Vertebrate Taphonomy Laboratory

Whitetail Deer: *Odocoileus virginianus*

BIODIVERSITY THROUGH TIME
GEOS-308 / BIOL-308
Denison University

Purpose

In this lab exercise, you will investigate taphonomic processes operating on a large vertebrate carcass (whitetail deer: *Odocoileus virginianus*) in a temperate, humid, terrestrial environment (i.e., central Ohio).

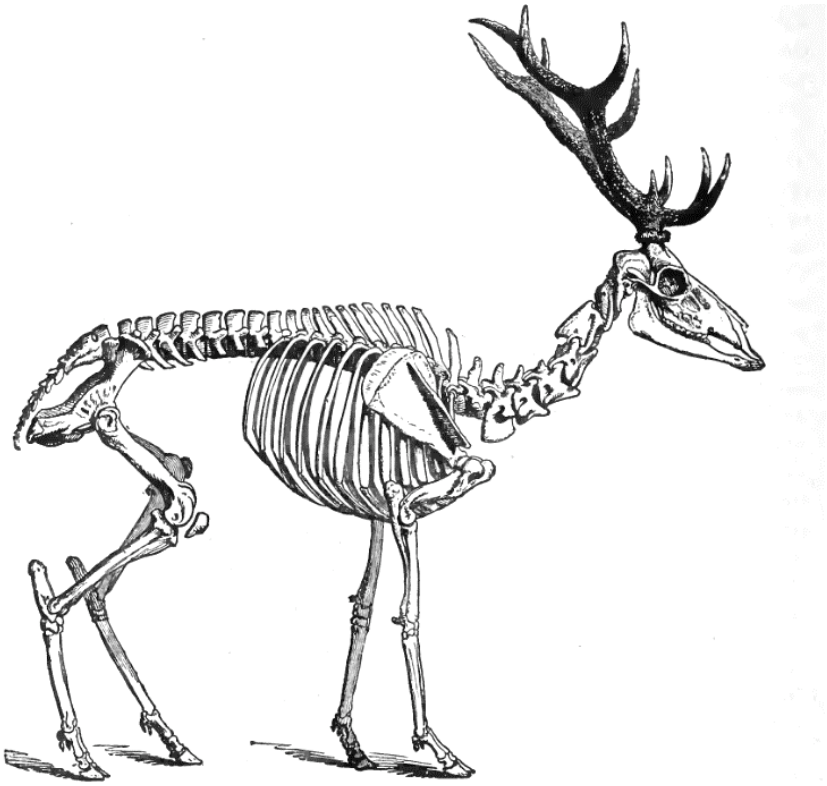
Objectives

The objectives of this lab are threefold:

1. To observe and document early postmortem processes operating on a deer carcass;

2. To compare the effects of scavenging on two carcasses, one placed in an open grassy field, the other placed in the same field but enclosed in wire mesh cage constructed to exclude macro-scavengers; and,

3. To consider the taphnomic biases imparted by scavengers on terrestrial vertebrate animal remains specifically, and on the fossil record in general.



Background

On Thursday, September 18, 2008, a whitetail deer carcass was placed in the bioreserve (see Figure 1). The specimen was collected in Loudon Street (Granville Township) in the early afternoon of the same day. I estimate that the animal had been dead for approximately 12 hours before collection. For the most part, the carcass was intact, save for a broken right hind leg. Scavengers had not perforated the hide, however, the preexisting bilaterian orifices showed early signs of exploitation.

In the days following the initial deployment, the carcass experienced significant taphonomic modification. Your task today will be to observe and document the state of the carcass (see Methods).

Figure 1. Whitetail deer (*Odocoileus virginianus*) placed in the bioreserve on Thursday, September 18, 2008.

Methods

1. Read the 1991 review article on terrestrial vertebrate accumulations by A. K. Behrensmeyer. A link to the article in the library can be found on the Biodiversity Through Time blackboard website.

2. Once in the field, familiarize yourself with the locality. Walk around and explore the site. Note the state of the carcass and the position of any disarticulated portions of the beast. Be sure to be careful of any loose material…we do not want to impart any additional human-induced taphonomic bias.

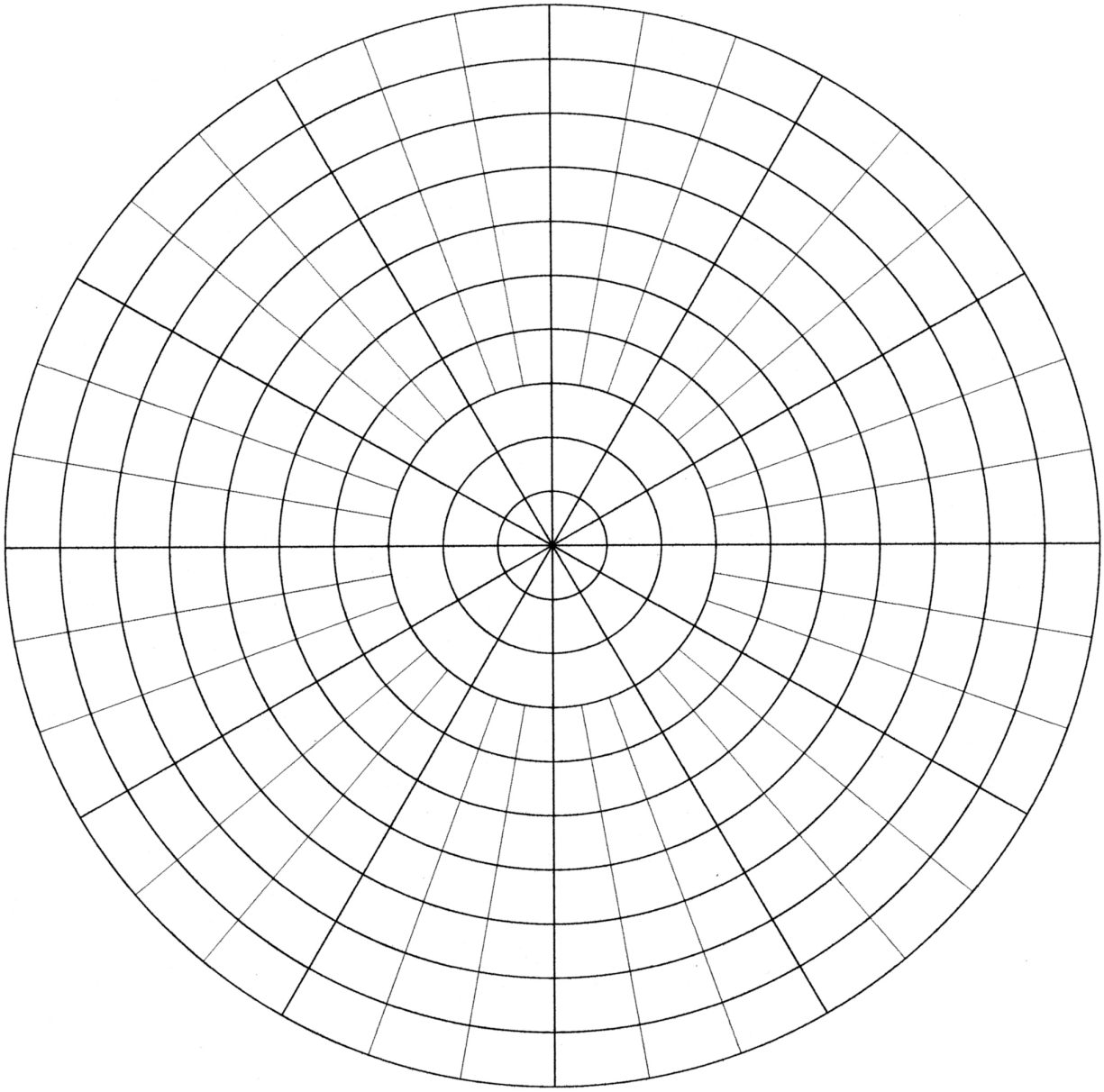
3. Using the stake flags mark the location of all the elements of the carcass.

4. Next using the Brunton compasses and the measuring tape, create a map of the site. You should note the both the azimuth bearing (0-360°) and the distance from the initial location of the carcass (marked with a stake). Be sure account for magnetic declination. Plot these results on the radial graph provided with this package. Remember to include a scale on your map.

5. Take notes describing the condition of all the elements of the carcass. Your notes should be detailed and accurately reflect the taphonomic condition of the bones and tissues.

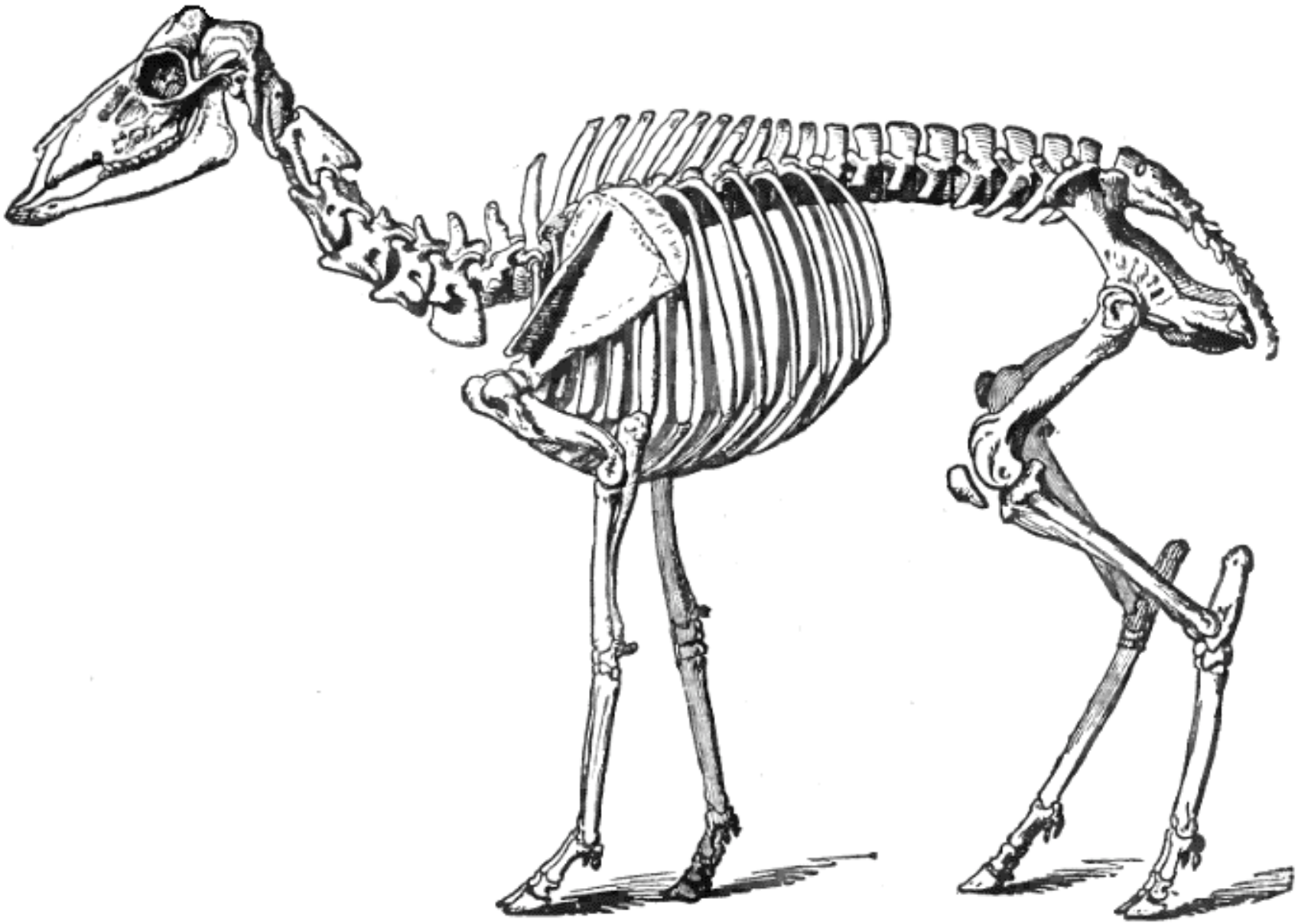
6. Reassemble all the elements of the carcass on the tarp. Next, identify all of the skeletal elements you locate. Using the colored pencils provided, color in the skeletal elements you located on the diagram below. You should use the labeled diagram to assist with bone identification.

7. Finally, note the condition of the deer placed in the wire mesh cage. Take notes and photographs to document the condition of the carcass. This specimen will function as our control treatment. So it is important that we pay lose attention to how it decays through time.

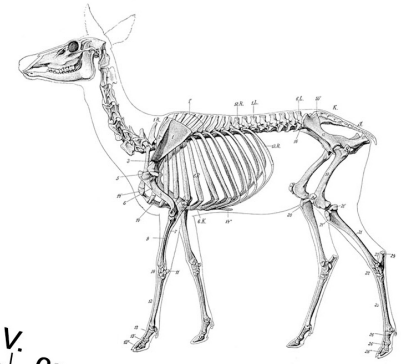


Scale:

Radial graph



Osteology of Cervidae (deer & kin) based on Elk (*Cervus elephas*)



Modified from:

Ellenberger, W., Baum, H., and Dittrich, H. 1961. An Atlas of Animal Anatomy for Artists. Dover Publications, NY. 2nd ed.

QUESTIONS

1. Characterize the condition of the disarticulated specimen. Did you recover all of the bones form the specimen? What are the implications of your findings?

2. Do the bones show signs of scavenging? How might you use these observations to reconstruct the history of scavenging on this specimen or specimens in the fossil record?

3. Discuss the distribution of the disarticulated bones. Which bones moved the farthest? Which bones were found closest to the original location of the body?

4. What biological and/or physical biostratinomic factors influenced the distribution of the disarticulated bones?

5. Did you find bones that cannot be attributed to the original specimen? If so, speculate on the implications for the fossil record.

6. Compare the remains of the disarticulated specimen with those placed in the mesh cage. How important are the activities of macro-scavengers in determining the condition of large terrestrial vertebrates?