A125 Vulture Scavenging of Small-Sized Pig Carcasses in Central Florida: Utilizing Geographic Information Systems (GIS) to Analyze Site Variables Affecting Skeletal Dispersal

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After attending this presentation, attendees will have a better understanding of vulture scavenging of the Central Florida region and its impact on the scavenging of small-sized carcasses. This presentation will focus on vulture consumption, disarticulation, and dispersal of remains in two micro-environments (shaded and unshaded) in order to discuss regionally specific taphonomic modifications of carcasses and deposition sites.

This presentation will impact the forensic science community by describing how vultures scavenge small-sized carcasses in Central Florida and their collective ability to modify deposition sites and destroy forensic contexts in the process. The dispersal of remains will be analyzed using arcGIS® spatial analysis tools.

Scavengers can significantly alter a forensic scene and consume, modify, disarticulate, and disperse bodies. These scavengers can differ greatly between different geographic regions. In recent years, there have been a number of important vulture studies; however, little research exists regarding scavenging in Central Florida, specifically scavenging involving black and turkey vultures (*Coragyps atratus* and *Cathartes aura*).

The research site was located on the University of Central Florida (UCF) campus at the Deep Foundations Geotechnical Research Site, which consists of approximately two acres surrounded by a six-foot chain-link fence. The tall fence was optimal to primarily select for avian scavengers. The research sample consisted of four pig (*Sus scrofa*) carcasses weighing between 25kgs and 29.5kgs that were deposited individually during the month of March in two distinct micro-environments: two in shaded and two in unshaded locations. The shaded micro-environment consisted of a grove of long-leaf pines with a layer of pine needles over the ground surface. The unshaded micro-environment consisted of vegetation on the ground surface and was surrounded by taller vegetation and bushes. Two field cameras were placed at each site to record both video and time-lapse photography. The dispersal data was mapped in the field using the azimuth control method and analyzed using arcGIS® v. 10.2.2 spatial analysis tools.

A mass vulture scavenging event occurred over two days, beginning during the evening of the sixth day of the postmortem time period and ceasing at dusk. Scavenging then continued during the morning of the seventh day. The vultures reduced the small-sized carcasses to primarily skeletal elements, with large sections of skin containing adhered small bones of the lower limbs, in approximately eight to nine hours of feeding time combined over these two days. This mass scavenging event was accomplished by large numbers of vultures simultaneously feeding at each carcass, with a maximum total number of 43 observed on video at one time at a single carcass. While two bald eagles were also recorded contributing to consumption of the carcasses, they participated minimally. Vultures disarticulated the carcasses, usually by entering through the orifices of the caudal and cranial ends. It is important to note that as the vultures consumed soft tissue, the large bones were scattered away from the initial deposition site of the carcass, while the smallest bones (including epiphyses) were sometimes consumed. It was after the initial mass scavenging event that opossums began scavenging the remains at night, particularly any remaining sections of skin, including skin with attached skeletal elements from the lower limbs.

The spatial analysis results indicated a number of site ground variables impacted vulture dispersal, such as the site perimeter fence and the tall ground surface foliage. Vultures primarily dispersed skeletal elements in open areas, and the majority of elements were dispersed within 6m of the initial carcass deposition site, with a maximum distance of approximately 15m. Conversely, opossums dispersed remains directly into denser foliage, most likely to consume the remains in more secure locations, including modifying a number of bones. Additionally, the ground surface and foliage of the carcass locations were further modified by the mass vulture frenzy, including scratching the ground surface with talons and digging with beaks to consume all remnants of the carcasses. The scavenging observed in the current study illustrates the capability of vultures to consume, disarticulate, and disperse remains and to modify depositional sites in Central Florida. This study can hopefully provide a standard format for more appropriate comparisons among future vulture studies.

Avian Scavenging, Vulture Scavenging, arcGIS®