GAME MANAGEMENT SESSION

EYELENS WEIGHTS VALUABLE DEER MANAGEMENT TOOLS

by

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INTRODUCTION:

Field aging of White-tailed Deer (*Odocoileus virginianus*) by means of tooth replacement and wear in the lower jaw can give reasonably accurate results. All too often, however, these ages lack the accuracy that is expected of such a technique. This problem apparently is not caused by deficiencies in the technique, but rather in the carelessness of the observer; aggravated by the fact that many hunters are unwilling to have the cheeks cut or the jaws removed from their deer, especially if the animal is suitable for mounting. Add varying degrees of ignorance of the technique to this and the result is a set of data with numerous inaccuracies.

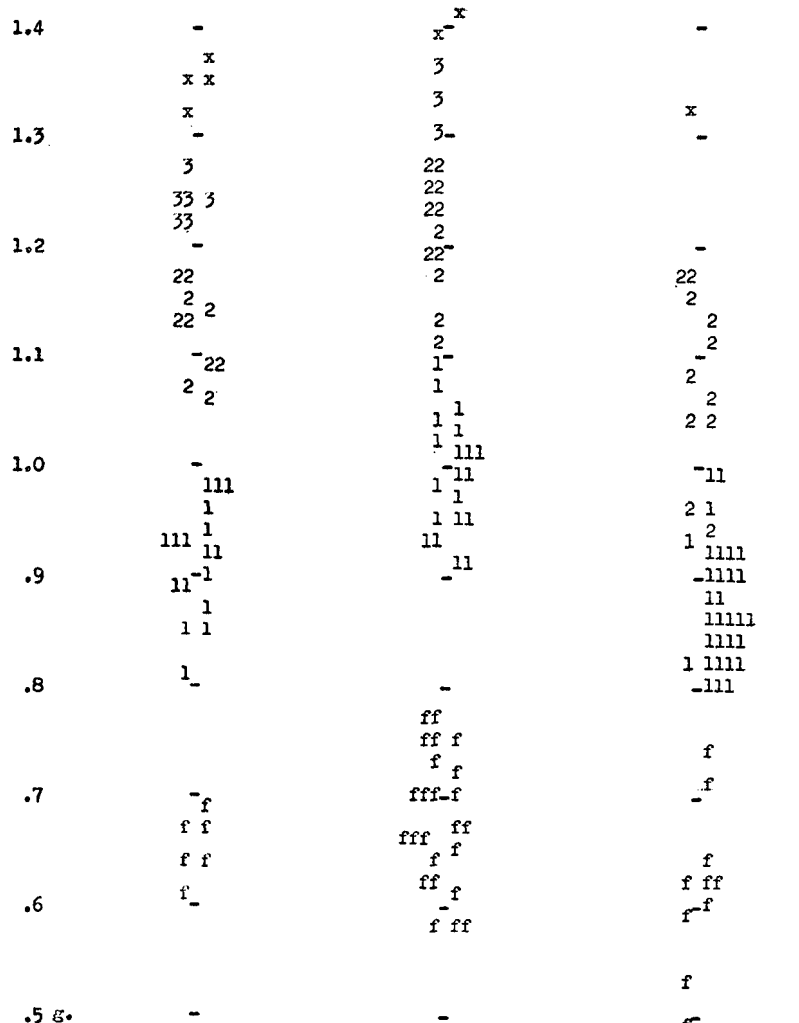
Several workers have recognized this difficulty and have attempted to collect specimens which could be analyzed in the lab. Leuth (1963) and others have collected jaws from deer for laboratory analysis. This is usually not possible if the deer has a trophy rack, so the sample must be taken from does and the younger and poorly antlered bucks. Flyger (1958) tried to sidestep this problem by making dental impressions for laboratory analysis, but making these impressions is tedious and somewhat time consuming. The numerous attempts to correlate age with weight, antler diameter, hind foot length, etc. have been unsuccessful due to the considerable overlap of these values between the various age classes.

Following the paper by Lord (1959) and some preliminary testing of our own, we decided to make a statewide collection of eyelenses for aging purposes. This promised to solve most of the problems of field aging because a specimen can be taken from every deer and because the age determination is highly objective and can be made in the lab.

This paper reports the conclusions reached after having examined more than 630 eyes of both bucks and does collected from ten areas in Georgia during the 1961, 1962, 1963 hunting seasons. We had not been able to get good field aging for most of these deer, nor were we able to collect jaws for aging, for the reasons already given. However, we felt that if age is the primary growth factor of eyelenses, a species such as deer which has definite, widely separated breeding seasons should show a natural grouping of plotted lens weights. We expected considerable overlap between the older age classes because here the relative difference in age is much less. We worked with small areas of homogenous range to keep a variety of nutrient levels from distorting the natural groups of lens weights, as suggested by Lord (1962).

METHODS:

A sharp knife with a blade less than one inch wide was used to gouge out deer eyes. Extra care was taken when the head was suitable for mounting to prevent damage to the eyelids. Eyes were collected whole without puncturing and placed in cloth bags with other specimens in 10 percent formalin. If no other specimens are being collected, eyes



f=faun; 1=1½ year old; 2=2½ year old; 3=3½ year old; x=4½ or older.

may be tagged with clip-on "alteration" tags obtainable from any cleaners. We analyzed the 1961 and 1962 eyes two to three months after collection and the 1963 eyes five to six months after collection. There appears to be a difference which will be discussed later.

In the laboratory, the eye was punctured from the side and the lens squeezed out. The lens was repeatedly pressed into a paper towel until all droplets of surface moisture were removed. Rubbing is to be avoided as this tends to remove particles from the lens. Weighing was carried out immediately on a scale accurate to the nearest centigram. One series of lenses was weighed in this manner and then dried according to the method described by Lord. It was found that for lenses preserved five months or more in formalin, a linear relationship exists in which wet weight is approximately 2.3 times dry weight. This agrees with the similar work by Leuth (1963). We have adopted the "wet" weight for use because it is quicker, more practical for large series, and less equipment is required. Collection of a deer eye can be accomplished in less than 30 seconds. Weighing can be accomplished in one minute.

RESULTS:

In every case where a series of 24 or more lenses from a single area collected during a single year were plotted for weight, definite groups were obvious. Six-month-old fawns were always widely separated from older deer. In nine of 16 area-years, the 1½-year-old group was separate and distinct from older deer. None of the 149 1½-year-olds from these nine areas is suspected of being 2½ years old. "Suspicion" results when the deer is much heavier or has much larger antlers than other deer in the group. Of the remaining seven area-years, five have no overlap of lens weights between 1½ and 2½ but the breakoff point was not obvious by examination of lens weight groups alone and had to be determined by comparing weights and antlers. It is possible that a larger series of lenses would have had more obvious groups, in some cases. On the remaining two areas, seven deer suspected of being 2½ would have been aged as 1½ if the separation had been made strictly by obvious groups. Natural grouping of 2½-year-olds was also obvious in seven of the 16 area-years. The 2½-year-old groups may appear distinct largely because they are unchallenged by the small number of 3½ and older specimens, however.

This is very encouraging in that it has resulted in a much greater accuracy than we would have expected from field aging. Had we used no information other than natural grouping of the plotted data, we would have aged accurately all 153 fawns and would have placed only 13 suspected 2½-year-olds among the 272 1½-year-old deer. In other words, over 95 percent of the deer "fit" the lens aged 1½-year-old class in every way. When we have gained more information on the normal range of deer weights and antler diameters, we expect to be able to eliminate the greater portion of the suspected 2½-year-olds on these grounds to achieve an accuracy of more than 98 percent for 1½-year-old deer.

We feel that for management purposes it is probably not necessary to age accurately any but the fawn and 1½-year-old classes. These two age classes should make up over 50 percent of a well regulated herd. The changes important to management, such as size and reproduction, should be noticeable in these age classes first.

We have tried to stress the importance of considering each area-year separately. Lens weights were lower in 1963 than in 1961 and 1962 on every area. We blamed this on the fact that the specimens stayed in formalin, a dehydrating agent, longer in 1963 than in 1961 or 1962. However, a number of lenses stored loose in formalin for 15 months had a relative dry weight considerably higher than some that had been in formalin only three months. We suspect that lenses lose water but gain formalin residue according to the duration of their

preservation and the strength of the solution. It is probably important to collect only whole, unpunctured eyes for use in aging so that relative exposure to the preservative in standardized.

These difficulties in obtaining the same range of lens weights from one year to the next have made it difficult for us to add much credence to Lord's speculation that lens weights may vary according to nutrition. The only supporting evidence we have is from several deer trapped on Georgia's coastal islands, which have extremely poor range, and released in the Albany Enclosure on very good range. Generally, for the same age deer at death, those moved as fawns and thereby spending a greater portion of their lives on good range had higher lens weights than those moved as adults. Another indication that nutrition may effect lens weight is that overlap of lens weights between the 1½ and 2½-year-old classes occurred only on the two areas which we believe are now in the process of becoming overpopulated. These ranges are probably much less homogenous than areas with no population problem or areas with a long history of overpopulation.

CONCLUSIONS:

Any statewide deer management program can profit from the use of this technique. Few states have more than one or two biologists who are capable of field aging the younger classes of deer with greater accuracy than this technique demonstrated in Georgia. No state has such a biologist for every checking station in the state. This technique offers accurate aging of every fawn or 1½-year-old deer that is brought to a checking station at the cost of a few jugs of formalin, a $30.00 set of scales, and a very few hours of work.

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