

GOVERNOR'S REPORT
ON DEER MANAGEMENT
IN NEW JERSEY

Submitted By:

**The Department of Environmental Protection
Division of Fish, Game and Wildlife**

**In Consultation With
The Department of Agriculture**

INTRODUCTION

In conjunction with amending Assembly Bill No. 1932, an Act concerning permits to control crop damage caused by deer and supplementing Title 23 of the Revised Statutes, Governor Christine Todd Whitman directed the Department of Environmental Protection, in consultation with the Department of Agriculture to do the following:

1. Perform a comprehensive analysis of the state's deer population.
2. Identify current problem areas.
3. Evaluate factors contributing to deer over-abundance.
4. Develop a plan to address factors contributing to deer over-abundance.
5. Provide recommendations to help alleviate deer conflicts, particularly in respect to the agricultural community.
6. Submit findings to the Governor.

* In a conditional veto of Assembly Bill No. 1933, known as the "Baiting Bill," the Governor directed that the effects of baiting on managing the deer population, other wildlife and the health, safety and welfare of the general population shall be included in the deer study.

BACKGROUND

White-tailed deer (*Odocoileus virginianus*) are a valuable public resource enjoyed by thousands of citizens each year in a variety of ways including recreational hunting, photography and general observation. For example, approximately 95,000 deer hunters enjoy 1.5 million recreation days afield participating in the annual deer seasons. More than 2.7 million pounds of venison are provided from the annual deer harvest. The **1996 National Survey of Fishing, Hunting and Wildlife-Associated Recreation** indicated that state residents spent more than \$132 million on big game hunting. Although the non-consumptive value of deer is unknown, the above survey also indicated that 1.6 million people spent more than \$863 million watching wildlife in New Jersey in 1996. It is quite likely that a significant portion of the wildlife watching expenditures involved deer. However, deer are over-abundant in many areas and deer-human conflicts do exist, particularly at the interface of suburbia and deer range, near tracts of public and private land that are deer refuges, and in agricultural production areas. Continued expansion of New Jersey's human population to formerly rural areas, the negative economic impact of deer damage on agricultural crops and residential landscaping, destruction of plant and animal habitat by excessive deer populations, concern regarding Lyme disease and the incidence of deer-vehicle collisions are some the major reasons that necessitate deer population reduction on 76 percent of the area which deer currently occupy. Controlling deer numbers has become increasingly difficult due to reduced hunter access to deer, local ordinances that prohibit hunting, establishment of deer refuges, housing patterns, activities of animal rights extremists and declining hunter numbers. Reducing deer numbers to a level that the majority of citizens can live with requires the cooperative effort of various levels of government, private landowners, sportsmen, the agricultural community and other responsible entities.

Note: Deer overabundance is a common problem in many parts of North America and probably represents one of the greatest challenges facing wildlife professionals during the next millennium (Warren 1997).

CURRENT STATUS OF NEW JERSEY'S DEER POPULATION

Statewide

White-tailed deer are very adaptive and occupy almost all undeveloped land within the state, which provides for their essential requirements of food, cover and fresh water. Population estimates for deer management zones are made utilizing population models. These models utilize deer harvest information such as age and sex ratios to reconstruct minimum populations which would have to be present to produce the deer harvested. In 1998, the statewide minimum fall, pre-hunting season deer population was estimated at 178,598. Hunting season proposals for 1999-2000 are designed to reduce this base population by 22%. Total population estimates for local areas including parks or watersheds are made using Forward Looking Infrared (FLIR) systems mounted on aircraft, however, associated costs are prohibitive. Spotlight surveys have also provided minimum counts and population indexes for parks and local areas. Deer populations peak in June after most fawns are born and begin to decline through the beginning of the next fawning season.

Deer within biological carrying capacity and on good deer range are highly productive. Female white-tailed deer are capable of breeding at 6 to 7 months of age, depending on the nutritional quality of their habitat. Under optimum habitat conditions, 40 percent or more of the fawn does may breed. Reproductive rates of older does are highly variable and are also dependent on nutrition. In areas of New Jersey with good nutrition, yearling does typically produce one fawn and adult does produce twin fawns (Burke et al. 1992). However, triplets, and in rare cases quadruplets, have been recorded for does on high quality diets. One of the most often cited examples of deer population growth involved a captive deer herd at the Edwin S. George Reserve in southeastern Michigan. After the introduction of six adult white-tailed deer to the 1,146-acre fenced property in 1928, the population grew to 162 deer in six years (McCullough 1979). The experiment was repeated from 1975 through 1980. After reducing the population to 10 deer by heavy harvesting, the herd was again protected and increased to 212 animals in six years (McCullough 1982). Although the growth rate of a population will decline as the quantity and quality of food declines, the population growth rate in these examples was more than 50 percent per year.

Statewide reproductive rates (fawns produced per fawn, yearling and adult doe) in New Jersey in 1997 were projected to be 0.29 for fawn does, 1.42 for yearling does and 1.78 for adult does (Burnett et al., 1999). In most areas inhabited by white-tailed deer, populations must be reduced by at least 40 percent per year to remain stable. If New Jersey's deer population was not controlled through hunting and other forms of mortality it could easily exceed 500,000 animals within a few years based on reproductive rates and deer densities on non-hunted sites in the northeastern United States.

Habitat has been defined as “the sum of all environmental conditions of the place occupied by an animal population” (Eabry 1970). New Jersey’s deer habitat or deer range includes the areas where deer actually live including woodland, agricultural land (cropland and pasture) and other undeveloped upland. Developed areas (industrial, commercial and residential), water (lakes, bays, and rivers), marshland and barrier-beach are not considered deer range. Deer occupy almost all areas of New Jersey that provide food, cover and fresh water.

Zones

Since 1974, New Jersey’s white-tailed deer resource has been managed on a zone basis. Major deer management zones are generally areas with similar land use, land ownership, soils, vegetation and deer. Special area management zones include military bases (Fort Dix, Earle Naval Weapons Station, Lakehurst Naval Air Engineering Center, Picatinny Arsenal), National Wildlife Refuges (Forsythe, Great Swamp and Supawna), State Parks (High Point, Monmouth Battlefield and Round Valley), a County Park (Atlantic) and the Federal Aviation Administration Technical Center. In 1999, New Jersey was divided into 63 deer management zones, including 16 special management areas. Zones replaced counties for management purposes because of the frequent lack of identifiable borders for regulating hunters and hunter harvest, and the vast differences in deer, land use, and habitat within counties.

In 1998, the average minimum statewide deer population density per square mile of range was estimated to be 38. In major management zones minimum average deer densities ranged from 13 in Zones 24 and 47 to 76 in Zone 10. [Figure 1](#). (attached) provides average minimum deer population densities per square mile of deer range in major management zones for 1998. Table 1. (attached) provides minimum population estimates and average deer densities for 1998.

Counties

In 1998, viable deer populations were known to inhabit 20 of New Jersey’s 21 Counties. Sightings of deer were also received from Hudson County (near Meadowlands Stadium) in 1997. County deer population information is of interest to the general public, but is not used for management purposes. Although population estimates have not been made on a county basis for several years, the three counties with the largest number of resident deer are Hunterdon, Sussex and Warren, based on hunter harvest information and portions of counties located within zones. Excluding Hudson County, the three counties with the lowest deer populations are Union, Bergen and Essex, however, local deer populations within parks and areas of these counties can be high. As indicated previously, alternative population estimation methods such as FLIR surveys must be used in predominantly developed areas, because there is little or no deer mortality information available to utilize population models.

Local Areas

Deer populations and average deer densities per square mile (or kilometer) of range are usually estimated for large geographic areas such as deer management zones. However, deer density and the total population vary within zones and over time. Populations peak during the summer and

reach their lowest levels during the spring, just prior to fawning season. During periods of normal and severe winter weather, deer are often concentrated in “wintering areas”. These areas often have evergreen cover that provides protection from wind and snow, and may include south facing slopes that allow deer to take advantage of the sun on clear days. In moderate or severe winters in northern New Jersey, deer concentrations of 100 or more are not uncommon. For example, aerial surveys of three study plots located in Hunterdon County in 1979 provided counts of 225 deer on an area in Holland Township, 289 deer on an area including the Clinton Wildlife Management Area, and 378 deer on an area of Franklin Township (McConnell 1980). Another time of year that deer may be found concentrated is early spring when grasses and other vegetation begins to grow. Large numbers of deer are often observed in fields in April and May. For example, 311 deer were observed via a helicopter survey of 260 acres of fields on Greenwood Forest Wildlife Management Area, Ocean County, in April 1976 (Burke 1976). Dispersal of deer generally occurs in late spring when does seek secluded areas to give birth and new growth is abundant. Parks and other areas where deer numbers are not controlled can have deer densities as high as a deer per one to six acres in the northeastern United States. Local surveys and general observation of local deer populations may have site-specific management implications, however, they are usually not representative of larger geographic area.

Deer Population Trends

Despite news media reports that the New Jersey deer population is exploding, the statewide population has remained relatively stable during the past several years. However, deer populations have fluctuated on an area or zone basis, and have exceeded the tolerance levels of many farmers, motorists, homeowners and others in agricultural and suburban areas. On a regional basis, deer populations actually peaked in the 1930s in the pinelands of southern New Jersey and in many areas of northern New Jersey in the 1950s (Burke et al., 1990). From the mid-1970s through the 1980s, the Division and the Fish and Game Council sought to allow deer numbers to increase within sections of the inner coastal plain including Salem, western Cumberland, Gloucester, northwestern Burlington and western Monmouth counties. By 1990, with the exceptions of Island Beach State Park, a small portion of Cape May County located below the Cape May canal and a few other isolated areas, deer occupied all available range. In the 1990s only minor population increases were sought in deer management zones comprised of a large percentage of public land and few deer-human conflicts. In most instances, the increases were small adjustments that were made to compensate for over-harvest in the preceding year and to allow the deer population to return to goal levels. In 1999, no population increases are sought for any zones.

Significant population increases have occurred in recent years in many areas of northeastern and west-central New Jersey. These increases have been caused by inadequate population control due to no or poor hunter access to land harboring deer, municipal ordinances banning hunting or firearm discharge, low density housing patterns, creation or expansion of parks not open to hunting, a decreasing hunter population, hunter unwillingness to shoot more antlerless deer, landowners protecting deer from hunters and other factors. The continuing increase in New Jersey's human population and movement from urban areas to formerly rural areas has also intensified deer-human conflicts even in areas where deer populations have been stable or even decreased. For example, the number of deer-vehicle collisions has increased in many areas because there are more vehicles being driven more miles on once rural roads. Additionally, deer and other wildlife damage to agricultural crops have exceeded the tolerance of farmers in most agricultural areas of the state.

Notes: Division deer population estimates are generally based on reported hunter harvest. Hunting regulation changes, which increased the rate that the deer are reported harvested have had major impacts on population estimates. For examples, institution of the mandatory deer check station, system in 1972 and second tag program in 1980 increased the reported deer harvest, and consequently population estimates. Some groups, individuals and the news media have misconstrued these increases in population estimates as population explosions. Additionally, population estimates must be derived by other techniques such as FLIR surveys for deer populations that are not hunted.

Carrying Capacity

There are two types of “carrying capacity” which are very important when considering management of a wildlife population. *Biological carrying capacity* (BCC) is generally referred to as the number of animals that a given area can support in good condition over an extended period of time. BCC is determined by the quality and quantity of food, water and cover in an area. *Cultural carrying capacity* (CCC) is the maximum number of deer that can coexist compatibly with local human populations (Ellingwood and Spignesi 1986). This level is dependent on human tolerance, land use, availability of natural foods, local values and other factors, and can vary from area to area. Zones containing a large percentage of public land and minimal human conflict are generally managed based on BCC. However, the majority of zones are managed based on CCC due to conflict with agricultural production and other human uses of the land. It should be noted that deer populations are below the biological carrying capacity throughout much of New Jersey’s deer range. In the absence of hunting or alternative population controls, New Jersey’s deer population could exceed 500,000 animals.

NEW JERSEY'S CURRENT DEER MANAGEMENT PROGRAM

New Jersey’s wildlife is a valuable public resource that belongs to all of the state’s citizens. The authority and responsibility for managing the State’s fish and wildlife resources was legally given by legislative action to the Board of Fish and Game Commissioners in 1894. The Board of Fish and Game Commissioners became the Division of Fish and Game in 1945, the Division of Fish, Game and Shell Fisheries in 1970, and the Division of Fish, Game and Wildlife (Division) in 1979 [N.J.S.A. 23:2]. The Division has been transferred several times and is currently in the Department of Environmental Protection. The Fish and Game Council in the Division is made up of eleven members: six sportsmen representatives, three farmer representatives, one public representative and

one person from the State's Endangered and Nongame Species Advisory Committee. The Council annually establishes seasons, bag or creel limits and methods for hunting, trapping and fishing. These seasons and related rules are based on scientific information provided by the technical staff of the Division.

A healthy deer herd has great value to the people of the state. Deer are photographed, watched and hunted by many New Jersey residents. Deer hunters spend over \$100 million each year as they enjoy more than of 1.6 million recreation days hunting deer. Money spent in the course of deer hunting benefits a wide variety of New Jersey businesses. The current goals of New Jersey's Deer Management Program are:

- To maintain a healthy deer population on suitable habitat throughout the State.
- To keep the deer population at a density compatible with land use.
- To maximize the recreational and economic benefits derived from this renewable natural resource (Burke et al., 1998).

Deer Population Management Strategies

There are three deer population strategies. The Division, through the annual hunting seasons, may seek to increase, stabilize or decrease a deer population based on various factors. A review of zone management strategies occurs each winter in conjunction with the development of proposed amendments to the annual Game Code. Requests for regulation changes from hunters, farmers and other interested parties are also reviewed and considered throughout the year. Proposed amendments to the Game Code, including adjustments to hunting season dates, bag-limits, permit quotas and method of take, are generally finalized by late March. A formal review and adoption process follows, which includes a public comment period and public hearing in early June. Annual hunting regulations are generally in place by early August.

As indicated previously, there are no deer population increases proposed for any deer management zones in New Jersey in 1999. Deer population stabilization is sought in 17 zones comprising 23.8 percent of the deer range. Deer population reductions are called for in 46 zones comprising 76.2 percent of the deer range. The need to reduce deer numbers is based on deer damage to agricultural crops and residential landscaping, the incidence of deer-vehicle collisions, the continued encroachment of New Jersey's human population on formerly rural lands and other factors previously listed.

The short-term population strategy seeks to reduce the statewide deer population by 22.8 percent in one to three years. Deer population reduction strategies range from 7.7 percent to 100 percent in urban areas (Zones 36 and 49). [Figure 2.](#) (attached) illustrates the 1999 deer management strategies for major management zones. [Table 2.](#) (attached) provides the deer range and management strategy by zone for 1999-2000.

Factors Which Determine Management Strategies

Deer-human conflicts and loss of habitat are major factors, which require deer populations to be reduced throughout much of New Jersey. Deer human conflicts include deer damage to agricultural crops, deer damage to residential landscaping and gardens, concern regarding Lyme disease and deer-vehicle accidents.

Information on commercial and residential deer damage is obtained annually from the Division's Wildlife Control Unit files, and is used in developing zone management strategies. Additional sources of information on agricultural damage include the State and County Boards of Agriculture; Farmer Representatives on the Fish and Game Council, farm damage surveys and direct contact with members of the farm community. Deer damage to agricultural crops is currently the most important factor influencing deer management in New Jersey.

Statistics on deer-vehicle accidents may be obtained from local police departments and the NJ Department of Transportation, Accident Records Section. For example, in calendar year 1996 there were 5,048 reportable accidents involving animals in New Jersey according to a preliminary report from the DOT Accidents Record Section (Murphy 1999). Over 90 percent of the animal-related accidents are likely to have involved deer. In addition, the DOT reported a total of 11,379 dead deer calls for the period of June 1998 through February 1999 (a single dead deer may generate more than one call). The cost of picking up and disposing of dead deer, the cost of vehicle repairs and the occasional injury of humans are very significant considerations in determining deer management strategies.

Data regarding loss of habitat and other land use changes is obtained from planning agencies on municipal, county and state levels, and from environmental organizations. Deer project field personnel also note changes in land use through surveys and while doing routine work such as maintaining the statewide deer check station system.

Tick-borne diseases are a serious health risk and public concern in New Jersey. Lyme disease is a tick-borne illness that is caused by the bacterial spirochete, *Borrelia burgdorferi* and is the most commonly reported tick-borne disease in the United States according to the Centers for Disease Control (1992). Although the "deer tick," *Ixodes dammini*, was classified as a separate species and was identified as the primary vector for the disease, further research indicated that the deer tick was actually the black-legged tick, *Ixodes scapularis* (Oliver et al., 1993). The white-footed mouse, *Peromyscus leucopus*, serves as the principal host of immature *I. scapularis* (Piesman and Spielman, 1979) and is recognized as the principal reservoir of the disease in the northeast (Levine et al., 1985; Anderson et al., 1987). White-tailed deer are not competent reservoirs for Lyme disease and uninfected ticks do not pickup the disease from deer (Telford et al., 1988). However, deer are regarded as a primary host for the adult-stage of *I. scapularis* (Main et al., 1981; Wilson et al., 1985). Some researchers believe that deer population densities regulate tick population densities and that deer population reduction would reduce tick populations (Wilson et al., 1990). Others argue that the available information is inconclusive (Ginsberg 1994). For example, recent research indicates that in the oak forests of the eastern United States, defoliation by gypsy moths and the risk of Lyme disease are determined by interactions among acorns, white-footed mice, moths, deer and ticks (Jones et al., 1998). Additionally, other wildlife including birds, reptiles and mammals, and domestic animals serve as hosts for ticks and transport infected ticks. The relationship of deer to the incidence of Lyme and other tick-borne diseases, continued movement of the human population to suburbia and increased human activity in the outdoors warrant additional research and public education.

In areas with minimal deer-human conflict and habitat loss, deer management strategy is often determined based on biological carrying capacity and maximization of recreation associated with the deer resource. In some forested areas where deer are at or near biological carrying capacity, deer have impacted forest regeneration and plant diversity. For example, despite overall low deer densities, excessive deer browsing has been identified as an important reason why Atlantic white-cedar (*Chamaecyparis thyoides*) fails to regenerate in New Jersey's pinelands region (Little and Somes 1965; Zimmerman 1997). The impact of deer forest regeneration and plant diversity is likely to become a more important factor in determining deer management strategies in the future, and was an important consideration in implementing a deer herd reduction program at High Point State Park in 1997. As previously indicated, most of New Jersey's deer range is managed based on cultural carrying capacity.

Regulated Hunting

Regulated hunting has been and continues to be the most efficient, economical and humane means of deer population control throughout most of New Jersey and North America. New Jersey has a well-managed deer herd where hunters have good access to the deer resource and are willing to harvest adequate numbers of deer of both sexes and all ages. New Jersey sportsmen have harvested more than one million deer since 1909.

As indicated previously, the Fish and Game Council establishes the annual hunting regulations with input from sportsmen, farmers, Division staff, other agencies and organizations, and the general public. In recent years, the Council has implemented deer management program changes to better control deer populations in zones characterized by poor hunter access, habitat loss, and a high incidence of deer-vehicle collisions or deer damage to agricultural crops. Expansion of the shotgun permit season, increased bag limits, zone boundary modifications, the opening of parks to deer hunting, and the "Earn a Buck Program" (hunters must harvest an antlerless deer before being eligible to take an antlered buck) have contributed to a steady increase in the antlerless deer harvest in most deer management zones.

Deer population control through regulated hunting is essential to ensuring that deer will remain a natural asset, not a liability, to all New Jerseyans.

Special Management Area Programs

Since the late 1960s, the Division has been very successful in working with managers and administrators of large tracts of public land in the development of controlled deer hunting programs. These cooperative programs have involved State and County parks, federal refuges, military bases, an airport, watersheds and large tracts of private land. There are currently 16 special management areas, which have separate zone designations. Several special management areas, such as Cape May National Wildlife Refuge, exist within major management zones and utilize standard seasons to manage deer on their respective areas. Expansion of cooperative, deer hunting programs to other large tracts of land could resolve deer control problems in many additional areas, if land administrators agree to participate.

Community-Based Deer Management Programs

Another more recent effort by the Division to assist local authorities in dealing with serious urban/suburban deer problems is the development of the Community-Based Deer Management Program (CBDMP). Under this evolving program, the Division cooperates with municipal, county, state and federal agencies and other responsible entities, to develop and implement alternative management strategies for use in urban/suburban environments where traditional or controlled hunting programs are either not a viable option or where hunting alone will not provide the desired level of reduction in deer numbers. For example, a CBDMP was successfully implemented at the Watchung Reservation, Union County in 1995. As a condition to the approval of any future deer reduction plan requests, Union County was required to complete the development and implementation of a long range (3-5 year) management plan with the ultimate goal of reducing and maintaining the deer population within Watchung Reservation at an over-wintering density of no more than 20 deer per square mile. The deer population goal was reached during the winter of 1998-99, one year ahead of schedule. Interest in the CBDMP is increasing, especially at the municipal level, and program information has been disseminated to many interested citizens and officials. This program was updated in the summer of 1998 and additional changes have been proposed for 1999. A copy of **Community-Based Programs for the Management of Suburban Deer Populations – Policy and Procedures** is attached (Appendix A).

Wildlife Services

The Division often works directly with farmers, foresters and other landowners to minimize deer damage. For example, the Division's Wildlife Control Unit provides technical assistance, limited amounts of fencing and repellents, and permits to destroy deer damaging crops to farmers. The Wildlife Control Unit operates on an annual budget of approximately \$500,000 from the Hunters' and Anglers' license fund. The Division's Wildlife Control Unit remains available to assist farmers with deer and other wildlife damage. Each year, the Division issues more than 500 permits to shoot wild deer where substantial crop damage is occurring. In recent years, between 2,500 and 3,200 deer have been reportedly removed on these permits. Additionally, 350 rolls of mesh wire and 100 rolls of barbed wire for fence construction and 600 gallons of deer repellent are provided to farmers. Additional funding is needed by the Wildlife Control Unit for it to adequately address both the increased impact of deer populations on the agricultural community and the wide range of other wildlife damage issues with which it must contend, including black bear depredations.

The Division's Wildlife Control Unit receives and responds to reports of wildlife damage throughout the State. Records of deer damage, deer depredation permits and reports of deer killed under depredation permits provide important annual information upon which deer management strategies are based.

In 1998, the Division began administering the distribution of nearly 5,000 rolls of mesh wire fencing made available through the NJ Department of Agriculture's (DOA) Deer Fencing Grant Program. Exclusion of deer from agricultural crops by fencing provides a long-term solution to deer damage where farmers own the land that they farm. The impact of providing a large amount of deer fence on reducing deer damage should be determined.

The main office of the Wildlife Control Unit is located at Clinton, Hunterdon County (908-

735-8793). The Division also provides \$20,000 annually from the Hunters' and Anglers' license fund, to Rutgers University for funding research on the use of chemical fertility materials to control problem deer populations. However, it should be noted that to date, no registration of a wildlife contraceptive vaccine has been approved for application to a free-ranging deer population. It appears that this technology may find future application in controlling small, confined deer populations inhabiting urban environments. If such a system is developed, it is most likely to be best applied as part of an integrated approach involving the proven control and mitigation techniques of hunting, repellents and fencing.

Farmer Hunting Permits

Over \$200,000 worth of free Farmer Deer Permits are issued for the extended bow, muzzleloader and shotgun permit deer seasons. Note: the law was recently modified by the Legislature to allow qualified farmers and their immediate family members to hunt on and obtain free special deer season permits on non-contiguous lands that they own or lease for agricultural production. The provision had previously been limited to contiguous land that the farmer resided on. The Division supported this change which assists farmers in controlling deer on the land that they own or lease.

The 1998-99 Deer Hunting Seasons

Amendments to the 1998-99 hunting regulations were designed to further enhance efforts to reduce and better control deer numbers. The changes included: providing additional days of permit shotgun hunting; expanding the Bonus Deer Tag Program to the muzzleloader and winter bow seasons; validating supplemental and bonus tags on the date of issuance during all seasons in southern New Jersey; increasing the daily bag limit to two deer in developed zones and some agricultural zones; and changing several deer management zone boundaries. New Jersey's six deer seasons provided 121 potential hunting days between September 12, 1998 and January 30, 1999. Bag limits varied from one deer per season to multiple deer per day. The 1998-99 harvest exceeded 60,000 deer for the first time. More than half the deer harvested were antlerless (33,025) for the sixth consecutive year. Statewide, 1.22 antlerless deer were harvested per antlered deer. In major agricultural zones, the rate antlerless deer were harvested per antlered deer ranged from 1.28 (Zone 5) to 1.87 (Zone 47). Table 3. (attached) provides information on the number of deer harvested by hunters by season since 1989. Figure 3. (attached) illustrates the antlerless and antlered deer harvest over the past 10 years.

1998-99 Hunting Season Extension

At the request of agricultural interests in west central New Jersey, the 1998-99 permit shotgun season was extended from February 1 – 13, 1999 in Zones 7, 8, 10, 11, 12 and 41. A total of 956 deer were taken during the season extension. During the six deer seasons, a total of 19,011 deer were harvested in these zones of which 11,071 were antlerless and 7,940 were antlered. Additionally, farmer crop depredation permits, known as Permits to Shoot Wild Deer, were authorized in February and March to farmers with a previous history of damage, whether or not a crop was

actually growing. The above emergency provisions were authorized by the Fish and Game Council to assist in reducing the deer population.

Comparison of Deer Hunting (1966-1996)

Table 4. compares deer hunting in New Jersey by decade from 1966 through 1996. This table illustrates the expansion of hunting days, seasons and harvest. Expansion of the deer hunting seasons continued in 1997 and 1998.

Table 4. Comparison of New Jersey Deer Hunting (1966-1996)

	<u>1966</u>	<u>1976</u>	<u>1986</u>	<u>1996</u>
Seasons provided	3	4	6	6
Potential hunting days	36	44	89	98
Maximum bag limit	3	4	11	37*
Antlered harvest	6,894	8,374	19,907	25,992
Antlerless harvest	2,952	4,644	13,870	30,712
Total harvest	9,846	13,018	33,777	56,704
Recreation days	620,000	765,000	1,290,000	1,600,000
# Bow hunters	25,600	36,220	46,000	52,000
# Shotgun hunters	120,000	116,000	115,000	92,000
# Muzzleloader hunters	0	0	13,280	23,000

*Bag limit dependent on number of permits purchased.

CURRENT PROBLEM AREAS

As indicated previously, the most serious deer management problems are in urban/suburban regions and in agricultural areas, and this report focuses on these areas.

Urban/Suburban Areas

Developed and developing portions of northeastern New Jersey (Zones 9, 13 and 36) have long been recognized as *deer problem areas*. Isolated islands of habitat, stream corridors, green belts, areas of low density housing, estates and other areas have provided the food, cover and water needed by deer. In the absence of hunting or other significant mortality, these local populations have increased to become a significant nuisance and road hazard. Early efforts to control deer in these areas included liberalization of hunting regulations and special deer permit quotas. As New Jersey's human population moved from urban areas, the problem of managing deer in a suburban environment expanded with it. Most of the coastal area from Sandy Hook to the Great Egg Harbor River (Zones 50, 51, 22 and 42), the Camden area (Zone 49) and the Route 1 Corridor (Zone 14) are areas where the deer population must be eliminated or maintained at low levels. New "tools and approaches" are needed to address the growing problems associated with un hunted/unmanaged deer populations inhabiting urban/suburban areas.

Agricultural Areas

The *1998 New Jersey Agriculture Annual Report Agricultural Statistics* indicated the following regarding New Jersey agriculture:

- New Jersey's 9,400 farms vary in size and occupy some 830,000 acres or about 18 percent of the state in 1997.
- Cash receipts for all New Jersey agricultural commodities totaled \$777,400,000 in 1997.
- The primary crops grown are nursery, vegetable, fruits and berries, and grain and forage crops.
- The average per acre value of farmland and buildings for 1998 was \$8,370; the highest average value in the nation.
- Receipts for field crops in 1997 totaled \$66,500,000.
- Income from vegetables in 1997 totaled \$166,200,000.
- Cash receipts from all fruits and berries in 1997 totaled \$109,600,000.
- Nursery, floriculture and sod (outdoors) totaled \$135,300.

The above highlights the importance of agriculture and farmland to New Jersey. Many of the crops produced are very expensive to grow and require a high level of production and gross income per acre for profitable farming. Excessive deer browsing can seriously affect all of these crops. Other types of deer damage include antler rubbing of nursery stock and trampling vegetation. In recent years, many farmers have expressed growing concern over the rising economic losses due to deer depredation. In some areas, losses have threatened the continuance of agricultural production. With the growing importance of farmland preservation and economic viability of agriculture at stake, the deer depredation problem must be resolved.

In October 1998 the New Jersey Agricultural Experiment Station (NJAES) Center for Wildlife Damage Control released its' report entitled "*How Are White-tailed Deer Affecting Agriculture In New Jersey*" (Rutgers Report). The survey was designed and conducted to provide a better understanding of how deer and current deer management practices impact farming and how such practices can lead to improved deer management programs that are more responsive to the needs of farmers seeking solutions to crop damage. The Division assisted with the development of the survey and has requested that NJAES continue to evaluate and report on information collected. A copy of the report summary is attached as Appendix B.

The statewide survey was made of 4,403 farmers, whose farm sales were reported greater than \$10,000 annually. A total of 2,142 farmers (51%) participated in the survey. Responding farmers indicated deer were responsible for 70% of the crop damage caused by wildlife. Thirty-nine percent reported intolerable damage to the point of taking additional action to resolve the problem. An estimated \$620,000 was spent to control deer damage. Twenty five percent of the respondents reported abandoning tillable ground and 36 percent ceased growing preferred crops as a result of deer damage. The DOA estimated the value of crops not grown on the 12,596 acres abandoned at \$5,385,000 and estimated the net loss of income for preferred crops no longer planted on 27,596 acres at \$2,014,000.

Fifty-percent of the growers owned less than eight acres of deer cover and rented or leased 25% of their farmlands from other owners, which affected their ability to control crop losses caused by deer. Fifty-six percent of the responding farmers indicated their ability to control deer numbers was limited by the close proximity of their fields to small residential properties. The presence of a 100-acre or larger parcel of land serving as deer refuge within one mile of farmers' fields was also cited by 43% of the responding growers as limiting their ability to control excessive deer numbers and the resultant crop losses.

Responding growers estimated annual losses between \$5-10 million in deer related damage and indicated that crop losses had exceeded the tolerance of producers throughout much of the state. Note: the Rutgers Report specifies that it makes no effort to project survey results to all farmers in New Jersey, as they may not be representative of farmers making less than \$10,000 annually or of farmers not responding to the survey questionnaire.

In January 1999, the area of west-central New Jersey, encompassing all of Hunterdon and parts of southern Warren, western Somerset, southern Morris and northern Mercer counties was identified by the State Board of Agriculture, the Hunterdon County Board of Agriculture and various local communities and individuals, as having severe damage to agricultural crops due to an

overabundance of deer. This area, which was also identified in the NJAES study as a severe problem area, includes deer management Zones 7, 8, 10, 11, 12 and 41. However, the problem of agricultural crop losses caused by deer is not limited to this particular region of New Jersey. The Rutgers Report also identified farms within Zones 2, 5, and 6 (northern); Zones 14, 15, 16, 17, 19, 20, 23 and 51 (central); and Zones 27, 28, 29, 34, 47 and 63 (southern) as having intolerable deer damage problems. According to Samuel Garrison, Assistant Secretary of the Department of Agriculture, "The State Board of Agriculture has endorsed and supported the results of the NJAES Center for Wildlife Damage Control report in its identification of agricultural areas impacted by overabundant deer that need major, prompt relief."

As noted elsewhere, the current deer management program calls for population reduction on over 76 percent of the deer range, based largely on deer damage to agricultural crops.

FACTORS CONTRIBUTING TO DEER OVER-ABUNDANCE

Decades of experience in New Jersey have shown that in deer management zones where hunters have adequate access to huntable land and the deer, harvesting enough deer to meet management objectives is not a problem. In fact, hunting must actually be highly restricted in many deer management zones so that too many deer are not taken. However, deer-human conflicts do exist, particularly at the interface of suburban and rural areas, and in specific agricultural areas which are often near deer refuges. The economic and environmental impacts of the deer-human conflict warrant development and implementation of special programs designed to reduce and control the deer population.

If sport hunting is the most economical and practical approach to deer population control throughout the nation and New Jersey has the most liberal hunting regulations in the Northeast, why hasn't hunting kept deer in check everywhere in the state? Since the mid-1970s hunter ***access to the deer resource in many areas has been severely reduced and even eliminated*** due to a variety of reasons discussed later in this report. Secondly, ***the number of hunters has declined***. In 1971, 190,418 firearm licenses were sold (excluding juveniles). The number of firearm licenses issued declined steadily to 93,252 in 1998 (-51 %). The number of bow license holders peaked in 1991 at 52,962 and decreased to 47,227 in 1998 (-11 %). In 1998, the Division contracted with Responsive Management Inc. of Harrisonburg, Virginia to determine why hunters stop hunting or decrease hunting activity, and to examine the opinions and attitudes of New Jersey hunters. The survey indicated that ex- and decreased activity hunters do not hunt because they don't have enough private lands to hunt upon, they don't have access to enough places to hunt and they don't have enough free time to hunt.

A discussion of various factors contributing to deer over-abundance follows.

Private Landowner Opposition to Hunting: Approximately 83 percent of New Jersey's deer live on private land. Most deer problems are also on private land. Landowners may eliminate hunting by prohibiting trespassing through several state statutes. In October 1998, the New Jersey Agricultural Experiment Station Center For Wildlife Damage Control released its report entitled *How Are White-tailed Deer Affecting Agriculture In New Jersey* (Rutgers Report). This report indicated that 20 percent of rented farmlands were closed to all hunting. The report also indicated that 17 percent of farmers surveyed allowed no deer hunting whatsoever. Deer populations cannot be controlled by sport hunting if hunters are denied access to deer. As New Jersey continues to "urbanize," the number of private landowners will increase and average size of land holdings will decrease, further complicating deer management on private land.

Local Land Use Regulations: Municipal land use regulations that create low density housing patterns, green belts, parks and other open space have also created deer refuges and contributed to deer overabundance in suburban areas. Low density residential development of one dwelling unit per three acres or more, establishment of dedicated open space, protection of environmentally-sensitive areas such as stream corridors, cluster housing patterns and other land use restrictions are generally well intended and often required by the Coastal Area Facilities Review Act, NJ Pinelands Protection Act, County Planning or other regulations. However, land use regulations that create a mix of open space and development have also unexpectedly created a protected and enhanced environment for deer. Landscaping, lawns, home gardens, grassy road shoulders and increased edge also increase the biological carrying capacity of areas. Additionally, these areas create temporary refuges for deer during hunting seasons. The Rutgers Report indicated that 56 percent of the respondents were limited in their ability to control deer due to the close proximity of their fields to small residential properties.

Local Ordinances Which Ban or Restrict Hunting: Municipal ordinances have been enacted that restrict or prohibit hunting and/or the discharge of firearms. These ordinances preclude deer population control through sport hunting and deer depredation permits. In many instances, the ordinances have been based on perceived safety and/or liability concerns. For example, Princeton Township banned firearm discharge in 1972. Elimination of firearm hunting allowed the deer population to increase dramatically. The number of deer-auto collisions and deer damage to residential landscaping, home gardens and agricultural crops increased with the deer population. The Rutgers Report indicated that 32 percent of the respondents (farmers) perceived that discharge ordinances were impacting their ability to reduce deer numbers.

Deer Refuges: The Rutgers Report indicated that 43 percent of the respondents with severe crop losses had a 100-acre or greater parcel of land serving as a deer refuge within one mile. The majority of refuges were under private ownership. The report also indicated that publicly owned deer refuges of 100-acres or more were common in Monmouth, Mercer, Hunterdon and Burlington counties. This finding is consistent with other Division reports and records. Division records also indicate that publicly owned lands are deer refuges in Cape May, Gloucester and Salem counties. In many situations, public land administrators and associated boards or commissions refuse to cooperate with the Division in developing deer management programs.

State Regulations: Some hunting regulations may be overly restrictive and inhibit deer population control. For example, state hunting regulations were amended legislatively in 1990 to prohibit bow hunting within 450 feet of a building or a school playground. This restriction may be unnecessary since there were few, if any associated safety problems through 1989.

Hunter Resistance to Reducing Deer Populations: Some hunters and hunting clubs are opposed to deer population reduction, particularly where large numbers of deer are being shot by farmers on deer depredation permits.

Hunter Preference for Harvesting Antlered Bucks: Some hunters will only harvest antlered deer which contributes very little to deer population control. Deer populations were re-established in many states, including New Jersey, by restricting the deer harvest to only antlered bucks. Due to sportsman opposition, the harvest of antlerless deer was not approved statewide until 1979. Many hunters retain the “bucks only” philosophy. Hunters with exclusive access to prime private land have demonstrated a preference for harvesting antlered deer. Conversely, hunters on public land and private land with public access have demonstrated a willingness to harvest antlerless deer. It should be noted that more than half the deer harvested statewide during 10 of the past 11 years were antlerless deer, and that fewer hunters are killing record numbers of antlerless deer. However, in many areas not enough antlerless deer are killed annually to control populations.

Disposition of Harvested Deer: Many hunters cannot consume or give away more than one or two deer per year. *The New Jersey Hunter Retention and Deer Hunter Satisfaction Survey* indicated that more than 60 percent of hunters would shoot more deer if they could donate the deer to a worthy cause if they did not have to pay the processing cost.

High Hunting Lease Fees: Some hunters have commented that they do not feel obligated to harvest antlerless deer or reduce local deer populations when they are paying what they perceive as high hunting lease fees. For example, a sportsman’s club representative reported paying \$32,000 to lease an 800-acre farm in Morris County. The owner of the property also rented the tillable land to a farmer, previously sold the development rights and was harvesting the mature timber from the woodlots. In 1998-99, the club harvested 32 antlered bucks, one fawn buck and one adult doe on the property which was also utilized for upland game hunting. (The club representative contacted the Division to protest proposed deer hunting season regulation changes that would restrict the harvest of antlered bucks and require that an antlerless deer be taken before a buck in 1999.)

Public Resistance to Reducing Deer Populations: Many citizens do not want deer populations reduced or are opposed to killing animals to control populations.

Animal Rights/Welfare Groups: Animal rights and welfare advocates constantly oppose deer population control efforts, especially those approaches involving lethal removal of deer. They are vehemently opposed to sport hunting.

Lack of Private Landowner Involvement in Deer Management: Many landowners, including some farmers, do not play an active role in managing deer on their land and often do not monitor hunter activity or harvest. For example, the Rutgers Report indicated that only five percent of farmers required that hunters shoot antlerless deer.

Leased Farmland: Many landowners lease their land at low rates to farmers for income, or at little or no cost to maintain farmland assessment benefits. In many instances, hunting rights are retained by landowners or leased separately at high rates (\$20 to more than \$40 per acre) to clubs or individuals, often resulting in disagreement regarding deer population levels. Farmers that lease land want no or minimal deer damage to crops, especially since they do not receive the additional income generated by the hunting lease to compensate for deer damage. Additionally, farmers that lease land on short-term contracts are generally not willing to make long-term improvements such as erecting a fence. The Rutgers Report indicated that farmers controlled hunting on only one half of the farmland they rented and that hunting was prohibited on 20 percent of the leased land. In problem areas, most farmers do not own the land that they farm.

The White-tailed Deer's Reproductive Capacity: Although deer litter sizes are small compared to many other mammals, populations can nearly double from year to year under optimum conditions and low mortality rates. It is essential to maintain deer populations at acceptable levels through the annual removal of 40 percent of the population in most areas.

RECOMMENDATIONS TO REDUCE DEER-HUMAN CONFLICTS

Legislature

The Legislature should support the initiative (Bill #s S-1378 and A-2549) that would ensure the funding base for the Division of Fish, Game and Wildlife through the year 2002. Without adequate funding, various programs will have to be further reduced or eliminated. These would include wildlife data control programs and services.

Regulations that restrict the use of bait for deer hunting should be permanently repealed (Bill #s S-1819; A-3022). The use of bait to attract deer can increase hunter harvest in many situations. Bait may be used to draw deer from areas that cannot be hunted to areas where they may safely be harvested. The use of bait as a hunting technique may be especially useful in suburban areas and on farms that are near deer refuges. The use of bait for deer hunting is supported by a majority of New Jersey hunters and has been a traditional hunting technique in much of the Pinelands region.

Amend the law to allow bow hunting for deer within 450 feet of buildings. Prior to 1990, bow hunting was exempt from the prohibition on hunting within 450 feet of buildings and there were few, if any, safety problems noted. In 1990, several related regulations were modified and bow hunting was prohibited within 450 feet of occupied buildings. The limited range of a bow, predominance of tree stand use for bow hunting, low profile nature of the sport, and safety record of bow hunting warrant repeal or relief from this regulation (for example, reduce the prohibited distance to 150 feet). Bow hunting is an important tool in deer population control.

Amend the law to allow firearm deer hunting within 450 feet of occupied buildings. Current regulations do allow the owner or lessee of a building to hunt with firearm or bow within 450 feet of said building(s). The regulations also allow the owner or lessee of buildings to provide written permission for others to hunt within 450 feet of their building(s). The same 150 foot minimum distance requirement could also be provided for firearm use if and when the shooting is done under the Division's Community-based Deer Management Program. Hunters must always be aware of their target and what is beyond, regardless of the distance requirement of the existing regulation.

Deer depredation and public safety laws and regulations should be amended to allow issuance of permits based on anticipated deer damage and at times other than the growing seasons. Deer depredation permit regulations (N.J.A.C. 7:25-23) should be amended to be in conformity with the revised statutes and to provide for alternative weapons and methods. Laws should be enacted to provide for other situations or circumstances requiring deer control such as at airports. Currently, the Division is without the legal authority to permit airports or local governments to kill deer during nighttime hours and on Sundays, or to use silencers or shoot deer within 450' of buildings. Such authority is needed, particularly to address public safety concerns

Lands purchased with public funds, such as dedicated open space monies, should be required to have wildlife management plans that include deer control and management elements (Bill # S-1776). Public land areas including parks, forests and watersheds that harbor deer should be open to hunting during the regular deer seasons unless there are special reasons that preclude hunting. If the area contains deer and is not open to general hunting, a deer management plan containing special area hunting provisions or alternative deer population control approaches as permitted in the Community Based Deer Management Plan should be required.

Additional financial support should be provided for the New Jersey Agricultural Experiment Station, Center for Wildlife Damage Control. The Department of Agriculture recommends that at least \$300,000 be appropriated to the Division for wildlife control purposes of which \$200,000 would be contracted to NJAES for wildlife control, research and education. The remaining \$100,000 would be available to the Division for wildlife control related to agriculture. The remaining \$100,000 would be available from the General Fund to the Division for wildlife control related to agriculture.

Provide financial support for the Division's Wildlife Control Unit from the General Fund for wildlife damage mitigation and emergency response. Additional funds are needed for personnel, materials and equipment. Appropriate \$100,000 for deer fencing (**Bill #s S-532; A-753**). This appropriation would fund the purchase of fence that would be provided to farmers at no charge. Fencing can be an effective technique for preventing deer damage to agricultural crops.

The New Jersey Landowners Liability Act should be amended (Bill # A-2966) to limit potential liability to landowners who open their land to hunting, fishing and trapping for a fee. For example, landowners that lease land to hunting clubs should have their liability limited.

The model venison donation program developed in 1998, Hunters Helping the Hungry in Hunterdon, Warren and Sussex counties, should be expanded statewide and financially supported from the General Fund. The program encourages hunters to harvest additional deer, which are utilized by food banks, soup kitchens or similar establishments. A recent survey of New Jersey hunters indicated that over 60 percent would kill more deer, if they could donate the deer to a worthy cause such as a food bank and they did not have to assume the processing fee (generally \$50 per deer). An appropriation of \$80,000 from the General Fund could provide for the processing of 1,500 deer with minimal administrative costs if handled by an organization such as NORWESCAP Food Bank. The Department of Agriculture, which administers a Venison Donation Program to needy food organizations from deer harvested through farmer deer depredation permits in early 1999, recommends that \$200,000 be appropriated from the General Fund for a larger, statewide program. The funding would cover (a) costs for processing and distribution of hunter-donated venison to needy organizations and (b) other costs associated with the handling and transportation of deer harvested under depredation or other authorized deer reduction programs.

Provide \$200,000 for community-based deer management in certain agricultural areas incurring deer damage (S-1768; A-2926). To date, the Division's community-based deer management program which benefits the general public has been funded by sportsmen through dedicated hunting license fees. Additional funding is needed from the state's General Fund for technical assistance, aerial population surveys, processing deer and other related expenses.

Provide the Department of Agriculture an appropriation of \$25,000 every three years in order to conduct a survey of growers to determine the extent of crop damage caused by

deer.

The Legislature should modify the ban on Sunday deer hunting should other methods to reduce deer not prove effective. A statutory change should be made to provide the option of Sunday deer hunting in specific areas where current hunting methods and programs are not adequate to manage or control deer populations. This change should be limited to specific areas when determined necessary. Sunday hunting is currently allowed on commercial and semi-wild shooting preserves (private land).

Department of Environmental Protection

Division of Fish Game and Wildlife

Continue Modification of Annual Deer Hunting Regulations. The Division's eleven member, Fish and Game Council (Council) establishes the annual seasons, bag limits and method of take for game animals including deer. The Council should continue to modify deer hunting regulations in order to reach deer population management objectives. Changes proposed to enhance deer population control efforts in 1999-2000 in agricultural and urban/suburban deer management zones include:

- Increasing the shotgun permit seasons and permit quotas to meet second and over-the-counter demand.
- Making all deer tags valid on the date of issuance and allowing for the taking of multiple deer in a day.
- Providing the opportunity to take two deer at a time during the shotgun permit season in many zones.
- Requiring an antlerless deer be taken first in all seasons except six-day firearm in many zones.
- Increasing the shotgun permit season length in many zones, including a 31-day format in some zones.
- Reducing the requirements for site specific shotgun and muzzleloader deer hunting season permits for harvesting antlerless deer.
- Generally modifying regulations to ensure that at least three antlerless deer are taken per antlered buck in deer reduction zones.

Develop Strategic and Operational Deer Management Plans: Development of strategic and operational deer management plans would consolidate existing information and provide working documents which could be periodically reviewed and modified. The strategic plan would describe current deer resource status and use; identify management problems; project future hunter demand and deer populations; and formalize deer management goals, objectives and strategies. The operational plan would identify programs including costs that would enable resource managers to reach objectives and goals. These plans should be developed with input from interested stakeholders and should cover a five-year period. Approximately six months of Division staff time would be required to complete the plans over a one-year period.

Develop and Annually Update an Assessment of White-tailed Deer in New Jersey: An Assessment of Deer Hunting in New Jersey (1976) and The White-tailed Deer in New Jersey: History, Biology and Management (unpublished) should be used as the basis for producing a general document. The document would include historical and current information and would serve as a primary information source on deer in New Jersey. Considerable effort would be needed to up-date much of the existing document. Select tables, figures and graphs could be updated annually using the latest data and available in the fall. Approximately 50 days of staff time would be required to produce the document and annual amendments would require an estimated 20 staff days. Production costs would be dependent on printing techniques, editing, and number and quality of booklets produced.

Increase Farmer/Landowner Input in Development of Deer Management Strategies and Annual Hunting Regulations: Farmer/landowner input in determining deer management strategies and hunting regulations in major agricultural production counties should be increased through annual meetings with County Boards of Agriculture, farmers and other major landowners. The meetings should be held in December or January to provide timely input for developing the annual hunting regulations. County Agricultural Board Representatives, farmers, interested landowners, the Regional Farmer Representative of the Fish and Game Council, the Division's County Representative, the Regional Deer Biologist, local Conservation Officers and the Regional Wildlife Control Unit Representative should attend. A summary of the meetings should be prepared and considered when developing management strategies and regulations for applicable zones. The Fish and Game Council Farmer Representative would take the lead in increasing farmer input.

Increase Sportsman Input in Development of Deer Management Strategies and Annual Hunting Regulations: Sportsman input in development of deer management strategies and hunting regulations should also be encouraged through regional meetings in January and February. The meetings would provide the opportunity for sportsmen, especially those not represented in County Federations of Sportsmen's Clubs, to express their views on deer management for possible consideration in developing the annual Game Code. The Regional Deer Biologist, Regional Sportsman Representatives on the Fish and Game Council, Wildlife Control Representative, local Conservation Officers and sportsmen should attend. The Fish and Game Council Representative would act as host for the meeting and convey applicable information to the full Fish and Game Council.

Continue to Develop the Community Based Deer Management Program: This relatively new and experimental program should continue to be evaluated, modified and supported to achieve deer population control objectives in urban/suburban areas. Similar efforts in other states such as Virginia should continue to be monitored for possible application in New Jersey. Applicable regulations should be modified to clarify and improve the program. For examples, the program should be expanded to include private and other non-governmental entities such as golf courses, corporate landowners, and homeowner associations. Laws should be changed to allow the discharge of firearms within 450 feet of buildings, shooting during the hours of darkness and use of noise suppressors on guns by qualified agents who would work under the supervision of law enforcement authorities. Minimum qualification standards for agents and standard operating procedures should also be developed. Increased funding is needed to pay for the program. Approximately \$125,000 is needed to provide technical assistance and limited aerial surveys for a few public areas.

Increase the Special Area Deer Management Program: A generic, deer management plan should be developed and made available to administrators of large tracts of public or quasi-public land. The plan should provide information regarding deer management and ecology, deer management options and existing special area programs on national wildlife refuges, military bases, state and county parks, watersheds and the Delaware Water Gap National Recreation Area. In 1998, there were 16 special management areas with separate zone designations. Additional special management areas participated in the program within regulations established for the deer management zones that they were located in including Hunterdon and Morris County Park Systems, Wallkill and Cape May National Wildlife Refuges, Newark Watershed, and Delaware Water Gap National Recreation Area. Completion of "Generic Deer Management Plan for Special Management Areas" would cost approximately \$10,000, primarily for salaries associated with writing and editing. Distribution would be through the Division's Trenton and Regional Deer Project Offices. Adequate staff time should be available to continue existing programs and to pursue development and implementation of special area management plans on additional state and county parks and other areas (development and implementation of a special management plan can involve six months of Division staff time).

Promote Quality Deer Management Programs: Quality deer management (QDM) programs have been developed primarily in the Southeastern United States to reduce deer populations and increase the number of bucks in 2.5 and older age classes. The New Jersey Hunter Retention and Deer Hunter Satisfaction Survey conducted in 1998 indicated that 75 percent of the hunters would support QDM. Specifically, the hunters would be willing to give up the opportunity to shoot small antlered bucks (young bucks with less than six points) and would shoot more does in exchange for an increased opportunity to harvest large antlered bucks (generally bucks 2.5 years or older) in later years. The western portion of Fort Dix (Zone 37), the Federal Aviation Administration Center in Pomona (Zone 66) and at least one sportsman's club have QDM programs. QDM has the potential to be an effective approach to reducing deer numbers in the agricultural areas of New Jersey. QDM programs could be established on an experimental basis for select zones by amending the Game Code. Program costs would include public education, evaluation of season results and enforcement of regulations.

Increase the Deer Research Program: Additional public funds and staff are needed for CBDMP, special management area programs, deer population estimation/modeling, and other research and management. Three principal biologists and one statistical/computer expert are needed.

Increase the Wildlife Control Program: Additional public funds are needed for fence, repellents and salaries. Personnel time and resources continue to be diverted to increasing bear-human conflicts in northern New Jersey.

Continue to Monitor Programs in Other States for Possible Solutions and Experiences: As indicated in the introduction, deer overabundance is a common problem which challenges professional wildlife managers throughout North America. Several regional conferences have been devoted to the topic or similar topics. Bulletins, books, popular and scientific articles, videos and other resources have been prepared and are available.

Increase Public Education: An increased effort is needed to inform the public of the need to control and manage deer populations. Messages to target groups should include the following:

- Landowners, including farmers, must be informed regarding the need to control deer on their properties. Materials such as the brochure *Deer Hunting and the Farmer* should be provided to landowners through governmental offices and direct mailings.
- The general public should be provided with a general overview of the status of deer, their significant negative impacts on agriculture and the need to control deer populations. The video entitled "*Deer Crossing*" was produced by New Jersey Network in 1998.
- Farmers should be made aware that the Division could provide additional hunting permits to cull antlerless deer on their lands.
- Supplemental or advanced hunter training should be provided through the Hunter

Education Unit to update hunter skills and knowledge. The combination of experience and additional training may enhance efforts to get landowners to open areas to deer hunting. Many special areas such as military bases and national wildlife refuges provide site specific and general training as a condition of access.

- Sportsmen should be informed and encouraged to discuss alternative hunting options with landowners to gain access to deer. For examples, hunters can request written permission to hunt within 450 feet of a building. They may agree to restrict themselves to hunting from elevated stands and during specific hours, and shooting in marked and designated zones. Deer in areas off limits to hunting can be baited, driven or chased to areas where it is safe or permissible to shoot safely.
- Feeding deer should be discouraged in urban/suburban areas. Providing supplemental food for deer increases the biological carrying capacity, causes a dependency on humans, increases the potential for disease transmission among deer and can increase the incidence of deer-auto collisions where deer cross roadways to reach feeding sites. Concentrating deer through supplemental feeding can also result in increased landscape damage for nearby landowners and increased winter deer mortality (dominant deer often consume all or most available food at feeding sites).

Department of Agriculture

In addition to the recommendations included in the Legislative section dealing with venison donation and deer damage surveys, the DOA should:

- Continue to consult and cooperate with the Division and Rutgers Center for Wildlife Damage Control regarding agricultural and wildlife management issues.
- Work with farm organizations to coordinate interests and develop positions and recommended needs to deal with wildlife management and control issues.
- Cooperate with private landowners and other government agencies in resolving deer depredation problems.

Rutgers Center for Wildlife Damage Control

Rutgers' New Jersey Agricultural Experiment Station (NJAES), Center For Wildlife Damage Control. The NJAES report entitled "*How are White-tailed Deer Affecting Agriculture in New Jersey,*" while "recognizing that field solutions must be customized to each landowner," also recommends several "broad policy changes." These recommendations included:

- Better record keeping by farmers regarding deer killed by hunters and crop losses.
- Removal of the appropriate number of male and female deer by site.
- Landowner regulation of hunters to ensure proper harvest.
- Improved communication between farmers renting land and landowners regarding the need to reduce deer numbers.
- Improved communication on the need to control deer numbers with adjacent landowners.

- Development of legislation requiring incorporation of deer management plans into open space protection programs.
- Implementation of deer management plans for public parks and reserves that do not currently have programs.
- Prompt reporting of deer damage to the Division via the special farmer hotline.
- Seeking advice and assistance from Rutgers Cooperative Extension.

It is recommended that NJAES:

- Continue to evaluate and publish findings from the 1998 survey.
- Conduct additional research and education efforts regarding wildlife damage control.
- Serve as resource specialists to landowners, farmers, public land managers, sportsmen and the public on wildlife management issues and resolving wildlife damage problems. For example, NJAES could provide a service to link landowners that want to reduce local deer populations with hunters seeking to hunt on private hunting lands.

County Governments

County governments and administrators should be aware of the need to control and manage deer populations on lands including parks that they control. Where hunting is not an option for legitimate safety reasons, county governments should fund, support and utilize the Community Based Deer Management Program. County planning agencies should consider the impact of development and regulations on deer populations. County park administrators and associated commissions should contact the Division for assistance in developing deer management plans.

Municipal Governments

Municipalities that have deer populations on private, undeveloped lands that could be safely hunted should consider the following:

- Not adopting regulations that restrict or prohibit hunting.
- Rescinding local existing ordinances that ban the discharge of firearms or prohibit hunting.
- The impact of land use regulations on deer. For example, low density housing patterns and establishment of conservation easements or open space creates deer refuges. Deer populations should be reduced in advance if development of large tracts of land is anticipated. Developers should be required to assess the impact of development on deer on sites of 20 acres or more, and to provide funding for deer control programs.
- Hunting should be permitted on municipal land whenever possible.

Where hunting is not an option, the Community Based Deer Management Program should be utilized. The local governing body must provide adequate funding for the CBDMP.

Federal Agencies

Federal agencies should develop and implement deer management programs for properties of 50 acres or more that support resident deer not open to hunting or included in a CBDMP. The United States Fish and Wildlife Service should provide adequate funding to support deer management programs on national wildlife refuges.

NJ Farm Bureau

The New Jersey Farm Bureau should review its program to assist landowners in obtaining hunters for their properties. If the program is not working, the reasons should be determined. The *New Jersey Hunter Retention and Deer Hunter Satisfaction* Survey contracted by the Division in 1998 indicated that hunters are dropping out of the sport because they do not have enough private land to hunt.

The publication *"This Week in Farm Bureau"* and the *Farm Bureau Website* should include additional information on Division programs and regulations that may be utilized to reduce deer damage.

Private Landowners

The control of wildlife populations on all private lands is essential to proper wildlife management and especially to proper deer management. The Rutgers Report made the following recommendations for landowners:

- Landowners should play an active role in managing deer on their properties. Records should be kept regarding the number and sex of deer harvested. Hunters should be required to harvest antlerless deer as a condition of access.
- Deer damage problems should be discussed with adjacent landowners.
- Landowners should support efforts to open “deer refuges” to hunting.
- Deer damage problems should be reported promptly to the Division.

The *New Jersey Hunter Retention and Deer Hunter Satisfaction* Survey indicated that the lack of private hunting land was a primary reason why hunters discontinue or reduce hunting activity. Increasing hunting opportunity on private lands would certainly enhance efforts to control deer numbers and retention of hunters in the sport of hunting.

State Federation of Sportsmen's Clubs

The liberal deer seasons and bag limits currently available to New Jersey deer hunters have provided a means for harvesting a significant number of deer and assisting the farmer with deer control problems. Sportsmen leadership should encourage members to take on an increased role of stewardship and assist with deer management efforts through the harvesting of female deer.

IMPACT OF ALLOWING BAITING FOR DEER HUNTING IN 1998-99

As indicated in the introduction, Governor Whitman conditionally vetoed Assembly Bill No. 1933, known as the “Baiting Bill.” The conditional veto allowed the use of bait for deer hunting during the 1998-99 deer hunting seasons in all counties except Bergen, Essex and Hudson, and required that the effects of baiting on managing deer, other wildlife and the general public be evaluated and included in this report. The impact of allowing the use of bait for deer hunting could not be evaluated until the deer seasons had concluded on February 13, 1999, and the deer mortality data was collected, edited, processed and accessed during April 1999. Additional information was obtained from field research, a telephone survey of hunters and questions included in a separate survey entitled *New Jersey Hunter Retention and Deer Hunter Satisfaction* conducted under contract by Responsive Management Inc. located in Harrisonburg, Virginia.

Available information regarding the impact of allowing baiting for deer hunting in 1998-99 is included in a separate report entitled *An Evaluation of the Effects of Baiting on Managing New Jersey's Deer Population, Other Wildlife and the Health, Safety, and Welfare of the General Population*. Following are some of the report's findings:

- The Division survey indicated that 70 percent of deer hunters support the use of bait on a statewide basis and 88 percent of deer hunters support use of bait in special situations such as in urban/suburban areas and agricultural areas experiencing excessive deer damage.
- Over 91 percent of hunters surveyed were aware of the regulatory change.
- The survey indicated that 27.7 percent of the respondents hunted while elevated, or from a structure that was within 300 feet of a baited area. Based on this information, more than 25,000 hunters may have used bait during the 1998-99 deer seasons.
- The total success rate of hunters using bait during the three permit seasons was significantly higher (49.1%) than those surveyed not using bait (36.6%) and the statewide hunter success rate (35.6%). Nearly 85 percent of bait use was on private property.

- More than 71 percent of bait users spent less than \$50 for its purchase. Three and a half percent (3.5%) of bait users spent \$250 or more. Corn was the most widely used bait. Based on the sample, hunters paid more than \$1,250,000 to farmers or farm produce suppliers for bait used in deer hunting. Based on the hunter expenditures and average prices of items typically used (such as whole corn), it is likely that more than 1,000,000 pounds of bait were distributed during the 1998-99 deer hunting seasons.
- Although hunters using bait reported a higher success rate than those who did not, the actual impact of the regulation change on the total deer harvest appears to have been minimal. Changes in season lengths, bag limits and permit quotas had a greater impact on the harvest regionally and in most zones. The 1998-99 total deer harvest would have actually been less than the previous year, had the shotgun permit season not been extended into February. Since the legal and illegal use of bait for deer hunting was historically a common practice, especially in the Pinelands, it is quite likely that a high percentage of the hunters reporting using bait in 1998 had used bait in previous years with similar results.
- There were no reports of bait impacting other wildlife or the health, safety and welfare of the general population. Some hunters and non-hunters contacted the Division to express disapproval of the use of bait on ethical grounds. The Division will investigate any future reports of negative impacts.

As indicated previously, the permanent repeal of the prohibition on using bait for deer hunting is recommended. The Division, including the Fish and Game Council, supports the permanent repeal. However, potential conflicts caused by baiting deer on public lands may require agency restrictions in the future. Additionally, hunters and wildlife watchers must be careful not to distribute contaminated grain such as moldy corn or create conditions for bait to become toxic to wildlife.

SUMMARY

White tailed deer are a valuable renewable public resource, enjoyed by thousands of New Jersey residents. In all areas where deer exist, populations must be controlled through human intervention. Regulated sport hunting has been, and continues to be, the most efficient, economical and humane means of deer population control throughout most of New Jersey and North America. In undeveloped regions of the state where hunters have good access to the deer resource, there is no problem controlling deer numbers at levels that the habitat can support and the majority of the human population can live with. However, deer numbers exceed human tolerance levels in many agricultural and developed areas because too few deer are being removed annually to achieve population goals. In many problem areas, 120 plus days of deer hunting with an unlimited bag, has not provided for significant population reduction. Since each problem deer area is unique, the factors contributing to deer overabundance must be identified so that appropriate solutions can be applied.

In urban/suburban areas, alternative approaches to managing deer must be applied as provided for in the Community Based Deer Management Program. In agricultural areas, deer populations may be better controlled throughout the year utilizing deer hunters (October – January) and deer depredation permits (year-round). Changes in statutes and regulations, such as allowing farmers to hunt on land that they do not reside on, may also enhance deer management efforts.

Other approaches to solving deer over-abundance will require increased funding for research, public education and management, and the cooperation of all the various stakeholders including farmers, hunters, government officials, legislators and the general public. The problem of deer overabundance can be resolved through a cooperative effort and adequate funding.