



Physical Anthropology Section – 2011

H81 Animal Scavenging and Taphonomic Interpretation: An Evaluation of the Role of Scavenger Behavior and Environmental Context in Outdoor Forensic Scenes

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The goals of this presentation are to provide an assessment of taphonomic predictions in relation to animal scavenging behavior, an evaluation of the role of animal behavior and environmental factors on human remains; and a discussion of actualistic experimental data that demonstrate patterns of damage and dispersal of skeletal elements from outdoor contexts.

This presentation will impact the forensic science community by providing a critical evaluation of taphonomic theory and discussing the benefits of a multidisciplinary approach to taphonomic analysis.

The goals of this research include: (1) an assessment of taphonomic predictions in relation to animal scavenging behavior; (2) an evaluation of the role of animal behavior and environmental factors on human remains; and, (3) a discussion of actualistic experimental data that demonstrate patterns of damage and dispersal of skeletal elements from outdoor contexts.

Taphonomy has become an integral area of research within forensic anthropology since the late 1980s. Previous studies have generally focused on field or laboratory-based experiments, retrospective case reviews, or case reports. However, little attention has been devoted to evaluating aspects of taphonomic theory, such as scavenging behavior, using rigorous experimental methodology. Sorg and Haglund (2002)¹ advocate the use of a bioenvironmental and idioecological approach to forensic taphonomic analysis. By focusing on the context specific features of an environment and the scavengers inhabiting that area, a more accurate interpretation of outdoor forensic scenes is possible. The incorporation of models from other disciplines, such as ecology and paleontology, provides a more detailed perspective.

This research was conducted at the Big Chico Creek Ecological Reserve (BCCER). The BCCER, owned and maintained by California State University, Chico, currently encompasses 3,950 acres of diverse habitats, which support more than 140 animal species. Common carnivores include the black bear, western spotted skunk, gray fox, coyote, raccoon, as well as the domestic dog and cat. Although the black bear and raccoon are omnivorous, they are known to actively scavenge animal carcasses, and are treated as carnivores for the purpose of this study. Less common scavengers include the bobcat, mountain lion, marten, fisher, and badger. Mountain lions excepted, these carnivores are thought to minimally contribute to the scavenging of human remains in northern California.

A pilot study was conducted in October of 2009 to document animal scavenging behavior at the BCCER. The carcass of a single adult mule deer (*Odocoileus hemionus*) was placed at a site where animal scavengers are known to frequent. A motion sensitive digital infra-red game camera was positioned within the site to identify carnivore species and to monitor scavenger behavior. The site included a 15 meter clearing protected by vegetation, which provided a suitable environment for scavengers to feed without being disturbed. This location is also a known popular habitation spot for bears inhabiting the BCCER, with easily visible game trails and access to water. To prevent the immediate

removal of the carcass from the camera position, it was tied down to rebar stakes with lengths of barbed wire wrapped around the forelimbs and hind limbs. The site was monitored for three days, and data such as time, temperature, and precipitation were recorded as well as notes on decomposition, surface scatter, and scavenging damage. The carcass was collected at the end of the three days, and was completely devoid of soft tissue. Many of the elements were scattered within the site, and a few elements, including the right and left scapula, left forelimb, eight ribs, thoracic vertebrae No. 12, and a small portion of the skull could not be located. The remains were transported to the CSU-Chico human identification laboratory for analysis of scavenging patterns.

The game camera recorded two different species: black bear (*Ursus americanus*) and the gray fox (*Urocyon cinereoargenteus*). The black bear was the only species documented actively scavenging the carcass. The carcass was not investigated until it had been exposed for seven hours, but once scavenging began it continued unabated for more than an hour. A majority of the activity occurred at night, and during the 24-48 hour exposure period. Bears ranging from a first year cub to the reserve's alpha male were documented feeding. The camera recorded significant damage, including tooth impact marks and breakage resulting from manipulation of the carcass.

The photographic, climatic, and osteological data in conjunction with biological, ecological, and anthropological theory, is being used to generate a model for scavenging behavior of human remains in Northern California. This model will be further tested using the remains of ten feral pigs (*Sus scrofa*) as models for human remains.



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Reference:

- ¹ Marcella Sorg and William Haglund. Advancing Forensic Taphonomy: Purpose, Theory, and Process. In: Haglund W and Sorg M, editors. Advances in Forensic Taphonomy Method, Theory, and Archaeological Perspectives. Boca Raton: CRC Press, 2002;3-30.

Taphonomy, Scavenging, Animal Behavior