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# **The Future of Deer Hunting in New York State:**

## **Preliminary Assessment of Three Possible Regulation Changes**



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## INTRODUCTION

Deer managers with the New York State Bureau of Wildlife (BOW) are considering a number of changes in deer hunting regulations, both to shape and to respond to likely scenarios associated with the future of deer hunting in New York. Changes in regulations that managers currently are considering relate to 2 objectives—encourage hunter participation (i.e., by maintaining and enhancing hunter satisfaction) and increase harvest of antlerless deer. Because of the evolving deer management situation in the state, the kinds of regulations and incentives needed to meet these management objectives in the near future are likely to be different than those in place in 2000.

In recent years, control of the deer population has become increasingly difficult because the number of deer hunters in New York State has gradually declined, and their interest in applying for deer management permits (DMPs) seems not to have kept pace with availability of DMPs. Within the confines of the current regulatory system, it may be impossible to control the deer population in parts of the state with even the existing number of hunters (Curtis et al., 2000, Brown et al. 2000).

Any assessments of possible regulation changes needs to consider effects on hunter satisfaction/participation and antlerless harvest. Changes in regulations also must be evaluated with regard to their effect on important stakeholders other than hunters (e.g., landowners who provide access to private land for hunting). The current situation has led managers to consider some relatively substantial changes in regulations. For some of these proposed changes, managers believe adequate information is available to evaluate likely impacts. For other changes, information is not readily available.

For this reason, BOW asked the HDRU to synthesize and assess existing information relevant to three regulatory changes under consideration. These analyses are intended to help BOW evaluate whether additional information will be needed before making decisions about the changes. Three proposed regulations, the likely effects of which have not been investigated directly and therefore are uncertain, were examined:

- allowing hunters to consign their deer management permits to other hunters;
- changing opening day of the regular season from Monday to Saturday; and
- changing the number of bucks that hunters could take.

This document examines existing information relevant to each of these proposed changes, and describes results in three separate "sections." Each section provides insights about:

- whether hunters would be likely to accept the change and participate in the opportunities it creates;
- how the change may affect overall hunter satisfaction;

- how the change may affect antlerless deer harvest;
- how other stakeholders likely would be affected;
- considerations for communicating about the change with various stakeholders;
- possible influence of a new license package or point-of-sale system on hunter acceptance and participation; and
- additional information needed to reduce uncertainty about likely outcomes.

For each proposed change, we also identified what we consider to be the most important unanswered questions about potential effects of the change. The analyses combine empirical data with professional judgment, and some speculation where data and experience are lacking. It is important to note that our effort was intended only to determine some of the effects that might be associated with the three possible regulation changes examined. We did not try to relate these effects to achievement of management objectives. That task requires the insight of BOW staff.

## **SECTION ONE: DMP CONSIGNMENT**

Issuing deer management permits (DMPs)—special permits allowing hunters to take antlerless deer—is DEC's primary tool for controlling deer populations. Hunters apply for DMPs in specified regions—the number of DMPs issued depends on population objectives for each region. Currently, DMPs are nontransferable; they may only be filled by the hunter to whom they are issued. DEC is considering legalizing the consignment of DMPs from one hunter to another—hunters with unused DMPs could allow other hunters to fill them. DMP consignment would be intended to: (1) increase management capability by making it more likely that DMPs issued would be filled; and (2) provide additional recreational opportunities for hunters. Allowing DMP consignment, however, could also have drawbacks. This section examines the likely consequences of DMP consignment.

### **Hunter Acceptance and Participation**

**Analysis:** *Most hunters would accept and take advantage of regulations allowing DMP consignment.*

- Some 56% of 1997 New York State deer hunters supported DMP consignment, outnumbering opponents (27%) by a two-to-one margin (Lauber and Brown, 2000a).
- Support for DMP consignment has increased since 1993 when supporters (41% of hunters) and opponents (42%) were evenly divided (Enck and Decker, 1995).

- Nearly half (47%) of 1997 hunters said they would probably or definitely take advantage of DMP consignment—either by consigning a DMP or obtaining one. Only about one-quarter (27%) said they definitely would not participate (Lauber and Brown, 2000a).
- Using different methodology, Enck and Decker (1995) also estimated that about half (461/6) of hunters were likely to take advantage of DMP consignment. Hunters who would consign DMPs outnumbered those who wanted to obtain them by more than 3-to-1. Enck and Decker estimated that more than half of hunters (54%) would not participate in DMP consignment.

**Analysis:** *Approximately one-third of hunters could be expected to have their satisfaction increase and one-third could be expected to have their satisfaction decrease if DMP consignment were legalized.*

- In a study of 1993 hunters, Enck and Decker (1995) found that DMP consignment would increase satisfaction for 33% and decrease satisfaction for 36%.
- We do not know the degree to which satisfaction would increase or decrease for consignors compared to consignees. Hunters obtaining DMPs from others would benefit more than consignors with respect to time spent afield. Some 70% of 1997 hunters said it was important for hunting regulations to increase the amount of time they could spend afield (Lauber and Brown, 2000b). An interest in increasing hunting opportunities was correlated with support for DMP consignment in that study.
- We believe that concerns about crowding, safety, and a fair distribution of the deer harvest are reasons why some hunters' satisfaction would decrease. Each of these concerns was important to at least 60% of 1997 deer hunters (Lauber and Brown, 2000b).

### **Effect an Antlerless Deer Harvest**

**Analysis:** *Antlerless harvest would likely increase, although estimates of magnitude are difficult to make with confidence.*

- In a study of 1993 deer hunters, Enck and Decker (1995) estimated DMP consignment would increase the antlerless harvest by 50%<sup>1</sup>. To make this estimate, they multiplied the number of DMPs that hunters would try to obtain by the hunters' mean success at filling DMPs over the previous three years. This

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<sup>1</sup>Above the system in place at that time (i.e., hunters could apply for up to 2 DMPs, but only in a limited number of units). In the intervening 8 years, the number of DMPs available has increased while the number of deer hunters has decreased. These trends reduce the transferability of the 1993 findings to the contemporary situation.

estimate suggests that the impact of DMP consignment on antlerless deer harvest could be considerable.

- In calculating their estimate, Enck and Decker (1995) did not account for the possibilities that: (a) hunters might not be able to obtain all the DMPs they wanted; and (b) hunters' mean success at filling DMPs might decrease if they could obtain additional DMPs. Both of these factors could limit the increase in the antlerless deer harvest.
- If DMP consignment became legal, new inexperienced hunters might begin to apply for DMPs. For example, a hunter's spouse might apply intending to consign the DMP to the hunter (a practice that occurs illegally already). In general, we would expect DMPs obtained by new hunters to be less likely to be filled than DMPs obtained by existing hunters—they would effectively serve as additional DMPs for the existing hunters, and the rate of filling second DMPs is lower than the rate of filling first DMPs.

### Consideration of Other Stakeholders

**Analysis:** *Landowners could be affected both positively and negatively by DMP consignment.*

- In many parts of the state, landowners experience considerable property damage by deer, and data from Dutchess County shows that rural landowners experiencing deer damage tend to want a reduction in the deer herd (Lauber and Brown, 2000b). If DMP consignment caused antlerless harvest to increase, landowners would benefit.
- The unauthorized use of private property for deer hunting is both prevalent and a concern for landowners (Siemer and Brown, 1993; Lauber and Brown, 2000b). Even landowners experiencing high levels of deer damage may be concerned about unauthorized use of their property for hunting. The expected increase in the amount of time that hunters might spend afield if DMP consignment is allowed could increase the unauthorized use of private property. Conceivably, DMP consignment could cause authorized use of property to increase to such a degree that it would begin to exceed landowners' tolerance.

**Analysis:** *Hunter associates (Stedman and Decker, 1993), nonhunters closely associated with the social world of hunting, would experience some benefits from DMP consignment.*

- Consignment would allow additional opportunities for hunter associates to become involved in the social world of hunting. Some could buy licenses and apply for DMPs with the intention of consigning them to others. Doing so might give them the opportunity to experience both utilitarian benefits (e.g., eating



venison) and increased sense of affiliation in the social world of hunting (e.g., vicarious contribution of deer to the larder).

## **Communication Considerations**

***Analysis: Acceptance of DMP consignment by hunters and other stakeholders would be influenced by DEC communication.***

- Lauber and Brown (2000b) elicited 1997 deer hunters' opinions about DMP consignment—some hunters were presented with arguments for and against consignment, while others were not. Hunters who received the arguments for and against consignment had different opinions from those who did not.
- Lauber and Knuth (1996) showed that opinions about management alternatives are influenced not only by the pros and cons of these alternatives, but also by the extent to which they understand and accept the process used to make a decision. Lauber and Knuth (1996) recommended that communication about how a decision is being made be included as part of any important management decision-making process.
- The most effective communication strategies will rely on audience segmentation - identifying the important characteristics and concerns of different stakeholder groups and tailoring communication to meet their needs (Stout and Knuth, 1995; Lauber and Knuth, 1998; Chase et al., 1999).

## **Other Considerations**

***Analysis: The impacts of DMP consignment on antlerless deer harvest will depend on how it interrelates with other planned changes in the deer hunting system.***

- The new license package proposed for the 2001-2002 deer season would likely lower the number of DMP applications. Hunters who take as many deer as they want during the special seasons would not need to apply for DMPs. As a consequence, fewer DMP than expected might be applied for and thus available to consign, and the potential increase in the antlerless deer harvest from DMP consignment might be dampened.
- Because the computerized licensing system makes it easier to apply for DMPs, the number of DMP applications would likely increase—many "new" applicants would apply who had not done so previously. The likelihood of these new applicants filling or consigning their DMPs is hard to predict, however. We can only say that we would expect them to differ from previous applicants, but we do not yet have the data to say how they will differ.

## **Additional Information Needs**

We identified a number of unanswered questions about DMP consignment. The most important of these are:

- Would DMP consignment increase DMP applications among: (a) existing hunters who previously had not applied for DMPs; and (b) new hunters?
- Would DMP consignment increase hunters' willingness to fill DMPs?
- How would the new license package affect the use of DMPs and the impacts of consignment?
- How would the computerized licensing system affect the use of DMPs and the impacts of consignment?

Any time significant changes are made to hunting regulations, old findings about deer hunter behavior may no longer be valid. This is particularly true when several changes are made simultaneously. Introducing major changes on an experimental basis in limited areas would allow exploration of how these changes in combination with other factors would influence hunter behavior.

## **SECTION TWO: OPENING DAY ON SATURDAY**

Currently, the opening day of the regular deer season is the first Monday after November 15. Various proposals for changing the timing of opening day have been considered. One of these proposals would have opening day fall on a Saturday. The purpose of this switch would be to decrease the need for many people to miss work to participate on opening day and thereby increase the number of hunters who could go afield on opening day and, possibly, increase the deer harvest. This section explores the possible consequences of having opening day of the regular deer season fall on Saturday.

### **Hunter Acceptance and Participation**

***Analysis: If opening day were changed from Monday to Saturday, the number of hunters participating on the first two days of the season probably would increase.***

- Data from Enck and Decker's (1991) study of 1989 deer hunters shows that 15% of those who hunted did not hunt on opening day. We assume that at least some of these would have liked to hunt on opening day, but were limited by work or school obligations—constraints that would also limit their participation on the second day of the season. Others may have hunted fewer hours than they wanted because of work or school. Switching opening day to Saturday, therefore, would likely eliminate a constraint on participation for some hunters.

**Analysis:** *Satisfaction would increase for some hunters, but decrease for others.*

- Presumably, satisfaction would increase for hunters who wanted to hunt opening day, but who were unable to do so previously because of work or school. Some 55% of deer hunters think it is important to increase hunting opportunities for those who have trouble taking time off work (Lauber and Brown, 2000c).
- Crowding would increase if more hunters were afield on opening day, and this would decrease satisfaction for many hunters. Enck and Decker (1991) found that "seeing a lot of hunters" while hunting was a primary source of dissatisfaction for 1989 deer hunters. However, the number of deer hunters decreased roughly 8.1% between 1989 and 1997. Given this decline, switching to a Saturday opening day today likely would not result in a large increase in hunters afield. Enck and Decker's (1991) data indicate that about 535,400 deer hunters were in the field on opening day in 1989. If: (1) the same percentage of license buyers hunted in 1997 as in 1989; and (2) a Saturday opening day allowed approximately half of those who previously could not hunt on opening day to hunt—approximately the same number of hunters would have been in the field in 1997 with a Saturday opening day as in 1989 with a Monday opener. Nevertheless, even with the overall lower levels of participation on opening day in 1997 versus 1989, Lauber and Brown (2000c) reported that 60% thought it was important to reduce crowding in 1997.
- Switching opening day to Saturday could potentially disrupt some hunters' traditional preparations for the hunting season. Enck and Decker (1989) reported that getting ready for the hunting season (e.g., getting firearm or bow ready, practicing with a firearm or bow, planning a hunt, and preseason scouting) was a primary source of satisfaction for hunters. Indeed, More (1979) found that many hunters spent more time preparing for the season than hunting during it. A Monday opening day allows hunters to use the weekend before the season for these preparations. These preparations could be more difficult with a Saturday opening day.
- No direct data on deer hunters' preferences for opening day are available. However, Siemer et al. (1995) found that turkey hunters had mixed feelings about a weekend opening day. Thirty-one percent agreed that opening turkey season on a weekend would make it more enjoyable, but 39% disagreed. Fifty-eight percent agreed that a weekday opener made turkey hunting safer, while only 22% disagreed.

**Effect on Antlerless Deer Harvest**

**Analysis:** *A Saturday opening day could increase the antlerless deer harvest.*

- A series of assumptions allows us to estimate the potential increase in antlerless deer harvest with a Saturday opening day. Enck and Decker's (1991) data show that 75% of license buyers (85% of those who actually hunted in 1989) hunted for an average of 6 hours each on opening day; 83% of license buyers (94% of those who hunted) hunted for an average of 43 hours each for the rest of the season. For these analyses, we assume that these percentages have not changed since 1989.
- Using these figures and NYSDEC (2000) data on buck tags and DMPs filled during each day of the 1999 season, we can estimate that 5.4 bucks are taken and 6.0 DMP's are filled for each 1,000 hunter hours on opening day. Some 1.1 bucks are taken and 2.8 DMPs filled for each 1,000 hunter hours during the rest of the regular season. For these analyses, we assume that these harvest rates would not change if New York State switched its opening day from Monday to Saturday.
- If switching opening day from Monday to Saturday allowed approximately two-thirds of those who previously could not hunt on opening day to hunt—and if our other assumptions hold—the buck harvest would increase by 4% and the rate of filling DMPs would increase by 2%.

### **Consideration of Other Stakeholders**

***Analysis: Landowners could be affected both positively and negatively by a Saturday opening day.***

- In many parts of the state, landowners experience considerable property damage by deer, and data from Dutchess County shows that rural landowners experiencing deer damage tend to want a reduction in the deer herd (Lauber and Brown, 2000b). If a Saturday opening day caused antlerless harvest to increase, landowners would benefit.
- The unauthorized use of private property for deer hunting is both prevalent and a concern for landowners (Siemer and Brown, 1993; Lauber and Brown, 2000a). Even landowners experiencing high levels of deer damage may be concerned about unauthorized use of their property for hunting. The increase in the number of hunters afield expected on a Saturday opening day could increase the unauthorized use of private property. A possible caution associated with a Saturday opening day could be that even authorized use of property might increase to such a degree that it would begin to exceed landowners' tolerance.

### **Additional Information Needs**

The most important unanswered questions about switching to a Saturday opening day are:

- Would deer hunters support a switch to a Saturday opening day? We do not have information that allows accurate prediction of the balance of trade-offs between those hunting satisfactions that would increase versus those that would decrease (i.e., net satisfaction resulting from the change).
- What percentage of hunters do not hunt (or hunt less than they would like) on opening day because of work or school constraints? Would these hunters participate in a Saturday opening day? What effect would this have on the number of hunters afield on opening day?

### **SECTION THREE: CHANGES IN BAG LIMITS FOR BUCKS**

Both the current license package and the proposed license restructuring package provide a 1-buck bag limit for resident regular season-only hunters, SZ muzzleloader-only hunters, and regular season-SZ muzzleloader hunters. Both packages provide a 2-buck-bag limit for hunters who hunt during >1 special seasons (early archery, late archery, or muzzleloader) or >1 special season and the regular firearms season. Some resident hunters have expressed interest in having the opportunity to bag up to 3 bucks annually, as nonresidents currently have if they hunt during archery, muzzleloader, and regular firearms seasons. However, considering that deer populations are at or above target levels in some areas of the state, DEC may need to consider the possibility of restricting all hunters to a 1-buck bag limit and increasing opportunities for antlerless harvest in some areas.

This section explores possible influences of different buck bag limits on hunters' interest in harvesting antlerless deer. Only resident hunters are considered in this section. Where data existed, we conducted analyses for 3 groups: (1) all deer hunters, (2) those who currently exercise hunting options that have a 1-buck bag limit (referred to as "firearms-only" deer hunters), and (3) those who currently exercise hunting options that collectively have a 2-buck bag limit (referred to as "special-seasons" deer hunters). These distinctions among hunters help us understand the effects of modifying buck bag limits.

#### **Hunter Acceptance and Participation**

***Analysis: Limiting all resident hunters to a 1-buck bag limit statewide would change the bag limit of about 37% of deer hunters under the current license package and 45% of hunters under the proposed license restructuring package. Offering all deer hunters a 3-buck bag limit statewide would increase the buck bag limit for all resident hunters under the current license package, and 55% under the proposed package.***

- Under the current license package:  
63.5% of deer hunters have a 1-buck bag limit because they choose to hunt only during the regular firearms season (55.0%) or regular and muzzleloader seasons (8.3%), or muzzleloader only (0.2%).

36.5% of deer hunters have a 2-buck bag limit because they hunt in >1 special seasons or >1 special seasons and regular firearms season (Lauber and Brown 2000c).

No resident deer hunters have a 3-buck bag limit.

- Under the proposed license-restructuring package:

55.0% of hunters would have a 1-buck bag limit (firearms-only hunters), assuming no changes in implement types used due to the new package.

45.0% of hunters would have a >2-buck bag limit because they participate in at least 1 special season, assuming no changes in implement types used due to the new package.

**Analysis:** *The total number of resident deer hunters is unlikely to be influenced substantially by either restricting all hunters to a 1-buck bag limit or giving all hunters a 3-buck bag limit.*

- Although hunting opportunity in general can influence whether someone goes hunting in a given year, few deer hunters take advantage of existing bag limits. In 1997, only 36.5% of resident hunters with a 1-buck bag limit harvested a buck, and only 11.4% with a 2-buck bag limit harvested 2 bucks (Lauber and Brown 2000c).
- Data are lacking about the amount of influence that buck (or doe) bag limits have on participation by deer hunters in New York (Brown and Connelly 1994). Indeed, factors other than hunting regulations (i.e., miles of interstate highway [an index to access at the landscape scale], buck harvest the previous year, number of licenses sold the previous year, nonagricultural employment [an index to occupational distance from the land], and license cost) have the greatest influence on year-to-year participation. Although relevance to deer hunting is unknown, we note that, regulatory factors other than bag limit (e.g., season length, timing of the season) have been shown to have the greatest influence on whether duck hunters continue to hunt annually or drop out of waterfowl hunting altogether (Enck et al. 1993).

**Analysis:** *The percentage of resident firearms-only vs. special-seasons deer hunters is unlikely to be influenced substantially by either restricting all hunters to a 1-buck bag limit or giving all hunters a 3-buck bag limit.*

- The percentage of special-seasons hunters among license buyers increased from 30.4% in 1989 (Enck and Decker 1991) to 35.6% in 1994 (Enck and Decker 1995) to 45.0% in 1999 (Lauber and Brown 2000c). Reasons for this increase have not been studied explicitly in New York State. However, similar increases in

special-seasons participation have been documented in other states such as Pennsylvania where buck bag limits probably have not changed (USFWS 1997). This suggests that the increase in special-seasons hunters is related to factors other than buck bag limit.

**Analysis:** *No data are available to assess the affect of restricting or liberalizing buck bag limit on hunter acceptance or satisfaction.*

### Effect on Antlerless Deer Harvest

**Analysis:** *Antlerless harvest will decrease as buck bag limit is increased.*

- Both firearms-only and special-season hunters already can harvest more total deer and antlerless deer under the current system than they desire to harvest. On average, firearms only hunters desire to harvest 2.5 total deer (1.6 bucks, and 0.9 antlerless deer) while special-seasons hunters desire to harvest 3.1 total deer (1.7 bucks, and 1.6 antlerless deer) (Lauber and Brown 2000c).
- The fewer deer that hunters want to harvest, the more likely they are to have a buck preference. The impact of this buck preference is magnified because most hunters want to harvest relatively few deer as described above. This is true for both special-seasons hunters (Figure 1) and firearms-only hunters (Figure 2). Thus, increasing buck bag limit likely will decrease antlerless harvest as those who prefer to harvest bucks will meet their desires for total deer bagged with bucks.
- The same relationships occur at smaller scales—even for hunters who self-select to hunt on parcels requiring antlerless harvest prior to gaining an opportunity to hunt bucks. Starting in 1999 at the Arnot Forest, hunters were required to harvest 2 antlerless deer prior to harvesting a buck (if a hunter harvests an antlerless deer 1 year, that total carries over to subsequent years until the hunter bags 2 antlerless deer and becomes buck eligible). Most (65%) of the hunters responding to a survey in 2000 had a clear buck preference despite a willingness to harvest several antlerless deer in a single season (Enck and Brown In prep (a)). Only for hunters willing to harvest 5 antlerless deer in a single season (8% of all hunters) did, the proportion of hunters with an antlerless preference exceed the proportion with a buck preference (Figure 3).
- Deer hunters from the general public (i.e., not military personnel or staff) who hunt on the West Point Military Reservation have been required for several years to harvest 1 antlerless deer prior to harvesting a buck. Most (89%) of the hunters responding to a survey in 2000 had a clear preference to harvest bucks despite a willingness to harvest up to 5 antlerless deer in a single season

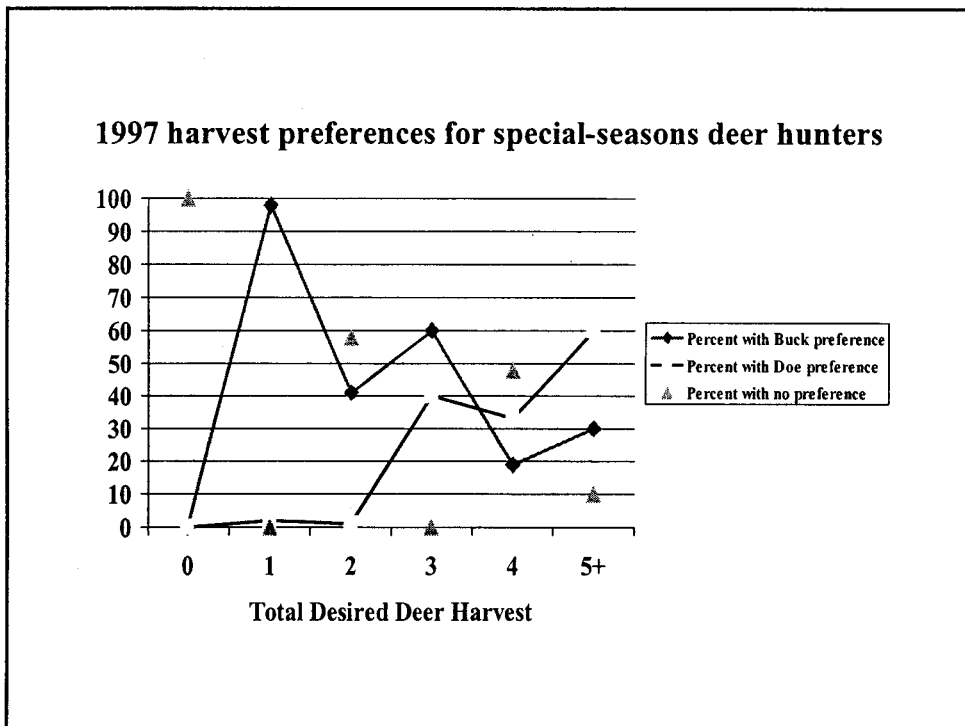


Figure 1. Comparison of total number of deer that 1997 New York special-seasons hunters said they were willing to harvest in a single season, with proportion of hunters who have a buck preference, doe preference, or no preference.



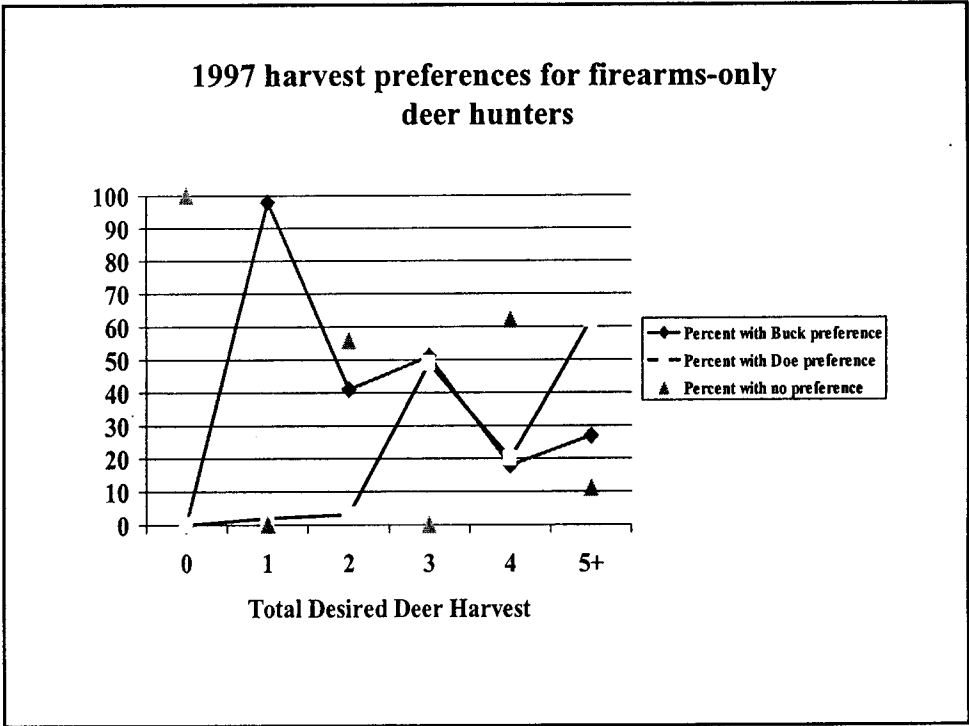


Figure 2. Comparison of total number of deer that 1997 New York firearms-only hunters said they were willing to harvest in a single season, with proportion of hunters who have a buck preference, doe preference, or no preference.

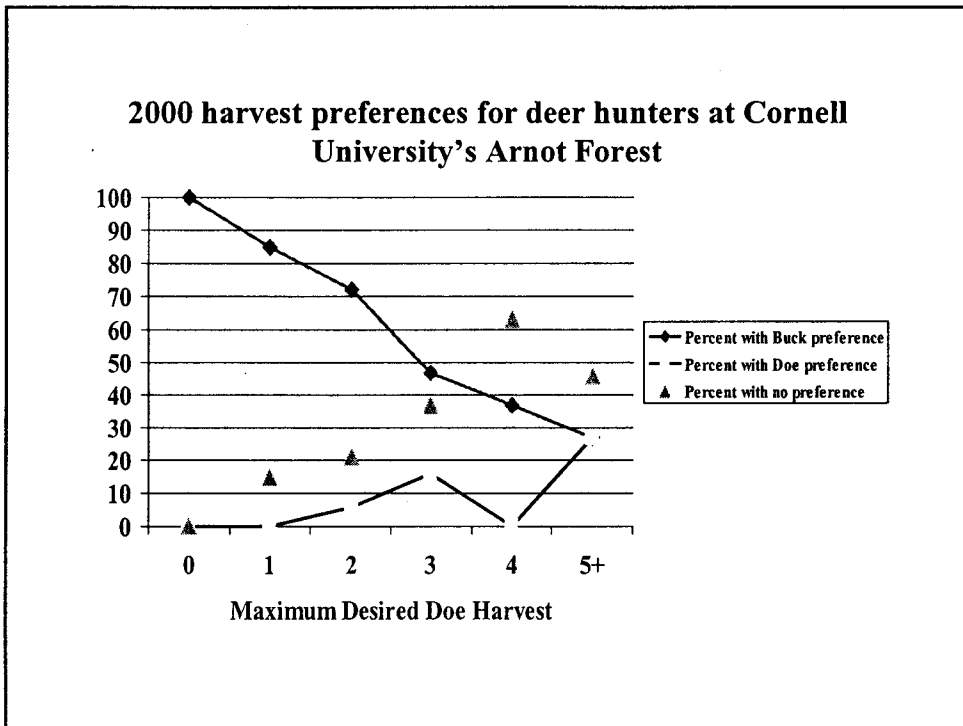


Figure 3. Comparison of number of antlerless deer that hunters at the Arnot Forest said they were willing to harvest in a single season, with proportion of hunters who have a buck preference, doe preference, or no preference.

(Enck and Brown In prep (b)). The proportion of hunters with an antlerless preference never exceeded the proportion with a buck preference regardless of the number of antlerless deer that the hunters were willing to harvest in a single season (Figure 4). Unlike statewide hunters or those hunting at the Arnot, the proportion of West Point hunters with an antlerless preference decreased as hunters' willingness to harvest antlerless deer increased, perhaps because they saw antlerless harvest as an incentive for getting a chance to take a mature buck.

***Analysis: Implementing a 1-buck bag limit for all hunters likely would increase antlerless harvest compared to the current situation.***

- In 1997, special-seasons hunters harvested more bucks and more antlerless deer on average compared to firearms-only hunters (Lauber and Brown 2000c). Thus, restricting special-seasons hunters to a 1-buck bag limit could shift some of their harvest to the antlerless segment of the deer population assuming they would harvest about the same number of total deer. If every special-seasons hunter who harvested 2 bucks in 1997 were restricted to a 1 buck bag limit and harvested 1 extra antlerless deer, the statewide total antlerless harvest would increase by about 25,000.
- Antlerless harvest likely would not change for firearms-only hunters given that they currently have a 1-buck bag limit.

***Analysis: Implementing either a 2-buck or 3-buck bag limit for all hunters likely would decrease antlerless harvest compared to the current system.***

- With a 2-buck bag limit, no change would be expected in antlerless harvest for special-seasons hunters because they already have a 2-buck bag limit.
- With a 2-buck bag limit, antlerless harvest by regular season hunters likely would decrease because of the relatively small total number of deer that hunters desire to harvest and their preference for harvesting bucks.
- In 1997, most firearms-only hunters (62.8%) desired to harvest <2 total deer (Lauber and Brown 2000c). Of these firearms-only hunters, 61.6% had a clear preference to shoot bucks.
- Among firearms-only hunters who desired to harvest 1 total deer and who had a buck preference, 24.0% harvested a buck and 24.0% harvested 1 antlerless deer.

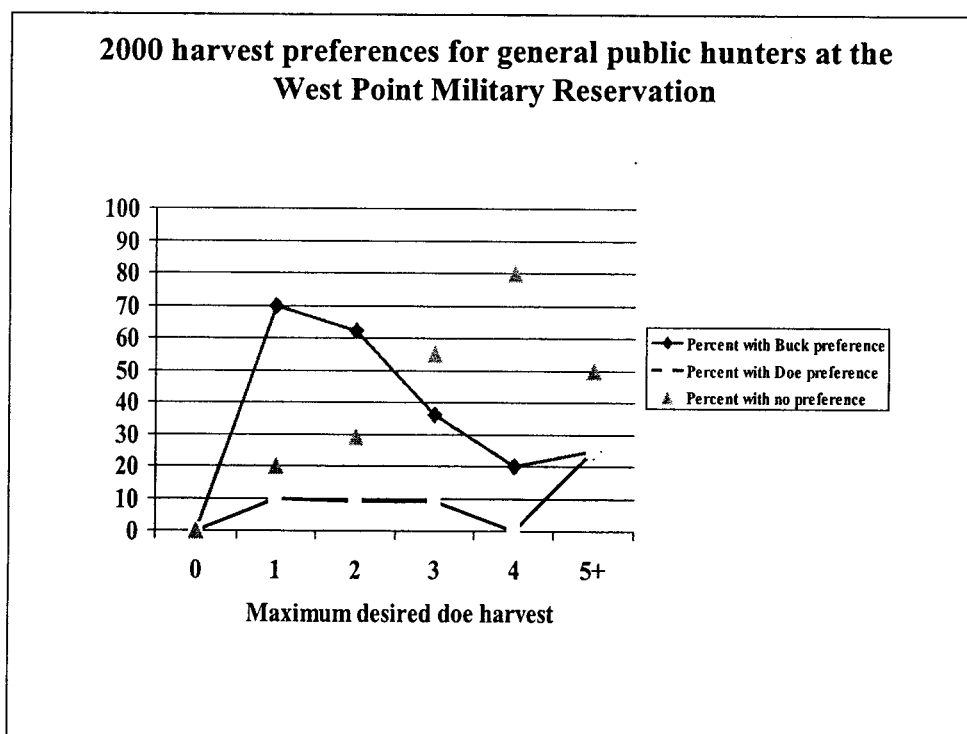


Figure 4. Comparison of number of antlerless deer that hunters at the West Point Military Reservation said they were willing to harvest in a single season, with proportion of hunters who have a buck preference, doe preference, or no preference.

- Among firearms-only hunters who desired to harvest 2 total deer and who had a buck preference, 66.7% harvested 1 buck, 0.0% harvested 2 bucks (none could legally), 53.0% harvested 1 antlerless deer, and 0.0% harvested 2 antlerless deer (Lauber and Brown 2000c).
- In 1997, among firearms-only hunters who desired to harvest >3 total deer and who had a buck preference, 44% harvested 1 buck, none could or did harvest more than 1 buck, 61% harvested no antlerless deer, 33% harvested 1 antlerless deer, and 6% harvested 2 antlerless deer (Lauber and Brown 2000c).
- Data from the Arnot Forest (Enck and Brown In prep (a)) and West Point (Enck and Brown In prep (b)) suggest that requiring antlerless harvest prior to buck harvest might be used to ameliorate the impact of increasing the buck bag limit—at least at small geographic scales. Required harvest of antlerless deer might be used as an incentive for hunters who want to harvest few total deer and have a clear buck preference.

### **Consideration of Other Stakeholders**

***Analysis: Landowners who desire lower deer populations on their private lands may be impacted negatively if buck bag limits are increased.***

- Increasing the buck bag limit might be inconsistent with desires of some landowners to reduce the overall deer population. Conceivably, landowners' satisfaction with DEC and hunters could be affected negatively.

***Analysis: General public support for hunting as a management tool might diminish.***

- If increased buck bag limits result in lower antlerless harvests, it could lead to an even larger challenge in managing deer populations across large, landscape-scale areas. The role of hunting as an effective tool for deer management could be called into question.

### **Communication Considerations**

- If buck bag limits are increased, some hunters may see DEC as behaving illogically—why increase buck bag limits if deer are overabundant in large areas of the state? DEC could suffer image consequences, being perceived as more interested in minority desires than public good.
- If the buck bag limit is increased, communication with nonhunter stakeholders will be necessary to address potential concerns about hunters being more

interested in opportunities to bag more trophies than in managing the deer population.

### **Additional Information Needs**

- What might the impacts be on hunter satisfaction and future participation? A 1-buck bag limit for all hunters statewide could affect satisfaction and participation negatively for special-seasons hunters who currently have a 2-buck bag limit. A 2-buck bag limit for all hunters would eliminate an advantage of participating during special seasons. What will be the influence on the increasing trend in special-seasons participation?
- More insight is needed about potential effectiveness of and support for linking an increase in buck bag limit to other regulatory changes such as mandatory antlerless harvest.

### **IMPLICATIONS OF THE THREE ASSESSMENTS**

Here we present some conclusions and implications for hunter satisfaction and antlerless deer harvest that might be associated with the three regulation changes.

Likely implications for overall hunter satisfaction:

- DMP consignment probably would have little net influence on satisfaction for the population of hunters; satisfaction would increase for about the same proportion that would experience a decrease in satisfaction.
- Opening the regular firearms season in the Southern Zone on a Saturday likely would result in a net increase in hunter satisfaction, although the magnitude of increase may be moderated by perceptions about crowding, and possibly decrease access to private lands which would exacerbate crowding.
- Increasing the maximum buck bag limit to 3 may be popular, but is unlikely to increase overall satisfaction because few hunters would ever be able to take the limit.

Likely implications for antlerless deer harvest:

- Consignment of DMPs likely would increase antlerless deer harvest, assuming those who obtain extra permits are willing and able to fill them.
- Opening the regular firearms season on a Saturday likely would lead to no more than a small increase in antlerless harvest.
- Increasing the buck bag limit would decrease antlerless deer harvest because most hunters want to take only a few deer and most prefer to harvest bucks.

Our analysis, though limited and shaky in places, indicates developing a set of regulations that balance maintenance of high levels of hunter satisfaction and sufficient

harvest of antlerless deer will be challenging. Hunter satisfaction is influenced by a variety of factors, and any 1 of the regulation changes examined likely would affect various satisfaction components in both positive and negative ways. Different hunters place different amounts of importance on the various components of satisfaction. Whether or not hunters' expectations are met for satisfaction components of highest importance to them has a profound influence on overall satisfaction. Expectations are based, in part, on tradition and what hunters are used to experiencing afield. Any change in regulation that affects what hunters are used to experiencing can affect satisfaction indirectly, especially if the regulation does not allow hunters' expectations to be met. However, expectations can change over time to accommodate changes in context. A period of elevated dissatisfaction may be unavoidable to effect change.

The degree to which any of the regulation changes examined will affect antlerless harvest likely will be related to the interaction between hunters' satisfaction and their willingness to take does. Willingness to harvest antlerless deer is influenced in part by the importance that hunters place on experiencing different components of deer-hunting satisfaction (Tsou 2001). In general, hunters who indicate that achievement-oriented components (e.g., bagging a deer, eating venison, showing a harvested deer to friends, butchering a deer) are of high importance are willing to harvest more antlerless deer compared to hunters who say these components are of low importance. Willingness to take antlerless deer seems to be affected less by the level of importance hunters place on satisfaction of affiliative-oriented or appreciative-oriented components.

Further, willingness to harvest antlerless deer seems to be affected by whether or not hunters' expectations are met for satisfaction components of high importance. Tsou (2001), using data from our 1990 study of deer hunter satisfaction (Enck and Decker 1991), found that hunters who placed high importance on (a) seeing deer while hunting and (b) bagging deer were willing to harvest more antlerless deer than hunters who placed low importance on either of those satisfaction components. For example, hunters who said that bagging deer was important and who bagged as many as expected were willing to take more antlerless deer than those who said bagging deer was important but who did not bag as many as expected.

These findings, based on data associated with lower overall deer population and more restrictive antlerless harvest opportunities suggest that hunters' future experiences could affect whether desired antlerless harvests can be achieved if new regulations successfully reduce the deer population in the next few years. Seeing deer will continue to be important for many hunters, but whether or not they see as many as expected will have little influence on their willingness to harvest antlerless deer. Not seeing as many deer as expected may affect their satisfaction level but not the number of does they say they would take. On the other hand, if lower deer populations mean they do not bag as many deer as they expect to, both their satisfaction and their future willingness to take antlerless deer may decrease.

This raises the issue of temporal scale. Any of the regulatory changes examined might increase overall satisfaction in the short-term because of increased hunting opportunity. However, satisfaction could decrease in the future because of changes in hunters' experiences associated with important satisfaction components.

Geographic scale is another important consideration. Brown et al. (2000) and Curtis et al. (2000) pointed out how willingness to harvest antlerless deer differs among ecoregions in the Southern Zone. Given the complex relationships between hunters' experiences, the importance they place on various satisfaction components, and their willingness to take antlerless deer, the impact of any regulatory change is likely to differ among ecoregions. Thus, the most management benefit might be gained by tailoring regulatory changes to specific areas, rather than making uniform changes statewide or at the scale of the Southern Zone. Also, because the effects of changes sometimes take several years to be observed and hunters' expectations can change over time, any regulation changes should be kept in place for a period sufficient to monitor results on deer population, deer impacts on stakeholders, and hunter expectations and satisfactions.

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