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TYPE OF PERCHES USED BY FALL MIGRANT AND WINTERING RED-TAILED HAWKS (*Buteo jamaicensis*) IN KANSAS

Roger D. Applegate¹, Brian E. Flock^{1, 2}, and Deborah R. Applegate³

¹Research and Survey Office, Kansas Department of Wildlife and Parks, P.O. Box 1525,
Emporia, KS 66801-1525, e-mail: rogera@wp.state.ks.us

²Department of Biological Sciences, Emporia State University, Emporia, KS 66801

³627 Rural Street, Emporia, KS 66801

Abstract. We recorded type and height of perches used by 1,008 wintering Red-tailed Hawks (*Buteo jamaicensis*) in eastern Kansas to determine if height and type of perch varied with time of day and cloud cover. Trees from < 3.4 m to > 6.1 m, utility poles and wires, and fences were the predominant perches used. Except for trees < 3.4 m, there was no temporal pattern to the use of trees > 3.4 m, fences, or the ground. Fences were used more on cloudy days. We hypothesize that perch use may be related to availability and individual site and habitat juxtaposition.

INTRODUCTION

Perches are an important component of winter raptor habitat (Meunier et al., 2000) and are used for both roosting (Terres, 1995) and as a base for foraging (Weidensaul, 2000). Red-tailed Hawks (*Buteo jamaicensis*) are known to use several perch substrates including powerline wires, utility poles, fences, trees, shrubs, debris piles, and the ground (Schnell, 1968; Bohall and Collopy, 1984; Langley, 1999). Cox (1978) found that wintering Red-tailed Hawks in eastern Kansas preferred trees as perches.

Several studies have examined characteristics of Red-tailed Hawk perches. Langley (1999) found that Red-tailed Hawks used leafless trees more frequently than trees with leaves. Preston (1980) compared use of perch sites by light and dark color morphs of Red-tailed Hawks and found that light morphs used more open perch sites than did dark morphs.

During five years of fall and winter roadside raptor counts in eastern Kansas, we observed what we believed to be a time and perch height interaction. We examined this during the 2000-2001 winter counts in order to better understand Red-tailed Hawk use of the landscape.

METHODS

From 15 September 2000 through 15 March 2001, we recorded data on perches used by Red-tailed Hawks. For each Red-tailed Hawk observed we recorded the type and height of perch each hawk was using. We used the following classification scheme to describe perches:

1. fence—including fence wire or fence post.
2. ground.
3. utility poles and wires
4. trees < 3.4 m.
5. trees 3.4-6.1 m.
6. trees > 6.1 m.

Prior to collecting data, we measured heights of a sample of trees with a clinometer in order to practice classifying tree heights at varying distances. All observations were collected by the authors. Counts were conducted in the Flint Hills and Osage Questas of eastern Kansas along major highways. All roadside routes counted had similar numbers of perches.

We classified each count into four time categories. These categories were early morning (0700-1000 CDT), late morning (1001-1159 CDT), early afternoon (1200-1530 CDT), and late afternoon (1531-1730 CDT). Cloud cover was recorded at the beginning of each count as clear/sunny, partly cloudy, partly sunny, or cloudy.

Knowledge of perch use is important for designing surveys and understanding how habitat is used on the landscape by Red-tailed Hawks during the winter. We tested the hypothesis (H_0) that there was no difference in perch type and height used during the four time periods. We also tested the hypothesis that cloud cover did not determine type and height of perches. We used contingency coefficients in SPSS (1999) for data analysis with $\alpha = 0.05$. Contingency coefficients measure the association between two variables and allow for the computation of a χ^2 statistic.

RESULTS

We recorded perch data on 1,008 Red-tailed Hawks. Some individual Red-tailed Hawks may have been counted on previous occasions, however, this would not have influenced the results of the study. We recorded perches for 281 hawks during early morning, 278 in late morning, 283 in early afternoon, and 166 in late afternoon. Trees (all heights, 60.7%), utility poles and wires (18.7%), and fences (16.5%) were used most as perches (Table 1).

Table 1. Perch use by migrant and wintering Red-tailed Hawks in eastern Kansas, 2000-2001.

Perch Type	N	Percent
Fence	166	16.5
Ground	14	1.4
Power poles and wires	189	18.7
Signs	27	2.7
Trees	612	60.7
Total	1,008	100

We accepted the hypothesis that all perch types and heights were not used differentially over time of day except for trees < 3.4 m. We also accepted the hypothesis that cloud cover did not determine use of perch type and height by Red-tailed Hawks in winter except for fences (Table 2). Fences were used more in the early morning and on cloudy days.

Table 2. Relationship between time-of-day, weather and perch type and height selected by fall migrant and wintering Red-tailed Hawks

Measured variable ¹	Phi	N	P2
Time-of-day * tree < 3.4 m	0.77	39	0.02
Time-of-day * tree 3.4-6.1 m	0.68	42	0.31
Time-of-day * tree > 6.1 m	0.65	34	0.42
Time-of-day * fence	0.67	35	0.66
Time-of-day * signs	0.55	15	0.68
Time-of-day * power pole/wire	0.69	32	0.39
Time-of-day * ground	0.56	11	0.18
Cloud cover * tree < 3.4 m	0.67	37	0.20
Cloud cover * tree 3.4-6.1 m	0.70	40	0.26
Cloud cover * tree > 6.1 m	0.40	33	0.98
Cloud cover * fence	0.74	33	0.02
Cloud cover * signs	0.62	14	0.19
Cloud cover * power pole and wire	0.53	31	0.75
Cloud cover * ground	0.15	11	0.89

¹ The * indicates an interaction

² Values in bold indicate those that are significant at the 0.05 level

DISCUSSION

Although we expected that high perches would make prey more readily observable during those times of the day when the sun was at its lowest angle and shadows were longest, our observations revealed that Red-tailed Hawks used perches proportional to their availability within the habitat. Perch use vs. availability was not addressed in this study but would be an important next step to understanding the role of perches in habitat use of Red-tailed Hawks.

Cox (1978) found that the majority of wintering Red-tailed Hawks perched 0-3 m and 6-12 m above the ground. In this study, the majority of wintering Red-tailed Hawks also perched in the 0-3 m (N = 429) and the > 6 m (N = 320) high perches. As with Cox (1978), Bohall and Collopy (1984), and Langley (1999), trees and power poles and wires were the predominant perches.

Further work should quantify the availability of perch types on the landscape vs. use by perching Red-tailed Hawks. In addition, there should be careful study of the effects of weather variables on perch selection. Wind and precipitation for example, may influence the type of perches used. Snow cover could also influence the type as well as height of perches used. The influence of each of these weather variables would further elucidate the relationship between Red-tailed Hawk numbers and habitat use.

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Calvin L. Cink, Editor, Biology Department, Baker University, Baldwin City, Kansas 66006. 785-594-4548 Calvin.Cink@bakeru.edu