

EFFECT OF SLOPE ASPECT ON FIELD UTILIZATION BY WHITE-TAILED DEER (*ODOCOILEUS VIRGINIANUS*)

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ABSTRACT

Overabundance of white-tailed deer (*Odocoileus virginianus*) has made them a pest species that not only ruins crops but also causes several thousand car accidents a year. Knowledge of deer habitat utilization can assist management efforts. I studied habitat utilization of deer at the Raystown Field Station. I tested the hypothesis that fields with south facing slopes will be more often used than north facing slopes, as measured by using pellet-counts. I established 7 2-meter radius circular plots on each slope and searched the circles for pellets. North slope (0.1 piles per plot) was not significantly different from the south slope (0.07 piles per plot) ($w = 56.5$, $df = 6$, $p > .05$). These preliminary results suggest that deer have no slope aspect preference.

Key words: White-tailed Deer, habitat preference, slope, pellet count

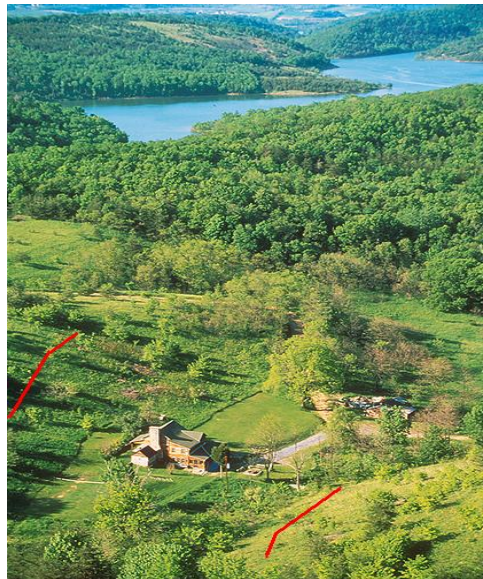
INTRODUCTION

Despite their size and abundance, determining population density and habitat utilization of white-tailed deer (*Odocoileus virginianus*) can be difficult. However, since around 1938, a pellet-count census has been developed (Bennett et al. 1940). This method usually involves establishing a series of plots, typically in a circle or long rectangle, and checking for pellets during certain time intervals and removing them or marking them (Bennett et al. 1940). Through an analysis of amount of pellets per day, pellet counts provide a general population size, and indicate where the deer are located during certain seasons. White-tailed deer spend a large majority of their time where they feed and thereby the larger proportion of their pellets will also be at those locales (Russell 2001). Thus, other influences of the environment, such as weather or even interactions with other local species, and their effects on white-tailed deer, can be studied with a pellet count (Bennett et al. 1940). During the autumn, white-tailed deer feed most in fields, just before the first frequent frosts occur. There is a significant difference between the amount of vegetation between a north-facing field slope and a south-facing slope (Russell 2001). Because of the higher abundance of sunlight and resulting higher growth rate and potential for more food, I hypothesized that deer would utilize south-facing slopes more often than the north-facing slopes, as measured using pellet-counts.

FIELD SITE

I conducted this study on the opposing north and south facing sloped fields on either side of the main house at the Juniata College Raystown Field Station during October and November 2001. The habitat is old field succession made up of the perennial herbaceous plant community type along a small valley (Fig 1). The south-facing slope is very large and extends up and over the top of the hill and length wise well past the house. The north-facing slope is smaller, about a quarter to half the size of the south-facing slope, and surrounded by dense forests. The selected deer trails were about half way up the slopes.

Figure 1. Location of study transects at the Raystown Field Station. Lines show approximately where deer runs are.



METHODS AND MATERIALS

I selected a deer trail that ran horizontally along the slope of both a north and south facing field. I then randomly selected 7 points along that trail and marked the center to establish a 2-meter radius plots. I cleared the plots for deer pellets and then revisited the plots and repeated the count and removal over a 10-day period. I tested the data for equal variances using Bartlett's homogeneity of variance test. I then compared north to south facing slopes using a Mann Whitney U test and considered differences to be significant if $p \leq .05$.

RESULTS

I found no significant difference in mean pellet numbers between north (0.1 piles per plot) and south (0.07 piles per plot) slopes ($w = 56.5$, $df = 6$, $p > 0.05$).

DISCUSSION

There may be several reasons why there was no difference between the north and south slope. Pauley et al. (1993) showed that deer more frequently use forests during the winter season and because my experiment was conducted in late autumn, it is possible the deer were already starting to utilize the forested habitat. The north sloping field seemed to have a more worn trail than the south-facing slope (pers. obsv.). It is possible that deer may use the north slope for typical travel and only use the south slope for escape paths and minor grazing habits. At the field station there is a rather noticeable difference between the cover from the house on north versus south facing slopes. The south field is somewhat larger and has less cover while the north slope has large trees disrupting the line of sight from the field to the house and is a shorter length field. This difference in amount of cover may effect deer behavior, such as feeding or wintering habits. Thus, it is possible that the north slope was used more frequently, resulting in a balance between amount of time on the south slope as on the north slope. I still hypothesize that there is a possible difference in utilization between north and south facing slopes and further investigation using larger area plots or longer time periods may show this. It has been shown that during the winter months, in forested areas, there is a significant difference in aspect utilization (Pauley et al. 1993). Although my observation area was small enough to avoid large effects of error, some of the common errors associated with most pellet-count data may still apply (Van Etten 1965). Using pellet-counts to determine amount of utilization has not been used very much and the method accuracy is still in dispute.

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