Deer and Elk Section

Pennsylvania Game Commission, Bureau of Wildlife Management, 2001 Elmerton Avenue, Harrisburg, PA 17110
www.pgc.state.pa.us

Predation and Pennsylvania's Deer Population

January 2010

Predators kill white-tailed deer. Field studies from across the United States, including Pennsylvania, show that predators – notably coyotes, bears, and bobcats – prey on white-tailed deer. Predation is a natural form of mortality for white-tailed deer.

Recent field studies from southeastern United States have prompted some to suggest antlerless license allocations in Pennsylvania be reduced to compensate for predation losses. These studies indicated predators had substantial impact on deer populations on study areas in Alabama, Georgia, and South Carolina. Because of these studies, questions about the role of predators in deer management in Pennsylvania are being asked: are predators reducing Pennsylvania's deer populations? Should antlerless allocations be cut?

Field studies in Pennsylvania confirm that predators prey on white-tailed deer; especially young fawns. Based on available data, including field studies from Pennsylvania, no evidence supports reducing antlerless allocations to compensate for predation on deer.

Predators impact young fawns most

Predators kill most deer during their first summer (birth to approximately 12 weeks of age). We reported this in our own study during the summers of 2000 and 2001 when we radio-tagged over 200 fawns and monitored them closely to measure cause-specific mortality. Of the fawns killed by predators in our study, 84 percent were killed prior to 9 weeks of age. Coyotes and bears killed similar numbers of fawns. In the South Carolina study, 100 percent of fawns killed by predators were killed within 9 weeks of birth. Despite predation and other mortality causes, 57 to 72 percent of fawns were still alive in Pennsylvania at 9 weeks of age.

Predators have less effect on older deer. In Pennsylvania, the Game Commission has monitored over 1,500 radio-collared deer aged 6 months and older. Based on hundreds of recorded mortalities of radio-collared older deer, less than 1 percent was caused by predators. Outside of hunting seasons, deer older than 6 months have survival rates of 80 to 90 percent in Pennsylvania.

The Game Commissions uses antlerless allocations to manage 'pre-hunt' deer populations

In Pennsylvania, the deer population moves through the following sequence each year:

Birth of fawns ⇨ majority of predation ⇨ 'pre-hunt' population ⇨ deer hunting seasons

Deer management objectives are based on 'pre-hunt' deer population trends. The 'pre-hunt' population is the number of deer available at the beginning of the first hunting season. Across most of Pennsylvania, this is the population in late September or early October. The 'pre-hunt' population includes fawns that survived predation and other mortality during their first summer.

Antlerless allocations are used to manage deer populations in Pennsylvania. Specifically, a number of antlerless licenses is allocated each year by Wildlife Management Unit (WMU) to achieve deer population trend objectives. Deer population objectives are to increase, decrease, or stabilize 'pre-hunt' deer population trends. If the objective is to stabilize a deer population and the 'pre-hunt' deer population trend is stable, then the objective has been achieved.

Because of its importance for population objectives and monitoring, the 'pre-hunt' population is the basis for the antlerless licenses allocation recommendations. If predation or other mortality factors were reducing the 'pre-hunt' deer population, this impact should be detected in 'pre-hunt' population trends.

Deer population trends and fawn-to-doe ratios are stable in Pennsylvania

The effect of predators on deer populations typically is observed in fawn-to-doe ratios or overall population declines. In studies in Alabama and Georgia, declining or low fawn-to-doe ratios were observed. In the South Carolina study, the deer population was declining. Declines in fawn-to-doe ratios and overall population raised questions about the influence of predators on the deer population. In each case, predators were shown to be an important factor affecting the composition and size of the deer population.

Deer populations in Pennsylvania do not show predation-caused effects. In recent years, deer management objectives to stabilize deer populations have been successful. Deer populations in all WMUs have stable population trends. Since 2002, percent of fawns in WMU harvests has not changed and averages about 41 percent which is similar to statewide levels in the early 1980s (i.e., 1981-1983: 42-43 percent).

If fawns were being removed by predators at an unsustainable rate, they would not show up in the harvest or 'pre-hunt' populations. Unlike the southeastern studies, no declines in population trends or harvest fawn-to-doe ratios are currently observed in Pennsylvania.

CONCLUSIONS & RECOMMENDATIONS

Current levels of antlerless license allocations are producing stable 'pre-hunt' deer population trends. Also, fawn-to-doe ratios in the harvest are stable. Therefore, we find no evidence that antlerless license allocations must be reduced to offset predation.

Predation is not ignored in deer management recommendations. The 'pre-hunt' population includes fawns that have survived their most vulnerable period. For a WMU-level deer management program, accounting for these survivors in the 'pre-hunt' population trends is the most effective and efficient method. If predation losses increase, the 'pre-hunt' population would decrease. This decrease would then be observed in the 'pre-hunt' population trend. If the population trend objective was to maintain a stable population and we observed a decline, we would recommend a reduction in the antlerless allocation to return the deer population to objective.

Attempts to directly account for predator losses in the antlerless allocation would result in duplicate removals. Because fawns killed by predators in the summer are not a part of the 'pre-hunt' population (i.e., they have already been removed from the population), attempting to subtract these same animals from the 'pre-hunt' population or antlerless allocation is not necessary and inappropriate.

Given available resources and our efforts to most effectively use available data, we focus on WMU-level 'pre-hunt' population trends and deer harvests when setting antlerless allocations – not on individual non-hunting mortality factors. If a desire for more up-to-date or area-specific data on predation or other mortality factors exists, we can collect the data. To accomplish this would require WMU-specific data on losses to roadkills (2^{nd} most common mortality cause), natural mortality (3^{rd} most common mortality cause), illegal activity (5^{th} most common mortality cause), and predation (6^{th} most common mortality cause). Unknown causes are the fourth most common cause of mortality. Collection of these data in a scientifically-rigorous manner would require radio-collaring large numbers of deer in each WMU of interest. Our staff and research partners have demonstrated the ability to complete large, landscape-level field studies. Given sufficient funding and personnel, a study of this magnitude could be accomplished within the Deer and Elk Section.

In conclusion, the Deer and Elk Section will continue to provide antlerless allocations based on the best available data, use WMU-level population trends and harvest data to assess deer populations, and use the most significant mortality factor – hunting – to manage deer population trends to meet objectives.