

FINAL REPORT

2017 DEER MANAGEMENT PROGRAM FOR ESSEX COUNTY, NEW JERSEY SOUTH MOUNTAIN RESERVATION HILLTOP RESERVATION

Prepared for

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the Essex County Board of Chosen Freeholders,

and

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by

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Background

In 1896, a year after the formation of the Essex County Park System, John Durand described the mountain that includes South Mountain Reservation as “a wilderness, as it probably existed at the time of Henrick Hudson, a primitive forest abounding with deer and other wild animals, and traversed by streams alive with trout. Game was plentiful – partridges, quail, woodcock, rabbits, squirrels of every species, raccoons and foxes.”

Today, the County of Essex, like many governmental entities in New Jersey, finds that deer abound in much greater numbers than the other wild animals. In several of its large tracts of parkland and open space, the County sees the problems typically associated with an over-population of white-tailed deer:

- Vegetation in tracts of public open space is being over-browsed, resulting in a loss of vegetative biodiversity;
- Loss of vegetation due to over-browsing is forcing a decline in the number of animal species, particularly songbirds and small mammals, that depend on the herbaceous and shrub layers of the forest and fields for food and cover;
- Over-browsing of native tree seedlings is precluding growth of new trees, altering the age structure of forested areas and stopping the ability of the forest to regenerate as older trees are lost;
- Loss of vegetation is decreasing the ability of forested areas to retain rainwater, increasing the rate and volume of stormwater runoff to streams and rivers, exacerbating erosion and flooding problems;
- Loss of native vegetation is enabling an incursion of invasive exotic plants, which outcompete native species, and provide little or no benefit to native wildlife;
- Trees and shrubs in the surrounding residential areas are being heavily browsed, resulting in huge financial losses for area residents, landscapers and nurseries;
- Deer-related motor vehicle accidents result in personal injury, significant property damage, and mortality or injury of many deer, and could lead to loss of human life;
- The fear of Lyme Disease diminishes enjoyment of the out-of-doors for many people, both in public open space and in their own yards; and
- Destruction of garden plants and the ubiquitous presence of deer droppings hinder the ability of homeowners to enjoy use of their own yards for gardening and recreating.

Officials of the County of Essex, including its Department of Parks, Recreation and Cultural Affairs, have been concerned for two decades with the dense population of white-tailed deer in the South Mountain Reservation, and the resultant effect on forest ecology and the surrounding community. Hearings organized by Freeholder Chairman (now County Executive) Joseph DiVincenzo in the mid 1990’s brought out residents complaining of the usual problems associated with high deer density in large tracts of public land surrounded by suburbia - residential landscaping damage, deer-related motor vehicle accidents, fear of Lyme Disease, and the inability of homeowners to enjoy use of their own yards.

Parks Department staff were particularly alarmed by the impact of overbrowsing of deer on the South Mountain Reservation, where the understory had been eaten away from most of the 2,047-acre park and the survival of plant and other animal communities was seriously threatened. In more recent years, expressions of concern for the forest ecology have been echoed by the South Mountain Conservancy and New Jersey Audubon.

In March, 2006, the County of Essex received a Landscape and Infrastructure Assessment and Restoration Management Plan for the South Mountain Reservation, prepared by Professional Planning and Engineering Corporation (PPE). Recommendations for management of deer presented in that plan were based on a Deer Management Report issued by The Louis Berger Group, Inc. in November, 2005.

Louis Berger and PPE noted that deer populations had been browsing on the understory of the forest at levels that were changing the vegetative species composition and disrupting the natural landscape. In addition, deer impacts were affecting the visitor's visual experience and the historic and scenic value of many areas in the largest park in the oldest County park system in the United States.

The impact of the high deer population on the forest ecology in South Mountain Reservation was most evident at the herbaceous and shrub layers of the understory. Tree seedlings, forbs, wildflowers, shrubs and even an accumulation of leaf litter had largely disappeared. The future effect on the forest was foretold as the tree canopy was thinning in some areas and not being replaced due to a lack of seedlings and saplings.

About 80% of the 2,047-acre park is forested. More than 75% of that area consists of an evenly aged stand of trees with low species diversity and minimal understory. The early successional habitat found in seedlings and saplings stands has been eliminated by deer overbrowsing, which precludes the possibility of forest regeneration.

In some areas, the lack of an understory has allowed the incursion of huge quantities of invasive exotic plants, which deer won't eat and which provide little or no food or shelter resources to other wildlife. Massive stands of Japanese knotweed are prevalent along many of the roads and at the edges of meadows and activity areas. Japanese stiltgrass covers acres of the forest floor.

A survey of vegetation species found throughout South Mountain Reservation as part of the PPE study identified 98 different tree, shrub and herbaceous species. Eleven of those species are invasive plants not native to North America.

The loss of vegetation due to overbrowsing by deer was leading to an increase in erosion and a decline in stream and lake water quality. Slope areas and hiking trails that were most badly eroded were in areas where the herbaceous layer of the forest had been stripped away. Instead of rainwater seeping into the porous ground of a healthy forest, thereby filtering pollutants and assimilating nutrients, the water was running quickly over the hardened slopes, washing soil with it and causing a decrease in water quality in the park's streams.

As a first step in trying to deal with the burgeoning deer population, the County of Essex looked at the feasibility of instituting a deer management program in the South Mountain Reservation. The County hoped to draw upon the experience of its neighbor, the County of Union, which successfully addressed similar issues in its 2,065-acre Watchung Reservation.

The Watchung Reservation is similar to South Mountain Reservation in terms of size, ecology, and topography. Implementation of a deer management program there in 1995 achieved a reduction of deer density from 180/square mile to 35/square mile in just four years, and now is maintaining the population at about 30/square mile (though still trying to go lower). Impacts on the Watchung Reservation have been greatly reduced and signs of regeneration are found throughout the forest.

Essex County officials felt that lessons learned during and since the reduction phase of the Watchung Reservation program could be applied to efforts in South Mountain Reservation, and could be expected to achieve deer population reduction with greater efficiency of time and manpower. County Executive DiVincenzo recruited Daniel J. Bernier, a wildlife management consultant, in mid-2008 to design, permit, prepare and implement a deer management program for South Mountain Reservation. As Director of the Union County Division of Park Environmental Services, Bernier has administered the Watchung Reservation Deer Management Program since its inception in 1995.

Numerous meetings were held between the wildlife management consultant, Essex County officials and staff, municipal officials, and representatives of several law enforcement agencies. A set of Program Guidelines was developed that almost replicated the plan successfully used to remove deer by selected agents from the Watchung Reservation. All elements of the shooting program were crafted and carefully reviewed to ensure that deer would be removed in a manner that was safe for program participants, park users, and park neighbors, while at the same time being humane in its treatment of the deer.

Essex County set its initial goal at reducing the deer population to the 20 deer per square mile goal density that is typically recommended for fostering a forest's ability to regenerate. That density equates to a targeted population size of about 64 deer in the park. Based on Forward Looking Infrared censuses of deer conducted between 1999 and 2005, it was estimated that achieving that density would require the removal of at least 250 deer.

After the New Jersey Division of Fish and Wildlife issued a Special Deer Management Permit, shooting activity began in January, 2008. When the program ended in late February, after 8 ½ days of operation, 213 deer had been harvested from the South Mountain Reservation. Similarly, in January and February of 2009, 83 deer were removed over the course of 9 days of hunting.

The Program Expands

In light of the considerable success achieved in reducing the deer density in South Mountain Reservation in just the first 2 years, County Executive DiVincenzo looked toward beginning to tackle the deer problem in other areas of the Essex County Park System. Two park properties where deer impacts were noticeable and complaints from the surrounding communities were high are Eagle Rock Reservation and the Hilltop Property.

Wildlife Management Consultant Bernier developed population density estimates that, in turn, guided the establishment of goals for removing 50 deer from South Mountain Reservation, 75 deer from Eagle Rock Reservation and 50 deer from the Hilltop Property in the 2010 season.

Because of a disparity in the number of deer killed on afternoon shifts versus morning shifts in 2009, it was recommended that hunting at South Mountain Reservation only be conducted in the afternoons in 2010. In 6 half-day shifts, another 44 deer were removed from the park. Remarkably, in 3 ½ full days of hunting, only 19 deer were removed from Eagle Rock Reservation. However, an incredible 97 deer were taken out of the Hilltop Property in that same time period.

In 2011, new goals were set for the removal of 60 deer from South Mountain Reservation in four half-day sessions, 25 deer from Eagle Rock Reservation in eight half-days, and 90 deer from the Hilltop Property in eight full days. In actuality, three half-day shifts yielded 48 deer from South Mountain. Only 19 deer were removed from Eagle Rock Reservation in seven half-days, but 120 deer were taken out of the Hilltop Property in seven full days.

Similarly in 2012, goals were set for the removal of 60 deer from South Mountain Reservation in 5 full-day sessions, 25 deer from Eagle Rock Reservation in 7 half-days, and 130 deer from the Hilltop Property in 7 full days. In actuality, 4 1/2 days yielded 50 deer from South Mountain. Twenty-three deer were removed from Eagle Rock Reservation in 7 half-days, and 102 deer were taken out of the Hilltop Property in 7 full days.

In 2013, goals were established for removing 115 deer from South Mountain Reservation in 3 afternoon sessions, as well as 80 deer from the Hilltop Property in 3 full days. No hunting was planned for Eagle Rock Reservation, as the deer population estimate at that time was lower than the amount that could be efficiently removed in terms of cost and manpower. The 3 half-days of hunting at South Mountain yielded 43 deer, and 61 deer were taken out of the Hilltop Property in 2 full days and 1 half-day.

In response to spotlight counts, goals were set for the removal of 9 deer from South Mountain Reservation in 4 half-day sessions in 2014, and 43 deer from the Hilltop Reservation in another 4 afternoon sessions. Surprisingly, in spite of difficult weather, 3 half-days of hunting yielded 52 deer from South Mountain. Fifty-six deer were taken out of the Hilltop Property in another 3 half-days.

In 2015, the goal was to remove 103 deer from South Mountain Reservation in 4 afternoon sessions, as well as 121 deer from the Hilltop Property in another 4 afternoons. Hunting was again not planned for Eagle Rock Reservation, as the deer population was too low to warrant the expense of a hunting program. Weather was extremely difficult, with snow ranging throughout the hunting program from 6" to 12" average depth. Temperatures were always below freezing, and the snow cover became capped with ice. As a result, the 3 half-days of hunting at South Mountain yielded only 31 deer, four afternoon sessions at the Hilltop Property yielded only 39 deer.

Weather conditions were considerably improved in 2016. But a snowstorm did cause the cancellation of hunting activity on 1 of the 6 scheduled afternoons in South Mountain Reservation. Snow was present on the ground at depths up to 12" on 3 days in South Mountain Reservation, as well as the first 2 days of hunting at the Hilltop Reservation. Two of the 7 scheduled days of hunting at Hilltop Reservation had to be cancelled due to rain and wind. Five half-days of hunting yielded 75 deer from South Mountain – more than double the goal of 33 deer – and 79 of the 120 anticipated deer were taken out of the Hilltop Reservation in another 5 half-days.

The Approval Process

Authority for the conduct of a deer management program of the type conducted in Essex County's parks since 2008 lies with the New Jersey Division of Fish and Wildlife, upon approval by the New Jersey Fish and Game Council. The Fish and Game Council, in January of 1994, adopted a program entitled the Community-Based Plan for the Management of Suburban Deer Populations. That program set forth optional methodology for deer reduction in areas where traditional hunting is not possible due to concerns for safety or public acceptance.

Until 2009, under the Community Based Plan, a permit for a special deer management program could be granted to a municipality, but not to a county. In 2008 and 2009, County officials appeared before the governing bodies of the municipalities that are spanned by South Mountain Reservation, Eagle Rock Reservation and the Hilltop Property. The governing bodies of the Townships of Cedar Grove, Maplewood, Millburn, Verona and West Orange and the Borough of North Caldwell subsequently passed resolutions authorizing the County of Essex, through its Department of Parks, Recreation and Cultural Affairs, to submit the appropriate permit applications on their behalf for 2009 and 2010. In 2010, through the efforts of the Essex County delegation to the State Legislature, the enabling legislation was revised to allow counties to apply directly for a permit.

In subsequent years, an application for designation of the South Mountain, Eagle Rock and Hilltop Reservations as Special Deer Management Areas and for approval of a Community Based Deer Management Plan was prepared by Wildlife Management Consultant Bernier and submitted to the State. Each year, the Fish and Game Council authorized a Community Based Deer Management Permit and a permit was subsequently issued by the New Jersey Division of

Fish and Wildlife.

Per the recommendation of the wildlife management consultant, Eagle Rock Reservation was not included in the 2013 or subsequent applications. Spotlight counts have shown a density that, though still above the recommended level, was not high enough to warrant the resources needed for a safe and effective hunting program.

For 2017, a Special Deer Management Area application and Community Based Deer Management Plan for South Mountain Reservation and the Hilltop Property were submitted to NJDFW on September 9, 2016. A permit was approved and issued on December 21, 2016.

The Planning Process

In preparation for the 2017 deer management program, meetings were again held between the wildlife management consultant, Essex County officials and staff, municipal officials, and representatives of law enforcement agencies. The Program Guidelines from 2017 were revised (see Appendix A) to continue to ensure that deer would be removed in a manner that was safe for program participants, park users, and park neighbors, while at the same time being humane in its treatment of the deer.

As in 2016, key elements of the plan included:

- * The two park properties would be closed to the public during this program, although the major roadways that cross the parks would remain open.
- * Fifteen agents would be carefully selected from among licensed hunters who would be screened through an orientation and proficiency testing program. Up to 13 of the 15 agents would be chosen from among hunters who participated in the Essex County Deer Management Programs between 2008 and 2016.
- * Shooting would occur only at pre-designated baiting stations, carefully chosen to effectuate site-specific reduction while ensuring absolute safety.
- * Shooting activities would be scheduled during daylight hours only.
- * Agents would be trained to maximize their chances of stopping a deer with one shot, in order to reduce suffering for the deer and to avoid the need to pursue a wounded deer into an area where shooting might be less safe than at the bait site.
- * Every effort would be made to minimize contact between agents and the general public and to preclude the possibility of offending the sensitivities of park users and neighbors.
- * Data would be collected not only to assess the health and demographics of the deer removed, but also to monitor the degree of effort required to effectuate that removal.
- * Although agents would be rewarded for their voluntary service with a share of the venison derived from the butchered deer, the majority of the meat would be distributed to homeless shelters and soup kitchens.

Public Notification

The County of Essex again utilized a variety of media outlets to notify the general public of the objectives and operational details of the Deer Management Program. Paid advertisements (see Appendix B) were placed in several local newspapers. News stories appeared in many local news outlets, in print and on-line, as the result of a County-issued press release. A postcard detailing the schedule for closing both park properties during the Deer Management Program was mailed to 40,000 homes in the affected municipalities.

Signs explaining the program were fabricated and posted at dozens of sites throughout both parks, including all parking areas. And electronic, trailer-mounted variable message boards operated at several major roadway locations throughout Essex County for a month before the program began and for the duration of the program.

Selection and Qualification of Agents

An application form (see Appendix C) for those interested in becoming agents of the County under this program was again distributed through park facilities and local sporting goods stores. It was also mailed to hunters who had previously expressed interest in or participated in the Essex County Deer Management Program. A copy of the Program Guidelines was attached as part of the application. Applicants were required to possess a valid New Jersey firearm hunting license, have at least five years of successful experience in hunting white-tailed deer with a shotgun, and be available and willing to contribute voluntary service to the program for a minimum of 4 half-day shifts.

Twenty applications were received, including 17 from agents from prior years' programs, 2 people who live or work in Essex County, and 1 non-County resident. All of the applicants were male. Thirteen of the agents from prior years, after being judged by program staff on the basis of availability, reliability, safety consciousness, self discipline, adherence to program objectives, teamwork, hunting skill, marksmanship, and productivity, were selected to participate again. The two new applicants who live or work in Essex County were also selected to participate. One veteran applicant was rejected for cause. Three of the applicants who were agents in prior years and the out-of-county applicant were designated as alternates.

The selected agents and alternates were required to take a qualifying marksmanship test, which was administered by the Essex County Sheriff's Department at the Essex County College Police Academy shooting range on November 26, 2016. The test consisted of shooting 3-round 3-inch groups twice.

Fifteen of the selected agents took the marksmanship test and completed it successfully. Two of the selected agents who had served as agents in previous years, and the 2 in-county new applicants were unable to attend the marksmanship test, and were therefore dropped from further consideration.

The 15 agents who passed the marksmanship test all participated in the subsequent 2-hour orientation program conducted by wildlife management consultant Daniel Bernier. The orientation stressed safety and ethics and included an introduction of program participants and staff, an explanation of the objectives of the program, the rules and regulations of the program, procedures to be followed, and scheduling of agents.

Fifteen applicants were certified as agents as a result of the selection and testing process. The participating agents included a factory manager, a fencing contractor, a retired police officer, a retired deputy police chief, a labor union officer, the owner of an advertising business, 2 firefighters, a retired firefighter, an educator, a motor fleet supervisor, a technician, a business manager, a clerk, and the owner of a truck repair company.

Program Preparation

Baiting stations were established at 15 locations throughout the South Mountain Reservation and 9 locations throughout the Hilltop Property. Station locations were chosen in an attempt to achieve site-specific reduction where it was most warranted, while ensuring the safety of the general public. Stations were carefully selected to provide the marksman with the likelihood of attracting deer and minimal chance of disturbance by a park user or park neighbor.

Automatic bait dispensers were hung, one at each bait station, up to five weeks before the shooting program was scheduled to begin at that station. With a barrel that holds up to 200 pounds of whole corn and an electronic timer set to dispense a small quantity of corn at a specific time each day, the automatic feeders have shown themselves to be very effective at attracting deer to bait stations with great regularity. Supplemental feeding with additional corn and other food products was conducted by the selected agents as their circumstances allowed.

A four-bay maintenance garage in South Mountain Reservation was again converted to a facility for processing the deer carcasses and readying them for transport to a butcher. The garage was outfitted with the supplies and equipment needed for hunting deer and processing deer carcasses. An adjoining room was set up as the Essex County Sheriff's Department command center and as a location for agents to warm up and eat.

Program Administration and Operational Details

Daily coordination and oversight of the program was conducted by wildlife management consultant Daniel Bernier and Tara Casella, Director of the Essex County Environmental Center. They were assisted in this effort by an agent from previous years who can no longer hunt for medical reasons. Maintenance staff of the Department of Parks, Recreation and Cultural Affairs provided operational support.

This program was scheduled to operate for 6 days, afternoons only, on Tuesdays and Thursdays, from January 17 through February 16. The first 2 afternoons of hunting would occur in South Mountain Reservation, and the other 4 afternoons would occur at the Hilltop Property. Two rain dates were built into the schedule for each of the 2 parks.

Agents were scheduled based on their availability. At South Mountain Reservation, each agent was assigned to a particular bait station. In the Hilltop Property, the assignment of agents was varied based on their availability and the productivity of each site. At the beginning of each shift, the agents would report to the headquarters area and confirm their baiting station assignment and other instructions. Agents would then be transported by County vehicle or would drive their own personal vehicle to their assigned area. Communications between agents and staff was maintained via cellular phones.

Agents were not restricted as to the number of deer each agent could harvest. All deer were to be taken, regardless of the presence or absence of antlers. However, the reduction of a deer population is accelerated in proportion to the number of females that can be removed. Therefore, when presented with a choice of several deer, agents were encouraged to make their choice of target in the following order - any weak, crippled or maimed deer; does; fawns, antlerless males, and antlered males. If antlered males were culled, the antlers were cut off and sent to the Essex County Environmental Center for use in educational programs.

Agents utilized shotguns of various gauges, with telescopic sights. Wildlife management experts consider shotguns loaded with slugs to be the safest, most effective firearm for deer control since they have restricted shooting range, excellent knockdown power, and minimal ricocheting potential. Therefore, only slugs were allowed or used for ammunition.

Agents were located in positions where they would have a clear line of sight on deer at or near the scattered bait. The use of a portable tree stand gives the agent an advantage over deer by placing him where he is less likely to be seen or smelled. It also greatly increases the margin of safety by ensuring that any slug that might miss or pass through a deer can only go into the ground. Each agent was required to provide his own portable tree stand and to climb a tree to a height of at least 20 feet; some agents regularly climbed higher.

Agents were required to only take shots of less than 40 yards, to increase the likelihood of culling a deer with one shot. In the infrequent cases where a deer was not stopped with one shot, the agent would track the injured deer into the woods until it lay down and died or could be dispatched with a second shot. Agents going into the woods to pursue a wounded deer were instructed to put on hunter orange to preclude any accidents, and where possible to climb a tree to shoot from above.

When an agent was successful in harvesting a deer, he would mark the deer's location with a yellow reflective tag fabricated specifically for this program. These pocket-size tags, manufactured from traffic sign sheeting and issued to each agent, were especially helpful in finding deer carcasses again at the end of a shift, particularly in thickly wooded areas and in the

dark. The tags were marked in advance with the agent's identification number and equipped with an elastic loop. When a deer carcass was removed from the woods, the agent's tag would be affixed to the carcass to facilitate the collection of data later during the processing operation. At the processing site, the deer would be matched by agent number to the site from which it was culled, as well as to scientific data.

At the end of each shift, the agents and program staff (including Park Maintenance personnel) were deployed to work in teams rounding up and removing deer carcasses from the forest. Plastic sleds and all-terrain vehicles were used to facilitate the effort of moving heavy deer and preserving the fur. All-terrain vehicles were loaned and operated by the agents who own them.

Considerable effort was made to prevent leaving traces of blood and to mask the carcass from any park users that might happen by. These efforts were taken both to respect the sensitivities of the general public and to try to maintain the confidentiality of the baiting station locations. Agents were instructed to remove all litter and spent shell casings and to otherwise minimize any lasting evidence of their presence. The harvested deer were generally picked up with a County vehicle and all deer carcasses and agents returned to the headquarters area.

The Processing Operation

Upon return to the headquarters area, all of the agents participating in a shift, whether they had taken a deer or not, would work together to dress those deer brought in on that shift. Scientific data was collected to determine demographics and general health of the deer population. Data was recorded on a standard data sheet supplied by NJ Division of Fish and Wildlife. The data sheet (see Appendix D) was modified to allow the recording of additional information needed for evaluation of program results, including identification of the park and the baiting station from which the deer was taken, the agent who shot it, and any anomalies exhibited by the deer.

As in the past, data collection included weighing the deer and determining its sex. David Alexander, an Essex County Environmental Center staff member, was trained by a NJ Division of Fish and Wildlife biologist during the previous years' programs on how to examine the deer's teeth to determine its age and to study the reproductive tract of female deer to determine whether the deer was pregnant, and, if so, how many viable fetuses she was carrying. Mr. Alexander carried out those functions again in 2017.

Biologists from the United States Department of Agriculture – Wildlife Services removed and stored tissue samples from several deer carcasses. These samples were to be used to determine the presence of Epizootic Hemorrhagic Disease in the Essex County deer population.

In keeping with the Division of Fish and Wildlife's practice of strict accountability for each deer harvested in New Jersey each year, agents affixed a NJDFW metal seal to each dressed carcass. At the conclusion of each shift, program staff completed a Shift Activity Report form (Appendix E) that captured a variety of data. Information recorded included the parks that were hunted, the

date and time period, weather conditions, man-hours expended, numbers of deer observed and culled, number of shots taken, and whether the shots were hits or misses.

Program Security

Security for the operation of the shooting program and the safety of program participants, park users, and park neighbors was again provided by the Essex County Sheriff's Department. Some of the surrounding municipalities contributed officers and vehicles to assist in that effort. Law enforcement officers closed the access drives to all park areas in the park being hunted that day, including Mayapple Hill, Turtle Back Rock, the Dog Park, and the Girl Scout Camp in South Mountain Reservation, and the parking area in Hilltop Reservation. Major roadways through and around South Mountain Reservation, including South Orange Avenue, Brookside Drive, and Cherry Lane, remained open.

All formal and informal parking areas were blocked off with barricades or yellow tape, and Essex County Parks workers were stationed in their own cars at many locations to enforce that restriction. Sheriff's officers in marked vehicles patrolled the main roadways to ensure that no one stopped or parked within the parks prior to or while hunting was underway. Turtle Back Zoo and the Richard J. Codey Arena in South Mountain Reservation did remain open for business throughout the days of program operation.

Coordination of all law enforcement personnel was coordinated by Captain Edward O'Mara of Sheriff Armando Fontoura's staff from a command post in the South Mountain Reservation maintenance facility during the days of hunting in South Mountain. A command post was set up in a new building in Cedar Grove Park while hunting was ongoing in the Hilltop Reservation. Law enforcement officers stayed at their posts until all agents and deer carcasses were removed to the headquarters area. At least one officer stood by at the headquarters area as deer were being processed.

Oversight of the program operation and adherence to the terms of the Special Deer Management Permit was provided by NJ Division of Fish and Wildlife Senior Biologist Jodi Powers.

Weather

In 2017, weather was again a factor in the operation of the Essex County Deer Management Program, but a change in the way hunting days were scheduled prevented weather from having a significant impact on the program results. The calendar of hunting days included two rain dates each for the South Mountain and Hilltop Reservation hunts. Hunting at South Mountain was postponed twice due to rain and wind, and one scheduled day was lost at Hilltop due to snow, wind and low temperatures. But those 3 days were made up on the scheduled rain dates, allowing hunting to occur for the full number of days that had been planned.

Results

Based on spotlight counts conducted on April 19, 2016, the Program Guidelines for the 2017 Essex County Deer Management Program set goals for the removal of 27 deer from South Mountain Reservation in 2 half-day sessions, and 57 deer from the Hilltop Reservation in another 4 afternoon sessions. In actuality, the 2 half-days of hunting yielded 48 deer from South Mountain. Forty-one deer were taken out of the Hilltop Reservation in the other 4 half-days.

A complete breakdown of the results by day, park and sex, as well as a daily shot count, can be found in Appendix F. A summary of deer removed since 2008 from South Mountain, Eagle Rock and Hilltop Reservations is found at Appendix G.

Disposition of Venison

Although state and federal law exempts the butchering of deer from inspection, the County contracted a butcher who is inspected and approved regularly by the USDA and his local Board of Health. Dressed deer were transported daily to the butcher's facility. The venison was cut by the butcher into steaks or roasts or ground into chopped meat. The butcher also handled disposal of the entrails.

The Program Guidelines for the Essex County Deer Management Program stipulated that the County of Essex would show its appreciation to any agent who voluntarily served on at least 4 half-day shifts by presenting him with 40 pounds of dressed venison, which approximates the average yield from one deer. Agents were given credit for any shift for which they were scheduled that was cancelled due to inclement weather. All of the 15 agents qualified for, and accepted, the venison.

The bulk of the venison was presented to the Community FoodBank of New Jersey, located in Hillside, for distribution to charitable organizations that operate within Essex County and elsewhere. A donation of 1,968 pounds of venison was made to the FoodBank. The venison will provide a protein portion in about 7,900 meals distributed through homeless shelters and soup kitchens to people who might otherwise have little meat in their diets. The Multi-Year Summary found at Appendix G shows that 38,420 pounds of venison have been donated to the Community FoodBank since 2008.

Agent Participation

Agents were placed in the field on a total of 6 shifts. The original schedule had a full roster of 15 agents assigned to every shift at South Mountain Reservation, and 9 agents on every shift at the Hilltop Reservation. However, it is typical for the actual attendance to have gaps due to illness, employment changes and poor weather.

Overall, agents participated in 62 of 66, or 94%, of the available shifts. This extremely high rate of hunter participation resulted from diligent use of a rotational system for inviting agents to fill in vacancies as they developed. Agent participation is summarized in Table 1.

Table 1. - Summary of Agent-related Data

| <i>Agent #</i> | <i>Shifts Worked</i> | <i>Hours Worked</i> | <i>Hit/ Kill</i> | <i>Hit/ Wound or Finish</i> | <i>Miss</i> | <i>Total Shots</i> | <i>Deer Culled</i> |
|----------------|----------------------|---------------------|------------------|-----------------------------|-------------|--------------------|--------------------|
| 1 | 6 | 44.75 | 1 | 2 | 0 | 3 | 2 |
| 6 | 4 | 29.50 | 1 | 0 | 0 | 1 | 1 |
| 7 | 6 | 44.50 | 12 | 1 | 0 | 13 | 12 |
| 9 | 5 | 38.00 | 9 | 2 | 0 | 11 | 10 |
| 11 | 4 | 29.50 | 3 | 3 | 2 | 8 | 4 |
| 27 | 6 | 44.25 | 31 | 0 | 0 | 31 | 31 |
| 32 | 4 | 29.25 | 9 | 0 | 0 | 9 | 9 |
| 35 | 3 | 21.25 | 0 | 0 | 0 | 0 | 0 |
| 45 | 4 | 30.75 | 5 | 0 | 0 | 5 | 5 |
| 47 | 4 | 27.50 | 1 | 2 | 0 | 3 | 2 |
| 50 | 3 | 21.50 | 0 | 0 | 0 | 0 | 0 |
| 53 | 3 | 24.00 | 2 | 4 | 0 | 6 | 4 |
| 61 | 3 | 21.25 | 3 | 0 | 0 | 3 | 3 |
| 63 | 3 | 21.50 | 2 | 0 | 0 | 2 | 2 |
| 71 | 4 | 29.50 | 4 | 0 | 0 | 4 | 4 |
| Total | 62 | 457.00 | 83 | 14 | 2 | 99 | 89 |

Cumulatively, the 15 agents dedicated 457.0 man-hours, or an average of 30.5 hours per person. This time includes that spent sitting at a baiting station, retrieving dead or wounded deer, and processing the carcasses. It does not include the many additional hours that agents contributed to set up and remove the automatic bait feeders and to provide supplemental baiting in the 5 weeks preceding any shooting. Individual agents donated anywhere from 21.25 to 44.75 hours each to

the program, in a range of from 3 to 6 shifts worked. The average agent worked 4 shifts during the 6 days of operation.

About 4.1 hours of effort were expended for the removal of each deer from South Mountain Reservation in 2017. This is a continued reduction from the 6.5 hours per deer expended in 2016 and 7.9 hours per deer in 2015. At Hilltop Reservation, 6.3 man-hours were used by the agents for each deer taken in 2017, almost identical to the 6.2 hours expended in 2015 but a significant increase from the 4.1 man-hours per deer used in 2016.

In 2012, 11.2 hours per deer was expended to remove deer from South Mountain and 7 hours per deer at Hilltop. The lower man-hour figures since then bear out the premise that an increased level of experience among the agents results in greater teamwork and cooperation, greater familiarity with deer movements, and greater ease in processing the carcasses.

Agents adhered tightly to the guidelines set forth for the program and were visibly mindful of the deer reduction program objectives. No agents were injured in the execution of this program.

Ballistics Data

Because of the tight controls and reporting requirements built into this program, every aspect of the program can be well documented, including data on the number of shots fired, as shown in Table 1. It can be reported with a high degree of certainty that only 99 shots were fired during the 6-day program.

Misses can generally be attributed to maladjusted gun sights, which are the inevitable result of jostling men and equipment around in trucks in such an intensive hunting program. Other misses can be caused by slugs striking and being deflected by twigs, which are not seen by the hunter in his focal plane as he lines up a deer in his telescopic sight. Of the 99 shots fired in the 2017 program, only 2 (or 2%) were missed shots.

Of the 89 deer harvested, 83 deer, or 93.3% of the total, were removed with one shot. This is an excellent ratio.

The number of deer harvested per agent ranged from 0 up to 31 with an average of 6 deer per agent. Table 1 shows that one agent, or 7% of the total number of agents, removed 31, or 35%, of the 89 deer. Four of the 15 agents together removed 70% of all of the deer. Of course, there is generally a correlation between the number of deer harvested by an agent and the number of hours he dedicates to the program. However, the productivity of particular hunters is also often seen to be a direct result of the agent's hunting knowledge, skill, and patience.

Critical Losses

Agents were trained to carefully select a shot that would drop a deer in its tracks. However, even with the most well placed shots, critically wounded deer sometimes run long distances before dying. Agents were drilled on the importance of searching for and retrieving all such deer, both to eliminate needless suffering by the deer and to prevent members of the public from being traumatized by the sight of a wounded deer. Agents must report to the program administrator that a wounded deer has left a baiting station area, and, where necessary, additional agents or County staff are dispatched to assist in the search.

Each year, as a result of these precautions, the number of unrecovered losses (deer which were shot but not recovered) in this program is typically only 2% or 3% of the total number of deer shot. In 2017, there was only 1 unrecovered loss, which is a loss rate of 1.1%. This is an outstanding accomplishment!

Baiting Station Productivity

This year's program utilized 15 baiting stations in South Mountain Reservation and 9 in the Hilltop Property. The selection of sites was based not only on where deer were expected to be seen, but also on the potential impact of use of those sites on park users and neighborhoods.

Table 2 shows the number of times that each site was hunted, and the yield from each site. Baiting sites are identified by a letter/number designation. The actual locations of sites will not be revealed so as to protect them from tampering in the future by those who oppose hunting.

Table 2. - BAITING STATION PRODUCTIVITY

South Mountain Reservation

| <i>Station</i> | <i>Municipality</i> | <i># of Times Used</i> | <i>Deer Taken</i> |
|----------------|---------------------|------------------------|-------------------|
| C | Millburn | 2 | 4 |
| E | Millburn | 2 | 7 |
| F | Maplewood | 2 | 3 |
| G | Maplewood | 1 | 5 |
| H | Millburn | 2 | 1 |
| HF | Millburn | 2 | 4 |
| M | West Orange | 2 | 14 |
| N | West Orange | 2 | 5 |
| P | Millburn | 2 | 2 |
| R | Millburn | 1 | 0 |
| SF | Maplewood | 1 | 2 |
| T | West Orange | 2 | 0 |
| TR | West Orange | 1 | 0 |
| V | Millburn | 2 | 1 |
| W | Millburn | 2 | 0 |

Hilltop Reservation

| | | | |
|------|----------------|---|----|
| H-1 | Verona | 4 | 2 |
| H-2 | Cedar Grove | 4 | 3 |
| H-3 | Cedar Grove | 4 | 2 |
| H-4 | Cedar Grove | 4 | 6 |
| H-6 | North Caldwell | 4 | 0 |
| H-9 | North Caldwell | 4 | 0 |
| H-10 | Cedar Grove | 4 | 17 |
| H-11 | Verona | 4 | 3 |
| H-12 | Verona | 4 | 8 |

Deer Data

Forty of the 89 deer harvested, or 44.9% of the total, were females. This is a continued increase from the 41.6% and 38.6% ratios from the last 2 years. In this deer management program, there is a bias for the taking of female deer in order to have the greatest effect on reducing the reproductive potential of the deer population. The lower percentage of females versus males harvested, and presumably seen, suggests that a larger portion of the female segment of the population, as opposed to male, has been removed.

At South Mountain Reservation, 22 of the 48 deer harvested (46%) were female, which was a significant increase from the 31% and 32% from the last two years. But at the Hilltop Property, 18 of the 41 deer taken (44%) were female, which was similar to the 43% and 44% rates from 2014 and 2015 but a decrease from the 53% rate in 2016.

Thirty-two of the 40 females, or 80%, were pregnant, a slight increase from the 75% rate in 2016 and a larger increase from the 63% in 2015. That number includes 28 of the 29 adult females and 4 of the 11 female fawns. The 32 pregnant females were carrying a total of 56 fetuses, for an average of 1.75 each. That average is almost equal to the 1.79 average in 2016, but less than the 1.94 average in 2015. Twenty-two does (69%) were carrying twins and one bore triplets.

Of the 49 total males, 23 were antlered, 6 had shed their antlers, and 20 were button bucks (fawns). At South Mountain Reservation, 13 of the 48 total deer killed (27%) were male or female fawns, comparable to 24% in 2016 and 23% in 2015. And at the Hilltop Property, 18 of the 41 total deer harvested (44%) were in that age category, similar to 39% in 2016 and 46% in 2015.

Program Costs

Direct costs to the County of Essex for the operation of the Essex County Deer Management Program in 2017 were as follows:

| | |
|---|--------------|
| Personnel overtime | |
| Park Maintenance and Sheriff's Department | \$ 14,732.79 |
| Contracted services | |
| Wildlife Management Consultant | 10,500.00 |
| Butchering fees | 6,230.00 |
| Electronic message boards | 5,100.00 |
| Expendable materials | |
| Bait (whole corn) | 1,000.00 |
| Food | 1,437.90 |
| Miscellaneous items | 698.37 |
| Newspaper advertisements | 4,880.00 |
| | _____ |
| TOTAL program costs | 44,579.06 |

As shown, the total direct program costs amounted to \$44,579.06. With 89 deer having been removed, this expense equates to a cost of \$500.89 per deer, which is only a minor increase from the cost of \$486.90 in 2016. However, it is considerably lower than the \$736.10 per deer cost in 2015, when inclement weather resulted in a low harvest, and fixed costs were spread out over less deer.

Most costs remained comparable from 2016 to 2017. Some costs, such as butchering services, the deer management consultant's contract and food for the hunters and staff decreased proportionate to the size of the harvest or the length of the program. The cost of the overtime pay for Park Maintenance workers and Sheriff's officers decreased by 60%, primarily due to the lesser number of days on which hunting occurred.

The County of Essex again implemented all reasonable measures to ensure that this effort would be conducted in a manner that would be as safe and humane as possible, and that the general public would be well informed and inconvenienced as little as possible. Some of those measures could be scaled back in subsequent years, thereby resulting in a lower cost per deer.

Subsequent Census Data

Spotlight counts of deer were conducted in South Mountain Reservation, Eagle Rock Reservation and the Hilltop Property on April 27, 2017. The counts were conducted at night by staff of the Essex County Department of Parks, Recreation and Cultural Affairs; Daniel Bernier, the County's wildlife management consultant; and Dennis Percher, Chairman of the South Mountain Conservancy. Copies of the three spotlight count reports are attached as Appendix H.

Two 1,000,000-candlepower spotlights were used to watch for deer from both sides of the survey vehicle. Light reflecting off the retina of a deer's eyes can be seen for more than 100 yards. Whenever the eyeshine of a deer was observed, the vehicle would be stopped to conduct a more thorough search for any other deer that might be nearby. The locations of all individuals or groups of deer were plotted on maps of the park units.

Deer in the Watchung Reservation in Union County were counted through the use of helicopter-mounted (FLIR) photography between 1997 and 2001. Spotlight counts were conducted in each of those years as well, within a few weeks of the FLIR counts. A comparison of the results of the FLIR counts and the spotlight counts showed that spotlight counts are a pretty consistent and reliable method for counting deer, but that the results need to be adjusted to correlate with the amount of land area that, because of topography, forest cover or road access, is viewable with spotlights.

Although spotlight count results can be erratic in any given year, perhaps due to a weather-related influence on deer behavior, the spotlight count results have been fairly consistent for the last 8 years, and will therefore be used as the basis for estimating the post-hunt deer population densities. Although an aerial FLIR count was conducted in 2012, none has been available since then.

In the 2017 spotlight count, 42 deer were observed in the 3.2 square mile South Mountain Reservation, with about 35% of the total land area having been accessible to spotlighting. Therefore, the number of deer observed (42) was divided by .35 to include the non-viewable area, and the corrected figure was divided by 3.2 to determine density on a per square mile basis. That calculation yielded a Spring, 2017 deer population estimate of 37.5 deer per square mile, or a total of 120 deer in the 2,047-acre park.

Likewise, a total of 17 deer were counted by spotlight in the 265-acre Hilltop Property. The spotlights reached about 40% of the total land area. Using the formula described above yields a Spring, 2017 population estimate of 43 deer, or 97 per square mile.

And lastly, at Eagle Rock Reservation, 3 deer were observed in the 408-acre park during the spotlight count. Approximately 25% of the land area was accessible to viewing by spotlight. These numbers result in a post-hunt population estimate of 12 deer, or 18 deer per square mile.

Recommendations

The results of the 2017 deer management program and the subsequent spotlight counts show that the population of deer in three Essex County parks is greatly reduced since deer management activities were first undertaken in 2008. However, that population, especially in the Hilltop Reservation, is still considerably higher than it should be.

Forest ecologists recommend a deer density no greater than 20 deer per square mile in a healthy forest ecosystem. In a forest that is damaged by overbrowsing by deer, as is certainly the case at South Mountain and Hilltop Reservations, the density might need to be reduced to as low as 5 deer per square mile in order for forest regeneration to succeed.

In order to gauge the likelihood of that success, we must project the deer population estimates ahead to the winter of 2017-18, after factoring in new births from Spring/early summer of 2017. We will assume conservatively, based on an average of the last 3 years, that 42% of the deer population is female. We will also assume, again based on 3-year averages, that 73% of the females are pregnant, and that the pregnant females will deliver an average of 1.83 offspring each. The number of deer will be reduced by 15% to account for loss to natural or accidental mortality.

Running out those numbers for South Mountain Reservation, we calculate an overwintering population for 2017-18 of 159 deer (50 per square mile), which is 150% more than the recommended population of 64 deer (20/square mile x 3.2 square miles) for this park, if this park had a healthy ecosystem. At the 5 deer/square mile density recommended for an impaired ecosystem, there is an excess of 143 deer.

Essex County has invested considerable resources to establish 41 fenced enclosures throughout South Mountain Reservation, in which native plantings have been installed to jumpstart the forest's recovery from the impacts of deer. In theory, as the deer population is incrementally decreased in size by the deer management program, the native plantings will have an increasing chance of repopulating themselves as they spread their seed beyond the fenced enclosures.

Therefore, reduction of the deer population in South Mountain Reservation should be continued. It is recommended that hunting occur on 5 days, at 15 baited sites, with a goal of removing 143 deer. Based on past experience, hunting should be limited to afternoon shifts only.

The estimated 2017-18 overwintering population of deer for the Hilltop Property will be 67 deer (152/sq. mi.), or 65 deer more than the 2 deer recommended for this 0.44 square mile area.

Therefore, the effort at the Hilltop Property should be continued in earnest. The extremely high density in and around the Hilltop Property needs to be cut drastically for the safety and welfare of park neighbors and the motoring public. Hunting should occur on 6 afternoons, at 9 baited sites, with a goal of removing at least 65 deer.

The 2017-18 overwintering population at Eagle Rock will be 16 deer, which is 13 more than the recommended population of 3 deer for this 0.68 square mile park. Removing that small number of deer is not warranted, in light of the manpower that would be required to accomplish it and the costs associated with securing that park during hunting. Therefore, it is not recommended that hunting be resumed at Eagle Rock Reservation in 2018.

Spotlight counts should be conducted as soon as possible after the 2018 deer removal concludes. They are important to determining the success of each harvest and in guiding continued deer removal efforts.

Acknowledgments

Essex County Executive Joseph DiVincenzo is to be commended for continuing the Essex County Deer Management Program in two of Essex County's most significant park properties. He recognizes the perilous future of the ecology of these irreplaceable park resources and is fighting to correct it in the most efficient and effective method possible, despite the objections of some County residents. The Essex County Board of Chosen Freeholders showed that they share the County Executive's concern by voting to allow this program to continue.

The success of the Essex County Deer Management Program is due to the hard work, commitment and cooperation of hundreds of people. Thanks are extended to the staff of the Essex County Department of Parks, Recreation and Cultural Affairs, and in particular its Director, Daniel Salvante and Tara Casella, Environmental Center Director; the Essex County Sheriff's Department, and in particular Sheriff Armando Fontoura and Captain Edward O'Mara; and the numerous other Essex County and municipal agencies and offices that contributed to this effort.

The County of Essex extends its thanks to Jodi Powers, Senior Biologist with the New Jersey Division of Fish and Wildlife, for her assistance in the conduct of this program.

The residents of Essex County again owe a great deal of thanks to the hunters who took time away from their families, jobs, and their own personal pursuits to serve voluntarily in a program that is saving the ecology of parks in the Essex County Park System for the enjoyment and benefit of future generations of County residents and visitors.



Joseph N. DiVincenzo, Jr.
County Executive

COUNTY OF ESSEX
DEPARTMENT OF PARKS, RECREATION AND CULTURAL AFFAIRS
115 CLIFTON AVENUE
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Daniel K. Salvante
Director

2017 DEER MANAGEMENT PROGRAM FOR ESSEX COUNTY, NEW JERSEY

Adopted – 8/24/16

PROGRAM GUIDELINES

INTRODUCTION

- The South Mountain Reservation encompasses 2047 acres (3.2 square miles) in the Townships of Maplewood, Millburn and West Orange.
- The Hilltop Reservation spans over 200 acres (0.33 square mile) in the Borough of North Caldwell and the Townships of Cedar Grove and Verona.
- Forest ecologists recommend that white-tailed deer populations in Northeast hardwood forests should not exceed an overwintering density of 20 deer per square mile in a healthy ecosystem in order for deer browse to not impair forest health. In an impaired ecosystem, density must be reduced to 5 deer per square mile to enable forest regeneration.
- Browse damage, damage to residential landscaping and the numbers of deer-related motor vehicle accidents indicate that white-tailed deer populations in South Mountain Reservation and the Hilltop Reservation far exceed the recommended density.
- Out of concern for the long-term health of the environment in its largest park properties, the County of Essex began in 2008 to reduce the density of deer.
- Achieving the goal density would curtail over-browsing of native vegetation and allow forest regeneration, minimize browsing of residential landscaping surrounding the County properties, and minimize the incidence of deer-related motor vehicle accidents.
- The County of Essex undertook programs in 2008 through 2016, with the assistance of community-minded licensed hunters with a proficiency in marksmanship, to reduce the population of deer in the South Mountain Reservation, Eagle Rock Reservation and the Hilltop Reservation. A total of 1,254 deer were removed as a result of those efforts.
- In 2017, the County of Essex will continue to reduce the number of deer in the South Mountain Reservation and the Hilltop Reservation.

GENERAL DESCRIPTION OF PROGRAM

- The County of Essex will continue to reduce the size of the South Mountain Reservation deer herd over the course of two (2) half days (afternoons) in January, 2017.
- The County of Essex will continue the removal of deer from the Hilltop Reservation over the course of four (4) half days (afternoons) in January and February, 2017.
- Such removal will again be accomplished through the efforts of selected agents, shooting over baited sites.
- 15 agents will be selected from among experienced, licensed hunters who can demonstrate a proficiency in marksmanship and some of whom participated in the previous deer management programs conducted in Essex County in 2008 through 2016.
- Agents will take part in this program on a voluntary basis.
- This program is designed to address a problem of population control; it is not intended to provide sport or recreational opportunities.

Putting Essex County First
ESSEX COUNTY IS AN EQUAL OPPORTUNITY EMPLOYER

PERMITS

- The County of Essex, through its Department of Parks, Recreation and Cultural Affairs, will submit an application for a Special Deer Management Permit to the New Jersey Division of Fish and Wildlife (NJDFW).
- If a permit is granted, the County of Essex will administer and conduct all deer management activities in South Mountain Reservation and the Hilltop Reservation.
- As agents of the County, participants will not be required to purchase hunting season or zone permits.
- Agents selected for this program will be required to purchase a 2017 hunting license prior to participation.
- Specific details of the deer control program may be adjusted as field conditions necessitate while conforming to statutory law and NJDFW policy and maintaining the highest standards of safety.

PROGRAM LENGTH

- The shooting program will occur on Tuesdays and Thursdays during the 5-week period starting January 17, 2017 and ending February 16, 2017.
- The program will occur on six (6) days only. The schedule includes two (2) rain dates for hunting in each park, to replace days of hunting that might need to be cancelled due to inclement weather.
- There is no limit on the number of deer to be removed.
- The number of agents to be utilized and the number of days of operation are based on a goal to remove at least 27 deer from South Mountain Reservation and 57 deer from the Hilltop Reservation.
- South Mountain Reservation and the Hilltop Reservation are closed to traditional hunting at all times.

HOURS OF PROGRAM OPERATION

- Agents may be in the field between 12:00 noon and 8:00 pm for each afternoon shift.
- Shooting will occur only during daylight, the hours of which will vary as sunset changes daily.
- Each shift begins with the deployment of agents into the field and ends after all deer taken on that shift have been processed for transport to a butcher.

SELECTION AND QUALIFICATION OF AGENTS

- Applicants must meet the following qualifications:
 - be at least 21 years old;
 - be able to speak and understand the English language;
 - possess a valid New Jersey Firearm Hunting License or All-Around Sportsman License;
 - possess a valid New Jersey Firearm Purchaser Identification Card;
 - have not been convicted of any firearms violation, in any state, in the last 10 years or of any fish and game code violation in the last 5 years;
 - have at least 5 years successful experience in hunting white-tailed deer with a shotgun;
 - be able to demonstrate an expertise in marksmanship; and
 - be available and willing to contribute voluntary service to the program for a minimum of 4 shifts.
- Agent Applications must be returned in person or by mail to the Essex County Dept. of Parks, Recreation and Cultural Affairs, 115 Clifton Ave., Newark, NJ, 07104, by Wednesday, October 5, 2016 no later than 4:30 PM.
- Applications may be sent via FAX or e-mail, to addresses stated on the application, before the deadline, but the original must follow by mail.
- The 15 agents will be selected in the following manner:
 - Applicants will be divided into two categories – 1.) those who participated as an agent in the Essex County Deer Management Program between 2008 and 2016, and 2.) all new applicants.
 - Applicants in the first category will be evaluated with respect to their hunting proficiency, availability, and adherence to program ethics and objectives.
 - Based on the evaluation and the number of applicants, up to 13 agents will be selected from among the applicants in the first category.
 - The remainder of the available agent positions will be filled with hunters chosen by lottery from the category of new applicants. Essex County residents or those who are employed within Essex County will be given preference in the lottery process.

- All agents will be informed that they have been selected, via telephone call, letter or e-mail.
- All selected agents will be required to pass a marksmanship proficiency test and attend an orientation program on Saturday, November 26, 2016.
- If information about one or more agents is requested by the general public, the agents' names, addresses, and other personal identifiers will be redacted by the County of Essex from all requested documentation. The County of Essex has a responsibility and an obligation to safeguard from public access a citizen's personal information with which it has been entrusted when disclosure thereof would violate the citizen's reasonable expectation of privacy.

SCHEDULING OF AGENTS

- Applicants are required to indicate their availability for program activities on the Agent Application.
- A schedule, assigning hunters to a specific park or parks and to particular days and shifts, will be set and distributed to all agents, based on the availability of agents as indicated on their applications.
- The program is scheduled to occur on January 17 and 19 at South Mountain Reservation and January 31, and February 2, 7 and 9 at the Hilltop Reservation.
- In the event of inclement weather, as judged by the Director of the Department of Parks, Recreation and Cultural Affairs, program activities will be postponed to January 24 or 26 for South Mountain Reservation and February 14 or 16 for Hilltop Reservation.

PUBLIC NOTIFICATION

- The County of Essex will again utilize press releases, signage and mailings to inform the general public of the details of this program.
- All informational signage and documents will clearly state the schedule by which the Deer Management Program will operate for each property.

PROGRAM OPERATION

- Baiting stations will be set up in a multitude of locations throughout South Mountain Reservation and the Hilltop Reservation.
- Baiting stations will be carefully selected to provide the marksman with a clear and open view of the deer.
- Agents must utilize 10, 12, 16 or 20 gauge shotguns with telescopic sights, shooting only slugs.
- All shooting will occur from portable tree stands, shooting near or over bait, with hunters positioned on platforms at least 20 feet above the ground. Agents must provide their own stands. The use of ladder stands is not permissible.
- In order to achieve a reduction in population size as quickly as possible, a bias for the taking of deer will be adhered to again, in the following order – injured or sick deer, does, fawns, antlerless bucks, antlered bucks.
- The antlers of any antlered buck harvested will be cut off and retained by the County or destroyed.
- At any one time, up to 15 agents may be deployed into the South Mountain Reservation and 9 in the Hilltop Reservation.
- Agents will not be restricted as to the number of deer each individual can harvest.
- Some park roads and the access drives to some park areas will be closed during program activities.

DISPOSITION OF DEER

- Harvested deer will be transported to a County-operated, NJDFW-supervised check station at a location within a County park where agents will clean the deer and complete reports about the age, sex, and weight of the deer, the disposition of all shots fired, and the number of volunteer man-hours expended.
- All deer will be transported by the County to a NJDOH-approved butcher for processing.
- Any agent who completes at least 4 shifts of voluntary service to this program will receive 40 pounds of dressed venison at the conclusion of the program.
- The remainder of the venison will be distributed to the needy and the homeless through the Community Food Bank of New Jersey.



Joseph N. DiVincenzo, Jr., *Essex County Executive*
and the Board of Chosen Freeholders



Essex County

Deer Management Program

For **SAFETY** Reasons,
Essex County South Mountain Reservation
will be **CLOSED** to the Public on **January 17 & 19**
(If inclement weather, make up days will be Jan. 24 & 26)

For Information, Call 973-621-4400

Putting Essex County First



Joseph N. DiVincenzo, Jr., *Essex County Executive*
and the Board of Chosen Freeholders



Essex County

Deer Management Program

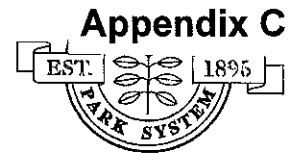
For **SAFETY** Reasons,
Essex County Hilltop Reservation
will be **CLOSED** to the Public on **Jan. 31, Feb. 2, 7, 9**
(If inclement weather, make up days will be Feb. 14 & 16)

For Information, Call 973-621-4400

Putting Essex County First



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Joseph N. DiVincenzo, Jr.
 County Executive

Daniel K. Salvante
 Director

Essex County Department of Parks, Recreation and Cultural Affairs
Essex County Deer Management Program

2017 AGENT APPLICATION

PLEASE READ THE 2017 ESSEX COUNTY DEER MANAGEMENT PROGRAM GUIDELINES BEFORE COMPLETING THIS APPLICATION.

All applications must be received by the Department of Parks, Recreation and Cultural Affairs, **by 4:30 PM, WEDNESDAY, October 5, 2016.** Please print all answers legibly.

Applications may be submitted:

- o in person or by mail to the Essex County Department of Parks, Recreation and Cultural Affairs, 115 Clifton Avenue, Newark, NJ, 07104, Attn.: Tara Casella;
- o by FAX to (973) 228-3793 (original must follow by mail); or
- o scanned and attached to an e-mail to tcasella@parks.essexcountynj.org (mail original).

Name: _____ Date of birth: ____/____/____

Address: _____ Town: _____

State: _____ Zip: _____ E-mail address: _____

Phone #: home-(____) _____ work-(____) _____ cell-(____) _____

NJ Driver's license #: _____

NJ Firearms hunting license # _____

NJ Firearm purchaser identification card # _____

Are you a law enforcement officer? YES NO (Circle one)

If yes, what agency do you work for? _____

If no, what is your occupation? _____

In what town is your place of employment? _____

How many years experience do you have hunting deer? _____

How many deer have you killed in the last 5 years? _____

Did you ever serve as an agent in the Essex County Deer Management Program?

_____ If yes, what year(s)? _____

Have you been convicted of a firearms violation, in any state, in the last 10 years or of any fish and game code violation in the last 5 years? (If yes, explain or give detail)

I can be available to serve as an agent of the County of Essex at the following dates and times: (indicate YES or NO in each time slot)

| | | | | |
|-------------------------------------|------------------|-------------------|------------------------------|-------------------------------|
| South Mountain Reservation | Tuesday, 1/17/17 | Thursday, 1/19/17 | Tuesday, 1/24/17 (rain date) | Thursday, 1/26/17 (rain date) |
| Afternoon (approx. 1:00 pm to 9 pm) | | | | |

| | | | | |
|-------------------------------------|------------------|-------------------|------------------|-------------------|
| Hilltop Reservation | Tuesday, 1/31/17 | Thursday, 2/02/17 | Tuesday, 2/07/17 | Thursday, 2/09/17 |
| Afternoon (approx. 1:00 pm to 9 pm) | | | | |

| | | |
|-------------------------------------|------------------------------|-------------------------------|
| Hilltop Reservation | Tuesday, 2/14/17 (rain date) | Thursday, 2/16/17 (rain date) |
| Afternoon (approx. 1:00 pm to 9 pm) | | |

I understand that all rules and regulations established by the New Jersey Division of Fish and Wildlife and the Essex County Department of Parks, Recreation and Cultural Affairs are to be strictly observed. I understand that the Department of Parks, Recreation and Cultural Affairs has the right to restrict or cancel the program at any time when conditions warrant.

I understand that, if selected, I will be expected to pass a marksmanship proficiency test and attend an orientation program. I will provide my own portable tree stand for use in the program, am comfortable with climbing at least 20 feet above the ground in that tree stand, and may be required to demonstrate use of my tree stand during the orientation program. I will be available and willing to contribute voluntary service to the program for a minimum of four shifts.

I further understand that, if selected, I will be asked to sign a Program Warning, Waiver, Assumption of Risk and Release of Liability prior to taking the marksmanship test and attending the orientation program. I hereby acknowledge receipt of, and certify that I have read, a copy of the 2017 Essex County Deer Management Program Guidelines. I attest to the truthfulness of all information provided on this application, and submit such application solely for the purpose of indicating my interest in being selected to serve as an agent of the County of Essex in its Deer Management Program.

SIGNATURE OF APPLICANT

DATE

DEER CHECK STATION INPUT FORM

| | | | |
|----------------------------------|--|--|---|
| SEASON CODE | A - FALL BOW B - PERMIT BOW W - WINTER BOW Y - YOUTH DAYS (BOW & FIREARM) | F - SIX-DAY FIREARM M - PERMIT MUZZLELOADER S - PERMIT SHOTGUN | METAL POSSESSION SEAL NUMBER |
| <input type="text" value="n/a"/> | | | <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="2"/> <input type="text" value="3"/> <input type="text"/> <input type="text"/> |

| | |
|--|---|
| CHECK STATION NUMBER | DATE DEER WAS HARVESTED |
| <input type="text" value="1"/> <input type="text" value="0"/> <input type="text" value="9"/> | <input type="text" value="0"/> <input type="text" value="1"/> <input type="text"/> <input type="text"/> <input type="text" value="1"/> <input type="text" value="7"/> |

| | | | |
|---|--|---|--|
| DEER MGMT. ZONE | COUNTY | TOWNSHIP | DEER MGMT. UNIT |
| <input type="text" value="3"/> <input type="text" value="6"/> | <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="7"/> | <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text"/> <input type="text"/> | <input type="text" value="1"/> <input type="text" value="1"/> <input type="text" value="4"/> |

| | | | | |
|-------------------------------|--------------------------------------|-------------------------------|---------------------------------|---|
| MALE <input type="checkbox"/> | BUTTON BUCK <input type="checkbox"/> | SHED <input type="checkbox"/> | BROKEN <input type="checkbox"/> | TOTAL ANTLER POINTS <input type="text"/> <input type="text"/> |
|-------------------------------|--------------------------------------|-------------------------------|---------------------------------|---|

| | | | |
|---------------------------------|-------------------------------|------------------------------|----------------------------------|
| FEMALE <input type="checkbox"/> | FAWN <input type="checkbox"/> | DOE <input type="checkbox"/> | EMBRYOS <input type="checkbox"/> |
|---------------------------------|-------------------------------|------------------------------|----------------------------------|

| | | | | | |
|--------------------------------|--|--------------------------------|--|--------|--|
| WEAPON TYPE | 1- compound 2- crossbow 3- long bow/recurve 4- shotgun 5- muzzleloader | LAND CODE | 1 - private 2 - state 3 - federal 4 - county 5 - municipal | WEIGHT | <input type="text"/> <input type="text"/> <input type="text"/> NOT REQUIRED |
| <input type="text" value="4"/> | | <input type="text" value="4"/> | | | |

| | |
|--|--------------------------------------|
| FOR DIVISION USE ONLY | |
| <input type="text"/> <input type="text"/> ANTLER BEAM DIAMETER (mm) | PARK <input type="text" value="HT"/> |
| AGE OF DEER | BAIT SITE <input type="text"/> |
| <input type="checkbox"/> 1/2 YEAR | AGENT # <input type="text"/> |
| <input type="checkbox"/> 1-1/2 YEARS | |
| <input type="checkbox"/> 2-1/2 YEARS | |
| <input type="checkbox"/> 3-1/2 YEARS OR OLDER | ANOMALIES <input type="text"/> |

**2017 Essex County
Deer Management Program
Daily Results Summary**

| Day #: | 1 | | | 2 | | | 3 | | | 4 | | | Totals to Date | | |
|----------------------------------|------------------------|----------------|-----------|----------|----------------|-------------|----------|-----------|-------------|----------|----------|-------------|----------------|-----------|----|
| | Day: | AM | PM | AM | PM | Daily total | AM | PM | Daily total | AM | PM | Daily total | | SM | HT |
| Date: | Thursday | January 19 | | | Thursday | | | Tuesday | | | Thursday | | | | |
| Location: | South Mountain | South Mountain | | | South Mountain | | | Hilltop | | | Hilltop | | | | |
| Shift: | | AM | PM | AM | PM | Daily total | AM | PM | Daily total | AM | PM | Daily total | | | |
| # of agents | | 15 | 15 | 11 | 11 | 11 | 9 | 9 | 9 | 9 | 9 | 9 | 26 | 18 | |
| Deer harvested | Females | Does | 15 | 15 | 3 | 3 | 8 | 8 | 8 | 1 | 1 | 1 | 18 | 9 | |
| | | Not pregnant | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| | Males | Fawns | 1 | 1 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 1 | 2 |
| | | Not pregnant | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 3 | 2 |
| Total females | 0 | 18 | 18 | 0 | 4 | 4 | 0 | 13 | 13 | 0 | 1 | 1 | 22 | 14 | |
| Antlered/broken | | 11 | 11 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 16 | 5 | |
| Shed | | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | |
| Button buck | | 6 | 6 | 3 | 3 | 3 | 8 | 8 | 8 | 2 | 2 | 2 | 9 | 10 | |
| Total males | 0 | 17 | 17 | 0 | 9 | 9 | 0 | 15 | 15 | 0 | 3 | 3 | 26 | 18 | |
| Total deer | 0 | 35 | 35 | 0 | 13 | 13 | 0 | 28 | 28 | 0 | 4 | 4 | 48 | 32 | |
| # of deer seen but not harvested | | 7 | 7 | 9 | 9 | 9 | 8 | 8 | 8 | 1 | 1 | 1 | | | |
| Reproductive impact | Total pregnant females | 0 | 16 | 3 | 3 | 3 | 0 | 10 | 10 | 0 | 1 | 1 | 19 | 11 | |
| | # carrying 1 fetus | 4 | 4 | 1 | 1 | 1 | 3 | 3 | 3 | 0 | 0 | 0 | 5 | 3 | |
| | # carrying 2 fetuses | 11 | 11 | 2 | 2 | 2 | 7 | 7 | 7 | 1 | 1 | 1 | 13 | 8 | |
| | # carrying 3 fetuses | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | |
| Total fetuses | 0 | 29 | 29 | 0 | 5 | 5 | 0 | 17 | 17 | 0 | 2 | 2 | 34 | 19 | |
| # of shots fired | | 41 | 41 | 14 | 14 | 14 | 30 | 30 | 30 | 4 | 4 | 4 | 55 | 34 | |

**2017 Essex County
Deer Management Program
Daily Results Summary**

| Day #: | | 5 | | | 6 | | | Totals to Date | | |
|----------------------------------|------------------------|------------|----|-------------|-------------|----|-------------|----------------|----|-------------|
| Day: | | Tuesday | | | Tuesday | | | | | |
| Date: | | February 7 | | | February 14 | | | | | |
| Location: | | Hilltop | | | Hilltop | | | | | |
| Shift: | | AM | PM | Daily total | AM | PM | Daily total | AM | PM | Daily total |
| # of agents | | | 9 | 9 | | 9 | 9 | | | |
| Deer harvested | Does | | 0 | 0 | | 1 | 1 | | | |
| | Pregnant | | 0 | 0 | | 0 | 0 | | | |
| | Not pregnant | | 0 | 0 | | 1 | 1 | | | |
| | Fawns | | 1 | 1 | | 1 | 1 | | | |
| Males | Total females | 0 | 1 | 1 | 0 | 3 | 3 | 0 | 0 | 0 |
| | Antlered | | 1 | 1 | | 1 | 1 | | | |
| | Shed | | 2 | 2 | | 0 | 0 | | | |
| | Button buck | | 0 | 0 | | 1 | 1 | | | |
| Total males | 0 | 3 | 3 | 0 | 2 | 2 | 0 | 0 | 0 | |
| Total deer | 0 | 4 | 4 | 0 | 5 | 5 | 0 | 0 | 0 | |
| # of deer seen but not harvested | | | 2 | 2 | | 0 | 0 | | | |
| Reproductive impact | Total pregnant females | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 |
| | # carrying 1 fetus | | 0 | 0 | | 1 | 1 | | | |
| | # carrying 2 fetuses | | 0 | 0 | | 1 | 1 | | | |
| | # carrying 3 fetuses | | 0 | 0 | | 0 | 0 | | | |
| Total fetuses | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | |
| # of shots fired | | 5 | 5 | | 5 | 5 | | | | |
| SM | | | | | | | | 26 | 36 | 62 |
| HT | | | | | | | | 18 | 10 | 28 |
| ALL | | | | | | | | 0 | 1 | 1 |
| SM | | | | | | | | 1 | 3 | 4 |
| HT | | | | | | | | 3 | 4 | 7 |
| ALL | | | | | | | | 22 | 18 | 40 |
| SM | | | | | | | | 16 | 7 | 23 |
| HT | | | | | | | | 1 | 5 | 6 |
| ALL | | | | | | | | 9 | 11 | 20 |
| SM | | | | | | | | 26 | 23 | 49 |
| HT | | | | | | | | 48 | 41 | 89 |
| ALL | | | | | | | | | | |
| SM | | | | | | | | 19 | 13 | 32 |
| HT | | | | | | | | 5 | 4 | 9 |
| ALL | | | | | | | | 13 | 9 | 22 |
| SM | | | | | | | | 1 | 0 | 1 |
| HT | | | | | | | | 34 | 22 | 56 |
| ALL | | | | | | | | 55 | 44 | 99 |

ESSEX COUNTY DEER MANAGEMENT PROGRAM

Multi-Year Summary

| | Harvest | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | Total to date |
|---------------------------------------|----------|----------|--------|----------|----------|----------|----------|----------|----------|----------|----------|---------------|
| South Mountain Reservation | Shifts: | 8.5 days | 9 days | 6 p.m.'s | 3 p.m.'s | 4.5 days | 3 p.m.'s | 3 p.m.'s | 3 p.m.'s | 5 p.m.'s | 2 p.m.'s | |
| | Deer: | 213 | 83 | 44 | 48 | 50 | 43 | 52 | 31 | 75 | 48 | 687 |
| | Fetuses: | 147 | 55 | 15 | 26 | 29 | 19 | 22 | 13 | 33 | 34 | 393 |
| | Total: | 360 | 138 | 59 | 74 | 79 | 62 | 74 | 44 | 108 | 82 | 1080 |
| Eagle Rock Reservation | Shifts: | | | 3.5 days | 7 p.m.'s | 7 p.m.'s | | | | | | |
| | Deer: | | | 19 | 19 | 23 | | | | | | 61 |
| | Fetuses: | | | 23 | 13 | 18 | | | | | | 54 |
| | Total: | | | 42 | 32 | 41 | 0 | 0 | 0 | 0 | 0 | 115 |
| Hilltop Reservation | Shifts: | | | 3.5 days | 7 days | 7 days | 2.5 days | 4 p.m.'s | 4 p.m.'s | 5 p.m.'s | 4 p.m.'s | |
| | Deer: | | | 97 | 120 | 102 | 61 | 56 | 39 | 79 | 41 | 595 |
| | Fetuses: | | | 54 | 113 | 52 | 29 | 25 | 20 | 53 | 22 | 368 |
| | Total: | | | 151 | 233 | 154 | 90 | 81 | 59 | 132 | 63 | 963 |
| All properties combined | Deer: | 213 | 83 | 160 | 187 | 175 | 104 | 108 | 70 | 154 | 89 | 1343 |
| | Fetuses: | 147 | 55 | 92 | 152 | 99 | 48 | 47 | 33 | 86 | 56 | 815 |
| | Total: | 360 | 138 | 252 | 339 | 274 | 152 | 155 | 103 | 240 | 145 | 2158 |
| Verison donated to Community FoodBank | lbs. | 8,000 | 3,000 | 5,717 | 4,824 | 4,572 | 2,291 | 2,577 | 1,668 | 3,803 | 1,968 | 38,420 |

| ESSEX COUNTY DEPARTMENT OF PARKS, RECREATION & CULTURAL AFFAIRS | | | | |
|--|---|------------|----------------|--------------|
| Spotlight Count of White-tailed Deer | | | | |
| Park: | South Mountain Reservation | | | |
| Date: | Thursday, April 27, 2017 | Weather: | Light fog | |
| Vehicle type: | 2008 Ford F150 crew-cab pickup truck | | | |
| Driver: | Mike Nugent, Park Maintenance Worker | | | |
| Spotter(s): | Daniel Bernier, Wildlife Management Consultant and Joe Guarino, Park Maintenance Supervisor | | | |
| Recorder: | Dennis Percher, South Mountain Conservancy | | | |
| Equipment: | Two 1,000,000-candlepower spotlights | | | |
| | | Start | Finished | Elapsed |
| | Time: | 10:41 p.m. | 1:15 a.m. | 2 hrs 26 min |
| | Mileage: | 31.5 | 51.3 | 19.8 |
| | Temperature (F): | 59 | 57 | -2 |
| SIGHTINGS | | | | |
| Location | Topography | Total deer | Antlered bucks | |
| Mayapple - Pleasant Valley | Dense woods | 1 | 0 | |
| Mayapple - Main loop | Dense woods | 2 | 0 | |
| Valley View Drive | Dense woods | 2 | 0 | |
| Cherry Lane | Open woods | 8 | 0 | |
| Tuttleback Rock picnic area | Open lawn | 3 | 0 | |
| Shady Nook | Open lawn | 3 | 0 | |
| South Orange Avenue | Light woods | 3 | 0 | |
| Crest Drive - north of Bear Lane | Light woods | 3 | 0 | |
| Crest Drive - south | Open woods | 10 | 0 | |
| Brookside Lane | Open woods | 4 | 0 | |
| Painter's Point | Open lawn | 3 | 0 | |
| TOTALS: | | 42 | 0 | |
| Estimation of Deer Density: | | | | |
| A total of 42 deer were counted in the 2,047-acre or 3.2 square mile South Mountain Reservation. That number is 3.5 times the number that was seen in 2016 and 1.5 times that which was seen in the 2015 spotlight count. | | | | |
| A comparison of spotlight counts to Forward Looking InfraRed (FLIR) helicopter counts for the Watchung Reservation in Union County for a 5-year period (1997-2001) showed that the number of deer observed in a spotlight count versus the number of deer observed in a FLIR count of the same area correlates roughly with the amount of acreage that, because of topography, forest cover or road access, is viewable in the park by spotlights. | | | | |
| During this spotlight count, approximately 35% of the total area encompassed within the borders of the South Mountain Reservation was accessible to viewing by spotlight, and was surveyed. | | | | |
| Therefore, the number of deer observed (42) must be divided by .35 to include the non-viewable area, and the corrected figure will be divided by 3.2 to determine density on a per square mile basis. That calculation yields a result of 37.5 deer per square mile, or a total of 120 deer in the 2,047-acre park. | | | | |

ESSEX COUNTY DEPARTMENT OF PARKS, RECREATION & CULTURAL AFFAIRS
Spotlight Count of White-tailed Deer

| | | | |
|---------------|---|----------|------------|
| Park: | Hilltop Property | | |
| Date: | Thursday, April 27, 2017 | Weather: | Light rain |
| Vehicle type: | 2008 Ford F150 crew-cab pickup truck | | |
| Driver: | Mike Nugent, Park Maintenance Worker | | |
| Spotter(s): | Daniel Bernier, Wildlife Management Consultant and Joe Guarino, Park Maintenance Supervisor | | |
| Recorder: | Dennis Percher, South Mountain Conservancy | | |
| Equipment: | Two 1,000,000-candlepower spotlights | | |

| | | | |
|------------------|-----------|-----------|---------------|
| | Start | Finished | Elapsed |
| Time: | 7:45 p.m. | 9:05 p.m. | 1 hr. 20 min. |
| Mileage: | 0 | 17.5 | 17.5 |
| Temperature (F): | | | 0 |

SIGHTINGS

| Location | Topography | Total deer | Antlered bucks |
|-------------------------------------|-------------|------------|----------------|
| Grove Ave., before Bradford - right | Open woods | 3 | 0 |
| Road to Carpenters' Shop | Dense brush | 3 | 0 |
| Cedar Grove Park (milepost 7) | Dense woods | 7 | 0 |
| Area H-9 | Dense woods | 4 | 0 |
| | | | |
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| TOTALS: | | 17 | 0 |

Estimation of Deer Density:
 A total of 17 deer were counted in a 265-acre or .44 square mile survey area, that includes the Hilltop Property and some adjoining areas. That number is 13% less than the number (22) of deer observed in the 2016 spotlight count, and only a third of the number (51) in 2015.

A comparison of spotlight counts to Forward Looking InfraRed (FLIR) helicopter counts for the Watchung Reservation in Union County for a 5-year period (1997-2001) showed that the number of deer observed in a spotlight count versus the number of deer observed in a FLIR count of the same area correlates roughly with the amount of acreage that, because of topography, forest cover or road access, is viewable in the park by spotlights.

During this spotlight count, approximately 40% of the total land area encompassed within the Hilltop Property survey area was accessible to viewing by spotlight, and was surveyed.

Therefore, the number of deer observed (17) must be divided by .40 to include the non-viewable area, and the corrected figure will be divided by 0.44 to determine density on a per square mile basis. That calculation yields a result of 97 deer per square mile, or a total of 43 deer in the 265-acre survey area.

ESSEX COUNTY DEPARTMENT OF PARKS, RECREATION & CULTURAL AFFAIRS
Spotlight Count of White-tailed Deer

| | | | |
|---------------|---|----------|-----------|
| Park: | Eagle Rock Reservation | | |
| Date: | Thursday, April 27, 2017 | Weather: | Light fog |
| Vehicle type: | 2008 Ford F150 crew-cab pickup truck | | |
| Driver: | Mike Nugent, Park Maintenance Worker | | |
| Spotter(s): | Daniel Bernier, Wildlife Management Consultant and Joe Guarino, Park Maintenance Supervisor | | |
| Recorder: | Dennis Percher, South Mountain Conservancy | | |
| Equipment: | Two 1,000,000-candlepower spotlights | | |

| | | | |
|------------------|-----------|------------|---------|
| | Start | Finished | Elapsed |
| Time: | 9:30 p.m. | 10:31 p.m. | 61 min. |
| Mileage: | 22.5 | 26.7 | 4.2 |
| Temperature (F): | | | 0 |

SIGHTINGS

| Location | Topography | Total deer | Antlered bucks |
|----------------------------------|-------------|------------|----------------|
| Site E-1 | Dense woods | 1 | 0 |
| Prospect Ave.past Dressage field | Light woods | 2 | 0 |
| | | | |
| | | | |
| TOTALS: | | 3 | 0 |

Estimation of Deer Density:

A total of 3 deer were counted in the 408-acre or 0.68 square mile Eagle Rock Reservation. That is 75% of the number of deer counted on a comparable night in the 2016 spotlight count, and only half of the number seen in 2015.

A comparison of spotlight counts to Forward Looking InfraRed (FLIR) helicopter counts for the Watchung Reservation in Union County for a 5-year period (1997-2001) showed that the number of deer observed in a spotlight count versus the number of deer observed in a FLIR count of the same area correlates roughly with the amount of acreage that, because of topography, forest cover or road access, is viewable in the park by spotlights.

During this spotlight count, approximately 25% of the total land area encompassed within the borders of the Eagle Rock Reservation was accessible to viewing by spotlight, and was surveyed.

Therefore, the number of deer observed (3) must be divided by .25 to include the non-viewable area, and the corrected figure will be divided by 0.68 to determine density on a per square mile basis. That calculation yields a result of 18 deer per square mile, or a total of 12 deer in the 408-acre park.