

Evaluation of Biological Effects and Social Acceptance of New Antler Restrictions for White-tailed Deer Hunting Season in Pennsylvania^a

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ABSTRACT Pennsylvania regulations for the harvest of white-tailed deer (*Odocoileus virginianus*) were designed for exploitation of antlered deer and regulating harvest of antlerless deer. The regulation defining a legal antlered deer for harvest remained unchanged from 1953 to 2002, when the Pennsylvania Game Commission re-defined the minimum antler size. The new antler point restrictions (APRs) were a ≥ 3 - or ≥ 4 -points on 1 antler depending on the wildlife management unit (WMU). New APRs were designed to protect 50 – 75% of subadult antlered deer (≤ 1.5 years of age), whereas remaining subadults and most adult males (≥ 2.5 years of age) were legal for harvest. The purpose of the APRs was to allow more subadults to advance into the adult age class, thus increasing the proportion of older males and antlered deer in the population. Although APRs have been applied to management of other ungulate species to increase the male age structure and the proportion of antlered males to females, they have been controversial with some wildlife biologists and hunters. Little research has been done to document the effects of APRs on deer survival, hunter harvest, and hunter support. We designed a research study using radio-collared subadult and adult male white-tailed deer to measure harvest and survival rates when hunting occurs with APRs. Simultaneously, we used pre- and post-hunting season surveys to evaluate hunter perception and support for APRs.

We established study areas in Centre and Armstrong counties. During 2002 – 2005, we captured, radio-marked, and monitored 453 subadult and 103 adult males to estimate hunting and non-hunting season survival parameters and cause-specific mortality. To assess hunter support and attitudes toward APRs, we conducted 7 deer hunter surveys. The first 6 surveys were pre- and post-hunting season surveys for the 12-day firearms deer season during the 2002, 2003, and 2004 hunting seasons. The first survey was conducted before APRs began, and served as a baseline measure of hunter support for APRs. We surveyed 2 different groups of hunters: a random sample, and a longitudinal panel consisting of hunters who filled out the first 6 surveys. If a panel member failed to return a survey, they were dropped from the panel, but were surveyed at the end of the study. The final survey from panel members and the final survey to dropped panel members were used to determine directional support (increasing or decreasing) for APRs after 3 years. We used harvest and survival rate data from radio-collared deer and mail survey data to conduct a comprehensive evaluation of APRs.

We found no difference in survival rates between study areas and years of the study, but survival rates differed by age (adult, subadult) and month. Monthly survival rates for subadults ranged between 0.64 (95% CI = 0.58 – 0.69) and 0.99 (95% CI = 0.97 – 1.0), with an annual survival rate of 0.46 (95% CI = 0.41 – 0.52). For adults, monthly survival rates varied between 0.36 (95% CI = 0.29 – 0.45) and 1.00, with an annual survival rate of 0.28 (95% CI = 0.22 – 0.35). Harvest rate for subadults was 0.31 (95% CI = 0.23 – 0.38), and for adults was 0.59 (95% CI = 0.40 – 0.72). After surviving their second hunting season, adult survival was 0.92 to the start of their third season. Most out-of-season losses for subadults and adults were from vehicle

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accidents. Other than legal harvest, sub-legal kills accounted for most mortalities during the hunting season. The statewide legal harvest declined because of the reduction in subadult harvest, while the adult harvest increased despite declining deer populations in most WMUs.

From the random sample surveys, we found hunter support for a statewide APR regulation varied between 0.61 (95% CI = 0.59 – 0.64) and 0.70 (95% CI = 0.66 – 0.73). Between 0.60 (95% CI = 0.57 – 0.62) and 0.67 (95% CI = 0.64 – 0.71) of all hunters supported APR regulations in the unit they principally hunted for deer. There was little change in the proportion of hunters supporting APRs from before the regulations were implemented to 3 years afterward. With regard to APRs as a statewide regulation, 0.23 were more supportive, 0.29 were less supportive, and 0.48 were unchanged in their level of agreement. Similar results were found for support of APRs in the unit the respondent hunted for deer (0.23 more supportive, 0.30 less supportive, and 0.47 unchanged).

APRs were successful from a biological perspective. During this study, APRs reduced harvest rates of subadults, and after surviving their first season with antlers, adult survival was 92% to the following hunting season. In addition, harvests exhibited an increasing number of adult males, despite declining deer abundance during the study years. Socially, a majority of hunters (62%) remained supportive (28% were unsupportive) with the use of APRs after 3 years of use.

Empirical data from this research indicated reduced subadult harvest rates, high survival rates outside of the hunting season, and an increased number of adults in the harvest. Hunters should have observed more antlered deer during their hunting experience. However, there was little change in directional support for APRs after 3 years. We believe hunters had an initial impression of what the effects of APRs would be, and then were unaffected by any additional information once APRs were implemented.

OBJECTIVES

1. To estimate survival and identify mortality causes of male white-tailed deer from 6 to 30 months of age.
2. To monitor movements of male white-tailed deer from 6 to 30 months of age.
3. To evaluate hunter acceptance and satisfaction with antler restrictions.

INTRODUCTION

This study was part of a cooperative research program between the Pennsylvania Game Commission (PGC) and the Pennsylvania Cooperative Fish and Wildlife Research Unit at Penn State University. The purpose was to provide a comprehensive evaluation of the biological and social aspects of antler point restrictions (APRs). A previous dissertation (Long 2005) documented dispersal patterns of male deer in Pennsylvania. A second dissertation from this

research was written by Bret Wallingford as a partial requirement of a Doctor of Philosophy program to document the effects of APRs on male survival and harvest rates, and evaluate hunter acceptance and satisfaction (Wallingford 2012). Both dissertations were placed in the PGC Bureau of Wildlife Management's final research report file.

METHODS

A detailed account of methods was published by Wallingford (2012). http://s3.amazonaws.com/file-storage.INDIVIDUAL-ACTIVITIES-CooperativeResearchUnits.digitalmeasures.usgs.edu/bret.wallingford/thesis_dissert/Wallingford%20dissertation%20%20v102%2020120402%20FINAL-1.pdf

RESULTS

A detailed account of results was published by Wallingford (2012). http://s3.amazonaws.com/file-storage.INDIVIDUAL-ACTIVITIES-CooperativeResearchUnits.digitalmeasures.usgs.edu/bret.wallingford/thesis_dissert/Wallingford%20dissertation%20%20v102%2020120402%20FINAL-1.pdf

DISCUSSION

A detailed discussion was published by Wallingford (2012). http://s3.amazonaws.com/file-storage.INDIVIDUAL-ACTIVITIES-CooperativeResearchUnits.digitalmeasures.usgs.edu/bret.wallingford/thesis_dissert/Wallingford%20dissertation%20%20v102%2020120402%20FINAL-1.pdf

LITERATURE CITED

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- Wallingford, B. D. 2012. White-tailed deer antler point restrictions, harvest and survival rates, and deer hunter support: Perception versus reality. Dissertation. The Pennsylvania State University, State College, USA.