The Effects of White-Tailed Deer on Dark Eyed Juncos

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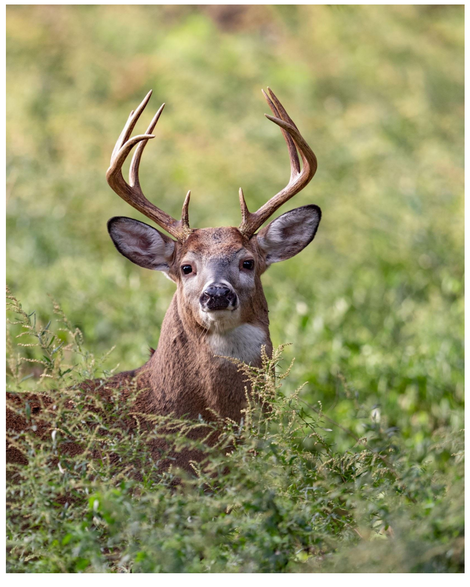
Abstract: This study investigated whether deer feeding on plants during the winter reduces dark eyed-junco activity in forest understory habitats. To test this, two similar forest plots on Mount Everett were used: one fenced to exclude deer and one left unfenced. Junco activity was measured using a BirdWeather PUC acoustic sensor and direct observation with binoculars over a January-February study period. The fenced plot showed consistently higher junco activity than the unfenced plot. Sensor data averaged 12.3 juncos per session in the fenced plot compared to 7.0 in the unfenced plot, while direct observations averaged 1.9 versus 1.1. These results suggest that areas without deer browsing support higher junco presence. The findings support the hypothesis that deer overbrowsing reduces understory vegetation, which is important for junco foraging. However, due to the small sample size and potential environmental variation between plots, the results demonstrate correlation rather than causation. Overall, this study highlights the potential impact of deer activity on bird populations and suggests that managing deer populations may help maintain healthy forest ecosystems.

INTRODUCTION

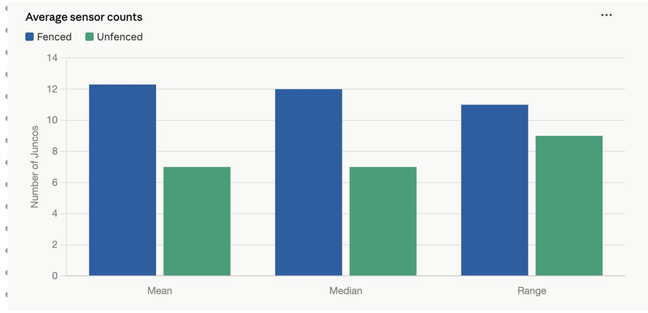
- White-tailed deer (*Odocoileus virginianus*) are an important force shaping forests in the Berkshires and across the northeastern United States.
- Because deer have fewer natural predators and can survive well in human-occupied areas, their populations have increased in many forests.
- As deer populations grow, they feed heavily on young trees, shrubs, seedlings, and plants on the forest floor.
- This feeding is called overbrowsing, and it can reduce the amount of low vegetation in a forest.
- The low vegetation layer, known as the understory, is important because it provides food, shelter, and nesting space for many species.
- When deer overbrowse an area, the forest floor can become more open, leaving fewer shrubs, saplings, and leaf-covered hiding places.
- Dark-eyed juncos (*Junco hyemalis*) are small ground-foraging birds that rely on low vegetation, leaf litter, and plant cover for nesting, protection, and finding food.
- Since juncos often nest on or near the ground, a thinner understory may make their habitat less safe and less suitable.
- Previous research shows that when deer are excluded from forest plots, native plants and understory vegetation often recover.
- Research also suggests that healthier understory habitats can support more bird activity and diversity.
- This study examines whether excluding deer from a forest plot increases dark-eyed junco activity in the Berkshires.
- **Hypothesis:** Areas with higher white-tailed deer activity will have lower dark-eyed junco activity because deer overbrowsing reduces the vegetation and ground cover juncos depend on.

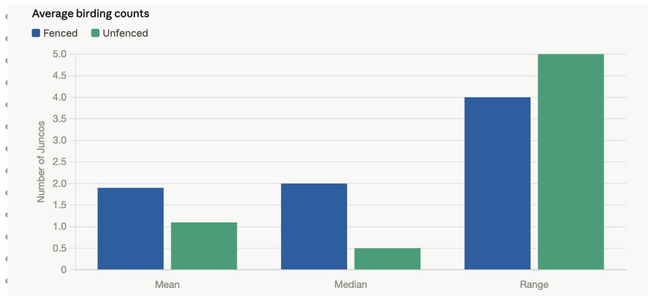
METHODS

- Two similar forest plots on Mount Everett were selected: one fenced plot and one unfenced control plot.
- Deer access was the independent variable, while dark-eyed junco activity was the dependent variable.
- The fenced plot was surrounded with 85 feet of plastic fencing to keep deer out while still allowing birds and smaller animals to enter.
- Both plots were kept similar in size, forest cover, ground cover, and observation setup.
- Materials used: plastic fencing, binoculars, trail cameras, lawn chair, and BirdWeather PUC sensor.
- Trail cameras were used to monitor deer activity in each plot.
- A BirdWeather PUC acoustic sensor was used to detect and record dark-eyed junco vocalizations.
- During observation sessions, binoculars were used to visually confirm junco presence and feeding behavior.
- Observations were made from a lawn chair placed about 10 meters away to reduce disturbance.
- Each observation session lasted about 30 minutes and was conducted during similar daylight hours.
- The number of junco sightings, feeding events, and vocal detections were recorded for each plot.
- Data from the fenced and unfenced plots were compared to see whether excluding deer affected junco activity and food availability.
- A main limitation was the small sample size of only two plots, along with possible differences in weather, time of day, and natural plot conditions.



RESULTS





- The data showed that dark-eyed juncos were detected more often in the fenced plot than in the unfenced plot.
- Sensor data showed the fenced plot had 7–18 juncos per session, while the unfenced plot had 3–12 juncos per session.
- Direct bird observations also showed more junco activity overall in the fenced plot.
- On average, sensor detections were about 75% higher in the fenced plot than in the unfenced plot.
- Both plots showed some variation across January and February, but there was no clear linear trend over time.
- The highest fenced plot sensor counts occurred on January 15 with 18 juncos and February 19 with 15 juncos.
- Since the fenced plot consistently had higher junco counts, deer exclusion may have made the habitat more suitable for juncos.
- These results support the hypothesis that areas with more deer activity may have lower dark-eyed junco activity.
- This pattern connects to previous research showing that deer overbrowsing reduces understory vegetation, which juncos rely on for cover, nesting, and foraging.
- However, the study shows correlation, not causation, because other factors like weather, vegetation differences, and nearby food sources may have influenced the results.
- A larger study with more plots would be needed to prove a stronger cause-and-effect relationship.

DISCUSSION & FUTURE DIRECTION

- The results mostly support the hypothesis that areas with more deer activity would have lower dark-eyed junco activity.
- The fenced plot averaged 12.3 juncos per session, while the unfenced plot averaged 7.0 juncos per session based on sensor data.
- Direct observations showed the same pattern, with the fenced plot averaging 1.9 juncos compared to 1.1 juncos in the unfenced plot.
- Since both detection methods showed higher junco activity in the fenced plot, deer exclusion may have helped create better habitat conditions.
- These results connect to previous research showing that deer overbrowsing reduces low vegetation, shrubs, and ground cover that birds rely on.
- The higher junco activity in the fenced plot may be linked to preserved understory vegetation and better protection from predators.
- However, this study cannot prove causation because only two plots were studied.
- Other factors, such as weather, natural differences between plots, food availability, or sensor error, may have influenced the results.
- Future studies should use more replicated plots, collect data over multiple seasons, and directly measure vegetation density and food availability.
- Overall, the study suggests that deer management may help protect understory habitats and support bird populations in the Berkshires.
- Conclusion: Increased deer activity was associated with lower dark-eyed junco activity, supporting the idea that deer overbrowsing can affect forest bird habitat.



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