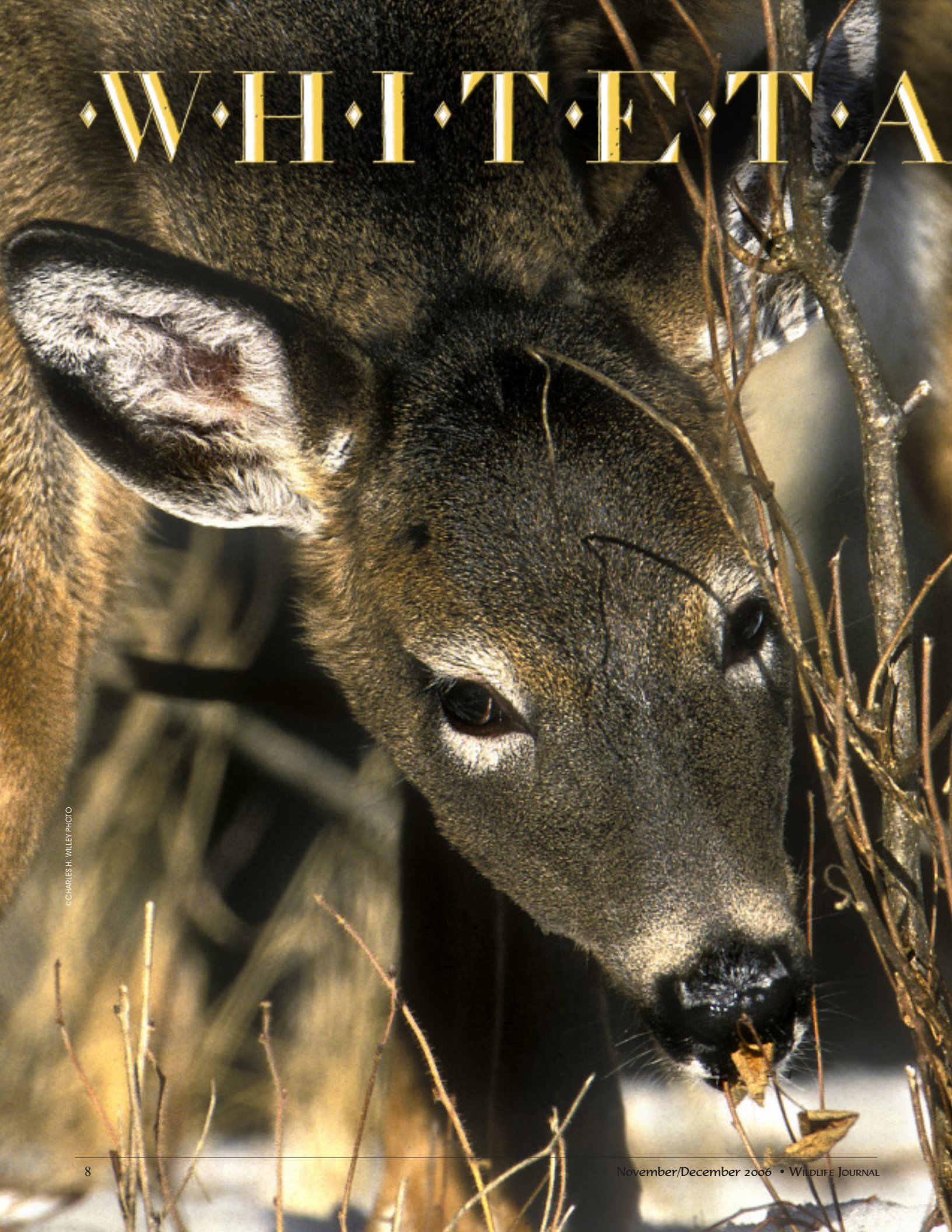


# W·H·I·T·E·T·A



©CHARLES H. WILLEY PHOTO

# ♦ I L S ♦

## 101

### *The hunter harvest is a rich source of management information for wildlife biologists.*

BY KENT GUSTAFSON

Each fall, hunters enjoy their time afield. Experiences with family and friends become lifetime memories and the basis for many deer camp stories. If successful, they have the added benefit of venison in the freezer. It may not be readily apparent, but the deer killed by those successful hunters also provide much of the information necessary to manage New Hampshire's deer population.

The New Hampshire Fish and Game Department collects a variety of information from New Hampshire's hunter-killed deer to assist in deer management and to help assess the health of the deer and their habitat. Mandatory registration of hunter-killed deer at one of about 90 stations around the state allows the collection of complete harvest information on a Wildlife Management Unit-specific basis.

This registration data allows the harvest to be accurately monitored and the deer population to be assessed in relationship to the specific population management objectives developed for the long-range New Hampshire Big Game Plan. In the process, we get a good snapshot of the health and distribution of our deer.

#### **WEIGHTS AND MEASURES**

In addition to analyzing registration data, Fish and Game biologists work at biological check stations each fall. At various deer registration stations across the state, they collect more detailed information on harvested deer, including weight, antler beam diameter, number of antler points and whether females still have residual milk in their udder. The biologists also age the deer to the nearest year by looking at the deer's teeth. Replacement of "milk teeth" and tooth wear provide an efficient method of assessing a deer's age out to at least five years.

The detailed biological data collected during the season allows biologists to assess the health of the deer in relationship to habitat quality. Decreases in average antler beam diameters, weights or lactation rates can suggest that deer densities are beginning to approach the "biological carrying capacity" of the habitat. As deer numbers increase, the quality of their habitat gets worse, and the animals' physical condition begins to decline. These measures of physical condition are most sensitive in yearling deer (those that are 1.5 years old in the fall). Yearling male antler beam diameters have recently averaged 17.5mm and field-dressed weights averaged 115 pounds in New Hampshire. An average of about 16% of New Hampshire's yearling does still show evidence of milk in their udder in the fall. This tells us that at least this proportion must have been bred the previous

*continued on next page*



© CHARLES H. WILLEY PHOTO

*Fields, forest edges, swamp borders and woodland openings are good places to look for deer, which feed on a variety of plants depending on the season.*

*continued from previous page*

fall, when they were approximately 6 months of age, and gave birth to a fawn in early summer at the age of about one year.

All of these measures show that New Hampshire's deer are comfortably within the biological carrying capacity of the habitat. However, if, for example, average yearling buck antler beam diameters were consistently below 16mm, it could indicate a decline in physical condition because high deer numbers are reducing habitat quality.

In many cases, however, increased deer-human conflicts between deer and gardeners, farmers and forest landowners become a problem before deer numbers exceed the true biological carrying capacity of the habitat. This type of situation can currently be seen in WMU M in southeastern New Hampshire. While the herd is healthy, the region has more deer than desired. To address this situation, since 1997 Fish and Game has offered hunters special permits to take an additional antlerless deer in Unit M. The number of these Unit M

special permits increased this year to a total of 5,500 (up from 3,250 in 2005), reflecting a long-term goal of reducing deer numbers in this urbanized area of the state.

### **WEATHER AND HABITAT**

Deer hunting is the primary management tool used to regulate deer numbers in New Hampshire, but many other factors also influence deer populations. In northern New England, severe winters can have a big effect on deer. In northern climates like New Hampshire's, deer are dependent on specialized forest habitats commonly referred to

as "deer yards" or deer wintering areas. These areas are typically mature softwood stands, but may be composed of spruce and fir in the north, or hemlock and pine in the south. At times when snow depths exceed approximately 18 inches or temperatures fall below zero, these mature softwood stands provide deer with areas of reduced snow depths and slightly warmer temperatures under the closed softwood canopy.

In spite of the benefits provided by deer wintering areas, prolonged periods of deep snow and cold can result in high deer mortality rates from starvation or predation. Winter feeding of deer by people provides limited benefits, and can even hurt the herd because of increased crowding, stress and vulnerability to predators and dangerous roadways. In addition, following a severe winter, fawn production and survival may be lower because of the poor condition of does.

New Hampshire Fish and Game has monitored the potential effect of winter on deer populations since the winter of 1964-65. This winter severity index (WSI) is collected from December 1 through April 30 each winter and is based on the number of days with 18 or more inches of snow on the ground and the number of days when the temperature falls below zero. Large differences exist across the state, with the long-term average WSI in far



© ROGER IRWIN PHOTO



© DWIGHT KUHN PHOTO

northern New Hampshire being 119, compared to 20 in southeastern New Hampshire.

In addition to monitoring WSI, wildlife biologists monitor deer wintering areas across the state by assessing their quality and use by deer. About 45 deer yards are assessed each winter, monitoring intensity of use, browse availability and the impact of development and winter mortality. Deer population management efforts take into account the potential increase in deer mortality during unusually severe winters, and deer seasons may be adjusted following these severe winters to mitigate their effects.

An example of this was seen after the harsh winter of

2002-2003, one of the most severe in decades, especially in central and southern New Hampshire. Fish and Game responded by reducing the number of days for taking antlerless deer the following fall. The 2003 deer season saw a 14% decrease in the total statewide deer kill, reflecting in part the impact of the previous severe winter, including above-average winter mortality and low productivity (fewer fawns) the following spring. Fish and Game's efforts to reduce the impact of the severe winter by limiting antlerless harvest during the 2003 season also contributed to a reduction in total harvest. Weather was kinder the following winter (2003-04), and reducing the antlerless harvest in 2003 had helped offset the effects of the previous hard winter. As a result, the herd rebounded, and in 2004 hunters in New Hampshire registered a 7 percent increase in deer harvest.

Development is another factor affecting deer populations, one that could potentially have the most adverse effect on deer and other wildlife habitat in New Hampshire. While deer are very adaptable and can thrive in relatively suburban areas, development decreases the amount of deer habitat; decreases its quality; increases deer-human conflicts; and makes control of deer numbers more difficult by limiting hunter access.

**KEEN SENSES**

Deer hunters and others who have watched or studied deer know that their senses — including hearing, smell and vision — are very good. A deer's ears can rotate like radar to track suspicious sounds that might pose a threat. Their sense of

smell is highly developed and helps them detect predators, find food and recognize other deer. It also allows bucks to find and follow females during the fall breeding season or "rut," which typically peaks about the third week of November.

Vision is one of the deer's most important senses. The placement of their eyes allows for a wide field of view, and their eye structure allows deer to have good vision both in the daytime and at night. They are particularly adept at detecting even subtle movement. It is hard to interpret the deer's ability to see what we call "color," but research suggests that deer are most sensitive to violet, blue and green. They are less sensitive to orange and red than other colors, which explains why blaze orange clothing doesn't alarm them. Typically, brightness and contrast draw a deer's attention.

Hunters and many others have probably witnessed deer "snorting" or "blowing," frequently accompanied by stamping of the front feet when a deer is suspicious, but uncertain, of something it has seen, smelled or heard. This is most likely an attempt to startle the potential threat into moving, making it easier for the deer to identify. Once aroused to this level of suspicion, a deer is unlikely to calm down and will almost certainly leave the premises, sometimes in a big hurry and most probably with its "white flag" raised.

**HOW ANTLERS GROW**

Male white-tailed deer and other members of the deer family grow antlers each year. Antlers are composed of true bone and are shed each winter. Typically, antler growth begins from mid-March to early April. Growing antlers are filled with blood vessels and nerves and are covered with hairy skin called "velvet." By August or September, the antlers stop growing, the bone hardens and the velvet is shed or rubbed off by October. Evidence of this can often be seen as "buck rubs" on young trees or shrubs.

While a buck's antlers tend to get larger with age, nutrition and genetics play an important role, so antler size and number of points are not necessarily good indicators of a buck's actual age.



FISH AND GAME STAFF PHOTOS

*Deer are red-green color blind. They possess less sensitivity to long wavelength colors, so red, orange, yellow, yellow-green, and green appear shifted in hue and paler to a deer's vision than they do to the human eye. With a greater sensitivity to short wavelength colors, deer see blues and violets as brighter than humans do. The lower image is an approximation of what a deer might see looking at the orange and blue-clad hunter at top.*

*continued on next page*



© ROGER IRWIN PHOTO

The “antler beam diameter” of hunter-killed deer can be an important measurement of deer nutrition and herd health.

*continued from previous page*

Antlers are shed from December through February, and re-growth begins again in the spring. Rarely, antlers occur in female deer with hormone imbalances or other problems, but these antlers are typically small and never lose the velvet. Occurring only in about 1 of 1,000 does, these antlered females are usually fertile and are normal in other respects.


### MANAGING THE HARVEST

Antlers, while they are important to deer, and to deer hunters, also play a role in deer management. Deer population management is accomplished through the strategy of regulating the “antlerless” deer harvest. Antlerless deer are considered those with antlers less than 3 inches in length, while antlered bucks are those that have at least one antler 3 or more inches long. While some antlerless deer are buck fawns, most are females. Since it is female deer that have fawns each year, and older does can have twin fawns each year, controlling the number of female deer in the population can control the productivity of the deer herd, causing populations to increase, decrease or stay the same.

In New Hampshire, antlerless harvests have been regulated for many years by adjusting the number of “either-sex” hunting days allowed on a unit-specific basis. During these either-sex days, both antlered and antlerless deer can legally be taken, while at other times during the season, only antlered deer can legally be harvested. Long experience allows biologists to estimate the effect of either-sex days on the antlerless harvest and to set seasons that will result in population growth, decline or stability. The deer harvest is monitored annually to assess the results of the season, and the physical condition of the deer and the impacts of winter severity are also considered in establishing deer seasons.

In addition to population objectives, the Big Game Plan seeks to maintain a diversity of age classes in the deer population, specifically among adult males. When at least 50% of the adult males are 2.5 years old or older, hunters have an increased chance of harvesting deer of an older age class; it also helps avoid potential concerns over breeding ecology that may occur when a very high proportion of adult males are only yearlings (1.5 years old). During the last three years in New Hampshire’s North Country (WMU A), for example, the yearling buck frequency has averaged almost 60%. Fish and Game needed to reduce harvest pressure on bucks in that unit, so this fall the regular firearms deer season will close a week early in WMU A. Based on previous years, this should reduce the buck kill enough to maintain older age bucks in that WMU. Once the management goal is met, the season can be lengthened again.

Deer can live to be 15 years old or more, but this is rare in wild populations. Each year during biological check station operation, a fair number of female deer are seen that are ten years old or older. This is much rarer among bucks, as harvest mortality rates tend to be higher than for females, and the natural mortality rate of males is also higher, largely because of the stresses associated with the rut that make it less likely that a buck will live to a ripe old age.

Twenty-two years ago, in 1983, the total deer harvest in New Hampshire was only 3,280. These days, it typically exceeds 10,000 per year. With a population of about 85,000 deer in New Hampshire, hunters and the public benefit from the recreation, enjoyment and venison these deer provide. While there are many facets to deer biology and management, the future of white-tailed deer as a valued part of New Hampshire’s wildlife is secure. 

*Wildlife Biologist Kent Gustafson is the Deer Project Leader and biometrician for the New Hampshire Fish and Game Department.*