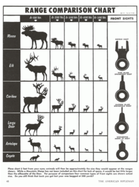
Revisiting Stan de Treville's Big Game Range Estimation Chart

I found the photo (right) of big game silhouettes titled Range Comparison Chart.



Later, I found the chart again, posted in the Shooter's Forum and learned that the chart originated from an article called "Hitting 'em out Yonder" by Stan de Treville (Oct. 1953; The American Rifleman Magazine).

The purpose of the chart was to show the relative sizes of big game animals at the various distances in relation to several styles of open sights.

The images relate the view with the naked eye (placed 5 feet from the eye) for moose, elk, caribou, large deer, antelope and also coyote at distances of 100, 200, 300, 400 and 500 yards.

The chart fascinated me and got me thinking about how to calculate the relative sizes of animals at the various distances to make my own version of the chart for elk and mule deer using photographs instead of the black silhouettes.

I also wanted to to use various magnifications as viewed through a scope complete with cross hairs and the field of view and all the subtensions on the cross hairs should be correct.

I started with the elk first and after finding and understanding the correct formulas, I learned to re-size and adjust the photographs so they are correct when viewed on my computer screen or from a print out at a given distance.

Was de Treville's Original Range Comparison Chart Correct?

About a year after seeing de Treville's chart for the first time, I found the image (above) that appeared to be had been scanned from the magazine. The original image I saw even had holes punched for a 3-ring binder that I hoped could be used for a scale reference. Something is still not correct, because the image still does not yield the expected value for an elk at shoulder height.

At least I found the missing part of the equation, the drawings were supposed to be viewed at 60 inches (five feet) as stated at the bottom of the image I provide.

Calculation of MOA

The "Hitting 'em out Yonder" article claimed the average elk was 55 inches at the shoulders. I do not agree with this value, but if that is what de Treville intended, the math is simple. Using the equation:

s= (d * MOA)/3437.7

- s= size of object in inches
- d= distance in inches
- MOA = the Minute of Angle
- 3437.7 is a constant

First, we need the MOA for shoulder height of elk (55 inches according to de Treville) at 100 yards and second, we need the size of an object with the same MOA view at a distance of 60 inches.

Short cutting the math, I get the following two equations (if there is enough interest, I can post how to quickly solve these equations using Excel):

- (3600 inches X 52.5204 MOA)/3437.7 = 55.000 inches
- (60 inches X 52.5204 MOA)/3437.7 = 0.9167 inches

The original de Treville's elk silhouette for elk should be 0.917 inches (between 29/32 and 15/16 of an inch) at shoulder height when viewed at a distance of 60 inches to represent a 55 inch (shoulder height) elk at 100 yards.

I have put out a few queries, but no one has yet verified if the de Treville's elk silhouette is correct or not. If anyone reading this has the magazine, I would appreciate learning the actual height of the elk silhouette.

In the mean time, since I disagree with de Treville's value of 55 inches for elk shoulder height, we need to verify the average size for a bull elk to recreate a visually correct perspective of an average bull elk with a picture.

How Big is a Bull Elk?

There is a lot of information on the web about the height of elk and the depth of the body or chest height, but there is little data other than offhand remarks about elk being 8 or 9 feet long. It seems the most reliable information is for shoulder height and chest height of bull elk:

- Average Height at Shoulder ranges from 48-59 inches with a maximum of 64 inches. The average bull elk is about 59 inches at the shoulder. (Thomas and Toweill. 2002. North American Elk: Ecology and Management)
- Average Chest Height ranges from 30.7-37.4 inches and averages 34.65 inches (from Bowhunting.net, but it is unclear what source is referenced)

It is a little surprising that no detailed information is easily available for elk body length, but the values for height at the shoulder and chest height are probably the most important for proper scaling of photographs.

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