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Technical Session

Population Dynamics: When Is Enough Enough?

A private lands approach to controlling New Jersey's deer population

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Abstract: In New Jersey, annual losses from white-tailed deer (*Odocoileus virginianus*) depredation to agricultural crops have been estimated as high as \$10 million. Additional problems caused by the state's overabundance of deer include increasing vehicle/deer collisions, possible human health concerns regarding increasing incidences of Lyme disease, and a loss of flora and fauna diversity. In an effort to reduce deer numbers and minimize damage, both non-lethal and lethal management practices have been used with limited success. Hunter access to private lands remains the biggest impediment to effective deer management in New Jersey. I propose an incentive-based program to increase lease and fee hunting on private lands in New Jersey. Among the benefits of such a program are an increase in landowner income, safe and controlled areas for hunters, and greater reduction of the deer population and resulting damage while improving overall wildlife management. I also discuss other types of wildlife-related lease and fee recreation and areas of needed research to effectively implement a private lands program.

Key words: fee hunting, lease hunting, *Odocoileus Virginianus*, white-tailed deer, wildlife damage

New Jersey's white-tailed deer (*Odocoileus virginianus*) population has steadily increased over the last 2 decades, creating an overabundance of deer throughout a majority of the state. Currently, some areas of the state are experiencing population densities in excess of 10 times the expected density (Mattfeld 1984), or upwards of 200 deer per square mile (J. Grande, Rutgers University, unpublished data). These high densities have resulted in both economic and ecological damage. It is estimated that New Jersey's agricultural community experiences annual yield losses from deer in the range of \$5-10 million (New Jersey Division of Fish, Game and Wildlife 1999). A conservative estimate of deer/vehicle collisions is in the neighborhood of 10,500 per year, resulting in millions of dollars of property damage, frequent human injury, and occasionally, driver fatalities (Conover et al. 1995, Romin

and Bissonette 1996). Wilson et al. (1988, 1990) suggested that the abundance of deer ticks (*Ixodes dammini*) was correlated with deer densities. The deer tick is the main vector of the agents for Lyme disease. There is a high risk of Lyme disease transmission in New Jersey, costing residents millions of dollars in annual treatment (Centers for Disease Control and Prevention 1999).

Ecologically, many forests throughout New Jersey are sans forest understories due to heavy browsing by deer. The loss of forest understory results in loss of plant diversity and habitat for species like ground-nesting birds, small mammals, and reptiles. Additionally, as native vegetation is browsed, it is being out competed and replaced by invasive, exotic species, thereby changing the vegetative and forest cover types of New Jersey (Reynolds 1980).

In an effort to minimize damage, a number of non-lethal and lethal deer management practices have been employed with varying degrees of success. Among the non-lethal methods, fencing (Curtis et al. 1994), repellants (El Hani and Conover 1997), trap and relocate (Craven et al. 1998), and deer warning signs and reflectors (Ujvari et al. 1998) have been used in areas of New Jersey.

In terms of deer management through lethal means, deer hunting seasons have been extended, harvest ideas new to New Jersey have been implemented (i.e. Earn-a-Buck), and depredation permits are routinely granted to farmers (New Jersey Division of Fish, Game and Wildlife 1999). Furthermore, a community-based deer management bill was signed into law in the summer of 2000 making it legal for trained personnel to use noise-suppressed rifles and night vision scopes to manage deer populations in certain agricultural, suburban, and airport environments. Despite the wide array of available options to moderate deer impacts, the New Jersey Division of Fish and Wildlife maintains a management objective for reduction of the deer population across 76% of the state (New Jersey Division of Fish, Game and Wildlife 1999).

There are a host of reasons to explain the seeming inability to properly reduce and manage New Jersey's deer population on a sustained basis. First and foremost is the fact that about 75% of New Jersey is privately-owned and highly fragmented, meaning that a majority of deer management must occur on land that is not easily and readily accessible due to private property rights (New Jersey

Department of Agriculture 1999). The lack of access to deer has, in turn, played a role in an annual decrease in the number of hunters. The New Jersey Hunter Retention and Deer Hunter Satisfaction survey found that limited private land to hunt and limited access to places to hunt are causing hunters to stop hunting or decrease their level of hunting activity (Responsive Management 1998). To further complicate matters, there is a growing anti-hunting sentiment amongst New Jersey residents, making it difficult to manage the deer population by hunting even where deer are accessible (New Jersey Division of Fish, Game and Wildlife 1999).

Although deer overabundance in New Jersey is a biological problem, it will require a public policy solution. Hunting remains the most effective and cost-efficient method to manage New Jersey's deer population. The challenge is the ability to employ this method statewide to affect a reduction in the deer population to a manageable level on a sustained basis. I propose an incentive-based policy to increase and improve deer and other wildlife management on private property in New Jersey through the development of a market to encourage lease and fee hunting on private lands.

History of hunting leases

leasing private land for the purpose of recreational hunting is not a new idea in the United States. Fee hunting has occurred in Texas since the passage of strict trespass laws in 1925 (Butler and Workman 1993). Leopold (1933) and Keller (1943) advocated the leasing of private lands for hunting in the 1930's and 1940's, respectively.

Interest in lease and fee hunting has increased dramatically since the 1980's. A multitude of lease and fee hunting operations are available in the western United States despite the vast public land holdings in that part of the country (Butler and Workman 1993). A number of fee hunting systems exist in the southeastern United States, the most popular of which is the leasing of hunting rights on nonindustrial private lands (Gynn 1983). The popularity of fee hunting on southern United States forest industry land is growing as well (Marsinko et al. 1993). Moreover, at least 2 symposia have been held to discuss lease and fee hunting and other natural resource income opportunities on private lands (Johnson 1996, Kays et al. 1998).

Advantages of increasing access to private lands in New Jersey

There are a number of advantages associated with increasing public access to private lands in New Jersey through a lease and fee program. These advantages reach beyond just reducing the state's deer population and improving wildlife habitat and management. The monetary advantages include providing an opportunity for private landowners to generate additional income by charging money for access to resources on their property. The New Jersey Division of Fish and Wildlife (NJ F&W) may also benefit. Like most state wildlife agencies, a large portion of the NJ F&W's budget is funded by the sale of hunting and fishing licenses. Additional revenue is generated through the Pittman-Robertson Act and Dingell-Johnson Act, respectively (Cubbage et al. 1993). Therefore, insufficient hunter access has important economic implications for wildlife

management because as opportunities for hunting decline, so do hunter numbers, and proportionately, wildlife program revenues (Wright and Kaiser 1986).

Aside from generating revenue for landowners and possibly the NJ F&W, there are other reasons for increasing access to private lands through lease and fee hunting. First, congestion on public lands and the resulting potential safety problems are of concern to many public land hunters (Messonnier and Luzar 1990). Hunting leases provide less competition and interference from other hunters, relatively abundant game densities and safe hunting areas (Porter 1992). In addition, an increase in use of leased lands has the potential to reduce competition for hunting on public lands for those who either do not want to lease land or cannot afford to lease land. Second, the supply of land on which to hunt has decreased both nationally and in New Jersey as agricultural, forest and wetland areas are converted to more profitable uses such as expanding development (Wright and Kaiser 1986). Compensating the landowner for use of the wildlife resource on his/her land increases the value of the land and makes conversion to uses not beneficial to wildlife less attractive. Third, the majority of wildlife resources in this nation occur on private lands (Gynn 1983). Attaching a value to wildlife through income from lease and fee hunting can lead to habitat improvements, increased game and non-game management, and recognition of wildlife as a significant product of the land (Smith et al. 1992). In other words, pro-active management of the wildlife resource in New Jersey can occur. Finally, by conducting game management (i.e. hunting) on private property, the anti-hunting debate may be muted since a

majority of the hunting for population and predation control could be removed from the public's view.

A proposed strategy to increase hunter access to private lands in New Jersey

The following is a suggested model for a certification program whereby incentives, education and outreach, and technical and financial assistance are provided to private landowners to encourage public access for hunting and enhanced wildlife management. My model is loosely based on a permit system proposed by Leopold (1933) and attempts to incorporate guidelines proposed by the Wildlife Management Institute (1983) for structuring a state program for improving access to private property. The objectives of my proposed certification program would be to improve NJ F&W - landowner - hunter relations, increase hunter access to private lands, and improve wildlife habitat and management on private lands in New Jersey.

To be eligible for the certification program, the landowner must develop, maintain, and implement a management plan for the tract of land they are enrolling. The management plan would address the landowner's intended stewardship of the soil, water, wildlife, and forest resource found on his property. The landowner, in return for certification and the accompanying benefits, would preserve and provide quality wildlife habitat.

A private lands certification program has advantages for all involved parties. The NJ F&W could retain control over the state's wildlife, which they are responsible for by law, while placing the management of the

resource in the hands of private citizens. By certifying the landowner and reviewing each landowner's certification annually, the NJ F&W can be assured that the management of the resource and its supporting habitat is being done responsibly. This would increase and improve wildlife habitat on private lands and landowner - NJ F&W relations while allowing the NJ F&W to devote its already stretched resources to other areas.

Private landowners in the certification program would receive priority from the NJ F&W over non-certified landowners in the provision of incentives, assistance, and enforcement. The quality of wildlife habitat and associated wildlife on certified private lands therefore, should be better than on non-certified lands, and higher-quality habitat means potentially higher lease fees. The NJ F&W would distribute a list of certified landowners in the annual hunting and fishing regulations digest that would help market and advertise those lands.

By obtaining a list of certified lands, hunters interested in leasing land could easily find a place to hunt near their home, or anywhere in the state for that matter. More importantly for hunters, a list of private lands certified by the NJ F&W provides a form of consumer protection. Hunters would be guaranteed that certified lands would have quality habitat, healthy game populations, and a controlled area to hunt. In essence, they would get their moneys worth.

Incentives, outreach, and assistance for certified landowners

Landowners involved with the wildlife certification program would be eligible for

assorted incentives, education and outreach, and technical and financial assistance.

Incentives

The investigation and provision of additional incentives beyond income from lease and fee hunting should be investigated. These include (Hazel et al. 1990):

1. Landowner liability relief: New Jersey's "recreational use statute" exempts landowners from liability when allowing public access to their property as long as the landowner receives no compensation in exchange for access. However, for landowners wishing to generate revenue by allowing access to their property, the recreational use statute does not apply. Therefore, effective ways of reducing or eliminating landowner liability must be investigated and implemented to ensure the success of increasing access to private property. Examples of ways to limit landowner liability include assisting landowners in writing a standard contract that all hunters accessing their property must sign and making affordable liability insurance available to both the hunter and the landowner. The lobbying of the state legislature to enact laws that would reduce or cap a landowner's liability if access to hunters is granted should also be explored.

2. Control and prosecution of trespassers: Certified landowners should be given priority by the NJ F&W Enforcement Division in enforcing trespass laws and prosecuting violators to the fullest extent of the law. While this may require an initial increase in time and resources on the part of the Enforcement Division, leased lands generally have fewer problems with trespass

than non-leased lands since hunters help in patrolling the area (Wildlife Management Institute 1983). In the long-run, this could free up Enforcement Division resources to be used in other areas of need.

3. Establish an awards program for participating landowners: Recognize outstanding landowners for their stewardship, conservation and cooperation. Provide the landowner with a sign that can be displayed on their property announcing them as an outstanding private landowner in the private lands' certification program. Other possible awards include habitat improvement materials (i.e. seed) or an article about the landowner in NJ F&W publications.

4. Special seasons for managed lease and fee hunting: Provide landowners an opportunity to increase bag limits or extend the season on game inhabiting their land, where warranted and according to a management plan. Allowing Sunday hunting on leased lands only may be another option. Special seasons would allow the landowner to increase revenue and would encourage hunters to seek out leased lands after the season is closed elsewhere.

5. Tax treatments: New Jersey has a use valuation tax known as the Farmland Assessment Act. In order to qualify each year for a property tax reduction based on agricultural land or forestland, a landowner must produce receipts demonstrating that a certain amount of money was generated from the particular tract of land. Amending the Farmland Assessment Act should be explored to make eligible for property tax relief any landowner who has a current stewardship management plan for their property.

All or any of the above listed incentives would help in developing a lease and fee hunting program in New Jersey. Incentives in addition to those listed above should also be explored. However, the best incentive of all for most landowners remains the income they can generate by leasing their lands to hunters.

Education and outreach

A proactive education and outreach campaign must complement the certification program to educate landowners, hunters and the general public. Opportunities to educate can also become opportunities to promote and market the certified private lands program. Rutgers Cooperative Extension should be an active cooperator in the education and outreach effort.

Landowners should be provided with materials regarding wildlife management principles, habitat improvement methods, how to start and maintain a lease and fee hunting operation, legal contract writing, legal information concerning liability, trespass and wildlife laws, public relations and marketing. In addition, regional and even county-wide seminars and workshops covering the above topics should be offered on a regular basis.

An important piece of information that is vital to making the certification program work is the compilation, annual revision, and distribution of a list of certified private landowners throughout the state interested in providing access to their property for a fee. The list should include names, addresses, phone numbers, acreage available for leasing, available game species, hunting seasons, lease and fee prices, and whether access is allowed for recreation other than hunting (i.e. bird

watching, fishing, mountain biking, camping). The compiled list should be included with the purchase of every hunting and fishing license. Other outlets for this information include county extension offices, outdoor sporting goods stores, and conservation organizations.

Aside from advertising the certified lands program, compiling a list of information that includes lease and fee prices will help private landowners get a better feel for appropriate pricing of leasing operations. Since there is not, at present, a well-established market for lease and fee hunting in New Jersey, many landowners are in the dark as to what is a fair price for leasing hunting rights. Compiling lease and fee hunting prices by region and throughout the state, combined with what is offered for the price, will help to establish a well-defined market that ensures landowners are receiving a fair price and hunters are paying a fair price. In addition, this will provide information on wildlife values that may be used by landowners when making land-use decisions.

Technical and financial assistance

The most useful form of technical assistance that may be offered to landowners is advice on how to improve, maintain, and manipulate wildlife habitat and manage wildlife on their property. The establishment of demonstration areas on private and/or state lands would be valuable to actually show the intended result of proper habitat management. To prepare natural resource managers to assist landowners, the NJ F&W and Rutgers Cooperative Extension should implement a training program through short-courses or workshops to train NJ F&W personnel and private consultants in private land wildlife management and leasing. Arrangements

should be made to ensure that NJ F&W personnel, consulting biologists or foresters, or other natural resource professionals prepare management plans for those landowners that are interested in joining the certification program. Additional types of assistance that could be provided include planting materials and signage to mark boundary lines.

Improving wildlife habitat and managing wildlife in general can be costly. There are a number of federal and state cost-share programs that are designed to defray costs and encourage habitat improvements. It would be necessary to assist the landowner in seeking funding through an appropriate landowner assistance program in order to reduce or eliminate the landowner's costs for management plan preparation, habitat improvements and maintenance, and wildlife management.

Other wildlife-related lease and fee recreation

There is tremendous potential for private landowners to further supplement their income by leasing their land for wildlife-related recreation besides hunting. As with hunters, non-consumptive users are experiencing congestion and competition on public lands. Landowners not interested in leasing their property for hunting might be interested in leasing their land for other wildlife-related recreation (i.e. birdwatching, fishing). Moreover, landowners that lease their land for hunting may be interested in attracting non-consumptive recreationists during closed hunting seasons in order to continue an income stream year-round. Leasing lands to non-consumptive users during closed hunting seasons would also help landowners with trespass problems since these

additional users would occupy and patrol the leased land in the absence of hunters. Furthermore, non-consumptive user leases would increase the land value above that of hunting leases, making it even less attractive to the landowner to convert the land to a use not beneficial to wildlife.

Areas for further research

To effectively implement a private lands lease and fee program in New Jersey, research into the supply and demand side of the leasing equation needs to be conducted. Landowner liability also needs to be investigated.

No data exist on the extent of public access to private lands in New Jersey. Therefore, I am conducting a mail survey in the fall of 2000 of private landowners to examine the access issue. One objective of the survey will be to assess the amount of public access allowed on private property. If access is not allowed, what are the reasons for not providing access? If access is allowed is the landowner monitoring the access? Has the landowner experienced any problems since allowing access? A second objective will be to examine deer densities relative to hunter access and determine if densities are lower in areas where access to private property is allowed as compared to areas where access is more limited or denied altogether.

The above survey addresses the supply side in terms of how much private land is accessible. A second survey will be administered to examine the demand side. A survey will be conducted of the general public with the objective of determining a consumer's willingness-to-pay for wildlife-related recreation on private lands. The

results of the survey will be used to help define a fair and competitive lease price for both the landowner and the recreationist.

A final area of research involves investigating landowner liability. Liability, especially the threat of suit for personal injury, is a major constraint preventing private landowners from initiating fee hunting programs (Guynn 1983). However, is landowner concern and exposure to liability a perception problem or a real problem? The objective of this study will be to examine liability case law to determine the prevalence of lawsuits against landowners that allow access to hunters and other wildlife-related recreationists.

Management implications

I have proposed a program to increase public access to private property in New Jersey via lease and fee hunting and other types of wildlife-related recreation. Improved hunter access to private lands would provide an opportunity to reduce the state's overabundant deer population and maintain the population on a sustained basis. Landowners could generate additional income by charging money for access to their property. In so doing, landowners would have an incentive to increase and improve management of wildlife and the supporting habitat since higher-quality habitat could potentially result in higher lease fees.

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