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Calvin Norman
Clemson University

Susan T. Guynn
Clemson University

David C. Guynn
Clemson University

John H. Thrift
Clemson University

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Effects of white-tailed deer herbivory on upland plant communities in the Piedmont of South Carolina

By Calvin Norman, Susan T. Guynn, David C. Guynn, Jr., John H. Thrift and Donald L. Hagan

Introduction

• Most research on deer herbivory indicates herbivory is negative:
  • Reduction in vegetation cover and diversity
  • Reduction in overstory abundance and diversity
  • Increased invasion by non-native/invasive species
• Little research has been done on the impact of deer herbivory in the Southeast

Objectives

• To determine the effect of deer herbivory on the understory plant community
• To determine the effect of deer herbivory on oaks
• To determine the effect of deer herbivory on invasive plants

Materials

• In 2004 six hardwood stands were clearcut
• A 20mx20m with a 2.5m high fence built in each stand (Figure 3 and Figure 4)
• Vegetation plots were 20mx20m
• Woody vegetation was classified as seedling (0–137 cm height), sapling (<2.5 cm DBH), overstory (≥2.5 cm DBH), vines (above or below DBH)
• Cover class was measured in a 5x5m plot
• Classifications were: herbs (0-137cm tall), shrubs (0-2.5cm DBH), overstory (>2.5cm DBH), and vines
• Data was analyzed using two-way ANOVA tests in R version 3.5.2

Results

Discussion

• Deer presence increased overall species richness ($p=0.075$)
• There were no significant differences in the number of invasive species ($p=.81$)
• Deer reduced the abundance of Japanese honeysuckle (Figure 1, Figure 3, and Figure 4)
• Deer presence increased sapling abundance by 857 individuals per Ha and overstory abundance by 1,134 individuals per Ha (Figure 2). This increase is not statistically significant

Conclusion

• At current density (32-38 deer/ km²) deer have a positive impact on the plant communities:
  • Oaks recruited faster and in greater abundance where deer were present
  • The understory plant community positively benefited from deer presence
  • Japanese honeysuckle regeneration was reduced by deer presence