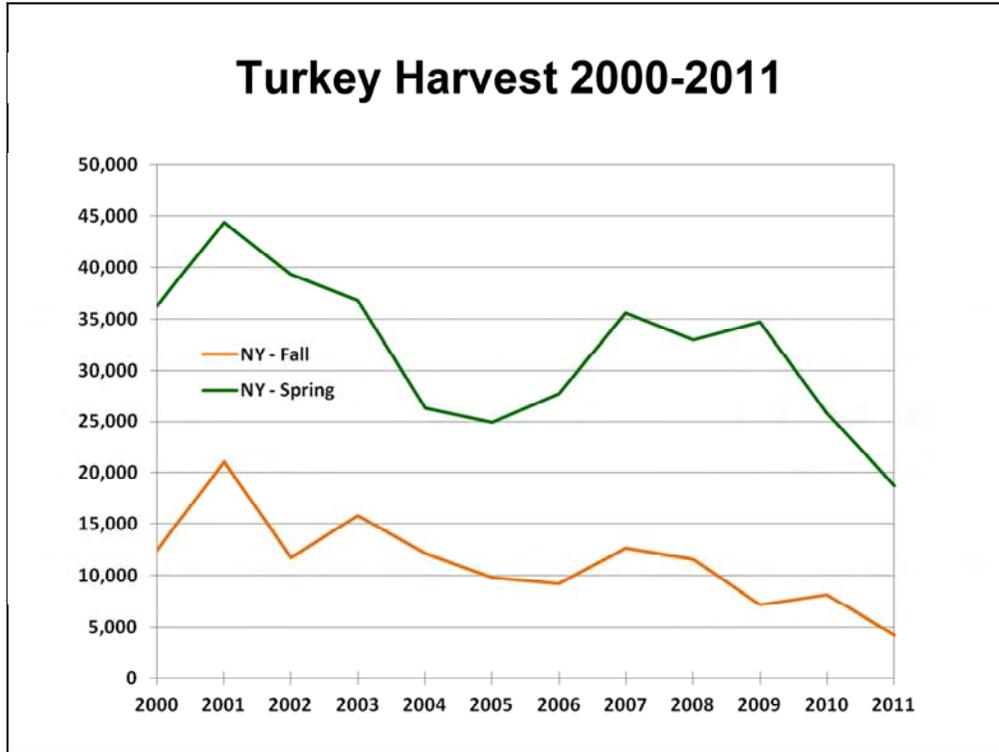
We used to think that wild turkeys were birds of the “big woods”. Research has shown that turkey populations will persist in forested landscapes, but they reach their highest densities in landscapes with a mix of woods, agricultural habitats (pasture, row crops, hayfields), and early succession habitats (grasslands, old fields, shrublands, young forests). The map above was created in the 1990s based on the habitat composition of the landscape and its relationship to turkey density. Over time there has been changes in the composition of the landscape, and subsequently, we have seen changes in where the highest turkey densities are observed.



Through the restoration efforts of DEC, volunteers from National Wild Turkey Federation (NWTF), and others, wild turkeys began to populate areas of the state with suitable habitat from which they had been absent for a long time, or where they did not exist. The population expanded rapidly as they filled in these unoccupied habitats, and we observed a concomitant increase in both spring and fall turkey harvest. Turkey populations probably peaked around 2000-01.

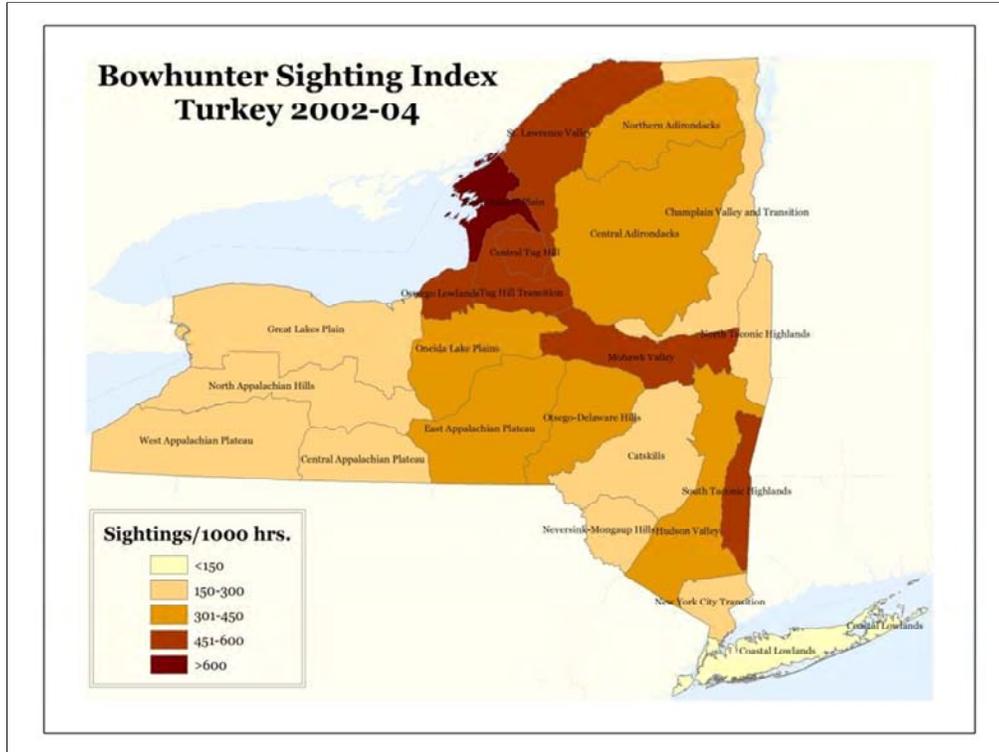


At the same time that populations were expanding, we saw a dramatic change in the predator community as raccoon rabies swept through the state in the early to mid-1990s, reducing nest predators such as raccoons, skunks, and opossums. Nest loss to predators, weather, and other factors can limit population growth. With that factor minimized by the rabies outbreak, turkey populations increased more rapidly than they may have had the disease not been so prevalent.



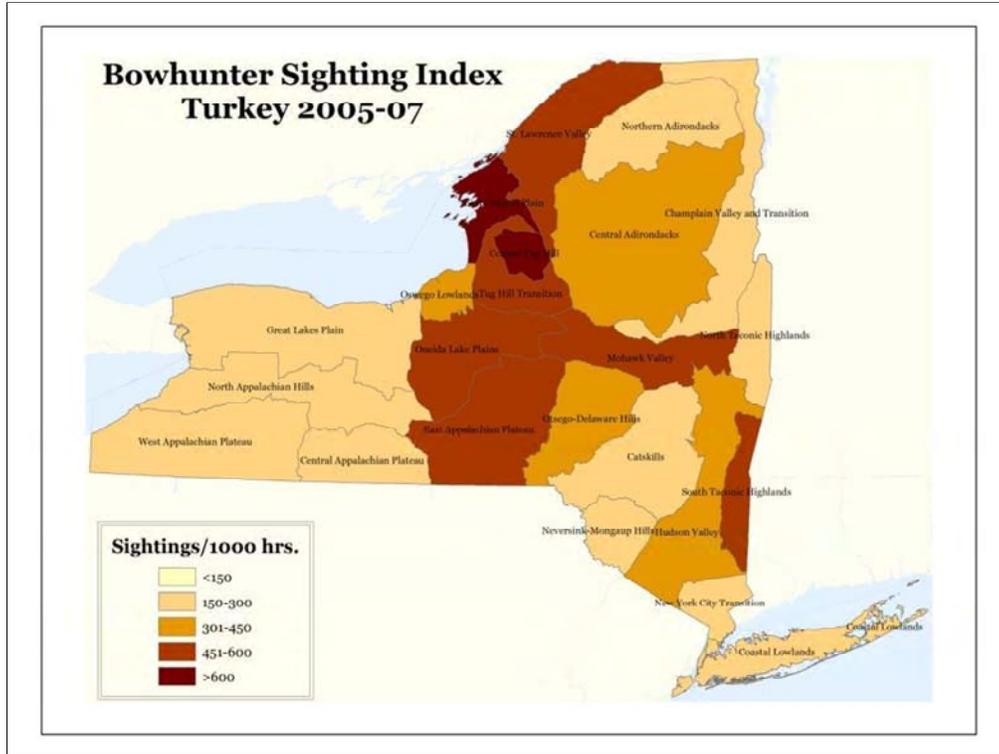
Since 2000-01, wild turkey populations have declined. There are several reasons for this, including a natural population contraction as turkey populations settled down to levels more in line with local environmental conditions. In the next few slides we'll look at this long-term decline more closely and consider other factors such as density dependence, changing habitats and predators communities, and even changes in hunting participation.



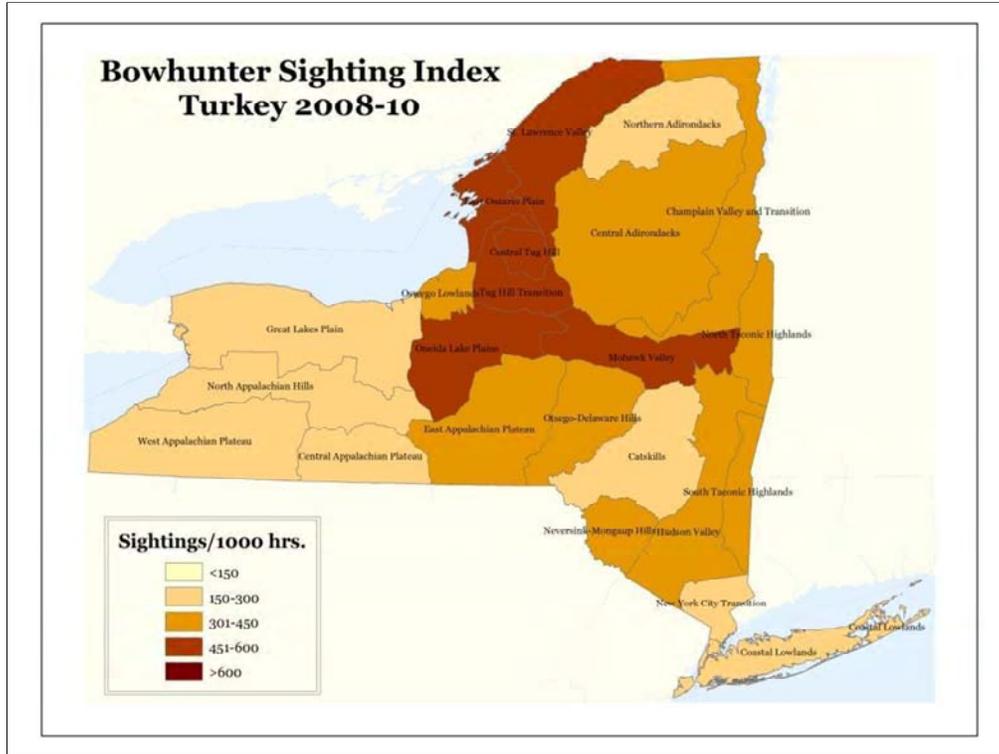


In the early 2000s, a “natural population contraction” coupled with poor production years caused populations to decline. As turkeys filled in available habitats, populations settled down to levels more in line with local environmental conditions. This contraction could be the result of competition for resources such as nest sites, the ability of predators to find turkey nests when nesting hens were at a relatively high density, or other factors.

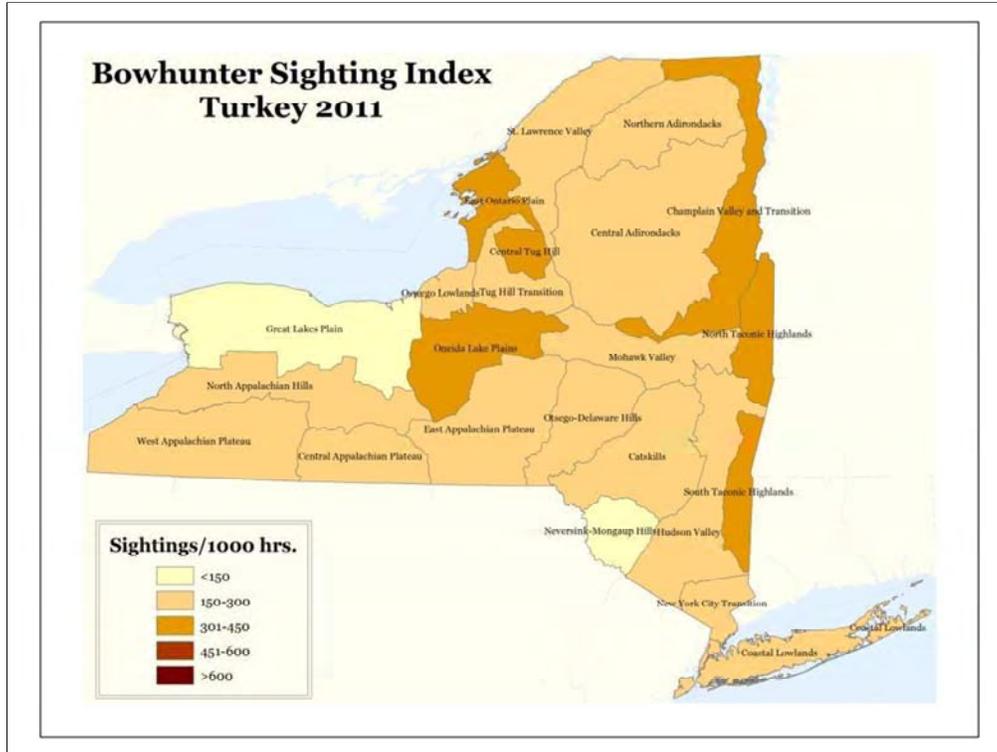
Note that the decline is more pronounced in some areas. This is likely due to factors such as above-normal spring rainfall resulting in poor production, more severe winters resulting in increased mortality, or a lack of the mix of habitat types that turkeys require to reach and maintain peak population densities (forest, agriculture, and early successional habitats such as old fields, shrublands, and young forests).



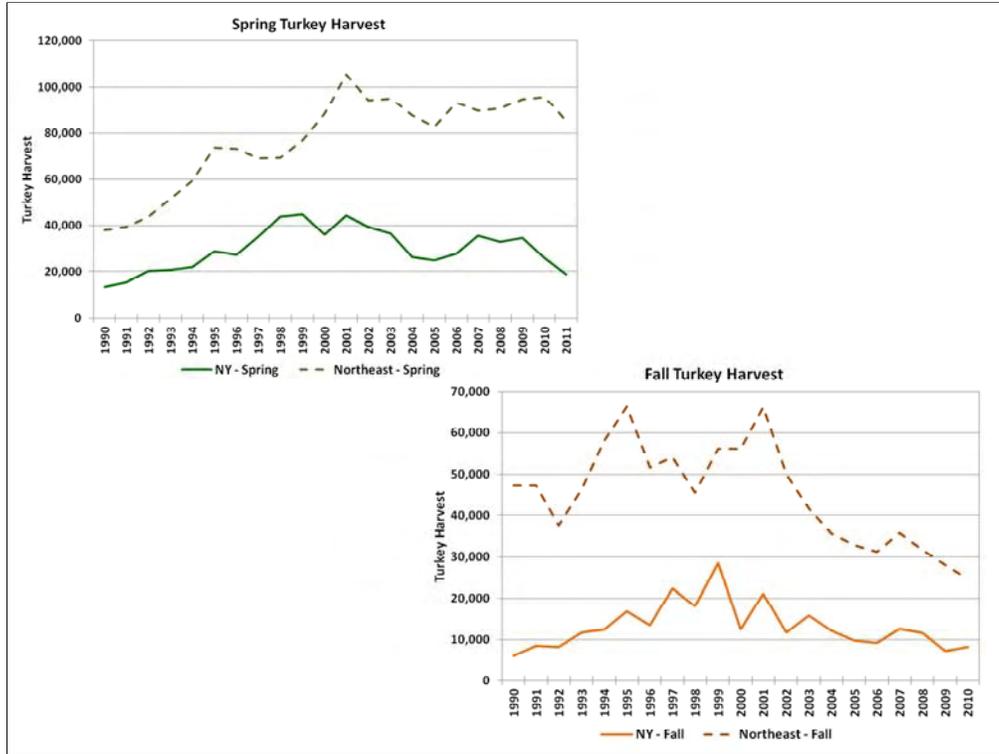
Above-average reproductive success in 2005 and 2007 lead to a resurgence in turkey populations in some parts of the state, while other regions continued to see declines. Again, factors such as weather and habitat are variable across the state, thus changes in turkey populations are more pronounced in some areas.



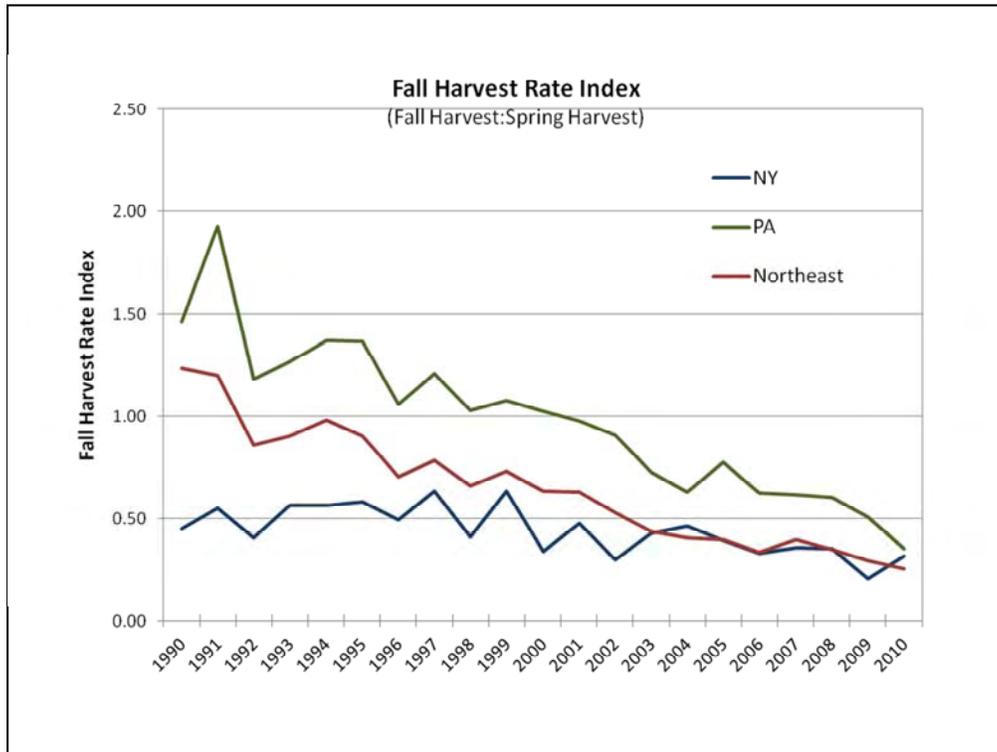
Since 2007 cold, wet spring weather has limited the reproductive capacity of the turkey population. Add to this long-term, changes in landscape-scale habitat and a changing predator community, and the result is a turkey population that is below the peaks we observed in 2000-01.



**The above image illustrates the sighting index for the fall 2011 survey only.** As stated earlier, there is a lot of annual variation in turkey populations due to changes in reproductive success, so using three-year averages provides a more realistic estimate of abundance for a physiographic region. However, this map provides some evidence that turkey populations are at their lowest level since the early 1990s. The sharp drop in turkey populations that we have observed since 2007 is a result of below-average production four of the past six years (including summer 2009 when we observed the lowest poult:hen ratio since we started conducting the Summer Sighting Survey in 1996), and a severe winter in 2011. In addition, many areas of upstate NY were impacted by two tropical storms in late summer 2011. While there are no data to document the impact of these storm events on turkey survival, data from the Bowhunter Sighting Log and from the fall harvest may suggest that they took a toll on young-of-the-year birds.

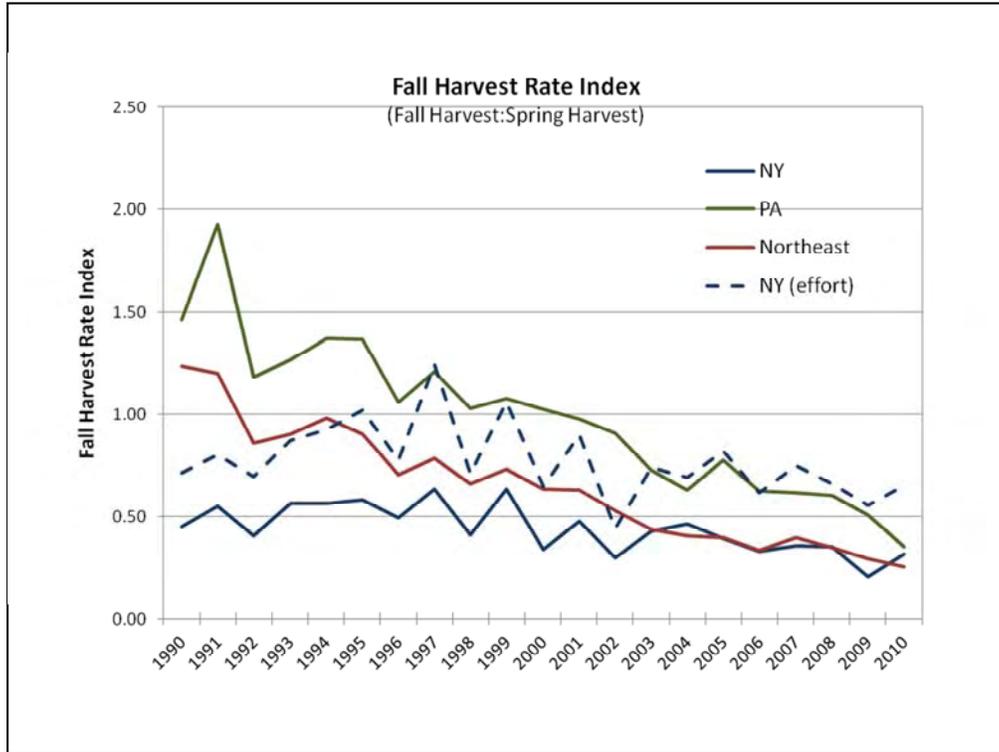


The long-term and short-term declines we have observed in NY are not unique to this state. When we look at spring and fall harvest data from other states in the northeast (Maine through Virginia), we observe similar patterns. Declines in the fall harvest in the northeast are similar to those observed in New York. This may be related to decline in fall turkey hunting participation.

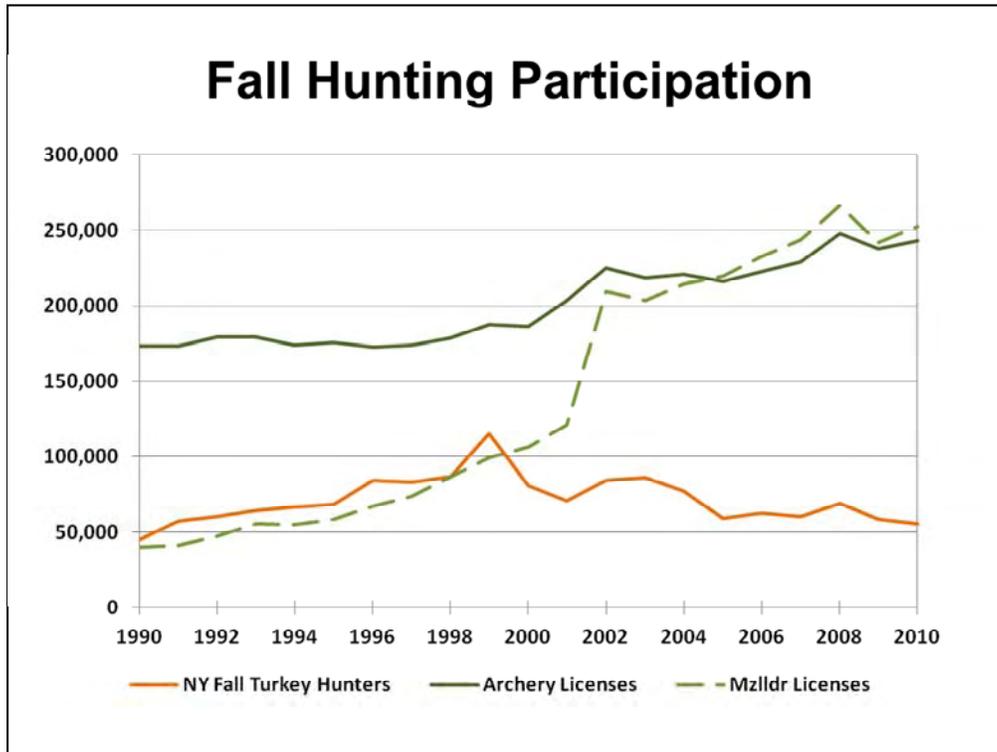


One of the tools we use to examine trends in fall harvest is the fall harvest rate index. It is the ratio of the fall harvest to the spring harvest, or in other words, the proportion of the fall harvest relative to the spring harvest (when spring and fall harvest are the same, the index is 1).

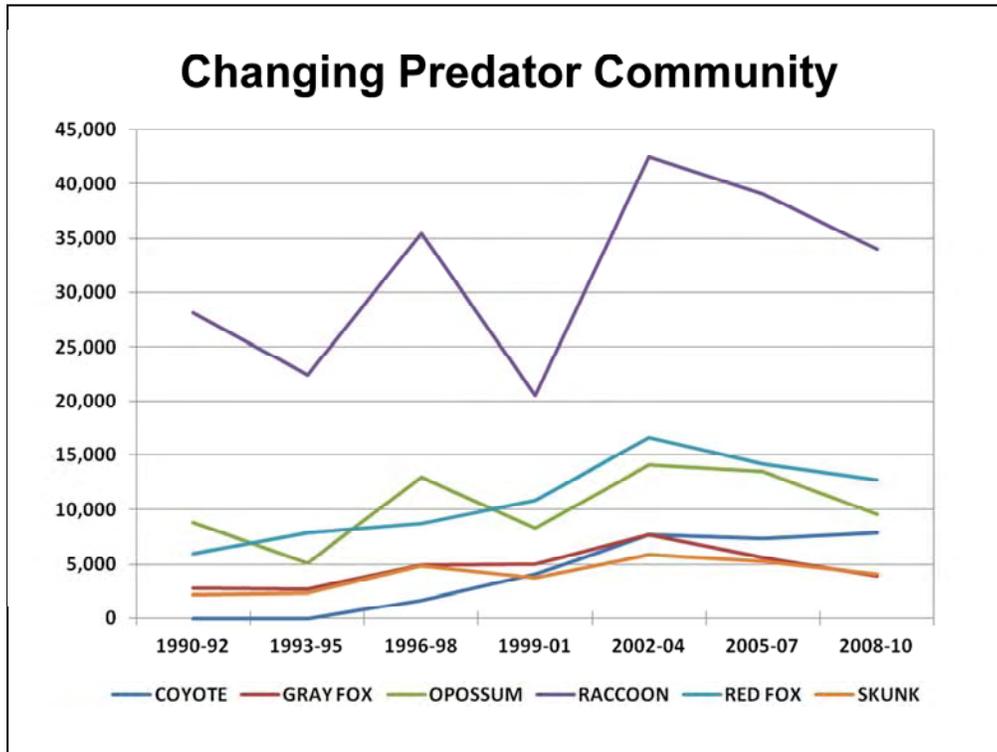
In NY, we observed a gradual decline in the fall harvest rate index starting around 2000. We observe much sharper decline in this index in the northeast and in neighboring Pennsylvania. Part of this decline is a result of fewer turkey on the landscape, but a significant role is played by declines in fall turkey hunting participation and effort, as we'll see in the next two slides.



The previous slide and the solid lines in the slide do not control for hunting effort, thus they mask the source of variation observed over time. When we calculate the fall harvest rate index using take/100 days effort, we get a more accurate picture of changes in harvest over time. From 2001 through 2010 the fall harvest rate index for NY appears stable, indicating that declining fall hunting participation plays a major role in the downward trend in fall turkey harvest.

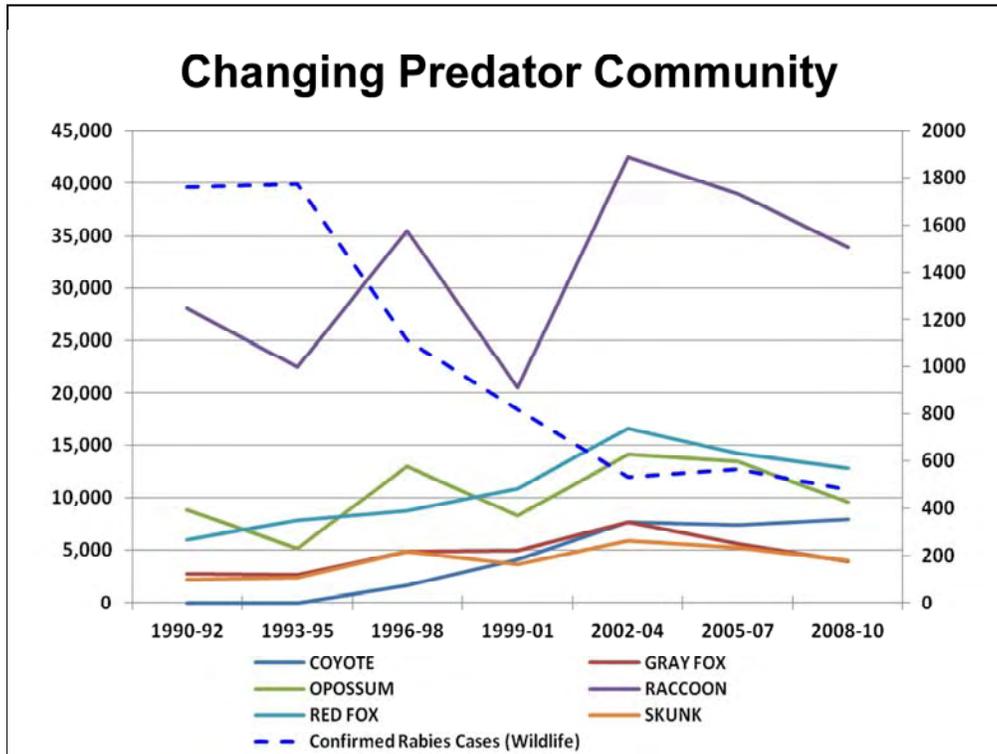


There has been a downward trend in fall turkey hunting participation over the past decade (from about 77,000 fall turkey hunters in 2001-02 to 52,000 in 2010-11). What has caused this decline? There are likely several factors including a loss of hunters through attrition and a lack of recruitment of new hunters, a loss of the “tradition” of fall turkey hunting as new hunters may be more inclined to spring turkey hunting (spring hunter numbers are stable), and a loss of hunters to other fall hunting opportunities such as bowhunting and muzzleloader hunting for deer.



Contributing to the long-term decline in turkey populations is a more abundant and diverse predator community. There are more predators on the landscape now than there was twenty years ago. When we think of predators we often think of coyote and fox, but potentially more important are nest predators such as raccoon, skunk, and opossum. If we use the estimated trapper harvest as an index of abundance for these species, we observe a gradual increase from 1990-92 through present. Trapping harvest varies annually due to fluctuations in fur prices and trapping participation, so the three-year average estimated take for each species is used here.

There are other predators of turkeys such as bobcat and fisher, but they are not included here to simplify the presentation of the graph.

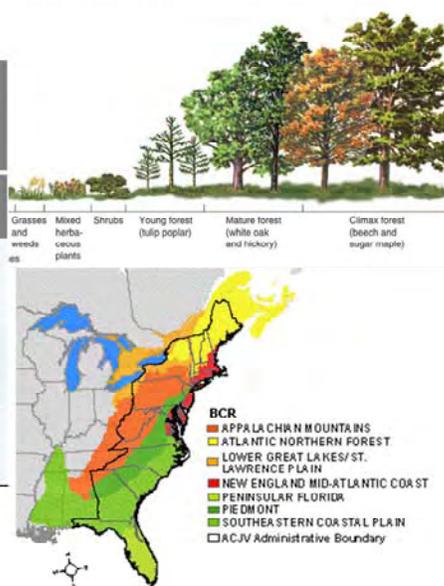


This figure is the same as on the previous slide (estimated trapping harvest), but includes the number of confirmed rabies cases in wildlife since 1990-92 (three-year averages). We saw a dramatic change in the predator community as raccoon rabies swept through the state in the early to mid-1990s, reducing nest predators such as raccoons and skunks. Nest loss to predators, weather, and other factors can limit population growth. With the prevalence of rabies being relatively low since 2002, predator populations have not been suppressed by this disease.

## Changing Habitats

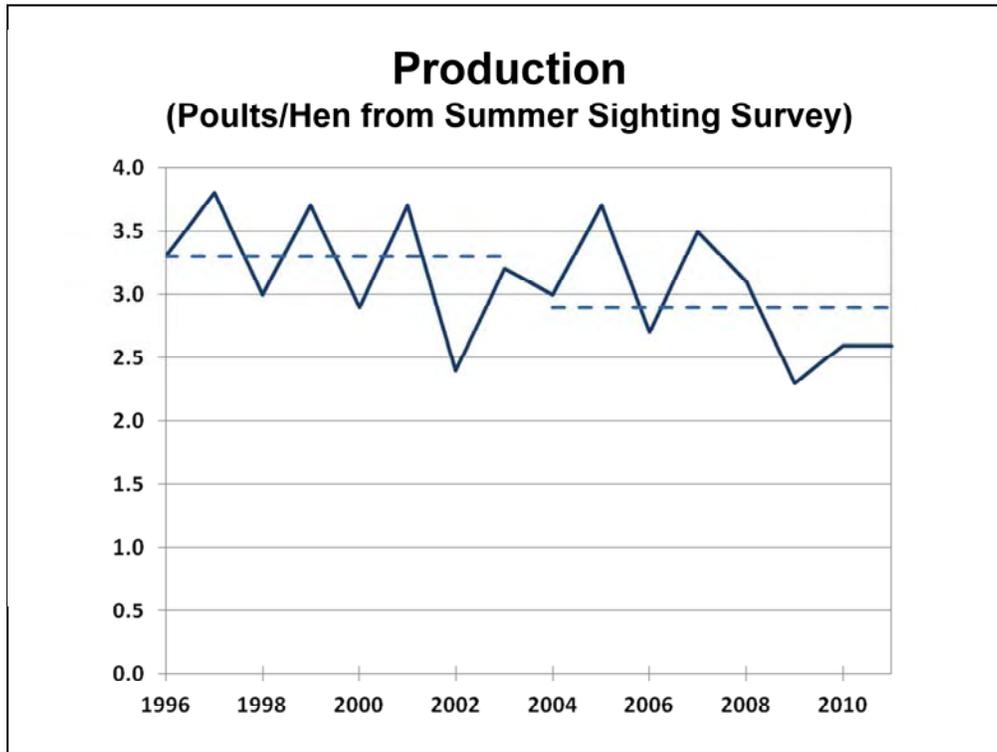
Bird Conservation Regions in New York	% Small Diameter Forest*	
	1980	2005
Lower Great Lakes/St. Lawrence Plain	34.5	14.2
Atlantic Northern Forest	21.2	11.2
Appalachian Mountains	29.1	12.4

\*Stands trees  $\leq 5$ " dbh



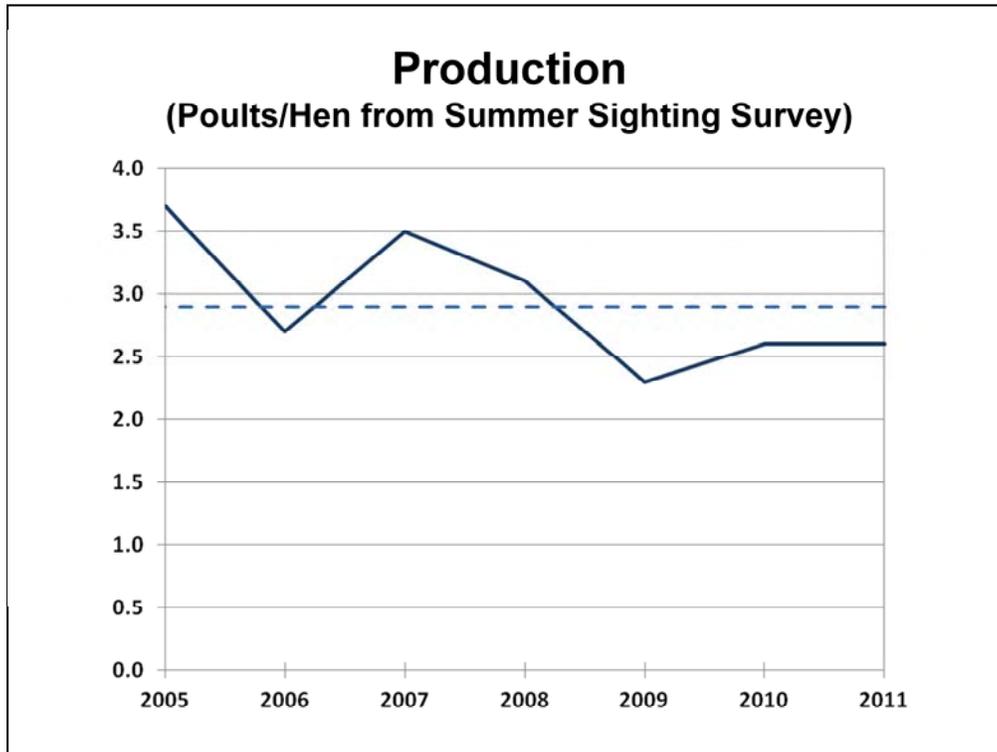
It's important to note that, predation can play a role in limiting turkey populations, but it is more likely that the problem is poor habitat quality that makes turkeys and their young more vulnerable to predation. Turkeys have evolved behaviors and reproductive strategies to cope with predation, but in highly fragmented landscapes predators may be more efficient in turkey nests and poults. This is particularly true for nest predators such as raccoons, skunks, and opossums. In areas with poor habitat quality, such as low stem densities or poor overhead cover, turkeys and poults may be more vulnerable to avian predators such as hawks and owls. It may be declining habitat quantity and quality on both a local and landscape scale that are increasing turkey vulnerability to predation, and not simply higher predator populations.

As mentioned earlier, turkey populations reach their highest densities in landscapes with a mix of habitat types including forest, agriculture, and early successional habitats such as old fields, shrublands, and young forests. New York's landscape has changed dramatically over the past 20-30 years as habitat has either been lost outright due to development, or as natural habitats have matured (see above). A landscape dominated by mature forest will still support turkeys, but not at the same densities that will be supported by a more heterogeneous landscape.

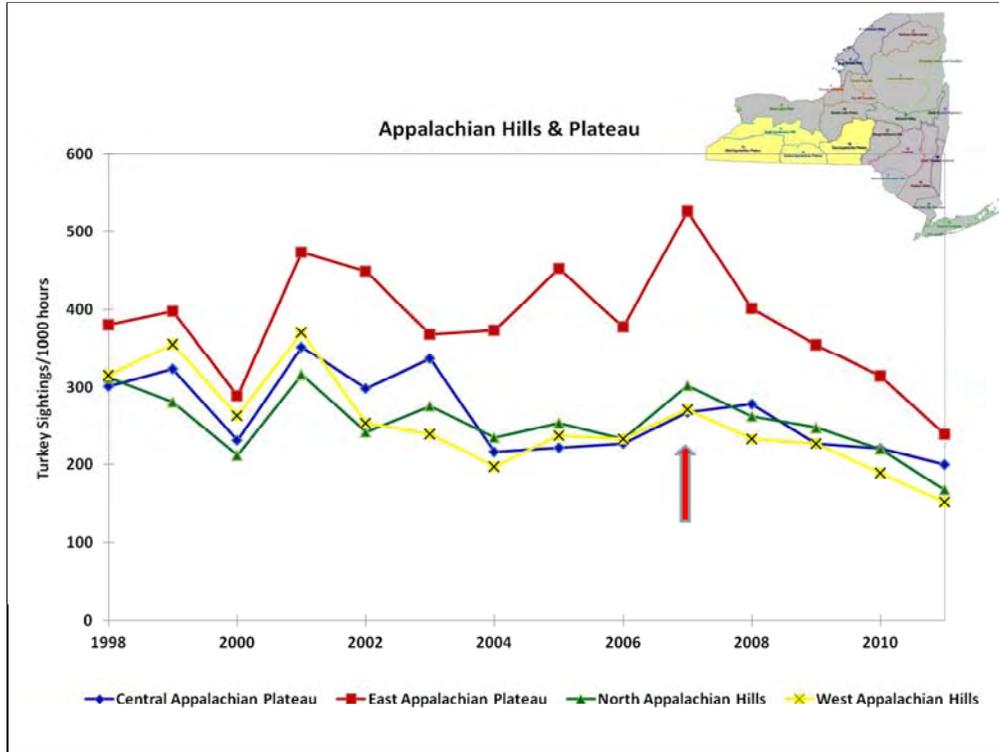


We conduct the Summer Turkey Sighting Survey during the month of August to estimate production – the number of poults per hen. When we look at the ten-year averages from the mid-1990s to now (the two dashed lines), we see a long-term decline in production. Some reasons for this may include density dependence, a changing predator community, and landscape-scale habitat alluded to earlier. Density dependence occurs when the size of wildlife populations influences birth or death rates (e.g., birth rate declines as density increases, mortality increases as density increases). For example, when turkey populations reached their peak around 2000-01, competition for nest sites or the ease with which predators could find nests may have limited the ability of the turkey population to expand further.

The factors of density dependence, predation, and habitat may help explain long-term changes in production, but the more recent short-term decline in populations observed since 2007 is likely related to weather, as we'll see in the next slide.



Four of the past six years have seen production that is below the long-term average (dashed line), including 2009 when production as measured by the Summer Sighting Survey was the lowest since the survey was initiated in 1996. Poor production in a given year is usually related to above-average rainfall in May and June. Also, harsh winter conditions in 2011 and severe hurricane-related storms in late summer 2011 likely resulted in diminished turkey populations in many regions of the state. For example, 2011 was the third wettest year ever observed in Albany since records have been kept.



New York is a large, diverse state, and long-term trends haven't been the same everywhere. Here, the four WMU aggregates that comprise the Appalachian Hills and Plateau (highlighted in yellow in the map above right) show relatively stable populations from 1998 through 2007, all followed by declines from 2007 through 2011 (from the Bowhunter Sighting Log). The short-term declines coincide with poor production four of the last six years.

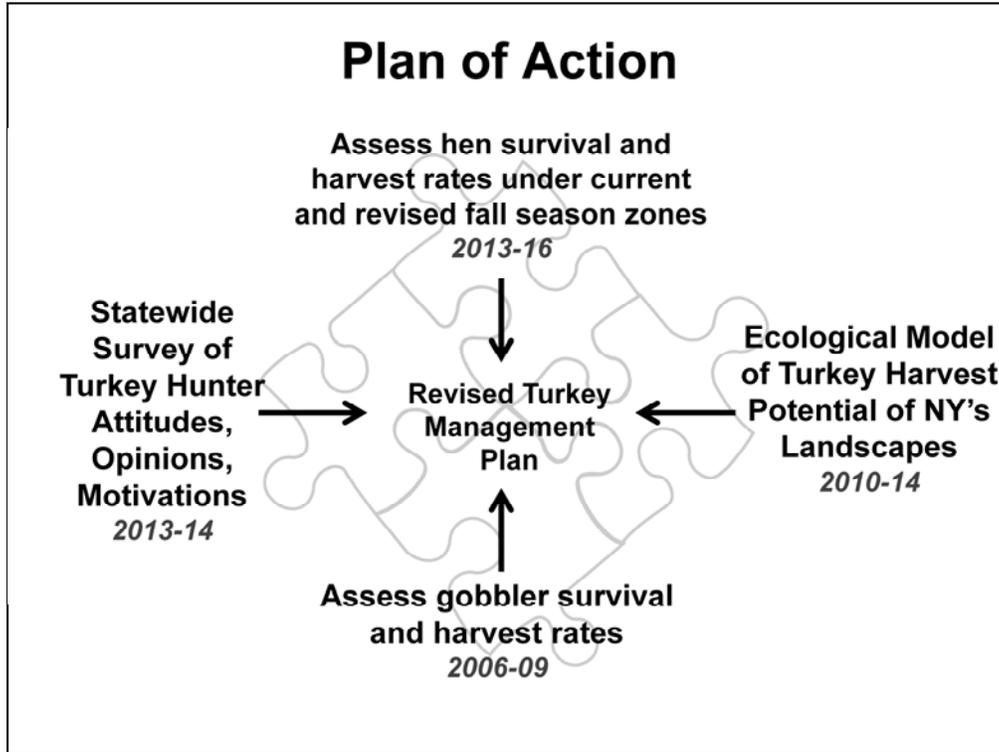
## **Long-term Decline 2001-11**

- **Natural population contraction**
- **Lower reproductive rates**
  - **Density dependence? Weather? Predation?**
- **Changing landscape-level habitat**
- **Changing predator community**
- **Hunting mortality?**

## **Short-term Decline 2007-11**

- **Poor production 4 of the last 6 years – wet springs & summers**
- **Severe winter in 2011**
- **Impact of two tropical storms in 2011?**

The main “drivers” of turkey populations are weather, habitat, predation, and potentially, fall hunting mortality of hens (particularly adult hens). Our research program is focused on gathering information on these factors to determine their relative importance, and to adapt our management program in the context of the ecological system in which it has to exist. As these slides have illustrated, there is evidence that the ecological system has changed over the past 20 years. The impact of predation or fall hunting mortality in 1995, when populations were rapidly expanding, may be different than the impact of predation or fall hunting mortality in 2012. It is our job to figure out if and how the system has changed, and to adjust our management accordingly.

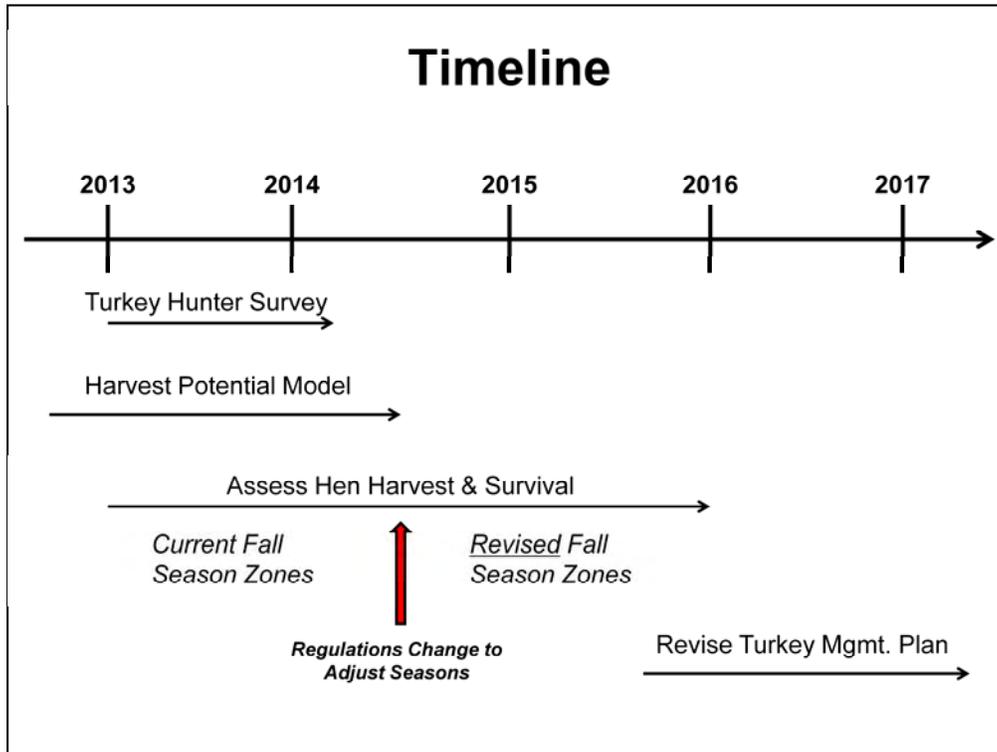


Since we initiated the groubler survival and harvest mortality study in 2006-09, our goal has been to put together the “puzzle pieces” of turkey management. Currently, Dr. Bill Porter and PhD candidate Andrea Bowling are examining the combined factors of weather and habitat to produce a map of turkey “harvest” potential for New York. This will provide us with a sound ecological basis upon which we can base fall season zones.

In the next year we will be initiating two new studies. The first provides insight into the “human dimensions” aspect of turkey management. We are partnering with Cornell University’s Human Dimensions Research Unit to conduct a statewide survey of turkey hunters to determine their motivations, attitudes, and opinions on turkey populations, hunting opportunities, and issues of concern to them. Understanding what hunters desire from and for the resource is an important part of turkey management.

Finally, hen survival is the major driving force behind turkey population changes. To better understand what is happening in NY, we will be conducting a large scale study where we band hens, radio-collaring some, to determine seasonal and annual hen survival and mortality. This should provide insight into the role of predation on hens, as well as the possible impacts of hunting mortality during the fall.

The long-term goal is to have all these pieces of the puzzle come together to produce a complete picture of turkey management in NY. The logical outcome of this is a revision of the wild turkey management plan that was completed in 2005.



We will be initiating the turkey hunter survey in winter 2013. This will take about 12-15 months to complete.

The harvest potential model has been “under construction” for about two years, and we will have the information we need to adjust fall season zones by the end of 2014.

The hen survival study will begin in January 2013 and will continue for four years. About 400 hens will be banded statewide from January through March each winter. The first two years of the study will assess survival and harvest rates under our current fall season structure. After fall 2014, based on the results of the harvest potential model, we will review the “map” of fall season zones and make changes as needed to more accurately reflect the sustainable harvest potential of NY’s landscapes. We will then continue to assess hen survival and harvest rates in 2015 and 2016 under the new fall season structure to evaluate the impact of our management action.

The results of the various research projects will all feed in to a comprehensive management program for wild turkeys in New York State. This will be described in a revision of the state’s turkey management plan that was originally completed in 2005.