The White-tailed Deer Handbook

Minnesota Department of Natural Resources Hunter Education Program

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Welcome

Welcome to the Advanced Hunter Education Program: White-tailed Deer Clinic. This clinic is one of a series of hunter education programs offered by the Minnesota Department of Natural Resources (DNR), Division of Enforcement. We are pleased that you have a special interest in this session which covers a variety of topics such as methods of deer management, hunting techniques, tracking, care of game in the woods, and compass reading. By the time you've completed the clinic, we hope you will have developed a better understanding of the white-tailed deer and a true sense of appreciation for this magnificent animal.

There are several question periods included in the agenda, so please wait until the appropriate time to ask your questions. You'll find space to record notes from the clinic at the end of this handbook.

Information about the DNR Division of Enforcement's Hunter Education Programs

The Division of Enforcement has three hunter related education programs. For the beginner there is the Firearms Safety Program (FAS). The FAS program emphasizes the safe handling of firearms in the field and in the home. It is designed for the hunter and the non-hunter alike. It is required in Minnesota and other states for persons of certain age groups to purchase a hunting license. The program is open to those eleven years of age or older. As is the case with all of the division programs, it is instructed by highly trained volunteer instructors.

The division offers the Minnesota Bowhunter Education Program (MBEP) for all bowhunters twelve years of age and older[1]. It is designed for beginning to experienced bowhunters. The seminar is based on the International Bowhunter Education Program materials. The seminar is required to participate in selected bow hunts in Minnesota as well as to purchase bow-hunting licenses in some states.

The Advanced Hunter Education Program (AHE) is offered by the Division of Enforcement. It is open to those 14 years of age and older[2]. It is designed for the outdoors person and hunter that have some firearms handling experience. The basic seminar is a six-session program that covers such topics as hunter behavior, laws and regulations, planning a hunt, survival, map and compass, small game, big game, waterfowl, and more. Participants that successfully complete this seminar, BESIDES EXPANDING THEIR KNOWLEDGE, receive a card which can be used when purchasing a hunting license in states which have a hunter education requirement.

The AHE certification can also be earned through a format of individual clinics. By completing this white-tailed deer clinic, you are a step closer to earning your AHE certification. Part of the certification involves attending five approved single topic clinics, one of which must include a shooting activity. Also, a take home, open book examination must be completed. In addition to this clinic, you can choose from black bear, waterfowl, wild turkey, planning a hunt, survival in the outdoors, map and compass, gun safety in the home, and more.

You can get information on other clinics and all of the DNR Safety Training Programs by calling toll free 1-800-366-8917. You can also find information at the DNR website: www.dnr.state.mn.us/enforcement/safety.

If the reader finds errors, omissions or has suggested changes to these materials, please contact our Camp Ripley office at 1-800-366-8917 or write: DNR Enforcement, Nelson Hall, attention Enforcement Education Program Coordinator, 15011 Hwy. 15, Little Falls, Mn. 56345-4173.

[1] Persons 12 through 15 years of age must have an FAS card.

[2] Those 14 and 15 years old must have an FAS card.

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The History of Deer and Deer Hunting Management in Minnesota

Edited by Al Berner and Mark Lenarz

Prior to settlement, white-tailed deer were most common in the hardwood forest transition zone running from southeast to northwest through the central part of the state and along the wooded river valleys in the southwest prairie areas of Minnesota. They were seldom found in the evergreen forests of northeastern Minnesota (Figures 1 and 2).

After settlement, deer numbers and distribution changed dramatically. By 1880, land clearing for farming and subsistence and market hunting had eliminated deer in the transition and prairie portions of Minnesota. As a result, deer hunting in southern Minnesota was closed in 1923 and remained closed for the next 22 years.

The first European settlers to the north woods began logging the mature coniferous (evergreen) forest. The logged forests were replaced by farms and young forests. The resident deer in these areas responded favorably to the excellent deer habitat created by the crops grown on the farms and the resulting secondary successional forest growth. By 1920, deer were common throughout northeastern Minnesota.

With the increased legal protection, deer began to repopulate the farmland zone (previously the transition and prairie areas) of Minnesota. Periodically, short deer hunting seasons were allowed in the farmland zone in the late '40s and the '50s. By the 1960s, all or significant portions of Minnesota's farmlands were open to deer hunting annually or on an every other year basis. Since 1975, however, deer hunting has been an annual event in the farmland zone of Minnesota.

As the northeastern forests began to mature, hardwood species were being replaced by conifers such as spruce and balsam and the marginal farms were abandoned. These changes gradually reduced the quality of the habitat for deer, and with the occurrence of several severe winters, the carrying capacity for deer of the forest zone began

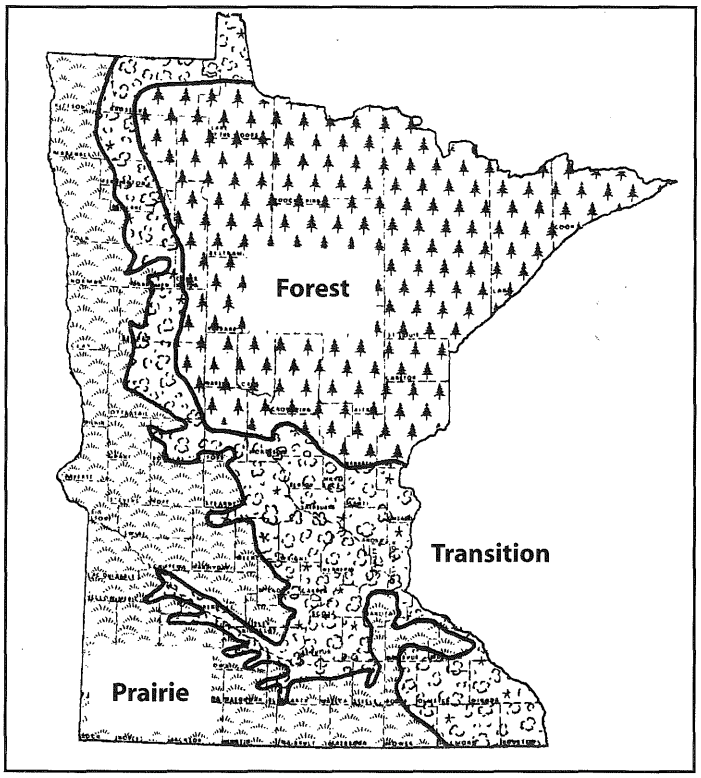


Figure 1. Original vegetation zones of Minnesota.

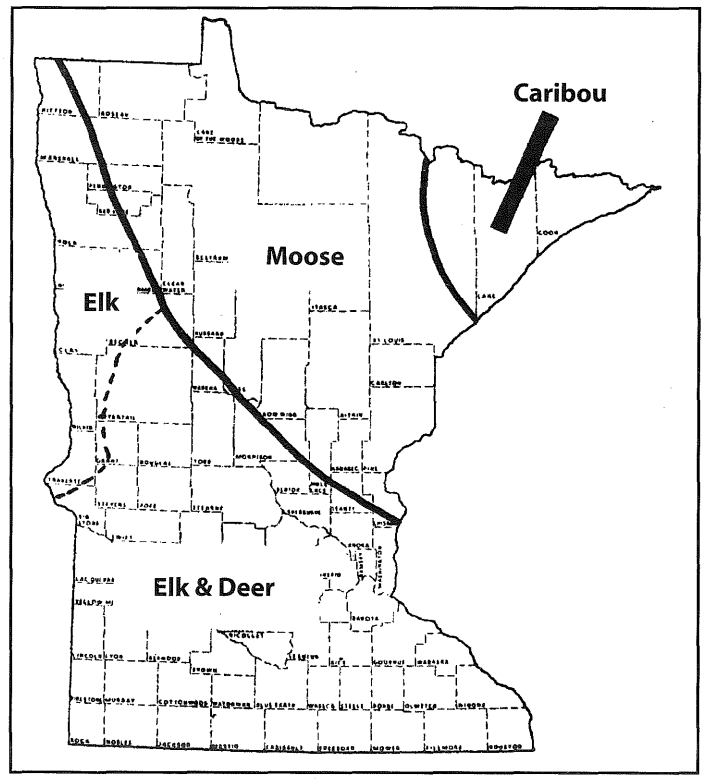


Figure 2. Diagrammatic distribution of ungulate species in Minnesota prior to 1860.

to decline. Continued logging has stabilized the carrying capacity, however, periodically severe winters reduce deer numbers significantly.

In the farmland zone, deer populations steadily increased from the 1920s. The harvest from these areas comprised about 10 percent of the state's harvest in the 1940s and 1950s, 24 percent in 1960, 44 percent in the 1970s, 52 percent in the 1980s and 60 percent in the 1990s. These increases were fostered by an abundance of food (including farm crops), generally milder winters, higher productivity, the absence of hunting in much of the agricultural zone from 1922 to 1946, and closely regulated hunting after the closures.

Deer harvest management began with broad regulations as to when and how many deer could be taken by a hunter. In 1858, deer could be hunted five months of the year and there was no limit to how many a person could take per season. In 1895, the season was reduced to one month and the limit was set at five deer per season per hunter. By 1911, the season was reduced to 21 days with a limit of only one deer per hunter per season (Table 1).

Table 1. Historic Minnesota Deer Season Restrictions, 1858–1945

Year	Season Length*	Season Dates	Limit
1858	5 months	09/01–01/31	None
1887	1 month	11/01–11/30	None
1895	1 month	11/01–11/30	5
1901	1 month	11/01–11/30	3
1905	20 days	11/10–11/30	2
1911	21 days	11/10–11/30	1
1918**	22 days	11/09–11/30	1
1921**	5–11 days	11/09–11/30	1
1945	5–9 days	11/09–11/30	1

**Open seasons and season length typically varied between the north and south portions of the state.*

***There were eight statewide closures and non-statewide seasons between 1918 and 1945.*

The first license for big game was required in 1897 at a cost of 25 cents. Reliable records of license sales and deer harvest, however, have only been available since 1920. Both license sales and deer harvest steadily increased from 1920 through the mid-1960s.

In the early 1920s, most states favoring annual hunting seasons used the buck law, which prohibited the killing of does and fawns, to increase deer populations. States such as Wisconsin, Michigan, and Pennsylvania that used this technique to build deer populations later ran into problems of overpopulation, because hunters resisted the harvesting of does to control the populations. This reluctance to shoot does lead to degradation of the deer habitat due to over browsing.

Instead of a buck law, the Minnesota legislature in 1923 enacted a law that provided for 5 to 11 days of any-deer hunting in even numbered years and closed seasons in odd-numbered years. Despite what appeared to be an aggressive deer harvesting strategy, there were areas in the north where deer were out of balance with their habitat, over browsing winter food sources resulting in winter deer losses.

Under this management strategy, the harvest showed a gradual increase each year the season was open, and generally 50 percent or more of the hunters tagged a deer. In 1943, the legislature repealed the every other-year law and allowed for an annual season of up to 11 days of any-deer hunting. In 1945, the maximum season length was shortened to nine days.

After World War II, the number of deer hunters and harvest increased dramatically. Except for a statewide closed season in 1950, all or a portion of Minnesota had annual deer seasons through the 1960s. Despite all this success, the deer herd was heading for trouble.

Throughout the 1950s and mid-60s, an increasing number of hunters harvested an increasing number of deer. During these years, Minnesota was experiencing a series of generally mild winters and a deer herd that continued to increase in the farmland zone of the state. During the mid- to late-1960s, however, deer populations in the forest zone experienced a series of high harvests and severe winters in succession from which the deer population could not recover without additional protection. The 1960s demonstrated that any-deer seasons worked fine when the number of hunters were in balance with the deer population's capacity. However, when the number of hunters exceeded 300,000, the any-deer season framework was no longer adequate to manage the deer population. This was espe-

cially true when the majority of deer lived in an area of declining habitat quality and where severe winters were periodically a problem.

The severe winters in the late 1960s caused major declines in the deer numbers, especially in northeast Minnesota, and the nine-day, any-deer seasons made things worse. Because the antlerless deer harvest, particularly adult does, could not be controlled under the any-deer framework, significant over-harvest occurred during this period. Because 60–70 percent of the total harvest took place during the first three to four days of the season, it was very difficult to control antlerless harvest, even with very short any-deer seasons. After the record harvest of 127,000 deer in 1965, the population and harvest declined rapidly, until the season was closed in 1971. The mature does had to be protected from over-harvest.

Beginning in 1969, much effort and thought was given to how to control the deer harvest so as to maintain or increase the population. In order to implement any reasonable options, legislation was sought and obtained to expand the allowable framework in 1971. The first season framework option implemented was designed to reduce hunting pressure of any given time, but still allow any-deer hunting. This was to be accomplished by dispersing hunters throughout the month of November, thereby producing hunter success and harvest. Therefore, in 1972, hunters in northern and southeastern Minnesota had to choose one of two options: any three consecutive days in the first half of November or any five consecutive days in the last half of the month. This arrangement also allowed hunters to choose their own season; they could hunt early during milder weather, or later with a good chance of a "tracking snow."

It soon became obvious that as long as any-deer hunting was still allowed, merely spreading out the hunting pressure did not adequately control the harvest. The primary problem still remained: an over harvest of does. The bucks-only zone first appeared in a portion of the forest zone in 1973, and was used in part or all of the forest zone through 1976.

Problems existed in the farmland zone of the state as well. After being closed since 1923, the deer population recovered sufficiently so that a four-day hunt was held in 1946. This resulted in an over harvest and five more years of closed seasons. A three-day hunt in 1951 produced another overkill and was followed by five more years of closure. From 1956 to 1974, deer hunting was held on the average of one or two days every other year in a patchwork of open and closed areas that changed every year.

Obviously, the one-day, any-deer hunting season in farmland Minnesota was not working. The boom-or-bust results created numerous problems. Deer numbers would increase in a given area, causing greater than normal crop damage which could not be alleviated until the next hunting season.

The entire state was open to deer hunting in only nine of 53 years from 1922 to 1974. The every-year changes in open and closed hunting zones caused hunters to shift into the open hunting zones, leading to trespass and other hunter and landowner-related problems. Part of the reason for these problems was that up until 1975, deer in the farmland zone were looked upon only as a species that had to be controlled periodically, rather than as a species that could be managed on a sustained-yield basis for the benefit of all concerned.

This all changed in the mid-1970s, after the need for change became obvious in the late 1960s and early 1970s. In 1974, a deer management committee, formed DNR's Section of Wildlife, developed the following set of deer management objectives:

A. Manage the deer population by maintaining the breeding population at the highest level that the habitat and landowners will tolerate, by:
   1. Reducing the antlered portion of the overwinter population.
   2. Closely regulating the antlerless harvest.

B. Allow the maximum recreational opportunities tolerated by the deer population while minimizing landowner/hunter conflicts, by:
   1. Having a statewide deer season every year.
   2. Better distributing hunting pressure through the season and across the state.
   3. Providing the opportunity for a choice of experiences.

C. Have a standardized, consistent season framework, by:
   1. Maintaining consistent zone and any-deer quota area boundaries.
   2. Standardizing season length and opening dates for each zone.

It became obvious that with over 300,000 deer hunters in Minnesota, we could not continue to allow any-age/sex deer hunting and maintain a viable deer population. A choice had to be made to either limit the number of hunters, or limit the targets. A survey showed that hunters preferred the opportunity to hunt every year, so limits

were aimed at regulating the kill of antlerless deer, particularly does by setting quotas and issuing a limited number of antlerless deer permits.

Note that this is not the same as the old buck-laws where it was illegal to kill any does. The idea here was to regulate, not eliminate, the killing of female deer. Why? Because the mature does are the most important reproductive portion of the population. Just as any cattle farmer can tell you, their production is dictated by the number of cows in their pasture, not by the number of bulls. Therefore, the larger the proportion of females in the breeding population, the higher the deer population will be in fall. Historically, any-age/sex deer seasons maintained about 48 percent bucks in the population. Today, under the present season frameworks, bucks represent from 38 to 45 percent of the deer populations. This shift towards does has increased the number of deer recruited annually, allowing for a greater sustainable harvest (Figure 3).

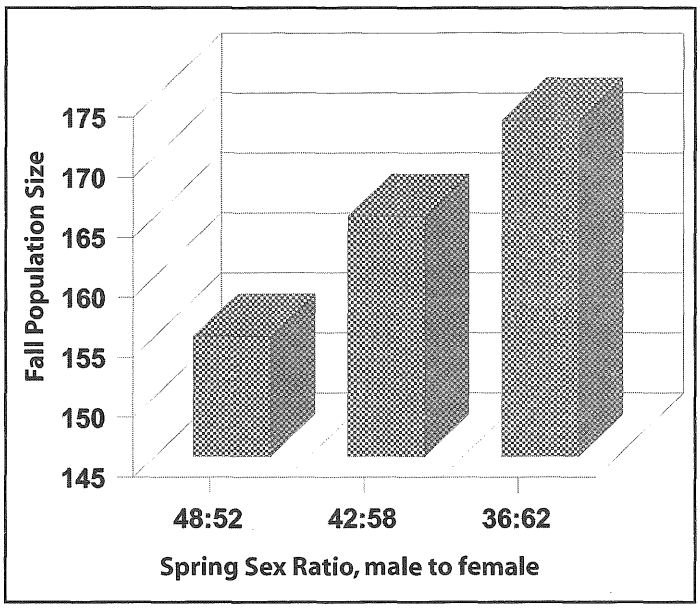


Figure 3. Fall deer populations in relation to the spring sex ratio.

Data gathered on reproduction and mortality indicated that deer in the farmland zone of Minnesota have significantly higher reproductive (Table 2) and lower natural mortality rates (Table 3) than those in the forest zone. Therefore, to more effectively manage the white-tailed deer resource, the state's deer population was partitioned

Table 2. Reproductive Rates of Minnesota Deer in the Forest and Farmland Zones

Age of Doe	Percent Pregnant		Fetuses per Doe	
	Forest	Farmland	Forest	Farmland
Fawn (0.5 yr.)	9	47	0.09	0.54
Yearling (1.5 yr.)	84	92	1.25	1.5
Adult (2.5 yr.+)	96	97	1.70	1.86
All does	63	77	1.07	1.30
Net productivity			0.70	1.15

Table 3. Deer Mortality

Type	Percentage mortality	
	Farmland	Forest
Legal hunting	74	44
Firearms	60	34
Archery	6	5
Wounding loss	8	5
Poaching	10	10
Cars	8	2
Winter losses	2	21
Predators	3	21
Miscellaneous	3	2
Total	100	100

These estimates are based on a stable breeding population with average reproductive and mortality rates.

—A. Berner, DNR, February 1999

into forest and farmland populations. Each was then partitioned into Deer Management Units, Subunits, and Antlerless Permit Areas. Population goals (deer per square mile) were established for each Permit Area, and registration stations were established to collect annual harvest information, (e.g., age and sex, and Permit Area of the kill) critical to sound deer management.

In 1976 (after a trial season in southwestern Minnesota in 1975), deer population management changed in Minnesota, with the regulation of the antlerless harvest by quota. Only 5,000 any-age/sex deer permits were available that first year. This season format met with some opposition from hunters the first few years. The most common concerns were: 1) so many adult bucks would be killed that there would be none left to breed; 2) too many deer would be killed illegally; and 3) hunters would not want to be limited to shooting bucks. Section of Wildlife personnel held many public meetings to explain the advantages and expected results of the new season format. Hunters were asked to "bear with us a few years to see the results."

What has happened? Outstanding success, perhaps even exceeding expectations. Compared to the 1970s, the deer population in Minnesota has slightly more than doubled while the statewide harvest has more than tripled. This was all accomplished with no closed seasons due to low populations. Presently, hunting seasons in most of the forest zone are 16 days while in the farmland areas hunting opportunity has been expanded from one day every other year to at least four days of hunting annually. In addition, archery deer hunting seasons are now 3½ months and muzzleloaders have 16 days of any-age/sex deer hunting.

Presently, Minnesota's fall white-tailed deer population is estimated at 900,000 ± 200,000. Slightly more than half of the deer population resides in the forest zone (500,000 vs. 400,000). Deer per square mile, however, is two-thirds higher in the forest zone. The forest zone, which is approximately 36,100 square miles, has about 13.9 deer per square mile. The farmland zone, which is approximately 48,000 square miles, has about 8.3 deer per square mile. Despite the higher deer population and densities in the forest zone, the majority of the deer harvest comes from the farmland zone (1990s mean: 76,629 vs. 116,518); the higher reproductive rates and lower mortality rates allow farmland deer to be harvested at a higher rate (30 percent of fall population vs. 15 percent).

This season framework emphasizes the taking of bucks. The opening dates are set during the time of peak breeding activity when bucks are most vulnerable. This has resulted in a shift in the age structure of antlered deer toward younger deer, reducing the number of older bucks. Aggressively shooting bucks has not only altered the sex ratio, but has reduced the age structure of the antlered buck population (Table 4). Instead of about 34 percent of the antlered bucks being 3½ years old or older, they now only comprise about 13–17 percent. And, instead of bucks potentially reaching the ripe old age of 8½, they seldom exceed 5½. However, since the deer populations have more than doubled, there are just about as many antlered males 3½ years and older as there used to be. Also, today's deer hunters observe 5 to 7 antlered deer younger than 3½ for every one 3½+. Whereas under an any-deer framework, they observed only two younger antlered deer for every one 3½+.

Present season frameworks appear to be allowing us to meet our deer population management objectives in Minnesota. The frameworks have resulted in the highest deer population and harvest and number of hunters in the history of the state, no closed seasons since 1974, and an adequate number of trophies.

Table 4. Percent of Bucks in Each Age Class Under Various Sex Ratios

Age Class	Male to Female Ratio		
	48:52	40:60	38:62
1½	43%	60%	65%
2½	23%	23%	22%
3½+	34%	17%	13%
Total	100%	100%	100%

The Mature White-tailed Deer Doe

The mature or adult (1½ years or more) white-tailed doe is the most important member of the deer herd. She is the member of the herd that determines its future. Adult does are also the most likely to survive adverse conditions.

Adult does, even if they give birth to and raise fawns, will be in the best condition going into winter in the northern portion of the country. Assuming average summer conditions, the adult doe will graze on broad leaf vegetation during the summer and into the fall, storing energy reserves for the winter.

Adult does will be the last to perish during adverse conditions such as a bad winter and/or late arriving spring. However, she may abort or give birth to a weak fawn(s) after a bad winter. Weak fawns may or may not survive. If she loses her fawn(s), she will spend less energy providing nourishment to her young and therefore have more to put herself back into good condition for the next winter.

Like the doe, the adult buck spends his summer grazing and storing energy reserves for the winter. However, as fall comes and the does begin to come into heat (rut), the buck spends less time eating and more time in rutting activities. Consequently, he will use up some of his stored energy during the fall while the doe is storing energy. He will be the second group in the herd to die during adverse conditions.

The first group to die is the fawns, especially the late born fawns. They spend their first summer growing, putting on body mass. The earlier born fawns have a better chance to store some energy for the coming winter.

The mature doe produces the most fawns and normally the earliest born fawns. Therefore, she is the member of the herd that contributes the most toward sustaining and increasing the population of the herd. Refer to Table 2 to compare the reproductive rates of different age classes of does in the population.

As indicated in Table 2, some fawn does will be impregnated and will give birth the next summer. One can see that the deer herd can multiply rapidly with favorable conditions.

Many areas of Minnesota have had a deer population greater than the habitat can support. In some areas, deer numbers have been such that a browse line will form. In other areas of Minnesota, the deer population may be greater than agricultural producers will tolerate because of crop damage. One example is the apple orchards of southeast Minnesota.

When the deer populations become too great, wildlife managers hear about it.

Wildlife managers use the hunter harvest of antlerless deer to regulate the deer population. If the population is above the goal for the area, more antlerless permits will be allowed in the area. The same is true if the population is under the goal, the number of antlerless permits allowed in the area will be reduced.

White-tailed Deer in Minnesota

Some people have not had the opportunity to learn specific information about white-tailed deer. This section relates some facts about the white-tailed deer of Minnesota.

Generally, deer are not as large as most people believe. The back of an adult whitetail is 30 to 40 inches tall. Average live weights for Minnesota deer in the fall are adult bucks: 180 pounds; adult does: 145 pounds; and fawns: about 95 pounds. A deer's weight varies greatly during the year. Bucks increase in weight in the summer and decrease during the rut. Does decrease in winter and summer, but increase rapidly in the fall. Old deer are generally heavier than young deer. Although the largest known buck in Minnesota weighed more than 500 pounds, there has been no statewide system of weighing deer and maintaining records.

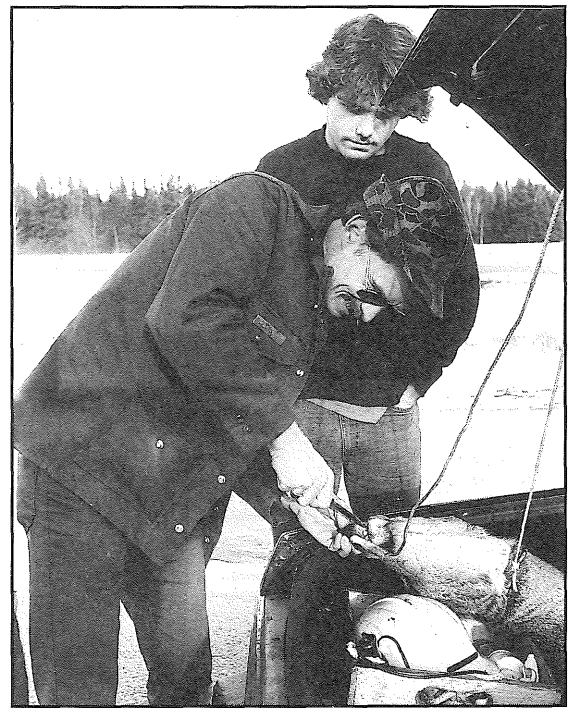
A deer's live weight can be estimated by increasing the field dressed weight by 25 percent.

Whitetails wear a thin reddish summer coat for about three months. A gray winter coat replaces it by September. The winter hair is longer and stiffer, and the individual hairs have cavities filled with light pith that provides insulation against snow and cold.

Deer have incisors on the lower jaw only, while the front of the upper jaw has only a tough leathery pad. Deer have upper and lower molars, teeth specialized for grinding woody stems and grasses. Tooth replacement and relative wear of the teeth is used in the field for estimating the age of a deer.

An accurate method to determine the age of a deer is to cut a thin cross-section of the root of an incisor tooth, stain it, and use a microscope to count the annual rings of cementum. This method requires a laboratory fee and time to complete the process. Wildlife managers still analyze tooth replacement and wear to estimate the age of deer. In the fall, fawns will have only four cheek teeth (you must check carefully because of the many ridges), and adults have six.

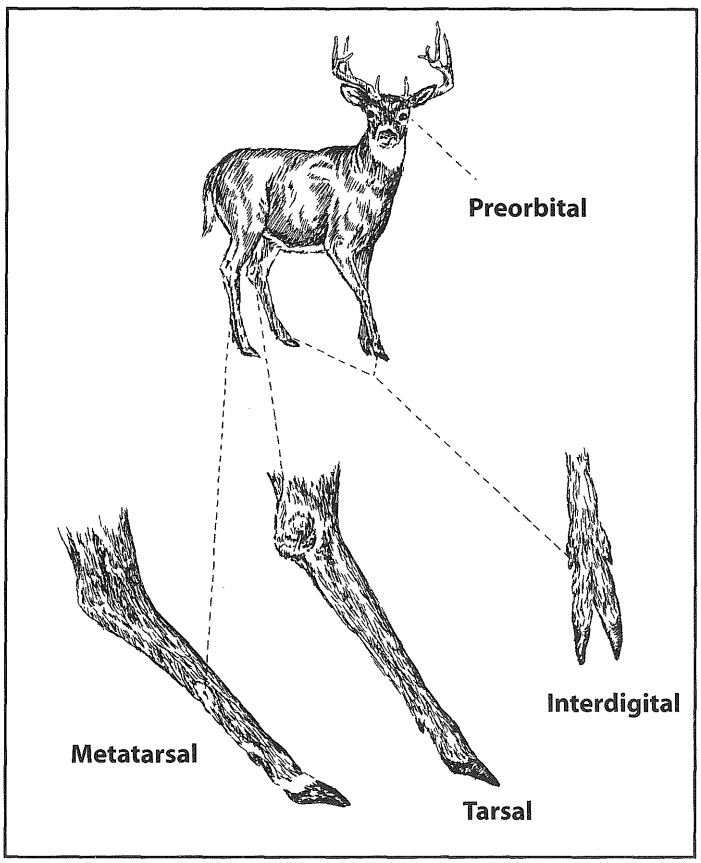
In the fall, male fawns can be identified by the small knobs or "buttons" found in the dense hair of the forehead. Occasionally, these knobs will develop enough to project a short distance above the hair. The knobs are the pedicle or bony supports upon which antlers grow the following spring.



Extracting a tooth for cross-sectioning to determine the animal's exact age.

Adult male deer grow antlers which are cast off annually. Antlers differ from horns typical of cattle, sheep, and goats which are not shed and are growths of specialized hair. The pronghorn antelope, an exception, sheds the outer layer of its horn each year.

Adult bucks begin growing antlers in late March and continue into August. Growing antlers are nourished by fuzzy tissues filled with blood vessels called "velvet."



Deer use scent from the tarsal and preorbital glands to communicate their presence to other deer.

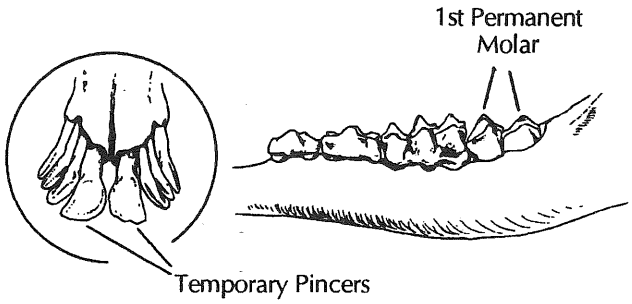
In adult deer, antler growth begins in late March and continues until late August. As they grow, the antlers are covered with a thin, fuzzy layer of skin filled with blood vessels. In September this "velvet" covering dries, peels, and sheds. Antlers are the fastest growing bones observed in nature.

Most bucks shed their antlers when the breeding season wanes in December. Some healthy, well-nourished bucks may retain their antlers until March. Antlers are shed in a process similar to a leaf separating from a twig in autumn.

After two and a half years of age, the configuration of a buck's antlers is relatively constant, even though they are shed annually. Antlers damaged during the growth period are an exception. The mass of bone material increases for several years, as long as the deer is well nourished during the growing period.

Scent from the tarsal glands mark scrapes and rubs while pre-orbital glands mark branches over scrapes. Deer use scent to communicate their presence to other deer. The role of interdigital and metatarsal glands is not well understood.

Determining the Age of a Deer

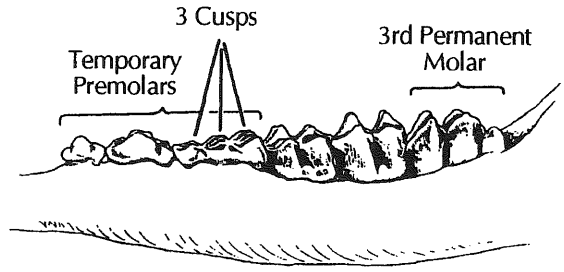


5 MONTHS OR LESS

In the fall fawns have only four cheek teeth.

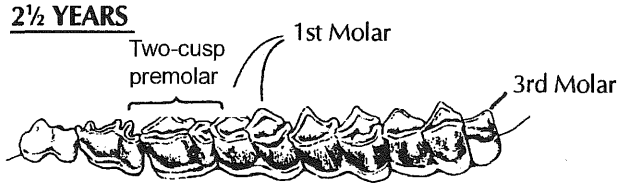
1 YEAR 5 MONTHS

Yearlings have six cheek teeth, and the 3rd premolar has three cusps.

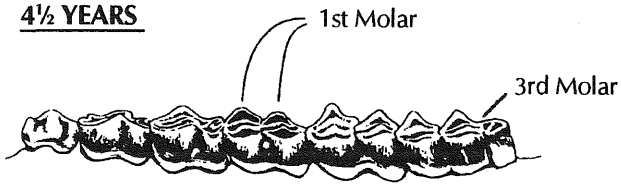


Beginning at 1½ years, the three-cusp premolar is replaced with a two-cusp premolar.

2½ YEARS

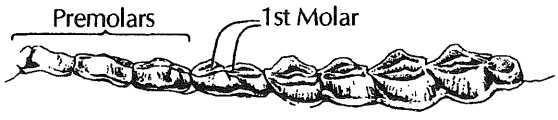


4½ YEARS

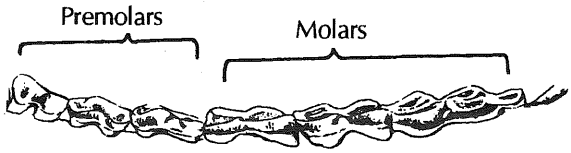


With advanced years, the teeth show wear and become flattened.

6½ YEARS



8½ YEARS



The white-tailed buck makes his presence known by developing scrapes marked with urine. He squats and urinates down his legs into his tarsal glands. Then he rubs the tarsal glands together forcing old, strong smelling urine onto the scrape.

Deer make a variety of sounds. Perhaps the best known is the snort or whistle adult bucks and does make when alarmed. Bucks emit a variety of grunting sounds when chasing does during the rut. The doe murmurs softly to call her young. Both sexes can bellow or bawl. Fawns may bleat when frightened or injured.

White-tailed bucks are polygamous, and tend a doe in estrus for 32 hours or less before moving to another receptive female. The first does come into estrus as early as late-September, but most are bred in November. Does are receptive to bucks for about 24 to 36 hours. If mating is not successful, the doe may come into estrus again after 28 days. Does may have as many as five cycles if fertilization is not accomplished.

Most fawns are born in late May and early June after a gestation period of about 200–210 days. At birth, fawns average six to seven pounds.

Fawn production is higher in agricultural areas because of nutritious foods such as corn and soybeans and less severe winters. The result is a greater incidence of twins (the rule for adult does in the farmland) and triplets among older does. In farmland, there is a 50 percent pregnancy rate among fawns. In forested areas, adult does typically have single births and fawns rarely give birth.

In captivity, deer may live longer than 20 years. In the wild, less than one percent reach the age of 10. The average life expectancy of a Minnesota white-tailed deer is about three years.

Fawns are born in late May and early June after a gestation period of about 210 days.

White-tailed Deer and Winter Survival

Adapted from writings by Pat Karns
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Understanding the deer's seasonal metabolic requirements—the food they need to live—provides insight into why deer die of malnutrition. A doe's energy requirement is highest in the summer when the quantity and quality of food is highest. At this time in the summer, does give birth, produce milk, and care for fawns. Bucks are growing antlers and building energy reserves for the breeding season. Bucks are relatively inactive in summer and become most active during the breeding season. In early fall, deer build up winter fat reserves. This includes proteins and minerals as well as energy in the fat. Bucks lose weight in the fall because they are more interested in does than food.

During January and February, food requirements of deer are minimal. In fact, in a study, all food was kept from penned deer for three weeks in January with little apparent effect upon their well-being. Adult deer with free access to food in mid-winter may eat one kilogram or less of food per day compared to as much as five kilograms per day during fall.

The annual cycle of a whitetail's metabolism is most critical at the end of winter. If sufficient fat has been stored by the end of December, then malnutrition or starvation will be averted.

Winter losses to malnutrition generally have very little to do with the weather conditions during mid-winter months. The more critical periods are early winter, when metabolic demands are still relatively high, and early spring when deer are weakened by lack of food during a cold winter. Deer starve in spring because their metabolic rates increase before nutritious green plants are available.

Energy demands, rate of fat accumulation, and subsequent winter survival all vary with sex and age. Does with twins, for example, have a higher energy demand upon their bodies than does with one or no fawns. Male deer build up fat until the beginning of the breeding season when rutting activities result in reduced feeding, increased energy expenditure, and a reduced rate of fat-accumulation. Fawns have a high energy demand because of rapid growth during their first summer and fall. This high energy demand prevents fat storage. This explains why fawns are the first to perish during winter.

The more fat a deer accumulates before winter, the longer it will be able to avoid malnutrition and starvation in spring. For example, when two blizzards in November and a freezing rain in December restricted deer movements, the resulting low fat reserves caused many deer to starve before spring green up. Winter browsing slows the rate of weight loss.

Obviously not all deer die in severe winters. Fawns have the smallest bodies, therefore have greater body surface area in relation to body mass, thus lose more heat during cold weather and are among the first to succumb. Older deer are next to die. Pregnant adult does are least susceptible, but fetus development may be stunted and fawns may be born dead or too small to survive.

Not all deer die in severe winters. Some may have superior ability to store energy, find better food or cover, or just get the breaks.

Some areas of the state may have a mild winter while other areas are severe. In farmland areas, winter weather is seldom severe enough to threaten deer, except late-born fawns, because of the highly nutritious foods that are available.

Genetic differences may also account for variable metabolic rates among whitetails. Metabolic rates are controlled by the thyroid gland. The greater the amount of thyroxine secreted by the thyroid gland, the higher the metabolic rate and the faster nutrient stores are utilized. Thyroxine levels vary according to the season, being highest in summer and lowest in winter. Thyroxine levels among individual deer can also vary greatly. Some may have levels four to five times greater than others in the same season and area.

When winter comes early and/or spring arrives late, concerned citizens sometimes feel they must feed deer. Because deer have relatively high metabolic demand in early and late winter, good nutrition is important. Furnishing browse during a severe winter by bulldozing and hand cutting or similar operations is generally not effective for that winter. The reason is that the deer are in need of more nutrients than can be provided by browse.

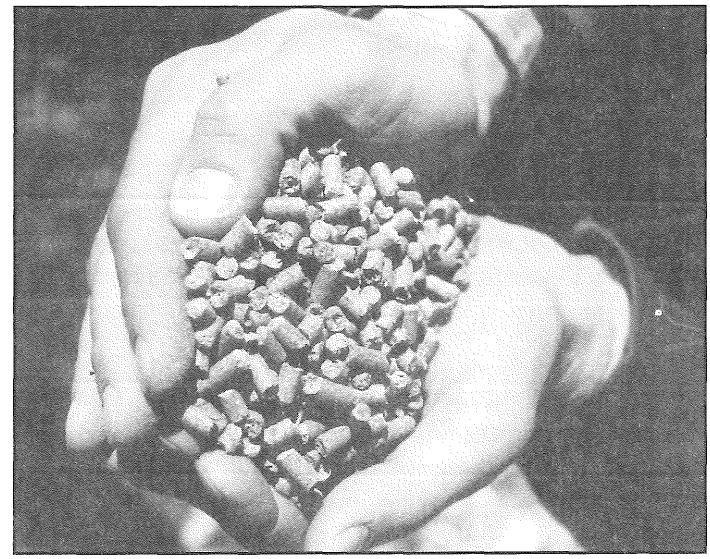
However, bulldozing and cutting in forested areas can stimulate growth of food plants in the future and are viable management tools. These measures have limited application in emergencies, and should be done on a regular basis to maintain deer habitat. Bulldozed trails also can provide deer with access to feeding sites.

Sometimes farm crops are offered for feeding programs. Although intentions may be good, providing artificial feeds of unknown quality may actually kill deer. When deer are fed foods other than their normal diet, bacteria in the rumen must have time to adjust before the new foods can be fully digested. Feeding grains can cause rumenitis. Rumenitis is a condition, caused by a drastic change in the type of food present, where the stomach contains more carbohydrates than stomach bacteria can process. Rumenitis can cause death.

Ammonia toxicity may develop in deer on artificial feeds when the nutrient content is too low to permit full conversion of the nitrogenous products to amino acids and proteins.

Pelletized deer ration can also be provided in emergencies. Such rations are complete in protein, energy, minerals, and vitamins. Deer suffering from malnutrition have fully recovered when fed pelletized deer ration. The balance of nutrients in the pellets assures that minerals and vitamins are provided which are essential to full utilization of the food. The only problem seems to be the development of diarrhea which clears up in a few days.

The number of deer lost because of winter weather in the north does not depend upon the deer population. When losses occur, the number lost is related to the percent of the population that lacks adequate reserves coupled with individual metabolic rates linked to age, sex, or genetic differences. The same percent of the population will be lost whether the population is large or small. Greater numbers of deer in an area does not mean a greater percentage of the deer population will be lost.



Pelletized deer ration which is complete in protein, energy, minerals, and vitamins.

Dr. Verme, a Michigan deer biologist, developed a winter severity index taking into account snow depth, snow support, and the cooling power of the environment. The cumulative index indicates how tough a winter may be for deer.

Minnesota biologists use the Winter Severity Index to determine when the cumulative effects of winter result in elevated deer losses. Biologists understand that deer die because of long winters or snow depth, either of which may extend beyond the deer's physiological limits.

Malnutrition may be compounded by the lack of thermal cover usually provided by coniferous trees. In agricultural areas of Minnesota, healthy deer can die of exposure or hypothermia during blizzards that equal or exceed a wind chill of minus 70 degrees F. Fortunately, these conditions are rare.

Agricultural crops are sometimes fed to deer during a time of need. However, the quality of such feed can be highly variable. Corn food plots provide good supplemental winter food for deer. In extreme emergencies, feeding corn in the agricultural areas may help.

Feeding Deer

Section of Wildlife biologists from the Minnesota DNR have studied the results of deer feeding done during severe winters in the northern half of the state. In spite of feeding, deer populations in both forest and farmland areas declined after severe winter conditions because of increased fawn mortality and reduced productions of fawns the following spring. However, the feeding program did moderate the impact of the severe winters on the following fall's population. Studies showed that in the forested areas about three percent more deer were present in the fall than there would have been had feeding not taken place. In the farmland section of northern Minnesota, about seven percent more deer were present the following fall because of the feeding.

The study found that it cost slightly less than $15 per deer for the winter feeding. The cost was the same for deer in the forested and farmland areas. However, because more deer were reached in the farmland area, (over 22 percent of the deer were fed in the farmland area compared to about nine percent in the forest areas) the feeding efficiency was three times higher there. The cost of feeding included the price of the feed and the hours of DNR staff time and equipment. The feeding was assisted by an estimated 8,000 volunteers who put in about 230,000 hours.

Some of the conclusions of the study were:

- The maximum number of deer reached in future feeding programs would be similar to the feeding period that was studied.
- Without volunteer help, an extensive emergency deer feeding program would be impossible to implement.
- Deer feeding is very expensive and diverts DNR employees from important long-term management activities. Also, the effectiveness of feeding varied in different areas of northern Minnesota. Feeding should be done only when and where it is effective and necessary.
- Improved year-around deer habitat can reduce the effects of severe winters on deer populations and can reduce the need for emergency deer feeding.
- In spite of the large scale of the feeding program, deer populations declined due to the winter weather, even in areas where a high proportion of the deer were fed. In addition, the deer population rebounded very quickly in most areas the year following the feeding program.
- Where state-funded feeding programs are not warranted, private feeding efforts can benefit small, localized deer populations.

Recommendations from the study were:

- State-funded deer feeding programs in the northern part of the state should be restricted to farmland areas and conducted only when the DNR determines that weather and/or food conditions warrant such actions. Future feeding programs should rely on volunteers for distribution of feed to deer, and should be initiated as late as possible to reduce costs of the program while still providing benefits to deer populations. Feeding programs should be designed to supplement, rather than replace, private feeding efforts for maximum benefits to the deer population. During severe winters where state-funded feeding programs are not warranted, the DNR should assist private individuals wishing to feed by providing information on the location of deer concentrations and how, what, and when to feed.
- The study also recommended intensified winter monitoring of the deers' condition. The study said research was needed to develop new techniques and strategies to assess the effects of winter weather on deer. It also recommended research to assess the impact of deer habitat improvements on deer survival during severe winters. Long-term research is currently being conducted to fulfill these recommendations. The study recommended reducing the need for future deer feeding programs by protecting and improving summer and winter deer habitat. At the same time, deer populations should be managed at levels appropriate to minimize damage to agricultural crops and natural food and cover, and to allow populations to recover quickly from winter losses.
- There is a great need to educate the general public and policy makers about deer feeding issues, and deer biology and management. Much of the controversy surrounding deer feeding has resulted from either a lack of information or misinformation regarding costs and effects of feeding.

White-tailed Deer Management

Introduction

In Minnesota and throughout the United States, the white-tailed deer is the best known and most plentiful large herbivore. Many people value and appreciate the white-tail. In Minnesota, the DNR Section of Wildlife is responsible for the management of this priceless resource. Hunters and many others sometime disagree on how deer should be managed.

Before Europeans came to North America, there were 24–36 million whitetails. By 1900, there were less than 500,000. Now there are 20–25 million. White-tailed deer have been present in certain areas of Minnesota in limited numbers long before European settlement.

Early deer management efforts were mostly an attempt to protect the deer from unregulated exploitation. Subsistence hunting, unregulated market hunting, and loss of habitat reduced deer populations by the early 1900s. Modern wildlife management in the U.S. began with the passage of the Federal Aid in Wildlife Restoration Act of 1937, commonly referred to as the Pittman-Robertson Act.

Management goals

Today, white-tailed deer management efforts are directed toward the maintenance of populations at levels that: 1) ensure the present and future well-being of the species and its habitat, 2) provide a sustained yield of deer for use by licensed hunters and 3) minimize conflicts between deer populations and human land-use practices, as well as other plant and animal communities.

Deer populations have the potential for rapid growth. Without hunting or predation, a whitetail population could nearly double each year. Natural factors limit the number of deer a given area can support. The quality and quantity of food and availability of winter cover are some of the limiting factors.

Biological carrying capacity

The number of organisms that the habitat can support year-around or during the least favorable time of the year is referred to as the *biological carrying capacity* (BCC). If the deer population is not controlled, reproduction will cause the herd to exceed the BCC. When the BCC is exceeded, deer damage their habitat which, in turn, reduces the overall condition of the herd. DNR wildlife managers monitor the health of deer herds and check the population density in relation to the BCC.

In some areas, deer populations can reach levels unacceptable to many people, such as when ornamental or fruit trees are browsed to the maximum height a deer can reach. In such cases, the cultural carrying capacity has been reached.

Cultural carrying capacity

Because the white-tailed deer have adapted to nearly every niche in Minnesota, DNR wildlife managers must consider another type of carrying capacity. This is related to the attitudes and priorities of the local human population and can be referred to as the *cultural carrying capacity* (CCC). CCC is the maximum number of deer in a locality that will be tolerated by people. In some instances one deer may be too many. Deer/vehicle collisions, agricultural damage, and home/gardener complaints are frequent when the CCC has been exceeded.

When either the BCC or CCC are exceeded, the deer herd must be reduced. There are a number of management tools that can be used.

Deer management methods

Regulated hunting

The use of regulated hunting has been an effective deer population management tool in Minnesota and elsewhere. It is the most efficient and least expensive way to remove deer and is the primary method used by wildlife managers to maintain or adjust the deer population. They do this by manipulating the size and sex composition of harvest, season type, season length and timing, number of permits, and land-access policies.

Bowhunting is used to reduce whitetails in some populated areas where discharge of a firearm is unsafe or illegal.

The ecological benefits of regulated hunting include reduction of overbrowsing which can threaten the habitat needed to sustain deer as well as other animals and plants.

Social benefits gained through regulated hunting include fewer land user/deer conflicts, a reduction in deer/vehicle collisions, educational and recreational opportunities, and the satisfaction many people get from living in the presence of a healthy deer herd.

Regulated hunting also brings economic benefits. In Minnesota, the value of a deer is estimated to be about seven hundred dollars when the economic impact of hunting-related activities is calculated.

Significant economic losses would occur if regulated hunting were not allowed through agricultural and forest product losses, and increased property damage and injuries related to deer /vehicle collisions.

Nature takes its course

Some recommend a management approach that permits nature to "take its course." If such an approach were implemented, farmers would probably march to the Governor's office before the biological carrying capacity was reached. Herd density would become cyclic, rising and falling with catastrophic losses. This approach would have negative effects on plants and other animals in the affected areas. In extreme cases, the balance achieved by "hands off" management could lead to local herd extinction.

Humans have caused dramatic changes in the landscape. Natural forces, such as large predators, and regulatory processes have changed because of human influences. Leaving things alone will not return the countryside to its natural state.

Trapping and relocating deer

A third management approach, unsatisfactory in most instances, might be to trap and relocate deer when the population becomes more than the habitat or people will tolerate.

The trapping and relocation of free ranging deer is not an alternative to controlling populations. Whether done by trapping, netting, or by some method of immobilization, the cost is prohibitive and the labor needed is great. Deer are susceptible to traumatic injury during handling. Most relocated deer die. Stress related to capture can cause immediate death or lead to diseases that eventually kill the animal.

Also, there is a shortage of release sites that could absorb the large numbers of deer that would have to be relocated. Transplanted deer would simply cause overpopulation problems elsewhere.

Deer fences and repellents

A fourth management tool is the use of fencing and repellents. These can be used for specific site problems in conjunction with other management methods. When the cost of fencing or repellents is equal to or less than the economic value of the area being protected, then there is justification for their use. For example, electrified fences have been used to protect apple orchards. Electric fences must be maintained and sometimes they don't work well. For instance, during very dry, cold weather with snow cover, it is difficult to properly ground the fence. The effectiveness of repellents is highly variable and there are extreme limits to their use.

Deer fertility control

Control of fertility in deer is being investigated. It is largely untested and will require additional research. In the future it may have limited use on populations in small areas. The agents available for use today have proven effective with captive deer. However, large scale use on free ranging herds is impractical at this time.

Feeding deer

The use of supplemental feeding programs would be counterproductive to control efforts on free ranging herds because it would allow additional population growth. Feeding programs are logistically and economically unusable on a statewide basis although it may be feasible in the farmland areas with the help of volunteers. It may be used to shortstop deer from doing damage in certain situations. Indications are that feeding could likely cause the spreading of disease between deer and increase predation of deer by dogs.

Sharpshooters

Sharpshooters are sometimes used to reduce deer herds in local situations. Effective use of sharpshooters would require shooting throughout the year to control local populations. Compared to hunting, this method is expensive just for the labor involved. Sharpshooting in lieu of hunting also brings a loss of income to the local economy, eliminating the dollars spent by deer hunters; local citizens are also denied access to a renewable public resource.

Large predators

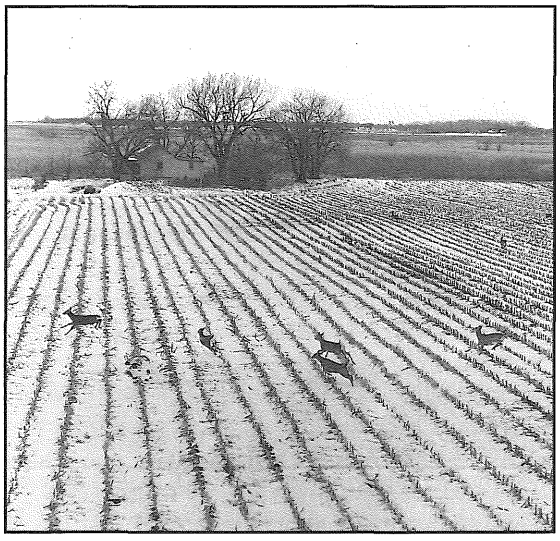
Reintroduction of large predators, such as mountain lions, and a statewide population of timber wolves has been suggested for use under certain conditions to keep the deer herd in balance. Many rural residents of the state will not tolerate large predators at levels dense enough to limit deer populations. These predators would also destroy livestock and other wildlife. Some would attack pets and there might be concern for human safety. Coyotes, bobcats, and bear are potential deer predators. However, their presence does not guarantee control of the deer population. High deer populations often occur where these predators are found.

Even with stable deer herds resulting from the presence of predators, a reduction of the population may be desirable from an ecological or social perspective. The fact that the herd is stabilized is no guarantee that such a herd is in balance with cultural or biological carrying capacity.

Farmland Deer Management

Adapted from writing by Larry R. Nelson, Minnesota, DNR Regional Wildlife Manager.
Reprinted with permission of "Whitetails," the official publication of the Minnesota Deer Hunters Association

.White-tailed deer have adapted very well to life in the farmed portions of Minnesota. Not many decades ago, deer sightings in most farmland areas were rare. By 1981, however, the farmland areas produced almost half of the statewide deer harvest, accommodated 40 percent of the hunters, and 30 percent of the deer-hunter days.



White-tailed deer have adapted well to life in Minnesota's agricultural areas.

Management problems

If farmland areas are to sustain realistic deer populations, there are several management problems to address. Although farmland-deer populations experience little starvation during even the most severe winters (except for fawns in isolated instances), depredation on standing corn, open corn cribs, hay stacks, fruit trees, etc., is commonplace. While deer numbers are now higher in farmland areas than in the past, the traditional wintering areas and woodlots (woody cover along streams and isolated woodlots) continue to be converted to other uses. Also, sprouting agricultural crops and fruit trees are now being damaged by deer in the spring.

Management efforts

Management efforts must include conservation of major deer wintering areas, and provision for accompanying food plots on state-owned crop land or adjacent private land. Severe winter weather (deep snow) may require emergency feeding (hauling corn or pelletized deer food to a specific problem site), usually to relieve depredation problems but occasionally to eliminate starvation.

A plan for addressing farmland deer management problems should include the following:

1. Inventory major traditional deer wintering areas. Locate the areas on a map of Minnesota's farmland area.
2. Identify major deer wintering areas already under public control such as state parks and WMAs.
3. Determine the number and distribution of major deer wintering areas not presently under public control that are necessary to sustain realistic deer population levels.
4. Permanently protect adequate deer wintering areas through acquisition, easements, zoning, or other methods to allow a better distribution of deer during the winter.
5. Provide annual food plots on private lands in wintering areas where no publicly owned crop land is available. In most cases, private landowners would be paid to establish a standing corn food plot.
6. Haul corn and/or pelletized deer food to specific sites in emergency situations where deer depredation on crops is a problem, or where deer are known to be starving. Use corn produced on WMAs until it runs out, then purchase food at the market rate.
7. Call on sporting groups to assist in handling deer problems during severe winters.
8. Plan the deer season to keep deer at population levels needed to avoid depredation while providing hunting opportunity.

Northern Minnesota Deer Management

Adapted from an article in the "Minnesota Volunteer" by Steve Caron, DNR Wildlife Habitat Specialist.

One out of ten Minnesotans hunt deer. But even those who don't hunt them might agree that deer symbolize freedom and wildness. Simply seeing deer is an enriching experience.

In much of Minnesota, woodlands are the plant communities that make up deer habitat. Ecologically, habitat is defined as where an organism lives. Broken down into its basic parts, habitat consists of food, shelter, water, and space.

Deer habitat requirement

Like all wild animals, white-tailed deer exist in an ever-changing environment. Therefore, understanding deer habitat requires insight into deer ecology—how deer function and interact in the ecological community in which they live. Tracing the history of white-tailed deer in north-central and northeastern Minnesota illustrates an essential point: deer abundance—the number of deer in an area—is directly related to habitat quality.

The fossil record indicates that, when the last glacier left what is now Minnesota about 10,000 years ago, most of the state was coniferous forest. Slowly, as the climate warmed, this forest retreated northeastward before the advancing prairie from the south and west.

Understanding the physiology of white-tailed deer enables wildlife managers to improve habitat in our forests.

Perhaps 6,000 years ago, modern white-tailed deer settled along a band of hardwood forest between the prairie and coniferous forest. This prairie-forest transition zone extended along a line from Roseau County, southeast through Otter Tail, Morrison, and Mille Lacs counties, to Chisago County on the Wisconsin border.

As European immigrants settled in Minnesota in the late 19th century, however, a dramatic change in the forest took place. The northern forests were "opened up" by logging (primarily for red and white pine), by clearing land for farming, and by frequent fires. These activities created a new, second-growth hardwood forest.

This young hardwood forest, together with many widely distributed cedar swamps, became ideal habitat for white-tailed deer. As a result, deer populations exploded in northern Minnesota from 1890 to 1930.

Dominant in this new forest was the aspen or poplar tree. The importance of aspen to white-tailed deer cannot be overemphasized. Young aspen stands, especially those under 25 years old, provide abundant, nutritious food. Even though deer feed on aspen, they prefer to feed on other sun-loving shrubs and herbs that grow among young aspen.

Deer seek out and eat new growth, such as grass and the leaves, buds, and blossoms of a variety of herbs and shrubs. These plants are rich in protein, carbohydrates, vitamins, and minerals. Some examples of herbs eaten by whitetails are large-leaved aster, goldenrod, wild sarsaparilla, bracken fern, and clover. Important shrubs include bush honeysuckle, mountain maple, and red-osier dogwood.

Because white-tailed deer seek out and feed on grass, herbs, and new growth for much of the year, we now view them as grazers rather than browsers. Even though northern whitetails browse or nip woody vegetation in winter, for much of the year they seek out green vegetation. The axiom, "If it's green, it's eaten," is appropriate for white-tailed deer.

Experiments on penned white-tailed deer in New Hampshire, Michigan, and Minnesota have shown that deer undergo seasonal physiological adjustments in their food habits. These changes are adaptations to plant phenology—different plants and plant parts become available to deer as the seasons change.

In spring, green nutritious plants, such as grass, help deer recover from the rigors of winter. In summer, deer feed heartily during the season of plenty. During fall, green vegetation slowly disappears so that, by winter, deer are left with a diet of woody browse which is lower in nutritional value. By gradually lowering their energy demands, whitetails adjust their metabolism: thus their rate of food intake lessens. In effect, northern whitetails fast in winter.

Because of our knowledge of deer physiology and seasonal food habits, wildlife managers recognize forest or wildlife openings as critical food sources to deer in spring and fall. These one-half to 10-acre grassy "fields" provide nutritious, easily digestible "greens" in spring and a last source of the food in fall.

High quality deer habitat in northern Minnesota, then, includes thermal cover (conifer stands are the most desirable) and associated shrubs (browse) for use in winter, and green vegetation (especially herbs and grasses) for use in spring, summer, and fall. The best producer of deer foods in the forested areas of Minnesota is a combination of young aspen forests and forest openings.

Deer habitat management goals

The goal of deer habitat management is to ensure that these crucial components exist in the proper proportions. When nutritious green vegetation is available, whitetails go into winter in top shape. Fawns have a better chance of surviving a severe winter, and pregnant does that are fattened up in fall are able to produce more healthy fawns in spring.

The DNR Section of Wildlife has adapted a method to evaluate the quality of white-tailed deer habitat in our northern forests. By using a computer-summarized forest inventory from the DNR's Division of Forestry, wildlife specialists determine the condition of existing habitat and make recommendations for improvements where needed.

The goal for each site may include a composite of vegetation such as shade-intolerant (sun-loving) hardwoods, conifers to provide winter cover for deer, and forest openings located on upland sites. An aspen component of the hardwood is important for deer. Ideally, one-fourth of the aspen should be in the sapling stage—not more than 10-years old.

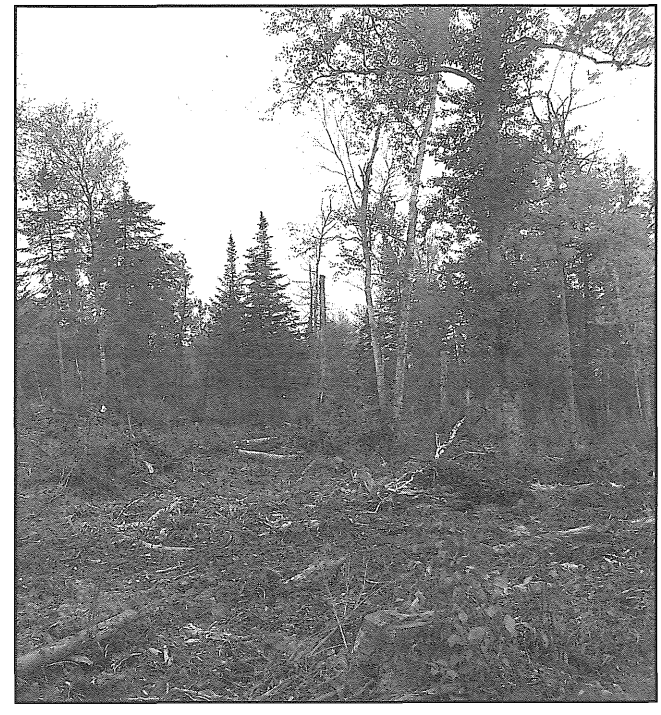
Habitat improvement

Habitat improvements can take place through special deer projects that improve forage for deer. Examples: locating and maintaining wildlife openings; destroying strategic timber units to improve forest habitat; bulldozing or disking to create wildlife openings; and using prescribed burns to improve timber stands and openings.

Overall, the most effective way to improve deer habitat is the timber sale. With habitat evaluation information on hand, wildlife managers work with foresters to dove-tail forest management goals with habitat improvements. They do this by modifying aspen sales or planning a long-range, diverse pattern of timber harvesting. In this way, the proper mosaic of young and mature aspen is interspersed throughout the northern forest deer range.

This pattern of timber harvesting is important for several reasons. The primary reason is that white-tailed deer require escape cover (mature timber) within 300 feet. Because of this, deer do not generally use the center of cut-overs larger than 20 acres as a food source. By cutting aspen in several parcels rather than in one large cut-over, foresters disperse habitat improvement over a large area which benefits more deer. Ruffed grouse and songbirds also benefit more from small block timber sales.

Minnesota's northern forest deer habitat program is designed to build high deer populations of 15 to 20 deer per square mile. Whether this will occur is conditional. The most important condition is demand for aspen products; they must remain high. Cooperation from nature is also necessary. Deer numbers can't keep building if severe winters beset the northern forests year after year. However, once the habitat program becomes effective over a significant portion of deer range, the effects of a severe winter will be reduced.



Habitat improvements to enhance forage for deer include using timber cuts to improve forest quality, bulldozing or disking to create wildlife openings, and using prescribed burns to improve timber stands and openings.

White-tailed Deer in the Twin Cities Metropolitan Area

Introduction

White-tailed deer are found throughout the Twin Cities metropolitan area. The mosaic of woodlands, wetlands, and croplands in the metro area are deer habitats that can sustain a breeding population of 20 or more deer per square mile. The deer habitat is shrinking as thousands of acres are converted to industrial, commercial, and residential neighborhoods. Deer populations are compressed into the remaining open space such as river valleys and parklands. At the same time deer populations are expanding in the urbanized areas because of land use and local firearms use ordinances that restrict and prevent hunting. Hunting is the most effective method to control deer problems.

Impacts of white-tailed deer

In the forested areas of Minnesota, legal hunting accounts for over 75 percent of annual deer mortality, whereas in the agricultural areas it is 60–70 percent. In the metro area, legal hunting and vehicle collisions cause over 90 percent of annual mortality. In areas where hunting is not permitted, vehicles account for virtually all of the annual losses.

In 1994, over 3,864 deer were reported killed by vehicles in the metro area, resulting in more than $6 million being spent on vehicle repair. Fortunately, there are very few human injuries or lives lost in deer-vehicle collisions.

Severe damage is done by deer to gardens, shrubbery, truck farm crops, and other agricultural crops in areas where deer cannot be controlled. Even in areas where the damage is not as great, deer are sometimes considered a nuisance.

Because deer are known to carry the tick that harbors Lyme disease, residents often consider deer populations a health hazard. Although deer do carry this tick, the risk of Lyme disease due to the presence of deer should not be exaggerated. Many species of mammals (e.g. mice and voles) and song birds also carry this species of tick. Inoculation of pets and education on how to prevent infection are the best methods of dealing with this health threat. There is a vaccine available for adults that may help prevent them from contacting Lyme disease.

Philosophy behind white-tailed deer management in the Twin Cities metropolitan area

Management goals and objectives begin with the premise that white-tailed deer are a valuable resource providing esthetic, educational, and recreational opportunities. In addition, a viable deer population indicates the success of land management activities in providing green space and creating a pleasing urban environment. The Twin Cities' diversity and abundance of wildlife and habitat adds to its character and contributes greatly to the quality of human life.

Minnesota statutes delegate the responsibility for deer management to the DNR. However, municipalities which have used their authority to prohibit the legal discharge of firearms or bows and arrows must accept a larger share of the responsibility for solving problems that may arise from their actions.

Although recreational hunting is the primary tool used to control populations, additional methods are necessary for adequate control. The challenge to manage deer in the metro area is to work with the appropriate agencies to develop and implement techniques that control populations.

The primary tool available to control the deer population is recreational hunting.

Long-range plan for the management of white-tailed deer in the metro region

GOAL: Manage white-tailed deer populations at socially acceptable levels that provide recreational and educational opportunities.

OBJECTIVES:

1. Maintain breeding populations within socially desired limits, but not more than 20 deer per square mile of available habitat.
2. Where feasible, utilize public hunting to maintain populations within acceptable limits.
3. Reduce the number of vehicle/deer collisions to acceptable levels.
4. Significantly reduce the number of deer depredation complaints.
5. Develop a framework for an operational deer management plan to be implemented by DNR and local units of government.
6. Promote the intrinsic value of deer as a resource to be enjoyed by metro citizens.

Some of the problems and the strategies to address them are outlined below:

PROBLEM A: Population data needed to manage (increase-decrease) populations effectively are inadequate.
STRATEGIES:

1. Conduct winter aerial counts to establish population density and distribution trends.
2. Continue annual collection of reproductive information from does killed between March 1 and June 1 to determine gross productivity.
3. Increase monitoring of mortality from vehicle kills, removal efforts, and harvests.
4. Refine population models for specific locations where needed in the metro region.
5. Request that municipalities and public and private land managers collect and share population data.
6. Collect summer browse data in natural areas and crop damage data from agricultural areas to supplement surveys.

PROBLEM B: Municipal ordinances that prohibit or restrict the discharge of firearms and/or bow and arrow reduce deer mortality, resulting in excessive deer numbers.
STRATEGIES:

1. Guide municipalities in the formulation and implementation of deer management plans.
2. Seek to alter ordinances to provide for hunting programs with appropriate regulations that address safety and trespass concerns.
3. Expand hunting opportunities, within season framework, to attain desired harvest.
4. Provide technical and regulatory assistance to municipalities for implementing appropriate alternate forms of population control and/or maintenance when hunting is not feasible.
5. Seek changes in legislation that allow for more flexible and aggressive harvest of deer including increased bag limits and expanded season framework.
6. Work with hunters in the metro area to change attitudes towards hunting to increase the harvest of antlerless deer.

PROBLEM C: Hunting opportunity is reduced because owners of small parcels in rural areas often restrict hunting.
STRATEGIES;

1. Work with units of government (state, local, and federal) to encourage zoning ordinances that reduce unplanned development in rural areas.
2. Continue to emphasize through news releases, public presentations and meetings that population control via hunting is necessary for overall health of the environment.

PROBLEM D: Increased vehicle/deer collisions arouse public safety concerns.
STRATEGIES:

1. Inform road authorities of highway segments with high numbers of vehicle/deer collisions.
2. Work with road authorities to develop and implement effective techniques to reduce vehicle/deer collisions.
3. Advise road authorities planning new or upgrading existing roads of deer population areas so that preventive measures will be integrated in the initial road design.
4. Reduce deer populations through hunting or other population control techniques where unacceptable public safety problems exist.
5. Prepare news releases that warn motorists to watch for deer during peak vehicle collision periods.

PROBLEM E: Depredation of garden crops and shrubbery is increasing as rural areas become developed.
STRATEGIES:

1. Provide landowners and governmental officials with technical expertise and information on techniques to reduce problems.
2. Reduce deer populations through hunting and other control techniques.

The urban connection

by Jay McAnnich
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Introduction

All across North America deer are becoming so abundant in city parks and natural areas that viewing deer has become an expected feature of urban life. In fact, deer roam neighborhoods and roadways in such high numbers that they annually cause an estimated 1.5 million deer/vehicle collisions, over $1.4 billion in vehicle damage, about $1.4 billion in the lost value of deer maimed or killed, 20,000 human injuries and over 200 human deaths. Yet, despite the many negative values associated with urban deer, most residents agree that deer have enriched their lives and made urban places a bit more "wild" and exciting.

To reduce conflicts, deer control programs have been developed and implemented with increasing urgency by state wildlife agencies and cities. Most programs have utilized professional sharpshooters (often police, conservation officers or park rangers), which has satisfied the public demand for safety while reducing deer/human conflicts. Firearms hunters and, occasionally, bowhunters also have been given opportunities to help control urban deer. But the public either has viewed such hunts as unsafe or as inefficient in reducing deer problems.

In the metropolitan area of Minneapolis-St. Paul, Minnesota—known as the Twin Cities Metropolitan Area (TCMA)—many communities, by the early 1990s, had adapted sharpshooting to reduce deer populations. After a few years, urban residents and local government officials began to accept the idea that deer populations had to be controlled by killing. At the same time, these same people also voiced concerns that the costs of deer control were becoming a burden. Sharpshooting programs were running $150 to $300 per deer killed—not considering the costs of processing, administration, security, and time lost from other duties by participating staff. Some cities were becoming wary of programs that required annual budgets of—well over $50,000.

A deer removal program was needed that would be effective, safe, humane, quiet, and inexpensive. The ideal method would not pierce neighborhoods with loud blasts, an unfortunate feature of firearms hunts, and it would utilize highly effective equipment that would humanely and efficiently kill deer, preferably stopping deer in their tracks. In addition, the ideal method would be to employ skilled individuals who would work odd hours for free, bring their own equipment, remove the deer from the field and even process the deer at no cost to the city, which would reduce costs per deer taken to as low as $20 in some cases to about $100 maximum.

A solution to the TCMA urban whitetail management problem has been qualified, cooperating bowhunters. In the TCMA, the DNR increased the total bag limit of deer to five per year. Each hunter can use his or her either-sex regular license to tag a deer and then they can purchase up to four additional antlerless tags. With this incentive, bowhunters have responded to a program operated by an organization called the Metro Bowhunters Resource Base (MBRB).

The Metro Bowhunters Resource Base

Information for this article was used with permission from the Minnesota Bowhunters Inc.

The Metro Bowhunters Resource Base (MBRB) is a nonprofit coalition of Minnesota's leading archery organizations that was formed to address the problem of expanding urban deer populations. The MBRB works very closely with the DNR and the metro communities when there is a need to provide qualified, competent, and responsible bowhunters for special hunts designed to help control deer populations in specific areas. Hunters must pass an accredited International Bowhunters Education Program bowhunter course. In Minnesota that is the Minnesota Bowhunter Education Program seminar. Hunters must sign a waiver of liability, sign an ethics pledge, and pass an archery proficiency test. Qualified hunters are selected for specific hunts based on information they provide on their application. When there are more qualifying hunters than opportunities, a random drawing is conducted from those hunters in the database who have not yet been selected. This way, as many hunters as possible are given a chance to hunt in a given year. The MBRB is not a private club. Membership in the MBRB is open to anyone willing to abide by the high ethical standards and restrictions that are generally required in urban deer management programs. The MBRB solicits members from a variety of avenues.

Although the MBRB is sponsored by Minnesota's leading bowhunting organizations, membership in those organizations is not required to join MBRB. Since 1995, the MBRB has been demonstrating that bowhunting is an effective, cost-efficient urban deer management tool.

The Animal Rights View

What do the animal activists think of using bowhunters to control urban deer populations? They don't like it. One of their experts, Allen Rutberg, has said, "...Sport hunting will rarely, if ever, be an appropriate long-term solution to urban deer controversies. The debate over sport hunting diverts attention from the search for effective and sustainable solutions to urban deer conflicts and undermines efforts to teach the urban public about the value of wildlife." (Allen Rutberg, 1997, Wildlife Society Bulletin, 25:520-523) Activists like Rutberg claim deer control is best done by trained professionals (paid by taxpayers) and that hunters will not participate in large enough numbers year after year to sustain population control. They claim hunters participate in urban deer hunts only to complete their civic duty, to make a political statement about hunting, to stock their freezers, and to enjoy killing animals.

Truth is, most bowhunters participate for all of those reasons. Jon Witt, one of the founders of the MBRB program, points out another important attraction—distance and time. As a business and family man, Jon figures "The time crunch makes these hunts—20 minutes from my office—the only possibility I have for consistent hunting. The opportunities are win-win, since I get a chance to harvest several deer and, if I'm lucky, get a shot at a really nice buck." Jon is typical of the excellent bowhunters who, by necessity, live in major metropolitan areas but long to enjoy the hunt several times a week. Urban hunts are ideal for these people.

Applications are sent out in the spring. Individuals not on the database can receive an application by calling the MBRB information hot line at 612-897-9789 and leave their name, address, and phone number to request the application. There is an annual fee of $10 to be included with the completed application. The application explains the procedures for its completion. Hunters will receive a letter of verification when their application has been processed as well as information related to the special hunts.

Hunters who are selected for a special hunt must attend an orientation session for that hunt. Alternate hunters fill the spots of those who do not attend the orientation session.

The MBRB application asks bowhunters to indicate which hunting restrictions they will accept. This section is critical for matching hunters with specific deer-control programs. The **restrictions** hunters must commonly accept are:

- Pass a proficiency test by shooting a specified number of shots into a nine-inch pie plate at 15 yards.
- Attend an orientation program to cement the agreement between hunters and hunt managers.
- Hunt only from temporary tree stands to keep the woods clear of obstructions.
- Use no screw-in tree steps that would leave holes in trees.
- Purchase additional antlerless permits beyond the archery license to maximize individual kills.
- Shoot only antlerless deer to maximize population control.
- Kill one or more antlerless deer before shooting a buck.
- Agree to party hunt to maximize kill.
- Hunt on weekdays or weekends only, or during specific morning or evening hours, to minimize conflicts with recreationists and residents.
- Hunt outside the regular season to increase the opportunity to reach kill goals.
- Demonstrate public service by giving up the meat, hide, and antlers of any deer killed.
- Increase meat for welfare programs by donating all or part of any deer killed to charity.
- Pay $20 for processing any deer meat donated to charity to ensure proper meat handling.
- Volunteer to help operate deer check stations.

To many bowhunters these restrictions may seem unacceptable, but most MBRB bowhunters have accepted restrictions as the necessary toll for opening new opportunities. They have realized the restrictions are critical to keep hunts compatible with local residents and city offi-

cials. Cooperation has become the key ingredient in making the MBRB approach work. Through cooperation, MBRB bowhunters have gained respect among city, county, and state officials.

The future

The MBRB program has proven that bowhunting can be used to control deer populations in even the most difficult urban neighborhoods. The critical ingredient is the willingness of bowhunters to accept restrictions and to work with cities and landowners to adapt the program over time. By first getting access, and then building the program slowly to gain the confidence of residents, the MBRB approach almost guarantees success.

As a method of urban deer control, bowhunting has a bright future, but its success will require cooperation and partnerships. The state wildlife agency must promote the use of bowhunting to cities needing control programs and must provide license and season incentives for bowhunters to participate. Cities must develop programs with enough restrictions to guarantee public safety while maximizing hunt effectiveness. Bowhunters have to look at these programs primarily as opportunities to demonstrate that bows are effective wildlife management tools.

For bowhunters, whose ethics have been questioned by some groups, urban hunts offer a chance to prove the truth. When hunting in communities, you must live up to the promises made to the residents. With everyone watching, bowhunters have no room for slip-ups, and no one will accept excuses for sloppy hunting. At the same time, there is a sense of satisfaction for bowhunters that have shared something of the age-old cycle of life and death of animal populations with people who have been separated from that reality. The idea that the efforts of bowhunters enable magnificent white-tailed deer to live at healthy levels and enrich the lives of urbanites is just plain neat. When bowhunters are frequently seen in and around neighborhoods and everything about it is considered right, things look good for deer, bowhunters, and communities alike.

Camp Ripley Bow Wounding Study

The Camp Ripley Bow Wounding study, completed in May, 1995, demonstrated clearly that bowhunting is an effective management tool. This four-year study at Camp Ripley in central Minnesota was conducted by Wendy Krueger. Contrary to all previous studies, the Camp Ripley study concluded that 87 percent of the deer hit by archery were ultimately recovered and only 13 percent unaccounted for. This study put to rest the wild accusations of the anti-groups that 50 percent or better of the deer hit by archers were lost. Another outcome of the study was that many people, including archers, have come to accept that wounding is a natural part of hunting. However, everyone must work together to keep the wounding loss to a minimum.

This landmark study cost $250,000. The project was paid for by the Save Our Heritage committee of the Archery Manufacturers Organization, and more than 50 bowhunting and conservation organizations. Hunters have historically supported the resource and wildlife management research. Although they were invited to participate, no anti-hunting group helped support the study.

Krueger, Wendy J., 1995. *"Aspects of Wounding of White-tailed Deer by Bowhunters,"* MS Thesis, School of Agriculture and Forestry, West Virginia University, Morgantown, WV.

Quality Deer Management

What is it?

Quality Deer Management (QDM) means different things to different people. To a wildlife manager, QDM is managing the deer herd so that each age class of both sexes reaches its biological potential. For does, the biological potential means that their weights and reproductive and survival rates reflect the biological potential for their age. For bucks, their weights and antler development reflect the biological potential for their age class. Also, the buck to doe ratio does not exceed 1:2.2 and the population density is maintained at the level that will provide the maximum harvest allowed under the existing environmental conditions (biological or cultural carrying capacity). To many hunters, however, QDM simply means trophy bucks or management for older bucks with large antlers.

How does Minnesota measure up to the QDM challenge? Prior to 1975, the buck to doe ratio was about 1:1.1, reproductive rates were at optimum where 95 percent of the does 1½ years and older and 40–50 percent of the fawns were pregnant, deer weights for each age class were at their biological potential, and bucks occasionally did reach 8½ years of age. Unfortunately, the hunting season framework was inadequate to maintain deer populations at the levels that would allow for the maximum harvest for existing environmental conditions. In fact, annual, statewide deer seasons were the exception rather than the rule.

Since 1975, annual, statewide, deer seasons have been the rule. Most deer populations match the existing environmental conditions and the harvest has been maximized; in fact, the buck harvest has doubled. Buck to doe ratios vary from 1:1.86 to 1:1.22. Doe reproductive rates and weights remain at optimum levels for the respective age classes. And, antler development and weights of bucks remain at optimum levels, but bucks seldom exceed 4½ years of age.

Presently, Minnesota maintains a prefawn population (late April/early May) of about 600,000 (±150,000) deer. Under the present season framework, the hunters, not the state, decide whether they will hunt or not hunt in any given year. Annually, Minnesota fields about 475,000 different hunters (both firearms and archery) which results in a harvest of about 198,000 deer (42 percent success). Firearms hunters (including muzzleloader) have a choice of from 2 to 16 days of hunting while archers have 3½ months.

Managing for big bucks

If hunters demanded that bucks comprise 48 percent of the present prefawn population (600,000 ±150,000) and reach the maximum age of at least 8½ years, adjustments would have to be made to reduce the number of antlered deer harvested. The two obvious options are to retain the existing hunting season framework or devise an any-deer framework. The first option would use the present firearm season frameworks, which allows anyone to purchase a license, the number of days that bucks could be taken would have to be reduced. The number of days per season might have to be reduced from the present 2 to 16, to 1 to 5 days. And, in order to make these restrictions enforceable, all antlered deer would have to be registered on the day they were shot.

The second option would institute an annual, any-deer hunting season framework and maintain the existing prefawn population objective, it would be necessary to shorten the seasons in most cases and control the number of hunters afield. In both cases, harvest restrictions may also have to be imposed on archers and muzzleloader hunters.

With either scenario, the allowable deer harvested would decline by 27 percent. The antlered deer harvest would be reduced by 35 percent and antlerless by 19 percent. If the number of hunters were maintained at 475,000 under the first scenario, hunter success would be reduced by 29 percent. If the number of hunters were controlled, the success rate of 42 percent could be maintained if the number of hunters were reduced by 27 percent and the season lengths reduced by half. This would result in more than 130,000 hunters not being able to hunt annually. In either case, the number of older bucks (3½+) harvested would increase by about 29 percent, but, 35,000 fewer hunters would tag an antlered deer.

The question that must be answered is: Under which scenario are deer hunters most satisfied? As things exist now or options one or two outlined above.

Whitetail Basics

by Dick Anderson

When is the best time to hunt deer? The answer remains the same: whenever you find time, assuming it is legal to do so.

When is the time to hunt bucks only? Again the same answer, but if possible, the week of November 12 may be the best. Why? That is the week the rut (does in heat or estrus) peaks in Minnesota. The week of November 12 marks the halfway point of the rut. What this means is that by the week of November 12, 50 percent of the does, 1½ years of age and older, have been impregnated.

Note: A doe impregnated on November 12 will give birth to her fawn(s) on or about June 1. The peak fawning date is during the week of June 1. About 75 percent of the fawns will be born in the period two weeks either side of this date. The gestation period for a white-tailed doe is about 200–210 days.

Why is the week of November 12 so exact and important? Popular wisdom has variables like the weather or moon phase triggering the rut but according to John Ozoga, retired Michigan researcher, "science doesn't agree." The rut is triggered by photoperiodism, the relationship of daylight to darkness." It is the shortening hours of daylight in the autumn that triggers the rut. This is the same triggering method that brings the swallows back to Capistrano or the buzzards back to Hinkley, Ohio on the same day every year. Arguments are made for other factors affecting the rut, but no solid research supports other ideas.

The rut actually begins in mid-August. The amount of daylight received through the retina of the eye causes the pituitary gland, located at the base of the skull, to begin secreting hormones that influence body changes such as activating the testicles. This increases the amount of the hormone testosterone in the white-tailed buck.

In Minnesota, does are in estrus during a very narrow period of time. The first does are bred in October and rutting activity peaks during the week of November 12. The time the does are bred is crucial because it affects when fawns are born.

In Minnesota, fawns will not survive if they're born in a snowbank or too late in the summer. When late storms hit in late March or early April, some concerned citizens want to know how the fawns are doing. They do not understand it will be late April and early May before the first fawns are born. The number of fawns born in this early time period is very small, probably less than one percent. In Minnesota, does ideally will have six to eight weeks of eating nutritious forbs and grasses before they give birth, thereby giving birth to good sized fawns which result in high survival rates. Fawns born later in the summer may not have enough time to grow and at the same time store energy reserves to take them through the winter.

Antlers, during the growing period, are covered with a thin layer of velvet, a soft covering laced with blood vessels to carry nutrients to the rapid growing bone. The velvet is also laced with nerves making the antler very sensitive. With an increase in hormones, blood flow to the antlers is cut off and the velvet will dry up and fall off.

In August, the testicles continue to produce testosterone and drop from the body cavity for the first time in several months. For all practical purposes, the buck is ready to breed, but the does are a long way from coming in to estrus.

August and early September is the time when most bowhunters start pre-season scouting for deer and for that special place to hunt. Veteran hunters become excited by the visible signs they find such as tracks, trails, deer droppings, scrapes, and "rubs."

The "rub" is found on saplings or small trees which are badly damaged, stripped of bark and left to excite hunters and challenge the students of the outdoors. The question remains, "Why would a buck deer want to inflict this type of damage to a helpless sapling?" The pat answers most writers and hunters have is that he is rubbing the velvet off his antlers, sharpening his antlers, polishing his antlers, sparring with the sapling, or learning something about the conformation of his antlers. Reasons go on and on.

Consider some of the responses:

1. Rubbing the velvet from their antlers - probably very little velvet is rubbed off since the antlers are very sensitive during the growing period. The buck would feel pain if he bumped or rubbed the antler when the blood is still flowing and the nerves are still intact. Then, when the blood flow to the antlers is cut off, the velvet quickly drys up and falls off and is eaten by the buck, all within about 24 hours. (Like a sunburn—burn today, peel tomorrow.) Depending on the conformation of the rack, a small amount of velvet may adhere to the rack and be rubbed off.

2. Sharpening the antlers - because antlers are solid bone, the buck would have to use a grinding stone or a good rasp to sharpen its antlers.

3. Polishing the antlers - the buck would be better off with Johnson wax and a buffer than a sapling.

4. Sparring with a sapling - many have said the buck is sparring with the sapling, developing neck and shoulder muscles for fights that lie ahead. They go on to say that there is a relationship between the size of the buck and the size of the sapling. (The bigger the sapling, the bigger the buck!) What about all those saplings the size of your thumb? What buck is so small he has to start his workouts with a half-inch sapling?

5. The buck is learning something about the conformation of his rack - if he wants to know what is on top of his head, he should look. Because of the placement of the buck's eyes and peripheral vision, he should be able to see his rack. The buck probably sees the rack best when in combat, when the head is lowered and eyes are looking up. Is this really what is happening?

Ask 12 buddies the purpose of a buck rub and you will probably get a dozen answers, few of them correct.

Opinions as to the purpose of the scrape are as varied as the reasons your buddies will give for the rub. Scrapes are a complex form of communication that no one really understands. Outdoor writers pen articles and make claims as to their knowledge, if for no other reason than to sell articles. In most instances, there is no scientific research to support the writers' claims.
Some of the claims include:

1. *There is a relationship between the size of the scrape and the size of the buck, meaning the larger the scrape, the larger the buck. Scrapes occur as large as 6–8 feet square. Maybe that is the reason some hunters use such large caliber rifles . In reality, the size of a scrape can be influenced by a number of factors such as the number of visits the buck makes, soil type, vegetative cover, and use by other deer.*

2. *Limbs over the scrape are trashed by antlers and chewed on. Writers call it a sign of dominance, and marking breeding territory. Who knows? Maybe, just maybe, those branches are part of a larger diversion? The buck may not be all that proud of the method he is using to mark his scrape, that is, urinating down the inside of his hind legs over the scent glands and onto the scrape.*

Hunters must leave their fantasy world and show more concern for the resource.

Let us look at antler growth based on age and nutrition. Fawns of the year that are harvested by hunters range in age from five to eight months of age. They will show antler growth developing from the pedestal on top of their skull. Some of these fawns will appear to have a bump on top of their heads covered with hair.

In April, the pedestal on the bucks head comes alive and the antlers begin to grow under a nourishing layer of velvet. Antlers receive their nourishment through blood vessels in the velvet for the rapidly growing bone. Growth is based on nutrition. Size will reflect nutritional history and age. A point to remember: if a buck has just survived the rigors of winter and is in poor physical condition, the majority of his nutritional intake will go to bodily needs and not to antler growth. This means antler growth after a harsh winter will not have the potential for size (mass) when compared to antler growth following a milder, less harsh winter.

Genetics may influence conformation/shape and may have some influence on growth potential if all other factors are met.

At 2½ years of age, the buck's antlers will take on the basic shape they will have the rest of its life. Once typical, always typical, and if not typical, always atypical. Some slight variations may occur from year-to-year as they lose and regrow their antlers. Antlers will increase in mass and tine length each year until the buck reaches its prime at five to six years of age. After its prime, the buck's antlers will decrease in mass and tine length. Remember, when dealing with nature, there are too many variables to make a statement that something will always or never occur.

With the information available regarding antler growth and development, the question is still not answered, "Why do bucks make rubs?" Rubs probably serve as both a sign and scent post for deer, but beyond that very little is known. Ask any deer researcher, "Why the rub?" Their answer will be, "I don't know, the verdict isn't in." The same goes for scrapes, they are a much more complex form of communication.

When you are scouting in September or early October, finding scrapes may not be the best indication of where to put up your deer stand. Rather, the scrapes indicate that there is a harvestable buck in the area. Mature bucks usually make the first rubs and scrapes starting in September. Yearling bucks start much later and make less than one-fourth as many scrapes and half as many rubs as mature bucks. The last half of October is a very active period for mature bucks. They are ready to breed, but few does are in estrus so the bucks are continually searching.

The last part of October may be the best time to influence a vulnerable buck by using sexual attracting scents, calls, or rattling. This is the time when bowhunters may set up on a line of active scrapes and have a chance to have a buck come by. Later, during the peak of the breeding season when a buck finds a doe in estrus, he will follow her for 24–36 hours until she accepts him. During this time, he will be hard to influence with artificial attractants. It is also the time when the bucks can be hard to find.

Hunters often complain that the rut is "running late" or there are not enough bucks around. This generally means they are not seeing the good buck sign they expect. What more likely has happened is that there is a healthy deer herd with a good number of breeding does. In this situation, the buck does not have to travel much to find does in estrus, so he does not leave as much sign.

December can be another period of high buck activity because of a limited number of does left to come in estrus. Some outdoor writers call this the second peak of the rut. It is hardly a peak, but rather a high activity time for bucks trying to find does in estrus.

December may find doe fawns of the year coming in to their first estrus cycle. Approximately 47 percent of female fawns will breed their first year in the agricultural areas of Minnesota. About nine percent of the doe fawns will breed in the non-agricultural areas. These percentages are a direct reflection on nutritional history of the fawn.

Does bred in December will give birth to their fawns in July. Does may be bred as late as January and February giving birth to fawns in August and September. The latest birth of a fawn recorded in Minnesota was about the 20th of September. These late born fawns have little chance of surviving in Minnesota. Their short life is spent developing bone and muscle (body mass) with little time left before winter to store the fat necessary for them to survive until nutritious food is available the following spring. Cold fall rains and ice storms may cause death by hypothermia.

When hunters see spotted fawns in October and November, they feel something is wrong with whitetail management practices. In reality, what probably has happened is that the previous fall allowed good growth and development of fawns followed by a mild winter. The bred fawns were able to survive and give birth to these late, still spotted fawns. This situation indicates a healthy and growing deer population.

Some outdoor writers have written in very precise terms about what a deer can smell, hear, and see. Generally, there is no scientific basis for their comments.

As a prey species, the white-tailed deer has struggled for survival and through natural selection, has honed its sense of smell, sight, and hearing. These senses present a never ending and almost unreal challenge to hunters. Most of what is known about the whitetail's senses comes from observing the animal and trying to interpret its behavior.

Hunters may find that the sense of smell is the easiest sense to overcome. By taking advantage of wind direction and thermal air currents, hunters can put themselves out of the deers' zone of smell.

A whitetail's large, cupped ears gather and, in effect, amplify sound. The slight difference in time it takes sound to reach each ear enables the deer to pinpoint the source of the sound.

Whitetails see much better in dim-light situations than do humans. The retina of the human eye is dominated by cones (color receptors) while the retina of a whitetail is dominated by rods (light receptors). Rods are about 1,000 times more sensitive to light than cones, allowing the deer to see better in low light conditions. Also, the pupil of a deer's eye opens about nine times wider than the human pupil, gathering more light and, therefore, producing better vision in poor light conditions. Deer have better peripheral vision and can detect motion better than humans as well. However, whitetails do not see as clearly as humans, especially at far distances. Whitetails are usually unable to identify a motionless hunter.

Whitetails are capable of using all of their senses at once to detect danger. A deer that has detected the odor of a human will stare in the direction the odor came from trying to pick up movement. At the same time they rotate their ears to pick up any sound. A combination of any two of their senses being triggered, such as seeing and smelling, seeing and hearing, or smelling and hearing will help a deer pinpoint the hunter. Triggering only one of their senses will not cause a deer to flee; this will only put them on alert. Thus, a hunter who has a deer look at them, but is out of the deer's zone of smell and who does not move, will not spook the deer. The hunter who moves or has the air currents carry his or her odor to the deer is a different story.

Minnesota Deer Hunting Techniques

Adapted from writing by Dick Anderson, Minnesota Advanced Hunter Program and
Chuck Vukonich, Biological Technician, U.S. Fish and Wildlife Service

Introduction

Outdoor writers across the nation have written an abundance of articles on how to outsmart and bag the wily whitetail. They usually discuss some sort of trick that is guaranteed to take deer. These gimmicks, as they turn out to be, result in many unsuccessful, frustrated hunters. The frustrated hunter is the one who is likely to attempt illegal, unsafe, and/or unethical methods to "get a deer." Planning your hunt will provide you with realistic expectations of your hunt. Part of your planning should include how you will hunt.

An important part of planning your hunt should be to define what a successful hunt is for your party. "Did you get your deer" is often a question asked of the hunter. Bagging a deer is considered by many to be the mark of success. To others, success includes tagging a deer with specific characteristics, i.e., a buck, a buck with a multipoint rack, or a "trophy" rack. Most experienced hunters will indicate that success is much more than tagging a deer. They may say "It's the total experience," or "It's the time together with family and friends." Bagging a deer may be a bonus. To others the "trophy" may be in the method or the pursuit of a deer, not the size of its rack.

For hunters interested in the measurements of their deers' rack, refer to the appendix for Big Game Trophy Scoring forms.

To bag a whitetail in Minnesota, it is necessary to first develop a positive attitude, gain knowledge of deer behavior, make plans by preseason scouting, and be persistent. If all these are done before opening day, Minnesota hunters can outsmart the whitetail at any game it wants to play. Why? Because hunters have the ability to reason and the whitetail doesn't.

Common hunting methods

The common hunting methods employed in Minnesota include:

- Spring scouting
- Preseason scouting
- Deer stands
- Deer "drives"
- Still hunting
- Tracking

Let's take a closer look at each tactic.

Spring scouting

Spring scouting can help you in finding that elusive whitetail. As the snow melts and you suffer from cabin fever, what can be a better cure for the condition than heading out to your favorite hunting spot to relive fall's golden memories and check with the landowner to see how the deer in the area have fared the winter?

It's important to remember that spring scouting needs to be done between snow melt and the start of green up. You have only two to four weeks to get into the woods and find valuable information. During this period, the deer sign from November and December, which has been covered by snow and locked in by the freezing ground, will begin to show itself. It will look as fresh as the time it was made. You will also have a chance to look for scrapes, rubs, and trails you missed in the fall. If you are scouting a new area, reading these early spring signs can help you decide where to locate your stand next fall.

Spring scouting has two other advantages: You can see the woods just as it will be in the fall when the leaves have dropped, and you'll have a chance to look around as much as you like without disturbing the deer or affecting the hunt.

The rubs you saw on trees may have been made by bucks learning the conformation of their antlers in preparation for battles like this.

You can't increase your chances for success by simply scouting in the spring. You need to keep these points in mind:

1. All deer sign found in spring are not golden. Be alert for sign made during the winter. If the area you hunt is a winter deer yard, the sign you see will be nearly impossible to date.

2. High water can move deer out of areas they frequent in the fall and wash out any sign such as in wetlands and river bottoms.

3. Spring scouting will be more beneficial to the bowhunter because fall deer movement will not be as affected by hunting pressure as it is during firearms season.

4. Bowhunting success is greatly affected by the availability of food in the agricultural zone. Crop rotation can influence patterns of movement.

5. A wet fall may slow up the harvest of crops such as corn, and hold deer in areas that normally may not have a high fall population. This also affects hunting success.

6. Fall drought can affect deer movement causing them to move closer to the remaining water.

7. Dropped antlers may be a fine token to take home from your spring scouting, but the buck that shed them may be miles away during summer and fall.

Remember, your spring trips can be most productive if you talk to landowners. This is a good time of the year to sit down and discuss last fall's hunt, ask if they have seen any deer, and obtain permission for the coming fall hunt. It's a good opportunity to offer to help the landowner with summer projects.

Preseason scouting

Scouting your hunting area before the archery or firearm season is a must. It will give you a chance to identify travel lanes from feeding to bedding areas. You can learn where and what the deer are feeding on and recognize "safety zones"—where the deer go when hunting pressure develops. The wise hunter considers the general hunting pressure of the area. Prescouting can give you an idea where others in the area will be hunting.

Any cutting of shooting lanes or altering cover should be done several weeks before the hunting season. First seek permission of the landowner to cut vegetation. *(Note: It is illegal to destroy public property; for instance, cutting trees on wildlife management areas, waterfowl production areas, and state and national forests.)* The deer will become wary and avoid the area for awhile. One final note: Keep those scouting trips as short as possible. Spending a lot of time in the woods prior to the season opener will put the whitetail on "alert" by the time hunting season rolls around. Properly planned prescouting will be time well spent.

Preseason sight-in and practice time

What is more frustrating than spending time and money preparing for the hunt and then missing the opportunity to harvest a deer because your firearm did not hit where you aimed. It is your responsibility to have your equipment ready.

Rifle sight-in: an important responsibility

In Minnesota, it has been estimated that white-tailed deer hunters spend over $700 per year for their hunt. Some of the costs in this dollar figure include the hunting license, food, lodging, hunting equipment, time off work, and travel expenses. Deer hunting success averages about 35 percent, that is, the average hunter bags a deer once every

three years. Therefore, the real cost of venison is three times the cost of one hunt, assuming the hunter hunts all three years.

To minimize the cost of harvesting a white-tailed deer, be as proficient with your firearm as possible. That is, when you make the decision to pull the trigger, you have sighted-in your firearm and the animal is harvested quickly and cleanly. You most know where your firearm is shooting. It is your responsibility to sight-in prior to the season opener.

Sighting-in your firearm must be completed prior to the fifth day before the opener, unless you are sighting-in on an authorized target range.

Note: Law Related to Sighting-in

No person may possess a firearm or ammunition outdoors during the period beginning the fifth day before the open firearms season and ending the second day after the close of the season within an area where deer may be legally taken by firearms.

There are some exceptions to this regulation (always check the current regulations), one of which is this: does not apply to "an authorized target range."

Preparation for and sighting-in:

- Purchase ammunition appropriate for your firearm.
- Locate an **authorized target range** or private property with a **safe back stop**.
- **Use hearing and eye protection.**
- Always practice the safe firearms handling practices. Always have control of the firearms muzzle, treat each firearm as if it is loaded, and know it is safe to shoot your target as well as beyond the target.
- Set up a target 25 yards from your shooting position. Use a stable support for your firearm. Take at least three shots at a target. Adjust sight as necessary. Continue to shoot groups of three shots until the bullets are grouping on target. Depending upon the caliber and bullet weight you are using, a rifle should be sighted-in between 100 and 200 yards.
- Move the target to a distance you expect to shoot while hunting. Shoot groups of three shots, fine tuning your sights until you are confident your rifle is shooting where you are sighting.

After you have sighted-in your rifle

- Practice shooting your rifle so you are confident you can hit your target under hunting conditions. Some of the considerations include weather conditions, the clothing you will be wearing, the shooting position you are likely to encounter, and the lighting conditions that may occur while hunting. Learn your limitations so you will take only those shots that you are sure will result in a quick and clean kill.
- Hunt safely.

Slugging it out for big bucks—using a shotgun with single slug for hunting deer

In Minnesota, many of our deer hunters use a shotgun with a single slug to harvest a deer. If you are going to use a slug-loaded shotgun to hunt deer you must sight-in your shotgun before the season opens.

Begin by selecting a shotgun that is or can be set up for shooting slugs. A shotgun with a special "slug" barrel or a barrel with a modified or improved cylinder choke is best for shooting slugs. You may want to investigate the rifled slug barrels that are available. (Rifled slug barrels have proven to be very accurate when shooting sabot slugs.)

A sighting device for your shotgun is a must. If your shotgun does not have at minium a front and rear sight, have them installed. Iron sights are fine if you can focus your eye on both the front and rear sights at the same time. Older hunters sometimes are not able to do this. If you cannot, a peep sight should work better. Better yet, have a low power scope (1 to 3 power) mounted on your shotgun. Recoil from shooting slugs is sufficient to loosen improperly mounted scopes. Consult with a gunsmith for proper mounting that will hold the scope securely when shooting.

When you have your shotgun set up and ready to shoot, you need to sight it in and learn how it shoots slugs. Purchase at least three different brands or types of slugs. Every gun barrel has its own characteristics and will perform differently with different slugs no matter what type of barrel it is. Identical barrels, that is, barrels from the same manufacturers which are made the same way will shoot differently.

Set up a target 25 yards from your shooting position. Be sure you have a safe shooting location and backstop. Use a secure gun rest and shoot three rounds with each slug type to determine which brand and type of slug groups the best. Do not be concerned where the slugs are hitting the target but that the slugs are in as tight a group as possible.

When sighting-in your firearm and practicing your shooting always:

- Use hearing and eye protection.
- Practice safe firearms handling methods. Always have control of the firearms muzzle, treat each firearm as if it is loaded, and know it is safe to shoot your target as well as beyond the target.

When the best brand and type of slug has been determined, it is time to sight-in the shotgun. Adjust your sight/scope until you are getting a tight group which is 2–3 inches high from where you are aiming. Then move your target to 50 and 75 yards to learn how your gun performs at these distances. Shotgun slugs do not have the velocity that a high-powered rifle has, thus the slug begins dropping quite rapidly as it goes down range. If necessary, adjust the elevation of your sighting device for the yardage you expect to shoot at while hunting.

Practice your shotgun and slug shooting skills until you are confident you can efficiently hit the target in hunting situations. Be aware of the recoil or "kick" of a shotgun shooting single slugs. You may have to spread your practice sessions out over a number of days and use recoil reducing products/techniques to prevent sore shoulders and to help hone your shooting skills.

Shotguns with single slugs are capable of killing a deer at distances greater than 100 yards, but because of the lack of consistent ballistics most shotgun and slug combinations are not reliable at distances over 100 yards. Ethical hunters will restrict their shots to distances they are sure they can quickly and cleanly kill the animal.

Don't miss that chance of a lifetime. Many of Minnesota's trophy bucks are harvested with shotgun and single slug. Know your limitations and help reduce wounding loss. Hunt safely.

Bowhunter preparation

Bowhunting opportunities abound today like never before. As these opportunities continue to increase, so do the reasons for prospective bowhunters, as well as veteran bowhunters, to continue to grow in knowledge and to improve their bowhunting skills. The Minnesota DNR Enforcement Division conducts the Minnesota Bowhunter Education Program (MBEP) seminar to help bowhunters increase their knowledge. Students learn bowhunting responsibility and safety, laws, survival techniques, and first aid. In addition, they learn about equipment, methods for game harvesting, recovery, and meat preservation. The MBEP seminar certification meets the mandatory requirements of the Minnesota Metro Bowhunter Resource Base and all states and provinces that require archery certification. For a recorded listing of seminars in your area, call 612-296-5015 (accessible 24 hours a day) or contact your local conservation officer.

Society will support bowhunting, including bowhunting in highly populated areas, as long as those participating in the hunt, hunt in a safe and responsible manner. To become the type of bowhunter that modern day hunting demands, the bowhunter must become proficient. To do so, use the best equipment you can afford, learn the fundamentals of shooting, and practice, practice, practice.

Tips for proper practice

Selecting the proper equipment is the first step in learning to be a proficient bowhunter. The MBEP seminar provides tips for selecting the proper equipment. A pro-shop is also an excellent place to get professional advice on selecting the right equipment and determining that it is fitted properly to the hunter and is correctly tuned . Pro-shops have experienced people who will help determine bow type and size, draw length, arrow and point selection, sights, etc. In addition, the archer can get pointers on proper stance, how to draw a bow, sight picture, concentration, releasing an arrow, and more. Many shops also have a place to practice indoors.

There are two different types of practice that you must consider. The first type of practice involves bulls-eye targets. This type of target should be used to learn how to properly shoot a bow and arrow and to develop good shooting form. This type of practice is used until the shooter learns to properly shoot and can consistently hit the bulls-eye. Having learned to shoot archery equipment, the experienced archer will use a bulls-eye target to make necessary adjustments to equipment such as sights.

The second type of practice involves the use of life-sized animal targets. These targets are used after the bowhunter has developed good shooting form. These life-sized targets should not have an aiming spot or bulls-eye. This type of practice requires that the bowhunter learn where the vital area of an animal is, how to pick a spot to aim , and then place an arrow in the vitals. This requires concentration and practice.

Practice often

- First, find or set up an area with a good backstop that is safe. Mortar sand or black dirt piles make excellent back-stops which will stop stray arrows.

- Start close and work back. As shooting proficiency is increased, increase the distance to the target. This type of practice will allow the bowhunter to determine maximum shooting distance. Once this is determined, never take a shot at an animal beyond the effective shooting range.

- Increase practice time as the hunting season approaches. For those who do not shoot year-round, start practicing at least 30 days before hunting. Be sure the equipment is tuned. Work out with the bow until your arm and shoulder muscles are in tune. Practice sessions should be comfortable. Too much shooting too soon will produce sore muscles which may result in developing bad habits.

- Practice from unknown distances. Avoid shooting from the same distance every time you practice. Distances should be varied to simulate situations that may be encountered in the field.

- Practice from elevated positions. Practice from heights used in the field. Use a deer stand to practice from so you become comfortable shooting from it. Lower heights will provide better trajectory angles and is safer. Always use a haul line and safety harness when hunting or practicing from any elevated stand.

- Practice using the exact clothes and equipment to be used while hunting. Loose fitting clothing can catch bow strings and tight fitting clothing can bind up muscles. **Practice with broadheads that will be used for hunting even if field points of the same grain weight have been used during practice. Most likely the broadhead will fly differently.**

- Finally, practice, practice, practice. Don't stop practicing because the hunting season has begun. Muscles not used will lose conditioning and memory. Be ready for **the shot.**

Stand selection and hunting technique

In Minnesota, stand hunting is the most successful method of hunting deer. A well-situated stand will consistently produce deer for the prudent hunter. Perhaps the most important factor in stand construction and placement is comfort to the hunter. A comfortable stand will allow you to stay put for long periods of time without becoming tired. When perched in a cozy stand, you may be able to succeed in overcoming the sharp senses of the whitetail.

Elevated stands have safety advantages and disadvantages. The danger is that hunters may fall while climbing into, out of, or while they are in the stand. (Safety precautions will be discussed later). The safety advantage is that shots taken from an elevated stand are usually in a downward angle. Thus stray bullets or arrows should be going into the ground and not beyond the target or over the horizon.

> Responsible hunters know their target and what is beyond before they shoot.

Determine the location of your stand with safety in mind, and ask, "Do I have a safe zone of fire from this location?" "Will it be safe when other hunters are in the woods?" "If I choose this location, will there be directions in which I can't shoot?" "Are there hard objects that may cause bullets to ricochet or will bullets ricochet off water beyond the expected target area?" Bowhunters need to ask the same questions even though an arrow may not travel as far.

Construction of permanent stands, that is, stands nailed or bolted into trees, is not recommended. They detract from the aesthetics of the land. In a year or so the wood may weaken from the shifting of the tree or moisture and become unsafe. If not removed completely when they're no longer used, the metal parts can damage a chainsaw and its operator. They damage the tree and decrease or destroy its value. They are not legal on public land and should be used on private land, only with the permission of the landowner. There are height restrictions on permanent stands. Always check the current regulations for the latest stipulation.

The law may allow you to place a portable tree stand higher than you need. In addition to safety factors, there are other reasons to place your stand at a moderate elevation. If you are too high, the angle of your shot will reduce the size of your target. Viewed from the top, the width of an animal's body is much less than its side profile, giving you a smaller area to shoot at. This is even more critical for bow hunters. Because they must be closer to their target, the angle is even greater. Also an animal has two parts to its lungs (the largest vital organ of the body). The lungs are separated into two sections from the spinal cord down. If a hunter is too high in a stand, the chance of hitting only one lung is greater. An animal hit in only one lung can travel a long distance before it dies. This increases the difficulty of retrieving the game. If a shot penetrates both lungs, the animal will usually live for about two minutes or less whether hit with a bullet or an arrow. Keep in mind that an animal can still travel a great distance in two minutes. Responsible hunters are aware of their limitations and restrict themselves to only high percentage shots.

There are several very good portable tree and free standing stands on the market that can be used successfully by the hunter. Select a model that is sturdy and will be comfortable so you can remain as motionless as possible for a long period of time. The models that are fastened to the tree are attached in a variety of ways. Those that require bolting or screwing into the tree may damage the tree and should be avoided.

Also consider how you will get into your tree stand. Some have ladders as a part of the stand. Others use a ladder as an accessory. Again there are screw-in-steps that can damage the tree. The steps that strap or clamp onto the tree do not damage the tree. Be sure that whatever type of stand and step you use, they are erected correctly and in good condition.

More tree stand accidents occur when a person is entering or leaving the stand than while they are in the stand. Use caution and be sure that the stand is secure before you place your full weight on it.

The use of a safety belt or harness is essential. Correctly and securely fasten your safety belt or harness before putting your weight on the stand. Your safety belt or harness should be designed so that if you fall you will be able to free yourself even if you are suspended upside down. Also consider where the belt/harness will support you in the event of a fall. Will it constrict under the rib cage causing serious injury? You may want to consider a harness system that supports you under the legs and holds the body upright in case of a fall.

A rope around the waist and tied to the tree may cause serious injury in the event of a fall and leave you hanging and unable to let yourself down.

For more protection, be sure to tell someone where you're going and when you plan to return so you can be found if you don't return when expected.

Approach your stand cautiously, walking quietly and slowly. The objective is to reach the stand undetected by deer.

Use a small light to go into the stand in the predawn darkness. This will alert other hunters that you're not game. You'll also be able to see obstructions and not suffer a fall or other injuries.

Use a "haul line" to lift your unloaded firearm or bow into the stand. Be sure your firearm is unloaded and the chamber is empty before lifting it or lowering it back to the ground. Be sure your arrows are securely fastened in a quiver which has a hood or covering to protect you from broadheads before hauling or lowering.

Don't work up a sweat on your trip to the stand. Sweat and body odor alert deer to your presence in the woods. Deer can smell human scent very easily. They will pinpoint the location of your stand and avoid it.

To reduce sweating, dress in layers. One-piece, insulated hunting coveralls are very warm and comfortable, but do not allow body heat to escape when you are involved in strenuous walking. A soft, quiet material of the proper legal color can be worn as an outer layer with numerous layers of clothing under it. When you begin to warm up, remove some of the under layers and put the legal outer layer back on. As the body begins to cool, layers can be put on again.

There is another reason to avoid sweating. Damp clothing acts like a wick and causes valuable body heat to be lost rapidly. If a hunter continues to lose heat, he or she will begin to shiver. A shivering hunter won't be able to stay motionless and will alert deer. More importantly, uncontrolled shivering is the first stage of hypothermia. The hunter is in real danger if these symptoms are not heeded.

Those who sweat usually leave their stands by 8:30 or 9:00 a.m. on a cold November morning. Dry, comfortable hunters benefit because those departing move deer. There may be some truth to the old saying that "Hunters who sweat are not worth their salt."

It's wise to stay on your stand during key hunting periods. These times include sunrise, sunset, and midmorning when many hunters start to move to stay warm or to avoid boredom. Lunchtime is obviously another key time because hungry hunters are heading for sandwiches and hot coffee. You, in your comfortable stand with your thermos, will be able to stay put as the others move the deer to you.

Hunting and a deer's five senses

Let's examine each of the deer's five senses to see how they affect your hunting success.

Sense of smell

Deer possess an acute sense of smell. They're able to sniff odors in the woods and separate the safe, familiar ones from those signaling danger. Wind direction and air currents must be considered when selecting a stand site. November mornings are usually cool and a hunter's scent hugs the ground. As the temperature rises, the warmed air rises carrying scents away from the ground and dispersing them into the atmosphere. Wind will also break up odors and carry them away from the deer. This breakup of odors often occurs within the shooting range of a deer passing your stand.

Much has been written about artificial cover scents or attractant lures. These include skunk screen, sweet apple scent, and the wide array of doe-in-heat and glandular scents. Most artificial lures probably do more to warn deer of your presence than to draw them within shooting range. Common sense is often the best "scent" to use.

Sense of sight

Deer also have acute eyesight. However, they generally have difficulty perceiving motionless objects or those with a varied or broken background. Avoid choosing a stand near a skyline or with a light background. Human silhouettes also alert a whitetail. Whether deer are color-blind or not is irrelevant. The worst thing a hunter can do is become a statue in a tree for all the deer to see.

Sense of hearing

Deer have sharp hearing and can pick up sounds from a great distance. Hunters needn't be overly concerned about noise. Noise by itself does not scare deer. However, uninterrupted walking or coughing will give you away. When deer hear unfamiliar sounds, they are put on "alert" until they can determine where the sound is coming from and what is causing it.

Hunters who accidentally break a branch or make other unnecessary noise should freeze immediately and wait several minutes before moving or continuing their activities. There are plenty of crackles, rattles, and rustling that occur naturally in the woods that don't alarm the deer. In fact, deer are very inquisitive and may be attracted to some sounds. Wise hunters blend their irregular walking cadence and accidental noises into those of the natural setting.

Senses of taste and touch

Generally speaking, these senses will determine where the deer are feeding and what areas they choose for travel lanes and cover.

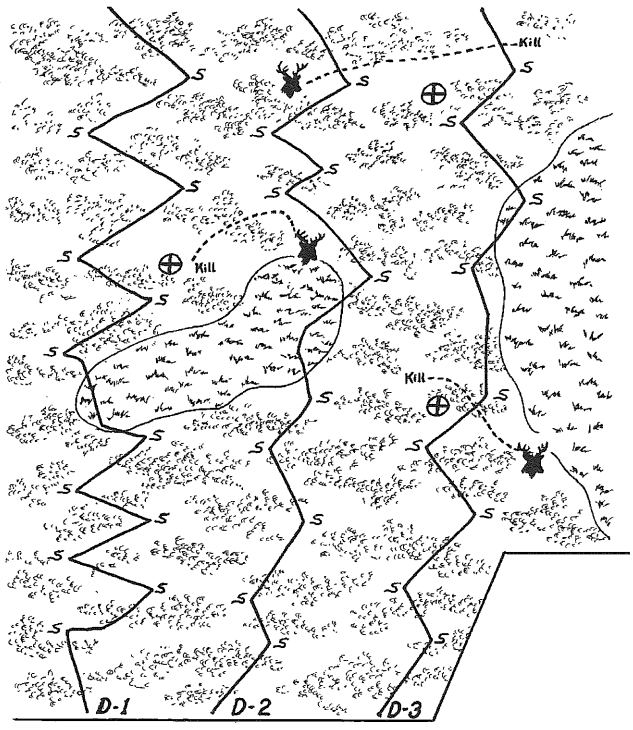
Many experienced hunters believe that you must alert two or more of a deer's senses to cause it to spook. If a deer catches your odor it may be put on alert, but if it smells you and hears or sees you, it is gone. The combination of two or more of the senses will cause them to flee.

Deer drives

Hunters who have taken part in "deer drives" have probably been exposed to unsafe hunting situations. Positioning hunters (posters) so that they can safely shoot at the deer that are moved to them is most important. The sudden appearance of a running deer can lead to hurried and unsafe shots. Deer often appear unexpectedly, presenting a shot that may or may not be safe. The simultaneous appearance of two or more deer can cause a party hunter to quickly shoot at several targets and forget about hunting safety in the excitement. The movement of hunters attempting to "drive" deer can be mistaken for game. There is also a chance that hunters, not in the party, are in the area. They may be there legally or illegally. The presence of non-hunters or domestic livestock and other unpredictable events can lead to hunting danger. Hunters planning a "deer drive" must make safety their first concern. Photo copies of aerial photographs of your hunting area should be secured. Then, prior to the drive, everyone involved in the drive should use the photograph to determine their movement and, most importantly, their safe zone of fire. Hunting groups that have hunted the same area many times that began using aerial photographs are often surprised and shocked to find that what they have been doing was very unsafe.

Those hunters who "drive" cornfields must determine where each member of the group is, where they will move, and where their safe zone of fire is. Cornfield drives can result in a person being shot. Someone should organize the hunt and everyone should follow the plan.

Modern "Deer Drive" Diagram



Symbols:

D-1, D-2, D-3	=	Walking hunters
—	=	Path of walking hunters
s	=	Points where hunters stop and change direction
⊗	=	Hunters on tree stand

"Moving deer to standers"

Actually, the term "deer drive" should be eliminated from hunting vocabulary. In the "good old days" it was possible to chase deer in a more or less straight line to hunters posted ahead. It's a different story now.

Deer have changed their behavior in the past 40 years. Years ago whitetails had not adapted to civilization. Deer have learned that it is not safe to run in straight lines away from a hunter. Deer that circled back on their tracks, used varied escape patterns, or didn't throw their tails up to warn of danger lived longer. Consequently, today's deer are more difficult to bag and nearly impossible to "drive." Fawns, which usually make up a large portion of the harvest, may still make some of these mistakes, but older deer know better.

Many whitetails may refuse to run. Like pheasants, they may hide while you walk past them wondering where all the deer are. Deer hunters can still take deer by moving them, but not in the traditional way. By using deer behavior to their own advantage, deer hunters working together can increase their chances of success by following these suggestions:

1. When preparing to hunt a particular area, place the standers in good deer escape cover. Be sure each has a safe zone of fire. The standers must know where the members of their party are and where other hunters, farmers, livestock, and buildings are or could be. Little used county and township roads do not make convenient posting locations. It is illegal and unsafe to shoot on or across a public right of way.

2. Deer movers should use the start-and-stop method to keep deer off guard. The idea is not to chase the deer out of the county but to get them on their feet and moving past one of the standers.

3. If deer sign is present, believe it and work the area systematically.

4. Move slowly; don't work up a sweat.

Still hunting

Still hunting can best be described as a lone hunter moving slowly through good deer cover using air currents and knowledge of the area to advantage. Still hunting skills can be integrated into all types of deer hunting, whether heading for the deer stand, moving deer for companions, or working fresh deer sign. Good still hunters walk slowly and stop for a minute or two every 50 yards or so. They change direction to keep the deer off guard, nervous, and more susceptible.

When moving, keep your eyes open and ears tuned for any hint of a sneaking whitetail; look for parts of a deer such as an ear, leg, etc. If you stumble or make unnecessary noise, stop immediately and let things settle down a while before continuing. Generally, a hunter should spend three to four minutes standing and looking for deer for each minute walking through the cover. When others are hunting the same area, safety must be exercised. Make them aware of your presence and always keep alert to spot them before going through their zone of fire.

Tracking

Following the trail of a whitetail and trying to read the pattern of tracks written in the snow is the essence of hunting.

Tracking conditions may not be perfect, and other hunters in the area can make outsmarting a deer a real challenge. Knowledge of the terrain is essential. Wear sturdy foot gear and dress so you can move freely without perspiring. Be confident and diligent in your efforts.

When you find a fresh track, follow it with enthusiasm and don't be concerned about noise. You want the deer to know you are behind them. The more they are aware that you are following, the better will be your chances of success. After awhile they will begin to look back and allow you to come within sight before they move on to their next vantage point. In the snow you may see evidence of nervous behavior such as stomping, urination or defecation. Usually this routine is repeated and becomes more evident as you continue to follow.

After playing "hide and seek" with them a few times, it's time to get serious. Circle downwind far enough to a position where you will be able to spot the deer looking back as they have done several times before. With luck, you will see them and the shot is yours.

If you are tracking with companions, keep them ahead and off to the side of the trail. As the tracker, you should talk continuously to keep your partners informed about the deer's direction of travel and behavior. As the deer hears your noisy approach, they will stay well ahead and out of your range. Again, they will become careless, and in time, one of the flanking hunters should get a good shot. You and your partners must know where each hunter is so it will be safe to shoot when the time comes.

Whether you are sitting on a stand, tracking, still hunting, or moving deer, don't forget that the deer know their territory. They are masters of escape. Invariably, both inexperienced and seasoned hunters may come away empty-handed. However, with preseason scouting and a good understanding of deer behavior, you will be able to beat them at their own game.

Trailing and Retrieving Big Game

Preparation before going into the field

You will need a compass, a knife, and toilet paper. The toilet paper is used for marking a blood trail. If there is a chance the weather will be warm, add black pepper and a game bag to your list of supplies and equipment. These will be useful to help reduce flies from contaminating the skinned carcass.

The best way for a hunter to learn how to follow blood trails is to enlist the help of an experienced hunter and to practice by setting up simulated blood trails. With a partner, make practice blood trails using artificial blood or blood obtained from a butcher shop. One person can set the trail and the other can practice following it.

Taking the shot

At no time while hunting do you take on more responsibility than when you pull the trigger or release an arrow. It cannot be called back. Be confident you will safely hit your target before you take the responsibility of taking the shot.

The shot

Note how the animal reacts to the shot. Watch for flinching, wobbling, or stumbling. Other things to look for are:

A. Where exactly did the bullet/arrow hit the animal? (Caution: If you "look" you may miss your point of aim. Concentrate on the spot you want to hit. It is more important to have a good hit than to see where the bullet/arrow struck.)

B. If bow-hunting, how far did the arrow penetrate? Did it pass through?

C. Did you see or hear the animal fall? If so, use your compass to determine the bearing from where you shot to where the animal was last seen or heard. Also, look for anything that will help you find the spot where the animal was located when you shot.

D. Some animals give no obvious outward evidence that they were hit. It is the hunter's responsibility to check and double check all game fired upon.

Mark the spot where you took the shot from unless you were on a permanent stand. If you are sure that the animal will not be disturbed by your movement, proceed to the spot where the animal was last seen and mark that spot also. (Note: bowhunters should wait for a period of time before taking this step. Arrows cause death by hemorrhaging and/or anoxia which requires a couple of minutes to several hours for an animal to die. Next, backtrack from the place where the animal was last seen to where it was when you shot. This is to determine if there is a blood trail, or if you missed the animal.

The color of blood, hair, and other clues may help indicate where your shot struck the animal. Listed below are clues to the possible point of projectile impact.

A. Dark hair - a hit on the upper body.

B. White hair - a hit on under body parts or front chest.

C. Bright red blood - a heart or main artery wound will generally produce a heavy flow of blood. A shoulder hit (forward of internal vital organs) may also produce a large flow of bright red blood at first, but may eventually fade away.

D. Pinkish color blood with bubbles - a lung hit produces a pinkish, bubbly-colored blood that looks like foam.

E. Dark red blood - large drops of blood indicate an abdominal wound.

F. Green and brown matter or food particles on an arrow - indicates a gut shot.

G. Greasy tallow on the arrow - may indicate a brisket shot.

To determine when to start trailing, consider weather conditions, time of day, where the animal may have been hit, and the number of hunters in the woods. Firearms hunters that are on public land or where a number of hunting parties have permission to hunt private land, may have to attempt to locate the animal immediately or they may find a gut pile at the end of their trail. Responsible hunters follow "the rule of first blood," although it is not law. It is the hunter who inflicts the first wound which will eventually cause the animal to die that has the right to

retrieve the animal. Even though you shoot an animal that then goes down, when you find that it already has a mortal wound, the responsible hunter should allow the hunter that caused the mortal wound to take possession of the animal.

Bowhunters should not hunt in weather conditions, such as rain or snow, that cause sign to be lost. The bow season is extended over a number of weeks. Bowhunters can hunt only days that have favorable weather for good trailing conditions. If circumstances are such that the bowhunter hunts during marginal weather conditions, they must be extra sure of their shot and ability to recover the animal. The same is true of firearms hunters.

The time of day must be considered when determining when to begin trailing. When the amount of daylight is limited, the hunter may want to begin trailing so as to get as far as possible before darkness sets in. In this situation, the hunter must be aware of what the sign is indicating. When the hunter finds any indication that the animal is not dead, the trail should be well marked (use toilet paper) and the animal should be allowed to die. Get flashlights, lanterns, and help. Also, notify the local conservation officer that you have a wounded animal that you need to attempt to recover after dark. In Minnesota, a hunter may trail in the dark with the use of artificial lights, without a firearm or archery equipment, until 10 p.m. Any animal not recovered by 10 p.m. will most likely still be usable the following day. The temperature at night during the hunting season is usually cool enough that the meat will not spoil. Trailing then can resume at daylight.

The hunter that is unsure of where the bullet or arrow struck the animal should wait before following the trail. Bullets can kill by the shock they cause to the animal. An animal struck with a bullet that is not recovered within a hundred yards indicates that shock will not be the immediate cause of death. This animal should be allowed to hemorrhage, that is, allowed time for it to bleed. Archery hunters should wait a minium of one half hour before trailing. An arrow that disrupts a vital organ such as the lungs, can cause death within seconds to a couple of minutes. Even so, in this short time span, an animal such as a deer, can travel a great distance. Hunters cannot always be sure that they struck a vital organ. Therefore, they should wait long enough for hemorrhaging to occur. If there is the possibility of a gut shot, a six-hour or longer wait may be necessary.

Ready to trail

Once you have determined it is time to begin trailing, orientate yourself to the area that lies ahead. Have a good compass, know how to use it, and use it as you trail. Make mental notes of the general, as well as, the specific direction the trail is going. It is best to have a partner assist you.

Before going for help, be sure you can relocate the exact spot. Use the toilet paper, your compass, and if you have and know how to use it, a GPS unit. Civilian GPS units have limited accuracy so be sure you use additional markers to find the spot.

Often a hunter has to take whatever help they can "round up." An experienced person is a good first choice. A person that can see the red color of blood will be a person that is not color blind. Color blindness is a sex-linked trait. That is, females are very seldom color blind where as most men have some degree of color blindness. Therefore, women are more likely than men to be able to see the red color of blood in the field. Also consider the age of the eyes. The younger the eyes, the more likely they are to see sign. Hunters may want to have their youngsters assist them in trailing wounded game. The experienced hunter can use the eyes of the younger person to help them find sign. Do not let your help rush ahead because they may destroy vital sign.

Things to do and look for on the trail

A. Never walk right on the blood trail, but alongside it. You might need to review the sign you have found.

B. Periodically look ahead for a dead or wounded animal.

C. Mark your progress with toilet paper and look back from time to time to see the general direction the trail is taking.

D. Look for blood on the ground as well as on grass, bushes, and trees. Note how high the blood is on the bushes. Blood sign on bushes, etc., may help you determine where the animal was hit and indicate whether you should continue tracking or wait for a while. Note that blood dries faster on brush and weeds than on the ground and will be darker and more difficult to detect.

E. Look for blood on both sides of the trail. This will tell you if the bullet or arrow passed through the animal. A pass through shot will allow for greater loss of blood and should allow the animal to be recovered sooner. A shot that does not have an exit opening may cause internal bleeding, creating less of a blood trail. The animal may or may not go as far as one that has an exit wound.

F. The amount of blood sign found may mislead hunters into thinking that they will find the animal soon. Consider that for an animal to die from hemorrhaging, it must lose one-third of its volume of blood. For example, a small deer may weigh 100 pounds. This deer will have 100 ounces of blood. To die of blood loss, the deer must lose 33 ounces of blood. To determine the length of a blood trail this deer could leave, make a half-and-half mixture of light (white) syrup and warm water to make 33 ounces. Add a few drops of red food coloring or tempera paint. Put the mixture into a squeeze bottle so that you can drip the mixture and make a "blood trail" you can follow. You will be surprised at how far you can go with this mixture. Now consider a mature doe weighing 150 pounds and a nice buck that weighs 180 pounds or more. Their trail could be much longer.

G. When trailing, look for more than blood sign. Disturbed vegetation and fallen leaves may indicate the animal you are trailing traveled through.

What to do when the blood trail ends

The place where you lose the trail is not necessarily the place where it ends. A lost trail always extends beyond the evidence. You may find the animal within a short distance.

Use the following suggestions to continue searching:

A. Mark the last sign and begin looking carefully in ever widening circles until you encounter additional sign.

B. Seriously wounded animals tend to head downhill or take the route of least resistance.

C. They head for cover. Check dense thickets and blow downs. They may double back to their home range or head for water.

D. Animals sometimes bleed internally leaving very little sign, but can be picked up by a careful and determined hunter. Check and double check all game fired upon. An animal running at full speed might not even flinch when hit in a vital area. Don't give up the search until you are sure the animal will recover.

Recovering the animal

Approach the animal carefully from the back. Determine if it is breathing. Look at its eyes. If the eyes are glazed over and dull, the animal is dead.

If the animal is dead, do not cut its throat. Many trophies are ruined this way. It's not necessary to bleed the animal. Once the heart stops, blood ceases to flow. Cutting the throat will yield a few ounces of blood at most. Excess blood will be removed during the field dressing process.

A Conservation Officer's Tips for Field Dressing White-tailed Deer

In years past, on a -10 degree F. night, it was not unusual for a conservation officer to have to field dress a road killed deer. The key was to do it quickly, without getting blood on your uniform. You can learn from the method developed and used by conservation officers.

A companion can assist in making the field dressing easier.

Program

1. Approach a downed deer from the rear as a safety precaution.

2. When you're certain its dead, unload your gun and set it out of the way.

3. Move the deer so its head is uphill, even if only slightly, and roll it onto its back. If you have a companion, ask for help to keep the animal in proper position, otherwise prop it up with rocks or wood.

4. Next, elevate the rump. Without a companion, prop the rump up with rocks or wood. This permits easy access to the rear area.

5. Grasp the testicles; cut them off and discard. Grasp the penis; cut the skin and tissue beneath and in front of it, and back towards the rear. There is some cartilage where the penis tubes enter the anal cavity. Cut this very carefully with the knife point. Don't cut off the penis. If the deer is a doe, cut the skin around the bag, then remove and discard it.

6. Cut the skin completely around the anus by keeping your knife blade straight and flat with the circle of bone at the anal cavity. Cut the inside tissue holding the intestinal and urinal tract and free them, being careful not to puncture the bladder. Some hunters prefer to split the pelvis.

   A tip to help with splitting is to feel a small nubbin on the inside of the pelvis where the intestine goes through. The pelvis is connected together at this point. It can be split easiest if the split is begun directly above the center of the nubbin.

7. Pull the entire mass of penis and bowels gently toward the rear, making sure all of it is free in the cavity. If it isn't, cut carefully around the inside of the cavity circle once more. Stop now and lower the rump. If you have no helper, bring the front feet far forward. If it's a buck, hook the legs under the antlers to stretch the deer out and stabilize it.

8. At the bottom of the abdominal cavity, lift a pinch of skin and slit it. Don't cut down. Great care is needed to avoid puncturing the intestines or paunch. If you have not retrieved the broadhead, caution must be used so as not to injure yourself on it while completing the rest of the field dressing.

9. Insert the tip of the blade into the small opening you made in the abdominal cavity. Make sure the knife point is toward the head of the deer and the cutting edge is up. Insert two fingers of your free hand in the slit on either side of blade. With the back of your hand, hold down the intestines and paunch as you gently slit up the belly.

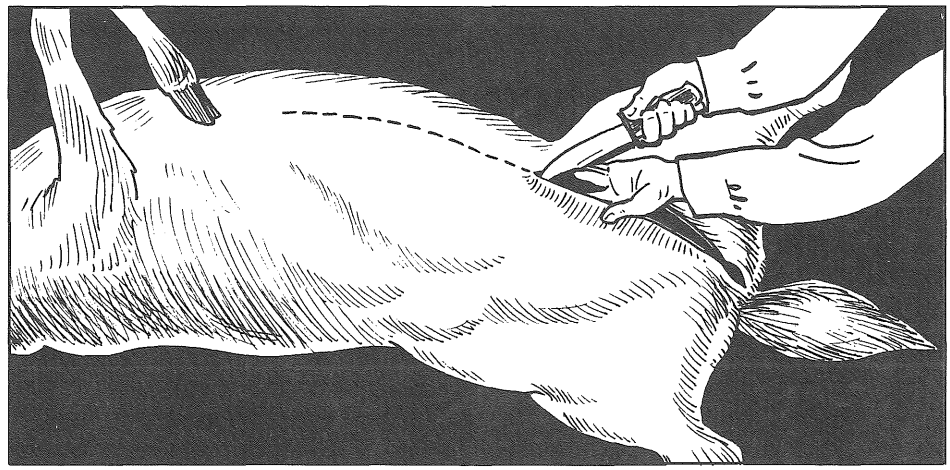


Diagram of initial cut.

10. Cut all the way to the bottom of the rib cage. At this point, the knife will meet the sternum.

11. The sternum is a very white bone. Do not cut into it. Instead cut to one side where the ribs attach. The bone is soft here. You may have to straddle the deer and cut upward. Never cut towards yourself, but towards the deer's neck. If the deer's head is to be mounted, stop cutting just at top of the brisket. If not, cut up to the neck. If the deer is to be dragged far, don't cut up to the neck—stop at the brisket until you get to camp. This will help keep dirt out.

12. Reach inside and grasp the windpipe. Pull it out and cut off as high up as possible. This may mean cutting in close quarters, so be careful not to injure yourself.

13. Now pull out the windpipe, lungs, and heart. If you intend to save the heart, cut it free and put it in a plastic bag. You should have a bag for this purpose.

14. Cut one side of the diaphragm loose from the rib cage, being careful not to puncture the paunch.

15. Roll the deer on its side, roll out the stomach, then cut the other side of the diaphragm. This frees all the entrails.

16. Grasp the lower intestines inside the body cavity down by the hams and pull carefully but firmly—don't jerk. Pull out the lower gut, bladder, penis/vaginal tract, and rectum.

17. Now you should have a cleaned animal. Lift the deer by the front legs and let the cavity drain. Or tip the deer over on its stomach keeping the head and shoulders higher than the rest of the animal so it will drain by itself.

Mounted white-tailed deer trophy. Know how to properly field dress a trophy buck so you do not ruin the cape.

Plan the Hunt to Eliminate Risk

A safe hunt requires more than a basic knowledge of firearms. The hunt itself needs to be planned in a way that eliminates risk. Beginners, especially, need careful guidance and direction from experienced hunters.

To prevent an accident:

First, scout the area you plan to hunt. Be certain everyone knows the location of buildings, roads, and other places people may be.

Discuss what is meant by the rule, "be sure of your target and what is beyond." Explain why shooting in the direction of a road or over a hill top is especially dangerous.

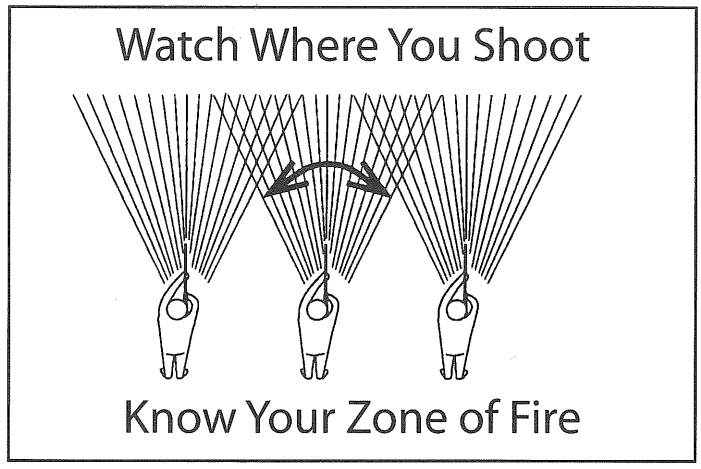
Second, position hunters to be certain each knows their safe zone of fire. Caution beginners that whenever there is any movement or sound, their first thought should be that it is another person.

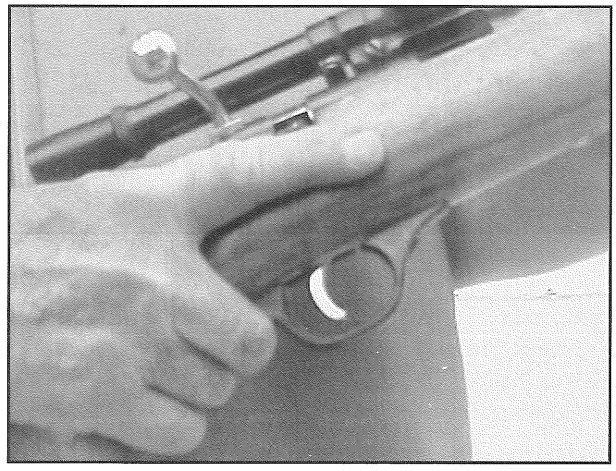
Explain too, that a hunter wearing blaze orange can walk through a cedar swamp, a pine plantation, or a corn field, and not be visible at all.

Third, agree that everyone will load only when in position and sure of their safe zone of fire. Take extra planning time and precaution if you are attempting to drive deer. Cornfields can be especially dangerous.

Fourth, remind each other to keep the safety on and the finger outside the trigger guard until after you have shouldered the firearm, and it still looks safe to shoot.

Lastly, and, perhaps, most important, make sure everyone understands that there's a lot more to being a good hunter than shooting game. A good hunter knows how to avoid the risk of an accident.





Q: When should a hunter put their finger on the trigger?
A: When you shoulder your firearm and it still looks safe to shoot.

Hunting Safety

Anatomy of an accident

Safety must be part of your white-tailed deer hunting plan. Hunters should know how hunting accidents happen. Knowing why hunting accidents happen can help you develop safe hunting practices. Consider the following true story adapted from an article "Anatomy of an Accident" by Homer E. Moe, Wisconsin Hunter Education.

The quarry

Hal was tense as he waited for the buck to approach. He knew it was a trophy. He knew he would bag it. He just knew.

There it was! A huge whitetail with a massive rack burst into view to Hal's left. He swung his .270 on the buck with the skill of an experienced deer hunter. He squinted into the 6x scope. He found the target. He put the cross hairs on the nose of the bounding buck. He followed it. He squeezed the trigger....

The preparation

Hal's opening morning hunt really started much earlier that fall. Hal had sighted in his rifle at 100 yards. He had cleaned his rifle and other hunting gear. He had studied topographic maps of the area. He had even read some of the hunting regulations. Hal was ready.

Hal had usually gotten his buck...and this year was going to be special. He had "scouted up" a huge buck just a few miles from home. He knew where to stand...and where to put his hunting buddy, Jerry.

The challenge

"Hal," Jerry had chided that morning, "I feel lucky today. I'll bet that big buck is mine before noon." "No way, buddy," Hal retorted. "He's mine—all mine—besides, you couldn't hit him anyway!" "We'll see who get lucky," Jerry replied, and their hunt began.

The excitement

"That Jerry has a way of getting under my skin," mused Hal, "he sure would like to shoot a big buck...right under my nose. But I'll get that brush-buster before he gets a chance to raise his rifle. I'll show him!"

Hal was fired up. He was excited. He felt exhilarated. He felt lucky. He was lucky. After all, here he was, hunting with one of the greatest buddies a man could want. They had grown up together, were classmates all through school, and had hunted most of the game animals and birds found in North America.

The partner

Buddies! Hal and Jerry had done it all. They understood without talking...they knew what each would do in any hunting situation. They were the epitome of "good buddy" hunting partners. Hal really enjoyed hunting with Jerry. Oh, he enjoyed the ball games, the family picnics, fishing trips, and poker games, too, but deer hunting with his friends was the greatest!

Hal was ready...about to bag the biggest buck he had ever seen. **His** buck—not Jerry's—not anyone else's...his.

Hal's heart pounded as he swung with the buck. His muscles tightened for the shot...he squeezed...BAM!

The final shot

The shot reverberated across the beautiful valley. The buck was gone—it was suddenly quiet. Too quiet. "Jerry!" Hal called out, his voice quivering as he suddenly realized that Jerry had been just beyond where he shot at the buck. "Jerry!" Hal frantically plowed through the blackberry thicket toward where Jerry had been. Why doesn't he answer? "JE-R-R-R-R-E-E-E!" The deathly quiet gave no reply.

"Jerry must have moved earlier," Hal thought...but I saw him just before that other group of hunters pushed my buck out. Where is he? Where did that buck go? Could I have? No! That's not possible...my God...I couldn't have shot my hunting partner...JERRREEEEEE!

Epilogue

The story you have just read is true. The characters are not fictional, only their names. The shooter was over-excited—and over-anxious to kill a big buck. He failed to heed the rule of establishing and following a safe zone of fire. He fatally shot his hunting partner. A split second of carelessness ended a life and caused a lifetime of regret. Competition, over-anxiousness to bag game, greed; they all kill more than game. Be sure you and your partners control your excitement while shooting game. The life you save could be your own.

Shooting accident narratives

Nationwide, a significant number of gun accidents occur while loading and unloading firearms. In Minnesota, during a 10-year period, 33 incidents have been recorded that occurred while hunters were either loading or unloading their firearms. Some of these actual incidents are listed below. Determine what could have been done to prevent each of the accidents.

The letter F and N under the casualty column signify fatal and non-fatal respectively. The letter Y and N under the self inflicted column signify YES and NO respectively.

Loading /Unloading Incidents in Minnesota in a 10-Year Period

Activity	Animal Hunted	Casualty	Self Inflicted	Narrative
Unloading	Deer	F	N	Shooter was unloading firearm in a separate room when firearm discharged. Bullet went through wall and struck victim's head.
Unloading	Deer	F	N	Shooter was unloading rifle when it slipped and the rifle went off shooting the victim.
Loading	Deer	F	N	Shooter was loading firearm, had one round in chamber, while attempting to load second round. Firearm discharged and bullet went through vehicle and struck victim in chest.
Loading	Deer	F	N	Shooter was loading lever action rifle. As he chambered a round, the gun discharged hitting his brother in the head
Loading	Deer	N	N	One member of hunting party was unloading the firearm when it discharged and struck victim in the leg.
Unloading	Deer	N	Y	Victim/shooter was unloading the firearm, manipulating the bolt with his right hand while holding the rifle in his left hand. Rifle discharged while pointed at his foot.
Loading	Deer	N	Y	Victim was loading lever action firearm. While checking firearm, it discharged striking victim in foot.
Unloading	Deer	N	N	Shooter unloading lever action rifle.
Unloading	Deer	N	N	Victim and shooter were at the end of a day hunt and stopped to unload the rifles. Shooter's rifle went off and struck victim in the lower left leg.
Unloading	Deer	N	N	The incident occurred when hunting party had all returned to camp and were unloading their firearms. The shooter, while turning one way to look at more deer, accidently discharged firearm in another direction, striking victim.
Unloading	Deer	N	N	Hunting party were unloading firearms preparing to leave an open field. Shooter was standing in front of victim unloading firearm when firearm discharged, shooting victim in left foot.
Loading	Deer	N	Y	Shooter was loading his rifle near vehicle when it fired and bullet hit him in the knee.

These Minnesota incidents clearly show that loading and unloading your firearm at the proper time and place could greatly reduce the risk of having an incident. All it takes is a movement, a slip or a fall, and a loaded firearm is pointed at someone.

What can you do to hunt safely?

Discuss with your hunting group how you can plan to avoid incidents like Hal and Jerry's. Discuss other situations that might occur. Listed below are some causes of hunting accidents. Talk about how to avoid them.

1. Victim out of sight of shooter.
2. Victim covered by shooter as shooter swings toward game.
3. Victim mistaken for game.
4. Victim moved into line of fire.
5. Loaded firearm removed from or placed in vehicle.
6. Loaded firearm discharged in vehicle.
7. Horseplay with loaded firearm.
8. Insecure rest; firearm fell.
9. Shooter stumbled and fell.
10. Trigger or exposed hammer caught on object.
11. Loading or unloading firearm.
12. Defective firearm or bow
13. Careless handling of firearm.
14. Improper crossing of obstacle.

Adopting safe hunting practices

Basic rules of firearm safety

Most hunters have an awareness of safety measures to be taken when hunting. However, there are some who do not. Each hunting accident that occurs sends this message: "hunting is a dangerous activity." Hunters are responsible for conducting themselves in a safe manner while hunting. After reviewing the causes listed above, consider adopting the following practices.

To prevent hunting accidents, the basic rules to follow when handling firearms are:

1. Treat every firearm as if it were loaded—even when you think it is not.
2. Always keep the muzzle pointed in a safe direction.
3. Be sure of your target and what is beyond.

Familiarity with firearms

1. Before you hunt, learn how to operate your firearm properly and safely. This includes sighting in, patterning, and knowing its effective shooting distance.
2. Practice as often as possible. To become comfortable and familiar with a gun, it must be used more than once a year.
3. Care for and maintain your firearm. Have a competent gunsmith check your firearm if you have any doubts about its condition.
4. Practice safety at home by storing firearms with open actions in locked safes. Store ammunition in a locked safe in a separate area from the firearms.
5. Be prepared for the hunt by getting into and staying in good physical condition. Be physically prepared for the type of hunt you plan to take.
6. Choose your hunting partners carefully. Camaraderie among hunting partners makes for an enjoyable hunt. But an unsafe partner can be deadly.

Firearm safety when traveling

Whether your firearm is being carried in a car, boat, motorcycle, or in any other vehicle, you must follow these safe firearm handling rules:

1. Be sure the firearm is unloaded.
2. Place the firearm in a protective and securely closed case.
3. Position the firearm securely so it will not move about during travel.
4. Be aware of laws and regulations regarding transportation of firearms for the area you are in or will be traveling through. Laws and regulations vary from state to state.

Hunters should set rules for themselves when loading and unloading their firearms:

1. Load when you are in position—actually in the woods, in the blind, or in the stand. Do not load in camp, near buildings or parking areas, or when in a group.
2. Unload whenever you are unable to give your full attention to controlling the firearm.
3. Unload before entering/exiting an elevated stand.
4. Unload before approaching landowners, hikers, or other hunters.
5. Unload before crossing slippery or rough terrain.
6. Unload and consider putting your firearm in a lightweight "stocking type" case before returning to camp, the parking area, or the highway.
7. Unload and case your firearm before transporting in a motor vehicle.

These basic rules of safety aren't covered by laws and regulations. It is up to you to decide the rules of the hunt. A hunt is safe if you and your hunting partners are safety conscious. Your actions will determine how others look at hunting.

Safety in the field

1. Once again, always establish your safe zone of fire, and insist that your hunting partners do the same. Be sure you are not in another hunter's zone of fire.
2. Correctly identify your game target. Be sure to see what is there, not what your mind wants to see. Your anticipation combined with noise, action, and/or color can fool your mind. If you are unsure of your target, don't shoot. Take time to fire a safe shot.
3. Running game shots are not recommenced because the shot is generally hurried resulting in more potential wounding and loss. Also, it is very difficult to see beyond your target and, finally, there is a much greater chance to ruin the meat.
4. Care should be taken when crossing fences. It is safest to crawl underneath, but not always possible. Fences can and do break, and can do harm to a trusting hunter. This is a time to unload, protect the muzzle from dirt and debris, and either hand over or place the gun on the other side, away from where you will be crossing.
5. Never use your scope as a substitute for binoculars.
6. Do not permit horseplay or careless handling of firearms at any time.
7. Alcohol, drugs, and shooting do not mix. Drugs and alcohol impair your judgement. It is illegal to hunt while intoxicated.
8. Beware of fatigue. When you become tired, quit hunting. Fatigue can cause carelessness, clumsiness, and an inclination to see things that are not there. Any of these factors can contribute to hunting incidences.

Safe firearms carrying practices

There are several ways to carry a firearm safely and at the same time have it ready for a quick, safe shot in the field. Whichever carrying method you use, these basic rules apply:

1. Keep the muzzle pointed in a safe direction away from yourself and others.
2. Keep the safety in the "on" position when carrying a firearm. Remember that the safety is a mechanical device and can fail.
3. Keep your finger outside the trigger guard until you have positively identified your target, determined that it is safe to shoot, raised your firearm to a shooting position, and determined that it is still safe to shoot.

Common Carrying Positions

Cold weather a factor in hunting accidents

Cold weather is very much a factor in Minnesota's hunting accidents. If we look at the way we hunt, our attitudes toward the cold, and the effect the cold has on our ability to think and move, it's easy to see the connection.

Minnesotans learn to tolerate the cold. We shiver, stiffen up, and sometimes lose the sense of touch in our fingers and toes. When we hunt with firearms in Minnesota, we may tell ourselves that this is how we can expect to feel on opening day.

Shivering is the first sign of hypothermia.

Cold causes us to use up energy—blood sugar—faster (hypoglycemia) and our body temperature drops (hypothermia). What many hunters fail to consider, however, is that as this begins to happen we shiver, begin to lose our sense of balance, and start losing our ability to think clearly. The risk of dropping the firearm or falling increases. Our judgment begins to fail. We may even forget to keep the muzzle pointed in a safe direction.

The scary part is that we actually lose our ability to think and concentrate on what we're doing. Too long in the cold and a hunter can end up both clumsy and careless. Hypothermia is not limited to below freezing temperatures. Getting wet on a windy day in 50-degree weather can be as dangerous as freezing temperatures. Even on a nice, sunny fall day where a hunter is walking and begins to sweat, then stops and sits, chills may set in—the beginning of hypothermia.

The ability to resist the cold can vary greatly among people in a group. A key symptom to watch for is severe shivering. If you or someone else starts to shiver, that's the signal to get warm and dry immediately. Severe shivering is the "final stage" in which a person still can think clearly enough to yet help themselves.

Lever action rifles are not for beginners!

Anyone using a lever action rifle with exposed hammer must know the ways the firearm can accidentally discharge because this style firearm is most frequently involved in accidents.

When chambering

To chamber a round in a lever action, the lever is moved forward and then back. The movement of the lever also cocks the hammer. As the lever is moved, the trigger is fully exposed. If the trigger is hit as the lever is moved back, the firearm will fire!

When placing the hammer at half-cock

A round has been chambered and the hammer is fully cocked. Unless the firearm is fired or unloaded immediately, the hammer should be placed in the half-cock or safe position. To do this, the hammer is held in place with the thumb, the trigger is pulled, and then the hammer is slowly lowered.

If the hammer should slip from the thumb as the trigger is pulled, the firearm will fire! The risk of an accidental discharge is greater with cold fingers, small hands, and bulky gloves.

If the hammer is hit or struck

The hammer on a lever action rifle is designed so that it can be easily cocked. Because of this design, it is also easy to bump or hit the hammer.

Be aware that a sharp blow to the hammer of a lever action rifle can cause the firearm to fire, even when the hammer is in the half-cock or "safe position."

When unloading

The first example explained how an accidental discharge can occur when chambering a round. The same thing can happen when unloading the firearm. That is because the tube magazine can be emptied only by chambering and ejecting each round.

Again, each time the lever is moved forward and brought back, the hammer is cocked and the trigger is exposed. If the trigger is hit by the thumb, for instance, the firearm will fire! **Note**: newer models of lever action rifles have a safety that can substantially reduce the risk of an accidental discharge. (Reminder: A safety is a mechanical device which can fail.)

Tips for safe use of elevated hunting stands

Follow these rules to ensure a successful and safe hunt
Make sure you can be found. Map your whereabouts and leave a note at camp, at home, or in your car. Consider carrying a cell phone.

- Before you climb (up or down), make sure that you are wearing a safety belt or harness. Know what you should do if you slip while using a safety device. Never use a

rope to replace a safety belt. Remove all mud, ice, and snow from your boots before your climb. Keep at least one hand and one foot on a secure place when reaching for the next hold. Step down onto a portable stand. Clambering up onto it can dislodge it.

- Check permanent tree stands every year before hunting from them and replace any worn or weak lumber before it breaks. Don't use old "permanent" wood platforms, stands or steps. Weather rots wood, and nails become weak and rusty over time. Nails left in season after season can work loose as a result of contraction and expansion caused by rising and falling temperatures. Before each season, check stress points on all connecting devices for failures, rust or broken welds. (Permanent tree stands are not recommended.)

- Inspect portable stands for loose nuts and bolts each time the stand is used. Check straps, cords, belts, and ropes for rodent or weather damage.

- Never carry guns, bows or equipment with you while climbing. Use a haul line to raise or lower your gear. Keep gun or bow cased when raising or lowering it. **Never** load your gun or nock an arrow until you are settled into your stand. **Always** know your target and what's beyond.

- Read the tree stand instructions thoroughly—seemingly minor variations between models can mean substantial differences in how to safely erect the stand.

- Test any new tree stand climbing equipment a few inches above the ground—not high in a tree.

- Choose only healthy, living trees when using climbing devices. Rough-barked trees such as oak and maple are best. Smooth-barked trees such as aspen (popple) get treacherously slick in wet or icy conditions. The bark also detaches more easily from the wood of the tree.

- Select a tree large enough to support your weight–before the season. Some mishaps occur as hunters are hurrying to set up their stands on opening morning.

- Select trees of moderate tape to avoid dangerous adjustments of your stand as you climb.

- Be alert for hung-up branches and dead-standing trees close to your tree stand.

- Screw metal tree-climbing pegs flush to the tree for secure support and to prevent breakage. (Screw in steps are not recommended as they are dangerous to use.)

- Ladder stands, strap-on pegs or metal pegs should be spaced at easy-to-reach intervals. Avoid the need to make dangerous over-reaches.

- Never put all your weight on a single branch.

- Use a connecting rope from tree stand to seat climber. An attached stand will not fall to the ground if your feet slide out of the harness.

- If you leave the stand in the tree, cover it with plastic or an old rug for easy snow and ice removal.

The Minnesota Department of Natural Resources does not endorse or encourage the use of a particular brand of tree stand, safety belt, harness, or climbing device. However, the DNR does endorse and encourage the use of portable stands, environmentally-friendly climbing blocks (not screw-in spikes), full body-leg harness, and placing stands less than 10 feet off the ground. Ultimately, our goal is to promote safe and responsible hunting.

Tree stand facts (dangers)

Either you or one of your two hunting buddies will fall from your tree stand sometime in your hunting lifetime. In a survey of their readers, *Deer and Deer Hunting* magazine (March 1993) found that 37.2 percent of the respondents indicated that they had been involved in a tree stand fall. Keep in mind that the fatalities were not able to respond to the survey. A study done by the United States Centers for Disease Control and Prevention in Atlanta found that of those who fell from a tree stand, three percent suffered permanently crippling injuries and less than four percent of the falls resulted in death.

You know you have to be careful when using a tree stand and you have read the tree stand safety tips, so how is reading more on the topic going to help you? The question becomes relevant when one considers how quickly the fall happens, especially when the majority of the accidents (26 percent, according to the *Deer and Deer Hunter* survey) indicated that the primary cause was structural failure. All is well, then, in an instant your equipment fails and you are on your way to the ground. The question becomes more real when the survey found instances where very well trained and experienced hunters were involved in tree stand accidents. Something has to be done. Constant reminders and continuing safe tree stand use will help.

Some of the information that the *Deer and Deer Hunting* survey found will help to reduce tree stand accidents. Table 1 presents the type of stand(s) used by the respondents.

Table 1

Deer and Deer Hunting survey responses to the question: "What type of tree stand(s) do you use?"

Type of Stand	% That Used
Permanent	56.5
Portable (homemade)	46.7
Portable (commercial)	80.0
Other	6.5

The survey indicated that 72.6 percent of the respondents owned and used two or more portable stands. Table 2 indicates that the tree stands were placed at an average of 16.55 feet.

Table 2

Deer and Deer Hunting survey responses to the question: "How many feet off the ground do you usually hunt?"

Height of Stand	% of Responses
1–9 feet	2.0
10–12 feet	25.7
13–15 feet	31.8
16–18 feet	11.3
19–21 feet	18.3
22–25 feet	6.7
26+ feet	4.2

There are a number of reasons why hunters use elevated stands. The hunter has better visibility as their line of sight is above the brush and their field of view is greater. The hunter is above the normal line of sight of the game. However, any experienced hunter will agree that animals do look up. The hunter's odor may be dispersed further away from the area. For the gun hunter, shooting at a downward angle allows for a better chance of the ground stopping the bullet. That is, the elevated position is a safety feature because it gives the shooter a better backstop. For the bowhunter, the angling down shot causes the exit wound to be lower on the animal's body which increases the chances of a better blood trail.

Climb no higher than you are willing to fall.

A person does not have to fall from great heights to become injured. A fall of less than one foot can cause injury. **It stands to reason that the further you fall, the greater the chance for more serious injury.** Also, the higher a person has to climb to get to their stand, the more chances they will have for a mishap. 1999 Minnesota regulations (always study laws each season to determine the current regulations) allow permanent stands to be placed at a maximum of sixteen feet. There is no limit to the height a portable stand can be placed.

Users of elevated stands need to consider the height they need to hunt from. **In most cases, six to eight feet may be the best height.** At this elevation, hunters will be well above the underbrush and their eyes will be eleven to fourteen feet above the ground. Even at these heights, the eyes may be in the branches and their ability to see may be restricted. Hunters need to consider what higher stand height does to their target, that is, the vital area of the animal. As the animal has greater depth to its body than width, the higher the hunter climbs, the greater angle of the shot and the narrower the vital area. This is even more true for the bowhunter because the arrow does not have the ability to cause death by shock as a bullet can. Give **yourself the greatest opportunity** you can to achieve a quick, clean kill. **The less the angle of trajectory for the arrow, the greater the exposed vital area.**

The *Deer and Deer Hunter* survey asked the question, "At the time you fell from your stand, where were you?" (See Table 3). Getting up to the stand and while on the stand were the most frequent answers. However, accidents occurred while leaving and descending the stand also. "What was the primary cause of your fall?" was another question asked in the *Deer and Deer Hunting* survey (See Table 4). The survey also considered weather factors (See Table 5).

The Occupational Safety and Health Administration (OSHA) has regulations for workers when they are working in an elevated situation. One such regulation states "each employee on a walking/working surface (horizontal and vertical surface) with an unprotected side or edge which is six feet (1.8 m) or more above a lower level shall be protected from falling by the use of guardrail systems,

Table 3

Deer and Deer Hunting survey responses to the question: "At the time you fell from your stand, where were you?"

Location	Percent
Ascending to, or with the stand	28.8
Entering the stand	10.1
In the stand	29.1
Departing the stand	9.7
Descending from, or with the stand	22.3

Table 4

Deer and Deer Hunting survey responses to the question: "What was the primary cause of your fall?"

Cause	Percent
Slipped	19.9
Fell asleep	4.3
Missed a step	4.3
Lost balance	6.1
Misused tree stand	6.4
Structural failure	23.0
Other*	36.0

*Included: branch broke, climber band/arm slipped, climbing belt broke, climbing spurs slipped, illness/blackout, etc.

Table 5

Deer and Deer Hunting survey responses to the question: "What, if any, weather factors contributed to your fall?"

Weather Factor	Percent
Not a factor	65.7
Cold temps	9.3
Rain	16.8
Snow	5.5
Wind	2.9
Other	16.1

safety net systems, or personal fall arrest systems." One can be assured that for OSHA to issue such a regulation, extensive testing has been done. When hunting from elevated stands, hunters can take advantage of OSHA knowledge. **They can either place their stand at less than six feet in height or use another system to protect themselves.**

The use of a safety belt is considered to help prevent elevated stand accidents from becoming more serious. The *Deer and Deer Hunting* survey asked the question related to the use of safety belts. (See Table 6). In the survey, those that indicated that they had fallen from a tree or elevated stand, 16.8 percent indicated that they were wearing a safety belt leaving 62.8 percent falling without a safety belt on. 74.5 percent of those wearing a safety belt when they fell indicated that the safety belt prevented serious injury.

Some of the hunters that responded to the survey indicated that a safety belt/harness prevented an accident from happening. That is, hunters lost their balance but were able to use the tether (strap) holding their safety belt to regain their balance. However, other hunters indicated that they usually used a safety belt/harness but had accidents when they forgot to wear the belt and leaned out, expecting the belt to hold the. A lesson here, **always** wear a safety belt/harness.

It is not a good practice to use the belt/harness as a support to lean against when shooting, etc. The previous scenario is an example. Also, hunters reported that parts of the belt/harness failed causing the accident. Always inspect your equipment before each use.

Table 6

Deer and Deer Hunting survey responses to the question: "How often do you use a safety belt while ascending/descending a tree?"

Response	Percent
Always	7.1
Usually	4.8
Sometimes	8.0
Rarely	13.7
Never	66.4

Which is safer: a belt or a full body harness?

Is the safety belt actually safe when compared to a full body harness?

Responses in the *Deer and Deer Hunting* survey from individual users of safety belts indicated that belts were of value in many instances. However, a fatality that occurred in Minnesota indicated that the hunter whose tree stand collapsed, died from the short fall because of the force of the safety belt on his mid-section and ribs. The question remains, would he have survived the twenty-foot fall to the ground?

A fall when a hunter is wearing a full body harness results in the pressure of the harness mainly being applied to the legs. A fall with a safety belt can result in pressure on the midsection where internal organ damage can occur. The malfunction or non-function of the organ(s) can cause death quickly.

OSHA regulations detail how far a worker can fall with their fall arrest system in place. This distance varies with the weight of the person. A rule of thumb is that a hunter should not fall more than twelve inches or the force from the fall even with a full harness, may be such that severe damage is done to the body or even death can occur. OSHA has guidelines for the use of a shock absorbing system (similar to a bungee cord) to reduce injury.

Full body harnesses designed for hunter use are on the market today. Hunters that need to hunt from an elevated stand at a height greater than six feet need to consider a well-made full body harness. Research the harnesses that are available and choose the one that you feel will work the best for you.

As indicated by the *Deer and Deer Hunting* survey, many accidents happened while the hunter was getting up into or climbing down from their stand. Hunters need to wear a full body harness designed for use while climbing up into and down from their stand as well as when they are in their stand.

An option that OSHA allows is a railing on work areas over six feet above the lower level. Hunters may consider a proper railing on their elevated stand as a method to prevent accidents.

There are many different types of stands available for hunter use. Listed below are a number of stand types and the advantages and disadvantages of each.

Permanent stands

Advantages: Can be large enough to accommodate two hunters—ideal for mentoring an inexperienced hunter. Comfortable and safe if built and maintained properly.
Disadvantages: Illegal in many areas, they damage trees, are highly visible, may invite other hunters. They need constant maintenance, they are dangerous as they age or rot. Even newly constructed stands can become quickly weakened by the movement of the tree they are attached to.

Self-climbing stands

Advantages: No steps or ladders needed, can climb to considerable heights.
Disadvantages: Bulky, fairly heavy and hard to carry. Noisy to erect, require strength and coordination, cannot be used on trees with low branches. Generally have a small platform and seat causing them to become uncomfortable when used for long periods of time.

Strap on stands

Advantages: Generally inexpensive, easy to carry, fairly inconspicuous.
Disadvantages: Special steps or ladder needed to reach high stands, most have no support railing, very small platforms and seats. If hunter feels insecure, it may affect their confidence and concentration.

Ladder stands

Advantages: Easy to erect and climb, safe, and sturdy.
Disadvantages: Generally expensive, heavy and bulky for relocating, uncomfortable, many have no seat and only a small platform to stand on.

Tripod stands

Advantages: Good in short brush, can be erected anywhere, easy to climb, generally equipped with railings for safety, and may serve as a gun rest.
Disadvantages: Expensive, heavy and bulky, time consuming and noisy to erect, obvious to other hunters and game.

Tree-limb stands

Advantages: Convenient, any large horizontal limb may do, quiet, generally other hunters cannot pinpoint your location.
Disadvantages: Very unsafe!! Requires large, sturdy limbs, very uncomfortable, most limbs are slippery when wet, limbs die and break.

Tower Box Stands

Advantages: Good for short brush and fields, protection from weather, freedom to move within the stand without being detected, excellent stand for introducing new hunters, side walls prevent unexpected falls.
Disadvantages: Need constant maintenance, if no roof, floors can become slippery and noisy, stairs and ladders need to be checked and double checked, stairs and ladders can be extremely slippery when wet, icy, or snow covered.

All stands, whether manufactured or personally made, can result in an accident if it is not installed and used properly. Read and follow the directions that come with your manufactured stand. Do not make alterations on your manufactured stand. Alterations may affect the stand's strength and function. Inspect every stand before each use. Do not use a stand if you are unsure of its condition.

Getting into your stand can be as dangerous as being in the stand. There are a number of methods to get into a stand. Be sure you understand how a climbing stand works and heed all warnings issued by its manufacturer. Ladders tend to be a safe and easy way to get into a stand. However, caution must be used when using ladders. The steps may be weak or slippery. In the woods, often times the ground is uneven and/or softer in one spot than it is in another, causing the ladder to tip or slide.

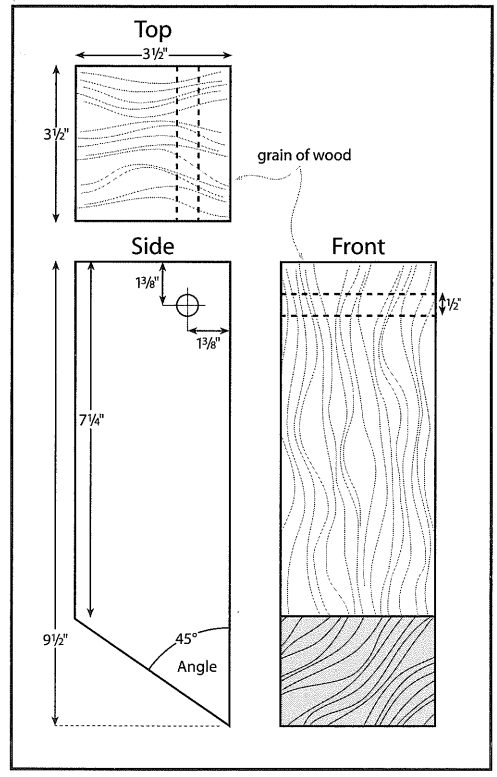
Strap or chain-on type steps generally do not harm a tree, but they must be used according to manufacturer directions. They can slip and they can fail. Screw in tree steps, which the user screws into the tree, tend to be very dangerous. Steps that have not been screwed in correctly may break or fall out when stepped on. The tree may be rotten causing the step to pull out. Apparently, good steps (defective) have broken. Also, the general design of this type of step is such that hunters slip and fall resulting in injury as the hunter is caught on lower steps.

Construction and use of tree "climbing blocks"

Caution

Using self-made tree "climbing blocks" presents risks to the user. Here are some tips on constructing and using blocks in a safe manner. But beware—following these tips does not mean you will stay safe. Climbing is inherently dangerous and no one can guarantee your safety. The bottom line is that caution and "common sense" must be used at all times. If you construct and use climbing blocks—even in the manner suggested—you must remember that you are assuming a risk of falling and suffering very serious injuries, and perhaps even death. If it seems too dangerous, don't do it!

Once the climbing block has been properly constructed, the block and the attaching rope must be checked before each use. Once the climbing block has been installed for use, it must be checked for proper installation. Before the person using the block places his or her full weight on the block, they must determine that the block will hold them. Climbing blocks must not be left attached to the tree overnight. They must be installed and removed after each day's use. They may become damaged by the elements and/or rodents, etc., if left in the woods. Dispose of any block that shows signs of weakening and damage.



Cuts used to make climbing blocks.

Construction of climbing blocks

Refer to the accompanying diagram for assistance in constructing your climbing blocks. Begin by selecting treated 4-inch by 4-inch stock that is free of defects and knots. Defects will cause the block to "give way" during use. Look for and avoid material that may "split." Treated material should extend the useful life of the block.

Two climbing blocks can be constructed with one 45-degree cut from a piece of 4-inch by 4-inch stock, 16¾ inches long. The diagram displays only one block. The angled cut reduces the weight of the block and makes it easy for you to properly place the block on the tree. Refer to the photo for proper placement.

Next drill a one-half inch hole across the grain of the wood, 1⅜ inches from the top and 1⅜ inches from the tree side of the block. The hole is located high and off the center to prevent tipping out when pressure is applied to the block. Drilling across the grain will reduce the chances of the block splitting when under pressure.

Ten feet of one-half inch diameter nylon or poly rope is needed for each block (you will need a longer piece of rope if you are going to be using the blocks on large diameter trees). Form a loop and tie a knot that will not slip on one end of the rope, leaving enough space in the loop to allow the rope to slide easily into. Heat the other end of the rope to prevent the end from unraveling. Slip the end of the rope through the hole in the block. Construct enough blocks for you to safely climb into and out of your tree stand. Properly store and care for your self-made climbing blocks.

Climbing blocks fasten to a tree.

Use of climbing blocks

Each climbing block must be carefully inspected before each use. Discard any block that shows any sign of damage or weakness.

Climbing blocks are practical to use with portable tree stands that can be installed (fastened to the tree) from the ground. The number of blocks needed will vary depending on the height the hunter needs to climb. The blocks need to be spaced close enough to each other that the user will not need to stretch unsafely to reach the next step. Extra layers of clothes and cold temperatures need to be considered when spacing climbing blocks (place blocks closer together).

The angle of the blocks placement from each other needs to be considered when placing the blocks on a tree. That is, the blocks need to be rotated around the tree so as a user steps up to the next block, it will be positioned so that the foot can safely step on the block. The blocks can be too close or too far apart around the tree for the foot to safely reach the block. The last block (highest) the user will step on should be the same elevation or slightly higher than the tree stand itself. This is so the user can step down into the tree stand to test its safety before their full weight is placed on the stand. The reverse is true for the user going down from their tree stand. The block can be tested before the user's full weight is placed on the block.

The block is fastened to the tree by holding the block slightly above the location the user wants the block to be. The rope is placed around the tree with the end inserted and pulled tight through the loop. The end of the rope is then wound around itself (but not tied in a knot) six or more times (see photo). The pressure from the weight of the user will cause the rope to "bind" and support the block and the user.

Each time a series of climbing blocks is used, the user should test each block carefully before placing their full weight on each block.

In the event that the user will be climbing to a height greater than six feet, a climbing belt/harness must be used.

Climbing blocks can be self-constructed at an economical price. Extreme care must be used when constructing and assembling the blocks. Four to five blocks can be easily carried to a stand site and safely attached to a tree (assuming the tree stand is installed from the ground by the hunter). The careful hunter can have a safe and successful hunt using self-constructed climbing blocks.

Hunting Behavior

"Shall the Minnesota Constitution be amended to affirm that hunting, fishing, and taking of game and fish are a valued part of our heritage that shall be forever preserved for the people and shall be managed by law and regulation for the public good?"

—Question on the Minnesota General Election Ballot, November 1998

On election day, November 1998, 1,567,844 Minnesotans, (77.2 percent of those who voted) said "Yes," that hunting and fishing in Minnesota are important enough activities to protect them by including language in the Minnesota Constitution to do so. Hunters need not be concerned about their right to hunt, right? 461,179 people on the same day said "no." Even with protection from the amendment, hunters need to be aware that there are those who oppose the action of hunters and/or are against hunting. Hunters need to know how to conduct themselves to continue to be accepted by the people of Minnesota.

People are judged by their actions. How we behave and how we follow the rules affect other people. Rules are developed to be followed. As a hunter, you must be aware of how your personal behavior and activities, as well as the actions of your companions, will affect others.

When driving a car, we are expected to drive carefully following the rules of the road. When we play any sport we are expected to follow the rules of the game. Hunters, too, are expected to behave responsibly while hunting—to hunt according to the rules.

Many of our rules are in the form of game laws which are designed to fulfill one or more of three basic needs:

1. To protect people (hunters and non-hunters) and property.
2. To provide equal hunting opportunities for all hunters.
3. To protect game populations.

Other rules are unwritten. They are referred to as ethics and can be defined as a standard of behavior or conduct that the individual believes to be morally correct.

Usually, if a large number of a population (group of hunters for example) believes in the same ethic, then they have it made law by the governing body (the state legislature in the case of game laws). It is the lack of good ethics on the part of a few who call themselves hunters that creates the need for ethics becoming laws. As laws multiply, so do restrictions. Such restrictions can lead to excessive control that spoils hunting.

Because each game species has different, specific habitats, species that a person hunts may require a special set of ethics. Therefore, each hunter must develop their own ethics for the game they are hunting.

Future opportunities to enjoy hunting in Minnesota will depend upon the hunter's public image. If hunters are viewed as "slobs" who shoot up the countryside, vandalize property, and disregard the rights of landowners and citizens, they will lose the privilege to hunt on private land and public land as well. However, if an increasing number of hunters follow the honorable traditions of their sport and practice a personal code of hunting ethics which meets public expectations, the future of hunting will be assured.

A real threat to hunting today is how it is being promoted and increasingly thought of as a competitive event. The escalating win/lose fever resulting from competition can only serve to discourage restrain and encourage risk taking. Until hunters make it very clear that hunting is not competitive, as are the shooting sports, there will continue to be accidents and unacceptable hunter behaviors.

To make hunting safe and place it in its proper perspective, hunting should most appropriately be though of as a ritual, or rite. Webster's dictionary defines rite as "a ceremonial or formal solemn act, observance or procedure in accordance with proscribed rule or custom..." To suggest that hunting should be a solemn act demonstrates respect. "In accordance with proscribed rule," affirms the importance of learning and following the rules. Through rules, hunters eliminate unnecessary risk. Risk taking need not, or should it ever be, a part of the hunting ritual.

Definition of ethics and laws

Ethics are standards of behavior or conduct which are considered to be morally right. Ethics begin with an individual's standard of behavior. Each individual must make a personal judgment about whether certain behavior is right or wrong. If we believe that a specific action is morally right, then it is ethical for us to act that way.

For example, if a hunter truly believes that it is right to shoot a duck with a shotgun while it is sitting on the water, then it is ethical for that particular hunter to do so. The hunter behavior is consistent with their personal code of ethics. If, however, a hunter believes it is wrong to shoot a sitting duck, then it would be wrong for them to do so. Such action would not be ethical for them.

Most hunters have a personal code of ethics which is very similar to the laws which are associated with hunting. Usually, hunters agree that the hunting laws are fair and just, and find these laws easy to obey.

Personal code of ethics

Personal ethics are "unwritten laws" which govern your behavior at all times—when you are with others, and when you are alone. They are our personal standard of conduct. Our personal code of ethics is based upon our respect for other people and their property, for all living things and their environment, and our own image of ourselves.

> *"The hunter ordinarily has no gallery to applaud or disapprove his conduct. Whatever his acts, they are dictated by his own conscience rather than by a mob of onlookers."*
>
> —Aldo Leopold

The basis of a personal code of ethics is a "sense of decency." You must ask yourself repeatedly, "What if someone else behaved the way I am—would I respect them?"

Many of us probably developed a personal code of ethics long before we became hunters. Because we want the respect of our parents and family, our friends and neighbors, we develop a standard of acceptable behavior. Some of us went on hunting trips, even before we were old enough to hunt and learned what was expected from the example of others.

However, in today's common, single-parent families, many beginning hunters do not have a role model to guide their development of hunting ethics. Also, because only about three percent of our population lives in a rural setting, many hunters do not have opportunities to begin hunting until they are in their late teens and early twenties. When they do, they may begin with others of their age and hunting experience. Without an experienced hunter to help form their hunting ethics, they may not know what is best for them and hunting.

Hunters must be willing to reconsider their hunting ethics. This may require changes in attitude and behavior. Concerned, experienced hunters are needed to assist less experienced hunters in "doing what is right." Positive role models will ensure good hunting traditions for the future.

Positive Role Model

Hunting enthusiasts and "role models" are needed in Minnesota today. Positive role models will do more for hunting than laws and regulations. This may require hunters to refuse to go along with certain members of their party or even change hunting groups.

Are you a Positive Role Model?

What more can a hunter do to promote and protect the tradition of hunting? BE INFORMED. Learn everything you can on the positive aspects of hunting. Use what you learn to promote hunting. BE A TEACHER. Take the responsibility for educating young people in the ways of the outdoors. Not just your own children but others as well. Volunteer to be an Advanced Hunter Education, Minnesota Bowhunter Education, or Firearms Safety Instructor. BE AN EMISSARY. Do everything you can to spread the positive aspects of hunting. Non-hunters must hear the truth; otherwise they may believe the misconceptions and opinions generated by anti-hunting groups. Talk intelligently about hunting. BE A JOINER. Get into every organization that looks as if it might help the cause—whether it be a local sportsmen's club or a national conservation organization. BE A DOER. Serve on committees, help influence people, work. Don't expect others to do the job. Do it yourself. BE POLITICALLY ACTIVE. Anti-hunting groups are continually pushing some kind of negative legislation. Politicians need to hear of your support for positive legislation. Become involved in grass-roots efforts at your local level. Irresponsible hunter behavior will lead to legislation that will curtail hunting. BE A GIVER. The anti-hunting groups are well financed. The pro-hunting forces are always operating on tight budgets.

Stages of the hunter

Your personal code of ethics and your hunting behavior may change through the years. Research conducted by Dr. Bob Jackson has found that it is usual for a hunter to go through five expectation stages.

1. First is the "shooter stage" - a time when shooting the firearm or bow is of primary interest.
2. Next is the "limiting-out stage" - when the hunter wants, above all, to bag the legal limit of game they are entitled to.
3. The third stage is the "trophy stage" - the hunter is selective—primarily seeking out trophy animals of a particular species.
4. Then the "technique stage" - the emphasis is on "how" rather than "what" they hunt.
5. The last stage is called the "mellowing-out-stage" - this is a time of enjoyment derived from the total hunting experience—the hunt, the companionship of other hunters, and an appreciation of the outdoors. When hunters mellow out, bagging game will be more symbolic than essential for their satisfaction.

Hunters' personal code of ethics will change as they pass through each of these five stages—often becoming more strict and imposing more constraints on their behavior and actions when hunting.

Each hunting season, ethical hunters invite novice hunters to accompany them in the field. They take the time to share their hunting knowledge with their companions and introduce them to the enjoyment of hunting.

These self-imposed restrictions, however, will add to the enjoyment of the hunting experience. Responsible hunters appreciate hunting more. Only they understand the new sense of freedom and independence that comes from hunting legally and responsibly.

Ethics for consideration

Many people have proposed ethical standards which they feel should be adopted by all hunters. Some are presented for your consideration. Consider each ethic carefully. Decide whether it is right or wrong in your opinion. If it is right, incorporate it into your personal code of hunting ethics and practice it when afield. In the final analysis, your standards of conduct while hunting will be the true indicator of your personal code of ethics.

Hunter-landowner relations

Responsible hunters realize they are guests of the landowner while hunting on private land. They make sure they are welcome by asking for permission before they hunt. On the rare occasions when permission is denied, they accept the situation gracefully.

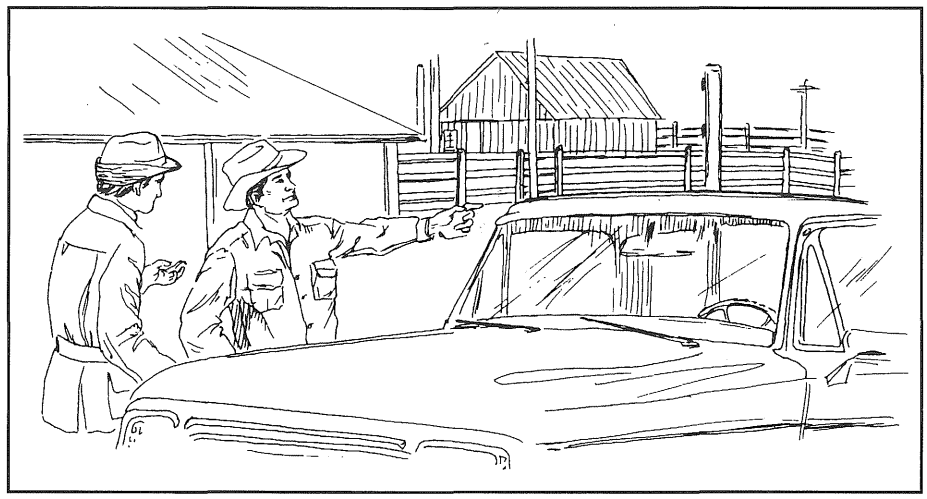
To avoid disturbing the landowner early in the morning, a responsible hunter obtains permission to hunt on private land ahead of time.

While hunting, the responsible hunter takes extra care to avoid disturbing livestock. If they are hunting with a dog, special precautions are taken to ensure it does not harass cattle, chickens, or other farm animals. They understand that disturbances can cause dairy cows to reduce their milk production, and poultry may crowd together in the chicken coop and suffocate. Beef cattle can suffer a weight loss costly to the rancher.

Responsible hunters leave all gates as they find them—and if closed, they ensure they are securely latched. They cross all fences by going underneath to avoid loosening the wires and posts. They only enter on the portions of private land where the owner has granted permission to hunt. They never assume they are welcome on private property simply because other hunters have gotten permission to hunt there.

Responsible hunters avoid littering the land with sandwich wrappings, pop cans, cigarette packages or other garbage, including empty casings, empty shell boxes, and shells.

They never drive or walk through standing crops, nor do they send their dogs through them. When driving across pastures or plowed fields, they keep their vehicles on the trail or road at all times. They understand that the ruts left by vehicles on hillsides can cause serious soil erosion. They hunt as much private property on foot as possible. When parking their vehicle, they are careful not to block the landowner's access to buildings, equipment, and roadways.



Responsible hunters respect the right of landowners and get permission to hunt on private land. These hunters ask and find out what they can and cannot do while hunting as a guest of the landowner.

If they see anything wrong on the property such as open gates, broken fences or injured livestock, they report it to the landowner as soon as possible. Responsible hunters limit the amount of game they and their friends take on a landowner's property. They realize the landowner may consider several bag limits as a sign of greed.

Unless they are close personal friends of the landowner, responsible hunters do not hunt on a specific farm or ranch more than two or three times each season. They do not want to wear out their welcome.

Before leaving, they thank the landowner or a member of their family for the privilege of hunting the property and they offer a share of their bag if they have been successful. In appreciation for their hospitality, a thoughtful hunter offers to help with chores. If the offer is accepted, they cheerfully pitch bales, mend fences, fork manure, etc. They may even use their special skills such as plumbing, mechanical abilities, painting or carpentry.

Responsible hunters stop and thank the landowner for the privilege of hunting on their land. If the hunter is successful, he/she may offer to share the game or by some other method, show appreciation for the hunting opportunity.

If they own property elsewhere such as a farm, ranch or lake cottage, responsible hunters will invite their host to use them. They note their host's name and address and send a thank you card in appreciation for the landowner's hospitality. Remember, a landowner has no respect for trespassers. It only takes a moment to request permission and you may be allowed to come back again.

Regard for other people's feelings

When hunting on public lands, a responsible hunter shows the same respect for other users of the land as they show for landowners on private land.

They hunt in areas where their activities will not conflict with other's enjoyment of the outdoors. They treat the land with respect, being careful not to litter or damage vegetation. They limit their use of vehicles to travel to and from their hunting area, always remaining on trails or developed roadways.

They know that alcoholic beverages can seriously impair their judgment while hunting. They restrict their drinking to the evening hours after the firearms have been put away. Even then, they drink in moderation to be sure that their actions do not offend others.

Responsible hunters recognize that many people are offended by the sight of a bloody carcass tied to vehicles or gut piles lying in full view of the road. People may also be put off if hunters parade vehicles through a campground or streets of a community with a gun rack full of firearms. Having respect for the feelings and beliefs of others, responsible hunters make a special effort to avoid offending non-hunters. They are consistently aware that many of these people are their friends, neighbors, relatives, and even members of their immediate family.

They appreciate the fact that many people do not hunt and understand some people are opposed to hunting. They respect these people as human beings whose likes and dislikes differ from their own. They accept the fact that hunters, non-hunters, and anti-hunters are equally sincere in their beliefs about hunting.

Relationship with other hunters

Responsible hunters show consideration for their companions. When leaving for a hunt, they are ready to go at the appointed time and they do not invite others to join the group unexpectedly.

In the field, their consideration extends to other hunters as well. They realize that hunting satisfaction does not depend on competing with others for game.

Responsible hunters avoid doing anything that will interfere with another's hunt or enjoyment of it. They do not shoot along fence lines adjacent to fields where others are hunting, nor do they try to intercept the game others have flushed. If disputes arise with other hunters, they try to work out a compromise—perhaps a cooperative hunt—which everyone can enjoy.

Responsible hunters do not hog shots—they do the opposite. They give friends a good shot whenever possible. They show special consideration for the inexperienced or hunters with disabilities by allowing them to hunt from the most advantageous position.

Each hunting season, responsible hunters invite novice hunters to accompany them in the field. They take the time to share their hunting knowledge with their companions and introduce them to the enjoyment of hunting.

They do not shoot over their limit to fill the bag of others. This includes shooting a deer and having a young hunter tag it. They realize that young hunters want to harvest their own game. Responsible hunter's do not take their limit unless they plan to use all they have taken.

They observe the rules of safe gun handling at all times and firmly insist that their companions do the same. They politely tell others when they think their behavior is out of line.

Self-respect

Responsible hunters realize it is their responsibility to know how to take care of themselves in the outdoors. They respect their limitations.

They never places their lives or the lives of others in jeopardy by failing to notify someone where they intend to hunt and how long they expect to be gone. If their plans change, they leave notes on their vehicles designating their destination, time of departure, and expected time of return.

They respect the limitations of their health and physical fitness. They consult with their doctor regularly to be sure they are capable of strenuous hunting activity. If unfit, they condition themselves before going hunting. They have their vision checked and, if necessary, wear glasses or contact lenses to correct any visual impairments.

To cope with unexpected outdoor emergencies, responsible hunters learn and practice first aid and survival skills. They know how to recognize and cope with hypothermia.

Respect of wildlife

Hunters are naturalists. Their interest in wildlife extends beyond game animals to all living things. They're thrilled by the sight of a bald eagle as well as a white-tailed deer. They know and study nature's ways, and realize that wildlife can be enjoyed year round—not just during the hunting season.

Fair chase hunters always give their quarry a "fair" chance to escape.

When hunting, their pursuit of game is always governed by the "fair chase" principle. Simply stated, this principle demands that hunters always give their quarry a "fair" chance to escape.

When hunting big game, responsible hunters will always attempt to get close enough to their quarry to ensure a quick, clean kill. They realize that in doing so, their quarry may notice them and escape, but they always give their quarry this sporting chance.

Responsible hunters never shoot indiscriminately at a flock of game birds or a herd of big game in the hope of hitting one. They will always attempt to kill their quarry quickly. Flock shooting any species causes much wounding. A good example is swatting ducks on the water. This bad behavior gives responsible hunters a bad name.

Through considerable practice before a hunt, they will learn the distance at which they can be most confident of killing game cleanly. They will ensure their rifle is accurately sighted in and determine the most effective shot size for their shotguns. The goal of practice, range estimation, sighting in, and proper shot selection is to reduce wounding loss.

Once afield, they will expend an extraordinary effort to retrieve all game—even if it means interrupting their hunting to help another hunter locate a wounded animal. When possible, they will use a trained hunting dog to retrieve ducks in a slough or upland game in heavy cover.

If it appears they have missed their shot, responsible hunters will always carefully inspect the spot where their quarry stood to ensure the animal was not hit.

Responsible hunters show respect for their game after it is taken, just as before. They never allow the meat or other usable parts of the animal to be wasted. They field dress or clean their game within minutes of being taken so it doesn't develop that "wild" taste. Even though they may not want the antlers or hide, they recover them to give to others who will use them. The Minnesota Deer Hunters Association (MDHA) sponsors a program called Hides for Habitat. Hunters who don't want their hides can benefit wildlife through habitat development by donating their deer hides. The fur and feathers of many game birds and mammals can also be used to make flies for fishing.

Respect for the environment

Responsible hunters are caretakers of the environment. While hunting, they are aware of damage they may do to the plant life and to the soil, they try to minimize their impact. They avoid needless destruction of vegetation. They down living trees or trim branches only when it is legal or with permission. They avoid actions that may cause erosion. They use only what is necessary, remove their garbage, and minimize any evidence of their presence.

Respect for laws and enforcement officers

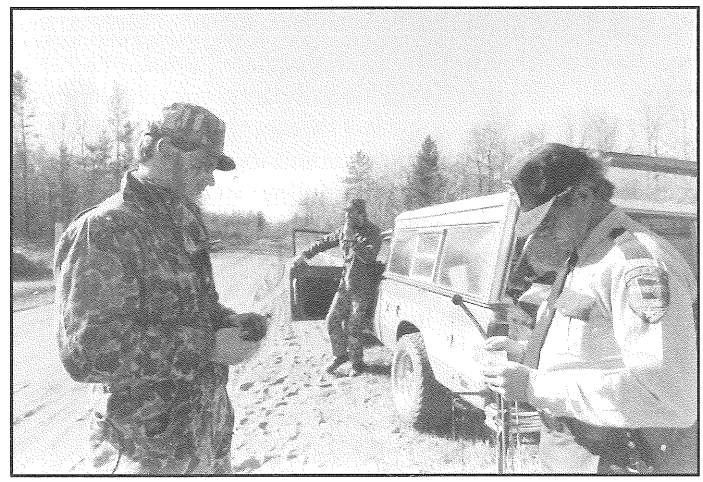
Responsible hunters obey all laws which govern their hunting activities, even those with which they disagree. Instead of ignoring a law, they work through their elected representatives to change laws which they feel are unjust.

Responsible hunters will not ignore illegal acts of others. They insist that all members of their hunting party obey the law and they report law violations to the appropriate law enforcement agencies. If asked to serve as a witness, they accept this responsibility. When they meet a state or federal wildlife officer, wildlife biologist or technician checking hunters, they are cooperative and provide the information requested. If they do not understand the need for certain information, they ask for an explanation.

Hunters realize the officer's responsibility is to protect the hunters wildlife and their hunting rights.

In summary, ethical hunters should have **respect for** and be **responsible to**:

1. Landowners
2. Non-hunters
3. Other hunters
4. Themselves
5. Wildlife
6. The environment
7. The laws and the officers whose duty it is to enforce them



Responsible hunters fully cooperate with conservation officers and wildlife officials, knowing that they protect and enhance their hunting opportunities.

Deer Hunter Behavior

Introduction

Deer hunters in Minnesota, with their relatively short season and large numbers, may experience conflict with other hunters as well as non-hunters. Hunter conduct is a key to reduction and resolution of these conflicts in the field.

Some questions and conflicts of deer hunters in the field

Conflicts can and do occur while hunting white-tailed deer. Unfortunately, conflicts between hunters can give hunting a black eye and encourage those who want to ban all hunting. Firearm hunters sometimes disagree with bowhunters. Bowhunters disagree among themselves. Some believe that only long bows should be used; others are for the compound bow or the cross bow. Those who hunt with muzzleloaders have other ideas about how hunting should be carried out. Disagreements and arguments among hunters will only add more restrictions and regulations. Those who use different hunting methods must work together to establish hunting systems that benefit everyone.

Whose animal is it?

Because many hunters may be in an area, more than one may have the opportunity to shoot at an animal, or a hunter may find a downed animal before the person who shot it has a chance to find it. Whose animal is it? There may or may not be a legal precedent to resolve the question. Responsible hunters often follow an *unwritten* rule referred to as "first blood." This is: "The hunter who inflicts the first wound that will cause the animal to die, has the right to the animal." Each hunter and those within a party need to decide in advance how to handle such situations.

If these disagreements can't be worked out between the hunters, the local conservation officer will most likely seize the deer and donate it to the local conservation club or VFW crippled vets program.

Whose stand is it?

Hunting stands are a common cause of conflicts. Hunters often come upon a vacant stand during the hunting season. The stand belongs to someone. Is it right for a hunter to use someone else's stand? How would you feel if you found someone in your stand?

Do you hunt there too?

Often hunters are privileged to be taken on a hunt to a new area as guests of their friends. Is it proper for you to return to these areas later without your hunting friend?

Misusing the trespass law

Part of the Minnesota Trespass Law allows a hunter to retrieve wounded animals on non-posted, private, agricultural land. Does this allow a group of hunters to travel through this type of land in such a manner that they may move game to an area where they have permission to hunt?

Whose responsibility is it to know who owns the land? Is the landowner obliged to mark boundary lines so that all will know where the border is? Responsible hunters will know whose land they are on.

Pulling the trigger or releasing the arrow

Responsible hunters will accept the obligations that result from pulling the trigger or releasing an arrow. This includes having confidence that they will hit their intended target and not take a "hope" shot, such as running game. This responsibility includes sighting in firearms or archery equipment, practicing with it, and knowing its limitations. They will not borrow equipment just before the season to go hunting.

In addition to having the confidence that they can hit their target, they are certain they can follow a blood trail and retrieve game or determine that the hit was not fatal. They do not easily conclude that they missed their target and that it isn't necessary to check. They learn to follow and retrieve game from expert trackers such as may be offered in the Minnesota Bowhunter Education course.

The cut-off

Responsible hunters do not take up a hunting position that they know will divert game animals from another hunter.

Doing your share

Responsible hunters do their share of work before, during, and after the hunt. This includes camp chores such as doing the dishes and cleaning up, to moving deer to other hunters in their party, or dragging deer out of the woods.

Competitive hunting

Is hunting a competitive event where hunters must outdo one another? Must every tag be filled? Do young or inexperienced hunters need to have their tag filled for them? Do inexperienced hunters like to take their own shots? The answers to these questions may affect the way you hunt.

Hunter visibility

Wearing blaze orange while hunting is required by the law and common sense, but wearing the hunting "uniform" may not be appropriate at other times and places. For example, those who wear their hunting clothes while enjoying alcoholic beverages may be looked upon as drunken hunters. Note the "s" on hunters, indicating that many will conclude that all hunters drink while they hunt.

Responsible hunters will also avoid gathering in groups near roads or other locations where the non-hunting public can readily see them. Some may view such groups as "gangs." Meetings at the start or end of a hunt should be held in a more private location. Responsible hunters do not drive around the countryside looking for game. The public considers road hunters lazy, which they may be. If they find game, they will probably have to either trespass or shoot illegally from the road to take a deer. Responsible hunters plan ahead so they have a place to hunt.

Display of game

Public display of game is offensive to many whether the display is on vehicles, in camp or at home. Hunters are proud of their success but display of game should be reserved for those who can appreciate it.

Hunter slang

The language or terminology used by some hunters may be offensive to many. Even family members may be offended by terms such as "blew it away," "stuck it," "knocked it over" and so on. Hunting stories can be told using language acceptable to everyone.

Defining your trophy

Instead of passing up small bucks for bigger bucks, ethical hunters should consider passing them up for antlerless deer when they have the proper permit. Here's why: Hunting is a tool of wildlife management. In fact, about 60 percent or more of deer mortality in Minnesota is due to hunting. In years with good or high deer populations, more antlerless permits are available. A hunter with an antlerless permit can shoot a buck or doe and legally tag it. When the deer population is high, hunters will see more small bucks. Hunters traditionally want to "get a buck" so many one-and-a-half year-old bucks are harvested. This does not help control the deer population because deer are polygamous. That young buck is unlikely to be a breeder in the population for a year or more. However, a doe of any age will add to the population yearly.

Hunters who understand the need to use hunting as a tool of wildlife management will do their part and harvest an antlerless deer if they have the proper permit.

White-tailed Deer Hunting Regulations

Note: The discussion of the following laws and regulations were correct at the time of publication. All laws and regulations are subject to change. Consult the current Minnesota Hunting and Trapping Regulations Handbook before you hunt each season.

Hunting method restriction

IT IS UNLAWFUL:

- To take deer or moose from any permanent artificial scaffold, platform, or other construction higher than 16 feet above the ground. The height restriction does not apply to portable stands that are chained, bolted, clamped, or tied with rope. On Wildlife Management Areas, only portable stands may be used, and they must not be left overnight.
- To take any wild animal with the use of a two-way radio, except they may be used to take unprotected wild animals by permit.
- To carry any firearm while hunting big game with bow and arrow, except while black bear hunting.
- To shoot any wild animal from a motor vehicle, except by disabled persons possessing a DNR special disability permit.

Legal firearms for big game

A rifle, shotgun, muzzleloader, or handgun is legal for taking deer if:

- it is at least .23 caliber;
- it is loaded only with single projectile ammunition;
- the projectile used has a soft point or is an expanding bullet type;
- the ammunition has a case length of at least 1.285 inches, with the exception of a 10mm cartridge that is at least .95 inches long;
- the muzzleloader (long gun or handgun) used cannot be loaded at the breech (muzzleloading revolvers are not legal for taking big game);
- the smooth-bore muzzleloader used is at least .45 caliber; and
- the rifled muzzleloader used is at least .40 caliber.

Other restrictions

- a person may not take big game with a .30 caliber M-1 carbine cartridge.
- rifled barrels on shotguns are legal statewide.
- no person may discharge a firearm or an arrow from a bow on, over, across, or within the right-of-way of an improved public highway (including but not limited to federal, state, county, and township roadways) at a big game animal or a decoy of a big game animal that has been set out by a licensed peace officer.
- a person may not use a dog or horse to take big game.
- a person may not take big game by archery while in possession of a firearm, expect a person may take a bear by archery while in possession of a firearm.

Handguns

- big game may be taken statewide with handguns that meet the definition of legal firearms.
- the most common calibers of handguns legal for big game are .357, .41, and .44 magnum.

Muzzleloader

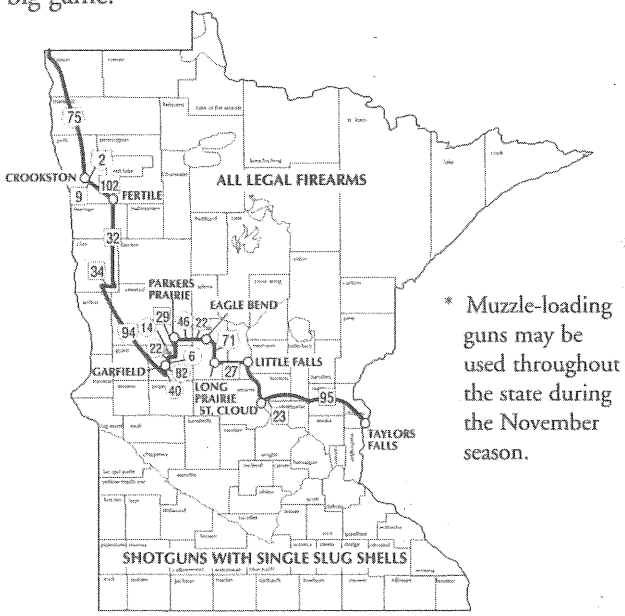
- big game may be taken with muzzleloaders that meet the definition of legal firearms.
- only open and "peep" type sights are legal during the Muzzleloader Deer Season.

Rifle-shotgun boundary

- in the Shotgun Zone **(see Figure 4, page 71)**, deer hunters may use only legal shotguns loaded with single-slug shotgun shells, legal muzzleloading long guns, or legal handguns.
- legal shotguns include those with rifled barrels.

NOVEMBER FIREARMS RESTRICTIONS

In the southern and western portion of the state shown in the map below, the only legal firearms for deer are shotguns using rifled slugs and handguns legal for big game.*



* Muzzle-loading guns may be used throughout the state during the November season.

Figure 4. Rifle-shotgun boundary.

Legal bows and arrows for big game

- bows must have a pull no less than 40 pounds at or before full draw. Note: This is a minimum draw weight. Some short-draw-length bows (under 28 inches) shooting light arrows may not effectively kill big game at a 40-pound draw weight.
- arrowheads used for taking big game must be sharp, have a minimum of two metal cutting edges.
- be of barbless broadhead design, and have a diameter of at least ⅞ inch.
- "retractable" broadheads may be used to take big game if they meet the requirements above, and 1) are at least ⅞ inch in width and no more than two inches in width at or after impact; 2) are of a barbless design and function in a barbless manner.
- no person may hunt with a bow drawn, held, or released by a mechanical device, except disabled hunters who have crossbow permits.
- a hand-held mechanical release attached to the bowstring may be used if the person's own strength draws and holds the bowstring.
- no person may hunt big game or wild turkeys with a crossbow expect by special permit issued to hunters unable to hunt by archery because of a temporary or permanent disability. This disability must be verified in writing by a licensed physician. The permit application is available from any DNR regional office.

Regulations for "party" hunting

1. A party is any group of two or more licensed deer hunters, all of whom are afield hunting together at the same time, all using firearms or all using bow and arrow. Therefore, a mixed arms group would be two separate parties.
2. Any member of a party may kill a legal buck for any other member of the party who has an unused tag. Any member of a party may tag a legal buck killed by any other member of the party.
3. Any member of a party may kill an antlerless deer for any other member of the party who has an unused tag valid for an antlerless deer, except that a youth under sixteen years of age must harvest their own anterless deer. Antlerless deer may only be tagged by party members licensed to take antlerless deer.
4. Party members must be within communication distance of each other to be a "party."

Wanton waste

Except as expressly permitted, no person shall wantonly waste or destroy any usable part of any protected wild animal.

Transporting arms

IT IS UNLAWFUL:

- To transport any firearm, including muzzle-loading firearms, in a motor vehicle, airplane, or snowmobile unless the firearm is unloaded in all barrels and magazine, and contained in a gun case expressly made for that purpose which is fully enclosed by being zipped, snapped, buckled, tied, or otherwise fastened with no

portion of the firearm exposed, or the firearm is unloaded and in the trunk of the car with the trunk door closed.

A muzzle-loading firearm with a flintlock ignition is fully unloaded if it has no priming powder in any pan. A muzzle-loading firearm with percussion ignition is fully unloaded if it has no percussion cap on any nipple.

- To transport a bow and arrow in a motor vehicle, airplane, or snowmobile unless unstrung or completely contained in a case or contained in the trunk of the car with the trunk door closed.

Shooting hours

(Time of sunrise and sunset is found in the *Minnesota Hunting and Trapping Regulations Handbook).*

Shooting hours are one-half hour before sunrise to one-half hour after sunset.

Tagging deer

The tag, which is a part of the hunters license, must be attached to the deer at the site of the kill, and the license must be validated before the animal may be removed from the site of the kill. The tag can be validated by using a knife or similar sharp object to cut out, or a pen to mark, the appropriate notches indicating:

- month the deer was killed,
- day it was killed, and
- time of day it was killed (a.m. or p.m.).

Mark the tag carefully—if more than one month, date, or time is cut out or marked, the tag becomes invalid. The tag may be sealed around the base of either antler, or through a slit cut through either ear, or between the tendon and the bone of a hind leg around either the tendon or the bone. To seal the tag, remove the tag's adhesive backing and seal the adhesive side together. The tag must be attached so that it cannot be readily removed.

Registering deer

Every deer taken must be registered. Registration stations display large, orange "Big Game Registration" signs. You may view a complete list of all stations at any DNR Wildlife office or county auditor's office.

The person whose tag is on the deer must personally present the deer at an official deer registration station and receive a possession tag. The license number and the year of issue are written on the possession tag by the registration agent.

A possession tag must be obtained:

a) within 24 hours after the expiration of the season under which the deer was taken (for example, a deer taken during the Zone 4A firearms season must be registered within 24 hours after the close of the 4A season, even if the deer is tagged by a Multi-Zone Buck licensee); and

b) before the deer is processed, either privately or commercially (except skin and entrails may be removed before registration).

c) a deer taken by bow must be registered within 48 hours after being taken.

Transporting deer

- a legally registered animal may be transported any time during and after the deer hunting season.
- the licensee must accompany the deer in transport except as follows: A deer that has been registered may be transported by another person, if the signature, address, and license number of the licensee and the origin and destination of the transport are written on the back of the possession tag. A licensee also does not have to accompany an animal transported by commercial transportation (see the *Minnesota Hunting and Trapping Regulations Handbook* available from DNR License Bureau or license vendors, for details).
- all deer in transport must be readily accessible for inspection by DNR conservation officers.
- the head of a deer must remain attached to the carcass until the deer is registered. Deer may be quartered before being registered, but the animal's head must remain attached to one of the quarters.

Safety provisions

You may not hunt or trap during the open season where deer may be taken by firearms (including muzzle loaders) under applicable laws and ordinances unless the visible portion of your cap and outer clothing above the waist, excluding sleeves and gloves, is blaze orange. Red is not a legal color. Blaze orange includes a camouflage pattern of

t least 50 percent blaze orange within each square foot. his restriction does not apply to migratory waterfowl hunters on waters or in a stationary shooting location.

You may not discharge any firearm or bow and arrow upon, over, or across any improved public highway at any big game animal, or when within the limits of the right-of-way of any improved public road.

You may not hunt protected wild animals with firearms or bow and arrow while visibly intoxicated, under the influence of narcotics, or if a habitual user of narcotics.

Artificial lights

A person may not cast the rays of a spotlight, headlight, or other artificial light onto a highway or into a field, woodland, or forest to spot, locate, or take a wild animal while possessing, either individually or as one of a group, a firearm, bow, or other implement that could be used to kill big game. The exceptions to this regulation are:

a) A firearm that is unloaded, cased, and in the closed trunk* of a motor vehicle or

b) A bow that is completely encased or unstrung and in the trunk of a motor vehicle.

Note: This regulation does not apply to taking raccoons or tending traps according to all other regulations as written in the Minnesota Hunting and Trapping Regulations Handbook.

Further restrictions: September 1–December 31

- With or without a firearm or bow, no person may cast the rays of a spotlight, headlight, or other artificial light into a field, woodland, or forest to spot, locate, or take a wild animal between the hours of 10 p.m. and 6 a.m. from September 1 to December 31. The exceptions are: taking raccoons and tending traps in accordance with all other regulations in the *Minnesota Hunting and Trapping Regulations Handbook.*
- It is not a violation of this law to shine lights while doing any agricultural, occupational, or recreational activity, including snowmobiling, not related to spotting, locating, or taking a wild animal.

If the motor vehicle does not have a trunk, the firearm or bow must be in the rearmost portion of the vehicle.

Dogs pursuing deer

A dog that is known to have killed or which is observed wounding, killing, or pursuing in a manner which endangers a big game animal, may be killed by a peace or conservation officer. Between January 1 and July 14, any person may kill such a dog. The officer or person killing such a dog is not liable for damages and the dog owner is guilty of a petty misdemeanor and subject to a civil penalty of up to $500 for each violation. The owner of any dog that kills or pursues domestic livestock is guilty of a petty misdemeanor.

Trespass law

This is only a summary of the Minnesota Trespass Law relating to taking wild animals. The complete text of this law is found in Minn. Stat. § 97B.001 and § 97A.315. In addition, there are other state laws pertaining to trespass that may apply. Consult local law enforcement authorities if you have questions.

Trespass is the most frequent complaint landowners have against hunters. Trespassing is illegal and can ruin hunters' and the DNR's relations with private landowners. This in turn hampers habitat programs, cut off land access, and possibly eliminates the future of hunting in many areas of Minnesota.

Always ask permission before entering private land. If you are caught trespassing, you may be issued a citation and assessed a fine under civil penalties, and the repeat violators can lose their license or registration. Or, if you are convicted of violating trespass laws under criminal procedures, you may lose your hunting privileges for up to two years, lose hunting equipment, and be subject to fines and possibly a jail sentence. All DNR conservation officers and all other licensed peace officers enforce trespass laws and may issue a citation to a person who trespasses in violation of the law or who removes a sign without authorization.

Restrictions

Exceptions, definitions, and posting requirements:

- A person may not enter legally posted land for outdoor recreation purposes without permission.
- A person may not enter agricultural land, including Conservation Reserve Program (CRP) and RIM reserve land, for outdoor recreation purposes without permission. If in doubt whether or not land is CRP or RIM, ask the landowner.

- A person may not remain on private land for outdoor recreation purposes after being told to leave.
- On another person's private land or a public right-of-way, a person may not take a wild animal with a firearm within 500 feet of a building occupied by humans or livestock without written permission.
- A person may not take a wild animal with a firearm within 500 feet of a corral containing livestock without permission.
- A person may not take a wild animal on any land where the person is prohibited from lawfully entering by this law.
- A person may not wound or kill another person's domestic animal, destroy private property, or pass through a closed gate without returning it to the original position.
- No person (including the lessee) may hunt on any land leased from the state that has been legally posted by the lessee to prohibit hunting.

Exceptions

- A person on foot may, without permission, enter land that is not legally posted to retrieve a wounded animal that was lawfully shot.
- A person on foot may, without permission, enter private land without a firearm to retrieve a hunting dog. After retrieving the dog, the person must immediately leave the premises. This exception does not authorize the taking of the wild animal.

Definitions and posting requirements

- "Outdoor Recreation" means any activity including hunting, fishing, trapping, boating, hiking, camping, and engaging in winter sports which is conducted primarily for the purposes of pleasure, rest, or relaxation and is dependent on or derives its principal benefit from natural surroundings.
- "Agricultural Land" is land that is plowed or tilled; has standing crops or crop residue; is within a maintained fence for enclosing domestic livestock; or is enrolled in the federal Conservation Reserve Program (CRP) or the state RIM Reserve Program. Landowners: You are strongly encouraged to legally post your CRP or RIM land. It is often difficult for hunters to be able to distinguish these lands from non-agricultural lands.
- To be legally posted, land must have signs:
  - posted once each year that state "no trespassing" or similar terms either: 1) along the boundaries every 1,000 feet or less, or in wooded areas where boundaries are less clear, at intervals of 500 feet or less; or 2) at the primary corners of each parcel of land and at access roads and trails at points of entrance to each parcel, except corners only accessible through agricultural land need not be posted.
  - with lettering at least two inches high and the signature or the legible name and telephone number of the owner, occupant, lessee, or authorized manager. An unauthorized person may not post land with signs prohibiting outdoor recreation or trespass.
- Notification to stay off private land, authorization to remove a sign posted to prevent trespass, or legal permission to enter private land or to take wild animals near occupied building or corals, may only be given by the owner, occupant, or lessee.

To protect the future of hunting, always ask permission before entering private land.

Questions for the conservation officer

Introduction

"Plan your hunt and hunt your plan." This advice is a "must do" for deer hunters that want a safe and successful hunt. Part of the plan includes knowing and following the deer hunting regulations. Often hunters accept what they think they have heard to be the correct regulation. Hunters must study and learn the regulations each season as regulations are updated yearly. Also, hunters must know the regulations for the area of the country or part of the state they will be hunting—regulations vary for different parts of the country.

Conservation officers are often asked questions related to hunting regulations. The questions and answers that follow are some that conservation officers are frequently asked. Use them to help you understand and follow the regulations they are addressing.

Note: The regulations that are addressed in the following paragraphs were correct at the time of writing. It is the hunter's responsibility to determine the current regulations.

1. **If I wound a deer and it goes onto someone else's land, am I allowed to follow the trail and retrieve it?**

   Answer: This depends on the type of land and whether or not the land is posted against trespass. First, there is no requirement for a landowner to post private agricultural lands. This land is posted by law without being signed. If a wounded animal goes onto "unposted" (by sign) agricultural land, a hunter may walk onto the land to retrieve the animal. If approached by the person who is controlling the land (owner, occupant, or lessee) and told to leave, the hunter must immediately leave. The landowner is not entitled to keep the animal unless he or she has lawfully taken it. Until an animal has been lawfully taken, the ownership remains with the state.

   In the case of lands that are posted by signing, whether they are wooded or agricultural, a hunter may not enter those lands without permission. This is usually accomplished by talking to neighboring landowners before season and developing some good relationships.

2. **If I wound a deer and it gets dark before I can find it, can I use a flashlight to look for or trail it after dark?**

   Answer: Without a firearm, bow, or any other means to kill the deer in possession you may use an artificial light to recover the deer until 10 p.m. After 10 p.m., the "shining law" prohibits the use of artificial light. Generally, if you haven't found the deer by 10 p.m., it may not be mortally wounded and it would be better to continue your search in the daylight the next morning.

3. **I shot a deer in the afternoon on the last day of the deer firearms season. I am unable to find the deer that day. May I go out the next day and track the deer with the aid of my dog as long as I do not have a firearm along?**

   Answer: No. It is unlawful to use the aid of a dog to assist in any manner in the taking of deer. This includes tracking. Also, the season is now closed. The hunter should contact the local conservation officer regarding the deer.

4. **Is it legal to use open peep sights with fiber optics on my muzzle loader during the special muzzle loader season?**

   Answer: Yes. The fiber optics do not magnify the image, but only enhance the natural light source.

5. **Is it legal to use a laser scope for deer hunting? The laser does project a small dot of light on the target.**

   Answer: No. The laser that projects the dot on the target would be considered an artificial light and is unlawful to use to take wild animals in Minnesota.

6. Can I use my uncle's deer tag so long as he's back at our deer shack?

Answer: No. This is a common misunderstanding that results in many costly citations each year. The DNR allows party hunting, which means that members of a group of hunters can kill a deer for other members who haven't yet killed a deer but have purchased a license. But the agency has certain restrictions to make sure that parties don't shoot more deer than the available number of tags or permits possessed by the party.

The most important regulation requires that all hunters who intend to tag deer for each other be hunting together, in the field, at the time the deer are shot. Party members who remain in camp or are not hunting near the shooter when the deer is taken may not legally tag that deer.

When in the field, hunters can only party hunt if they hunt close enough to each other to quickly communicate when one has shot a deer.

Enforcement conservation officers and peace officers must enforce the trespass laws.

Turn In Poachers (TIP)

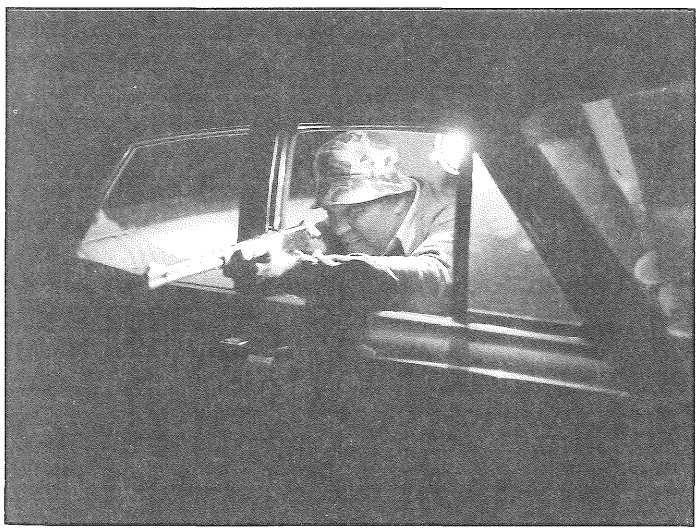
In many states, the illegal killing of fish and wildlife—poaching—has become a serious problem. The Minnesota DNR estimates that the accidental and illegal killing of white-tailed deer may be more than one-half of the annual harvest taken by licensed hunters.

Minnesota's economic loss to poaching has been projected to be $25 million or more, calculated on the basis that the average deer has an economic value of $600. This enormous loss does not include moose, waterfowl, fish, pheasants, grouse, and other game birds, or a significant number of protected species.

TIP is a non-profit grassroots movement formed by a group of concerned conservationists who are dedicated to preserving our vast treasury of fish and wildlife.

How the program works

Basically, TIP encourages Minnesotans to make anonymous reports of fish and wildlife violations for a cash reward. Anyone wishing to report a game and fish law violation may call the toll free number 1-800-652-9039, or 651-297-3999 in the seven-county metropolitan area. To protect the person's anonymity, the caller is assigned a code number to use when communicating with the DNR's Division of Enforcement.



The accidental and illegal killing of white-tailed deer may be more than one-half of the annual harvest by licensed hunters.

Information provided by the caller is recorded on a numbered form which is sent to the conservation officer assigned to the area nearest the violation. If the tip leads to an arrest, the investigating officer returns the form to TIP via the Division of Enforcement headquarters in St. Paul.

Each tipster is told to watch local newspapers for an announcement of an arrest. Once they read of the arrest, they can call the same toll-free or metro area phone number, identify themselves by the code number, and make arrangements for the reward to be paid.

TIP rewards

Rewards paid to tipsters fall into three categories: $100 minimum for small game, fish, and non-game species violations; $250 minimum for big game and endangered species; and up to $1,000 maximum for violations such as large numbers of animals taken illegally or a commercial poaching venture. TIP is aimed at controlling the persistent violator and poaching rings that exist in Minnesota. However, no leads are turned down. If a call is received about a hunter shooting too many ducks, the report will probably be pursued—a violation is a violation.

Sometimes poachers use heinous methods to kill wildlife, from leg snares to wire nooses that can slowly strangle a luckless deer. After all, poachers are mostly concerned about how they can avoid getting caught. If they cripple a deer while spotlighting at night, they will simply leave it to find another animal that they can kill quickly.

You can help

TIP works only if the public supports the program. Citizens must be willing to make anonymous tips to stop game and fish lawbreakers. Financial support is also important. TIP is not an enforcement arm of government. It is a private, non-profit foundation whose board of directors is composed of citizens throughout Minnesota. Like any foundation, it survives primarily on donations.

For more information on TIP, call toll-free at 1-800-652-9093 or 651-297-3999 in the metro area.

Using a Compass and a Map

Hunters' responsibility

It is the hunters' responsibility to know:

- How to get where you want to go
- Where you are (whose land you are on)
- How to get back to where you started from

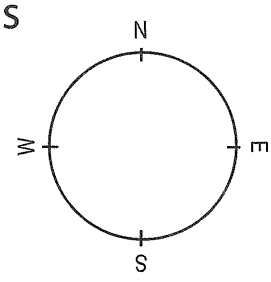
Safe and responsible hunters learn to use a compass and to read and use a variety of maps so they do not get lost. Getting lost generally occurs when a person lacks navigating skills or poorly planned the outing or both. Getting lost results in much undue stress to family, partners, and friends, not to mention the considerable cost incurred in attempting to find the lost hunter. Many people, when lost, are found carrying a compass. When asked why they didn't use the compass to find their way back, their reply is either they didn't know how to use it or they didn't believe what the compass was telling them.

The following section on map and compass is designed to introduce you to navigating with the use of map and compass—tools that can help you become a more responsible hunter.

How to use a compass

Using the compass alone

Learn the directions on the compass first: North, South, East, and West. Look at the figure and see how they are positioned. North is the most important.



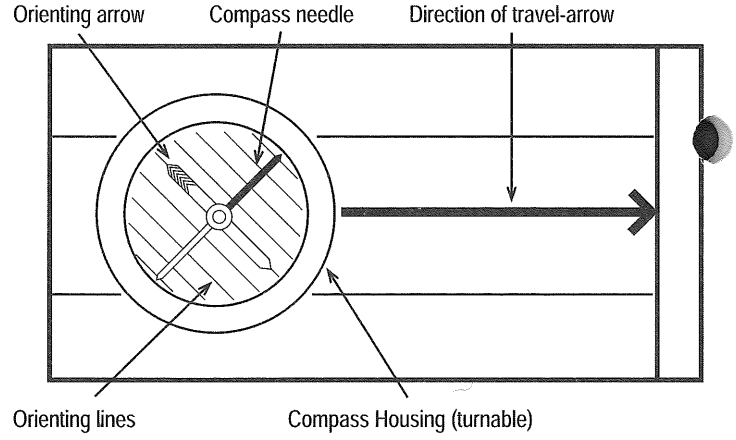
The orienteering compass

The red and black arrow is called the compass needle. On some compasses, the arrow might be red and white, but the red part of it is always pointing towards the earth's magnetic north pole. The needle is contained in the compass housing. On the edge of the compass housing, there is a scale from 0 to 360 indicating degrees, or bearing. Generally, the letters N, S, E, and W are used for North, South, East, and West. If you want to go in a direction between two of these positions, you would combine them.

For example, if you want to go in a direction just between North and West, you simply say: "I would like to go northwest."

Let's use that example: You want to go northwest. You find out where northwest is on the compass housing. Then you turn the compass housing so that "northwest" on the housing comes exactly where the large direction of travel-arrow meets the housing.

Hold the compass flat in your hand so that the compass needle can turn. Then turn yourself, your hand, and the entire compass (just make sure the compass housing doesn't turn) until the compass needle is aligned with the lines inside the compass housing.



Now, it's time to be careful! It is extremely important that the red, or north part of the compass needle, points at north in the compass housing. If south points at north, you would walk off in the exact opposite direction of where you want to go! So always take a second look to make sure you did it right!

Another problem you might encounter is local magnetic attractions. If you are carrying something made of iron, it could disturb the arrow. Even a staple in your map might be a problem. Make sure there is nothing of the sort around. There is the possibility for magnetic attractions to exist in the soil as well. This is known as "magnetic deviation." While rare, magnetic deviation might occur if you're in a mining district.

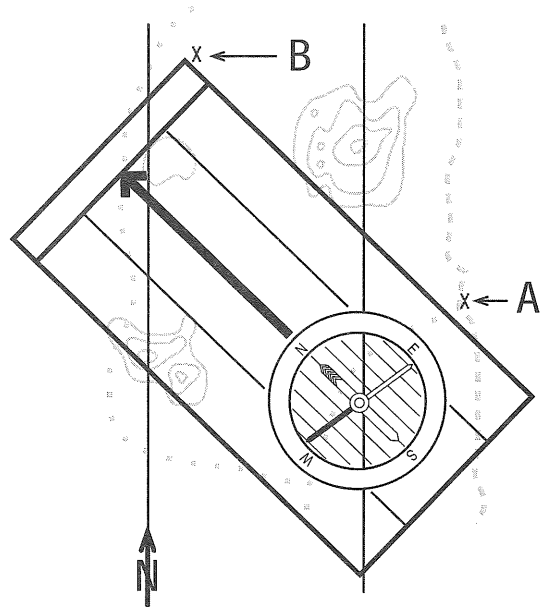
When you're sure you've got it right, walk off in the direction the travel-arrow is pointing. To avoid getting off course, make sure to look at the compass quite frequently, say every hundred yards at least, but don't stare down on the compass. Once you have your direction, aim on some point in the distance, and go there.

When do you need to use this technique?

You'll need to use this technique if you don't know where you are and you're without a map. However, you do know that there is a road, trail, stream, river, or something long and big you can't miss if you go in the right direction. And you know in what direction, or the approximate direction, you must go to get there. Then all you need to do is to simply turn the compass housing so that the direction you want to go in is where the direction of travel-arrow meets the housing and follow the steps listed above.

Using the compass in conjunction with a map

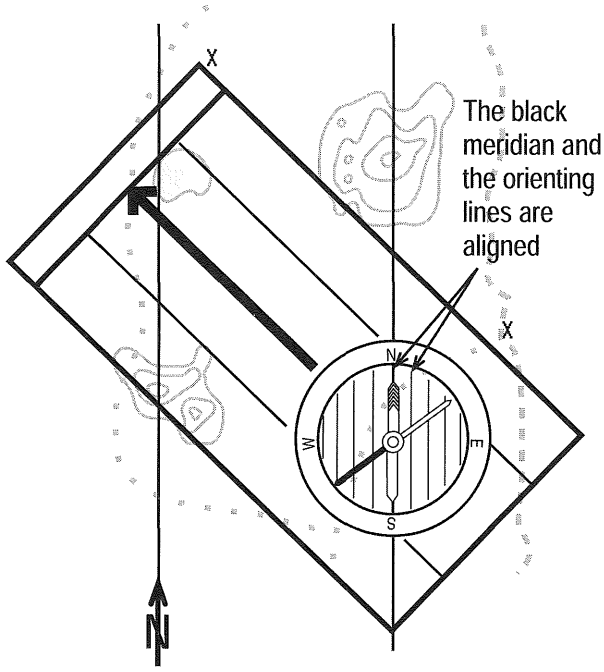
It takes practice, but before long you'll be able to use a compass along with a map to help you navigate terrain you've never been in before safely and accurately. Say you want to go from the trail crossing at "A," to the rock at point "B." Of course, to use this method successfully, you'll have to know you really are at "A." Put your compass on the map so that the edge of the compass is at "A." The edge you must be using is the edge that is parallel to the direction of travel-arrow. Then put "B" somewhere along the same edge, like it is on the drawing. Of course, you could use the direction arrow itself, or one of the parallel lines, but it's usually more convenient to use the edge.



Take careful note: the edge of the compass, or rather the direction arrow, must point from "A" to "B." If you do this incorrectly, you'll walk off in the exact opposite direction of where you want to go! So, take a second look. Beginners often make this mistake.

Keep the compass steady on the map. Next, align the orienting lines and the orienting arrow with the meridian lines of the map—the lines on the map going north, that is. While you have the edge of the compass carefully aligned from "A" to "B," turn the compass housing so that the orienting lines in the compass housing are aligned with the meridian lines on the map. During this action, you don't need to be concerned with what happens to the compass needle.

However, there are a number of serious mistakes that can be made here. First, let's discuss the problem of going in the opposite direction. Be absolutely certain that you know where north is on the map, and be sure that the orienting arrow is pointing towards north on the map. Normally, north will be "up" on the map. It is possible, though, to make the mistake of letting the orienting arrow point towards south on the map.

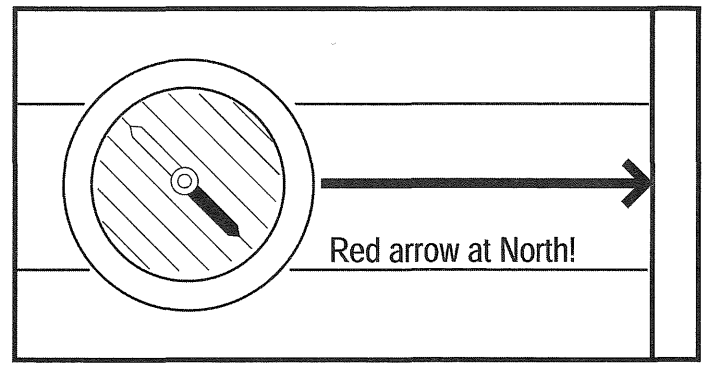


Keep an eye on the edge of the compass. If the edge isn't going along the line from "A" to "B" when you have finished turning the compass housing, you will have an error in your direction which will take you off your course.

When you're sure you have the compass housing right, you may take the compass away from the map. Now you can read the bearing off the housing from where the housing meets the direction of travel arrow. Be sure that the housing doesn't turn before you reach your target "B"!

Hold the compass flat in your hand so that the compass needle can turn. Then turn yourself, your hand, and the entire compass making sure the compass housing doesn't turn. Turn it until the compass needle is aligned with the lines inside the compass housing.

The mistake is again to let the compass needle point towards the south. The red part of the compass needle must point at north in the compass housing, or you'll go in the opposite direction.

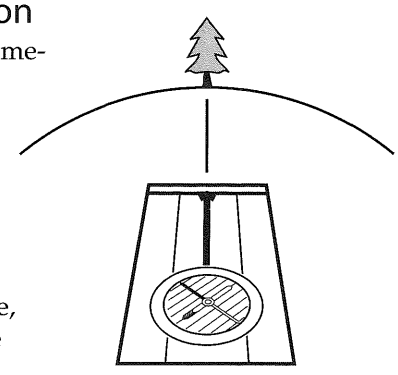


It's time to walk off, but you'll need to do that in a special way as well in order to do so with complete accuracy. Hold the compass in your hand, the needle well-aligned with the orienting arrow. Then aim, as carefully as you can, in the direction that the travel-arrow is pointing. Fix your eye on some special geographic feature—one that is located as far as you can see in that direction. Then go there. As you go, be sure that the compass housing doesn't turn. If you're in a dense forest, you might need to aim several times. Hopefully, you will reach your target "B" when you do this.

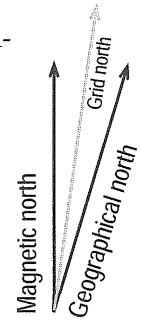
At this time, you may want to go out and practice reading your compass.

Magnetic declination

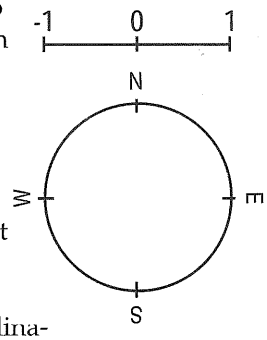
Unfortunately, there is something called "magnetic declination." Magnetic declination occurs when the compass needle points towards the magnetic north pole and the map is pointing towards the geographic north pole, but they are not the same place.



First, you'll have to know how large the declination is in degrees. This depends on where on earth you're standing. Topographic maps from the U.S. Geological Survey give the declination for the map. You have to remember, the declination changes significantly in some areas, so you'll need to know what it is this year.



The declination is given as, for example, "15 degrees east." When you look at the figure, you can pretend that plus is to the right, or east, and minus is to the left and west—like a curved row of numbers. When something is more than zero, you'll subtract to get it back to zero. And if it is less, you'll need to add. In this case you'll subtract fifteen degrees to the bearing by turning the compass housing, according to the numbers on the housing. Now, finally, the direction of the travel-arrow points in the direction you want to go. Again, be careful to aim at some distant object, and off you go.



There is a fast method to find the declination wherever you are. This method is advantageous because it corrects for any local conditions that may be present. This is what you do:

1. Determine by map inspection the grid bearing from your location to a known, visible, distant point. The further away, the more accurate it gets. This means you have to know where you are and be pretty sure about one other feature in the terrain.

2. Sight on that distant point with the compass and note the magnetic bearing. Do this by turning the compass housing so that it is aligned with the needle. You now read the number from the housing where it meets the base of the direction of travel-arrow.

3. Compare the two bearings. The difference is the declination.

4. Update as necessary. You shouldn't need to do this very often, unless you travel in a terrain with lots of mineral deposits.

Uncertainty

You can't alawys expect to hit exactly what you are looking for. In fact, you must expect to get a little off couse. How much you get off course often depends on the things around you: for example, how dense the forest is, if there is fog, and above all, visibility. Ultimately, it depends on how accurate you are. You do make things better by being careful when you take a course, and it is important to aim as far ahead as you can see. As a rule of thumb, under normal forest conditions, the uncertainty is one-tenth of the distance traveled. If you go 200 yards on course, it is possible that you end up a little off course, perhaps by 20 yards or so. If you're looking for something smaller than 20 yards across, there is a chance you'll miss your mark.

Practice! Practice! Practice! Get a compass and a topographic map of an area that you're familiar with and use them together.

Appendix

Official Boone and Crockett scoring system forms

Forms for typical and non-typical white-tailed and coues' deer follow.

Reprinted courtesy of:

Boone and Crockett Club
250 Station Drive
Missoula, MT 59801
(406) 542-1888

Minimum score requirements for white-tailed deer to be entered into the Boone and Crockett records:

• typical white-tailed deer	170
• non-typical white-tailed deer	195

Records of
North American
Big Game

250 Station Drive
Missoula, MT 59801
(406) 542-1888

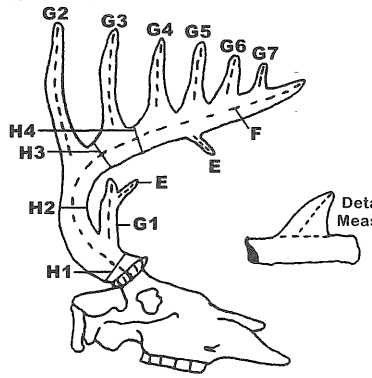
BOONE AND CROCKETT CLUB®

OFFICIAL SCORING SYSTEM FOR NORTH AMERICAN BIG GAME TROPHIES

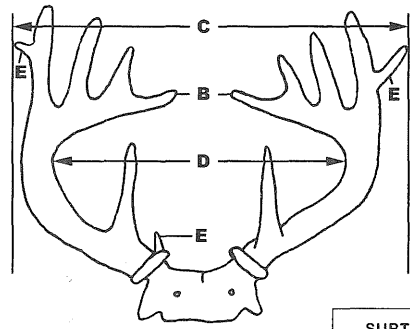
	MINIMUM SCORES AWARDS	ALL-TIME
whitetail	160	170
Coues'	100	110

TYPICAL WHITETAIL AND COUES' DEER

KIND OF DEER (check one)
☐ whitetail
☐ Coues'



Detail of Point Measurement



Abnormal Points	
Right Antler	Left Antler
SUBTOTALS	
TOTAL TO E	

SEE OTHER SIDE FOR INSTRUCTIONS				COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
A. No. Points on Right Antler		No. Points on Left Antler		Spread Credit	Right Antler	Left Antler	Difference
B. Tip to Tip Spread		C. Greatest Spread					
D. Inside Spread of Main Beams		SPREAD CREDIT MAY EQUAL BUT NOT EXCEED LONGER ANTLER					
E. Total of Lengths of Abnormal Points							
F. Length of Main Beam							
G-1. Length of First Point							
G-2. Length of Second Point							
G-3. Length of Third Point							
G-4. Length of Fourth Point, If Present							
G-5. Length of Fifth Point, If Present							
G-6. Length of Sixth Point, If Present							
G-7. Length of Seventh Point, If Present							
H-1. Circumference at Smallest Place Between Burr and First Point							
H-2. Circumference at Smallest Place Between First and Second Points							
H-3. Circumference at Smallest Place Between Second and Third Points							
H-4. Circumference at Smallest Place Between Third and Fourth Points							
TOTALS							

ADD	Column 1		Exact Locality Where Killed:
	Column 2		Date Killed: Hunter:
	Column 3		Owner: Telephone #:
	Subtotal		Owner's Address:
	SUBTRACT Column 4		Guide's Name and Address:
	FINAL SCORE		Remarks: (Mention Any Abnormalities or Unique Qualities)

I, _____, certify that I have measured this trophy on _____
PRINT NAME MM/DD/YYYY

at _____
STREET ADDRESS CITY STATE/PROVINCE

and that these measurements and data are, to the best of my knowledge and belief, made in accordance with the instructions given.

Witness: _____ Signature: _____ I.D. Number | | | | |
B&C OFFICIAL MEASURER

INSTRUCTIONS FOR MEASURING TYPICAL WHITETAIL AND COUES' DEER

All measurements must be made with a 1/4-inch wide flexible steel tape to the nearest one-eighth of an inch. (Note: A flexible steel cable can be used to measure points and main beams only.) Enter fractional figures in eighths, without reduction. Official measurements cannot be taken until the antlers have air dried for at least 60 days after the animal was killed.

A. Number of Points on Each Antler: To be counted a point, the projection must be at least one inch long, with the length exceeding width at one inch or more of length. All points are measured from tip of point to nearest edge of beam as illustrated. Beam tip is counted as a point but not measured as a point.

B. Tip to Tip Spread is measured between tips of main beams.

C. Greatest Spread is measured between perpendiculars at a right angle to the center line of the skull at widest part, whether across main beams or points.

D. Inside Spread of Main Beams is measured at a right angle to the center line of the skull at widest point between main beams. Enter this measurement again as the Spread Credit if it is less than or equal to the length of the longer antler; if greater, enter longer antler length for Spread Credit.

E. Total of Lengths of all Abnormal Points: Abnormal Points are those non-typical in location (such as points originating from a point or from bottom or sides of main beam) or extra points beyond the normal pattern of points. Measure in usual manner and enter in appropriate blanks.

F. Length of Main Beam is measured from the center of the lowest outside edge of burr over the outer side to the most distant point of the main beam. The point of beginning is that point on the burr where the center line along the outer side of the beam intersects the burr, then following generally the line of the illustration.

G-1-2-3-4-5-6-7. Length of Normal Points: Normal points project from the top of the main beam. They are measured from nearest edge of main beam over outer curve to tip. Lay the tape along the outer curve of the beam so that the top edge of the tape coincides with the top edge of the beam on both sides of the point to determine the baseline for point measurements. Record point lengths in appropriate blanks.

H-1-2-3-4. Circumferences are taken as detailed in illustration for each measurement. If brow point is missing, take H-1 and H-2 at smallest place between burr and G-2. If G-4 is missing, take H-4 halfway between G-3 and tip of main beam.

ENTRY AFFIDAVIT FOR ALL HUNTER-TAKEN TROPHIES

For the purpose of entry into the Boone and Crockett Club's® records, North American big game harvested by the use of the following methods or under the following conditions are ineligible:

I. Spotting or herding game from the air, followed by landing in its vicinity for the purpose of pursuit and shooting;
II. Herding or chasing with the aid of any motorized equipment;
III. Use of electronic communication devices, artificial lighting, or electronic light intensifying devices;
IV. Confined by artificial barriers, including escape-proof fenced enclosures;
V. Transplanted for the purpose of commercial shooting;
VI. By the use of traps or pharmaceuticals;
VII. While swimming, helpless in deep snow, or helpless in any other natural or artificial medium;
VIII. On another hunter's license;
IX. Not in full compliance with the game laws or regulations of the federal government or of any state, province, territory, or tribal council on reservations or tribal lands;

I certify that the trophy scored on this chart was not taken in violation of the conditions listed above. In signing this statement, I understand that if the information provided on this entry is found to be misrepresented or fraudulent in any respect, it will not be accepted into the Awards Program and 1) all of my prior entries are subject to deletion from future editions of **Records of North American Big Game** 2) future entries may not be accepted.

FAIR CHASE, as defined by the Boone and Crockett Club®, is the ethical, sportsmanlike and lawful pursuit and taking of any free-ranging wild, native North American big game animal in a manner that does not give the hunter an improper advantage over such game animals.

The Boone and Crockett Club® may exclude the entry of any animal that it deems to have been taken in an unethical manner or under conditions deemed inappropriate by the Club.

Date: _____ Signature of Hunter: _____
(SIGNATURE MUST BE WITNESSED BY AN OFFICIAL MEASURER OR A NOTARY PUBLIC.)

Date: _____ Signature of Notary or Official Measurer: _____

Records of
North American
Big Game

250 Station Drive
Missoula, MT 59801
(406) 542-1888

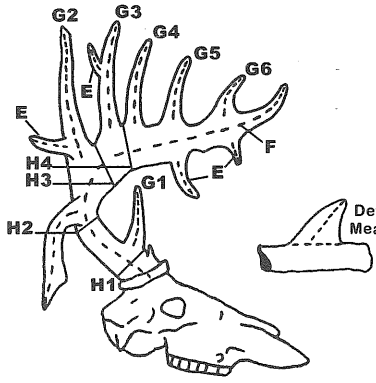
BOONE AND CROCKETT CLUB®

OFFICIAL SCORING SYSTEM FOR NORTH AMERICAN BIG GAME TROPHIES

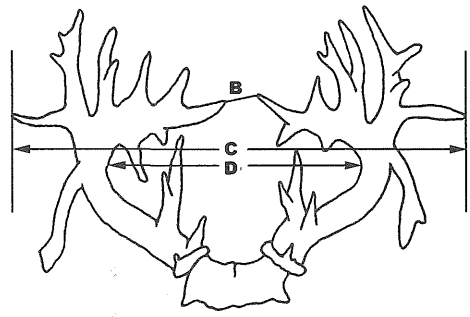
MINIMUM SCORES	AWARDS	ALL-TIME
whitetail	185	195
Coues'	105	120

NON-TYPICAL WHITETAIL AND COUES' DEER

KIND OF DEER (check one)
☐ whitetail
☐ Coues'



Detail of Point Measurement



Abnormal Points	
Right Antler	Left Antler
SUBTOTALS	
E. TOTAL	

SEE OTHER SIDE FOR INSTRUCTIONS				COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4
A. No. Points on Right Antler		No. Points on Left Antler		Spread Credit	Right Antler	Left Antler	Difference
B. Tip to Tip Spread		C. Greatest Spread					
D. Inside Spread of Main Beams		SPREAD CREDIT MAY EQUAL BUT NOT EXCEED LONGER ANTLER					
F. Length of Main Beam							
G-1. Length of First Point							
G-2. Length of Second Point							
G-3. Length of Third Point							
G-4. Length of Fourth Point, If Present							
G-5. Length of Fifth Point, If Present							
G-6. Length of Sixth Point, If Present							
G-7. Length of Seventh Point, If Present							
H-1. Circumference at Smallest Place Between Burr and First Point							
H-2. Circumference at Smallest Place Between First and Second Points							
H-3. Circumference at Smallest Place Between Second and Third Points							
H-4. Circumference at Smallest Place Between Third and Fourth Points							
TOTALS							

ADD	Column 1	
	Column 2	
	Column 3	
Subtotal		
SUBTRACT Column 4		
Subtotal		
ADD Line E Total		
FINAL SCORE		

Exact Locality Where Killed:

Date Killed: Hunter:

Owner: Telephone #:

Owner's Address:

Guide's Name and Address:

Remarks: (Mention Any Abnormalities or Unique Qualities)

I, _____, certify that I have measured this trophy on _____
PRINT NAME MM/DD/YYYYY

at _____
STREET ADDRESS CITY STATE/PROVINCE

and that these measurements and data are, to the best of my knowledge and belief, made in accordance with the instructions given.

Witness: _____ Signature: _____ I.D. Number
B&C OFFICIAL MEASURER

INSTRUCTIONS FOR MEASURING NON-TYPICAL WHITETAIL AND COUES' DEER

All measurements must be made with a 1/4-inch wide flexible steel tape to the nearest one-eighth of an inch. (Note: A flexible steel cable can be used to measure points and main beams only.) Enter fractional figures in eighths, without reduction. Official measurements cannot be taken until the antlers have air dried for at least 60 days after the animal was killed.

A. Number of Points on Each Antler: To be counted a point, the projection must be at least one inch long, with the length exceeding width at one inch or more of length. All points are measured from tip of point to nearest edge of beam as illustrated. Beam tip is counted as a point but not measured as a point.

B. Tip to Tip Spread is measured between tips of main beams.

C. Greatest Spread is measured between perpendiculars at a right angle to the center line of the skull at widest part, whether across main beams or points.

D. Inside Spread of Main Beams is measured at a right angle to the center line of the skull at widest point between main beams. Enter this measurement again as the Spread Credit if it is less than or equal to the length of the longer antler; if greater, enter longer antler length for Spread Credit.

E. Total of Lengths of all Abnormal Points: Abnormal Points are those non-typical in location (such as points originating from a point or from bottom or sides of main beam) or extra points beyond the normal pattern of points. Measure in usual manner and enter in appropriate blanks.

F. Length of Main Beam is measured from the center of the lowest outside edge of burr over the outer side to the most distant point of the main beam. The point of beginning is that point on the burr where the center line along the outer side of the beam intersects the burr, then following generally the line of the illustration.

G-1-2-3-4-5-6-7. Length of Normal Points: Normal points project from the top of the main beam. They are measured from nearest edge of main beam over outer curve to tip. Lay the tape along the outer curve of the beam so that the top edge of the tape coincides with the top edge of the beam on both sides of the point to determine the baseline for point measurement. Record point lengths in appropriate blanks.

H-1-2-3-4. Circumferences are taken as detailed in illustration for each measurement. If brow point is missing, take H-1 and H-2 at smallest place between burr and G-2. If G-4 is missing, take H-4 halfway between G-3 and tip of main beam.

ENTRY AFFIDAVIT FOR ALL HUNTER-TAKEN TROPHIES

For the purpose of entry into the Boone and Crockett Club's® records, North American big game harvested by the use of the following methods or under the following conditions are ineligible:

I. Spotting or herding game from the air, followed by landing in its vicinity for the purpose of pursuit and shooting;
II. Herding or chasing with the aid of any motorized equipment;
III. Use of electronic communication devices, artificial lighting, or electronic light intensifying devices;
IV. Confined by artificial barriers, including escape-proof fenced enclosures;
V. Transplanted for the purpose of commercial shooting;
VI. By the use of traps or pharmaceuticals;
VII. While swimming, helpless in deep snow, or helpless in any other natural or artificial medium;
VIII. On another hunter's license;
IX. Not in full compliance with the game laws or regulations of the federal government or of any state, province, territory, or tribal council on reservations or tribal lands;

I certify that the trophy scored on this chart was not taken in violation of the conditions listed above. In signing this statement, I understand that if the information provided on this entry is found to be misrepresented or fraudulent in any respect, it will not be accepted into the Awards Program and 1) all of my prior entries are subject to deletion from future editions of **Records of North American Big Game** 2) future entries may not be accepted.

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The Boone and Crockett Club® may exclude the entry of any animal that it deems to have been taken in an unethical manner or under conditions deemed inappropriate by the Club.

Date: _____ Signature of Hunter: _____
(SIGNATURE MUST BE WITNESSED BY AN OFFICIAL MEASURER OR A NOTARY PUBLIC.)

Date: _____ Signature of Notary or Official Measurer: _____

Official Pope and Young scoring system forms

Forms for typical and non-typical white-tailed and coues' deer follow.

Reprinted courtesy of:

Pope and Young Club
Box 548, Dept. BH
Chatfield, MN 55923
(507) 867-4144

Minimum score requirements for white-tailed deer to be entered into the Pope and Young Club records:

•typical white-tailed deer	125
•non-typical white-tailed deer	155

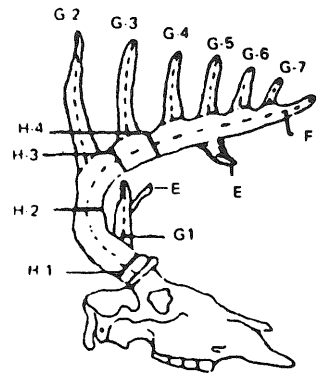
POPE & YOUNG CLUB

NORTH AMERICAN BIG GAME TROPHY SCORING FORM

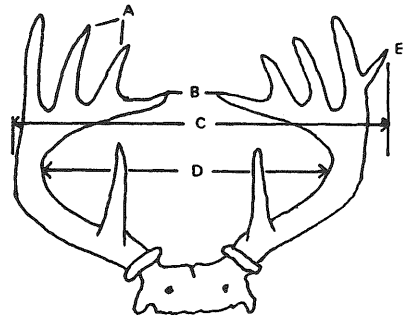
BOWHUNTING

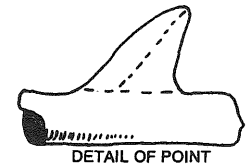
BIG GAME RECORDS

KIND OF DEER _____



TYPICAL
WHITETAIL AND COUES DEER





DETAIL OF POINT MEASUREMENT

Abnormal Points	
Right	Left

Total To E

SEE OTHER SIDE FOR INSTRUCTIONS		Supplementary Data		Column 1	Column 2	Column 3	Column 4
A.	Number of Points on Each Antler	R	L	Spread Credit	Right Antler	Left Antler	Difference
B.	Tip to Tip Spread						
C.	Greatest Spread						
D.	Inside Spread of MAIN BEAMS		Spread credit may equal but not exceed length of longer antler				
E.	Total of Lengths of all Abnormal Points						
F.	Length of Main Beam						
G-1	Length of First Point, if present						
G-2	Length of Second Point						
G-3	Length of Third Point						
G-4	Length of Fourth Point, if present						
G-5	Length of Fifth Point, if present						
G-6	Length of Sixth Point, if present						
G-7	Length of Seventh Point, if present						
H-1	Circumference at Smallest Place Between Burr and First Point						
H-2	Circumference at Smallest Place Between First and Second Points						
H-3	Circumference at Smallest Place Between Second and Third Points						
H-4	Circumference at Smallest Place between Third and Fourth Points Or half way between Third point and Beam Tip if Fourth Point is missing						
TOTALS							

	Column 1		Location of kill (County) (State)
ADD	Column 2		Date killed / By whom killed
	Column 3		Present owner Phone ( )
	Total		Address
	SUBTRACT Column 4		Guide's name and Complete Address
	FINAL SCORE		Remarks: (Mention any abnormalities)

I certify that I have measured the above trophy on_____ 19_____
at (address)_____ City_____
State_____ Zip Code_____ and that these measurements and data are, to the best of my knowledge and belief, made in accordance with the instructions given.

Witness:_____ Signature_____
(To Measurer's Signature)

Pope & Young Club Official Measurer

MEASURER (Print)

ADDRESS

CITY STATE ZIP

INSTRUCTIONS

Measurements must be made with a flexible steel tape or steel cable to the nearest one-eighth of an inch. To simplify addition, please enter fractional figures in **eighths**. Official measurements cannot be taken for at least sixty days after the day the animal was killed. **Please submit photographs (see below).**

A. Number of Points on each antler. To be counted a point, a projection must be at least one inch long AND at some location at least one inch from the tip, the length of the projection must exceed its width. **Beam tip is counted as a point but not measured as a point.**

B. Tip to Tip Spread is measured between tips of main beams.

C. Greatest Spread is measured between perpendiculars at right angles to the center line of the skull at widest part whether across main beams or points.

D. Inside Spread on Main Beam is measured at right angles to the center line of the skull at widest point between main beams. Enter this measurement again in "Spread Credit" column if it is less than or equal to the length of longer antler; if longer, enter longer antler length for spread credit.

E. Total of Length of all Abnormal Points. Abnormal points are generally considered to be those non-typical in location. Sketch all abnormal points on antler illustration (front of form) showing location and approximate size. Measure in usual manner and enter in appropriate blanks.

F. Length of Main Beam is measured from lowest outside edge of burr over outer curve to the most distant point of the main beam. The point of beginning is that point on the burr where the center line along the outer curve of the beam intersects the burr.

G-1-2-3-4-5-6-7. Length of Normal Points. Normal points project from the top of the main beam as shown in illustration. They are measured from nearest edge of beam over outer curve to tip. To determine nearest edge (top edge) of beam, lay the tape along the outer curve of the beam so that the top edge of the tape coincides with the top edge of the beam on both sides of the point. Draw line along top of tape. This line will be base line from which point is measured.

H-1-2-3-4. Circumferences. If first point is missing, take H-1 and H-2 at smallest place between burr and second point. If G-4 is missing, take H-4 halfway between G-3 and tip of main beam. Circumference measurements must be taken with a steel tape (a cable cannot be used for these measurements).

Photographs: All entries must include photographs of the trophy. A right side, left side and front view photograph is required for all antlers. A photograph of the entire animal, preferably at the site of kill, is requested if at all possible.

Drying Period: To be eligible for entry in the Pope & Young Records, a trophy must first have been stored under normal room temperature and humidity for at least 60 days after date of kill. No trophy will be considered which has in any way been altered from its natural state.

THIS SCORING FORM MUST BE ACCOMPANIED BY A SIGNED POPE & YOUNG FAIR CHASE AFFIDAVIT, 3 PHOTOS OF ANTLERS, AND A RECORDING FEE OF $25.00.

POPE & YOUNG CLUB

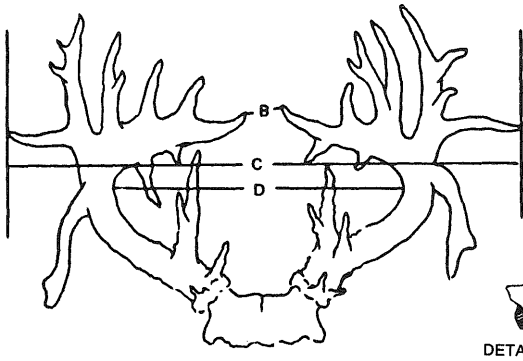
NORTH AMERICAN BIG GAME TROPHY SCORING FORM

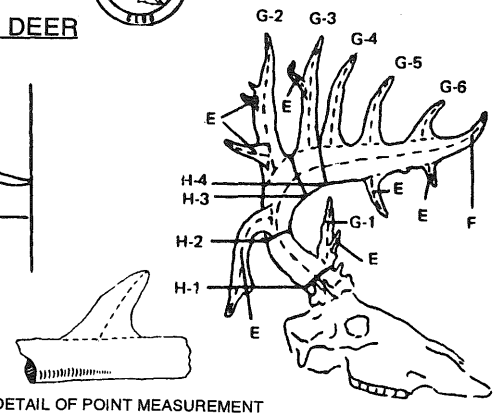
BOWHUNTING

BIG GAME **RECORDS**

KIND OF DEER _____

NON-TYPICAL WHITETAIL AND COUES' DEER





DETAIL OF POINT MEASUREMENT

ABNORMAL

Points Line E	
R	L

Total To E

SEE OTHER SIDE FOR INSTRUCTIONS		Supplementary Data		Column 1	Column 2	Column 3	Column 4
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TOTALS							

ADD	Column 1	
	Column 2	
	Column 3	
	TOTAL	
	SUBTRACT Column 4	
	Result	
	Add Line E Total	
	FINAL SCORE	

Exact locality where killed (County) (State)

Date killed By whom killed

Present owner Phone ( )

Address

Guide's Name and Complete Address

REMARKS: (Mention any abnormalities)

I certify that I have measured the above trophy on _____ 19_____
at (address)_____ City _____
State_____ Zip Code _____ and that these measurements and data are, to the best of my knowledge and belief, made in accordance with the instructions given.

Witness: _____ Signature_____
(To Measurer's Signature) Pope & Young Club Official Measurer

_____
MEASURER (Print)

_____
ADDRESS

_____
CITY STATE ZIP

INSTRUCTIONS

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NOTES

Certificate and Class Information

- For duplicate Advanced Hunter Education, Bowhunter Education, Firearms Safety, and Snowmobile Safety certificates, call 1-800-366-8917. There is a charge for the duplicate certificate.
- For a listing of Firearms Safety and Snowmobile Safety classes, call 651-296-4819.
- For a listing of Advanced Hunter Education and Bowhunter Education classes, call 651-296-5015.

For more information, contact:

Department of Natural Resources
500 Lafayette Road
St. Paul, MN 55155-4040
651-296-6157 (Metro Area)
1-888-MINNDNR (646-6367) (MN Toll Free)
Telecommunication Device for the Deaf
651-296-5484 (Metro Area)
1-800-657-3929 (MN Toll Free)
http://www.dnr.state.mn.us

This information is available in an alternative format upon request.

Printed on recycled paper containing a minimum of 10% post-consumer waste and soy-based ink.