

The Occurrence of Browsing by White-Tailed Deer (*Odocoileus virginianus*) on Texas Red Oak (*Quercus buckleyi*) at Wild Basin Preserve

William J. Quinn and Devin K. Gillen, St. Edward's University
billq@stedwards.edu

Purpose – The purpose of this project is to document the degree to which browsing at Wild Basin Preserve is occurring so that the indirect effects of that browsing on Golden Cheeked Warbler habitat can be estimated.

Introduction – With increasing deer populations throughout the United States, browsing has increased dramatically. Vegetative species in the deer's historic range have been variably affected, depending on their palatability, but overall impacts have been recognized for decades (Alverson, et al. 1988; Van Auken, 1993; Russell and Fowler, 2002). *Quercus buckleyi* is a species that appears to play a prominent role in the community where the endangered Golden Cheeked Warbler (*Setophaga chrysoparia*) nests (Kroll, 1980). In fact, this tree species seems to play a vital role in the life cycle of many insect species, particularly Lepidopterans, upon which the warbler preys (Pulich, 1969). As deer browsing on the oak increases in intensity, the recruitment of young saplings into the over-story is reduced, and the long term structure of the nesting community may be threatened.

Materials and Methods – In order to determine the degree to which browsing occurs on *Q. buckleyi* at the preserve, seven belt transects were established near warbler nesting sites at the Wild Basin Preserve and two others were established at the Barton Creek Habitat Preserve in the summer of 2013. The sample sites were chosen to correspond to sites in which warbler nesting success had been documented the previous year. The Barton Creek Habitat Preserve sites were included because the author had previously established severe browsing at those sites in October, 2003.

The occurrence of each woody angiosperm plant that was over 2 cm in diameter at the ground and that reached breast height within one meter of a 30 meter transect was documented. The species, height, diameter at ground level and degree of browse (none, light, moderate, severe) was determined for each individual. The data were analyzed to determine if *Q. buckleyi* or any other woody angiosperm had suffered severe browsing in the current growing season and to compare that level of browsing with browsing on other woody species.

Results – In all transects, one occurrence of light browsing was noted, on one individual of *Q. buckleyi*. No other browsing was documented. The height and diameter data for some species are reported in the graphs below.

Figure 1. Frequency distribution of *Quercus buckleyi* by diameter class.

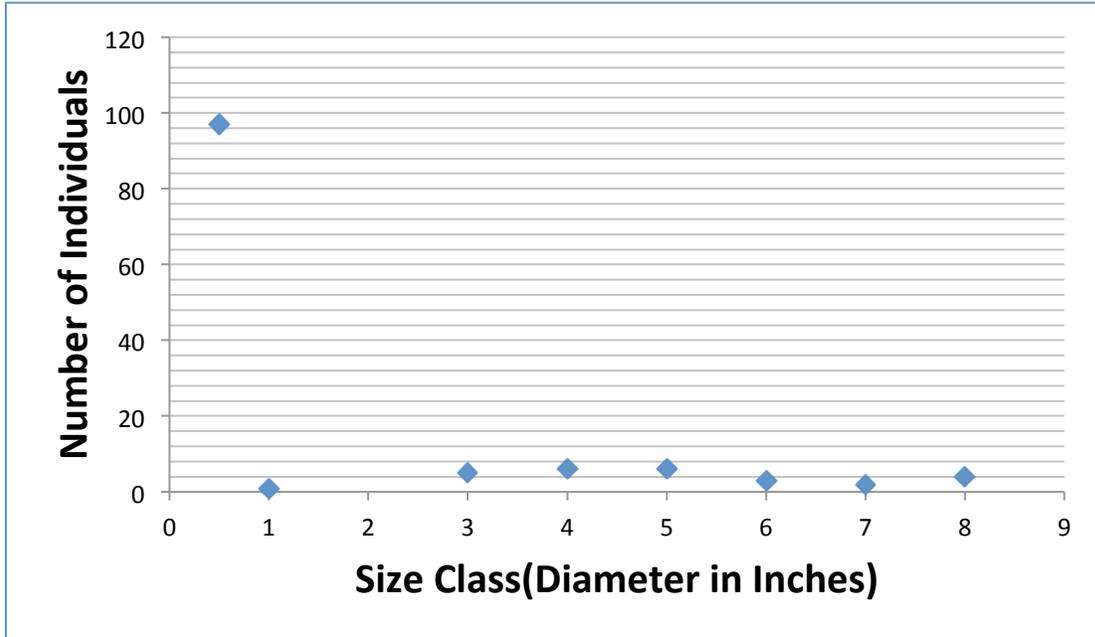
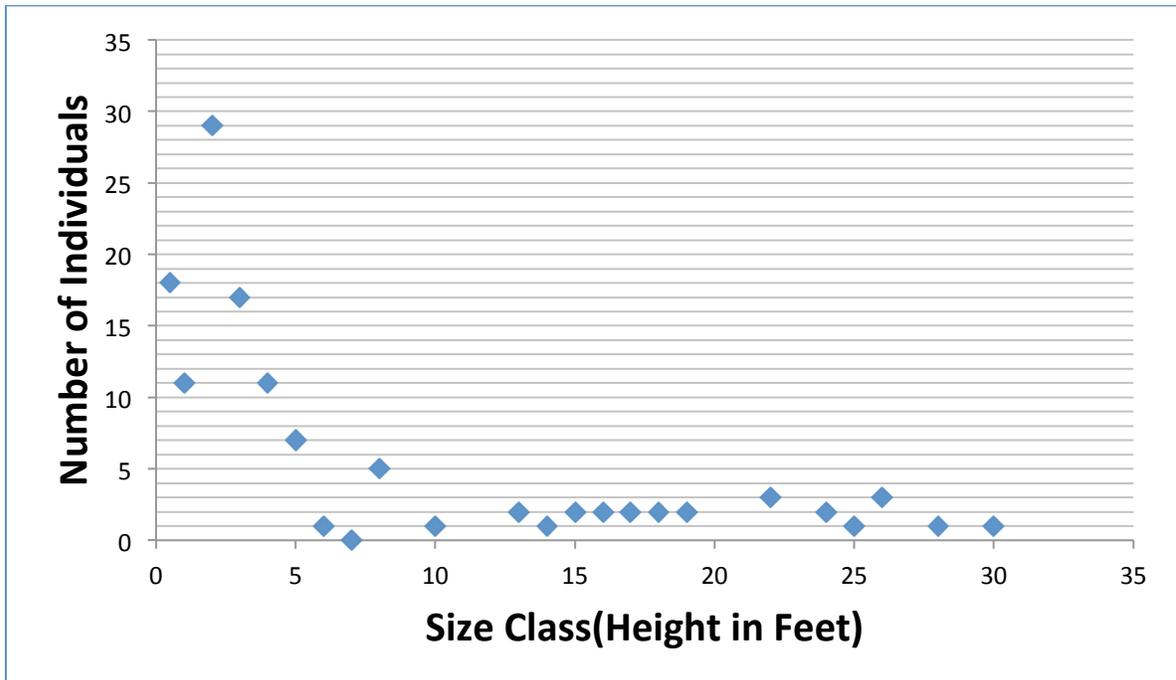


Figure 2. Frequency distribution of *Quercus buckleyi* by height class.



Discussion – Since the purpose of the project was to determine the extent of browsing, and not to describe the composition of the woody vegetative community, our major response has to be that there was no appreciable browsing on any species that could be detected from our sampling, conducted in June, 2013. Not only was there no browsing apparent in the Wild Basin Preserve, there was no browsing detected in the same areas in which Quinn and Penn had documented significant browsing in the Barton Creek Habitat in 2003. The 2003 effort was conducted in October, and it would be beneficial to repeat our data collection in the autumn. That has not yet been done.

Although the project was not specifically designed to allow us to draw conclusions about the size class distribution of the deciduous woody vegetation at the preserve, it is clear from our data that both *Q. buckleyi* and *Fraxinus texensis* (data not summarized here) populations are experiencing a lack of recruitment from sapling stages to the mid- or over-story stages. This is consistent with earlier observations.

References

- Alverson, W. S., D. M. Waller, S. L. Solheim. 1988. *Forests too deer: edge effects in northern Wisconsin*. *Conservation Biology*. 2:348-358.
- Kroll, J. C. 1980. *Habitat requirement of the Golden-Cheeked Warbler: management implications*. *Journal of Range Management*. 33:60-65.
- Pulich, W. M. 1969. *Golden-Cheeked Warbler Threatened Bird of the Cedar-Brakes Dendroica chrysoparia Ecology Conservation*. *National Parks Magazine*. 43:10–12.
- Russell, F. L. and N. L. Fowler. 2002. *Failure of adult recruitment in Quercus buckleyi populations on the eastern Edwards Plateau*. *American Midland Naturalist*. 148:201-217.
- Van Auken, O. W. 1993. *Size distribution patterns and potential population change of some dominant upland deciduous and evergreen forests of central Texas*. *Texas Journal of Science*. 45:199-210.