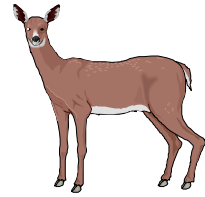


FUNDAMENTALS OF DEER HARVEST MANAGEMENT



Publication No. 806

The Basic Considerations

There are two components of deer management: harvest management and habitat management. Both are important in determining the quality and quantity of the deer population; however, harvest management is the component which is most often overlooked in a good deer management program. The first step in deer harvest management is the establishment of a clear and well defined objective. A clear objective is essential to determine what harvest goals are needed. For example, if the landowner desires to have more deer on his property the logical step may be to reduce or totally restrict the number of does being harvested. However, if the objective is to manage for trophy or quality bucks, then the landowner must manage to preserve older bucks along with the removal of the proper number of antlerless deer to ensure adequate nutrition for the deer herd. In some situations, deer damage is a primary consideration and the landowner needs to know how many antlerless deer to remove to reduce the population to an acceptable level.

The Principal Tool

White-tailed deer herds were once subject to predation from large predators such as the Eastern Timber Wolf and the Eastern Cougar; however, these predators no longer control deer herds in the east. In fact, the deer herd will increase 30 to 40 percent per year when protected and under good habitat conditions. Most of the deer herd recruitment must be removed annually to maintain the population at its current levels. The only economically practical method of deer harvest management is through regulated hunting. Although farmers and other landowners suffering deer damage may remove offending animals by utilizing deer damage permits, the vast majority of deer harvested in West Virginia

are killed during the regular hunting seasons. Illegal kills, deer vehicle collisions, and other natural mortalities account for a lesser amount of deer being removed from the population.

Even though regulated antlerless harvests have repeatedly proven successful in maintaining white-tailed deer populations and their habitats, resistance to doe hunting remains rooted in the minds of many landowners and hunters who lived through the sparse deer populations of the early half of the 1900's. When a surplus buck is not harvested, that buck will remain as an individual in the population until it is removed; however, when a doe is not harvested, each surplus doe increases the population by a multiple of the reproductive rate during subsequent seasons and the population continues to expand. One can readily see that buck hunters do not reduce deer populations.

Who is responsible for the removal of surplus antlerless deer? Responsibility for the management of the deer herd on private land lies with the landowner, the West Virginia Division of Natural Resources (DNR), and the hunter. This is a mutual responsibility and all parties must do their part to ensure a successful deer management program. The landowners must see that adequate numbers of hunters are allowed access to their property during the deer hunting seasons and monitor their harvest to ensure that an adequate number of does are removed each year. The State of West Virginia must allow the hunters a sufficiently liberal season and bag limits to remove the surplus deer. The hunter must conduct himself in an ethical manner and be flexible to the harvest needs of the landowner.

West Virginia's deer harvest management plan is a dynamic, 8-step plan with the primary objective to harvest appropriate numbers of deer within a county management unit based on the desired deer population. It provides for incremental increases or decreases in bag limits and liberalizations of seasons as necessary to manage the State's deer population.

Getting Started

After the landowner has determined a deer harvest management objective on his property, which may be to improve the deer herd quality; increase antler size; or to decrease, increase, stabilize, or even eliminate the herd, then goals to achieve the objective must be planned. Goals will be formulated by the number and quality of deer, both does and bucks, to be removed and/or left on the property.

In order to understand how the harvest of deer correlates to the deer population, it is fitting to define a few terms. Carrying capacity is the maximum number of animals which an environment will support. However, managers may refer to carrying capacity as the maximum sustainable yield of a deer population. In this context it is only important to know that carrying capacity is a term that relates the deer population to the habitat. Except during years of severe winters combined with poor food conditions (i.e., mast failures) most deer herds in West Virginia are well below carrying capacity but above the maximum sustainable yield. Population dynamics or change in the deer population is determined by mortality, reproduction, and movement within the population. Three population indicators that effect population dynamics are size and condition of the animals, sex ratio, and age distribution. Deer can be aged at the time of death by removing the lower jaw bone and aging by tooth replacement and wear. During the hunting season, harvested deer can be placed in various age classes: fawns ($\frac{1}{2}$ years old), yearlings (1 $\frac{1}{2}$ years old), and adults (2 $\frac{1}{2}$ +). Aging allows deer size and age distributions to be analyzed.

Estimating deer populations is a difficult and expensive job. Usually by the time a good population estimate can be made the data is ancient history and not useful for management purposes. In reality state wildlife agencies use an index to estimate populations. An index is the number of animals related to some measurable parameter of the population. Indices such as harvest, hunter pressure, pellet counts, browse surveys, and population models are used to measure deer population abundance from year to year. In West Virginia, the number of bucks killed during the buck gun season per square mile of deer range in the county has been successfully used as an indicator of population abundance for many years. Indices do not provide an accurate estimate of the population, but provide trend data to analyze the population over time. However, it is useful to convert the buck kill per square mile to a population estimate when explaining or

comparing deer populations. Relating this index to a population is dependent on many variables but in most cases the buck kill represents 10 to 20 percent of the deer population.

The landowner usually knows whether he needs to remove more or less does. The biggest question is how many does or bucks to remove. If in doubt, a good place to start is the Big Game Bulletin distributed by the Wildlife Resources Section or the DNR webpage (www.dnr.state.wv.us/hunting). This bulletin lists the kill of antlerless deer and bucks killed per county on a square mile basis (640 acres). A few simple calculations and consultation with the harvest guide (Table 1) should tell if you are decreasing or increasing the deer herd on your property. Landowners who wish to manage for bigger bucks need to pick a criteria that will result in younger, smaller bucks being left to grow.

To successfully evaluate the deer management program, records must be kept in as much detail as necessary to accomplish the objective. Records may be as simple as: the number of antlerless deer and bucks killed each year, or bucks now average 110 pounds and previously weighed 100 pounds, or number of deer observed in an alfalfa field from year to year. However, more intensive deer management efforts need considerably more data to evaluate the program. It is recommended that yearly records be kept of the deer harvest. Records should include the hunters name, date, sex of the deer, age (pull jaw bone and save for DNR biologists), number of points, outside spread of the rack, weight (dressed or live), and if a doe is lactating or not. The landowner will need a good hanging scale capable of weighing to the nearest pound for taking weights and a one-eighth inch steel tape for antler measurements. A Speedager as sold by Forestry Suppliers or a similar deer jaw aging chart is helpful.

Deer Population Indicators

Deer records can be analyzed and used as indicators of population growth or decline as well as the health and structure of the deer herd. The manager uses these indicators to adjust the harvest of bucks and does each year to meet the desired objective. Some commonly used indicators and their management implications are given below:

- I. **Harvest sex ratios** - When the purpose is to stabilize the deer herd, a ratio of approximately 1:1 antlerless deer (does and button bucks) to bucks in the harvest is generally used. Thirty to forty percent

does in the harvest will usually stabilize the deer herd assuming that the deer herd is being exploited at recommended hunting pressures (normally 1 hunter per 20-50 acres). When the percent of yearling bucks in the harvest exceeds 50%, the recommended exploitation rates can be assumed. When managing for quality or trophy deer the manager should strive for a sex ratio in the deer herd of no more than 3 does to 1 buck.

II. Harvest Age Ratios - When the harvested deer are aged by tooth replacement and wear, valuable information about the deer herd can be obtained. Age ratios are an indication of survival. For example, if 80% of the bucks harvested are yearlings, survival of bucks to the 2 ½ years old age class is only about 20%. Weights and antler size of yearling bucks are often compared from year to year in the harvest. The average age of does and bucks in the harvest is also a useful indicator of the population. When managing for the maximum number of deer in the population an average buck age of 1 ½ to 2 ½ years and 50% or more of the does in the 2 ½ years and younger age classes would be desired. In contrast, the trophy manager would strive for a buck age of 5 ½ or more and over 50% of his does above the age of 2 ½ years. The number of spike bucks in the buck harvest is another useful indicator. The trophy manager should strive for 15% or less spike bucks. When the number reaches 30% or more it may be an indication that nutrition is declining and more antlerless deer should be removed.

III. Antler Size - Antler size is correlated to the age, health and genetics of the buck. Proper nutrition and herd management will ensure the health of the buck. Older age classes and superior genetics can be favored by allowing younger bucks to get older and selectively leaving better quality bucks for breeding purposes. It is recommended that antler size be compared by using the average number of points and the average outside spread of the antlers. The average number of points and antler spread of yearling bucks is usually 4 points and 8 inches in West Virginia. These yearling buck averages are similar in our bowhunting only counties in southern West Virginia. However, in these counties the average age of bucks is much higher and trophy bucks are more common. A 5 ½ year old buck in southern West Virginia averages 11 points with a spread of 19 inches.

IV. Weights -Weight of deer is the most useful indicator of herd health. Average weights can be used to compare age and sex classes. The most commonly used indicator is the average weight of yearling bucks. Dressed weights of yearling bucks in West Virginia average 80 to 110 pounds depending on herd health and range conditions. The manager should be careful to compare either live weights or dressed weights.

V. Other Indicators - The Division of Natural Resources routinely conducts herd health checks in selected counties in the State. These health checks test for possible diseases in the herd as well as being indicators of herd health. In addition, fetuses are collected from road kills and deer killed on damage permits as indicators of reproductive performance.

Guidelines for Managing Deer Through Hunter Harvest

As a landowner you can do much toward maintaining the deer herd at a desirable level. A general rule is that deer herds increase if you shoot only bucks; stabilize at present levels when you shoot equal amounts of bucks and antlerless deer; and decrease if you shoot more antlerless deer than you do bucks. The harvest guide (Table 1) indicates how many antlerless deer you should remove in relation to the bucks you harvest depending on whether you want to increase, decrease, or stabilize your herd. As deer may not restrict their home range to your farm, you will need to take into account what your neighbors do and adjust your harvest accordingly unless you have an extremely large farm (2,000+ acres). Normally one hunter per 20-50 acres will provide the hunting pressure needed to attain an adequate buck harvest. Generally, it takes about 4 hunters to kill one buck and about 2 hunters to kill one antlerless deer in West Virginia.

AUTHORS

James E. Evans, William N. Grafton, Thomas R. McConnell.

Appreciation is extended to Michael J. Kridle.

Table 1. Deer Harvest Guide

If the number of bucks harvested on your land is:	2	4	6	8	10	12	14	16	18	20
<u>and you want your deer herd to:</u>	<u>then harvest this many antlerless deer:</u>									
increase rapidly	NONE									
increase slowly	1	3	5	6	8	10	11	13	14	16
maintain present level	2	5	7	10	12	15	17	19	22	24
decrease slowly		6	8	11	14	17	20	22	25	28
decrease rapidly	4	7	10	13	16	19	23	26	29	32

Programs and activities offered by the West Virginia University Cooperative Extension Service are available to all persons without regard to race, color, sex, disability, religion, age, veteran status, sexual orientation, or national origin.

Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Director, Cooperative Extension Service, West Virginia University. West Virginia University is governed by the Board of Trustees of the University System of West Virginia.