

phase was more common than dark phase among both Red-tailed and Rough-legged Hawks. For Red-tailed Hawks 22 were dark phase, 116 were light phase and the color phase of 19 was not identified. Among Rough-legged Hawks 23 were dark phase, 76 were light phase and the color phase of 30 was not identified.

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WINTER ROADSIDE RAPTOR SURVEY IN EL PASO COUNTY, COLORADO, 1962-1979

by

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Abstract

A fixed-route car survey was conducted from October to February 1979-80 on a 103-km strip of predominantly rangeland east of Colorado Springs, Colorado. Comparison of these data with past relative density data from 1962-1979 shows fairly steady numbers for 7 of the 8 species. Rough-legged Hawks showed a slight decline. Most raptors were seen perched on REA poles. Cropland was used most by all species considering its availability to the area.

Introduction

Car surveys are a convenient method for sampling raptor populations which are conspicuous yet thinly distributed over large areas. Previous car surveys on rangeland in eastern Colorado have been conducted showing estimates of raptor abundance (Ender-son 1965, Johnson and Enderson 1972, unpublished data) and behavioral data of perch-site preference (Marion and Ryder 1974, Stahlecker 1978).

The purpose of this study was to compare relative abundance and behavioral patterns with past data to investigate possible trends. Perch-site preference could be important in management of raptors on rangeland.

Materials and Methods

The 166 km² area about 12 km east of Colorado Springs, Colorado is a 103-km circuitous strip 1.6 km wide. It is predominantly (90.9%) rangeland comprised mainly of blue gramma (*Bouteloua gracilis*) and sandhill

bluestem (*Andropogon hallii*). The remainder is 4.0% cropland (primarily winter wheat, *Triticum anetivum*), 3.5% residential (where most trees occur), and 1.6% cottonwood (*Populus sargentii*) and willow (*Salix exigua*) riverbottom. The lack of tall vegetation makes the prairie ideal for spotting large birds at great distances.

Fenceposts are predominant perches available to raptors, running along both sides of almost the entire road and spaced about 5 m apart. Next are Rural Electrification Administration (REA) poles usually occurring along one side of the route about 0.1 km apart. Other potential perches include windmills, trees, large transmission line towers, and irrigation sprinkler towers (about 3.5 m high).

Censuses began 4 October 1979 and ended 1 February 1980. Thirty-one counts, totalling 3,194 km, were made between 3 and 6 h at a rate averaging 48 km/h. Fourteen surveys were made in October, 4 in November, 7 in December, 5 in January and 1 in February. All days of censusing were clear to partly cloudy and with winds no greater than 15 knots.

Species, location, activity and sex (when possible) of raptors seen were recorded. I tried to avoid recording the same bird twice by noting the direction it flew. Because I was both driving and observing, my sightings were necessarily biased to the vicinity of the road. However, the roads traveled were virtually traffic free and because I made a conscious effort to scan the sky, the results are not strongly biased to perching birds.

Results and Discussion

In all, 358 raptors of 8 species were seen. Most birds were perched (87%) (Table 1),

Table 1. Perching of raptors on 103-km route, Colorado, 1979-80

| Species | flying or soaring | Number of observations (percent) | | | | | | total seen |
|---|-------------------------|-------------------------------------|----------------|------------|------------|----------------|------------|---------------|
| | | REA poles | fence posts | ground | wire | power poles | other | |
| Red-tailed Hawk (<i>Buteo jamaicensis</i>) | 2 | 21 (60) | 1 | 4 (11) | - | - | 7 (20) | 35 |
| Rough-legged Hawk (<i>Buteo lagopus</i>) | 11 (16) | 35 (50) | 8 (11) | 4 | - | - | 12 (17) | 70 |
| Ferruginous Hawk (<i>Buteo regalis</i>) | 7 (15) | 25 (53) | 6 (13) | 3 | - | 1 | 5 (11) | 47 |
| Golden Eagle (<i>Aquila chrysaetos</i>) | 11 (22) | 19 (39) | 3 | 2 | - | 3 | 11 (22) | 49 |
| Marsh Hawk (<i>Circus cyaneus</i>) | 17 (49) | 4 (11) | 3 | 11 (31) | - | - | - | 35 |
| Prairie Falcon (<i>Falco mexicanus</i>) | 8 (13) | 44 (70) | 5 | 1 | 1 | 2 | 1 | 62 |
| American Kestrel (<i>Falco sparverius</i>) | 5 | 11 (19) | 7 (12) | - | 30 (52) | - | 5 | 58 |
| Merlin | 2 | | 1 | | | | | 3 |

contrary to the findings of Marion and Ryder (1974), but in agreement with those of Craig (1978). Roadside REA poles were the most common perch for all species except the Golden Eagle (*Aquila chrysaetos*), Marsh Hawk (*Circus cyaneus*) and American Kestrel (*Falco sparverius*). Stahlecker (1978) found a significant usage of 230kV transmission line towers in areas where they occur. I saw only 8 raptors, mostly Golden Eagles, on these towers even though I gave particular attention to them.

A seasonal change in abundance was noticed for 7 species in the study area (Table 2). The Red-tailed Hawk (*Buteo jamaicensis*) was seen in October but completely left the area by December. Of 35 recorded, 32 were identified as mature, 3 immature. The Ferruginous Hawk (*Buteo regalis*) was common in October and then decreased to a fairly

Table 2. Raptors seen per month on the 103-km route

| Species | October | | November | | December | | January | |
|-------------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|
| | no. seen | birds/100 km | no. seen | birds/100 km | no. seen | birds/100 km | no. seen | birds/100 km |
| Red-tailed Hawk | 29 | 2.2 | 2 | .32 | - | - | - | - |
| Rough-legged Hawk | 14 | 1.0 | 8 | 1.3 | 16 | 2.6 | 31 | 5.0 |
| Ferruginous Hawk | 26 | 1.9 | 4 | .65 | 4 | .65 | 6 | .97 |
| Golden Eagle | 15 | 1.1 | 6 | .97 | 8 | 1.3 | 14 | 2.3 |
| Marsh Hawk | 17 | 1.3 | 4 | .65 | 5 | .81 | 6 | .97 |
| Prairie Falcon | 34 | 2.5 | 14 | 2.3 | 6 | .97 | 8 | 1.3 |
| Kestrel | 41 | 3.1 | 8 | 1.3 | 5 | .81 | 4 | .65 |
| Merlin | - | - | - | - | 1 | .16 | 2 | .32 |
| km per month | 1,340 | | 618 | | 618 | | 618 | |

*Total number of raptors seen is less than in Table 1 due to the omittance of data taken on days of variable weather.

constant number throughout the remaining months. These 2 species of hawks apparently migrate through the plains in October. The Rough-legged Hawk (*Buteo lagopus*) was the most common winter raptor; their population increased as winter progressed. Golden Eagle population was steady until January when there was a noticeable increase. Of 49 sightings, 21 were identified as mature, 17 immature. Marsh Hawks dropped in number after October. Of the 35 individuals seen, 23 were identified as males and 10 as females. The Prairie Falcon (*Falco mexicanus*) was common the first 2 months, but decreased in numbers in December and January. Of 62 seen, 25 were identified as adults, 8 immature, 14 males and 20 females. American Kestrels, most abundant in October in migration, showed a decrease in numbers throughout the winter. Of 58 seen, 38 were identified as males and 10 as females. Only 3 sightings of the Merlin (*Falco columbarius*) occurred.

Relative to its availability, cropland was the favored habitat (Table 3). Wakely (1978) found a preference by Ferruginous Hawks for areas dependent upon the amount of vegetational cover rather than on prey densities. Similarly, I found Ferruginous Hawks only in open areas of low vegetation density (pasture and cropland). Open areas appeared to be favored by Rough-legged Hawks, Golden Eagles and Prairie Falcons. Red-tailed Hawks, Marsh Hawks and Kestrels were found in a variety of areas.

Table 3. Percentage of times raptors seen in habitats to the total times seen

| Species | Habitats (percent of the area to the total roadside area) | | | |
|-------------------|--|--------------------------------|-------------------------------|-------------------|
| | Pasture (90.9) | Cottonwood/ willow (1.6) | Residences/ trees (3.5) | Cropland (4.0) |
| Red-tailed Hawk | 71.4 | 8.6 | 5.7 | 14.3 |
| Rough-legged Hawk | 84.8 | 1.3 | 1.3 | 12.6 |
| Ferruginous Hawk | 78.8 | - | - | 21.2 |
| Golden Eagle | 83.7 | - | - | 16.3 |
| Marsh Hawk | 65.7 | 5.7 | 5.7 | 22.9 |
| Prairie Falcon | 76.2 | - | - | 23.8 |
| Kestrel | 77.6 | 1.7 | 3.5 | 17.2 |

Raptors seen/100 km traveled in earlier studies in the same area have been compiled by two-year periods to obtain a significant number of kilometers in each time period (Table 4). The data are subject to biases because of variations in methods used. The majority of censuses were made by one observer, routes were fairly similar to mine and were made in winter on clear days.

Table 4. Raptors (individuals/km) recorded in car censuses in El Paso County, Colorado, 1962-80

| Species | 62-64 | 69-70 71-72 | 72-74 | 74-76 | 76-78 | 78-80 |
|-------------------|--------|----------------|--------|-------|--------|--------|
| Red-tailed Hawk | .15 | 1.8 | 6.8(h) | 1.5 | 3.8 | 1.6 |
| Rough-legged Hawk | 6.9 | 6.1 | 2.6 | 3.9 | 5.5 | 2.5(l) |
| Ferruginous Hawk | .55 | 1.3 | .26(l) | 2.1 | 2.8(h) | 1.4 |
| Golden Eagle | 1.2 | 2.7(h) | .52 | 2.5 | .69 | 1.4 |
| Marsh Hawk | 2.8 | 1.6 | .52(l) | 1.8 | 4.5(h) | 1.4 |
| Prairie Falcon | 2.3 | 2.1 | 1.3(l) | 2.8 | 5.2(h) | 1.9 |
| Kestrel | 1.2(l) | 3.0 | 3.6 | 3.5 | 4.1(h) | 2.5 |
| Merlin | .33 | .38 | - | .38 | .35 | .08(l) |
| Total kilometers | 674 | 782 | 386 | 1,065 | 290 | 3,540 |

Values are marked high (h) or low (l) if they vary significantly by t-test analysis for a 90% confidence interval using data from all years per species. Past data from published works of Enderson (1965), Johnson and Enderson (1972) and unpublished works of Enderson, R. Beidleman, J. Craig, P. Kennedy and B. Winternitz.

Merlins have the lowest density figures. Density was steady from 1962 until the last two-year period of 1978-80 when they reached a low. Prairie Falcons and Kestrels show fairly low variation in numbers throughout the years if the data for 1972-74 and 1976-78 periods are discounted because of the low numbers of kilometers traveled in these periods. In fact, these periods show most of the significant deviation. In view of this variation the populations of hawks and eagles appear steady throughout the years. The Rough-legged Hawk is an exception and showed a decrease (disregarding the two low mileage periods).

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