Capture Rate of American Kestrel During Non-breeding Season Influenced by Sex of Bird in Upstate South Carolina

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Introduction

Assuming equal distribution of male and female American Kestrels (*Falco sparverius*) according to genetic frequency, a near equal capture rate might be anticipated (Cooke *et al.* 1987). Conversely, it is known that during the nesting season males tend to provide most of the female's energetic needs, so males would be more available for capture during the breeding season (Dawson *et al.* 2001). Blood parasite status may reduce prey gathering ability and motility, and hence capture rate (Dawson *et al.* 2000). A study during the kestrel non-nesting season, which has been roughly established in South Carolina as August through March (Clark 1983; Cely *et al.* 1988), was undertaken.

Methods

Bal-chatri noose traps were employed during the study period from fall 1996 through spring 2001. All kestrels captured and banded from two adjacent banding locations in Abbeville and Greenwood Counties, South Carolina, were included in the study. Birds were captured without regard to sex. Common house mice (*Mus musculus*) were captured from a local roller mill with live traps according to Bub (1991). Birds were sexed according to North American Bird Banding guidelines and aged as HY (Hatch Year) or AHY (After Hatch Year) accordingly (North American Bird Banding Manual 1991, 1997). Birds were weighed to the nearest 0.1 gram. Blood was collected with a 23 gauge needle from a superficial vein between the hallux and second toe after thorough alcohol cleansing, and blood was smeared on a glass slide for air drying. Smears were stored at room temperature until Wright/Giemsa staining on an automated hematology stainer and forwarded to Dr. Thaddeus Graczyk for blood parasite qualitative identification in a blinded fashion. Wing cord was measured at the capture site to the nearest millimeter. Bird status, time and date of capture, and location were recorded prior to release. All studies were performed in accordance with Master Banding permit 22771. Statistical application was advised by Professor Bruce White at Lander University, which compared males vs. females applying probability formula and Z chart comparison.

Results

Sixty-six kestrels were captured during the study period, 42 male and 24 female. The null hypothesis of equal capture rate was rejected, and an alternate hypothesis of male > female capture success was accepted. Wing cord, weight, age, and parasite status are recorded in the Table. Tukey t tests on male vs. female weight and wing cord were statistically significant at $P < 0.05$. No difference was seen in the age of males (HY = 2, AHY = 1) for males vs. females with non-paired two-tailed t test. Blood parasite studies were performed on 24 of the 66 birds captured. Of the 24 studied, 4 of 18 males harbored *Hemoproteus,* and one had *Plasmodium.* For females, 6 of 6 harbored *Hemoproteus.* During the study, 21 recaptures were recorded. Fourteen were males and seven females. Two recoveries were documented during the study, one road kill male in the vicinity of the capture site was found shortly after capture, and one freshly dead female found during the kestrel nesting season on 7 June 2001 (originally banded on 30 November 1996). Young birds were described at the site by the person who returned the female kestrel's band.

Discussion

The observed discrepancy between capture rate for males vs. females may be attributed to several factors. The 100% *Hemoproteus* infestation incidence in females compared to 28% (*Hemoproteus* plus *Plasmodium*) is noteworthy and may explain the discrepancy, although females are larger than males and are more successful in allocating energy to reduce parasite burden (Dawson *et al.* 2001; Wheeler *et al.* 1995). It is unclear whether the winter population in the South Carolina Piedmont is predominately resident (*Falco sparverius sparverius*) or migratory (*Falco sparverius*), although a previous study suggests that they are migratory (Cely *et al.* 1988). In the current study area, however, paired kestrels have been identified during the breeding season, and the female bird recovered during the breeding season support both resident and migratory populations in the study area. Whether the aforementioned discrepancy represents increased population density of males in the study area is unclear, although migrating males generally are the first to return to nesting areas, while females tend to remain closer to breeding grounds (Clark 1983). Since females assume the primary role in species propagation, they simply may be more hesitant to take risks. Studies of wintering kestrels show that females out compete males for prime hunting habitat (Ardia *et al.* 1997). This Piedmont area is heavily forested, with limited open areas in stable Mennonite farm areas providing prime but limited American Kestrel habitat. This results in concentration of several raptor species that share similar habitats.

Nest box placement studies and future band recoveries should help further clarify the kestrel population in the study area (Rohrbaugh *et al.* 1997).

Data

	Body Wgt GRS/Mean ± SD	Wing Cord MM/Mean ± SD	Parasites Positive/ # Studied	N Size Total	Retrap Number	Age* HY/AHY ±SD
Males	105.5±8.5	186.5±4.6	4 +1/18	42	14	1.38±0.5
Females	119.1±17	193.2±3.9	6/6	24	7	1.38±0.5

* HY = Hatch Year; AHY = After Hatch Year

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