

Fall Harvest Rates Of Female Wild Turkeys In Pennsylvania



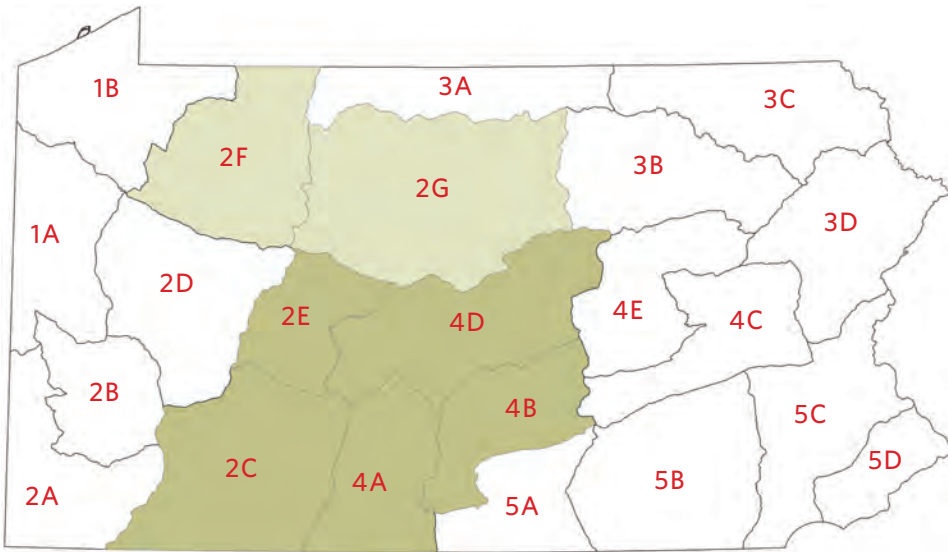
Goal and Objectives

The Pennsylvania Game Commission's management plan for wild turkeys specifies that the goal is to provide optimum wild turkey populations in suitable habitats throughout Pennsylvania for hunting and viewing recreation by current and future generations. The primary means of accomplishing this goal is maintaining a conservative fall either-sex harvest because harvesting more than 10% of the fall population can lead to population declines.

Changing fall season length is the basis upon which turkey populations are managed because fall harvest is believed to influence the number of hens that survive to reproduce the following spring. Consequently, if this is the premise upon which turkey populations are managed it is imperative that the priority of any research project regarding fall harvest rates be able to estimate the effect of lengthening or shortening the hunting season. Simply estimating fall harvest rates would provide little guidance for making management decisions.

The proposed research is designed to meet the following primary objectives:

- Estimate hen wild turkey harvest rates
- Determine the effect of changing fall season length on harvest rates of hen wild turkeys



Study Area 1 indicated in dark shading, Study Area 2 highlighted with light shading.

Location of Study

We identified 2 study areas composed of groups of similar Wildlife Management Units.

■ **Study Area 1:** WMUs 2C, 2E, 4A, 4B, and 4D — WMUs that have shown to be sensitive to 3-week seasons.

■ **Study Area 2:** WMUs 2F and 2G — WMUs that traditionally have had 3-week seasons but have lower spring harvest densities than the state average and after harsh winters in the 1970s populations recovered

slowly. Population modeling suggests fall harvest rates are high (~10%). In 2007 the fall season in WMU 2F was decreased to 2 weeks to aid population recovery. WMU 2G remains 3 weeks. For this study both WMUs would have 3-week seasons for the first two years. This study would be an opportunity to discover if fall harvest rates are suppressing turkey abundance.

Duration of Study

The study will last 4 hunting seasons. Fieldwork will begin in January 2010 (trapping

birds Jan–Mar and Aug–Sept) and monitoring of birds will continue through the November 2013 hunting season. Each of 4 years we will capture and band additional birds.

How We Will Accomplish Objective 1 — estimate harvest rates

Hen turkeys will be captured during January–March and August–September (4 years, 2010–2013) and fitted with a reward leg band. A sample of the hens trapped during the winter will be fitted with radio-transmitters. Hens with radio-transmitters will allow us to estimate how many birds survive to the fall hunting season. The harvest of reward-banded and transmittered birds will allow us to estimate the proportion of birds that are harvested — the harvest rate for hen turkeys.

Why are Rewards Essential?

Many studies have shown that if a reward is not offered then not all hunters will report that they harvested a banded bird. Research in Pennsylvania has shown that at least \$100 has to be offered before all hunters cooperate. Pennsylvania is currently using rewards to encourage cooperation from hunters that harvest white-tailed deer and recently completed a similar study on turkey gobblers.





unpopular with some hunters. However, we have carefully considered the alternatives and a cross-over design provides the best chance of detecting and measuring the effect of changing fall season length.

Why Do We Change Season Length in the Middle of the Study?

Knowing the rate at which hen turkeys are harvested is helpful, but harvest rate alone

has limited value when making management recommendations and decisions for setting season lengths. Two areas with the same season length may have the same or different harvest rates, such that one area could sustain a stable population and another may continue to increase, or decrease.

For making management decisions, it is important to know by how much harvest rate changes when you lengthen or shorten the season. If you shorten a season to allow the population to recover, knowing how much harvest rate is reduced will reduce uncertainty in how quickly a population will increase. Season length is our primary means of managing the turkey population, but we strive to keep changes to a minimum

for consistency with the public. With a better understanding of the effect of changing season length on harvest rates the agency will be able to better justify management decisions to sportsmen and sportswomen.

A cross-over study design provides a better than 80% chance of measuring the effect of changing fall season length.

How We Will Accomplish Objective 2 — determine effect of season length change

After 2 years, we will need to change the season length in each study area. The best approach is to implement what is called a **cross-over design** — after 2 years increase the season length in Study Area 1 by one week (from 2 weeks to 3 weeks) and simultaneously decrease the season length by the same amount in Study Area 2 (from 3 weeks to 2 weeks). This will allow us to detect differences in harvest rates within study areas as well as any differences in the pattern of change between study areas. This study design requires shortening the season length by one week in Study Area 2 and may be

Can Overharvest Occur in Study Area 1 (WMUs 2C, 2E, 4A, 4B and 4D)?

These WMUs are thought to be sensitive to longer fall hunting seasons. However, some hunters have supported lengthening the fall seasons in these WMUs. Therefore, we can use this research project as an opportunity to assess the effect of adding one week to the fall season in these WMUs. Because we will obtain harvest rate estimates we will be able to immediately assess the effect of the lengthened seasons rather than having to rely on standard trend indicators (summer sightings, spring harvest density, etc.) that are available only after hunting seasons are enacted.

The cross-over experimental design clearly shows the effect of changing season length.

The study area that has the season length shortened shows reduced harvest rates and the study area with an extended season exhibits increased harvest rates.

Concerning the substantial staff time and financial commitment (\$3 million) to this study, we cannot afford to pass up the opportunity to use the cross-over design to have the best chance of measuring the effect of changing season length. The shortened season will be for only two years in Study Area 2.



Why is a Cross-Over Design Best?

By simultaneously shortening and lengthening season length on each study area we eliminate the effect of confounding factors (e.g., weather conditions, food availability, etc.) that influence harvest rates. **In our statistical evaluation of different study designs, the cross-over design more than doubled our chances of detecting the effect of a season length change and our ability to obtain statistically precise estimates.**

Problems with Other Study Designs

Alternative 1: Lengthen season in Study Area 1 but don't change Study Area 2 — the problem with this study design is that other factors could cause harvest rates to increase unrelated to season length. For example, environmental conditions (food availability, weather, etc.) are known to affect harvest rates unrelated to season length. In that case, we do not know how much of the change in Study Area 1 is due to season

length change versus other factors. Even without confounding effects, harvest rate estimates under this study design are much less precise than with the cross-over design. The cross-over design is more than twice as likely to measure the effect of changing season length.

Alternative 2: Lengthen season in both Study Areas (2 weeks to 3 weeks and 3 weeks to 4 weeks) — this would require the turkey season to be concurrent with bear season, which could lead to greater harvest rates than normal because of the greater number of hunters in the woods during bear season. Similarly, opening the 4-week season earlier would make it concurrent with the opening week of small game. Also, if the 4-week study area would be the only area in the state open to turkey hunting this could result in greater hunter participation and confound results. Finally, it won't be possible to assess whether any changes are due to harvest regulations or other confounding factors.

Alternative 3: Lengthen season in Study Area 1, increase bag limit in Study Area 2 — changing the bag limit is not equivalent to

IN SUMMARY

Study Area 1 defined as WMUs 2C, 2E, 4A, 4B and 4D.

Study Area 2 defined as WMUs 2F and 2G.

Employ a cross-over design in which Study Area 1 goes from a 2-week season in fall 2010 and 2011 and increases to a 3-week season for fall 2012 and 2013. Study Area 2 goes from a 3-week season during 2010–11 and decreases to a 2-week season for 2012 and 2013.

changing season length. The issue of the effect of bag limits on harvest rates is a different question best addressed with a separate study. At this time, understanding the effects of changing season length is a priority.

Is the increase in harvest rate due to the extended season or just a random fluctuation?

Possible outcome of a study where season length is lengthened one week in Study Area 1 after the 2nd year of the study, but season length remains 3 weeks for all four years in the other study area. This study design has a less than 40% chance of detecting a 2% change in harvest rate and could be explained by other factors (e.g., weather or food abundance) rather than changes in season length

