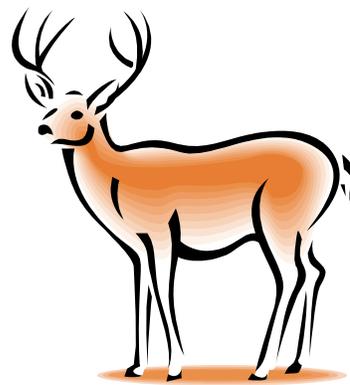

Deer Hunters' Assessment of Antler Restrictions in Wildlife Management Units (WMUs) 3C, 3J, 3H, and 3K During the 2007 Hunting Season



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Prepared by:

Jody W. Enck and Tommy L. Brown
Human Dimensions Research Unit
Department of Natural Resources
Cornell University

EXECUTIVE SUMMARY

Introduction

The New York State Department of Environmental Conservation (DEC) initiated a pilot program of antler restrictions (only adult bucks with ≥ 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

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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.

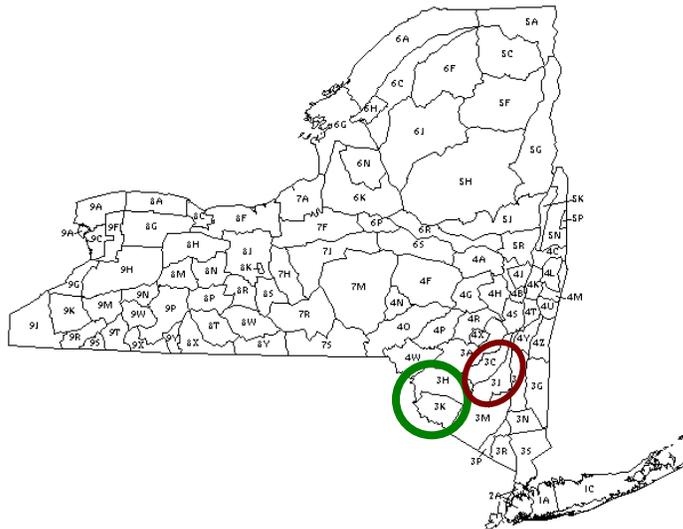


Figure 1. Location of Wildlife Management Units (WMUs) 3C and 3J (oval, mostly in Ulster County) and 3H and 3K (circle, mostly in Sullivan County) where pilot antler restrictions have been in place since 2005 and 2006, respectively.

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 ≥ 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 ≥ 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>%^a</u>	<u>Mean</u>	<u>S.E.</u>	<u>n</u>	<u>%^a</u>	<u>Mean</u>	<u>S.E.</u>
Early archery								
(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
Regular firearms								
(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
Late special seasons								
(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
Total days hunted								
all deer seasons in 2007								
(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

^aPercent 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> ^a	<u>Mean</u>	<u>SE</u>	<u>n</u>	<u>Mean</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
Number of antlerless deer seen per day of hunting	185	2.0	0.165	131	7.0	2.053	-2.437	0.016 ^b
% vulnerable (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
index to willingness to shoot (of vulnerable, % that were shot at)	122	12.0	2.50	85	7.0	1.98	1.556	0.121
index to shooting effectiveness (of those shot at, % harvested)	50	82.0	5.70	32	81.0	6.75	0.055	0.956
index to shooting efficiency (total shots taken per antlerless deer harvested)	43	1.3	0.103	26	1.4	0.193	-0.411	0.680
# antlerless deer harvested per hunter	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			

^anumber of respondents.

^bdenotes 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^a</u>	<u>Mean</u>	<u>SE</u>	<u>n</u>	<u>Mean</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
Number of sub-legal bucks seen per day of hunting	182	0.4	0.041	131	2.86	1.70	-1.450	0.150
% vulnerable (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
index to willingness to shoot (of vulnerable, % that were shot at)	81	9.9	4.30	64	1.3	0.93	1.945	0.054
index to shooting effectiveness (of those shot at, % harvested)	12	75.0	13.1	5	80.0	20.0	-0.207	0.836
index to shooting efficiency (total shots taken per sub-legal buck harvested)	9	1.2	0.222	7	1.0	0.000	0.999	0.347
# sub-legal bucks^b harvested per hunter	respondents = 164			respondents = 116				
n, % harvested 0	154	93.9		112	96.6			
n, % harvested 1	10	6.1		4	3.4			

^anumber of respondents.

^bYouth 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^a</u>	<u>Mean</u>	<u>SE</u>	<u>n</u>	<u>Mean</u>	<u>SE</u>	<u>t-value</u>	<u>p</u>
Number of mature, legal bucks seen per day of hunting	186	0.1	0.014	131	0.9	0.762	-1.05	0.296
% vulnerable (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
index to willingness to shoot (of vulnerable, % that were shot at)	39	50.0	7.60	38	48.3	7.67	0.167	0.868
index to shooting effectiveness (of those shot at, % harvested)	41	78.0	6.54	29	69.0	8.74	0.824	0.413
index to shooting efficiency (total shots taken per mature, legal buck harvested)	31	1.1	0.05	20	1.1	0.10	0.122	0.905
# mature, legal bucks harvested per hunter	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			

^anumber 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>X²</u>	<u>p</u>
Skewed ^a 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		

^aSkewed 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 ^a	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>X²</u>	<u>p</u>
	<u>n</u>	<u>% of hunters</u>	<u>n</u>	<u>% of hunters</u>		
Skewed ^a 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		

^aSkewed 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 WMUs 3H-3K							
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 WMUs 3C-3J							
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 ²	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	52	48.1	23	21.3	46.5	<0.001
	Dissatisfied in 2007	58	82.9	10	14.3	2	2.9		
# 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	41	40.6	14	13.9	21.1	<0.001
	Dissatisfied in 2007	55	80.9	12	17.6	1	1.5		

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	82	41.0	43	21.5	41.1	<0.001
	Satisfied in 2007	18	17.3	51	49.0	35	33.7		
	Dissatisfied in 2007	45	65.2	20	29.0	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	10.9	0.001
	Satisfied in 2007	38	39.2	33	34.0	26	26.8		
	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	56	28.0	51	25.5	37.4	<0.001
	Satisfied in 2007	28	27.5	35	34.3	39	38.2		
	Dissatisfied in 2007	53	74.6	13	18.3	5	7.0		
Assurance from knowing that other hunters must pass up small bucks	All 3C-3J hunters	77	38.1	54	26.7	71	35.1	47.4	<0.001
	Satisfied in 2007	23	22.1	26	25.0	55	52.9		
	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 ²	p
Total # antlered bucks I saw	All 3H-3K hunters	70	48.6	46	31.9	28	19.4	32.9	<0.001
	Satisfied in 2007	22	28.2	31	39.7	25	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	15.0	<0.001
	Satisfied in 2007	47	60.3	21	26.9	10	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	19.1	<0.001
	Satisfied in 2007	45	60.0	19	25.3	11	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	18.2	<0.001
	Satisfied in 2007	36	48.0	31	41.3	8	10.7		
	Dissatisfied in 2007	45	84.9	6	11.3	2	3.8		

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.	
		n	%	n	%	n	%	X^2	p
Total # of deer I saw	All 3H-3K hunters	42	29.0	60	41.4	43	29.7	36.2	<0.001
	Satisfied in 2007	8	10.0	40	50.0	32	40.0		
	Dissatisfied in 2007	31	58.5	15	28.3	7	13.2		
Freedom to shoot any antlered buck that I want to shoot	All 3H-3K hunters	72	51.1	50	35.5	19	13.5	23.3	<0.001
	Satisfied in 2007	27	35.5	35	46.1	14	18.4		
	Dissatisfied in 2007	41	78.8	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	67	46.9	32	22.4	44	30.8	35.7	<0.001
	Satisfied in 2007	20	26.0	22	28.6	35	45.5		
	Dissatisfied in 2007	42	79.2	4	7.5	7	13.2		
Assurance from knowing that other hunters must pass up small bucks	All 3H-3K hunters	42	29.8	39	27.7	60	42.6	17.4	<0.001
	Satisfied in 2007	13	17.1	17	22.4	46	60.5		
	Dissatisfied in 2007	27	51.9	15	28.8	10	19.2		

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 ²	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	33	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	34	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	24	22.4	64	59.8		
	Dissatisfied in 2007	11	15.5	14	19.7	46	64.8		

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 ²	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 ²	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	24	32.0	39	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	%	n	%	n	%	X ²	p
# of sub-legal bucks shot by mistake by other hunters	All 3H-3K hunters	42	31.8	38	28.8	52	39.4	1.3	0.256
	Satisfied in 2007	19	26.4	21	29.2	32	44.4		
	Dissatisfied in 2007	18	36.0	14	28.0	18	36.0		
Anxiety about shooting an illegal buck	All 3H-3K hunters	28	20.4	32	23.4	77	56.2	6.3	0.012
	Satisfied in 2007	10	13.9	16	22.2	46	63.9		
	Dissatisfied in 2007	17	32.7	12	23.1	23	44.2		
Frustration about having to pass-up bucks with small antlers	All 3H-3K hunters	27	19.4	28	20.1	84	60.4	17.2	<0.001
	Satisfied in 2007	6	8.1	11	14.9	57	77.0		
	Dissatisfied in 2007	20	38.5	13	25.0	19	36.5		

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 raked 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-raked 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-raked 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 ≥ 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
3rd Year Survey
Ulster County



**Antler Restriction Pilot Program
3rd 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>	Increased <u>a lot</u>	Increased <u>a little</u>	No <u>change</u>	Decreased <u>a little</u>	Decreased <u>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 ≥ 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)			
	2006	2007	2008	row n
Consistently DISSATISFIED total = 72	DISSATISFIED	DECREASED	DECREASED	29
	DISSATISFIED	DECREASE	no data	15
	DISSATISFIED	no data	DECREASED	6
	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	8
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
	SATISFIED	no data	INCREASED	8
	SATISFIED	INCREASED	no data	10
	SATISFIED	INCREASED	INCREASED	17

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

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

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 ≥ 2 years to post-season mail surveys conducted in January 2006, 2007, and 2008.

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
