

Lunar Illumination as an Indicator for Black-tailed Deer Activity

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Introduction

Black-tailed deer (*Odocoileus hemionus columbianus*) are a large ungulate species that frequently are the subject of human-wildlife conflict in Northern California (Furnas et al. 2020). As urban expansion continues across California, it is crucial that wildlife managers are well-informed about the natural processes that drive wildlife activity in order to minimize conflict.

Objective

The goal of this study is to test the long-standing local notion that there is a positive correlation between nightly deer activity and lunar illumination.

Study Area



This study was conducted in the northern portion of the Lost Coast, which is managed by the Bureau of Land Management. The Lost Coast is known for being too rugged for urban development (Wick 2016), making it the ideal location to study Black-tailed deer that are not habituated to urban areas.

Figure 1: Map showing the location of the Lost Coast in Northern California.

Image courtesy of Janet Young, Friends of the Lost Coast.

Methods

- 8 game cameras with identical capture settings were deployed approximately ¼ mile apart.
- Study sites selected based on prevalence of deer sign or use as well as available vegetation for camera deployment.
- Cameras were left active for 5 weeks to capture data across a full lunar cycle.
- Photos were sorted through one by one, noting the count of deer photographed between sunset and sunrise by date.
- Lunar illumination data was obtained www.timeanddate.com

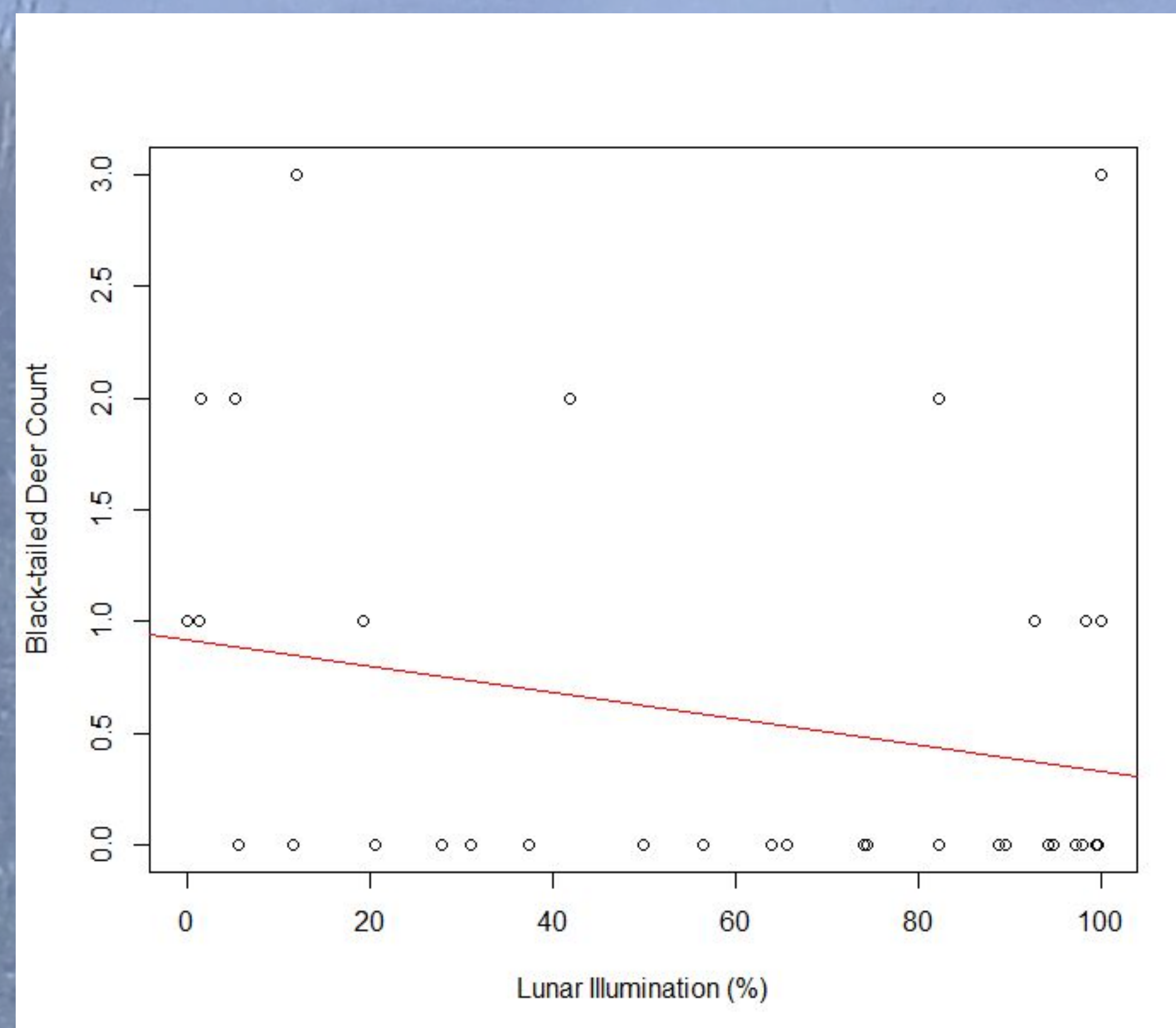


Figure 2: A scatterplot displaying the relationship between lunar illumination and Black-tailed deer counts.

Results

- Data was analyzed using a simple linear regression from a poisson distribution.
- A t-test was used to compare counts of Black-tailed deer and the percentage of lunar illumination.
- Black-tailed deer counts did not show any significant correlation to lunar illumination (t-test, $p=0.1714$)

Discussion

- The results of this study were not statistically significant. Therefore we are unable to reject the idea that there is no correlation between nightly Black-tailed deer activity and lunar illumination.
- To correct for this in the future, it would be ideal to conduct data collection over multiple lunar cycles and over more study sites.
- To further ensure significant results from future studies, GPS collars could be fitted to individual deer. This would collect 24/7 movement data, rather than rely coincidental occurrence counts.
- Continued research should be conducted in order to help minimize future human-wildlife conflict.

Literature Cited

- Furnas, B. J., R. H. Landers, R. G. Paiste, and B. N. Sacks. 2020. Overabundance of Black-tailed deer in urbanized coastal California. *Journal of Wildlife Management* 84(5):979–988
- Wick, R. 2016. Technology brings new challenges to wilderness managers: an example from the Bureau of Land Management - managed Lost Coast of California. *Journal of Forestry* 114(3):415-416