

Diet Composition of Long Beach Coyotes via Solids Scat Analysis

Armaan Zare, DeLisa Madere; Dr. P. Auger, Dr. E. Strauss, M. Curley, E. Simso
Center For Urban Resilience | Loyola Marymount University | Spring 2018



Abstract

Canus latrans (coyotes) have posed threats against both urban wildlife and domesticated animals all across the United States. In the urban and residential areas encompassing Long Beach, green areas such as parks and golf courses create a series of wildlife corridors that coyotes may use to provide themselves with food, shelter, and a means of refuge for breeding. Along with wildlife corridors, anthropogenic food sources also contribute to the increased coyote density in the city of Long Beach; this inevitably leads to more frequent coyote-human interactions. Now in its second year, our study aims to accurately assess the diet of the coyote population to better understand their interactive relationship with the urban wildlife and domesticated animals of Long Beach. A solids scat analysis is being performed on samples from Long Beach as it is a practical and inexpensive starting point to understand the diet of the Long Beach coyotes. The lab will analyze the bones and other remains in an attempt to understand what organism they may have come from, including: fruit, insects, grass, vegetable material and bones. The lab will reference anatomy books as well as Biology faculty for assistance on identifying species from the bones.

Introduction

Coyotes studied in the urban environment encompassing the Santa Monica Mountains have been shown that "...at most 25% of the coyote diet consisted of anthropogenic food" (Riley et al., 2003) and their home ranges tended to be smaller in urban areas than non-urban areas area (Atkinson & Shackleton 1991). A solids scat analysis is being performed on 32 scat samples from Long Beach as an inexpensive starting point to understand the diet of Long Beach coyotes.



Figure 1: The locations of the three game cameras at Long Beach Fire Station 19.

Methods

- Place each scat in a nylon sock and label it (Figure 3)
- Allow each sample to soak in a 5 gallon bucket of warm water for 30 minutes
- Boil each sample in a 2 liter beaker of water for 30 minutes
- Wash each sample with detergent to remove organic material (Phillips et al., 2007; Klare et al., 2011)
- Analyze the bones and other remains in each sample to identify what organism they may have come from.

The remains left in the nylon socks will be classified into the following categories: fruit, vertebrates, insects, grass, vegetable material and bones (Zabala et al., 2003).

We will implement a "semi-quantitative" method that will allow us to assess the importance of type of food as the food is indirectly quantified by its remains in the scat (Reynolds and Aebischer, 1991).

Data

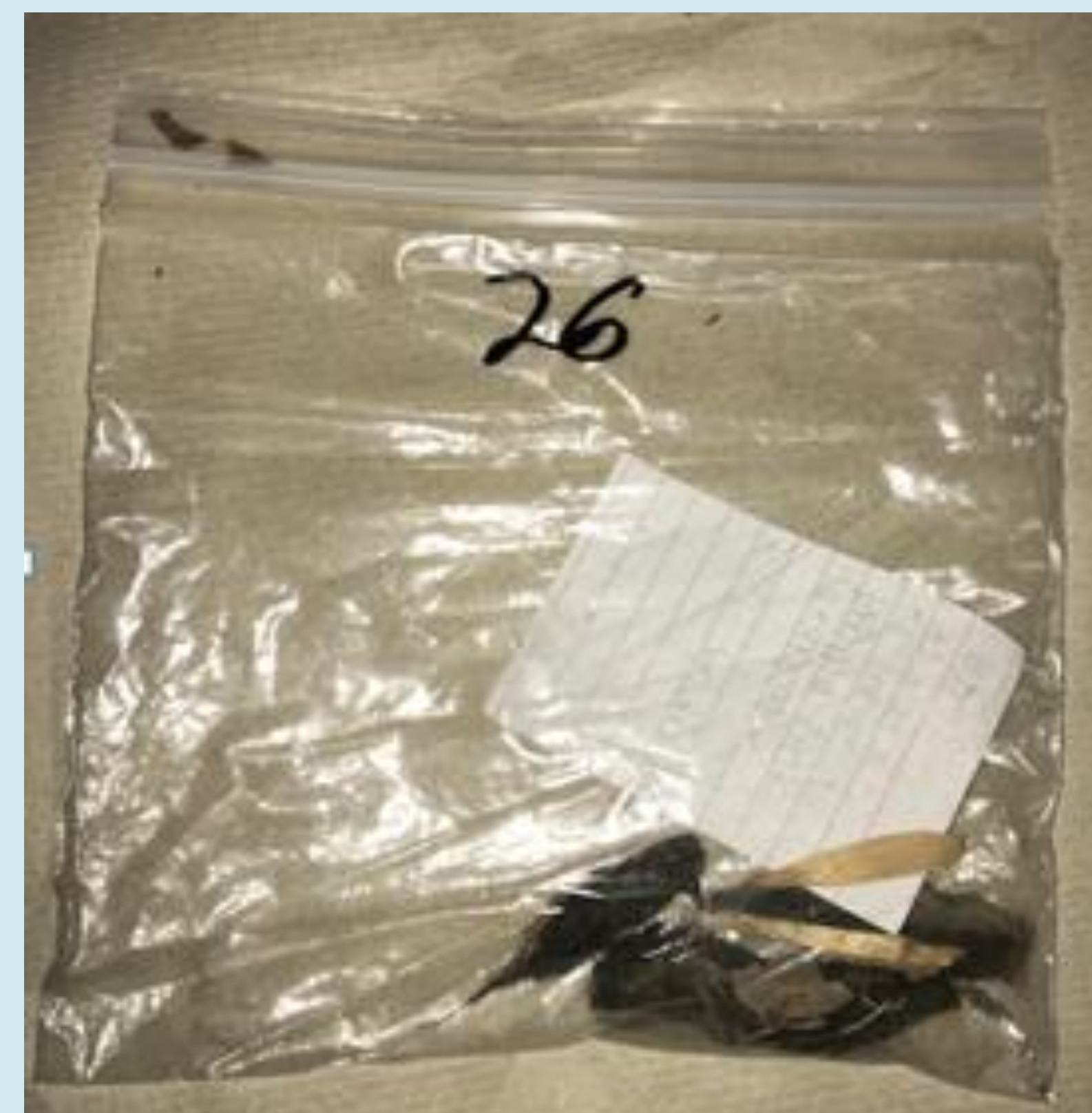


Figure 2: Example of a scat sample retrieved from the study site in Long Beach, California.



Figure 3: (Left) Scat samples in nylon socks after the sterilization and detergent wash. (Right) Scat sample retained in centrifuge tubes for DNA analysis.

Discussion

Labeled and sterilized all 32 scat samples.

A sample of each scat is retained and labeled in centrifuge tubes for later use in the DNA analysis portion of the study (Figure 3).

Analyzing the scat sample for bones and other food items is the goal of the lab by the end of the semester.

An additional technique that we will use is "...the identification of mammalian hairs... a valuable supplement to the conventional techniques used in mammal surveys and that it can provide useful information on the diet of these predators" (Brunner et al., 1976).

Literature Cited

Zabala, Jabi, and Iñigo Zuberogoitia. "Badger, *Meles meles* (Mustelidae, Carnivora), diet assessed through scat-analysis: a comparison and critique of different methods." *folia zoologica-praha*- 52.1 (2003): 23-30.

Phillips RB, Winchell CS, Schmidt RH (2007) Dietary overlap of an alien and native carnivore on San Clemente Island, California. *Journal of Mammalogy* 88: 173–180

Klare, Unn, Jan F. Kamler, and David W. Macdonald. "A comparison and critique of different scat-analysis methods for determining carnivore diet." *Mammal Review* 41.4 (2011): 294-312.

Brunner, H., R. L. Amor, and P. L. Stevens. "The use of predator scat analysis in a mammal survey at Dartmouth in north-eastern Victoria." *Wildlife Research* 3.1 (1976): 85-90.

Reynolds, Jonathan C., and Nicholas J. Aebischer. "Comparison and quantification of carnivore diet by faecal analysis: a critique, with recommendations, based on a study of the fox *Vulpes vulpes*." *Mammal review* 21.3 (1991): 97-122.

Riley, Seth PD, et al. "Effects of urbanization and habitat fragmentation on bobcats and coyotes in southern California." *Conservation Biology* 17.2 (2003): 566-576.

Atkinson, K. T., and D. M. Shackleton. "Coyote, *Canis latrans*, ecology in a rural-urban environment." *Canadian Field-Naturalist* (1991).

Acknowledgements

We would like to thank the Center For Urban Resilience for their support and lab space, as well as the University for fostering an educational environment.