AERIAL CLASSIFICATION OF BULL MOOSE BASED ON ANTLER DEVELOPMENT

by

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Moose surveyors need to be familiar with antler architecture and variations in antler size within and between cohorts in order to collect accurate bull composition data. These factors will be discussed and illustrated for bull moose in Interior Alaska.

Description of Antler Characteristics Used to Classify Moose

Bull moose seen during aerial surveys are classified based on antler development and placed into one of the following categories:

1. **Yearling bulls** - moose that possess antlers typical of yearling bulls.

2. **Medium bulls** - moose that have nonyearling antlers less than 50 inches in spread.

3. **Large bulls** - moose that have an antler spread of 50 inches or wider.

Moose antlers can be classified based on the presence or absence of palmation. Cervicorn antlers (pole-type) have no palmation and resemble deer antlers (Fig. 1a). Palmicorn antlers (shovel horn-type) have varying degrees of palmation (Fig. 1b).

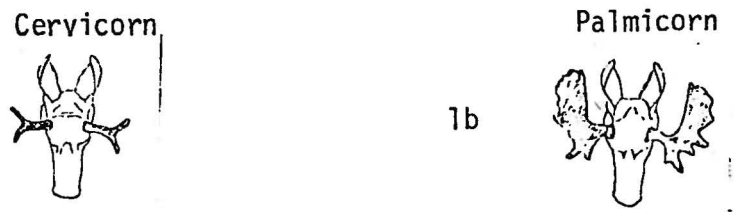

Fig. 1. Comparison of cervicorn and palmicorn antlers of bull moose.

Figure 2 illustrates a set of antlers that demonstrate typical adult antler architecture of either medium or large bulls and three important characteristics for aerial classification of bull moose are labeled.

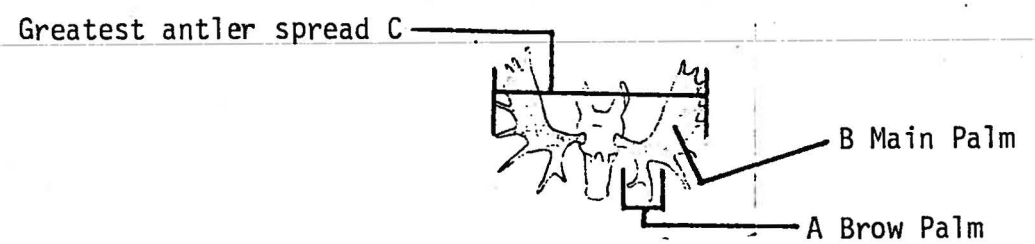

Fig. 2. Antler characteristics important for accurate classification of bull moose during aerial surveys.

Each antler consists of forward projecting brow development in the form of a brow palm or brow tine (A) and a rearward projecting main palm (B). Brow and main palm development are easy to analyze from the air. Antler spread (C) is the greatest straight line distance across the palms (Fig. 2). Antler spread can be estimated from the air by using the bull's head width as a visual ruler. When viewed from above, the span across the eyes of a moose (the widest part of the head when viewed from above) can be visually superimposed across the antlers to determine spread (Fig. 3). With a little practice these measurements can be obtained with one pass of the airplane.

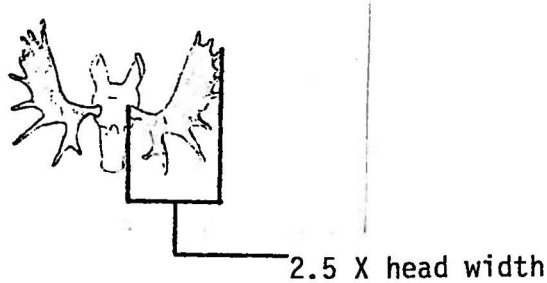

Fig. 3. Use of moose head width to estimate antler spread.

Criteria for Distinguishing Between Yearling Bulls and 2-1/2- to 3-1/2-Year-Old Medium Bulls

Most yearling bulls are easy to distinguish from most medium bulls. Unfortunately, there can be some difficulty distinguishing between those yearlings that produce large palmicorn antlers and those 2-1/2- to 3-1/2-year-old bulls that produce smaller than average antlers. However, it is not a common problem and with practice it is possible to classify most moose without confusion.

Yearling bulls usually produce cervicorn antlers that commonly have only a single spike or fork (Fig. 4), but occasionally they will produce 3-5 points on a side. Some spike antlers are so small they are difficult to detect from the air. To avoid incorrectly classifying these moose as cows, look for small antlers on any "cow-like" moose without a calf. If spike antlers are present on the moose, they can be seen protruding from the skull between the eye and the ear. Concentrate on this area of the head as you fly over moose.

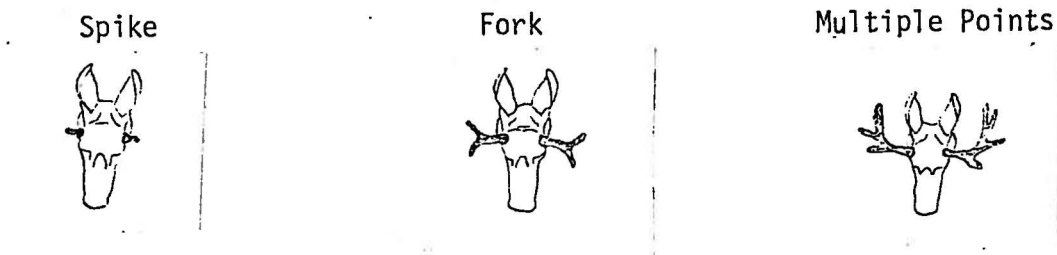

Fig. 4. Examples of cervicorn antlers that may be seen on yearling bull moose.

The following three characteristics distinguish yearling bulls with palmicorn antlers from 2-1/2- to 3-1/2-year-old medium bulls with which they might be confused:

1. Antler Architecture: Palmicorn antlers of yearling bulls appear as "ping-pong paddles" or "wedges" with points (Fig. 5a). These antlers lack prominent forward projecting brow development or rearward projecting main palm development that is typical of adult antlers (Fig. 5b).

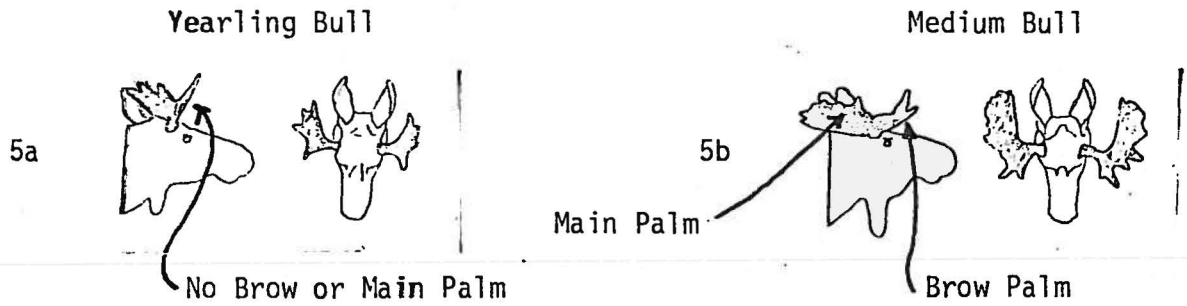

Fig. 5. Comparison of brow and main palm development between palmicorn antlers of a yearling bull and a medium bull moose.

2. Antler Spread: Yearling bulls can also be distinguished from older bulls by their narrower antler spread. Yearling bull antler spread is generally 1.0X head width or narrower when viewed from above, and they rarely attain a spread of 1.3X head width (Fig. 6a). Antler spread of 2-1/2- to 3-1/2-year-old bulls averages 1.3X head width and is rarely less than 1.0X head width (Fig. 6b).

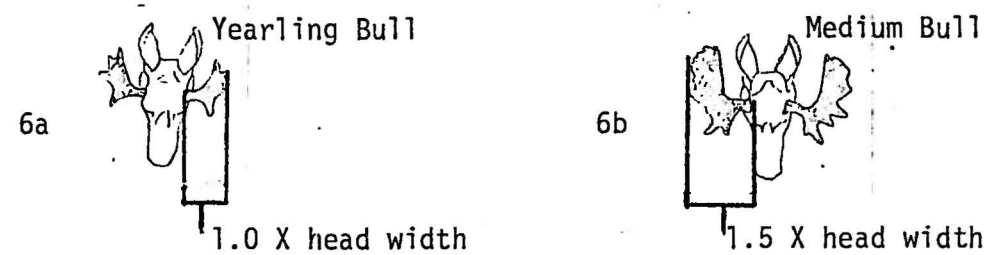

Fig. 6. Comparison of antler spread between palmicorn antlers of a yearling bull moose and a medium bull moose.

3. Antler Length: The antler length (including points) of yearling bulls with palmicorn antlers seldom exceeds 1.3X head width (Fig. 7a). On the other hand, 2-1/2- and 3-1/2-year-old bulls are rarely less than 2.0X head width and average nearly 2.5X head width (Fig. 7b).

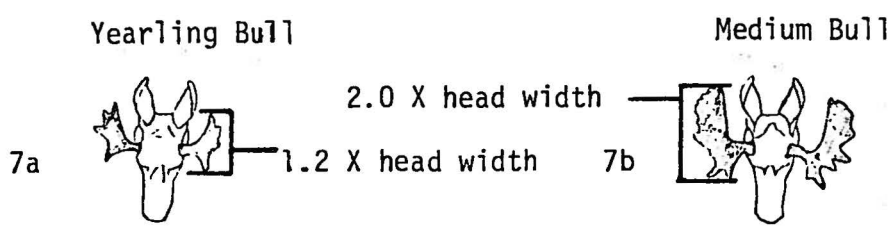

Fig. 7. Comparison of antler length between palmicorn antlers of a yearling bull moose and a medium bull moose.

Criteria for Distinguishing Between Medium Bulls and Large Bulls

Differentiating between medium and large bulls is simply a matter of estimating antler spread based on head width. Assume a head width across the eyes of 10 inches for these bulls. For example, a bull with a 50-inch antler spread would have antlers which extend two head widths beyond the bull's head. Total spread is determined by summing the following measurements:

1. Head width = 10 inches
2. Right antler = 2 x 10 = 20 inches
3. Left antler = 2 x 10 = 20 inches

Estimated total antler spread = 50 inches

This moose would be classified as a large bull.

Conclusion

The majority of bull moose seen during aerial surveys are easy to classify. Only those bulls with antler development that overlaps the yearling-medium or medium-large classifications present a problem. Familiarity with antler size and architecture in these gray areas will enable moose surveyors to collect accurate bull moose composition data.