

# NEW YORK'S WILDLIFE RESOURCES

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## White-tailed Deer (*Odocoileus virginianus*)

### Description

The white-tailed deer is New York's only member of the Cervidae (deer) family, a group of mammals characterized by paired antlers occurring primarily in males. Other species of this group of ungulates (hoofed animals) in North America are the moose, elk, caribou, and mule deer. About 30 subspecies of white-tailed deer have been recognized in North America, with only the northern woodland white-tailed deer (*O.v. borealis*) native to New York.

In summer the whitetail's coat is reddish tan. Newborn fawns are darker red, with white spots arranged more or less in rows along the back and sides. By late summer or early autumn the thin, red, summer coat of the deer is shed and replaced by a dense winter coat of darker, hollow hairs about 5 cm (2 in) long and an undercoat of short, soft hairs. Coloration of deer during fall and winter varies from reddish brown to grayish brown on the sides and back, with the upper parts generally darker than the flanks. The underparts (throat, belly, inside hind legs, and underside of tail) are usually white.

White-tailed deer vary considerably in size between sexes, ages, and locations in New York. For deer of the same age and sex, nutrition (usually determined by habitat quality) often is the most important factor influencing size. Mature males (bucks) typically weigh 55-90 kg (125-200

White-tailed Deer

lbs), but occasionally may reach or exceed 135 kg (300 lbs). Adult females (does) usually are smaller, weighing 50-60 kg (110-135 lbs), but may reach or exceed 70 kg (160 lbs). The length of a deer from nose to tail is about 165 to 195 cm (5.5 to 6.5 ft); shoulder height may be 90 to 105 cm (3.0 to 3.5 ft) in adult deer.

Adult males (and the rare, abnormal female) have paired, branching antlers projecting upward and forward from their skull between and slightly forward of the ears. The size of these antlers is determined by genetic traits, age, and, most importantly, nutrition. A fawn buck usually has visible bumps under the skin on its head during its first fall (1.3 cm [0.5 in] long). These are almost always covered with hair, but occasionally may be bare, bony spikes. These are areas where antler growth began and are called nubbins or buttons--thus giving rise to the term "button buck" for male fawns.

## **Distribution and Abundance**

In New York, as in most of the Northeast, deer populations have fluctuated widely during the past 3 centuries. It is a common misconception that large numbers of deer roamed our state before the arrival of European settlers. Actually, deer probably were quite scarce in most of what is now the Empire State prior to settlement by colonists. At that time most of the State was covered with mature forests. Deer, however, prefer "edges"--habitat transition zones along the borders of forest clearings and waterways, or between various habitat types where grass and brush are available for food and cover. Mature forests with little undergrowth provide neither the food nor cover that deer need to thrive. Therefore, it is very likely that in precolonial New York deer were restricted to places where beaver, blowdowns, and fires created openings in the otherwise dense forest.

European immigrants settling in New York produced marked changes in the deer's environment. Tree cutting for homes along with clearing and burning of forests for cropland and pastures created excellent conditions for deer around the edges of each farm. Shrubs and saplings flourished, providing food and cover for wildlife species such as ruffed grouse and cottontail rabbits, as well as deer.

During this early colonial period other occurrences also helped deer populations to increase. Wildfires caused by people's carelessness became more frequent, and often burned large areas that afterward experienced sprouting of new woody plant growth providing food for deer. Wolves and mountain lions, both important predators of deer, gradually were eliminated from the state.

The number of deer apparently continued to increase until the mid-1800's. By this time the tremendous increase in farmland, especially outside the Adirondack Region of northern New York, had more than counter-balanced the earlier beneficial effects of clearing land. Edge was greatly diminished again, but this time it was because very little forest was left. In addition, many more people were seeking deer to supplement their food supply. If each farm family harvested only one deer per year, the total harvest would have been several times the current legal harvest in New York. Also at that time, market hunting (illegal since the turn of the century) was taking thousands of deer for consumption by city dwellers.

The combined impact of these factors caused a rapid decline in deer throughout the state, except in the more inaccessible areas of the Adirondacks. By 1880-90 the deer population reached its lowest point. Deer were extremely rare or absent in large portions of the state.

In the central Adirondacks this general decline in numbers was not evident. In fact, extensive logging, followed in many cases by fires, produced abundant food in much the same way that the early settlers had elsewhere by clearing land for farming. The openings in the forest canopy allowed more sunlight to penetrate and encouraged the growth of dense thickets of brush, shrubs and young trees. Deer numbers in this area continued to increase until about 1890, when overbrowsing led to the destruction of winter range. Heavy losses of deer from starvation were common around the turn of the century. Since 1890, deer populations in the Adirondacks have experienced sporadic increases for several years, followed by significant losses from starvation during severe winters. These fluctuations can be expected to continue.

In other parts of the state, deer had become so scarce that by about 1890 market hunting was almost nonexistent. Hunting regulations became

much more strict in the early 1900's and deer populations began to build in response. More important, large areas of farmland were abandoned during the first half of this century. These abandoned farmlands soon were invaded by shrubs and pioneer tree species. Habitat conditions once more became suitable for deer in many parts of the state outside the central Adirondacks. Herds increased rapidly in some areas, more slowly in others. Starvation became serious as deer densities became too high, particularly in a few local areas of the Catskills. Legal and illegal harvest cropped large numbers of deer. Hunting regulations were adjusted to take more animals where they were ruining their own range or causing significant crop damage on the remaining farms.

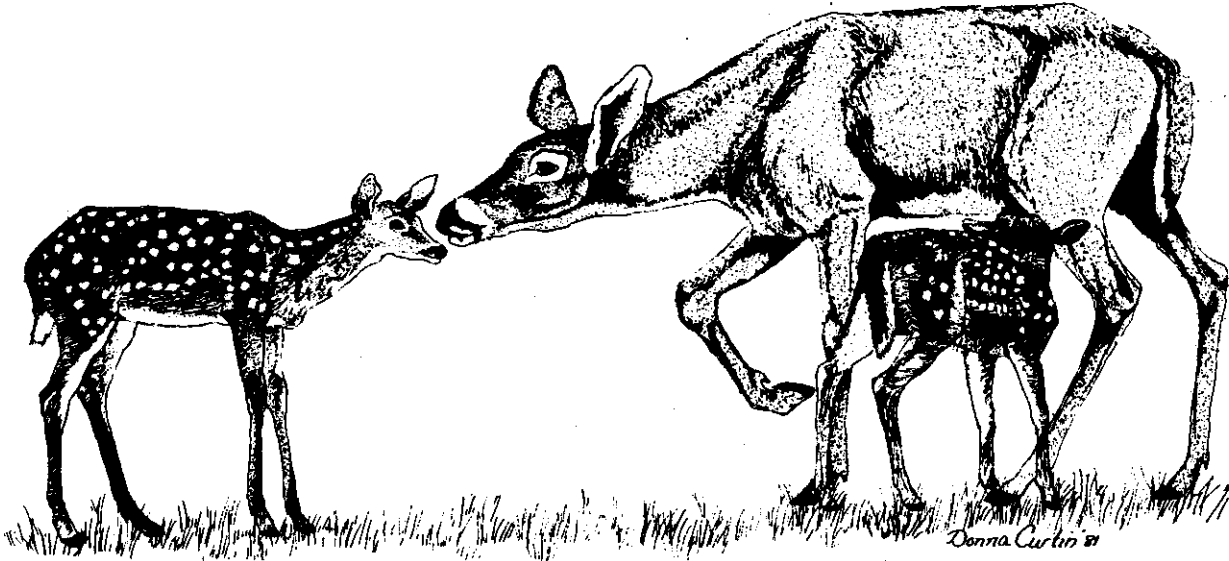
Whitetails are now widely distributed throughout New York State, including parts of Long Island. Deer can be found in forested and agricultural areas, as well as on the fringe of urban and suburban development. Only in the most densely developed places are deer usually absent. The late summer-early fall population of deer in New York is estimated to be between 350,000 and 450,000 animals.

## **Life History**

Reproduction, Development, and Mortality: In New York, deer typically breed between mid-September and late February, with the peak breeding period being in mid-November. Bucks usually become sexually mature when 1.5 years old--that is, during their second fall. Does are sexually mature at this age also, although on good quality range a large proportion (up to 50% or more) of doe fawns will also mature sexually and be bred (usually late in the breeding season).

The gestation period of deer is about 200 days, with most births occurring between late May and mid-June. Newborn fawns weigh an average of 3.4 kg (7.5 lbs) for males and about 2.6 kg (5.8 lbs) for females. For about the first day of life the spotted fawn nurses while laying down, but from then on it can easily nurse while standing.

During the first few days of life, fawns react to danger by flattening on the ground rather than by fleeing, thereby remaining difficult to detect among the grass and underbrush. Afterward they are able to outrun a human, and soon are able to escape most predators by



running. The doe leaves her fawns alone for short periods while she is feeding, returning frequently to let them nurse. During these first few days many fawns are mistakenly (and illegally) picked up as orphans. When the fawns are strong enough to keep up with their mother they will accompany her while she is feeding.

The fawns grow rapidly doubling their weight in 15 days and quadrupling it in 30-40 days. By the time they are 5 months old, fawns will have lost their spots and will be  $\frac{2}{3}$  to  $\frac{3}{4}$  the size of the adult doe.

Captive deer, and a few tagged wild deer that were later recovered, have been known to live almost 20 years. But in a herd of wild deer, these would be truly exceptional animals. Most deer can be expected to live only 2.5 to 4.5 years, depending upon the particular mortality factors operating in the area where they live. In heavily hunted areas, 70 percent or more of all bucks harvested will be 1.5 years old. Another 20 percent will be 2.5, and only 10 percent will be older than 2.5. In remote areas, where hunting pressure is light, a much higher percentage of deer will reach the older age classes.

From the moment of conception, every deer is subject to many life-threatening pressures. Some deer die almost immediately; others may live a considerable time. A starvation diet or other environmental stress factors may halt development of the embryo or fetus, resulting in an abortion. More commonly in deer, the embryonic tissues are resorbed into the body of the mother.

Accidental death may come in many forms for deer. Some fall down banks or off cliffs. Others become entangled in fences or tree crotches, or impale themselves on sharp sticks while running. Deer may drown, especially if they break through thin ice. Trains kill a few. Bucks may die with entangled antlers. Deer may be trapped in forest fires. But all of these and other miscellaneous accidents take only a small proportion of the herd each year.

Collisions with cars are a major cause of accidental death of deer. In New York thousands of deer are killed each year by motor vehicles. Fortunately, very few people are injured, but the cost of these accidents amounts to hundreds of thousands of dollars annually.

Predators probably were important mortality factors in pre-colonial times, but wolves and mountain lions, effective deer predators, are no longer in the state. Coyotes, bobcats and, in the case of fawns, possibly foxes, kill some deer; more often they feed on the carcasses of deer that have died from other causes.

Domestic dogs have taken the place of natural predators in some areas and kill many deer each winter. When a thin crust forms on deep snow, dogs are sometimes able to run on the crust, keeping on top of the snow, whereas deer break through and flounder, making them easy prey for the dogs. In late winter, when deer may be weakened by malnutrition, they are particularly vulnerable to dogs. Harassment alone may deplete a deer's remaining energy reserves to the point where it may later die of starvation. Dogs of all descriptions and breeds are potential deer killers, from the "meanest" wild mongrel to the most expensive, pedigreed "harmless" family pet.

As with most wild animals, deer are hosts to a variety of parasites and diseases. Various parasitic worms may be found in the lungs, stomach, intestines or brain. Wartlike skin tumors may be present, especially along the flanks and belly. Lice, ticks, and other external parasites frequently are found on the body.

Flat, leechlike liver flukes are common in New York deer, especially in the Adirondacks. They usually do little harm to the deer and do not affect the meat for eating purposes, except that the small areas affected by the flukes should be cut from the liver before it is eaten.

Nose botflies also are common parasites of deer. These grubs (fly larvae) live in the nasal passages and throat of a deer. They rarely do serious damage to their host, as is generally true of the other parasites mentioned.

Leptospirosis, a blood disease, has been found in New York deer, but its effects on the animal are not fully known. Several other diseases of minor importance are known. Generally, deer are very healthy when living under good habitat conditions. No disease present in New York deer has been found to affect their populations seriously.

Hunting takes large numbers of deer each year. During recent years the legal harvest has been about 100,000 annually. Unfortunately, illegal hunting takes many deer, too. Despite the efforts of law enforcement officers and concerned sportsmen, deer are harvested illegally year round in some areas of New York.

Starvation is an important mortality factor in some regions (e.g., central Adirondacks, central Catskills). With the arrival of winter's severe weather, especially deep snow, deer move into their wintering areas for shelter, even though many of the deeryards have been overbrowsed for several years. As winter progresses deer on a starvation diet quickly use up fat deposits under the skin. Next, deposits of fat around the heart, on the mesenteries surrounding the intestines, and around the kidneys are depleted. Finally, the fat stored in the bone marrow is used. The normally hard, creamy pink, greasy marrow turns to a red, watery gelatinous material when the fat is completely gone. Biologists check the marrow in the femurs (the large, upper leg bones) of dead deer for this sure sign of starvation.

During a severe winter, thousands of deer may die from starvation in New York State. In addition, some surviving does may abort or have stillborn fawns. More important, reproduction in does from starvation areas will be lower the following year and a reduced fawn crop will occur the second summer after a severe winter. On poor range weights of similarly aged deer will generally be considerably lower than on good

range, and antler development will be poorer. Finally, the survivors will have caused further damage to their own winter range, reducing its carrying capacity for future winters.

Births normally are more or less balanced by deaths in stable deer populations. If both birth rates and death rates are low (as in the Adirondack herd) the average age of animals in the population will be comparatively old. If both birth rates and death rates are high (as in parts of western New York), the average age of animals will be younger.

Only in special circumstances are birth rates and death rates unequal. When habitat conditions change rapidly or when unusual disasters occur, deer numbers may go up or down accordingly. In managed deer herds, such as we have in most of New York State, the mortality rate from hunting is sometimes intentionally increased or decreased to effect a decrease or an increase in the deer population.

There are, however, limitations in managing deer populations by manipulating the mortality rate. Increased hunting pressure usually reduces deer populations, thereby decreasing the influence of other mortality factors. That is, where more deer are harvested during legal seasons, fewer are killed by disease, predators, starvation or cars. Reproductive rates may also increase as a result. Conversely, where legal harvests are decreased, more deer fall victim to disease, predators, starvation, and cars. Thus, it is possible to harvest deer heavily. Deer cannot be stockpiled; those not harvested by humans will die from other causes.

It is not only possible to harvest deer at heavy rates, it is actually necessary in most areas in order to keep herds at levels compatible with human land-use practices. To maintain vigorous, healthy deer in quality habitat, hunting must often take the place of mortality formerly supplied by large predators.

Food Habits: Deer are herbivores--plant eaters. They are primarily browsers rather than grazers. This means that during much of the year their diet consists mainly of leaves, buds and young twigs from trees and shrubs. However, deer also eat large quantities of grass and other herbaceous vegetation, especially when it first becomes available in the spring.



Deer need 2.3 to 3.0 kg (5-7 lbs) of good food each day, or more if it is of poor quality. This means that each deer will eat over one metric ton of food in a year.

Like cattle and sheep, white-tailed deer are ruminants and have a four-part stomach. The first part, the rumen, is a large storage chamber accounting for about 80 percent of the stomach. In deer it can hold as much as 8 liters (8 qts.) of partially chewed food and water. Before passing to the other parts of the stomach (reticulum, omasum and abomasum), partially chewed food from the rumen and reticulum is regurgitated and chewed as a cud. This digestive mechanism allows deer to browse and graze rather rapidly; then they may retire to safer locations to complete digestion of their meal.

Deer are unable, by themselves, to digest the cellulose in many of the woody types of foods they eat. However, in the rumen they have a combination of microflora composed chiefly of bacteria which through fermentation are able to convert cellulose into useable nutrients.

Field surveys and experimental feeding trials in pens show that deer eat hundreds of different species of plants. Among the highly preferred (and generally most nutritious) foods in New York are: white cedar, yew, sumac, sassafras, basswood, and various species of maples and dogwoods. Acorns, beechnuts, and apples are also choice foods and, in years when they are plentiful, they are very important in the diet of deer during fall and early winter. Unfortunately for farmers, corn, alfalfa, buckwheat, clover, apples, lettuce, celery, potatoes, turnips, sugar beets, and strawberries rank high on the list of foods eaten by deer. Second-choice foods include hemlock, highbush cranberry, blueberry, wild raisin, honeysuckles, juneberry, cherry, birches, ashes, and oaks. Some common starvation or "stuffing" foods are the spruces, balsam fir, alder, tamarack or larch, most pines, junipers, hawthorn, rhododendron, and sweet fern. In areas where any of these are eaten in quantity, and where individual plants of these species show evidence of heavy browsing, the local deer are probably in serious difficulty due to inadequate supplies of quality food for the existing deer population.

Antler Growth and Development: Antlers are solid, bony growths projecting from the deer's skull. In the white-tailed deer, as in most species of



deer, only the male normally grows antlers. These are shed every winter and regrown every spring and summer. Antlers are not horns. Sheep, cattle, and bison have hollow or partly hollow, permanent horns.

Adult deer begin growing new antlers in April or May. This antler growth is stimulated by male hormone secretions. While they are growing, antlers are covered with a soft, velvety skin that is richly supplied with blood vessels. At first the bone is spongy and soft, but it soon hardens. As antlers reach maximum size in September, the blood supply is cut off and the skin dies and peels off. Much of this dried "velvet" is rubbed away by the buck as he thrashes brush with his antlers. It is believed that these rubs are made by bucks to delineate their breeding territories, rather than as a deliberate attempt to remove the velvet from their antlers. In late December or January the cells at the base of the antler degenerate and the antlers are shed. Mice, squirrels, and porcupines soon eat the shed antlers for their mineral content--the reason why it is rare to find such antlers in the woods.

The size of the antlers depends on three factors: heredity, age, and food quality. Since bucks with good antler development may have an

advantage when competing for mates, they are more likely to pass on this genetic trait. The white-tailed deer stock in New York generally has an excellent hereditary capacity for antler production, as demonstrated by the trophy deer harvested annually, feeding experiments, and healthy zoo animals.

Older bucks generally have heavier antlers with more points than young deer, even in areas where food conditions are poor. But a buck's age cannot be determined by simply counting the number of points. A buck living on good range may have 6 or possibly 8 antler points when he is 1.5 years old, but a deer several years older may have only 4 or 5 points if he has been living on a poor diet. Because hunting pressures have increased greatly in recent years, more bucks are taken today at younger ages and with smaller antlers than formerly.

## **Habitat**

During summer and fall, deer are widely distributed over their range in New York (130,000 sq. km [50,000 sq. mi]). They inhabit brushy, overgrown, and abandoned farmlands, active farmlands, openings in the hardwood forest, and to a lesser extent the forest itself. As winter approaches, deer move to areas where shelter from wind and snow is available. In some parts of the state these areas of winter range are called deeryards or winter concentration areas. Often this protective cover is found in low-lying conifer forests--swamp areas of spruce, balsam, cedar, and pines. Ideally, such areas have hardwood browse around the edges or intermixed with the conifers to provide easily accessible food.

Depending upon the severity of the winter, deer may occupy the yards for 60 to 110 days. In deeryards that have been overcrowded for years, the preferred foods have disappeared due to overbrowsing. New sprouts are nipped off at snow level. A "browse line" below which no new growth remains will appear as deer eat all good and fair food as high as they can reach on trees and shrubs. The least nourishing plants then begin to be browsed on heavily and the capacity of a deeryard to sustain a large number of deer over the winter is destroyed for many years to come.

Under such conditions many deer die of starvation. Fawns (up to 80% in some areas), the very old, and the sick and diseased are often the

first victims. Survivors may lose as much as 30 percent of their body weight between the onset of winter and spring.

## Management

Management of deer populations is a relatively new activity. Prior to the 1900's, deer were generally regarded as just another natural resource to be exploited as desired. Times of abundance and scarcity were usually taken as a matter of course. Only in this century have the factors influencing deer population levels and fluctuations in abundance been studied extensively. The knowledge and experience gained through research, observation and in some cases trial and error provides an increasingly sound basis for habitat improvement programs and for regulations to maintain deer populations at optimum levels with respect to their habitat.

Herd Management: Management of deer herds to maintain maximum populations that are within range carrying capacity and are compatible with human land use is largely achieved by varying harvest regulations. The total number of deer harvested annually can be influenced by regulating the sex and age of deer taken, the geographic location of harvest, and the distribution of the harvest among hunters.

In recent years, deer hunting seasons have been held from late October through early December in the Adirondacks and in the northeastern part of the state. With few exceptions, the remainder of the state has had a season from the third week of November through early December.

From 1912 through the late 1950's, in most years and in most areas of New York, only deer having antlers 7.5 cm (3 in) long or longer were legal to harvest. Since bucks are polygamous and capable of mating with many does, this "bucks-only law" of early wildlife conservationists did not prevent the deer herd from increasing. Over the past two decades, as deer numbers continued to climb, other regulations allowing the harvest of antlerless deer have been applied to balance deer numbers with long-term winter range carrying capacity.

Several systems are used to regulate the harvest of antlerless deer. In New York and some other states, a deer management permit quota system

has been quite successful. In this system a group of 2 to 5 hunters may receive a permit (1/group) allowing one member of the group the opportunity to take 1 deer of any age or sex in addition to the one buck each allowed individuals in the group under their regular licenses. (In recent years, in some areas of New York, permits are issued to an individual rather than a group.) To receive a permit, the group of hunters must apply for one in a specific deer management unit (DMU). A DMU is a geographic unit, usually consisting of several townships, within which the deer range is relatively uniform and where specific regulations may be employed to manage deer, based on biological data. A quota of permits is established for the DMU, based on the deer population should be increased, decreased, or remain stable. The quota of permits for a DMU is randomly drawn from the pool of applications for that DMU. This system allows harvest rates to be varied according to local conditions, making it possible to achieve variable hunting intensity and appropriate antlerless harvest as needed in specific areas.

Sometimes the harvest of bucks and antlerless deer during the fall season is insufficient to prevent damage to agricultural crops. This type of damage may be especially severe to orchards and nursery stock in winter and to green vegetables and small fruits in summer. Crops of high value may be severely damaged in a few nights of feeding by deer. Where crop damage is localized but severe, growers may be allowed to shoot the depredating deer under a damage control permit issued by the New York State Department of Environmental Conservation. Damage permits give some relief to those experiencing damage in localized areas, but are viewed largely as only a temporary solution to the problem. Relatively few of these permits are issued annually.

Feeding Deer: People interested in maintaining deer often suggest that starvation and overbrowsing can be avoided by winter feeding programs. Artificial feeding may seem to help a few deer on a small area but the enormity of the task on a statewide basis is mind boggling. It would take about 45,000 metric tons (50,000 tons) of good food to feed 200,000 deer for 100 days. In addition to the impossible task of transporting and distributing this feed to the deer is the reality that readily available cattle feed is not easily digested by deer until stomach bacteria have

time to change. If deer populations are maintained by winter feeding at levels that require more food than is naturally available, two detrimental results will be felt. First, overpopulation causes an acceleration of winter range deterioration. Second, excess deer (the number of which would increase annually) must be fed ever-increasing quantities of artificial feed to compensate for overbrowsing of the natural food supply and the maintenance of more deer than the natural winter range will support. In general, artificial feeding only adds to an already bad situation and delays the deer population adjustment that must eventually take place.

Artificially concentrating deer, by attracting them with winter feed, promotes the spread of diseases and parasites through the population. Domestic dogs and natural predators are often attracted to such areas. The deer themselves actually make living conditions difficult for some members of the herd. Larger deer aggressively dominate feeding stations where feed is concentrated or in limited supply. Under such conditions a doe will drive even her own fawns away from feed, which may lead to eventual starvation for the fawns despite food availability.

The eventual outcome of a program of winter feeding is a collapse of the deer population, because eventually both natural and supplemental foods are exhausted. Winter deer feeding programs generally are a case of killing deer by misguided kindness. They are a treatment of symptoms rather than elimination of the cause of the problem--an imbalance of natural food and deer numbers.

Habitat Management: Although a great deal has been learned concerning what constitutes good deer range, direct improvement for deer alone is seldom economically feasible. Nevertheless, in some areas habitat manipulation may be practical.

Fortunately for deer enthusiasts, much of New York is naturally good deer habitat. But it is constantly changing through the process of ecological or plant succession. Through this process abandoned pasture grows to weeds, old fields are invaded by brush, immature trees become mature forests. If undisturbed, these events occur in a predictable, orderly succession in any area, finally leading (in New York) to a stage of mature trees called a climax forest. Because these changes are

predictable and orderly, biologists are sometimes able to manipulate the vegetation such that the intermediate stages of succession, those forming good deer habitat, are produced or maintained.

Frequently, biologists will attempt to halt or slow succession in areas where conditions are already favorable for deer. Several types of disturbances--discing, brush cutting, bulldozing, plowing, timber cutting, and fire--will act to hold back plant succession. In areas of mature forests, logging operations produce conditions that will allow earlier successional stages of vegetation (e.g., brush) to reoccur. These disturbances must be planned carefully, for they are not always beneficial. For instance, cutting of conifers in a winter concentration area would remove the critical protective cover needed by wintering deer.

### **Economic and Social Values**

Almost everyone in New York is familiar with the white-tailed deer. Farmers see them in their fields. Motorists see the green glow of their eyes along the roadside at night. Hunters see their flashing white "flag" (white underside of their erect tail) in the brush or hear a snort, a stamping hoof, and the crashing of a startled deer retreating through the underbrush. Spring often finds wildlife enthusiasts scouting traditional locations where deer congregate on sunny hillsides and south-facing slopes. Photographers, campers, hikers, hunters, and fishermen often know the deer rather intimately. Due to their hours in the outdoors, these people are frequently rewarded by many opportunities for close-up observations of whitetails.

Deer are admired by nearly everyone. Even those probably most negatively affected by deer--farmers and orchardists--are tolerant of fairly serious deer depredations to their crops because they enjoy deer and consider them aesthetically valuable. Deer also have a dedicated following among the 750,000 big game hunters of New York. These deer enthusiasts collectively spend millions of hours and dollars in pursuit of recreational deer hunting experiences. Sales of hunting clothes, fire-arms, ammunition, food, lodging, and gasoline to hunters are important to the economy of many "tourist" communities during the late fall season. The dollar value of recreational expenditures related to deer hunting are estimated

to be in the tens of millions. Additionally, the meat and hide value of deer to these hunters is well over \$5 million dollars.

Deer also add to the outdoor recreation experiences of hikers, campers, and picnickers. The value of deer to these people is difficult to express in dollars and cents.

Although it is not always easy to see a deer in the forest, the observant person usually can find several signs of deer's presence. The following list includes several things to look for when searching for a likely spot to see deer:

Tracks: heart-shaped imprints in soil or snow.

Browsed buds and twigs: twigs that have been nipped off by feeding deer (be careful not to confuse deer browsing with that of cottontail rabbits or snowshoe hares; deer leave a ragged edge where rabbits cut a twig cleanly).

Beds: oval-shaped depressions (90 cm X 60 cm [3 ft X 2 ft]) in leaves, grass or snow where deer have bedded down. If you look carefully in a suspected bed you can almost always find a few deer hairs.

Trails: narrow, well-worn paths used as travel lanes by deer; usually with tracks.

Rubs (fresh ones only in the fall): areas on trees (1.5 to 10 cm [0.5 to 4.0 in] diameter) about 30 to 90 cm (1 to 3 ft) above ground where bucks have rubbed the bark off stems with their antlers.

Scrapes: patches of 30 to 150 cm (1 to 5 ft) in diameter on the ground where bucks have torn up the soil and vegetation with their antlers and hooves; rubs often nearby.

Droppings: jelly bean-shaped, brown; usually in groups.

Deer are crepuscular animals. This means that if undisturbed they are most active at dawn and dusk, when light intensity is low. These are the best times to look for deer. They may also be quite active on cloudy, overcast days and on moonlit nights.

Sometimes you can approach quite near to deer in dense cover without actually seeing one. Often the only way you will know of their presence is by hearing them snort or blow (a loud, sharp, exhaling noise), stamp



their front hooves (a sharp, hollow "thump"), or bound off through the brush. All these sounds are clues to the presence of deer.

Despite all the positive aspects of our deer resource, they are sometimes a nuisance and in some situations they are an economic burden. Deer may feed on shrubbery around homes and make nocturnal forays into backyard gardens, much to the resident's displeasure. They cause minor losses to most farmers, and in many locations, severe and extensive damage to growers of high value crops such as grapes, cherries, apples, and nursery shrubs, necessitating large investments in control measures or causing heavy financial losses. The thousands of deer killed on our highways result in a great deal of damage to motor vehicles and hundreds of thousands of dollars in insurance claims. It is largely because of these negative impacts that deer need to be managed. Regulated hunting is an economical and the only practical means of widespread deer population control.

## **Control Methods**

Control of deer damage to field crops, fruit and shrubbery has been attempted through fencing, chemical repellents, and other methods. Fencing is generally the most effective, but most costly method of control. Fencing is only feasible for small areas (gardens) or high value crops (e.g., dwarf apple tree orchards). Some chemical repellents are effective when applied correctly, if deer are not extremely pressed for food. Other methods include hanging mesh bags of human hair around the area to be protected, leaving dogs near troubled areas, placing dried blood or lion scent around the perimeter of the area, hanging bags of tankage (a slaughterhouse by-product) near the area, and use of sound and visual scare devices. As mentioned previously, permits to shoot deer are also used in special situations. (For more information on deer damage control see Caslick and Decker 1978 and 1981.)

-- D. J. Decker  
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