Deer Pellet and Kill Count Analysis (2014–2022)

Abstract

This study investigates whether deer pellet counts, used as a proxy for deer population, correlate with actual kill counts in the BRF region from 2014 to 2022. Through a combination of visual analysis and statistical correlation, we explore if pellet counts can be considered a reliable indicator of deer presence. The results show that while pellet and kill counts vary year-to-year, they do not positively correlate. The Pearson correlation coefficient is -0.47, suggesting a moderate negative relationship.

Introduction

Pellet count surveys have been widely used in wildlife ecology as a proxy for estimating ungulate population density. For instance, recent studies such as Acevedo et al. (2017) and LaRue et al. (2020) examined spatial variability and reliability of pellet-based surveys in forest ecosystems. These studies emphasize that while pellet counts are cost-effective and non-invasive, their interpretation requires caution due to factors like decomposition rate, observer variability, and seasonal pellet detectability.

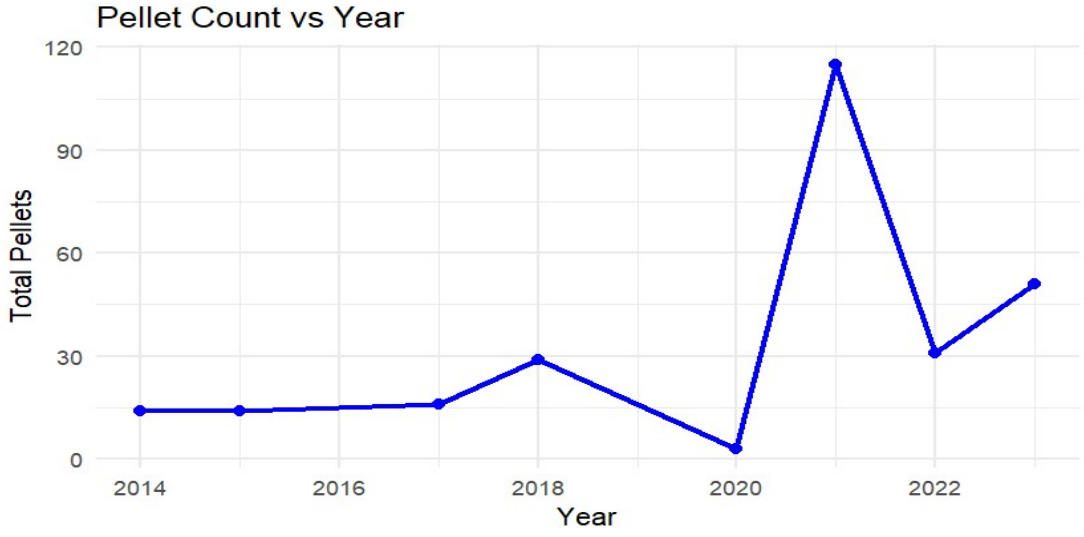
Deer management relies heavily on understanding population dynamics over time. Pellet counts are a common non-invasive method to estimate deer presence. However, the reliability of pellet counts in predicting actual harvest outcomes is debatable. This project aims to assess trends in deer pellet and kill counts across years and determine whether pellet counts can predict hunting success.

Methods

Data from 2014 to 2022 was extracted from two sources: one recording pellet count observations, and the other documenting deer harvest records. Pellet and kill counts were aggregated by year. Four key plots were created: pellet count over time, kill count over time, both counts combined, and a scatter plot comparing pellet count vs. kill count. A Pearson correlation test was performed to measure the relationship between pellet and kill counts.

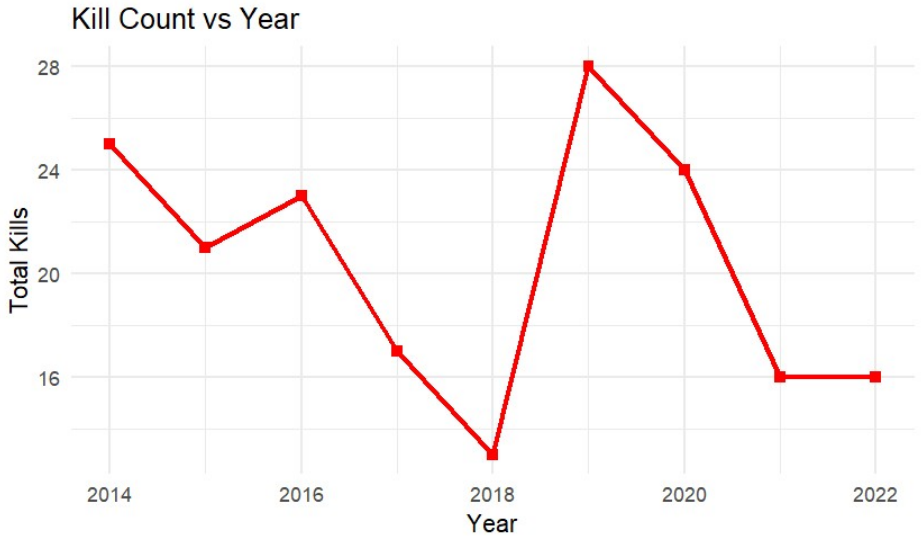
Results & Interpretation

Pellet Count vs Year



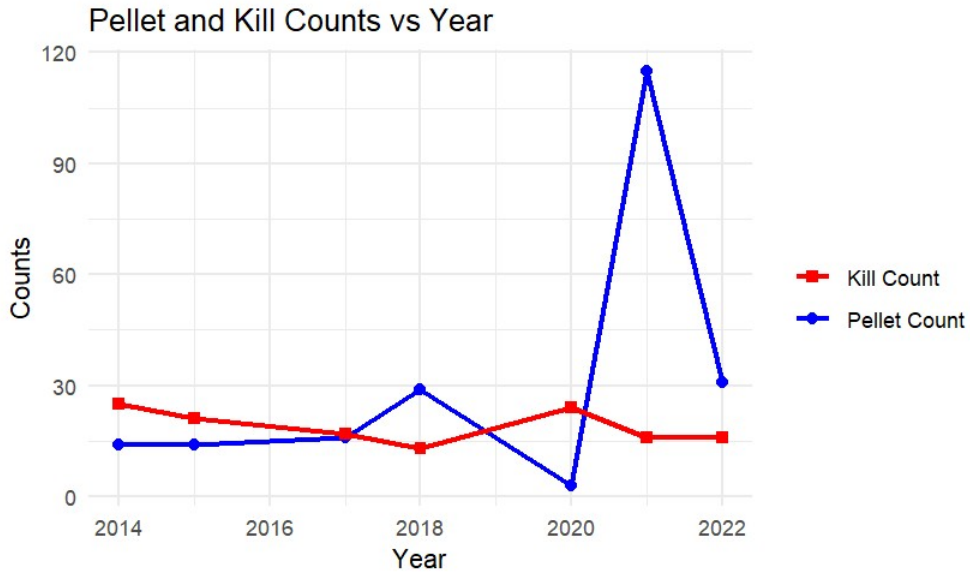
Pellet counts show a general increase from 2014 to 2021, peaking sharply in 2021 before declining in 2022.

Kill Count vs Year



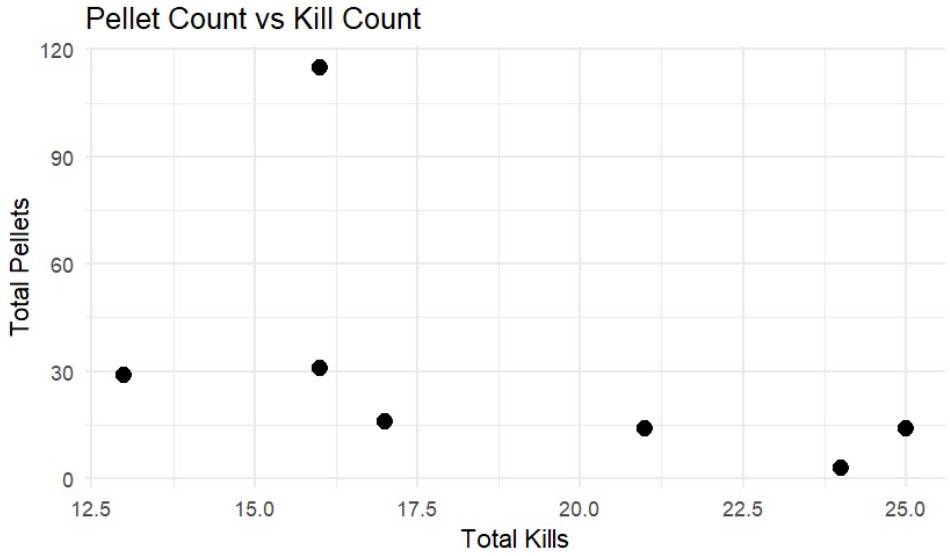
Kill counts decreased from 2014 to 2018, recovered in 2020, and remained relatively stable afterward.

Pellet and Kill Counts vs Year



A comparison of both trends shows that they do not rise or fall together. 2021 had the highest pellet count but not the highest kill count, indicating a divergence between indicators.

Pellet Count vs Kill Count (Scatter Plot)



A negative correlation was observed (Pearson r = -0.47), suggesting that higher pellet counts may not correspond with higher harvest numbers.

Conclusion

This analysis reveals no strong positive correlation between pellet counts and kill counts from 2014 to 2022. The moderate negative correlation implies that pellet counts alone may not be reliable predictors of harvest success. Future studies should consider incorporating other environmental and behavioral variables to strengthen population monitoring efforts.

References

Acevedo, P., Vicente, J., Triguero-Ocaña, R., Gortázar, C., & Cassinello, J. (2017). Spatial distribution of fecal pellet counts and the implications for estimating ungulate densities. Wildlife Biology, 2017(1). https://doi.org/10.2981/wlb.00259

LaRue, M. A., Kunkel, K. E., & Rumble, M. A. (2020). Comparing pellet counts and camera traps to monitor white-tailed deer populations. Ecological Indicators, 115, 106401. https://doi.org/10.1016/j.ecolind.2020.106401