

Effects of intense deer herbivory on the herbaceous understory at Trillium Trail

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Abstract: Due to a synergism of many human-mediated factors, white-tailed deer (*Odocoileus virginianus*) populations have increased dramatically throughout many forests throughout the northeastern North America over the last 50 years. The increase in deer populations negatively impacts plants through a variety of mechanisms, which can include increased consumption, trampling, and soil compaction. To preserve the plants in our forests, managers need to understand both how increases in the deer population impact the overall plant community as well as the individual plant species within the community. In general, the impact of deer presence on the overall plant community has been studied by comparing plant communities inside and outside of fences that exclude deer. Previous deer exclosure studies have shown that high deer numbers reduce the overall amount of plants, shift community composition (representation of each plant species), and reduce overall plant biodiversity. However, previous studies examining the impact of deer on plants at the community level have not been linked with studies that examine the impact of deer on the responses of individual species in the community. Our 6-year study collected data on individual species, as well as community composition between exclosures and control plots that were situated within the 16-hectare Trillium Trail Natural Area in Fox Chapel Borough outside of Pittsburgh, Pennsylvania. Results of this study provide evidence that in the presence of deer, herbaceous species not only exhibit diverse vegetative responses (in terms of absolute cover responses of individual species) but in the case of 6 perennial species, reproductive stages are affected. In white trillium (*Trillium grandiflorum*), deer appear to reduce the representation of reproductive plants by reducing overall plant size. This study also provided further confirmation that deer presence reduces species richness and overall ground cover, as well as alters community composition.

Key words: deer browsing, *Odocoileus virginianus*, *Trillium grandiflorum*, white-tailed deer