

4-1-2019

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

Calvin Norman  
*Clemson University*

Susan T. Guynn  
*Clemson University*

David C. Guynn  
*Clemson University*

John H. Thrift  
*Clemson University*

Follow this and additional works at: [https://tigerprints.clemson.edu/grads\\_symposium](https://tigerprints.clemson.edu/grads_symposium)

---

## Recommended Citation

Norman, Calvin; Guynn, Susan T.; Guynn, David C.; and Thrift, John H., "Effects of white-tailed deer herbivory on upland plant communities in the Piedmont of South Carolina" (2019). *Graduate Research and Discovery Symposium (GRADS)*. 220.  
[https://tigerprints.clemson.edu/grads\\_symposium/220](https://tigerprints.clemson.edu/grads_symposium/220)

This Poster is brought to you for free and open access by the Student Works at TigerPrints. It has been accepted for inclusion in Graduate Research and Discovery Symposium (GRADS) by an authorized administrator of TigerPrints. For more information, please contact [kokeefe@clemson.edu](mailto:kokeefe@clemson.edu).



# 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

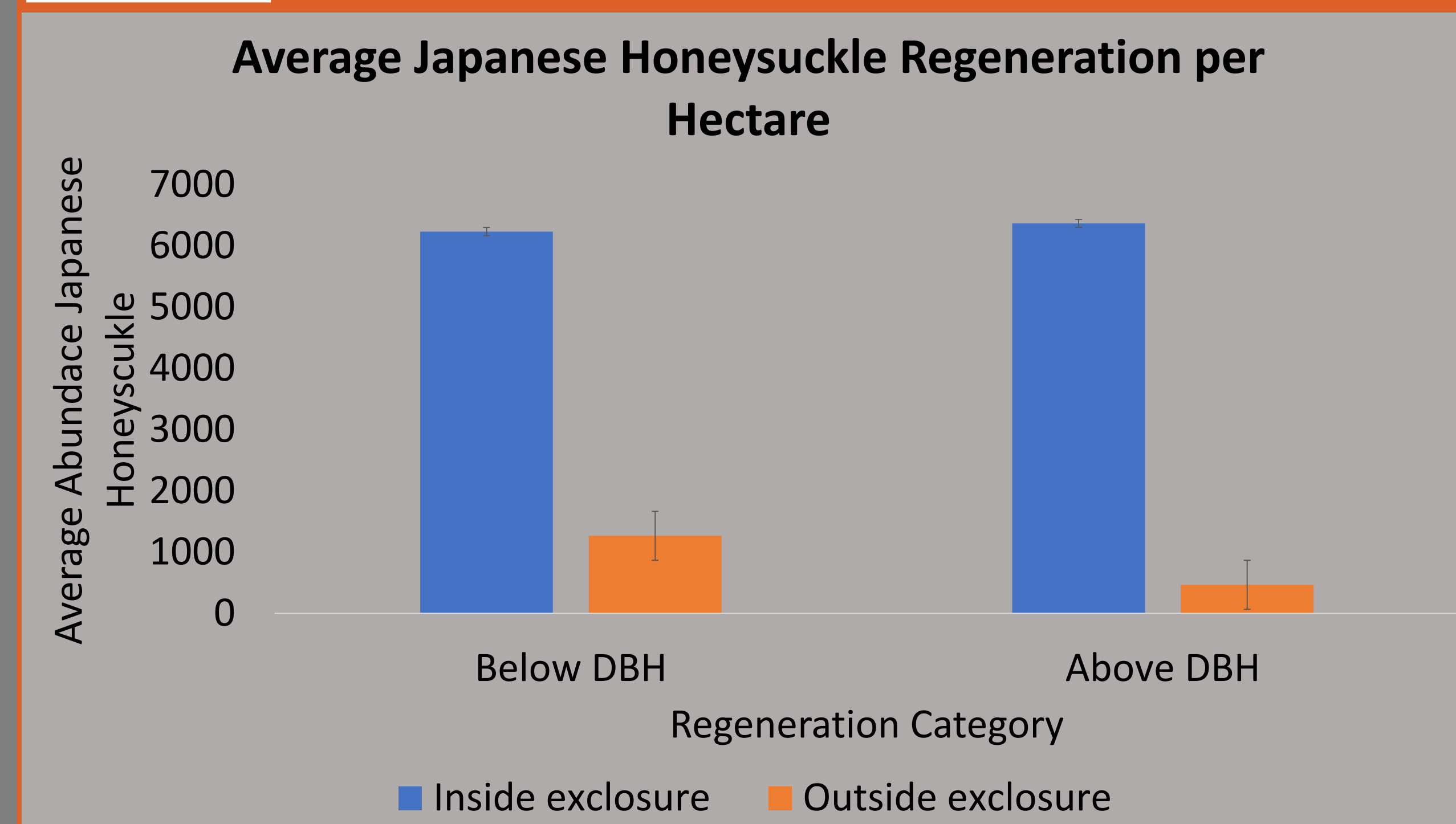
## Objectives

- 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 ( $\geq 2.5$  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

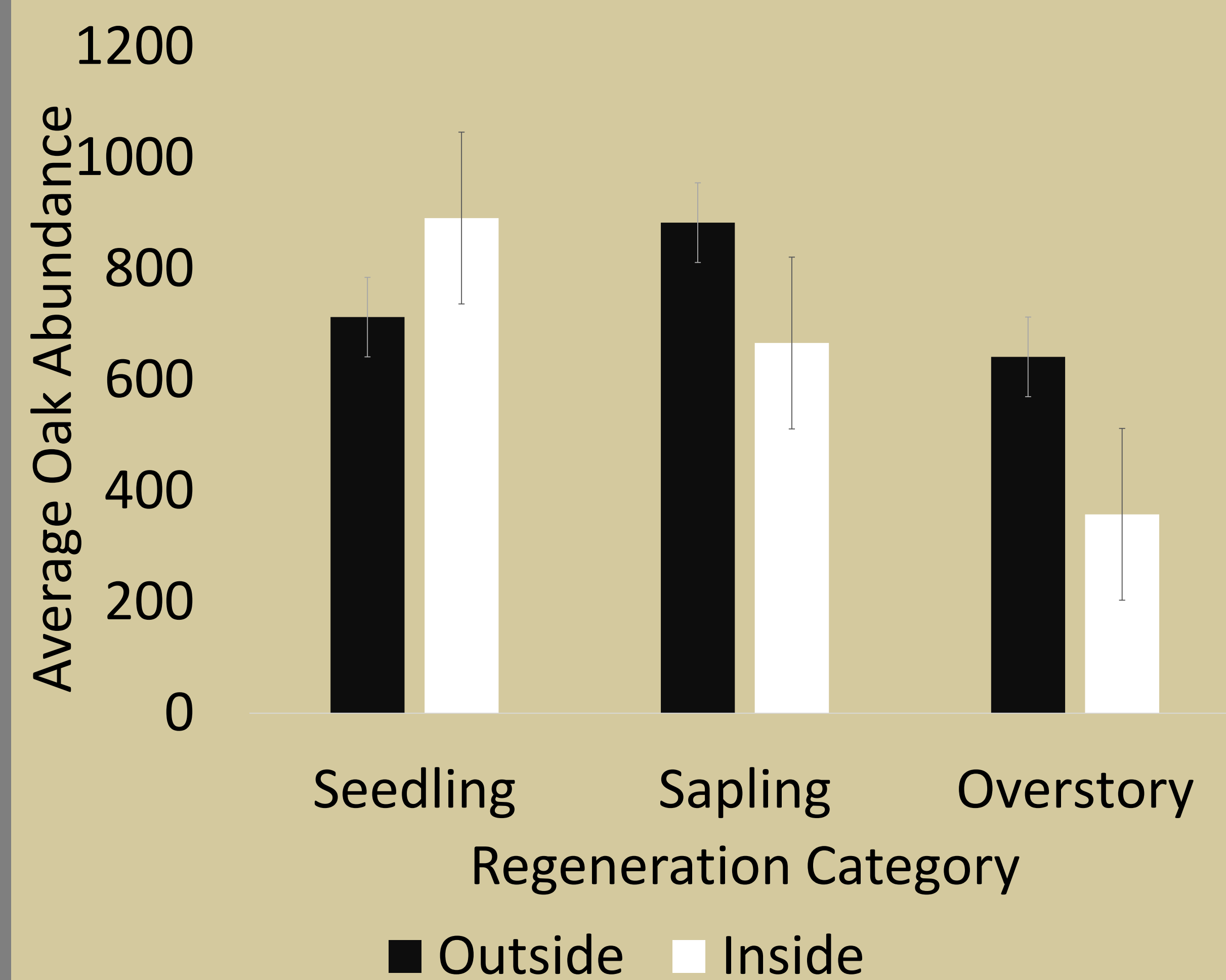


**Figure 1** Average regeneration of *Lonicera japonica* per hectare 13 years after clearcut. There were 4,967 more *Lonicera japonica* below DBH 5,900 above DBH inside the enclosure than outside the enclosure in a 13-year-old clearcut in the Clemson Experimental Forest in the Piedmont, South Carolina in 2017. Error bars indicate standard error.

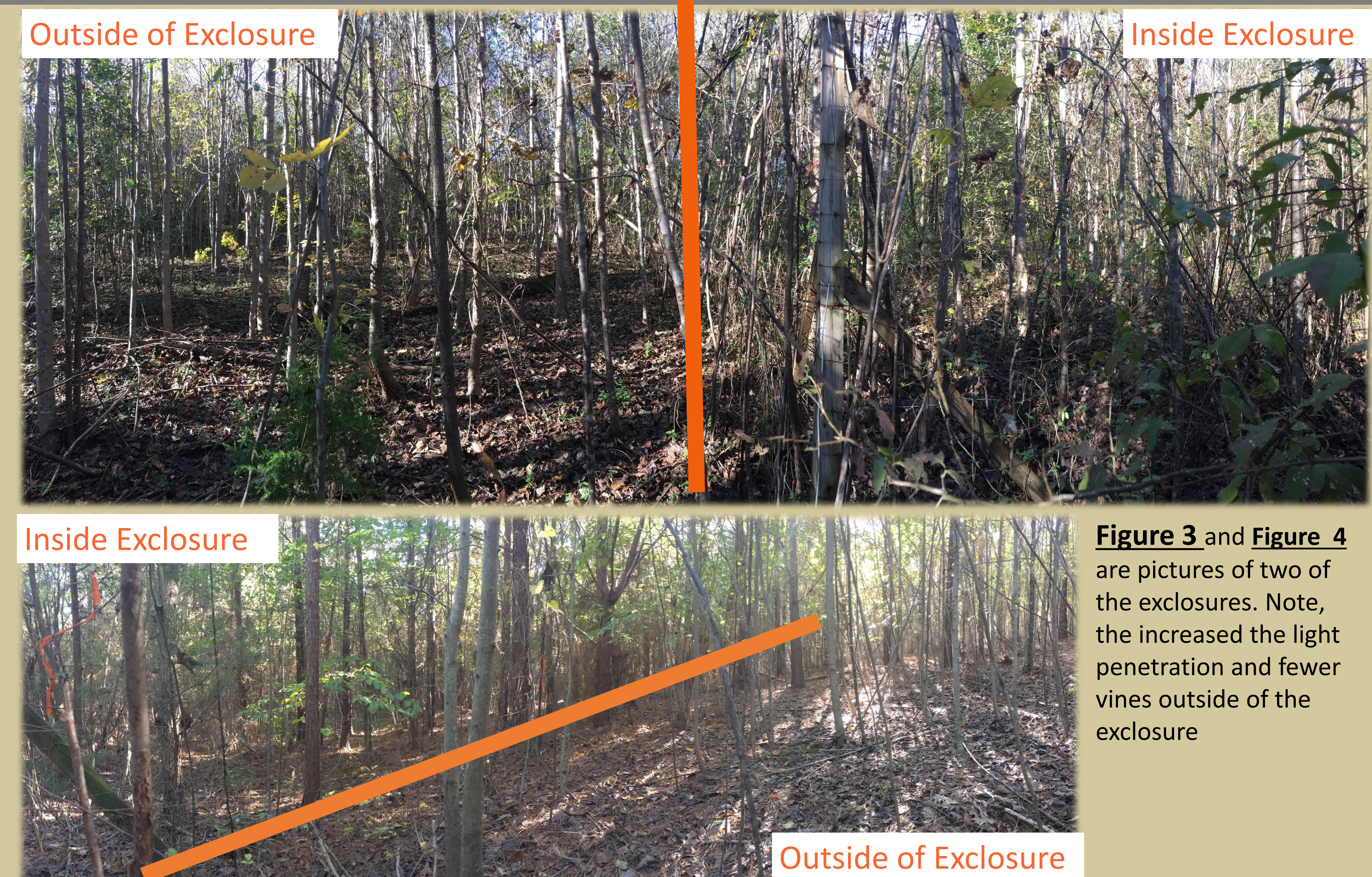
## Discussion

- Deer presence increased overall species richness ( $p=.075$ )
- 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

## Average Oak Regeneration per Hectare



**Figure 2.** Average oak regeneration/recruitment per hectare inside and outside enclosures in the Clemson Experimental Forest in Piedmont, South Carolina 13 years after a clear cut in 2017. Error bars indicate standard error.



**Figure 3** and **Figure 4** are pictures of two of the enclosures. Note, the increased the light penetration and fewer vines outside of the enclosure

## Conclusion

- At current density (32-38 deer/ km<sup>2</sup>) 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