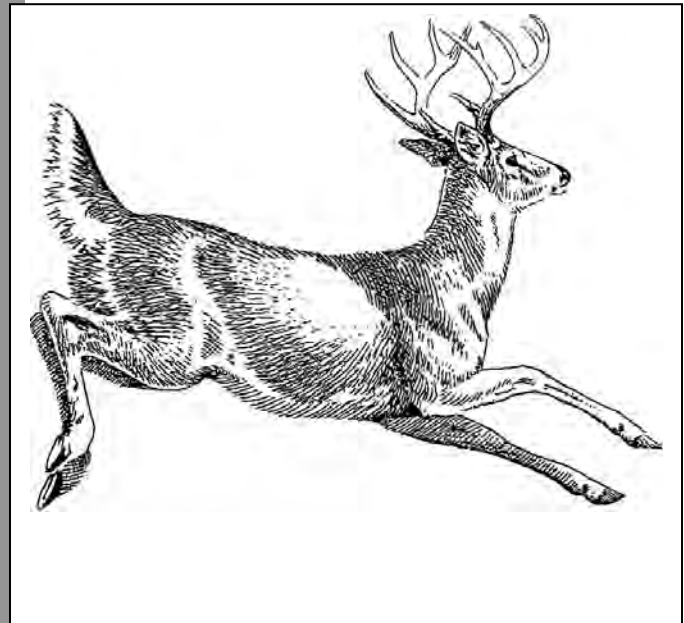


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# **Ulster County Deer Hunters' Satisfaction with the Pilot Antler Restriction Program in Wildlife Management Units 3C and 3J**



**May 2006**

**HDRU Series No 06-5**

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## HUMAN DIMENSIONS RESEARCH UNIT PUBLICATIONS SERIES

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## **ACKNOWLEDGMENTS**

This study was conducted in collaboration with the New York State Department of Environmental Conservation (DEC), and in particular with members of the DEC Deer Team and biometrician, Ed Kautz. Jeremy Hurst played the lead role in coordinating DEC input to the survey. Staff involved in setting the objectives for the study and reviewing questionnaire drafts included John O'Pezio, Ted Kerpez, Christfried Arfsten, Jeffrey Peil, and Michael Putnam. Reviews of the final report were also provided by Ed Kautz and John Major.

Several HDRU staff also contributed to this study. Karlene Smith and Heather Irvine did the mailings and data entry. Nancy Connelly did the data analysis. Jody Enck provided information and insights from the DEC study of hunters and landowners at King Ferry in Region 7 that were useful to the design and data interpretation from this study, and also provided comparative deer harvest data from other studies. Margie Peech provided formatting for both the questionnaire and the final report.

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## INTRODUCTION

Given strong local support from sportsmen in Ulster County, the Department of Environmental Conservation (DEC) implemented a pilot antler restriction program in 2005 in Wildlife Management Units 3C and 3J to enhance the age structure of adult bucks. This pilot program incorporates special regulations requiring that bucks taken in WMUs 3C and 3J have at least one antler with 3 or more points that are at least one inch in length. In an effort to provide greater opportunity for young hunters, those under age 17 are exempt from this regulation and may still take any buck with at least one antler that is 3 or more inches long.

Staff from DEC's Deer Management Team requested that HDRU assess hunters' evaluation of the program after the first year (2005). HDRU and DEC staff collaborated to develop a survey of a sample of hunters from Ulster County. This report summarizes the survey's findings.

## METHODS

DEC staff used the DECALS automated licensing system to select a sample of hunters from areas within or immediately adjacent to WMUs 3C and 3J who purchased big game licenses in 2005-06. The vast majority of the acreage of each of these WMUs is within Ulster County. About 13% of the initial list of 5,298 hunters were from Greene and Orange Counties. For sampling efficiency, we removed those names, which left a total of 4,591 hunters who had Ulster County residences. From this total, we selected a random sample of 1,000 hunters. The survey was mailed to these hunters on February 10, 2006. Up to three reminder notices were mailed, which is the typical protocol for HDRU mail surveys. Data entry from the surveys occurred in late March and early April, and analysis was facilitated by the software Statistical Package for the Social Sciences (SPSS).

## RESULTS

Of the 1,000 surveys mailed out, 35 were undeliverable and 498 were returned for an adjusted response rate of 52%,

### **Deer Hunting in 2005**

The vast majority of respondents (82%) indicated that their primary hunting area was in WMU 3C or 3J, and 76% actually hunted in one of the 2 units in 2005. Of the hunters who did not hunt WMU 3C or 3J in 2005 but who usually hunt there, only 12 individuals (< 3%) indicated it was because they do not support the new regulations. Deer hunting activity and harvest of respondents is summarized in Table 1 and harvest per hunter day is summarized in Table 2. The antlered harvest rate in WMUs 3C and 3J was about half that of the rate in other areas where these respondents hunted, an anticipated impact of the antler restriction program.

**Table 1. Percent of respondents who hunted various seasons and mean number of days hunted.**

Hunting Season	Percent who hunted			Mean days hunted <sup>1</sup>			Mean harvest antlered bucks <sup>1</sup>			Mean harvest antlerless bucks <sup>1</sup>		
	3C	3J	Other	3C	3J	Other	3C	3J	Other	3C	3J	Other
Early bow	26	20	14	8.4	8.0	5.8	0.12	0.18	0.29	0.18	0.29	0.15
Regular	52	43	29	7.7	6.8	6.0						
Late special seasons	13	12	5	3.2	2.9	4.0						

<sup>1</sup> Mean days hunted and harvest is for those who hunted at least one day in each area. Mean harvest combines all seasons.

**Table 2. Effort and harvest summary for respondents.**

WMU	Area Hunted		
	3C	3J	Elsewhere
Total days hunted	3,247	2,392	1,353
Antlered deer taken	32	43	46
Antlered deer harvest per hunter day	0.010	0.018	0.034
Antlerless deer taken	44	60	24
Antlerless harvest per hunter day	0.014	0.025	0.018
Ratio of antlered to antlerless harvest	0.7:1	0.7:1	1.9:1

Most respondents (89%) who hunted in 3C or 3J indicated one of these WMUs to be the primary unit where they have hunted in the past. About one-third (31%) indicated that they hunted in WMU 3C or 3J because they support the pilot program. Of the few hunters for whom 3C or 3J was not their primary hunting area, about half (51%) indicated they thought their chances of getting a mature buck in 3C or 3J would be greater there than where they typically hunt.

### Favored Program Outcomes

Table 3 indicates outcomes of the pilot program that are important to respondents. (It was noted in the accompanying survey question that a combination of the deer management program and the pilot antler restriction program might be needed to achieve some of the outcomes.) Outcomes most frequently indicated as important were to see a larger number of mature bucks and to be able to harvest more mature bucks. To see a larger number of mature antlered bucks was most frequently cited as the *most* important possible outcome—by almost one-third of the respondents.

### Willingness to Take Antlerless Deer

Most hunters (83%) indicated a willingness to take antlerless deer; 67% had done so in the past and an additional 16% who had not taken an antlerless deer indicated a willingness to do so. Many respondents (41%) did not know whether the program had

any effect on hunters' willingness to take antlerless deer. Those who had opinions were evenly divided—45% thought hunters were now more willing to take antlerless deer, while 44% thought the program had little effect on willingness to take antlerless deer. A small number (5%) thought the program caused fewer hunters to take antlerless deer.

**Table 3. Possible outcomes of the antler restriction program that are important to respondents and the most important possible outcome.**

Possible Outcome	Impor- tant (%)	Most Impor- tant (%)
To see a larger number of mature antlered bucks	70	31
To be able to harvest more mature antlered bucks	61	17
To increase the quality and health of all deer	52	12
To see a more equal ratio of bucks to does	51	13
To decrease the urgency by hunters to shoot at the first deer they see	46	4
To see a more balanced age structure among male deer	45	4
To increase hunting safety by encouraging better target identification	40	6
To increase the deer density	28	7
To make WMUs 3C and 3J a premier hunting destination	18	1
To reduce the deer density	4	2
To allow landowners to get top dollar for hunting leases	3	0
Other reasons	8	3

### Attitudes about the Pilot Program

There was considerable divergence as to how respondent's perceived other hunters' attitudes about the program prior to the 2005 deer season. The largest group (41%) thought that hunters took a "wait and see" attitude. Almost one-third (32%) thought hunters were generally opposed to the program, while 26% thought hunters supported the program. Following the deer hunting season, somewhat more respondents (51%) believed that support for the program has remained the same; 28% felt fewer hunters supported the program after the season, and 20% indicated that more hunters support the program after the season.

### Compliance with the Regulations

Most hunters (60%) indicated they didn't know how good hunter compliance was with the pilot program regulations. Of those who had an opinion, 72% felt that compliance was strong enough to begin to show a change in the age structure of bucks. Thirteen percent of those who answered the question, or 9% of all respondents, indicated they knew someone other than a hunter under 17 years of age who took a buck in 3C or 3J that did not meet the antler restriction criteria. These 47 respondents reported knowing of 105 bucks that taken that did not meet the minimum antler criteria. At the



upper end, 2 respondents reported 6 bucks, one reported 7, and one reported 8 bucks taken (not necessarily by the same hunter) that did not meet the minimum antler criteria.

Additionally, 22% indicated they heard about bucks that were did not meet the minimum antler criteria. These 74 respondents reported a total of 197 bucks that were taken illegally; one respondent had heard about 11 deer taken illegally, and another heard about 10 deer taken illegally (not necessarily by the same hunter).

### Overall Satisfaction

Overall, 39% of respondents indicated they were generally satisfied with their hunting in WMUs 3C and 3J, 31% indicated they were generally dissatisfied, and 30% gave a neutral rating of neither satisfied nor dissatisfied. The general outdoor experience, hunting with friends and family, and knowing efforts are underway to change the age structure of bucks were the leading sources of satisfaction. Not seeing enough deer, insufficient access, and lack of time to hunt more were the leading sources of dissatisfaction.

**Table 4. Factors that contributed most to hunters' satisfaction and dissatisfaction in WMUs 3C and 3J in 2005.<sup>1</sup>**

<b>Factors Most Affecting Satisfaction</b>	<b>Percent</b>
The general outdoor experience	63
Hunting with friends and family	49
Knowing efforts are underway to change the age structure of bucks	40
Having enough time afield	26
Seeing enough deer	24
Harvesting one or more deer	18
Getting shots at deer	7
Other reasons	4
<b>Factors Most Affecting Dissatisfaction</b>	
Not seeing enough deer	54
Insufficient access	41
Lack of time to hunt more	36
Weather of field conditions	16
Other reasons	16
Not being able to shoot young bucks	15
Lack of a hunting companion	5

<sup>1</sup> Respondents could check up to 3 choices that most affected both satisfaction and dissatisfaction.

Having respondents proceed through the above topics, including the consideration of both satisfactions and dissatisfactions, places them in a better position to give a reasoned opinion on whether the pilot program should be continued in 2006. Two-thirds (66%) of all respondents, and 75% of those with an opinion indicated they believe the

program should be continued. One-third of that number (22%) did not believe the antler restrictions should be continued, and 12% had no opinion.

## SUMMARY AND IMPLICATIONS

One of the most striking results of this survey is that hunters in 3C probably did not see many deer, and certainly did not kill very many in 2005. The combined antlered and antlerless harvest per hunter day was only 0.024 in 3C and 0.043 in 3J, compared to 0.52 deer harvested per hunter day reported by respondents who hunted outside the pilot antler restriction area. Thus, on average, it took about 42 hunter days in 3C and 23 hunter days in 3J to harvest a deer, compared to 20 days for respondents who hunted elsewhere. This compares to a statewide estimate of 18 days in 1990. One-quarter (24%) of respondents checked “seeing enough deer” as a reason for their hunting satisfaction, but 54% checked “not seeing enough deer” as a reason for their hunting dissatisfaction in these WMUs.

As expected, most hunters who hunted 3C or 3J in 2005 did so because it was already their traditional area to hunt; not a lot of other hunters were attracted to these WMUs initially. That appears to be fine with local hunters—very few indicated interest in these WMUs becoming a premier hunting destination (there were individual write-in comments to this effect as well as the data in Table 3).

While the pilot program had strong support from local organized sportsmen, it did not seem to have overwhelming support across all hunters prior to the 2005 season. The perception of the largest group of respondents (41%) was that most hunters had a “wait and see” attitude; of the remaining respondents, slightly more felt that hunters were generally against the pilot program, compared to those who favored it. However, by the end of the 2005 deer season and the time when this survey was implemented in February 2006, most respondents felt the pilot program should be continued. Indeed, 75% of respondents with a point of view indicated the program should be continued.

These data are insufficient to conclusively determine hunter compliance with the new regulations, but the number of respondents who had knowledge of illegal harvest of young bucks, plus the number of others who had heard of violations, may be cause for concern. In a much smaller-scale (~25 square miles) experiment with *voluntary* antler restrictions from 2001 through 2004 in part of WMU 7H near King Ferry, a perceived intolerably high level of non-compliance was one factor leading to the end of the experiment prior to the 2005 hunting season. Most respondents from WMUs 3C and 3J with an opinion thought compliance was high enough for the program to continue, but the illegal harvest should be further examined to more closely estimate its effect on the buck population and age structure.

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# **Evaluation of Antler Restrictions in DEC Region 3: 2<sup>nd</sup> Year in 3C and 3J, 1<sup>st</sup> Year in 3H and 3K**



**June 2008**

**HDRU Series No. 08-4**

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## HUMAN DIMENSIONS RESEARCH UNIT PUBLICATIONS SERIES

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This publication is part of a series of reports resulting from investigations dealing with public issues in the management of wildlife, fish, and other natural resources. The Human Dimensions Research Unit (HDRU) in the Department of Natural Resources at Cornell University studies the social and economic values of wildlife, fish, and other natural resources and the application of such information in management planning and policy. A list of HDRU publications may be obtained by writing to the Human Dimensions Research Unit, Department of Natural Resources, Fernow Hall, Cornell University, Ithaca, NY 14853, or by accessing our World Wide Web site at: <http://www.dnr.cornell.edu/hdru>.



This report is available electronically at: <http://www.dnr.cornell.edu/hdru/pubs/Elecpubs.asp>.

# EXECUTIVE SUMMARY

## Introduction

This report presents findings from the continuing evaluation of the pilot antler restriction program initiated in WMUs 3C-3J prior to the 2005 hunting season and expanded to WMUs 3H-3K prior to the 2006 hunting season. Findings included here are from the second year of data collection in 3C-3J and are the first year of data from 3H-3K.

## Methods

We used mail surveys to collect data from licensed deer hunters living in all four pilot WMUs. The sample for WMUs 3C-3J consisted of all 498 hunters who had responded to the mail survey conducted in early 2006 after the initial year of pilot program (during the 2005 hunting season). The sample WMUs 3H-3K consisted of 500 persons who lived in or adjacent to those units and who had purchased a 2006-07 big game license. We implemented both mail surveys on 15 February 2007, and analyzed all questionnaires returned by 10 April 2007.

To assess any non-response bias in our data from respondents, we contacted by telephone 50 non-respondents to the mail survey implemented with hunters in WMUs 3C-3J and 69 non-respondents from WMUs 3H-3K.

## Results

- The sample of 498 hunters from WMUs 3C-3J resulted in a 71.9% response rate. For WMUs 3H-3K, the initial sample of 500 resulted in a 46.9% response rate.
- We found only a few expected differences between respondents and non-respondents, with non-respondents participating fewer days and harvesting less deer, yet generally being satisfied with their hunting experiences.
- Awareness of the pilot. The vast majority of respondents from WMUs 3C-3J (98%) and WMUs 3H-3K (95%) were aware of the pilot antler restriction program in those units.
- Primary place to hunt. Very high percentages of respondents from both 3C-3J (84.0%) and 3H-3K (81.0%) indicated their primary hunting location was in those respective WMUs. Also, about three-quarters of respondents from 3C-3J (76%) and 3H-3K (75%) hunted in those WMUs, respectively, during the 2006 hunting season.
- Change in primary place to hunt among 3C-3J hunters between the first and second years of the pilot. More than two-thirds of hunters (69%) reported that their primary place to hunt was in 3C-3J in both 2005 and 2006. About 13% said 3C-3J was their primary place in 2005, but that changed to “elsewhere” in 2006. Conversely, 17% reported that their primary place to hunt was “elsewhere” in 2005 but was in 3C-3J in 2006. Less than 1% reported their primary place to hunt deer was “elsewhere” both in 2005 and 2006.

- Reasons for hunting in these units. More than two-thirds of hunters from 3C-3J (69%) and more than three-quarters from 3H-3K (82%) said they hunted in those units because that was their primary place to hunt deer. Most of the remainder from both sets of WMUs reported that, “I live there,” “it’s close to home,” or “I own land there.”
- Reasons for not hunting in these units. A plurality of hunters who live but do not hunt in the pilot WMUs hunt elsewhere because they have family and friends or own land somewhere else. Among those who live but do not hunt in 3C-3J, about 13% said “I do not support the pilot program,” and about 8% said, “I support the program but thought my odds of taking a buck were better elsewhere.” Among the hunters who live but do not hunt in 3H-3K, about 10% said, “I support the pilot program, but felt my odds of taking a buck were better elsewhere,” and only 2% said, “I do not support the pilot program.”
- Days of hunting. Hunters from the pilot WMUs bowhunted an average of 3-4 days during the early archery season, 8.5 days during the regular firearms season, and 1.5 days during the late special seasons. Overall, respondents hunted an average of 12-14 total days for deer in the pilot units in 2006, and 14-15 days total throughout New York State.
- Deer harvest. About 20% of hunters from 3C-3K reported taking a buck in those units in 2006, compared to 15% from 3H-3K. More than one-quarter of hunters from 3C-3J took an antlerless deer in those units in 2006 whereas 18% of hunters from 3H-3K did so. Overall, 28% of 3C-3J hunters reported taking at least one antlerless deer somewhere in New York during 2006, and 23% reported taking a buck. Also, 18% of respondents from 3H-3K harvested at least one antlerless deer, and 23% took a buck.
- Effort to bag a deer. It took an average of 16.3 days for hunters in 3C-3J to harvest a doe, and 14.2 days on average to harvest a buck. In 3H-3K, hunters took 15.3 days on average to harvest a doe, and 14.1 days to take a buck.
- Perceptions of deer sex ratio and buck age ratio. In 3C-3J, hunters believed there were an average of 20% antlered bucks and 80% antlerless deer out of every 100 total deer prior to the 2006 season. In 3H-3K, the percentages were 18% bucks and 81% antlerless deer. Hunters in 3C-3J perceived 71% young bucks and 29% older bucks out of every 10 antlered bucks. In 3H-3K, the percentages were 72% young bucks and 27% older bucks.
- Change in willingness to harvest an antlerless deer. About two-thirds of hunters from both sets of WMUs said their willingness to take an antlerless deer had not changed since the inception of the pilot program in those areas.
- Satisfaction with hunting experiences. In 3C-3J, 46% of hunters reported were dissatisfied with their hunting experiences during the 2006 season, and 38% said they were satisfied. In 3H-3K, 41% were dissatisfied and 44% were satisfied.
- Change in satisfaction since inception of the pilot program. Following the 2006, 42% of hunters in WMUs 3C-3J said their satisfaction had decreased, 37% said it had not changed, and 21% said it had increased. Among hunters from 3H-3K, 36% reported a

decrease in satisfaction, 53% reported no change, and 11% said their satisfaction had increased.

- Positive impacts to be managed. Positive impacts (i.e., aspects that are “very important”) for >50% of respondents from both sets of pilot WMUs are: “seeing healthy deer,” “seeing antlered bucks of any size/age,” “seeing older bucks with larger antlers,” “having a natural buck age ratio,” and “having a natural sex ratio.” On average, hunters from 3H-3K placed greater importance than hunters from 3C-3J on “seeing older bucks with larger antlers,” and “having a natural buck age ratio.”
- Changes in positive impacts. Strong pluralities or simple majorities of hunters from both sets of pilot units reported noticing no change in the number of antlered bucks of any age, the number of older (i.e., legal) bucks, or in the age ratio of bucks or in the buck to doe ratio. Overall, more hunters from both sets of units said they had noticed that all bucks, generally, and older (legal) bucks, specifically, had decreased vs. the percentages who said they had noticed an increase in bucks. A majority of hunters from WMUs 3C-3J noticed a decrease in deer density after two years of the pilot program whereas in 3H-3J a similar percentage reported no change as reported a decrease.
- Which positive impacts are at desirable levels? A majority of hunters from 3C-3J reported that all six possible, positive impacts about which we asked were “too low” for them to be satisfied. A majority of hunters from 3H-3K indicated that four of the six were “too low.” In both sets of WMUs, the greatest percentages of hunters indicated that the number of older, legal bucks was too low. Less than one-quarter of hunters from either set of WMUs indicated that any of the six aspects were “more than enough for me to be satisfied.”
- Negative impacts to be managed. Only “feeling crowded by too many hunters” is a negative impact for a majority of hunters from WMUs 3H-3K, and only 45% in 3C-3J. Both “seeing that some sub-legal bucks have been shot by mistake,” and “fearing for my safety because people shoot unsafely at deer” are impacts for substantial minorities of hunters from both sets of WMUs. Hunters from both sets of WMUs are split about whether they are “not at all concerned” or “very concerned” about “having difficulty figuring out if a buck I see is legal to shoot.”
- Changes in negative impacts. Overall, all possible negative impacts increased for more hunters than who said they decreased. Level of “fear of being shot” had changed for the fewest hunters from both sets of WMUs. Amount of “difficulty figuring out if a buck I see is legal to shoot” increased for the most hunters. “Sense of urgency to shoot the first buck I see instead of waiting for one I’d rather shoot” decreased for the most hunters in both sets of WMUs, but sense of urgency still increased for more hunters than for whom it decreased.
- Which negative impacts are at tolerable levels? More hunters in both areas reported that all five negative aspects about which we asked were “low enough for me to still be satisfied” compared to those who indicated that the experiences were “too high for me to

be satisfied.” Between 30-40% of hunters from both sets of WMUs indicated that many of the negative aspects we examined were “just about at the maximum level I can tolerate.”

- Current perceptions about whether the pilot program should continue. Strong majorities of hunters from both WMUs 3C-3J (64%) and WMUs 3H-3K (81%) believe the pilot antler restrictions should be continued in those units. About one-quarter of hunters (27%) from 3C-3J, and 11% from 3H-3K indicated that the pilot should not be continued.
- Changes in perceptions about continuing the pilot program. After the second hunting season under antler restrictions in 3C-3J, about one-quarter of hunters (26%) said their support for the pilot program had increased, and one-quarter (27%) said their support had decreased. The remaining 47% said their support had not changed over the two years. In 3H-3K where the pilot was in place for only one season prior to the survey, 56% said their support for the pilot program had increased, 13% said their support had decreased, and 31% reported no change in their level of support.

## **Summary and Implications**

Fairly strong majorities of hunters from both sets of WMUs supported the idea of continuing the pilot antler restrictions for the 2007 hunting season. Apparently, a small percentage of 3C-3J respondents have changed their primary location for deer hunting as a result of the pilot program. About as many hunters were attracted to units 3C-3J (17%) for the second year of the pilot as were lost (13%) after the first year of the antler restrictions. Thus, no large changes in the number of people hunting in these units have occurred because of the pilot.

Seeing and bagging deer, particularly older bucks with larger antlers, certainly is attractive to deer hunters surveyed from the pilot WMUs. However, the degree to which hunters are satisfied with their hunting experiences depends on a complex set of factors. A majority of hunters indicated that four or five positive aspects (depending on the WMU) were “very important” to them, and >40% of hunters in both sets of pilot units were “very concerned” about three negative aspects.

Whether hunters perceived positive impacts to be at or above desirable levels and negative impacts to be at or below tolerable levels clearly influenced hunter satisfaction in the pilot units. The relatively high percentage of dissatisfied hunters in all pilot units seems to be related mostly to multiple, positive impacts being “too low” for hunters to be satisfied.

Despite the relatively high dissatisfaction, strong majorities of hunters from both WMUs 3C-3J and 3H-3K support continuation of the pilot program. Overall, hunters who believe that seeing bucks in general and older bucks with larger antlers in particular are “very important” and who believe the number of bucks has increased, also generally believe the increased number is at least at a minimum desired level. The vast majority of hunters who believe seeing bucks is an impact to be managed, but that the number has not changed since the inception of antler restrictions, indicated that the existing number is “too low.” Obviously, this



condition is dissatisfying. Nonetheless, these hunters seem to be continuing to express the “wait and see attitude” reported after the first year of the pilot in WMUs 3C-3J.

Negative impacts that are “too high” seem to be weighted less by hunters than positive impacts that are “too low.” Despite already “too high” levels of negative impacts that apparently are worsening, the majority of hunters seem willing to support continuation of antler restrictions based on the potential of improving levels of positive impacts. Beyond these findings, it is possible – even likely – that additional positive impacts and negative impacts exist for which we have no data. If levels of both positive and negative impacts are improving under antler restrictions, it could help explain why so many hunters are supportive of continuing the pilot program.

## **ACKNOWLEDGMENTS**

We greatly appreciate the assistance provided to us by the Deer Team members of the New York State Department of Environmental Conservation (DEC). J. Hurst and K. Clarke were particularly instrumental in helping to develop the mail survey instruments and all Deer Team members provided helpful suggestions for improving the questionnaires. E. Kautz obtained the sample of hunters' names, addresses, and telephone numbers. Several staff from Cornell University's Human Dimensions Research Unit (HDRU) assisted in implementing the mail surveys, including K. Smith and M. Peech. Telephone interviews with subsamples of non-respondents to the mail surveys were conducted by staff with Cornell University's Survey Research Institute. Finally, we greatly appreciate the information provided by the hundreds of respondents who returned questionnaires.

Funding for this study was provided by the New York Federal Aid in Wildlife Restoration Grant WE-173-G, Activity 6.4.3.

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## **INTRODUCTION**

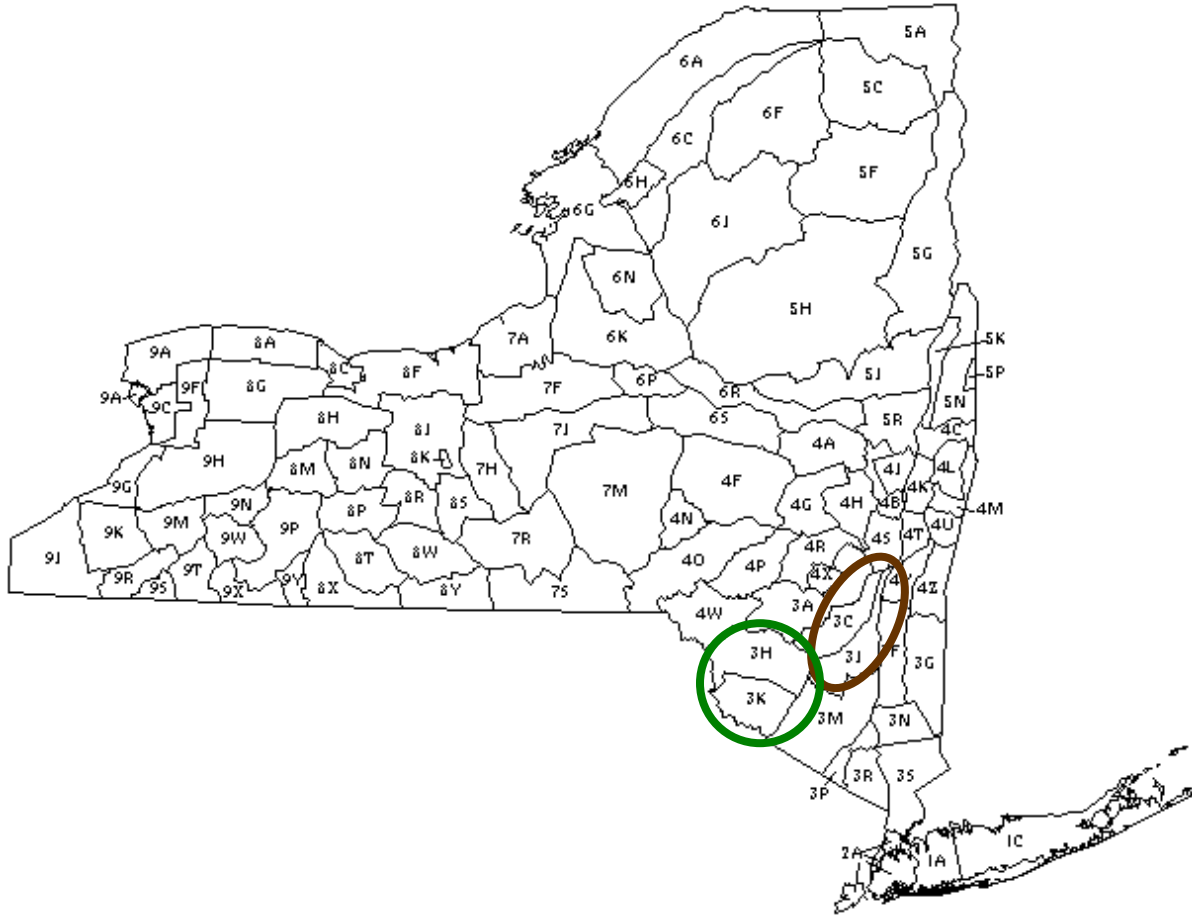
This report presents findings from the continuing evaluation of the Pilot Antler Restriction Program in southeastern New York. In 2005, deer managers with the New York State Department of Environmental Conservation (DEC) implemented a pilot program in Wildlife Management Units (WMUs) 3C and 3J, occurring largely in Ulster County (Figure 1), to enhance the age structure of adult bucks. In 2006, the pilot program was expanded to WMUs 3H and 3K, occurring largely in Sullivan County. The pilot restrictions require that antlered bucks harvested in these four WMUs have at least one antler with three points that are at least one inch in length. To provide maximum opportunity for young hunters to harvest an antlered buck, those under age 17 are exempt from the regulation, and may harvest any antlered buck with at least one antler three or more inches long.

DEC staff requested that HDRU evaluate hunter satisfaction and beliefs about the pilot program after the first year it was implemented in WMUs 3C and 3J. A mail survey revealed that many hunters (41%) had a “wait and see” attitude about whether the pilot program would improve the buck age structure and ultimately increase hunter satisfaction (Brown 2006). That survey also identified two particular issues to monitor in subsequent years. These were the number of deer seen by hunters (and whether this number was sufficiently satisfying), and perceptions of hunter compliance with the pilot restrictions. Despite these possible concerns identified in the initial survey, most respondents (75%) with a point of view wanted the pilot program to continue.

This report presents findings and insights from a mail survey conducted after the second year of the pilot program in WMUs 3C and 3J, and a similar mail survey conducted in WMUs 3H and 3K the first year after the pilot program was expanded to those units.

### **Study Objectives**

1. Determine hunters’ attitudes toward, and degree of support for, antler restrictions in the QDM pilot area.
2. Determine reasons underlying hunters’ attitudes toward antler restrictions, including their assessment of whether desirable/intolerable experiences that affect their hunting satisfaction are improving or worsening as a result of the pilot program.
3. Monitor hunter effort and harvest-related behaviors to determine whether any changes have occurred in response to antler restrictions in the QDM pilot area.



**Figure 1. Location of Wildlife Management Units (WMUs) 3C and 3J (oval, largely in Ulster County) and 3H and 3K (circle, largely in Sullivan County) where pilot antler restrictions have been in place since 2005 and 2006, respectively.**

## METHODS

### Sampling Frame

The sample for WMUs 3C and 3J consisted of all 498 hunters who had responded to the mail survey conducted after the initial year of pilot program in 2005. Resurveying these hunters allowed us to monitor any changes in their behavior or attitudes due to their experiences with the pilot program. The sample WMUs 3H and 3K consisted of 500 persons who lived in or adjacent to those units and who had purchased a 2006-07 big game license. Both samples were obtained by DEC staff using the DECALS automated licensing system.

We implemented both mail surveys on 15 February 2007 following Dillman's (2000) four-wave procedure. Our last reminder letter was mailed to non-respondents on 15 March, and we included in our analysis all questionnaires returned by 10 April 2007.

## **Questionnaire Development**

We developed slightly different instruments given that the pilot program had been in place for two hunting seasons in WMUs 3C and 3J, but only one hunting season in WMUs 3H and 3K. See Appendices A and B for the two instruments. The main differences between the instruments were simple word changes to reflect that the 2006 hunting season was the second year of the pilot program in the Ulster County WMUs, but only the first year in the Sullivan County WMUs.

### **General Deer-hunting Information:**

We first assessed whether hunters were aware of the pilot program, whether any of the pilot WMUs was their primary hunting location, whether they hunted deer in the pilot WMUs during the 2006 hunting season, and if not, why not. We then asked how many days they hunted during the early archery season, regular firearms season, and late special seasons in each of the pilot WMUs. We also asked how many antlered bucks and antlerless deer they harvested in those units. Finally, we asked why they chose to hunt deer in the pilot WMUs.

### **Deer-hunting Satisfaction in the Pilot WMUs and Factors Affecting Satisfaction:**

Prior to asking opinions about any changes they had perceived in deer population characteristics or whether they thought the pilot program should continue, we used a 7-point scale (from greatly satisfied to greatly dissatisfied) to determine hunters' satisfaction with their overall deer-hunting experiences in the pilot WMUs during the 2006 season. We also used a 5-point scale (from increased a lot to decreased a lot) to assess whether and how much their satisfaction from hunting in these WMUs had changed since the inception of the pilot program.

Next, we used a 4-point scale (from not at all important to very important) to assess how important each of eight possible positive aspect of deer hunting is to them personally. The possible positive aspects were: (1) seeing antlered bucks of any age, (2) seeing older bucks with larger antlers, (3) having a natural mix of older and yearling bucks, (4) having a natural deer sex ratio, (5) seeing healthy deer, (6) being considered a "good" or expert buck hunter by others, (7) being considered a "good" or expert deer hunter by others, and (8) freedom of choice to shoot at the buck of my preference. Similarly, we used a 4-point scale (from not at all concerned to very concerned) to assess how concerned they were personally about each of five possible negative aspects of deer hunting. The possible negative aspects were: (1) feeling crowded by too many hunters, (2) fearing for my safety because people shoot unsafely at deer, (3) having difficulty figuring out if a buck I see is legal to shoot, (4) seeing that some sub-legal bucks have been shot by mistake, and (5) feeling a sense of urgency to shoot the first legal buck I see instead of waiting for one I'd rather shoot.

We followed these questions with an assessment of changes hunters noticed in 10 specific aspect of deer hunting since the inception of the pilot program. To do this, we used a 5-point scale from increased a lot to decreased a lot. The 10 items were: (1) number of antlered bucks of any age, (2) number of older, legal bucks, (3) sense of urgency to shoot the first legal buck I see instead of waiting for one I'd rather shoot, (4) amount of difficulty figuring out if a



buck I see is legal to shoot, (5) total deer density, (6) fear of being shot by people who shoot unsafely at deer, (7) freedom of choice to shoot at the buck of my preference, (8) feeling crowded by other hunters, (9) number of sub-legal bucks shot by mistake, and (10) my willingness to shoot a doe.

Next, we asked hunters to consider how their experiences during the season with each of six possible positive aspects of deer hunting affected their overall satisfaction. The possible positive aspects were: (a) total number of bucks seen, (b) total number of deer seen, (c) number of older, larger-antlered bucks seen, (d) naturalness of the mix of older bucks compared to yearling bucks in the deer population, (e) naturalness of the mix of bucks and antlerless deer, and (f) their freedom of choice to shoot at a buck of their preference. For each, we asked them to indicate whether what they experienced was “too low for me to be satisfied,” “just about the minimum level I need to be satisfied,” or “more than enough for me to be satisfied.”

We also asked hunters to consider how their experiences during the season with each of five possible negative aspects of deer hunting affected their overall satisfaction. The possible negative aspects were: (a) sense of urgency to shoot the first legal buck seen when hunter would rather wait for a different one, (b) number of sub-legal bucks shot by mistake, (c) feeling crowded by other hunters, (d) fear of being shot by people who shoot unsafely at deer, and (e) amount of difficulty figuring out if bucks hunter sees were legal to shoot. For each of these, we asked them to indicate whether what they experienced was “too high for me to be satisfied,” “just about the maximum level I can tolerate,” or “low enough for me to still be satisfied.”

To monitor perceived changes in specific deer population characteristics, we used two pairs of questions. First, we asked them to estimate what percent of deer in pilot WMUs were antlered bucks and what percent were antlerless deer (does and fawns) before the start of the 2006-07 deer hunting season. We also asked them to estimate the percent of antlered bucks were yearlings with smaller antlers and what percent were older bucks with larger antlers. Second, we used a 5-point scale (from increased a lot to decreased a lot) to determine any changes they had noticed since the pilot program began in: (1) the number of older bucks compared to younger bucks, and (2) number of bucks compared to does.

### **Evaluation Questions:**

We used two questions to determine hunters’ beliefs about whether they were in favor of the pilot program being continued. First, we assessed their attitude toward the program using a 5-point scale (from I am much more supportive now to I am much less supportive now). Second, we asked their opinion about whether the pilot program should be continued in 2007.

### **Data Analysis:**

We analyzed all survey data using SPSS-X (Version 16.0). In this report, we present descriptive statistics (percentages, means and standard errors), and do not make comparisons between the Ulster County WMUs (3C-3J) and the Sullivan County WMUs (3H-3K). Thus, we report no significance thresholds for any of these analyses. Where we have two years of data for

the same respondents from WMUs 3C-3J, we present the percentage whose attitudes/behaviors remained the same vs. changed.

### **Assessment of Non-response Bias:**

To assess any non-response bias in our data from respondents, we contacted by telephone 50 non-respondents to the mail survey implemented with hunters in WMUs 3C-3J and 69 non-respondents from WMUs 3H-3K. We administered a shortened version of the questionnaire to these persons, and compared their aggregated responses to those of respondents to the mail survey. We used t-tests to compare mean values and the Fisher Exact to compare proportional data.

## **RESULTS**

### **Survey Response Rates**

The initial sample of 498 hunters from WMUs 3C and 3J resulted in 477 deliverable questionnaires and 343 useable returns (71.9% response rate). For hunters from WMUs 3H and 3K, the initial sample of 500 resulted in 458 deliverable questionnaires and 215 useable returns (46.9% response rate).

### **Differences Between Respondents and Non-respondents**

We found only two differences out of 15 variables between non-respondents and respondents in WMUs 3H and 3K. First, a higher percentage of non-respondents (12%) compared to respondents (5%) were not aware of the regulation pertaining to antler restrictions ( $X^2 = 4.107$ ,  $p = 0.043$ ). Second, more respondents (19%) compared to non-respondents (6%) reported an increase in their fear of being shot by hunters shooting unsafely at deer since the inception of the pilot program ( $X^2 = 5.243$ ,  $p = 0.022$ ).

We found five differences out of 11 variables between non-respondents and respondents in WMUs 3C and 3J. Four of these differences were with participation and harvest variables. First, non-respondents hunted fewer days (mean = 9) than respondents (mean = 15) during the 2006 deer-hunting seasons in New York ( $t = -3.124$ ,  $p = 0.003$ ), but hunted similar numbers of days (11 vs. 14) within the pilot WMUs ( $t = -1.13$ ,  $p = 0.261$ ). Fewer nonrespondents than respondents (8% vs. 39%, respectively) harvested an antlerless deer within 3C or 3J in 2006 ( $X^2 = 13.412$ ,  $p < 0.001$ ). Similarly, no nonrespondents harvested an antlered buck or an antlerless deer someplace other than 3C-3J whereas 14% and 9% of respondents did so, respectively.

Finally, respondents and nonrespondents differed substantially about whether their hunting experiences in 3C-3J during 2006 had been satisfying or dissatisfying ( $X^2 = 7.207$ ,  $p = 0.007$ ). Nonrespondents generally were satisfied (61%; 22% dissatisfied) with their hunting experiences in during 2006. Respondents were more split about whether they were satisfied (38%) or dissatisfied (46%).

## Results for Respondents

### Awareness of, and Hunting Within, the Pilot WMUs:

Awareness. The vast majority of respondents from WMUs 3C-3J (98%) and WMUs 3H-3K (95%) were aware of the pilot antler restriction program in those units. In both WMUs 3C-3J and 3H-3K, hunters who were unaware of the pilot program did not hunt in any of those units.

Primary place to hunt deer. Similar percentages of respondents from both 3C-3J (84.0%) and 3H-3K (81.0%) indicated their primary hunting location was in those respective WMUs. Also, similar percentages of respondents from 3C-3J (76%) and 3H-3K (75%) hunted in those WMUs, respectively, during the 2006 hunting season. Slightly more than one-half of hunters from 3C-3J (56%) hunted deer in those units in both 2005 and 2006, 20% hunted there in 2005 but not 2006, and another 20% did not hunt in 3C-3J in 2005 but did in 2006. The remaining 4% did not hunt in 3C-3J in either year.

Change in primary place to hunt deer. Among 3C-3J hunters, about 30% reported a change in their primary place to hunt between 2005 and 2006. Of those, 13% indicated that 3C-3J was their primary place to hunt in 2005, but that changed to “elsewhere” in 2006. Conversely, 17% reported that their primary place to hunt was “elsewhere” in 2005 but had changed to units 3C-3J in 2006. For most hunters (69%) 3C-3J was their primary location in 2005 and remained their primary location in 2006. Less than 1% reported their primary place to hunt deer was “elsewhere” both in 2005 and 2006.

Reasons for hunting in these units. More than two-thirds of hunters from 3C-3J (69%) and more than three-quarters from 3H-3K (82%) indicated that they hunted in those units because that was their primary place to hunt deer. About 9% from 3C-3J and 2% from 3H-3K indicated they hunted in those units because they thought their chances of taking an older buck would be better there than elsewhere. The remainder from each area indicated “other” as the reason. However, 50 of 56 “other” reasons from 3C-3J and 24 of 25 “other” reasons from 3H-3K pertained to “I live there,” “it’s close to home,” or “I own land there.”

Reasons for not hunting in these units. We found somewhat different reasons among the approximately one-quarter of respondents from both 3C-3J and 3H-3K who did not hunt in those units in 2006. “I usually hunt somewhere else” was the primary reason given by 42.3% of respondents from 3H-3K, but only 25.3% of respondents from 3C-3J. “I do not support the pilot program” was a reason for 12.7% of respondents from 3C-3J, but only 1.9% from 3H-3K. “I support the pilot program, but felt my odds of taking a buck were better elsewhere” was indicated by 7.6% from 3C-3J and a similar 9.6% in 3H-3K. Among the hunters from 3C-3J who did not hunt in those pilot units, 54.5% indicated “other” as the reason for not hunting there. About one-third (36.5%) of hunters from 3H-3K who did not hunt in those units also indicated “other” as the reason.

Days of hunting. On average, hunters in 3H-3K hunted about two fewer days during the early bow season than hunters in 3C-3J, but hunters in both areas hunted about 8.5 days during the regular firearms season and 1.5 days during the late special seasons (Table 1). Overall, respondents from 3C-3J hunted an average of 14.1 total days for deer in those units in 2006 and 15.2 days total in all of New York State. Respondents from 3H-3K hunted an average of 12.4 total days for deer in those units and 14.4 total days in all of New York State during 2006.

**Table 1. Mean days of participation in various deer-hunting seasons reported by hunters taking part in management units with pilot antler restrictions in southeastern New York, from mail surveys conducted in 2007.**

Wildlife Management Unit	Days hunted <u>early archery</u>		Days hunted <u>regular firearms</u>		Days hunted <u>late seasons</u>	
	<u>mean</u>	<u>SE</u>	<u>mean</u>	<u>SE</u>	<u>mean</u>	<u>SE</u>
3H	3.5	.52	6.8	.48	1.5	.22
3K	2.1	.46	4.5	.54	0.7	0.17
Total Sullivan Co.	4.5	.61	8.4	.48	1.8	.23
Elsewhere in NY	2.1	.60	4.4	.60	0.7	.18
3C	4.6	.48	6.3	.38	1.0	.16
3J	3.9	.41	5.1	.35	0.9	.14
Total Ulster Co.	6.7	.50	8.5	.39	1.5	.17
Elsewhere in NY	1.5	.30	3.5	.38	0.3	.10

Deer harvest. Hunters from 3C-3J were somewhat more successful than hunters from 3H-3K. About 20% of hunters from 3C-3K reported taking a buck in those units in 2006, compared to 15% from 3H-3K (Table 2). More than one-quarter of hunters from 3C-3J took an antlerless deer in those units in 2006 whereas 18% of hunters from 3H-3K did so. Overall, 28.2% of 3C-3J hunters reported taking at least one antlerless deer somewhere in New York during 2006, and 23.2% reported taking a buck. Also, 18.5% of respondents from 3H-3K harvested at least one antlerless deer, and 22.7% took a buck.

In both sets of WMUs, hunters had to hunt relatively long periods, on average, to bag deer. It took an average of 16.3 days for hunters in 3C-3J to harvest a doe, and 14.2 days on average to harvest a buck. In 3H-3K, hunters took 15.3 days on average to harvest a doe, and 14.1 days to take a buck.

Perceptions of deer sex ratio and buck age ratio. Hunters in both 3C-3J and 3H-3K perceived similar deer sex ratios and bucks age ratios prior to the 2006 season. In 3C-3J, hunters believed there were an average of 20% antlered bucks and 80% antlerless deer out of every 100 total deer. In 3H-3K, the percentages were 18% bucks and 81% antlerless deer. Hunters in 3C-3J perceived 71% young bucks and 29% older bucks out of every 10 antlered bucks. In 3H-3K, the percentages were 72% young bucks and 27% older bucks.

**Table 2. Deer harvest reported by hunters taking part in management units with pilot antler restrictions in southeastern New York, from mail surveys conducted in 2007.**

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Wildlife Management Unit	Antlered bucks harvested			Antlerless deer harvested			
	% taking...			% taking...			
	<u>0</u>	<u>1</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>3+</u>
3H	88.6	8.3	3.0	85.6	9.6	2.4	2.4
3K	85.9	14.1	0.0	92.1	7.9	0.0	0.0
total Sullivan Co.	84.9	10.3	4.9	82.4	15.1	2.5	0.0
elsewhere in NY	87.1	11.4	1.5	90.6	9.4	0.0	0.0
3C	86.4	12.0	1.6	81.4	13.8	3.2	1.6
3J	86.7	11.6	1.7	80.3	15.0	2.3	2.3
total Ulster Co.	80.5	17.1	2.4	73.5	18.9	4.6	2.9
elsewhere in NY	87.1	11.4	1.5	90.6	9.4	0.0	0.0

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**Positive and Negative Hunting-related Impacts:**

Seeing healthy deer while hunting is a positive impact (i.e., “very important”) for the vast majority of hunters in both WMUs 3C-3J (88.5%) and WMUs 3H-3K (92.4%). Other positive impacts for  $\geq 50\%$  of hunters from both sets of WMUs are: “seeing antlered bucks of any size/age,” “seeing older bucks with larger antlers,” “having a natural buck age ratio,” and “having a natural sex ratio.” On average, hunters from 3H-3K placed greater importance than hunters from 3C-3J on “seeing older bucks with larger antlers,” and “having a natural buck age ratio.” “Having freedom of choice to shoot at the buck of my preference” is an impact for a substantial minority of hunters from both sets of WMUs (Table 3).

We identified only “feeling crowded by too many hunters” as a negative impact to be managed for  $\geq 50\%$  of hunters from WMUs 3H-3K (~45% in 3C-3J; Table 4). None of the five possible negative experiences we examined are impacts to be managed for a majority of hunters from 3C-3J. Nonetheless, both “seeing that some sub-legal bucks have been shot by mistake,” and “fearing for my safety because people shoot unsafely at deer” were impacts for substantial minorities of hunters from both sets of WMUs. Note that hunters from both sets of WMUs are split about whether they are “not at all concerned” or “very concerned” about “having difficulty figuring out if a buck I see is legal to shoot.”

**Table 3. Mean levels of importance placed by persons hunting deer in either of two areas in New York State on possible positive hunting experiences, from mail surveys conducted in 2007.**

	Geographic area hunted		t	p		
	WMUs 3C-3J	WMUs 3H-3K				
<u>Potential positive influence on deer-hunting satisfaction</u>	<u>Mean<sup>a</sup></u>	<u>SE</u>				
Seeing healthy deer	3.9	0.03	3.9	0.03	0.000	1.000
% not at all important	0.8%		1.3%			
% very important	88.5%		92.4%			
Seeing antlered bucks of any age or size	3.4	0.05	3.3	0.07	1.155	0.249
% not at all important	3.6%		5.1%			
% very important	57.1%		54.5%			
Seeing older bucks with larger antlers	3.2	0.06	3.5	0.06	-2.944	0.003
% not at all important	9.0%		4.4%			
% very important	55.3%		65.4%			
Having a natural mix of older and younger bucks (buck age ratio)	3.2	0.05	3.4	0.07	-2.342	0.020
% not at all important	5.2%		5.1%			
% very important	48.2%		56.1%			
Having a natural mix of bucks and does (sex ratio)	3.2	0.06	3.3	0.06	-1.159	0.247
% not at all important	6.0%		2.6%			
% very important	50.8%		50.0%			
Freedom of choice to shoot the buck of my preference	2.9	0.07	2.8	0.09	0.837	0.403
% not at all important	17.5%		21.4%			
% very important	45.8%		42.1%			

Table 3. Continued.

	<u>Geographic area hunted</u>		<u>t</u>	<u>p</u>
	<u>WMUs 3C-3J</u>	<u>WMUs 3H-3K</u>		
<u>Potential positive influence on deer-hunting satisfaction</u>	<u>Mean<sup>a</sup></u>	<u>SE</u>		
Being considered a “good” or “expert” <u>deer</u> hunter by others	2.5	0.07	2.5	0.10
% not at all important	29.3%		31.6%	
% very important	23.7%		31.6%	
Being considered a “good” or “expert” <u>buck</u> hunter by others	2.2	0.07	2.3	0.10
% not at all important	39.2 %		37.1%	
% very important	17.6%		25.8%	

<sup>a</sup>On scale from 1 = not at all important, 2 = slightly important, 3 = moderately important, and 4 = very important.

**Table 4. Mean levels of concern placed by persons hunting deer in either of two areas in New York State on possible negative hunting experiences, from mail surveys conducted in 2007.**

	<u>Geographic area hunted</u>		<u>t</u>	<u>p</u>		
	<u>3C-3J</u>	<u>3H-3K</u>				
Potential positive influence on deer-hunting satisfaction	<u>Mean</u>	<u>SE</u>	<u>Mean</u>	<u>SE</u>		
Feeling crowded by too many other deer hunters	3.0	0.07	3.2	0.08	-1.877	0.062
% not at all concerned	12.5%		11.5%			
% very concerned	44.9%		53.5%			
Seeing that some sub-legal bucks have been shot by mistake	3.0	0.07	3.1	0.08	-0.929	0.354
% not at all concerned	13.5%		10.2%			
% very concerned	44.4%		48.4%			
Fear of being shot by people who shoot unsafely at deer	2.9	0.07	3.1	0.07	-1.948	0.053
% not at all concerned	14.1%		6.3%			
% very concerned	43.5%		47.2%			
Having difficulty figuring out if a buck I see is legal to shoot	2.6	0.08	2.5	0.09	0.825	0.410
% not at all concerned	28.7%		28.5%			
% very concerned	33.1%		28.5%			
Feeling a sense of urgency to shoot the first legal buck I see instead of waiting for one I'd rather shoot	2.0	0.07	2.0	0.09	0.000	1.000
% not at all concerned	48.4%		44.6%			
% very concerned	15.0%		14.6%			

<sup>a</sup>On scale from 1 = not at all concerned, 2 = slightly concerned, 3 = moderately concerned, and 4 = very concerned.



### **Satisfaction with Hunting Experiences in the Pilot WMUs:**

Hunters from both sets of WMUs were relatively split about whether they were satisfied or dissatisfied with the overall deer-hunting experiences in those units. In 3C-3J, 46% said they were dissatisfied, but only 38% said they were satisfied. In 3H-3K, 41% were dissatisfied and 44% were satisfied.

When we examined reported satisfaction/dissatisfaction for hunters in 3C-3J after the 2006 season with satisfaction/dissatisfaction reported by those same hunters after the 2005 season using our longitudinal data set, we found that about twice as many indicated a decrease in satisfaction from 2005 to 2006 (40%) compared to those who indicated an improvement in their satisfaction (21%). We found no change in what the other 39% had reported in 2006 vs. 2005. These measured changes in satisfaction are reflected almost exactly in the long-term perceptions of hunters. Following the 2006 season, we asked hunters from 3C-3J how their satisfaction had changed since the inception of the pilot program. Twice as many said their satisfaction had decreased (42%) as said it had increased (21%), with the remaining 37% saying their satisfaction had not changed.

We also asked hunters from 3H-3K how their satisfaction had changed after participating in the pilot for one hunting season. About one-half (53%) said their satisfaction had not changed. More than one-third (36%) said their satisfaction had decreased. Only about 11% said their satisfaction had increased.

### **Change in Willingness to Harvest Antlerless Deer as an Outcome of the Pilot Program:**

Among hunters from WMUs 3C-3J, nearly two-thirds (66%) reported that their willingness to shoot an antlerless deer had not changed since the inception of the pilot program in 2005. For the remaining one-third of hunters, about twice as many said their willingness had increased (24%) as indicated their willingness had decreased (10%). Most (71%) of the hunters who said their willingness had decreased had taken a doe in 3C-3J previously and had said in the 2006 survey that they would do so again. However, this decrease was more than offset by the finding that 86% of those who said their willingness had increased also had taken a doe previously in 3C-3J and said in the 2006 survey that they would do so again.

Reported change in willingness to harvest an antlerless deer among hunters in WMUs 3H-3K was similar to that reported above. Just under two-thirds (64%) said their willingness had not changed in the one year since the pilot was extended to these units. Among the remainder, twice as many reported that their willingness had increased (24%) as said their willingness had decreased (12%). We have no information from these hunters about their past antlerless deer harvest in these units.

**Evaluation of Changes in Experiences Since Inception of the Pilot Program:**

We found patterns of responses from hunters in WMUs 3H-3K similar to those for hunters from 3C-3J with respect to six positive aspects of deer hunting (Table 5). Many hunters from both pairs of units said they had noticed no changes in these experiences, with slightly higher percentages of hunters from 3H-3K (where the pilot had been in place for only one hunting season) reporting no change in various experiences. In particular, strong pluralities or majorities of hunters from both sets of units reported noticing no change in the number of antlered bucks of any age, the number of older (i.e., legal) bucks, or in the age ratio of bucks or in the buck to doe ratio.

However, more hunters from both sets of units said they had noticed that all bucks, generally, and older (legal) bucks, specifically, had decreased vs. the percentages who said they had noticed an increase in bucks. Despite this finding, more hunters from 3C-3J noticed an increase in all bucks after two years of the pilot compared to the percentages of hunters from 3H-3J who noticed an increase after just one year of the pilot in those units. More hunters from 3C-3J also noticed an improving buck age ratio compared to hunters from 3H-3K. Conversely, more hunters from 3C-3J noticed a decrease in total deer density after two years of the pilot compared to the percentage who noticed a decrease in deer density after one year in 3H-3K.

**Table 5. Percentages of deer hunters from either of two areas in New York State indicating that various positive aspects of deer hunting had increased, decreased, or not changed since inception of a pilot antler restriction program in those areas (2005 for WMUs 3C-3J, and 2006 for WMUs 3H-3K), from mail surveys conducted in 2007.**

Possible positive aspects of deer hunting	Geographic area hunted					
	WMUs 3C-3J			WMUs 3H-3K		
	% increase	% no change	% decrease	% increase	% no change	% decrease
Number of antlered bucks of any age/size	28.6	42.0	29.4	19.3	46.2	34.6
Number of older, legal bucks	23.3	47.7	30.1	13.4	48.7	37.9
Freedom of choice to shoot at the buck of my preference	21.6	49.6	28.7	18.7	56.1	25.1
Total deer density (as index to total deer seen)	13.5	33.2	53.3	16.9	42.2	40.9
Change in number of older bucks compared to younger bucks (buck age ratio)	33.9	46.2	19.8	22.7	52.0	25.3
Change in number of bucks compared to antlerless deer (deer sex ratio)	25.9	42.5	31.6	18.4	47.6	34.0

Among possible negative experiences, level of “fear of being shot” had changed for the lowest percentage of hunters from both sets of WMUs (Table 6). Amount of “difficulty figuring out if a buck I see is legal to shoot” increased for the most hunters. “Sense of urgency to shoot the first buck I see instead of waiting for one I’d rather shoot” decreased the most for hunters in both sets of WMUs, but sense of urgency still increased for more hunters than for whom it decreased. Overall, all possible negative experiences increased for more hunters than who said they decreased.

**Table 6. Percentages of deer hunters from either of two areas in New York State indicating that various negative aspects of deer hunting had increased, decreased, or not changed since inception of a pilot antler restriction program in those areas (2005 for WMUs 3C-3J, and 2006 for WMUs 3H-3K), from mail surveys conducted in 2007.**

Possible negative aspects of deer hunting	Geographic area hunted					
	WMUs 3C-3J			WMUs 3H-3K		
	% increase	% no change	% decrease	% increase	% no change	% decrease
Fear of being shot by people who shoot unsafely at deer	17.8	77.5	4.8	19.5	70.1	10.3
Feeling crowded by other hunters	24.9	67.6	7.5	22.1	66.9	11.0
Sense of urgency to shoot the first legal buck I see instead of waiting for one I’d rather shoot	28.4	57.7	13.8	21.9	61.3	16.8
Number of sub-legal bucks shot by mistake	35.6	55.3	9.0	37.1	53.6	9.3
Amount of difficulty figuring out if a buck I see is legal to shoot	48.2	44.5	6.3	42.9	48.7	7.7

Overall, large percentages of hunters in both sets of WMUs believe that the positive experiences about which we asked were “too low” for them to be satisfied (Table 7). Indeed, all six kinds of experiences about which we asked were “too low” for a majority of hunters in 3C-3J, and four of the six were “too low” for hunters in 3H-3K. In both sets of WMUs, the greatest percentages of hunters indicated that the number of older, legal bucks was too low. Fewer than one-quarter of hunters from either set of WMUs indicated that any of the six experiences were “more than enough for me to be satisfied.”

**Table 7. Percentages of deer hunters from two areas in New York State, where pilot antler restrictions have been implemented, indicating that experienced levels of various positive aspects of deer hunting were “too low for me to be satisfied,” “just about at the minimum level I need to be satisfied,” or “more than high enough for me to be satisfied”, from mail surveys administered in 2007.**

<u>Possible positive aspects of deer hunting</u>	<u>Geographic area hunted</u>					
	<u>WMUs 3C-3J</u>			<u>WMUs 3H-3K</u>		
	<u>% too low for me</u>	<u>% just at minimum level</u>	<u>% more than high enough</u>	<u>% too low for me</u>	<u>% just at minimum level</u>	<u>% more than high enough</u>
Number older, large-antlered bucks I saw	74.6	17.3	8.1	87.0	13.0	0.0
Naturalness of the mix of older bucks compared to yearling bucks (age ratio)	64.2	30.7	5.1	67.9	32.1	0.0
Naturalness of the mix of bucks compared to antlerless deer (sex ratio)	63.2	32.9	3.9	64.7	31.4	3.9
Total number of antlered bucks I saw	63.0	24.8	12.2	58.9	28.6	12.5
Total number of deer I saw	51.7	31.9	16.3	48.1	27.8	24.1
Freedom of choice to shoot at a buck of my preference	54.3	30.7	15.0	45.1	37.3	17.6

Conversely, only about one-third or fewer hunters from either set of WMUs indicated that any of the five negative experiences about which we asked were “too high for me to be satisfied” (Table 8). Indeed, with the exception of 3H-3K hunters’ perceptions of the “number of sub-legal bucks shot by mistake” (similar percentages “too high” and “low enough”), a greater percentage of hunters in both areas reported that all the negative experiences were “low enough for me to still be satisfied” compared to those who indicated that the experiences were “too high for me to be satisfied.” It should be noted, however, that 30-40% of hunters from both sets of WMUs indicated that many of the negative experiences we examined were “just about at the maximum level I can tolerate.”

**Table 8. Percentages of deer hunters from two areas in New York State, where antler restrictions have been piloted, indicating that experienced levels of various negative aspects of deer hunting were “too high for me to be satisfied,” “just about at the maximum level I can tolerate,” or “low enough for me to still be satisfied,” from mail surveys administered in 2007.**

Possible negative aspects of deer hunting	Geographic area hunted					
	WMUs 3C-3J			WMUs 3H-3K		
	% too high for me	% just at maximum level	% more than low enough	% too high for me	% just at maximum level	% more than low enough
Sense of urgency to shoot a buck when I'd rather wait for a different one	22.4	31.7	45.9	31.8	18.2	50.0
Amount of difficulty figuring out if a buck I see is legal to shoot	23.6	35.4	40.9	17.8	40.0	42.2
Fear of being shot by people who shoot unsafely at deer	13.5	27.1	59.4	17.8	40.0	42.2
Feeling crowded by other hunters	16.7	37.5	45.8	23.4	38.3	38.3
Number of sub-legal bucks shot by mistake	17.0	29.8	53.2	34.1	31.8	34.1

**Hunters’ Perceptions of Whether the Pilot Program Should Continue:**

Strong majorities of hunters from both WMUs 3C-3J (64%) and WMUs 3H-3K (81%) believe the pilot antler restrictions should be continued in those units. About one-quarter of hunters (27%) from 3C-3J indicated that the pilot should not be continued in those units. Only about one in nine hunters (11%) from 3H-3K believed the pilot should not be continued.

After the second hunting season under antler restrictions in 3C-3J, about one-quarter of hunters (26%) said their support for the pilot program had increased, and one-quarter (27%) said their support had decreased. The remaining 47% said their support had not changed over the two years. Between the end of the first pilot season and the end of the second pilot season, some hunters from 3C-3J had changed their mind about whether the pilot should be continued (Table 9). Nearly the same percentage changed their mind from “no – do not continue” after the 2005 to “yes – continue” after the 2006 season (15.6%) as changed from “yes” after 2005 to “no” after 2006 (16.7%). Thus, although about two-thirds of hunters from 3C-3J supported continuation of the pilot after both its first and second years, the individual hunters who accounted for the two-thirds support differed somewhat between the first and second years.

**Table 9. Longitudinal comparison of the percentages of deer hunters from wildlife management units 3C and 3J in southeastern New York State who believed a pilot antler restriction program should be continued or not continued for the 2006 and 2007 hunting seasons, based on mail surveys of the same hunters after the 2005 and 2006 hunting seasons.**

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Should the pilot be continued for the 2006 season	Should the pilot be continued for the 2007 season?			Row (2006) totals
	% no	% yes	% not sure	
% no	5.6	15.6	2.2	23.4
% yes	16.7	42.2	5.6	64.5
% not sure	<u>3.3</u>	<u>7.8</u>	<u>1.1</u>	12.2
Column (2007) totals	25.6	65.6	8.9	

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Overall, the percentage of 3C-3J hunters who were undecided decreased slightly from the first year of the pilot (12%) to the second year (9%). Relatively few hunters (6%) consistently believed (after both the 2005 and 2006 seasons) that the pilot should not be continued. A strong plurality (42%) consistently believed the pilot should be continued after both the 2005 and 2006 seasons.

In 3H-3K where the pilot was in place for only one season prior to the survey, more than one-half of hunters (56%) said their support for the pilot program had increased after the first year under antler restrictions. About 13% of hunters said their support had decreased. The remaining one-third (31%) reported no change in their level of support after the first season of the pilot.

### SUMMARY AND IMPLICATIONS

Fairly strong majorities of hunters from both sets of WMUs supported the idea of continuing the pilot antler restrictions for the 2007 hunting season. More than one-half of hunters from 3H-3K indicated that their support had increased after experiencing a first hunting season under the restrictions. Among 3C-3J hunters, some shift in opinion occurred, but the net result was that about two-thirds of hunters registered support for continuation of the pilot after both the first and second seasons in those units.

Evidence, particularly from WMUs 3C-3J where we have data from the same hunters for two years, indicates that a small percentage of hunters (<18%) have changed their primary location for deer hunting as a result of the pilot. However, about as many hunters were attracted to units 3C-3J (17%) for the second year of the pilot as had been lost (13%) after the first year of the antler restrictions. Thus, no large changes in the number of people hunting in these units have occurred because of the pilot.

Although it took hunters, on average, about two weeks of hunting to harvest a deer in either set of WMUs, this amount of effort required to harvest a deer was much less than the estimated effort required in 3C-3J during the 2005 season (Brown 2006). Then, it took an average of 42 hunter days in 3C and 23 in 3J to take a deer. At least in WMUs 3C-3J, hunters seem to have been more effective at taking deer in 2006 compared to 2005, as the same individual hunters were surveyed in both years and a high percentage of them responded in both years.

Seeing and bagging deer, particularly older bucks with larger antlers, certainly is attractive to deer hunters surveyed from all four WMUs. However, the degree to which hunters are satisfied with their hunting experiences depends on a complex set of factors. Of eight potential positive aspects of deer hunting that we examined, a majority of hunters indicated that four or five (depending on the WMU) were “very important.” Fewer hunters were “very concerned” about the five potential negative aspects that we examined. However, three of the five still were very concerning to >40% of hunters. Aspects that are “very important” to hunters or about which hunters are “very concerned” are, according to the concept of adaptive impact management (AIM), impacts to be managed (e.g., Riley et al. 2003, Enck et al. 2006).

Whether hunters perceived positive impacts to be at or above desirable levels and negative impacts to be at or below tolerable levels clearly influenced hunter satisfaction in the pilot units. More than 40% of hunters in WMUs 3C-3J and 3H-3K were dissatisfied with their hunting experiences. Further, two times as many hunters in 3C-3J and three times as many in 3H-3K indicated that their satisfaction had decreased since inception of the pilot program, compared to those who said their satisfaction had increased. The relatively high dissatisfaction seems to be related mostly to multiple, positive impacts being “too low” for hunters to be satisfied.

Despite the relatively high dissatisfaction, strong majorities of hunters from both WMUs 3C-3J and 3H-3K support continuation of the pilot antler restrictions. Several reasons likely account for this seemingly contradictory set of relationships. First, perceptions about experienced levels of positive and negative aspects of deer hunting differ greatly between hunters who believe that those aspects are impacts vs. those who believe they are of lesser importance or concern. In particular, hunters who believe that seeing bucks in general and older bucks with larger antlers in particular are “very important” and who believe the number of bucks has increased, also generally believe the increased number is at least at a minimum desired level. The vast majority of hunters who believe seeing bucks is an impact to be managed, but that the number has not changed since the inception of antler restrictions, indicated that the existing number is “too low.” Obviously, this condition is dissatisfying. Nonetheless, these hunters seem to be continuing to express the “wait and see attitude” reported by Brown (2006) after the first year of the pilot in WMUs 3C-3J.

Second, negative impacts that are “too high” seem to be weighted less by hunters than positive impacts that are “too low.” Among hunters identifying various potential negative aspects of deer hunting as things about which they are “very concerned,” relatively few indicated that experienced levels had decreased, and higher percentages indicated that experienced levels of these negative impacts had increased under the antler restrictions. Further, majorities of

hunters indicated that experienced levels of these negative impacts generally were “too high” for them to be satisfied – which is reflected in the low levels of satisfaction. Despite already “too high” levels of negative impacts worsening, the majority of hunters seem willing to support continuation of antler restrictions based on the potential of improving levels of positive impacts.

Finally, we inquired about only a small set of potential positive and negative aspects of deer hunting. It is possible – even likely – that additional positive impacts and negative impacts exist for which we have no data. If levels of both positive and negative impacts are improving under antler restrictions, it could help explain why so many hunters are supportive of continuing the pilot program.

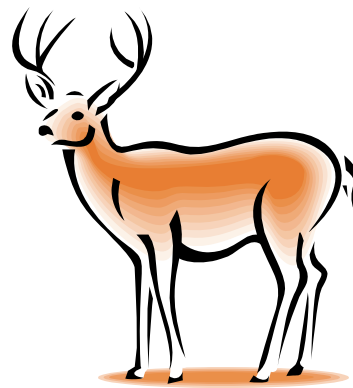
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# **Deer Hunters' Assessment of Antler Restrictions in Wildlife Management Units (WMUs) 3C, 3J, 3H, and 3K During the 2007 Hunting Season**



**December 2008**

**HDRU Series No 08-7**

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## EXECUTIVE SUMMARY

### Introduction

The New York State Department of Environmental Conservation (DEC) initiated a pilot program of antler restrictions (only adult bucks with  $\geq 3$  points on a side are legal) in wildlife management units (WMUs) 3C-3J for the 2005 hunting season, and expanded the pilot to include WMUs 3H-3K in 2006. This report is the third in a series of annual evaluations of hunter behaviors and perceptions associated with the pilot program in those WMUs.

### Methods

Staff with the Human Dimensions Research Unit (HDRU) in the Department of Natural Resources at Cornell University developed and implemented a mail survey with 486 deer hunters from WMUs 3C-3J, and who had responded to mail surveys after the 2005 and/or 2006 seasons. We also implemented a nearly identical mail survey (only the WMUs and years since inception of antler restrictions were changed) with a sample of 500 hunters from WMUS 3H-3K, 214 of whom had responded to the survey after the 2006 season.

### Results

- Response rates were 62% (283 of 456 deliverable) for WMUs 3C-3J and 42% (199 of 463 deliverable) for WMUs 3H-3K.
- >90% of hunters from both pairs of pilot WMUs hunted deer in New York during the 2007 season, and >75% hunted in the WMUs from which they were sampled. Overall, they spent ~15 days combined during archery, regular firearms, and late special seasons.
- Observed deer: on average hunters saw about twice as many antlerless deer per day (7/day in WMUs 3H-3K vs. 2/day in 3C-3J) than antlered bucks. Vulnerability to harvest: (% observed deer that could have been shot at) did not differ between areas; sub-legal bucks were most vulnerable and legal bucks were least vulnerable. Willingness to harvest: in both areas, hunters were most willing to shoot at legal bucks. Willingness to take shots at antlerless deer was higher in 3C-3J than 3H-3K. Shooting effectiveness: high in both areas, with >70% of shooting events resulting in harvest.
- Perceived deer sex ratio was 80% antlerless deer and 20% antlered bucks in both areas. Buck age ratio was perceived to be comprised of about 69% sub-legal antlered bucks in 3C-3J and 74% sub-legal bucks in 3H-3K.
- >50% of hunters from both areas were satisfied with their **overall deer-hunting experiences** during the 2007 season (35% from both areas were dissatisfied).
- <50% of hunters from both areas were satisfied with their **buck-hunting experiences** during the 2007 season (44% of hunters from 3C-3J and 38% from 3H-3K were dissatisfied).
- Majorities of hunters from both areas reported that 4 of 8 possible, positive aspects of hunting examined were “too low for me to be satisfied”: (1) number mature, legal bucks

seen, (2) ratio of bucks to antlerless deer, (3) ratio of legal to sub-legal bucks, and (4) freedom to shoot any buck I want. A majority of 3C-3J hunters also reported that total number of bucks seen was “too low.”

- Hunters who were satisfied with their deer-hunting experiences in 2007 in either area were more likely than dissatisfied hunters to believe each of the 8 positive aspects were at least at “a minimum level” or “more than enough” for them to be satisfied. Conversely, those who reported being dissatisfied during 2007 were more likely to believe all 8 positive aspects were “too low.”
- <35% of hunters from either pilot area reported that any of 7 possible, negative aspects of their hunting experiences were “too high for me to be satisfied.” Even among dissatisfied hunters from either area, only a minority reported that 5 of the 7 negative aspects were “too high.”
- Hunters from 3H-3K noticed more changes in deer- or hunter-characteristics since inception of antler restrictions than hunters from 3C-3J.
  - In 3C-3J, >40% noticed an increase in number of hunters complying with restrictions, and >40% noticed no change in: buck age ratio, deer sex ratio, number of older, mature bucks, total number of deer, and number of hunters in those WMUs.
  - In 3H-3K, >40% noticed an increase in: buck age ratio, number of antlered bucks of any age/size, and number of hunters complying with restrictions; >40% noticed no change in number of hunters in those WMUs.
- More hunters from 3H-3K than 3C-3J reported that their expectations for changes in deer and hunter characteristics had been met.
- More hunters from 3H-3K (46%) than 3C-3K (30%) said they are more supportive of antler restrictions after the 2007 season than when the pilot began. Fewer hunters from 3H-3K (14%) than 3C-3K (25%) reported that they are less supportive of antler restrictions now.
- 60% of 3C-3J hunters and 77% of 3H-3K hunters believe the pilot program should be continued. 29% from 3C-3J and 14% from 3H-3K believe it should not be continued.
- Analysis of time series data for 3C-3J hunters (same individuals responding to 2006, 2007, and 2008 surveys) revealed that 52% consistently believed the pilot should be continued, and 10% registered an increasing desire over the three year period. 15% consistently believed that the pilot should not be continued, and 14% registered a decreasing desire for antler restrictions.
- Analysis of time series data also revealed that 28% consistently reported being satisfied all years and 26% reported being consistently dissatisfied. About 22% had decreasing levels of satisfaction over the 3 years whereas 12% had increasing levels.

## Discussion

Hunters participating in the pilot program in both pairs of WMUs 3C-3J and 3H-3K reported similar rates of hunting participation and levels of hunting activity as hunters in the broader southeastern region of the state when compared with the most recent statewide survey of deer hunters. However, some of the hunting experiences differed within pairs of pilot WMUs as well as between pilot areas and the broader region. Perceptions of the deer sex ratio (i.e., 80:20 antlerless to antlered) were nearly identical in both pairs of pilot WMUs as in the broader region. However, perceptions of the buck age ratio were higher in the broader region (~30:70 larger-antlered to smaller-antlered) than in within the pilot areas (~25:75).

Hunters' demonstrated willingness to pass-up shots at smaller-antlered (sub-legal) bucks provides some evidence of high compliance with antler restrictions and an indirect indicator that at least one precondition for success is being met. On the other hand, both (1) fewer observations of smaller-antlered bucks per day afield and (2) the perceived younger buck age structure in the pilot WMUs compared to the broader region raise questions about success of the pilot in general. More specifically, however, more hunters from 3H-3K than 3C-3J noticed changes in deer population characteristics, reported their expectations were being met, and noted that their buck-hunting satisfaction had increased since inception of antler restrictions.

Despite substantial dissatisfaction and (as of yet) unmet expectations for desirable levels of many impacts in both pairs of pilot WMUs, most hunters still want antler restrictions to be continued. Reasons for this are linked to hoped-for improvements in several positive hunting-related impacts. If experienced levels of positive impacts continue to increase toward desirable levels and experienced levels of negative impacts do not worsen, hunters seem likely to continue favoring the antler restriction regulations.

## **ACKNOWLEDGMENTS**

We are very grateful to all members of the Deer Team from the New York State Department of Environmental Conservation (DEC) who identified the need for, and helped guide, the multi-year evaluation of which this report is part. We also thank the deer hunter respondents who provided us with their data. Further, we greatly appreciate the assistance of HDRU's Karlene Smith, who conducted the mailings and helped with data analysis, and Margie Peech, who helped to prepare this report and with communication efforts between HDRU and DEC.

Funding for this study was provided by the New York Federal Aid in Wildlife Restoration Grant WE-173-G, Job 146-6.4.3.

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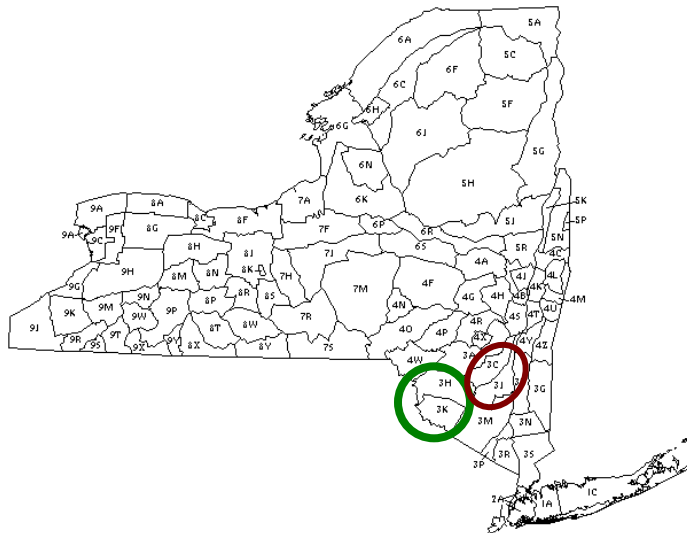
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## INTRODUCTION

This report is the third in a series of annual evaluations of the Pilot Antler Restriction Program in southeastern New York (see also Brown 2006, and Enck and Brown 2008). In 2005, deer managers with the New York State Department of Environmental Conservation (DEC) implemented a pilot program in Wildlife Management Units (WMUs) 3C and 3J, occurring largely in Ulster County (Figure 1), to enhance the age structure of adult bucks. In 2006, the pilot program was expanded to WMUs 3H and 3K, occurring largely in Sullivan County. The pilot restrictions require that antlered bucks harvested in these four WMUs have at least one antler with three points that are at least one inch in length. To provide maximum opportunity for young hunters to harvest an antlered buck, those under age 17 are exempt from the regulation, and may harvest any antlered buck with at least one antler three or more inches long.

### Overall Objectives for the Multi-year Evaluation

1. Determine hunters' attitudes toward, and degree of support for, antler restrictions in the QDM pilot area.
2. Determine reasons underlying hunters' attitudes toward antler restrictions, including their assessment of whether desirable/intolerable experiences that affect their hunting satisfaction are improving or worsening as a result of the pilot program.
3. Monitor hunter effort and harvest-related behaviors to determine whether any changes have occurred in response to antler restrictions in the QDM pilot area.



**Figure 1. Location of Wildlife Management Units (WMUs) 3C and 3J (oval, mostly in Ulster County) and 3H and 3K (circle, mostly in Sullivan County) where pilot antler restrictions have been in place since 2005 and 2006, respectively.**

## METHODS

### Sampling Frame

After the 2005 hunting season, Brown (2006) surveyed 1,000 randomly selected hunters from WMUs 3C-3J. Of the 965 deliverable questionnaires, 498 responded (51.6%). The next year Enck and Brown (2007) used these 498 respondents as their initial sample, and recorded 345 responses out of 479 deliverable questionnaires that year (72.0% response rate). For the current survey, we used as our initial sample the 479 deliverable addresses from 2007 augmented by 7 additional hunters who had responded in 2006 and for whom we found useable addresses. This resulted in a final sample size of 486 for the post-2007 season survey in WMUs 3C-3J.

The pilot antler restrictions were expanded to WMUs 3H-3K for the 2006 hunting season. After that first season of antler restrictions, Enck and Brown (2007) surveyed 500 randomly selected hunters from WMUs 3H-3K. Of these, 463 were deliverable, and 214 of those responded (46.2% response rate). For the post-2007 season survey, we re-surveyed these 214 respondents along with an additional random sample of 286 hunters from WMUs 3H-3K for a total initial sample of 500.

### Questionnaire Development

We developed virtually identical instruments to implement in WMUs 3C-3J and in WMUs 3H-3K given that the pilot antler restrictions had been in place for  $\geq 2$  years in both pairs of WMUs. See Appendix A for a copy of the instrument. Questions were developed for the following topic areas: days of participation by deer-hunting season and WMU, satisfaction with general deer-hunting experiences and specifically with buck-hunting experiences during the 2007 hunting seasons, change in general and buck-specific hunting satisfaction since the pilot began, enumeration of hunters' encounters with deer during the regular firearms season, experienced level of eight positive impacts and eight negative impacts associated with deer hunting, changes hunters had noticed in seven aspects of hunting since the pilot began, whether hunters' expectations were met for 6 aspects of their hunting experiences, their attitude about the pilot program, and their belief about whether the pilot should be continued.

### Data Analysis

We analyzed all survey data using SPSS-X (Version 16.0). In this report, we present descriptive statistics (percentages, means and standard errors), and do not make comparisons between the Ulster County WMUs (3C-3J) and the Sullivan County WMUs (3H-3K). Thus, we report no significance thresholds for any of these analyses. However, for any variables for which we have multiple years of data for the same respondents, we present the percentage whose attitudes/behaviors remained the same vs. changed. We did not conduct a non-respondent follow-up to surveys in either set of WMUs for this year of the overall evaluation.

## **RESULTS**

### **Survey Response Rates**

Of the initial sample of 486 hunters in the sample for WMUs 3C-3J, 30 addresses were undelivered. We received 283 responses for a 62.1% response rate. Our initial sample of 3H-3K hunters contained 37 undeliverable addresses for an adjusted sample size of 463. We received 199 responses for a 42.0% response rate in 3H-3K.

### **Hunting Participation in the Pilot WMUs and Elsewhere During 2007**

More than 90% of respondents from both pairs of pilot WMUs hunted deer somewhere in New York during the 2007 deer-hunting seasons (91.2% in 3C-3J and 93.2% 3H-3K). Among hunters from the 3C-3J sample, 75.3% hunted deer in one or both of those WMUs. Similarly, 78.4% of respondents from the 3H-3K sample hunted deer in one or both of those WMUs.

A higher percentage of hunters from WMUs 3C-3J than 3H-3K hunted during the early archery season in 2007, but a higher percentage of hunters from WMUs 3H-3K hunted during the late special seasons (Table 1). Respondents hunted more days within the pilot WMUs than elsewhere in the state for all the types of seasons examined. Bowhunters and regular firearms hunters spent about 10 days afield in the pilot WMUs during those respective seasons. Those who hunted in the late special seasons spent about 2-3 days in the pilot WMUs. Respondents from both pairs of WMUs spent about 15 days afield overall during the 2007 hunting seasons.

### **Hunter-Deer Interactions in the Pilot WMUs During 2007**

On average, hunters from WMUs 3H-3K saw about three times more antlerless deer per day of hunting than hunters from 3C-3J (Table 2). Sightings of smaller-antlered, sub-legal bucks (Table 3) and larger-antlered, legal bucks (Table 4) were quite variable, and did not differ statistically between 3H-3K and 3C-3J. It may be worth noting that the pattern showed fewer observations of bucks in 3C-3J than 3H-3K. Overall, hunters in both pairs of pilot WMUs saw more antlerless deer per day than antlered bucks of any size.

We found no differences between pilot WMUs in the vulnerability of deer by age or sex. In both pairs of pilot WMUs, sub-legal bucks were the most vulnerable whereas mature, legal bucks were the least vulnerable. Willingness of hunters to shoot at deer of particular age/sex did not differ between the two pairs of pilot WMUS, although we found different patterns of willingness for antlerless deer and sub-legal bucks. Hunters in 3C-3J shot at 12% of vulnerable antlerless deer vs. 7% in 3H-3K (Table 2). Hunters in both pairs of pilot WMUs shot at about half of the vulnerable, mature, legal bucks they saw (Table 4).

Hunters from both pairs of pilot WMUs were fairly effective at harvesting deer when they did take shots at those deer. More than 80% of hunters who took shots at antlerless deer were successful (Table 2) as were >69% of those who shot at larger-antlered, legal bucks (Table 4). The few (apparently youth) hunters who shot at sub-legal bucks were successful in 75-80% of those situations (Table 3).

**Table 1. Number and percent of deer hunters participating, and mean number of days hunted, in various 2007 deer—hunting seasons in wildlife management units (WMUs) in southeastern New York State where pilot antler restrictions have been in place for  $\geq 2$  hunting seasons, from mail surveys conducted in 2008 of deer hunters living in those WMUs.**

<u>Deer-hunting season</u>	<u>WMUs 3C-3J</u>				<u>WMUs 3H-3K</u>			
	<u>Participants</u>		<u>Days hunted</u>		<u>Participants</u>		<u>Days hunted</u>	
	<u>n</u>	<u>%<sup>a</sup></u>	<u>Mean</u>	<u>S.E.</u>	<u>n</u>	<u>%<sup>a</sup></u>	<u>Mean</u>	<u>S.E.</u>
<b>Early archery</b>								
(max = 33 days)								
in pilot WMUs	105	49.3	10.8	0.623	56	35.9	10.1	0.958
elsewhere in NY	21	7.4	4.5	0.830	22	11.0	7.8	1.698
<b>Regular firearms</b>								
(max = 23 days)								
in pilot WMUs	201	94.4	9.5	0.371	140	89.7	10.2	0.513
elsewhere in NY	64	22.6	6.2	0.542	40	20.1	7.5	0.881
<b>Late special seasons</b>								
(max = 7 days)								
in pilot WMUs	53	24.9	3.4	0.206	56	35.9	3.5	0.308
elsewhere in NY	15	5.3	2.3	0.431	18	9.0	2.2	0.275
<b>Total days hunted</b>								
<b>all deer seasons in 2007</b>								
(max = 56)								
in pilot WMUs	209	91.2	15.4	0.743	149	93.2	14.8	0.920
elsewhere in NY	68	29.7	7.7	0.849	45	28.1	11.4	1.378

<sup>a</sup>Percent of all respondents.

**Table 2. Numbers of antlerless deer observed, perceived as potential targets, shot at, and harvested by deer hunters hunting in wildlife management units (WMUs) in southeastern New York State operating under pilot antler restrictions during the 2007 regular firearms season, from two simultaneous mail surveys conducted in 2008.**

Hunter interactions and effects with antlerless deer	WMUs 3C-3J			WMUs 3H-3K			Comparison	
	<u>n</u> <sup>a</sup>	<u>Mean</u>	<u>SE</u>	<u>n</u>	<u>Mean</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
<b>Number of antlerless deer seen per day of hunting</b>	185	2.0	0.165	131	7.0	2.053	-2.437	0.016 <sup>b</sup>
<b>% vulnerable</b> (of # seen, % that could have been shot at; hunter had tag, in-range)	154	45.1	3.00	113	47.9	3.60	-0.595	0.553
<b>index to willingness to shoot</b> (of vulnerable, % that were shot at)	122	12.0	2.50	85	7.0	1.98	1.556	0.121
<b>index to shooting effectiveness</b> (of those shot at, % harvested)	50	82.0	5.70	32	81.0	6.75	0.055	0.956
<b>index to shooting efficiency</b> (total shots taken per antlerless deer harvested)	43	1.3	0.103	26	1.4	0.193	-0.411	0.680
<b># antlerless deer harvested per hunter</b>	respondents = 184			respondents = 131				
n, % harvested 0	135	73.4		100	76.3			
n, % harvested 1	29	15.8		24	18.3			
n, % harvested 2	17	9.2		7	5.3			
n, % harvested 3	3	1.6		0	0.0			

<sup>a</sup>number of respondents.

<sup>b</sup>denotes a difference between pilot WMUs.

**Table 3. Numbers of smaller-antlered, sub-legal bucks observed, perceived as potential targets, shot at, and harvested by deer hunters hunting in wildlife management units (WMUs) in southeastern New York State operating under pilot antler restrictions during the 2007 regular firearms season, from two simultaneous mail surveys conducted in 2008.**

Hunter interactions and effects with sub-legal bucks	WMUs 3C-3J			WMUs 3H-3K			Comparison	
	<u>n<sup>a</sup></u>	<u>Mean</u>	<u>SE</u>	<u>n</u>	<u>Mean</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
<b>Number of sub-legal bucks seen per day of hunting</b>	182	0.4	0.041	131	2.86	1.70	-1.450	0.150
<b>% vulnerable</b> (of # seen, % that could have been shot at; hunter had tag, in-range)	119	56.0	4.50	89	54.2	4.60	0.280	0.779
<b>index to willingness to shoot</b> (of vulnerable, % that were shot at)	81	9.9	4.30	64	1.3	0.93	1.945	0.054
<b>index to shooting effectiveness</b> (of those shot at, % harvested)	12	75.0	13.1	5	80.0	20.0	-0.207	0.836
<b>index to shooting efficiency</b> (total shots taken per sub-legal buck harvested)	9	1.2	0.222	7	1.0	0.000	0.999	0.347
<b># sub-legal bucks<sup>b</sup> harvested per hunter</b>	respondents = 164			respondents = 116				
n, % harvested 0	154	93.9		112	96.6			
n, % harvested 1	10	6.1		4	3.4			

<sup>a</sup>number of respondents.

<sup>b</sup>Youth hunters do not have to abide by antler restrictions.

**Table 4. Numbers of larger-antlered, legal bucks observed, perceived as potential targets, shot at, and harvested by deer hunters hunting in wildlife management units (WMUs) in southeastern New York State operating under pilot antler restrictions during the 2007 regular firearms season, from two simultaneous mail surveys conducted in 2008.**

Hunter interactions and effects with antlerless deer	WMUs 3C-3J			WMUs 3H-3K			Comparison	
	<u>n</u> <sup>a</sup>	<u>Mean</u>	<u>SE</u>	<u>n</u>	<u>Mean</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
<b>Number of mature, legal bucks seen per day of hunting</b>	186	0.1	0.014	131	0.9	0.762	-1.05	0.296
<b>% vulnerable</b> (of # seen, % that could have been shot at; hunter had, tag in-range)	68	38.5	5.30	51	45.1	5.90	-0.830	0.407
<b>index to willingness to shoot</b> (of vulnerable, % that were shot at)	39	50.0	7.60	38	48.3	7.67	0.167	0.868
<b>index to shooting effectiveness</b> (of those shot at, % harvested)	41	78.0	6.54	29	69.0	8.74	0.824	0.413
<b>index to shooting efficiency</b> (total shots taken per mature, legal buck harvested)	31	1.1	0.05	20	1.1	0.10	0.122	0.905
<b># mature, legal bucks harvested per hunter</b>	respondents = 180			respondents = 125				
n, % harvested 0	145	80.6		101	80.8			
n, % harvested 1	33	18.3		23	18.4			
n, % harvested 2	2	1.1		1	0.8			

<sup>a</sup>number of respondents.



On average, respondents from both pairs of WMUs perceived the deer populations in their hunting areas to be comprised of about 80% antlerless deer and the remainder antlered bucks (Table 5, top). Indeed, the vast majority of hunters from both pairs of WMUs believed the deer population to be substantially skewed toward antlerless deer (Table 5, bottom). Hunters' perceptions of the deer sex ratio did not differ between the pairs of pilot WMUs.

Similarly, we found no difference between pairs of WMUs with respect to hunters' perceptions of the mean buck age ratio (Table 6, top). However, more hunters from WMUs 3H-3K than 3C-3J believed the buck population to be skewed toward younger bucks, and more hunters from 3C-3J perceived either an equal age ratio or an older buck population compared to hunters from 3H-3K (Table 6, bottom). This latter finding suggests that antler restrictions that have been in place for 3 years in 3C-3J are resulting in a shift in the buck age structure.

**Table 5. Perceptions of the deer sex ratio prior to the 2007 hunting season, for respondents hunting in wildlife management units (WMUs) in southeastern New York State operating under pilot antler restrictions, and proportion of hunters by area who perceived the deer sex ratio to be skewed (>60% antlerless deer or antlered bucks), from two simultaneous mail surveys conducted in 2008.**

Percent of deer that were this type	WMUs 3C-3J			WMUs 3H-3K			Statistical comparison	
	<u>n</u>	<u>x %</u>	<u>SE</u>	<u>n</u>	<u>x %</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
Antlerless deer	196	80.9	1.12	145	82.9	1.26	1.187	0.236
Antlered bucks	196	17.5	0.87	145	16.3	1.12	-0.846	0.399

Overall perception of deer sex ratio	WMUs 3C-3J		WMUs 3H-3K		Statistical comparison	
	<u>n</u>	<u>% of hunters</u>	<u>n</u>	<u>% of hunters</u>	<u>X<sup>2</sup></u>	<u>p</u>
Skewed <sup>a</sup> toward antlerless deer	189	96.4	139	95.9	0.073	0.788
Sex ratio about equal	4	2.1	4	2.7		
Skewed toward antlered bucks	3	1.5	2	1.4		

<sup>a</sup>Skewed means that hunters perceived  $\geq 60\%$  of the population to be of this type of deer.

**Table 6. Perceptions of the buck age ratio prior to the 2007 hunting season, for respondents hunting in wildlife management units (WMUs) in southeastern New York State operating under pilot antler restrictions, and proportion of hunters in each area who perceived the buck age ratio to be skewed (>60% younger bucks with small antlers or older bucks with larger antlers), from two simultaneous mail surveys conducted in 2008.**

Percent of deer that were this type <sup>a</sup>	WMUs 3C-3J			WMUs 3H-3K			Statistical comparison	
	<u>n</u>	<u>x %</u>	<u>SE</u>	<u>n</u>	<u>x %</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
Younger bucks with smaller antler	189	68.7	2.15	141	73.9	2.10	1.729	0.085
Older bucks with larger antler	189	24.9	1.77	141	24.2	1.91	-0.269	0.788

Overall perception of buck age ratio	WMUs 3C-3J		WMUs 3H-3K		<u>X<sup>2</sup></u>	<u>p</u>
	<u>n</u>	<u>% of hunters</u>	<u>n</u>	<u>% of hunters</u>		
Skewed <sup>a</sup> toward younger bucks	140	74.1	121	85.8	6.732	0.009
Age ratio about equal	26	13.7	9	6.4		
Skewed toward older bucks	23	12.2	11	7.8		

<sup>a</sup>Skewed means that hunters perceived  $\geq 60\%$  of the population to be of this type of deer.

### **Hunting Satisfaction During the 2007 Hunting Season and Change in Satisfaction since Inception of Antler Restrictions**

Slightly more than one-half of hunters from both pairs of WMUs reported being satisfied with their **overall deer-hunting experiences** during the 2007 hunting season, and about one-third from both pairs of WMUs reported being dissatisfied (Table 7). The percentage who were satisfied did not differ between pilot areas ( $X^2 = 1.021$ ,  $p = 0.312$ ), nor did the percentage who were dissatisfied ( $X^2 = 0.006$ ,  $p = 0.940$ ). Since inception of the pilot antler restrictions, about one-third of hunters in both pairs of WMUs believed their overall deer-hunting satisfaction had increased, and about one-third believed their overall hunting satisfaction had decreased. The percentage who reported an increasing trend in overall deer-hunting satisfaction did not differ between WMUs ( $X^2 = 2.686$ ,  $p = 0.101$ ), nor did the percentage who reported a decreasing trend ( $X^2 = 0.379$ ,  $p = 0.538$ ).

**Table 7. Satisfaction with overall deer-hunting experiences during the 2007 hunting season perceived by respondents hunting in wildlife management units (WMUs) in southeastern New York State operating under pilot antler restrictions, and trend in overall hunting satisfaction since inception of antler restrictions (2005 in 3C-3J and 2006 in 3H-3K), from two simultaneous mail surveys conducted in 2008.**

Change in overall deer-hunting satisfaction since 2006 when pilot antler restrictions began in <b>WMUs 3H-3K</b>							
Deer-hunting satisfaction in WMUs 3H-3K in 2007	Increased		No change		Decreased		Row totals n (% of total)
	n	%	n	%	n	%	
Satisfied	54	90.0	23	48.9	15	26.8	92 (56.4)
Neither	3	5.0	9	19.1	2	3.6	14 ( 8.6)
Dissatisfied	3	5.0	15	32.0	39	69.6	57 (35.0)
Column totals n (% of total)	60 (36.8)		47 (28.8)		56 (34.4)		163 respondents
Change in overall deer-hunting satisfaction since 2005 when pilot antler restrictions began in <b>WMUs 3C-3J</b>							
Deer-hunting satisfaction in WMUs 3C-3J in 2007	Increased		No change		Decreased		Row totals n (% of total)
	n	%	n	%	n	%	
Satisfied	62	88.6	37	59.7	9	11.4	108 (51.2)
Neither	7	10.0	15	24.2	8	10.1	30 (14.2)
Dissatisfied	1	1.4	10	16.1	62	78.5	73 (34.6)
Column totals n (% of total)	70 (33.2)		62 (29.4)		79 (37.4)		211 respondents

One pattern of note is that most hunters who were satisfied in 2007 also indicated an increasing trend in **overall deer-hunting satisfaction** whereas most of those who were dissatisfied in 2007 reported a decreasing trend. One deviation from this pattern is that hunters from 3H-3K were more likely than hunters from 3C-3J to report being satisfied during the 2007 season, but also to report a decrease in satisfaction since inception of the pilot program.

Whereas these data from the 2008 survey reflect respondents' assessments of satisfaction change "looking back" over the history of the pilot program, we also were able to conduct a time-series analysis of satisfaction assessments for 279 hunters from WMUs 3C-3J who had

responded in multiple years (Appendix B). More than 60% of hunters reported consistent changes in their level of satisfaction over all years for which we had data. However, they were split nearly evenly with respect to whether they were consistently satisfied (28.3%) or consistently dissatisfied (25.8%). Further, more hunters reported decreasing levels of satisfaction over time (21.9%) than hunters who reported increasing levels (12.5%).

Slightly less than one-half of hunters from both pairs of WMUs reported that they were satisfied with their **buck-hunting experiences** during the 2007 hunting season, and 37-44% from either set of WMUs reported being dissatisfied (Table 8). The percentage who reported being satisfied did not differ between pilot areas ( $X^2 = 1.416$ ,  $p = 0.234$ ), nor did the percentage

**Table 8. Satisfaction with buck-hunting experiences during the 2007 hunting season perceived by respondents hunting in wildlife management units (WMUs) in southeastern New York State operating under pilot antler restrictions, and trend in buck-hunting satisfaction since inception of antler restrictions (2005 in 3C-3J and 2006 in 3H-3K), from two simultaneous mail surveys conducted in 2008.**

Buck-hunting satisfaction in WMUs 3H-3K in 2007	Change in buck-hunting satisfaction since 2006 when pilot antler restrictions began in WMUs 3H-3K						Row totals n (% of total)
	Increased		No change		Decreased		
	n	%	n	%	n	%	
Satisfied	55	88.7	12	26.7	6	13.6	73 (48.3)
Neither	5	8.1	13	28.9	3	6.8	21 (13.9)
Dissatisfied	2	3.2	20	44.4	35	79.5	57 (37.7)
Column totals n (% of total)	62 (41.1)		45 (29.8)		44 (29.1)		151 respondents

Buck-hunting satisfaction in WMUs 3C-3J in 2007	Change in buck-hunting satisfaction since 2005 when pilot antler restrictions began in WMUs 3C-3J						Row totals n (% of total)
	Increased		No change		Decreased		
	n	%	n	%	n	%	
Satisfied	63	92.6	23	33.8	4	5.2	90 (42.3)
Neither	3	4.4	24	35.3	3	3.9	30 (14.1)
Dissatisfied	2	2.9	21	30.9	70	90.9	94 (44.1)
Column totals n (% of total)	68 (31.9)		68 (31.9)		77 (36.2)		213 respondents

who reported being dissatisfied ( $X^2 = 1.393$ ,  $p = 0.238$ ). Although not statistically different ( $X^2 = 3.211$ ,  $p = 0.073$ ), note that 41% of 3H-3K hunters who reported their **buck-hunting satisfaction** had increased since inception of the pilot antler restriction program, compared to 32% of 3C-3J hunters. Similarly, 29% of 3H-3K hunters reported their buck-hunting satisfaction had decreased since the start of the pilot program compared to 36% of 3C-3J hunters. Again, this was notable, but not significantly different ( $X^2 = 1.957$ ,  $p = 0.162$ ).

### **Influences on Overall Hunting Satisfaction During 2007**

A majority of all respondents from 3C-3J reported that five of eight possible positive aspects of hunting (all related to antlered bucks) were “too low” for them to be satisfied (Table 9). Three other aspects of deer hunting were “too low” for only a minority of respondents: the total number of deer observed, assurance from knowing that other hunters must pass up small bucks, and freedom of choice to wait for a mature buck instead of shooting the first buck seen. A substantial majority of hunters who said they were dissatisfied with their overall deer-hunting experiences in WMUs 3C-3J in 2007 reported that all eight positive aspects we examined were “too low.”

For all eight of the positive aspects of hunting that we examined, much higher percentages of dissatisfied than satisfied hunters reported that the eight aspects were “too low” (all at the  $p \leq 0.001$  level). A majority of hunters who reported being satisfied with their overall deer-hunting experiences in 3C-3J reported that six of the eight aspects were at least at the “minimum level” or “more than enough” for them to be satisfied. However, majorities of hunters who were satisfied overall reported that the number of mature bucks they saw, and the naturalness of the mix of older to younger bucks were “too low” for them to be satisfied. Results from hunters in WMUs 3H-3K (Table 10) were quite similar as those for hunters from 3C-3J.

Excessive levels of negative aspects of deer-hunting experiences seemed to have less influence on overall hunting satisfaction than insufficient levels of positive aspects. No more than about one-third of respondents from WMUs 3C-3J (Table 11) or from 3H-3K (Table 12) reported that any of seven possible negative aspects of their hunting experiences were “too high” for them to be satisfied. Indeed, even among hunters from 3C-3J who were dissatisfied with their overall hunting experiences, only minorities of hunters reported that five of the seven negative aspects examined were “too high” for them to be satisfied (see Table 11). The two exceptions were that slim majorities of dissatisfied hunters said that the difficulty of figuring out if an observed buck was legal to shoot, and the frustration of having to pass up a buck with small antlers were “too high.” Among dissatisfied hunters from 3H-3K,  $\leq 44\%$  reported that any of the seven negative aspects were “too high” (see Table 12).



**Table 9. Influence of eight positive aspects of deer hunting on overall satisfaction for respondents hunting deer in wildlife management units (WMUs) 3C-3J in southeastern New York State, from two simultaneous mail surveys conducted in 2008.**

2007 hunting experiences	Group of deer hunters	Too low for me to be satisfied		Just about at the minimum level I need to be satisfied		More than enough for me to be satisfied		Difference in % "too low" vs. $\geq$ min level satisfied. vs. dissat.	
		n	%	n	%	n	%	X <sup>2</sup>	p
Total # antlered bucks I saw	All 3C-3J hunters	111	53.6	69	33.3	27	13.0		
	Satisfied in 2007	33	30.6		48.1		21.3		
	Dissatisfied in 2007	58	82.9	10	14.3	2	2.9	46.5	<0.001
# of older (mature) bucks I saw	All 3C-3J hunters	144	70.6	43	21.1	17	8.3		
	Satisfied in 2007	53	49.5	37	34.6	17	15.9	43.8	<0.001
	Dissatisfied in 2007	67	97.1	2	2.9	0	0.0		
Naturalness of the mix of older to younger bucks	All 3C-3J hunters	138	69.7	45	22.7	15	7.6		
	Satisfied in 2007	51	50.0	36	35.3	15	14.7	36.8	<0.001
	Dissatisfied in 2007	65	94.2	4	5.8	0	0.0		
Naturalness of the mix of bucks compared to antlerless deer	All 3C-3J hunters	117	59.7	63	32.1	16	5.7		
	Satisfied in 2007	46	45.5		40.6		13.9		
	Dissatisfied in 2007	55	80.9	12	17.6	1	1.5	21.1	<0.001

Table 9 continued.

2007 hunting experiences	Group of deer hunters	Too low for me to be satisfied			Just about at the minimum level I need to be satisfied			More than enough for me to be satisfied		Difference in % "too low" vs. $\geq$ min level satisfied. vs. dissat.	
		n	%		n	%		n	%	$X^2$	p
Total # of deer I saw	All 3C-3J hunters	75	37.5		41.0		21.5				
	Satisfied in 2007	18	17.3	n	51	49.0	n	35	33.7	41.1	<0.001
	Dissatisfied in 2007	45	65.2	82	20	29.0	43	4	5.8		
Freedom to shoot any antlered buck that I want to shoot	All 3C-3J hunters	109	56.5		51	26.4		33	17.1		
	Satisfied in 2007	38	39.2		33	34.0		26	26.8	10.9	0.001
	Dissatisfied in 2007	45	65.2		20	29.0		4	5.8		
Freedom of choice to wait for a mature buck instead of feeling like I have to shoot the first buck I see	All 3C-3J hunters	93	46.5		28.0		25.5				
	Satisfied in 2007	28	27.5		34.3		38.2				
	Dissatisfied in 2007	53	74.6	56	13	18.3	51	5	7.0	37.4	<0.001
Assurance from knowing that other hunters must pass up small bucks	All 3C-3J hunters	77	38.1	35	54	26.7		71	35.1		
	Satisfied in 2007	23	22.1		26	25.0		55	52.9	47.4	<0.001
	Dissatisfied in 2007	53	74.6		12	16.9		6	8.5		

**Table 10. Influence of eight positive aspects of deer hunting on overall satisfaction for respondents hunting deer in wildlife management units (WMUs) 3H-3K in southeastern New York State, from two simultaneous mail surveys conducted in 2008.**

2007 hunting experiences	Group of deer hunters	Too low for me to be satisfied		Just about at the minimum level I need to be satisfied		More than enough for me to be satisfied		Difference in % “too low” vs. $\geq$ min level satisfied. vs. dissat.	
		n	%	n	%	n	%	X <sup>2</sup>	p
Total # antlered bucks I saw	All 3H-3K hunters	70	48.6	46	31.9	28	19.4		
	Satisfied in 2007	22	28.2		39.7		32.1		
	Dissatisfied in 2007	42	79.2	10	18.9	1	1.9		
# of older (legal) bucks I saw	All 3H-3K hunters	107	73.8	26	17.9	12	8.3	32.9	<0.001
	Satisfied in 2007	47	60.3		26.9		12.8		
	Dissatisfied in 2007	49	90.7	4	7.4	1	1.9		
Naturalness of the mix older bucks to younger bucks	All 3H-3K hunters	104	73.8	25	17.7	12	8.5	15.0	<0.001
	Satisfied in 2007	45	60.0		25.3		14.7		
	Dissatisfied in 2007	50	94.3	3	5.7	0	0.0		
Naturalness of the mix of bucks compared to antlerless deer	All 3H-3K hunters	90	63.8	40	28.4	11	7.8	19.1	<0.001
	Satisfied in 2007	36	48.0		41.3	8	10.7		
	Dissatisfied in 2007	45	84.9	6	11.3	2	3.8	18.2	<0.001



Table 10 continued.

2007 hunting experiences	Group of deer hunters	Too low for me to be satisfied		Just about at the minimum level I need to be satisfied		More than enough for me to be satisfied		Difference in % "too low" vs. $\geq$ min level satisfied. vs. dissat.	
			%		%		%	$X^2$	p
Total # of deer I saw	All 3H-3K hunters	42	29.0	n	41.4	n	29.7		
	Satisfied in 2007	8	10.0		50.0		40.0		
	Dissatisfied in 2007	31	58.5	60	15	28.3	43	7	13.2
Freedom to shoot any antlered buck that I want to shoot	All 3H-3K hunters			40				36.2	<0.001
	Satisfied in 2007	72	51.1		50	35.5		19	13.5
	Dissatisfied in 2007	27	35.5		8	15.4		3	5.8
Freedom of choice to wait for a mature buck instead of feeling like I have to shoot the first buck I see	All 3H-3K hunters			35				23.3	<0.001
	Satisfied in 2007	67	46.9		32	22.4		44	30.8
	Dissatisfied in 2007	20	26.0		22	28.6		35	45.5
Assurance from knowing that other hunters must pass up small bucks	All 3H-3K hunters	42	79.2		4	7.5		7	13.2
	Satisfied in 2007	42	29.8		39	27.7		60	42.6
	Dissatisfied in 2007	13	17.1		15	22.4		10	60.5
		27	51.9		15	28.8		10	19.2
				17				46	
								17.4	<0.001

**Table 11. Influence of seven negative aspects of deer hunting on overall satisfaction for respondents hunting deer in wildlife management units (WMUs) 3C-3J in southeastern New York State, from two simultaneous mail surveys conducted in 2008.**

2007 hunting experiences	Group of deer hunters	Too high for me to be satisfied		Just about at the maximum level I can tolerate		Low enough for me still to be satisfied		Difference in % "too high" vs. ≤ max level satisfied. vs. dissat.	
		n	%	n	%	n	%	X <sup>2</sup>	p
Sense of urgency to shoot a buck when I'd rather wait for a different one	All 3C-3J hunters	44	22.2	58	29.3	96	33.9	12.5	<0.001
	Satisfied in 2007	14	13.6		32.0	56	54.4		
	Dissatisfied in 2007	25	36.8	19	27.9	24	35.3		
Amount of difficulty figuring out if a buck I see is legal to shoot	All 3C-3J hunters	64	31.2	62	30.2	79	38.5	29.0	<0.001
	Satisfied in 2007	17	16.3		32.7	53	51.0		
	Dissatisfied in 2007	40	54.8	17	23.3	16	21.9		
Fear of being shot by people who shoot unsafely at deer	All 3C-3J hunters	26	12.7	41	20.1	137	67.2	cannot be determined	
	Satisfied in 2007	13	12.5	22	21.2	69	66.3		
	Dissatisfied in 2007	9	12.5	14	19.4	49	68.1		
Feeling crowded by other hunters	All 3C-3J hunters	32	15.5	50	24.3	124	60.2	0.16	0.693
	Satisfied in 2007	19	17.8		22.4	64	59.8		
	Dissatisfied in 2007	11	15.5	14	19.7	46	64.8		
				24					

Table 11 continued.

2007 hunting experiences	Group of deer hunters	Too high for me to be satisfied		Just about at the maximum level I can tolerate		Low enough for me still to be satisfied		Difference in % "too high" vs. ≤ max level satisfied. vs. dissat.	
		n	%	n	%	n	%	X <sup>2</sup>	p
# of sub-legal bucks shot by mistake by other hunters	All 3C-3J hunters	50	26.2	50	26.2	91	47.6	0.8	0.378
	Satisfied in 2007	25	25.5	26	26.5	47	48.0		
	Dissatisfied in 2007	21	31.8	17	25.8	28	42.4		
Anxiety about shooting an illegal buck	All 3C-3J hunters	34	17.3	52	26.5	110	56.1	7.9	0.005
	Satisfied in 2007	11	11.0	30	30.0	59	59.0		
	Dissatisfied in 2007	19	27.9	16	23.5	33	48.5		
Frustration about having to pass-up bucks with small antlers	All 3C-3J hunters	48	24.0	44	22.0	108	54.0	37.4	<0.001
	Satisfied in 2007	9	8.7	25	24.3	69	67.0		
	Dissatisfied in 2007	35	50.0	13	18.6	22	31.4		

**Table 12. Influence of seven negative aspects of deer hunting on overall satisfaction for respondents hunting deer in wildlife management units (WMUs) 3C-3J in southeastern New York State, from two simultaneous mail surveys conducted in 2008.**

2007 hunting experiences	Group of deer hunters	Too high for me to be satisfied		Just about at the maximum level I can tolerate		Low enough for me still to be satisfied		Difference in % "too high" vs. ≤ max level satisfied. vs. dissat.	
		n	%	n	%	n	%	X <sup>2</sup>	p
Sense of urgency to shoot a buck when I'd rather wait for a different one	All 3H-3K hunters	32	23.2	35	25.4	71	51.4	20.4	<0.001
	Satisfied in 2007	7	9.5	17	23.0	50	67.6		
	Dissatisfied in 2007	23	44.2	14	26.9	15	28.8		
Amount of difficulty figuring out if a buck I see is legal to shoot	All 3H-3K hunters	34	24.5	51	36.7	54	38.8	7.0	0.008
	Satisfied in 2007	12	16.0		32.0		52.0		
	Dissatisfied in 2007	19	36.5	21	40.4	12	23.1		
Fear of being shot by people who shoot unsafely at deer	All 3H-3K hunters	19	13.9	31	22.6	87	63.5	7.1	0.008
	Satisfied in 2007	5	6.8	20	27.4	48	65.8		
	Dissatisfied in 2007	12	23.5	8	15.7	31	60.8		
Feeling crowded by other hunters	All 3H-3K hunters	27	19.3	34	24.3	79	56.4	5.2	0.022
	Satisfied in 2007	8	10.8	17	23.0	49	66.2		
	Dissatisfied in 2007	14	26.4	13	24.5	26	49.1		

Table 12 continued.

2007 hunting experiences	Group of deer hunters	Too high for me to be satisfied		Just about at the maximum level I can tolerate		Low enough for me still to be satisfied		Difference in % “too high” vs. ≤ max level satisfied. vs. dissat.	
		n	%		%		%	X <sup>2</sup>	p
# of sub-legal bucks shot by mistake by other hunters	All 3H-3K hunters	42	31.8	n		n			
	Satisfied in 2007	19	26.4					1.3	
	Dissatisfied in 2007	18	36.0						
Anxiety about shooting an illegal buck	All 3H-3K hunters			21		32			0.256
	Satisfied in 2007	10	13.9					6.3	
	Dissatisfied in 2007	17	32.7	32		77			
Frustration about having to pass-up bucks with small antlers	All 3H-3K hunters			16		46			0.012
	Satisfied in 2007	6	8.1	12		23			
	Dissatisfied in 2007	20	38.5	28		84		17.2	<0.001

## Changes in Hunting Experiences since Inception of Antler Restrictions

Among 3C-3J hunters, a plurality noticed no change in five of the seven deer or hunter characteristics about which we asked (Table 13). However, a plurality did notice increases in both (1) the number of other hunters complying with antler restrictions and (2) the total number of antlered bucks in those WMUs. Slightly more than one-third noticed a decrease in the total deer population.

**Table 13. Percentages of deer hunters noticing changes in deer and hunter characteristics in wildlife management units 3C and 3J in southeastern New York State since inception of antler restrictions in 2005, from a mail survey conducted in 2008.**

Deer and hunter characteristics	Change noticed in characteristics									
	Increased a lot		Increased a little		No change		Decreased a little		Decreased a lot	
	n	%	n	%	n	%	n	%	n	%
# of older bucks compared to younger bucks	22	10.6	51	24.5	97	46.6	20	9.6	18	8.7
# bucks compared to does	7	3.4	54	26.2	91	44.2	29	14.1	25	12.1
# of other hunters complying with the antler restrictions	39	20.2	50	25.9	72	37.3	21	10.9	11	5.7
Total # of deer in these WMU's	4	2.0	43	21.1	88	43.1	37	18.1	32	15.7
# of people hunting in these WMU's	10	5.0	23	11.6	113	56.8	35	17.6	18	9.0
# of older bucks with larger antlers	16	8.0	52	25.9	80	39.8	23	11.4	30	14.9
Total # of antlered bucks of any size or age in these WMU's	12	6.0	66	32.8	75	37.3	24	11.9	24	11.9

Hunters from WMUs 3H-3K noticed more changes in those WMUs despite antler restrictions being in place for only two hunting seasons compared to three seasons in 3C-3J. Indeed, a plurality of 3H-3K hunters noticed increases in: (1) the buck age ratio, (2) the number of other hunters complying with antler restrictions, (3) the total deer population in those WMUs, (4) the total number of antlered bucks, and (5) the number of older bucks with large antlers (Table 14). It is worth noting that majorities of hunters from both pairs of pilot WMUs reported the total number of hunters in those WMUs had remained the same since the pilot began.

**Table 14. Percentages of deer hunters noticing changes in deer and hunter characteristics in wildlife management units 3H and 3K in southeastern New York State since inception of antler restrictions in 2006, from a mail survey conducted in 2008.**

Deer and hunter characteristics	Change noticed in characteristics									
	Increased a lot		Increased a little		No change		Decreased a little		Decreased a lot	
	n	%	n	%	n	%	n	%	n	%
# of older bucks compared to younger bucks	5	3.4	64	43.2	53	35.8	12	8.1	14	9.5
# bucks compared to does	9	6.1	41	27.7	57	38.5	18	12.2	23	15.5
# of other hunters complying with the antler restrictions	38	27.7	33	24.1	43	31.4	14	10.2	9	6.6
Total # of deer in these WMU's	14	9.7	38	26.4	48	33.3	28	19.4	16	11.1
# of people hunting in these WMU's	3	2.1	17	12.0	82	57.7	29	20.4	11	7.7
# of older bucks with larger antlers	4	2.8	53	36.8	54	37.5	10	6.9	23	16.0
Total # of antlered bucks of any size or age in these WMU's	14	9.7	55	37.9	43	29.7	18	12.4	15	10.3

## Changes in Hunting Experiences since Inception of Antler Restrictions

Most hunters' expectations have not been met for changes in the number of older bucks or big racked bucks seen in WMUs 3C-3J (Table 15). Prior to the pilot program, DEC had informed hunters that their chances of shooting an antlered buck likely would decrease under antler restrictions, but that their chances of shooting an older, larger-antlered buck likely would increase. Hunters from 3C-3J reported that the changes they experienced in their chances to shoot an antlered buck in general and a large-antlered buck specifically both were lower than expected. Very few hunters from 3C-3J indicated that their expectations had been exceeded for any of the six variables we examined.

**Table 15. Comparison of deer hunters' selected experiences with expectations in wildlife management units (WMUs) 3C-3J in southeastern New York State since inception of antler restrictions in 2005, from a mail survey conducted in 2008.**

Deer-hunting experience	How did experiences compare with expectations?					
	Lower than expected		About as much as expected		Higher than expected	
	n	%	n	%	n	%
# of older bucks I see while hunting	134	64.4	64	30.8	10	4.8
# of big-racked bucks I see while hunting	152	73.4	48	23.2	7	3.4
Change in ratio of bucks to does	89	43.6	104	51.0	11	5.4
Change in my chances of shooting a buck	112	53.8	92	44.2	4	1.9
Change in my chances of shooting a big-racked buck	117	56.2	75	36.1	16	7.7
Change in my overall satisfaction	97	46.4	88	42.1	24	11.5



Consistent with the changes in deer and hunter characteristics noticed by hunters in WMUs 3H-3K, expectations generally were met for slightly more hunters in 3H-3K than 3C-3J. Indeed, pluralities of hunters indicated that their expectations were met for (1) changes in the buck to doe sex ratio, (2) their chances to shoot an antlered buck in general, and (3) their overall satisfaction (Table 16). However, like hunters from 3C-3J, most hunters in 3H-3K indicated that their expectations had not been met for (1) the number of older bucks they see, (2) number of bigger-racked bucks they see, nor (3) the change in their chances of taking a bigger-racked buck.

**Table 16. Comparison of deer hunters' selected experiences with expectations in wildlife management units (WMUs) 3H-3K in southeastern New York State since inception of antler restrictions in 2008, from a mail survey conducted in 2008.**

Deer-hunting experience	How did experiences compare with expectations?					
	Lower than expected		About as much as expected		Higher than expected	
	n	%	n	%	n	%
# of older bucks I see while hunting	87	59.2	51	34.7	9	6.1
# of big-racked bucks I see while hunting	94	64.8	47	32.4	4	2.8
Change in ratio of bucks to does	57	39.0	73	50.0	16	11.0
Change in my chances of shooting a buck	64	43.8	71	48.6	11	7.5
Change in my chances of shooting a big-racked buck	74	50.0	62	41.9	12	8.1
Change in my overall Satisfaction	56	38.1	66	44.9	25	17.0

## **Attitudes Toward Antler Restrictions and Opinion About Continuing the Pilot Program**

Hunters from WMUs 3H-3K reported a more positive change in their attitudes toward antler restrictions since inception of the pilot program, compared to hunters from WMUs 3C-3J ( $X^2 = 20.508$ ,  $p < 0.001$ ). More hunters from 3H-3K (46%) than 3C-3J (30%) said they are more supportive of antler restrictions now than they were when the pilot program began. Similarly, fewer hunters from 3H-3K (14%) than 3C-3J (25%) reported that they are less supportive of antler restrictions now. Relatively similar percentages of hunters from both sets of WMUs reported that their support for antler restrictions has not changed since inception of the pilot program in those respective WMUs (45% in 3H-3K and 40% in 3C-3J).

Majorities of hunters from both pairs of pilot WMUs believe antler restrictions should be continued for the 2008 season. Sixty percent of hunters from 3C-3J and 77% from 3H-3K believe the pilot program should be continued. Only 29% of hunters from 3C-3J and 14% from 3H-3K believe the pilot should not be continued. The remainder in both pairs of WMUs explicitly said they have no opinion about whether antler restrictions should be continued.

A time series analysis using data from the same individuals responding to surveys in 2006, 2007, and 2008 revealed that 68% of hunters from 3C-3J were consistent in their beliefs about whether the pilot program should be continued (Appendix C). Indeed, more than one-half (52.1%) consistently believed (over all the years for which we had data) that the pilot program should be continued, and another 9.6% registered an increasing desire for continuation. About 15.5% consistently believed that antler restrictions should not be continued, and another 14.2% registered a decreasing desire for antler restrictions. The remainder either reported varying beliefs from year to year with no discernable pattern (6.9%) or reported that they were consistently unsure about whether antler restrictions should be considered (1.6%).

## **DISCUSSION**

### **To What Degree are Deer-hunting Experiences Similar or Different for Hunters from the Pilot WMUs Compared to the Broader Southeastern Region of the State?**

Hunters participating in the pilot program in WMUs 3C-3J and 3H-3K reported similar rates of hunting participation (>90% of hunters reported hunting  $\geq 1$  day) and levels of hunting activity (~15 total days of deer hunting) as hunters in all of southeastern New York when compared with data from a statewide survey of hunters following the 2006 hunting season (Enck and Brown 2008). Hunters' experiences with antlerless deer differed somewhat within pairs of pilot WMUs as well as between pilot areas and the broader region. For example, hunters from 3H-3K saw more antlerless deer per day compared to hunters from 3C-3J, but hunters from the latter pair of WMUs had a higher willingness to shoot at antlerless deer. As a result, about 25% of hunters from both pairs of pilot WMUs harvested at least one antlerless deer, compared to only about 15% in the broader area (Enck and Brown 2008). The percentage of observed antlerless deer vulnerable to harvest was similar in pilot WMUs and the broader region. However, hunters in the pilot WMUs were more effective harvesters when shooting at antlerless deer compared to hunters throughout the southeastern part of the state, with >81% of shooting events resulting in harvest compared to about 67%.

Interactions with smaller-antlered bucks generally differed between the pilot WMUs and the broader southeastern area. Hunters in 3H-3K saw more smaller-antlered bucks per day than hunters in either 3C-3J or outside the pilot areas (Enck and Brown 2008). Vulnerability of observed, smaller-antlered bucks was less in the pilot WMUs than in the southeastern part of the state. Despite the vast majority of hunters in the pilot WMUs passing up shots at smaller-antlered bucks, the number of larger-antlered (i.e., legal) bucks seen per day in 3C-3J was similar to the number observed per day throughout all southeastern New York State. Vulnerability of larger-antlered bucks was reported to be higher in pilot WMUs compared to the broader southeastern area (Enck and Brown 2008). However, hunters were willing to shoot at about 50% of those vulnerable, larger-antlered bucks, regardless of whether the hunters were in the pilot WMUs or outside of them.

Perceptions of the deer sex ratio being about 80% antlerless deer and 20% antlered bucks were nearly identical in both pairs of pilot WMUs as in the broader region (Enck and Brown 2008). On the contrary, perceptions of the buck age ratio (i.e., percentage of mature, larger-antlered bucks that would be legal in pilot areas) were higher in the broader region (~30%) than in within the pilot areas (~25%).

### **What do Indirect Indicators Suggest About the Success of Antler Restrictions?**

Achieving the desired changes in deer population characteristics in the pilot areas depends on compliance of hunters with the antler restrictions. One indirect indicator of hunter compliance is their willingness to shoot at vulnerable, smaller-antlered bucks. Apropos to the pilot program, hunters' willingness to shoot at smaller-antlered bucks was substantially less in pilot areas compared to the Southeast in general. The few hunters who shot at smaller bucks in the pilot WMUs may have been youth who did not have to abide by the restrictions, although this cannot be confirmed.

Two indirect indicators raise questions about the success of the pilot program. First, hunters in 3C-3J observed fewer bucks with smaller antlers per day of hunting than hunters in the broader area. Second, hunters in both pairs of pilot WMUs perceived a buck age ratio with fewer larger-antlered bucks than did hunters throughout the southeastern region.

### **What do more Direct Indicators Suggest About the Success of Antler Restrictions?**

Several variables measured in our survey suggest that antler restrictions might be more successful after only two years in WMUs 3H-3K than after three years in WMUs 3C-3J. First, more hunters noticed changes in deer population characteristics in the former pair of WMUs compared to the latter. Second, more hunters from 3H-3K than from 3C-3J reported that their expectations had been met for changes in deer population characteristics. Third, more hunters from 3H-3K than 3C-3J said their buck-hunting satisfaction had increased in the years since inception of antler restrictions.

Consistent with these indicators of success, more hunters from 3H-3K than 3C-3J said they are more supportive of antler restrictions after the 2007 hunting season than they were when

the pilot program began. Similarly, fewer hunters from 3H-3K than 3C-3J reported that they are less supportive of antler restrictions now. Also, although majorities of hunters from both pairs of pilot WMUs believe antler restrictions should be continued for the 2008 season, the percentage is higher in 3H-3K than in 3C-3J.

### **How is Hunter Satisfaction and Preference for Continuation of Antler Restrictions Influenced by Hunters' Perceptions of Deer-related Impacts?**

Brown (2006) determined that hunters in 3C-3J (the only pair of WMUs piloting antler restrictions at the time of his survey) had a variety of reasons for wanting to hunt in the pilot area. Enck and Brown (2008) more specifically identified four positive aspects of hunting, but no negative aspects that were important enough to 3C-3J hunters for those aspects to be considered impacts to manage (Riley et al. 2003, Enck et al. 2006). In 3H-3K, Enck and Brown (2008) identified five positive and one negative aspects of hunting as impacts to manage. The influence of those and other possible positive and negative impacts on satisfaction were examined in this study.

In both pairs of pilot WMUs, relatively high percentages of hunters were dissatisfied with their hunting experiences, especially those relating to interactions with antlered bucks. Much of the dissatisfaction was linked to experienced levels of positive impacts that are below desirable levels, rather than negative impacts that are above tolerable levels. Indeed, most of the experienced levels of positive impacts we assessed are "too low" for a majority of hunters to be satisfied. On the other hand, experienced levels of negative impacts either are "more than low enough" or just about at "the maximum level" hunters can tolerate. These results provide another example of how the concept of impacts can provide help in understanding hunter satisfaction.

Results from both the recent statewide survey of deer hunters (Enck and Brown 2008) and a rapid assessment of hot-button issues in Region 7 (Enck and Brown 2007) demonstrated the utility of the impacts concept in understanding support for or opposition to the idea of antler restrictions. In those studies, supporters of antler restrictions generally believed that positive impacts that currently are "too low" for them to be satisfied would be improved. Those who opposed antler restrictions generally believed that negative impacts that either are already "too high" for them to be satisfied or just about at the maximum level they can tolerate would worsen.

Those findings largely were mirrored in this study with respect to hunters' opinions about whether the pilot antler restrictions should be continued. Despite substantial dissatisfaction and (as of yet) unmet expectations for desirable levels of many impacts, most hunters in both pairs of pilot WMUs want antler restrictions to continue. If experienced levels of positive impacts continue to increase toward desirable levels and experienced levels of negative impacts do not worsen, hunters seem likely to continue favoring the antler restriction regulations.

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**Appendix A:**

**Study Questionnaire for 3C-3J**  
**(Questionnaire for 3H-3K identical except for WMU labels and**  
**years since inception of pilot program)**

**Antler Restriction Pilot Program**  
**3<sup>rd</sup> Year Survey**  
**Ulster County**



**Antler Restriction Pilot Program  
3<sup>rd</sup> Year Survey - Ulster County**

Research conducted by the  
Human Dimensions Research Unit  
Department of Natural Resources  
Cornell University

Sponsored by the New York State  
Department of Environmental Conservation (DEC)

At the urging of many Ulster County sportsmen, DEC initiated a pilot program for deer management in Units 3C and 3J in 2005. This program is aimed at allowing more bucks to survive into the older age classes. To help accomplish this, special regulations in these units prohibit the taking of bucks that do not have at least one antler with three points that are at least one inch long. (Hunters under age 17 are exempt from this requirement).

DEC asked the Human Dimensions Research Unit at Cornell University to help evaluate the success of this pilot program and how it has affected your hunting experience. If you did not hunt in Units 3C or 3J in 2007, we are asking you to answer just a few of the questions. If you did hunt in Units 3C or 3J in 2006, your response to all of the questions is very important to this initial assessment of the program.

Please take a few minutes now to complete this survey. The information you provide will remain strictly confidential and will never be associated with your name.

**THANK YOU FOR YOUR ASSISTANCE!**

**GENERAL DEER HUNTING INFORMATION**

**1. Did you hunt deer in Units 3C or 3J in fall 2007?**

\_\_\_ No      \_\_\_ Yes

**2. Indicate in the table below the number of days you hunted, and the number of antlered bucks and antlerless deer you harvested in 2007. (Write in a number for each line below. If none, write in 0.)**

Location	# days hunted early bow season	# days hunted regular season	# days hunted late special seasons	total # antlered bucks harvested	total # antlerless deer (does or fawns) harvested
Unit 3C	___	___	___	___	___
Unit 3J	___	___	___	___	___
Elsewhere in NY	___	___	___	___	___

**If you did not hunt in Units 3C or 3J in fall 2007, you are finished. Please stop here and return your questionnaire. If you did hunt in Units 3C or 3J in fall 2007, please continue and answer the remaining questions.**

**YOUR 2007 HUNTING IN UNIT 3C OR 3J**

**3. How satisfied were you with your overall deer-hunting experiences in Units 3C or 3J during the 2007 season? (Circle one choice).**

Greatly satisfied    Moderately satisfied    Slightly satisfied    Neither satisfied nor dissatisfied    Slightly dissatisfied    Moderately dissatisfied    Greatly dissatisfied

**4. How has your overall deer-hunting satisfaction in these Units changed since the pilot antler restrictions began in the 2005 season? (Circle one choice.)**

Increased a lot    Increased a little    No change    Decreased a little    Decreased a lot



5. How satisfied were you with your buck-hunting experiences in Units 3C or 3J during the 2007 season? (*Circle one choice*).

Greatly satisfied    Moderately satisfied    Slightly satisfied    Neither satisfied nor dissatisfied    Slightly dissatisfied    Moderately dissatisfied    Greatly dissatisfied

6. How has your buck-hunting satisfaction in these Units changed since the pilot antler restrictions began in the 2005 season? (*Circle one choice*.)

Increased a lot    Increased a little    No change    Decreased a little    Decreased a lot

7. How many deer of the following types did you see, shoot at, and take in WMUs 3C and 3J during the fall 2007 regular firearms deer season? (*Write a number in each box. Write in 0 if you saw no deer of a particular type, took no shots, or harvested no deer*).

Sightings, shots, and harvest (# = number)	All antlerless deer (does and fawns)	Younger antlered bucks with smaller antlers	Older antlered bucks with larger antlers
# I saw while hunting			
# I <u>could</u> have shot at if I wanted (had an unfilled tag and a clear shot in range)			
# I did shoot at			
# I harvested			
# of total shots I took at these deer			

**8. Based on your hunting in Units 3C and 3J in 2007, how did each of the following possible positive experiences affect your overall hunting satisfaction?**

Possible positive aspects of my <u>hunting experiences in 3C and 3J</u>	Too low for me to be <u>satisfied</u>	Just about at the minimum level I need to be <u>satisfied</u>	More than enough for me to be <u>satisfied</u>
total # antlered bucks I saw	1	2	3
# of older, large-antlered bucks I saw	1	2	3
naturalness of the mix of older bucks compared to yearling bucks	1	2	3
naturalness of the mix of bucks compared to antlerless deer	1	2	3
total # of deer I saw	1	2	3
freedom to shoot any antlered buck that I want to shoot	1	2	3
freedom of choice to wait for a mature buck instead of feeling like I have to shoot the first buck I see	1	2	3

**9. Based on your hunting in Units 3C and 3J in 2007, how did each of the following possible negative experiences affect your overall hunting satisfaction?**

Possible negative aspects of my <u>hunting experiences in 3C and 3J</u>	Too high for me to be <u>satisfied</u>	Just about at the maximum level I can <u>tolerate</u>	Low enough for me to still <u>be satisfied</u>
sense of urgency to shoot first legal buck I see when I'd rather wait for a different one	1	2	3
amount of difficulty figuring out if a buck I see is legal to shoot	1	2	3
fear of being shot by people who shoot unsafely at deer	1	2	3
feeling crowded by other hunters	1	2	3
# of sub-legal bucks shot by mistake by other hunters	1	2	3

**10. Before the start of the fall 2007 season, about what percent of deer were antlered bucks, and what percent were antlerless deer (does and fawns) in these WMUs? (Write a number on each line.)**

\_\_\_ % were antlered bucks

\_\_\_ % were antlerless deer (does and fawns)

Total = 100%

**11. Before the start of the fall 2007 season, about what percent of antlered bucks were yearlings with smaller antlers, and what percent were older bucks with larger antlers in these WMUs? (Write a number on each line.)**

\_\_\_ % were yearling bucks with smaller antlers

\_\_\_ % were older bucks with larger antlers

Total = 100%

**12. Based on your hunting experiences in Units 3C and 3J since the pilot program started in 2005, what changes have you noticed in each of the following aspects of your hunting experiences?**

<u>What changes have you noticed in:</u>	<u>Increased a lot</u>	<u>Increased a little</u>	<u>No change</u>	<u>Decreased a little</u>	<u>Decreased a lot</u>
number of older bucks compared to younger bucks	1	2	3	4	5
number of bucks compared to does	1	2	3	4	5
number of other hunters complying with the antler restrictions	1	2	3	4	5
total number of deer in these WMUs	1	2	3	4	5
number of people hunting in these WMUs	1	2	3	4	5
number of older bucks with larger antlers	1	2	3	4	5
total number of antlered bucks of any size or age in these WMUs	1	2	3	4	5

**13. How do each of the following experiences compare with your expectations for outcomes of the pilot antler restriction program?**  
*(Circle one number for each experience.)*

<u>Experience</u>	<u>Lower than I expected</u>	<u>About as much as I expected</u>	<u>Higher than I expected</u>
# of older bucks I see while hunting	1	2	3
# of big-racked bucks I see while hunting	1	2	3
change in ratio of bucks to does	1	2	3
change in my chances of shooting a buck	1	2	3
change in my chances of shooting a big-racked buck	1	2	3
change in my overall satisfaction	1	2	3

**14. How has your attitude about the pilot program changed after 3 years of experience with it?**

- I am much more supportive now
- I am somewhat more supportive now
- My support for the program has remained about the same
- I am somewhat less supportive now
- I am much less supportive now

**15. Do you believe the antler restriction program should be continued in 2008?**

- Yes
- No
- Don't know or no opinion

**THANK YOU VERY MUCH FOR YOUR ASSISTANCE.**

**To return this questionnaire, simply seal it and drop it in the mail.  
Return postage has been provided.**

## Appendix B:

Time-series analysis of initial level of deer hunters satisfaction with antler restrictions in WMUs 3C-3J and change in satisfaction since inception of the pilot program (in 2005), based on 279 deer hunters who responded  $\geq 2$  years to post-season mail surveys conducted in January 2006, 2007, and 2008.

Satisfaction with antler restrictions since inception in 2005?	Initial level of satisfaction and subsequent change in satisfaction distributed across time (by year of survey)			row n	
Consistently DISSATISFIED total = 72	2006	DISSATISFIED	DECREASED	DECREASED	29
		DISSATISFIED	DECREASE	no data	15
		DISSATISFIED	no data	DECREASED	6
	2007	DISSATISFIED	DECREASED	NO CHANGE	3
		DISSATISFIED	no data	NO CHANGE	3
		DISSATISFIED	NO CHANGE	no data	7
		DISSATISFIED	NO CHANGE	NO CHANGE	9
Consistently NEITHER satisfied nor dissatisfied total = 18		NEITHER	no data	NO CHANGE	
		NEITHER	NO CHANGE	no data	2
		NEITHER	NO CHANGE	NO CHANGE	8
Consistently SATISFIED totals = 79		SATISFIED	NO CHANGE	no data	17
		SATISFIED	no data	NO CHANGE	6
		SATISFIED	NO CHANGE	NO CHANGE	11
		SATISFIED	INCREASED	NO CHANGE	3
		SATISFIED	NO CHANGE	INCREASED	7
			no data		8
				no data	10
		SATISFIED	INCREASED	INCREASED	17
		INCREASED	INCREASED		

Satisfaction with antler restrictions since inception in 2005?  
 Initial level of satisfaction and subsequent change in satisfaction distributed across time (by year of survey)  
 row n

DECREASING satisfaction total n = 61	2006	SATISFIED	NO CHANGE	DECREASED		
		SATISFIED	DECREASED	NO CHANGE	6	
				DECREASED	6 5	
		2007	no data	2008		5
			DECREASED	no data		5
			no data	DECREASED	no data	8
			DECREASED	no data	DECREASED	3
			NO CHANGE	DECREASED	DECREASED	3
			DECREASED	DECREASED	NO CHANGE	4
			DECREASED	DECREASED	DECREASED	12
			DISSATISFIED	NO CHANGE	DECREASED	
			no data		DECREASED	3 1
	Stable satisfaction, unknown initial level (total n = 1) INCREASING satisfaction total n = 35		no data	DECREASED	NO CHANGE	
				NO CHANGE	NO CHANGE	1
			DISSATISFIED	no data	INCREASED	
		DISSATISFIED	INCREASED	INCREASED	3	
			NO CHANGE	INCREASED	3 5	
				no data	8	
		NEITHER	INCREASED	NO CHANGE	1	
		NEITHER	no data	INCREASED		
		NEITHER	INCREASED	INCREASED	6	
		no data	NO CHANGE	INCREASED	6	
		no data	INCREASED	NO CHANGE	1	
		no data	INCREASED	INCREASED	1	
					1	

NEITHER  
NEITHER

Satisfaction with antler restrictions since inception in 2005? Initial level of satisfaction and subsequent change in satisfaction distributed across time (by year of survey)

		2006	2007	2008	row n
Varying satisfaction total n = 13	NEITHER	DECREASED	INCREASED	DECREASED	3
		INCREASED	DECREASED	INCREASED	1 3
		DECREASED	INCREASED	INCREASED	2 2
	DISSATISFIED	NO CHANGE	INCREASED	INCREASED	2 2
	DISSATISFIED	DECREASED	INCREASED	INCREASED	2
SATISFIED	no data				2

---

DECREASED

NEITHER



### Appendix C:

Time-series analysis of deer hunters' stated desire for antler restrictions in WMUs 3C-3J (which were instituted in 2005) to be continued, based on 303 deer hunters who responded  $\geq 2$  years to post-season mail surveys conducted in January 2006, 2007, and 2008.

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Desire antler restrictions to continue next season?	Distribution of responses across time (year of survey)			
	2006	2007	2008	row n
Consistently NO total n = 47	NO	NO	no data	12
	NO	no data	NO	6
	no data	NO	NO	3
	NO	NO	NO	26
Consistently UNSURE total n = 5	UNSURE	UNSURE	no data	2
	UNSURE	no data	UNSURE	2
	no data	UNSURE	UNSURE	0
	UNSURE	UNSURE	UNSURE	1
Consistently YES total n = 158	YES	YES	no data	45
	YES	no data	YES	25
	no data	YES	YES	8
	YES	YES	YES	80
Decreasing desire for AR total n = 43	YES	UNSURE	no data	2
	YES	no data	UNSURE	4
	YES	UNSURE	UNSURE	3
	YES	NO	no data	3
	YES	no data	NO	3
	YES	NO	NO	5
	YES	YES	UNSURE	6
	YES	YES	NO	5
	YES	UNSURE	NO	3
	UNSURE	UNSURE	NO	2
	UNSURE	no data	NO	3
	UNSURE	NO	no data	1
	UNSURE	NO	NO	3

Distribution of responses across time (year of survey)

	2006	2007	2008	row n
Increasing desire for AR total n = 29	NO	NO	YES	3
	NO	NO	UNSURE	2
	NO	no data	YES	2
	NO	YES	no data	1
	NO	YES	YES	5
	NO	no data	UNSURE	1
	UNSURE	UNSURE	YES	2
	UNSURE	no data	YES	6
	UNSURE	YES	no data	5
	UNSURE	YES	YES	2
Varying opinion about AR total n = 21	UNSURE	YES	UNSURE	1
	UNSURE	NO	YES	1
	UNSURE	YES	NO	1
	YES	UNUSRE	YES	6
	YES	NO	UNSURE	3
	YES	NO	YES	3
	NO	YES	UNUSRE	1
	NO	UNUSRE	NO	2
	NO	YES	NO	3

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# Hunters' Experiences with and Attitudes about Antler Restrictions in Wildlife Management Units 3C, 3J, 3H, and 3K during the 2010 Hunting Season.



May 2011

HDRU Series No 11-3

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## EXECUTIVE SUMMARY

The New York State Department of Environmental Conservation (DEC) initiated a pilot program of antler restrictions (i.e., at least 3 points  $\geq$  1 inch on an antler; youth exempted) in Wildlife Management Units (WMUs) 3C and 3J for the 2005 hunting season and expanded the pilot to include WMUs 3H and 3K for the 2006 hunting season. Cornell University's Human Dimensions Research Unit (HDRU) surveyed samples of hunters living and/or hunting in WMUs 3C and 3J after the 2005, 2006, and 2007 hunting seasons, and hunters living or hunting in WMUs 3H and 3K were surveyed after the 2006 and 2007 hunting seasons, as part of an evaluation of hunters' experiences and attitudes about hunting under antler restrictions. We continued this evaluation with the current survey (following the 2010 season), specifically determining whether antler restrictions changed hunters' participation in the pilot WMUs or influenced their willingness to voluntarily pass-up shots at smaller-antlered bucks in areas without mandatory antler restrictions.

The current survey included 474 persons living in WMUs 3C or 3J (referred to as the 3C/3J Panel) who had been surveyed previously about the pilot antler restrictions, and who had responded in at least one of the years in which they were surveyed (i.e., 2006, 2007, and/or 2008) and 280 persons living in WMUs 3H or 3K (the 3H/3K Panel) who had been surveyed previously about the pilot antler restrictions, and who had responded in at least one of the years in which they were surveyed (i.e., 2007, and/or 2008). We also surveyed an additional group of hunters living outside the pilot WMUs, but who had either applied for a Deer Management Permit (DMP) in one of the pilot WMUs ( $n = 316$ ) in 2004 (i.e., prior to antler restrictions) or 2010, and those who reported harvesting a deer in one of the WMUs ( $n = 318$ ) in 2004 or 2010. Responses of these non-local hunters were included only in the assessment of whether antler restrictions have caused a change in participation behavior.

All 1,388 hunters in the four samples were mailed a questionnaire on 18 February 2011 (125 questionnaires were not deliverable), and were sent up to three reminder letters. We received 757 completed questionnaires. In addition, telephone interviews using a subset of the most important questions were completed with 200 nonrespondents to the mail surveys (100 from the two panels, and 100 from the non-local hunters) between April 6 and 20, 2011. In general, nonrespondents were less likely to have hunted deer in 2010 (68% hunted), but otherwise reported similar levels of satisfaction and opinions about the antler restriction program as respondents. Non-local hunters also reported levels of satisfaction and opinions about the pilot program that were similar to respondents from the two panels.

### Summary of Findings

The following four bullets highlight general hunting behavior, experiences and satisfactions of responding hunters.

- Antler restrictions had no influence on deer-hunting participation in the pilot WMUs for >70% of respondents from the two panels and for >60% of non-local hunters. Most respondents hunted in the pilot WMUs every year since antler restrictions started.

- 45% of respondents from the 3C/3J Panel and 51% of respondents from the 3H/3K Panel were satisfied with their **overall deer-hunting experiences** during the 2010 hunting season; 35% (3C/3J Panel) and 29% (3H/3K Panel) were dissatisfied.
- 42% of respondents from the 3C/3J Panel and 52% of respondents from the 3H/3K Panel were satisfied with their **buck-hunting experiences** during the 2010 hunting season; 40% (3C/3J Panel) and 29% (3H/3K Panel) were dissatisfied.
- 40% of respondents from the 3C/3J Panel and 56% from the 3H/3K Panel reported that their buck-hunting satisfaction had increased since the pilot was implemented; 36% (3C/3J Panel) and 19% (3H/3K Panel) reported that their buck-hunting satisfaction had decreased.

In general, hunters' assessment of satisfaction depends, in part, on whether the level of positive aspects experienced while hunting are above (high enough), below (too low), or just at the minimum level they desire to feel satisfied. Satisfaction also depends, in part, on whether the level of negative aspects that hunters experience while hunting are above (too high), below (low enough), or at the maximum level they can tolerate and still feel satisfied. The next two bullets relate to these assessments of various aspects of hunting satisfaction.

- Fewer than one-half of respondents in each panel reported that any of the nine positive aspects of hunting that we examined were “high enough” for them to be satisfied. Majorities in both panels indicated that four positive aspects were “too low” for them to be satisfied: (1) their perception of the deer sex ratio (not enough males) and (2) buck age ratio (not enough older bucks), (3) the number of older bucks they saw while hunting, and (4) their perception of the opportunity to harvest an older buck. About one-quarter to one-third of respondents in both panels indicated that each of the nine positive aspects we examined was at the minimum level they needed to be satisfied.
- Fewer than one-half of respondents in each panel reported that any of the four negative aspects of hunting that we examined were “low enough” for them to be satisfied. No more than one-third of respondents, however, indicated that each of the four negative aspects were “too high.” About one-third of respondents in each panel indicated that each of the four negative aspects was at the maximum level they could tolerate and still be satisfied.

The following bullets report general findings about hunters' expectations, behavioral intentions, and preference for the future of antler restriction regulations in the four pilot WMUs.

- A majority of respondents from each panel indicated that, under the antler restrictions, their expectations were not met for: (1) the number of older, larger-antlered bucks they saw while hunting, (2) the number of antlered bucks seen compared to the number of antlerless deer, and (3) their opportunities to shoot a larger-antlered buck. About one-half of the respondents from the two panels reported their expectations were met and one-half reported their expectations were not met for two other aspects that we examined: (1)

the total number of antlered bucks of any size seen while hunting, and (2) their perceived chances of shooting a buck.

- Most respondents (65% for the 3C/3J Panel and 78% for the 3H/3K Panel) have a positive attitude towards voluntarily passing up younger, smaller antlered buck in areas without antler restrictions. More respondents agreed than disagreed that hunting under antler restrictions in the pilot WMUs had made them more likely to pass-up younger bucks in places without restrictions.
- The pilot antler restriction program has had little influence on hunters' willingness to apply for or try to fill deer management permits (DMPs).
- Continuing the pilot program as it currently operates is "very acceptable" or "moderately acceptable" to 62% of 3C/3J respondents and 80% of 3H/3K respondents. The idea of discontinuing antler restrictions and emphasizing voluntary restraint against shooting younger bucks is "not at all acceptable" to 47% of 3C/3J respondents and 61% of 3H/3K respondents. Overall, majorities in both panels expressed a preference for continuing the program "as is."

## **ACKNOWLEDGMENTS**

We are grateful for guidance and assistance from staff with the New York State Department of Environmental Conservation, especially J. Hurst, E. Kautz, and K. Clarke. K. Smith with the Human Dimensions Research Unit, Department of Natural Resources, Cornell University mailed the questionnaires and entered the data in preparation for statistical analysis. Staff with Cornell University's Survey Research Institute conducted the non-respondent telephone interviews.

Funding for this study was provided by the New York Federal Aid in Wildlife Restoration Grant WE-173-G.

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## INTRODUCTION

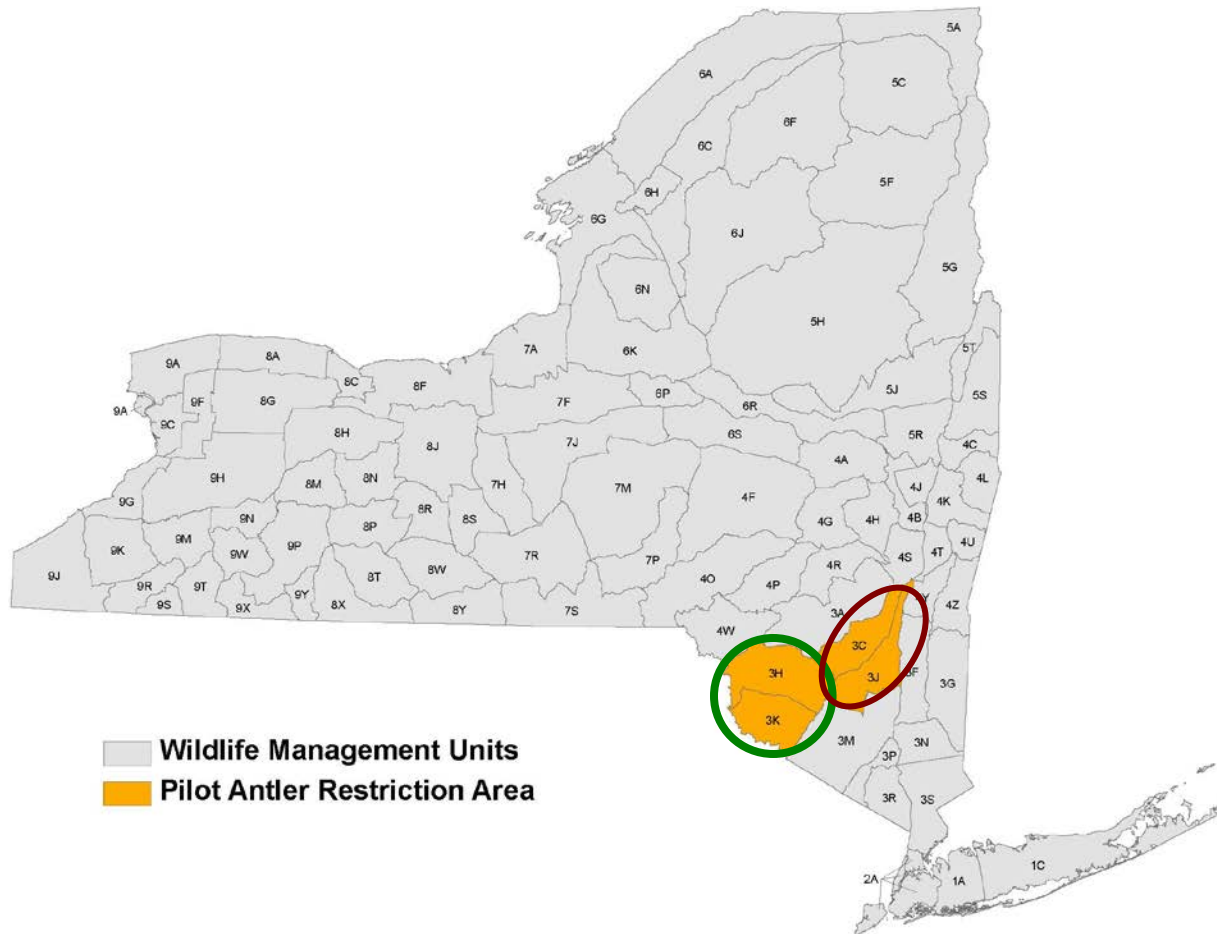
The New York State Department of Environmental Conservation (DEC) initiated a pilot program of antler restrictions<sup>1</sup> in wildlife management units (WMUs) 3C and 3J for the 2005 hunting season, and expanded the pilot program to include WMUs 3H and 3K in 2006 (Figure 1). As part an evaluation of the effects of the pilot program on hunter experiences and perceptions, staff with Cornell University's Human Dimensions Research Unit (HDRU) surveyed samples of hunters living and/or hunting in WMUs 3C and 3J after the 2005, 2006, and 2007 hunting seasons (Brown 2006, Enck and Brown 2008a, Enck and Brown 2008b, respectively). Hunters living or hunting in WMUs 3H and 3K were surveyed after the 2006 and 2007 hunting seasons.

The purpose of this current survey (following the 2010 season) was to add to the overall evaluation by monitoring and better understanding hunters' experiences and attitudes with respect to the pilot antler restrictions. Of particular interest was determining whether antler restrictions changed hunters' participation in the pilot WMUs or influenced their willingness to voluntarily pass-up shots at smaller-antlered bucks in areas without mandatory antler restrictions. We also wanted to determine the acceptability of continuing, discontinuing, or modifying the antler restriction regulations.

## METHODS

The main groups of interest for this survey included 474 persons living in WMUs 3C or 3J (3C/3J Panel) who had been surveyed previously about the pilot antler restrictions, and who had responded in at least one of the years in which they were surveyed (i.e., 2006, 2007, and/or 2008) and 280 persons living in WMUs 3H or 3K (3H/3K Panel) who had been surveyed previously about the pilot antler restrictions, and who had responded in at least one of the years in which they were surveyed (i.e., 2007, and/or 2008). Together, these two strata of 754 hunters allowed us to monitor experiences and attitudes of the same people over time.

To fully assess whether the antler restrictions either attracted hunters to the pilot WMUs or caused them to stop hunting there, we surveyed an additional 634 hunters who did not live in the pilot WMUs (Non-local Hunters). Non-local Hunters were split between those who had applied for a DMP in one of the pilot WMUs (n = 316) in 2004 (prior to antler restrictions) or 2010, and those who reported harvesting a deer in one of the WMUs (n = 318) in 2004 or 2010. These Non-local Hunters are included in the assessment of whether antler restrictions have caused a change in participation behavior, but are not combined with respondents from the two panels for the other results because the sampling frames for selecting these hunters differed substantially from the sampling frames for the panels.



**Figure 1. Location of Wildlife Management Units (WMUs) 3C and 3J (oval, mostly in Ulster County) and 3H and 3K (circle, mostly in Sullivan County) where pilot antler restrictions have been in place since 2005 and 2006, respectively.**

All 1,388 hunters in the four samples were mailed a questionnaire on 18 February 2011 (125 questionnaires were not deliverable). Reminder letters were mailed to survey nonrespondents on 25 February, 11 March, and 18 March. We received 757 completed questionnaires. These included: 281 (65.7%) from the 3C/3J Panel, 173 (65.8%) from the 3H/3K Panel, 140 (49.0%) from the DMP applicants, and 159 (55.6%) from the harvest reporters. In

<sup>1</sup> Antlered bucks must have  $\geq 3$  points on a side to be harvested legally by hunters  $\geq 17$  years of age; younger hunters are exempted.

addition, telephone surveys using a subset of the most important questions were completed with 200 nonrespondents to the mail surveys (100 from the two panels, and 100 from the DMP applicants and harvest reporters) between April 6 and 20, 2011 to determine if nonrespondents' experiences or attitudes differed from those of respondents to the mail survey. In general, nonrespondents were less likely to have hunted deer in 2010 (68% hunted), but otherwise reported similar levels of satisfaction and opinions about the antler restriction program as respondents. Non-local Hunters also reported levels of satisfaction and opinions about the pilot program that were similar to respondents from the two panels.

## RESULTS

### Hunting Participation

Antler restrictions had little influence on deer-hunting participation in the pilot WMUs for the majority of respondents from each stratum (Table 1). Very few respondents from any stratum were attracted to hunt in the pilot WMUs because of antler restrictions (2-9%), or stopped hunting in the pilot WMUs because of antler restrictions (3-8%).

**Table 1. Influence of antler restrictions on deer-hunting participation in the pilot WMUs.**

<u>Hunting participation</u>	Group		
	<u>3C/3J</u> <u>Panel</u> (%)	<u>3H/3K</u> <u>Panel</u> (%)	<u>Non-local</u> <u>Hunters</u> (%)
Did not hunt in the pilot WMUs before antler restrictions, but was attracted to hunt there because of the restrictions	2.3	3.9	8.9
Hunted in the pilot WMUs before antler restrictions, but now hunt <u>more days</u> there because of the restrictions	7.2	14.4	4.1
Antler restrictions have had no effect on my hunting participation	72.2	70.6	60.2
Hunted in the pilot WMUs before antler restrictions, but now hunt <u>fewer days</u> there because of the restrictions	12.2	7.8	18.7
Hunted in the pilot WMUs before antler restrictions, but stopped hunting there because of the restrictions	<u>6.1</u>	<u>3.3</u>	<u>8.1</u>
Column totals	100.0	100.0	100.0

About 60-70% of respondents from the 3C/3J panel, the 3H/3K panel and Non-local Hunters hunted deer in the pilot WMUs each year since the antler restrictions started (Table 2). About one in six respondents from each group had not hunted in the pilot WMUs since antler restrictions started. We do not know if these persons hunted there prior to the start of the pilot program. Consistent with the results in Table 1, relatively few respondents in any stratum either started hunting in the pilot WMUs sometime since the antler restriction pilot program began, or stopped hunting there since the pilot began.

**Table 2. Participation in the pilot WMUs during the 2005 through 2010 hunting seasons.**

---

Participation pattern	3C/3J Panel (%)	3H/3K Panel (%)	Non-local Hunters (%)
Hunted in one or more of the pilot WMUs every year since antler restrictions started	68.1	69.4	61.6
Have not hunted in pilot WMUs since antler restrictions	16.1	16.8	17.4
Started hunting consistently year-to-year in the pilot WMUs after the pilot began started	4.6	3.6	7.6
Hunted consistently in the pilot WMUs for $\geq 3$ years, but have not hunted there in last few years.	7.1	7.6	8.5
All other combinations of years hunted (mostly patterns of intermittent year-to-year hunting in the pilot WMUs)	4.1	2.6	4.9
	100.0	100.0	100.0

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### Satisfaction with Hunting Experiences

A plurality of respondents in each stratum (45-51%) was satisfied with their overall deer-hunting experiences in 2010, whereas 29-35% were dissatisfied (Table 3). Satisfaction with buck-hunting experiences in 2010 season was nearly identical to satisfaction with overall experiences (Table 4). A higher percentage of hunters participating in the pilot WMUs (only slightly higher in 3C/3J) were satisfied with their buck-hunting experiences in 2010 than was found recently for deer hunters in DEC Regions 3 and 4 that includes the pilot WMUs, but where most WMUs do not have antler restrictions. Indeed, a statewide deer hunter survey conducted after the 2009 season revealed that 39% of hunters whose primary place to hunt deer was in DEC Regions 3 and 4 were satisfied with their buck-hunting experiences and 46% were dissatisfied (Enck et al. 2011).

Respondents from the two panels differed slightly in the magnitude of changes in satisfaction with their overall deer-hunting experiences (Table 5) and with their buck-hunting experiences (Table 6) since antler restrictions began. Higher percentages of respondents from the 3H/3K Panel compared to the 3C/3J Panel reported that their satisfaction had increased over time, as was the case throughout DEC Regions 3 and 4 (Enck and Brown 2008c, Enck et al. 2011). In general, pluralities of those who reported their satisfaction had increased indicated it had increased “greatly” whereas the magnitude of change for those whose satisfaction decreased was more evenly split among “slightly,” “moderately,” and “greatly.” These patterns did not differ greatly between overall deer hunting and buck hunting more specifically.

**Table 3. Level of satisfaction with overall deer-hunting experiences in the pilot WMUs during the 2010 hunting season.**

<u>Satisfaction</u>	Strata	
	<u>3C/3J</u> <u>Panel</u> (%)	<u>3H/3K</u> <u>Panel</u> (%)
Greatly satisfied	16.7	26.6
Moderately satisfied	18.6	19.4
Slightly satisfied	9.5	5.0
Neither satisfied nor dissatisfied	19.9	19.4
Slightly dissatisfied	12.7	12.2
Moderately dissatisfied	6.8	5.0
Greatly dissatisfied	15.8	12.2
	100.0	100.0

**Table 4. Level of satisfaction with buck-hunting experiences in the pilot WMUs during the 2010 hunting season.**

<u>Satisfaction</u>	Strata	
	<u>3C/3J</u> <u>Panel</u> (%)	<u>3H/3K</u> <u>Panel</u> (%)
Greatly satisfied	15.1	27.3
Moderately satisfied	17.4	16.5
Slightly satisfied	9.6	7.9
Neither satisfied nor dissatisfied	18.3	19.4
Slightly dissatisfied	11.9	8.6
Moderately dissatisfied	8.2	5.0
Greatly dissatisfied	19.6	15.1
	100.0	100.0



**Table 5. Change in satisfaction with overall deer-hunting experiences since antler restrictions began in the pilot WMUs.**

<u>Change in satisfaction</u>	Strata	
	3C/3J <u>Panel</u> (%)	3H/3K <u>Panel</u> (%)
Greatly increased	17.5	16.3
Moderately increased	12.2	21.3
Slightly increased	10.9	13.5
No change	23.6	27.7
Slightly decreased	12.7	7.1
Moderately decreased	9.6	6.4
Greatly decreased	13.5	7.8
	100.0	100.0

**Table 6. Change in satisfaction with buck-hunting experiences since antler restrictions began in the pilot WMUs.**

<u>Change in satisfaction</u>	Strata	
	3C/3J <u>Panel</u> (%)	3H/3K <u>Panel</u> (%)
Greatly increased	16.6	22.5
Moderately increased	11.8	18.3
Slightly increased	11.4	14.8
No change	24.0	25.4
Slightly decreased	12.2	5.6
Moderately decreased	9.2	4.9
Greatly decreased	14.8	8.5
	100.0	100.0

## Factors Affecting Hunters' Satisfaction

One-half or more of respondents from the two panels indicated that four factors were below the thresholds that enabled them to be satisfied: (1) their perception of the deer sex ratio (not enough males) and (2) buck age ratio (not enough older bucks), (3) the number of older bucks they saw while hunting, and (4) their perception of the opportunity to harvest an older buck (Table 7). Respondents from the 3C/3J and 3H/3K panels were consistent in their estimates of the deer sex ratio (about one-quarter antlered bucks and three-quarters antlerless deer) and buck age ratio (about two-thirds younger bucks and one-third older bucks).

Three additional factors associated with hunting satisfaction were each “too low” for between 40-50% of respondents: (1) total number of antlered bucks seen, (2) total number of deer seen, and (3) their perception of the freedom of choice they had to take the buck they wanted (Table 8). For two factors, more respondents indicated that experienced levels were “high enough” for them to be satisfied than indicated experienced levels were “too low”: (1) perceived amount of protection afforded young bucks, and (2) perceived sense of being safe because other hunters had to be more careful about whether a buck met the antler restriction requirements before they could shoot (Table 9).

Among possible negative aspects of hunting, respondents' frustration with the level at which they perceived other hunters to not be complying with the antler restrictions was “too high” for about one-third to be satisfied (Table 10). Indeed, respondents believed that 17-18% of hunters who harvested a buck shot one that was “too small.” In addition to frustration about noncompliance, 23-30% of respondents also reported that the difficulty they experienced in determining whether bucks they saw were legal to shoot was “too high.”

A majority of respondents indicated that, under the antler restrictions, their expectations were not met for three aspects of their hunting experiences: (1) the number of older, larger-antlered bucks they saw while hunting, (2) the number of antlered bucks seen compared to the number of antlerless deer, and (3) their opportunities to shoot a larger-antlered buck (Table 11). Respondents in the two panels reported slight differences about whether their expectations were met for two other aspects that we examined, with slightly more hunters from the 3H/3K Panel than the 3C/3J Panel indicating their expectations were met for: (1) the total number of antlered bucks of any size seen while hunting, and (2) their perceived chances of shooting a buck.

**Table 7. Positive aspects of hunters' experiences for which approximately one-half or more of respondents were dissatisfied.**  
**(Percents total across rows.)**

Factors affecting satisfaction (Stratum)	Far too low for me to be satisfied %	Too low for me to be satisfied %	Total dissatisfied %	Just at the minimum I need to be satisfied %	More than I need to be satisfied %	Much more than I need to be satisfied %	Total satisfied %
<b>Number of antlered bucks compared to number of antlerless deer I saw (deer sex ratio)</b>							
3C/3J Panel	33.0	24.7	57.7	25.3	14.3	2.7	17.0
3H/3K Panel	40.5	22.4	62.9	19.0	11.2	6.9	18.1
<b>Number of older, larger-antlered bucks I saw</b>							
3C/3J Panel	42.9	15.3	58.2	17.5	17.5	6.8	24.3
3H/3K Panel	32.2	17.8	50.0	24.6	16.9	8.5	25.4
<b>Number of older bucks compared to number of younger bucks I saw (buck age ratio)</b>							
3C/3J Panel	37.0	17.7	54.7	22.7	19.3	3.3	22.6
3H/3K Panel	34.5	17.2	51.7	28.4	12.9	6.9	19.8
<b>My opportunity to shoot a large-antlered buck</b>							
3C/3J Panel	40.4	13.1	53.5	26.2	15.3	4.9	20.2
3H/3K Panel	34.2	16.2	50.4	24.8	17.9	6.8	24.7

**Table 8. Positive aspects of hunters' experiences for which 40-50% of respondents were dissatisfied. (Percents total across rows.)**

Factors affecting satisfaction (Stratum)	Far too low for me to be satisfied %	Too low for me to be satisfied %	Total dissatisfied %	Just at the minimum I need to be satisfied %	More than I need to be satisfied %	Much more than I need to be satisfied %	Total satisfied %
<b>Total number of antlered bucks I saw</b>							
3C/3J Panel	31.3	17.9	49.2	19.6	22.9	8.4	31.3
3H/3K Panel	28.8	18.6	47.4	22.0	19.5	11.0	30.5
<b>My freedom of choice about which buck I could harvest</b>							
3C/3J Panel	35.2	9.3	44.5	28.6	13.7	13.2	26.9
3H/3K Panel	25.0	16.4	41.4	28.4	18.1	12.1	30.2
<b>Total number of deer I saw</b>							
3C/3J Panel	29.6	11.2	40.8	25.1	22.9	11.2	34.1
3H/3K Panel	28.1	14.9	43.0	23.7	20.2	13.2	33.4

**Table 9. Positive aspects of hunters' experiences for which more respondents were satisfied than dissatisfied. (Percents total across rows.)**

Factors affecting satisfaction (Stratum)	Far too low for me to be satisfied %	Too low for me to be satisfied %	Total dissatisfied %	Just at the minimum I need to be satisfied %	More than I need to be satisfied %	Much more than I need to be satisfied %	Total satisfied %
<b>Level of protection from harvest that I felt young bucks were given</b>							
3C/3J Panel	11.8	13.5	25.3	32.6	24.2	18.0	42.2
3H/3K Panel	16.7	11.4	28.1	27.2	26.3	18.4	44.7
<b>Level of safety I felt knowing that other hunters must carefully assess if a buck is legal before they shoot at it</b>							
3C/3J Panel	11.1	8.3	19.4	42.2	25.6	12.8	38.4
3H/3K Panel	8.7	17.4	26.1	28.7	25.2	20.0	45.2

**Table 10. Negative aspects of hunters' experiences compared with their level of tolerance for those aspects. (Percents total across rows.)**

Factors affecting satisfaction (Stratum)	Far more than I could tolerate and still be satisfied %	A little more than I could tolerate and still be satisfied %	Total dissatisfied %	Just at the limit of what I could tolerate to be satisfied %	A little below what I could tolerate and still be satisfied %	Plenty low enough for me to be satisfied %	Total satisfied %
<b>Frustration that other hunters were not complying with antler restrictions</b>							
3C/3J Panel	15.3	21.0	36.3	32.4	13.6	17.6	31.2
3H/3K Panel	13.3	20.4	33.7	42.5	14.2	9.7	23.9
<b>Difficulty I had figuring out if bucks I saw were legal to shoot</b>							
3C/3J Panel	14.2	15.9	30.1	33.5	19.3	17.0	36.3
3H/3K Panel	5.3	17.7	23.0	36.3	24.8	15.9	40.7
<b>Pressure to shoot the first legal buck I saw instead of waiting for one I would rather shoot</b>							
3C/3J Panel	15.8	10.2	26.0	33.3	14.1	26.6	40.7
3H/3K Panel	14.4	10.8	25.2	34.2	18.9	21.6	40.5
<b>Crowding by other hunters</b>							
3C/3J Panel	5.6	11.2	16.8	42.5	19.0	21.8	40.8
3H/3K Panel	3.5	13.0	16.5	35.7	25.2	22.6	47.8

**Table 11. Comparison of hunters' expectations and experiences for five aspects of deer hunting. (Percents total across rows.)**

Factors affecting satisfaction (Stratum)	Much lower than I expected %	A little lower than I expected %	Expectations <u>not</u> met %	About what I expected %	A little higher than I expected %	Much higher than I expected %	Expectations met or <u>exceeded</u> %
<b>Number of older, larger-antlered bucks I saw while hunting</b>							
3C/3J Panel	43.7	19.7	63.4	19.7	12.6	4.4	36.6
3H/3K Panel	35.7	18.3	54.0	19.1	19.1	7.8	46.0
<b>Number of bucks seen compared to number of does (deer sex ratio)</b>							
3C/3J Panel	40.4	14.2	54.6	33.3	8.7	3.3	45.3
3H/3K Panel	39.1	16.5	55.6	20.9	18.3	5.2	44.4
<b>My opportunity to shoot larger- antlered buck</b>							
3C/3J Panel	43.5	12.0	55.5	21.7	15.2	7.6	44.5
3H/3K Panel	36.2	14.7	50.9	17.2	20.7	11.2	49.1
<b>Number of bucks (any age) I saw when hunting</b>							
3C/3J Panel	37.7	16.4	54.1	27.3	12.6	6.0	45.9
3H/3K Panel	30.4	18.3	48.7	27.8	17.4	6.1	51.3
<b>My chances of shooting a buck</b>							
3C/3J Panel	35.0	16.4	51.4	33.3	11.5	3.8	48.6
3H/3K Panel	23.3	20.7	44.4	31.9	16.4	7.8	55.6

## Attitudes Toward Voluntary Restraint in lieu of Antler Restrictions

In addition to intolerable levels of frustration expressed by respondents about other hunters not complying with antler restrictions (Table 10), >70% of respondents believed that someone else will shoot a small-antlered buck if they pass-up a shot at it. Despite these two findings, most respondents still have a positive attitude towards showing voluntary restraint in areas without antler restrictions (Table 12). In particular, three beliefs about hunting that we measured contribute to positive attitudes toward voluntary restraint (Table 13): (1) being a deer hunter means being selective about the kind of deer one shoots (i.e., is part of their identity as a deer hunter), (2) if I shoot only larger-antlered bucks, I will be contributing to a better mix of younger and older bucks in the area, and (3) passing up shots at smaller-antlered bucks is a way of expressing my freedom of choice about which buck I shoot. Conversely, relatively few hunters accrue respect or prestige from other hunters by harvesting a young buck compared to not harvesting any buck at all (Table 13). Overall, more respondents agreed than disagreed that hunting under antler restrictions in the pilot WMUs had made them more likely to pass-up younger bucks in places without restrictions.

**Table 12. Hunters’ attitudes toward showing voluntary restraint by passing-up shots at young bucks with small antlers in places without mandatory antler restrictions.**

Attitude	Strata	
	3C, 3J Panel (%)	3H, 3K Panel (%)
Very positive	36.1	47.3
Moderately positive	15.5	21.3
Slightly positive	13.3	10.0
Neither positive nor negative	13.7	14.7
Slightly negative	3.2	0.7
Moderately negative	2.8	2.0
Very negative	6.3	4.0
	100.0	100.0

Summary statistics from the table:  
 - Positive attitudes (Very, Moderately, Slightly positive): 64.9% (3C, 3J) and 78.3% (3H, 3K)  
 - Negative attitudes (Slightly, Moderately, Very negative): 12.3% (3C, 3J) and 6.7% (3H, 3K)



**Table 13. Respondents' agreement or disagreement with statements about possible factors affecting their willingness to voluntarily pass-up shots at young bucks with smaller antlers in places without mandatory antler restrictions. (Percents total across rows.)**

Possible factors affecting willingness to pass-up smaller-antlered bucks (Stratum)	Strongly disagree %	Disagree %	Total disagree %	Neither agree nor disagree %	Agree %	Strongly agree %	Total agree %
<b>If I voluntarily pass-up a small-antlered buck, someone else will probably shoot it</b>							
3C/3J Panel	2.4	6.4	8.8	18.3	47.8	25.1	72.9
3H/3K Panel	2.0	11.3	13.3	14.6	46.4	25.8	72.2
<b>Being a deer hunter means being selective about the type of antlered buck one shoots</b>							
3C/3J Panel	11.6	10.8	22.4	18.3	31.9	27.5	59.4
3H/3K Panel	4.6	6.6	11.0	17.8	35.5	35.5	71.0
<b>Taking a small-antlered buck will get me more respect from my hunting companions than taking an antlerless deer</b>							
3C/3J Panel	26.2	26.6	52.8	29.4	12.3	5.6	17.9
3H/3K Panel	34.2	26.3	60.5	30.9	7.2	1.3	8.5
<b>If I shoot only large-antlered bucks, I will be contributing to a better mix of younger and older bucks in the area</b>							
3C/3J Panel	9.5	13.5	23.0	24.2	30.6	22.2	52.8
3H/3K Panel	6.6	7.9	14.5	23.7	30.9	30.9	61.8
<b>Shooting only larger-antlered bucks is consistent with my idea of what it means to be a deer hunter</b>							
3C/3J Panel	20.2	17.4	37.6	22.5	20.6	19.4	40.0
3H/3K Panel	11.8	15.1	26.9	23.0	23.7	26.3	50.0

<b>Table 13. Continued.</b>							
Possible factors affecting willingness to pass-up smaller-antlered bucks (Stratum)	Strongly disagree %	Disagree %	Total disagree %	Neither agree nor disagree %	Agree %	Strongly agree %	Total agree %
<b>Hunting under antler restrictions in the pilot WMUs has made me more likely to voluntarily pass-up shots at small bucks if I were to hunt in places without antler restrictions</b>							
3C/3J Panel	16.5	14.5	31.0	23.8	30.6	14.5	45.1
3H/3K Panel	8.0	9.3	17.3	22.7	38.0	22.0	60.0
<b>Passing-up shots at small-antlered bucks is a way to express my freedom of choice about which buck to shoot</b>							
3C/3J Panel	8.4	10.0	18.4	19.9	38.2	23.5	61.7
3H/3K Panel	4.6	2.6	7.2	21.7	38.2	32.9	71.7

## Willingness to Harvest Antlerless Deer

We assessed the influence of the antler restriction pilot program on hunters' willingness to apply for DMPs (Table 14) and willingness to try to fill any DMPs they receive (Table 15). In general, the percentage of respondents expressing each level of willingness has not changed in relation to the antler restriction pilot program. Hunters from the 3H/3K Panel were slightly more willing to apply for and to try to fill a DMP than hunters from the 3C/3J Panel.

**Table 14. Changes in willingness to apply for DMPs prior to and since experiencing the pilot antler restrictions.**

<u>Level of willingness</u>	<u>3C/3J Panel</u>		<u>3H/3K Panel</u>	
	<u>Prior to antler restrictions (%)</u>	<u>Since antler restrictions (%)</u>	<u>Prior to antler restrictions (%)</u>	<u>Since antler restrictions (%)</u>
Not at all willing	10.1	13.1	9.2	11.4
Slightly willing	11.3	13.9	9.9	12.8
Moderately willing	24.2	21.2	23.0	20.8
Very willing	<u>54.4</u>	<u>51.6</u>	<u>57.9</u>	<u>55.0</u>
	100.0	100.0	100.0	100.0

**Table 15. Changes in willingness to try to fill DMPs before and since experiencing the pilot antler restrictions.**

<u>Level of willingness</u>	<u>3C/3J Panel</u>		<u>3H/3K Panel</u>	
	<u>Prior to antler restrictions (%)</u>	<u>Since antler restrictions (%)</u>	<u>Prior to antler restrictions (%)</u>	<u>Since antler restrictions (%)</u>
Not at all willing	12.7	15.4	8.7	9.3
Slightly willing	18.0	13.8	16.1	15.3
Moderately willing	29.5	29.2	27.5	26.7
Very willing	<u>39.8</u>	<u>41.7</u>	<u>47.7</u>	<u>48.7</u>
	100.0	100.0	100.0	100.0

## Acceptability of Possible Future Management Actions

Continuation of the pilot program as it currently operates is “very acceptable” to a plurality or majority of respondents from both panels (Table 16). The idea of discontinuing antler restrictions and emphasizing voluntary restraint against shooting younger bucks is “not at all acceptable” to a plurality or majority in both panels. Respondents expressed split opinions about modifying the program to protect yearling bucks in a way that did not include antler restrictions. Overall, majorities in both panels prefer continuing the program “as is” (Table 17).

**Table 16. Acceptability of possible future management directions for the pilot WMUs.**

Possible future direction for antler restriction program (Stratum)	Very acceptable (%)	Moderately acceptable (%)	Slightly acceptable (%)	Not at all acceptable (%)	Row totals (%)
<b>DEC <u>continues</u> the pilot antler restriction program as is in WMUs 3C, 3J, 3H and 3K</b>					
3C/3J Panel	45.9	16.0	15.2	23.0	100.0
3H/3K Panel	62.0	17.7	10.8	9.5	100.0
<b>DEC <u>modifies</u> the pilot program in WMUs 3C, 3J, 3H, and 3K by protecting yearling bucks in some way other than antler restrictions</b>					
3C/3J Panel	21.3	24.5	28.1	26.1	100.0
3H/3K Panel	17.4	26.5	25.2	31.0	100.0
<b>DEC <u>discontinues</u> the pilot program and instead emphasizes voluntary restraint on the part of hunters to pass-up smaller-antlered bucks</b>					
3C/3J Panel	25.0	14.3	13.5	47.2	100.0
3H/3K Panel	17.3	7.7	13.5	61.5	100.0

**Table 17. Preferences for possible future management directions in the pilot WMUs.**

<u>Stratum</u>	<u>Continue antler restrictions as it currently is</u> (%)	<u>Modify program to protect yearling bucks another way</u> (%)	<u>Discontinue antler restrictions, emphasize voluntary restraint</u> (%)	<u>Row totals</u> (%)
3C/3J Panel	55.7	14.1	30.2	100.0
3H/3K Panel	70.5	16.8	12.8	100.0

## Influence of the Pilot Program on Attitudes toward DEC

In general, DEC's implementation and evaluation of a pilot program focused on antler restrictions as a way of protecting yearling bucks from harvest has had a positive influence on hunters' attitudes toward DEC (Table 18). More respondents reported increases than decreases in their confidence in DEC's ability to manage deer, and their sense that DEC listens to hunters' interests and takes those interests into account when setting regulations. Among hunters from the 3H/3K Panel, twice as many expressed an increase in their overall satisfaction with the deer management program than reported a decrease in satisfaction. Hunters from the 3C/3J Panel were split about whether their satisfaction had increased or decreased.

**Table 18. Influence of DEC' use of the pilot program to experimentally evaluate hunters' satisfaction with antler restrictions on hunters' perceptions of DEC's deer management program.**

Perceptions about DEC's deer management program (stratum)	Decreased (%)	No change (%)	Increased (%)	Row totals (%)
<b>My confidence in DEC's ability to manage deer</b>				
3C/3J Panel	19.8	56.1	24.0	100.0
3H/3K Panel	17.2	51.6	31.2	100.0
<b>My sense that DEC is willing to listen to deer hunters' interests</b>				
3C/3J Panel	18.4	42.9	38.7	100.0
3H/3K Panel	17.6	34.6	47.8	100.0
<b>My sense that DEC takes deer hunters' interests into account when setting hunting regulations</b>				
3C/3J Panel	21.8	45.6	32.6	100.0
3H/3K Panel	18.5	46.5	35.0	100.0
<b>My satisfaction with DEC's deer management program</b>				
3C/3J Panel	27.1	43.5	29.4	100.0
3H/3K Panel	22.2	34.8	43.0	100.0

## SUMMARY

In general, more hunters in the 3H/3K Panel than in the 3C/3J Panel report being satisfied with their experiences, as we have consistently found in other surveys of hunters participating in the pilot WMUs (Brown 2006, Enck and Brown 2008a, Enck and Brown 2008b). Dissatisfaction among hunters in both panels seems related both to unmet expectations about hunting experiences under antler restrictions and levels of positive aspects of hunting that were “too low” for the hunters to be satisfied. Negative aspects of hunting generally are not experienced at levels “too high” for hunters to be satisfied, with the exception of their frustration with what they perceive as non-compliance by other hunters with the restrictions.

Many respondents indicated that their experiences with antler restrictions in the pilot WMUs have increased their willingness to voluntarily pass up shots at smaller-antlered bucks in places without antler restrictions. Hunters’ willingness to apply for and try to fill DMPs did not change because of their experiences under antler restrictions.

Despite many hunters having dissatisfying experiences, unmet expectations, and insufficient levels of desirable hunting experiences, a majority of respondents prefer to have the antler restriction program continue as it currently exists. In addition, DEC’s willingness to implement antler restrictions on a pilot basis generally has had a positive effect on hunters’ attitudes towards DEC and the deer management program.

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