ABUNDANCE AND TIME OF DAY VARIATION IN RAPTOR POPULATIONS IN MARACAS VALLEY, TRINIDAD

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Abstract.—We studied raptor populations in Maracas Valley, Trinidad, by conducting 20 5-min counts for each hour of daylight (21.7 total h). Of eight species observed, Black Vulture (*Coragyps atratus*) was by far the most common, followed by Turkey Vulture (*Cathartes aura*), which accounted for 96.2% and 3.2%, respectively, of all raptors censused. Four species of family Accipitridae and two species of family Falconidae represented only 0.45% and 0.15%, respectively, of all raptors. The proximity of our study site to the Beetham Dump, where large numbers of Black Vultures forage, likely explains the dominance of this species. Time of day variation in vulture abundance likely reflects movements between foraging areas and roosts.

Key words: abundance, *Accipitridae*, *Cathartidae*, *Falconidae*, *populations*, *raptors*, *time of day variation*, *Trinidad*

Resumen.—ABUNDANCIA Y VARIACIÓN CON HORA DEL DÍA EN POBLACIONES DE RAPACES EN LA VALLE DE MARACAS, TRINIDAD. Estudiamos las poblaciones de rapaces en la Valle de Maracas, Trinidad, a través de veinte conteos de 5 min para cada hora del día (21.7 h total). De las ocho especies observadas, el Zapilote (*Coragyps atratus*) fue la más común, seguida por el Aura Tiñosa (*Cathartes aura*), cuales constituyeron 96.2% y 3.2%, respectivamente, de todas las rapaces contados. Cuatro especies de la familia Accipitridae y dos especies de la familia Falconidae representaron solamente 0.45% y 0.15%, respectivamente, de todas las rapaces. La proximidad de nuestro sitio de estudio al Basurero Beetham, donde cantidades altas del Zopilote buscan de comer, probablemente explica la dominancia de esta especie. La variación con la hora del día en la abundancia de Zopilotes probablemente refleja movimientos entre lugares de comer y dormilones.

Palabras clave: abundancia, *Accipitridae*, *Cathartidae*, *Falconidae*, *poblaciones*, *rapaces*, *variación con hora del día*, *Trinidad*

ALTHOUGH TRINIDAD AND TOBAGO is inhabited by 35 species of raptors, of which 22 are known to breed (ffrench 1991; 1996a,b), little is known about their population ecology within the country. Previously published studies compared the abundance of raptors in Caribbean pine (*Pinus caribaea*) and native broad-leaved forest in the Northern Range of Trinidad (Hayes and Samad 1998), and in the Bocas Islands off northwestern Trinidad (Hayes and Samad 2002). However, these studies focused on the entire avifauna and the methods used were less than ideal for counting raptors (e.g., excluding birds flying above the forest canopy). Given the alarming rate of habitat destruction within the country, further data on raptor abundance is needed to monitor the responses of raptor populations to changing environmental conditions. In this paper we provide data on the time of day variation in raptor abundance in Maracas Valley, Trinidad.

STUDY AREA AND METHODS

We studied raptor populations from our home in La Baja Road, at an elevation of about 70 m on the western slope of the lower Maracas Valley, St. Joseph, and southern slopes of the Northern Range of Trinidad, at 10°40′ N, 61°25′ W. La Baja Road bisects a residential area that is surrounded by a mosaic of anthropogenic savannas (mostly to the west), a narrow riparian forest corridor to the east, seasonal forest (mostly to the east), and a Caribbean pine plantation along the ridge to the east.

Raptors were censused intermittently from a stationary point during 5 min periods between 06:00 and 18:40 h from 10 March to 19 April 2001 and from 28 March to 5 April 2002. All raptors visible within an unlimited radius were counted; no attempt was made to avoid recounting the same individuals in successive counts. Identification was facilitated with the use of 8x32 binoculars and a 25x telescope, and by consulting Meyer de Schauensee and Phelps (1978) and National Geographic Society (1999). To avoid observer bias, all counts were conducted by B. D. Hayes. The taxonomy follows the American Ornithologists' Union (1998).

The data were compiled and descriptive statistics were computed with Statistix 3.1 software (Anonymous 1990). Because the data represented time series and did not meet the assumptions of in-

Table 1. Mean number of raptors seen per 5-min period during different hours of the day (n = 20 for each hour) at Maracas Valley, Trinidad.

Species	Hour of day											
	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00
Black Vulture	34.9	30.6	23.1	40.5	76.7	43.1	41.5	38.4	56.4	33.9	37.4	100.4	34.3
Turkey Vulture	2.2	2.6	1.1	1.0	0.9	0.5	1.1	0.2	0.7	0.6	3.4	4.4	1.6
Gray Hawk	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Common Black-Hawk	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.3	0.0
Short-tailed Hawk	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0
Zone-tailed Hawk	0.1	0.4	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.1
Yellow-headed Caracara	0.1	0.0	0.0	0.1	0.3	0.0	0.0	0.1	0.0	0.0	0.2	0.1	0.1
Merlin	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0

dependence, statistical tests were not used to test for differences in time of day variation.

RESULTS AND DISCUSSION

A cumulative total of 20 counts was conducted during each hour of daylight, for a total of 21.7 h of observation. A total of 12,285 raptors (many undoubtedly counted repeatedly) of eight species were censused during this survey. The vast majority of raptors were vultures (family Cathartidae), representing 99.4% of all raptors counted. The Black Vulture (*Coragyps atratus*) was by far the most common species, accounting for 96.2% of all raptors seen. Large numbers appeared throughout the day, but the highest counts were at midday, possibly representing birds soaring on thermals in search of food, and late in the afternoon when circling birds were likely moving toward their roosts (Table 1). The Turkey Vulture (*Cathartes aura*) accounted for 3.2% of all raptors observed. Its numbers were highest in the early morning and, especially, in the late afternoon (Table 1), suggesting that most individuals were moving between their roosts and foraging areas.

Hawks (family Accipitridae) comprised only 0.45% of all raptors observed. Of 55 hawk observations, Zone-tailed Hawk (*Buteo albonotatus*) accounted for 52.7%, Common Black-Hawk (*Buteogallus anthracinus*) 20.0%, Gray Hawk (*Asturina nitida*) 14.5%, and Short-tailed Hawk (*Buteo brachyurus*) 12.7%.

Falcons and caracaras (family Falconidae) represented only 0.15% of the raptors counted. Of 19 such observations, Yellow-headed Caracara (*Milvago chimachima*) accounted for 78.9% and Merlin (*Falco columbarius*), the only Nearctic migrant, 21.1%.

Six other species were observed at the study site, but not during this study: Gray-headed Kite (*Leptodon cayanensis*), Pearl Kite (*Gampsonyx swainsonii*), White Hawk (*Leucopternis albicollis*), Broad-winged Hawk (*Buteo platypterus*), Bat Falcon (*Falco rufigularis*), and Peregrine Falcon (*Falco peregrinus*).

Although Black Vultures are a conspicuous component of the avifauna throughout Trinidad, their numbers appear to be highest in areas densely populated by humans, especially in the vicinity of Port of Spain, northwestern Trinidad, where large numbers (probably exceeding 1000) routinely forage for food scraps in the Beetham Dump. The proximity of our observation point to the dump, only 7.5 km to the west-southwest, likely explains the dominance of Black Vultures in the counts. Quantitative studies of raptor populations should be conducted in other areas of Trinidad.

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WHITE-CROWNED PIGEON WORKING GROUP

The Society for the Conservation and Study of Caribbean Birds is sponsoring the formation of an international working group to share information and develop strategies for research, management, and conservation of the White-crowned Pigeon (*Columba leucocephala*) throughout its range. The group will hold its first meeting in conjunction with the 2003 meeting of the Society in Tobago 21–26 July. If you are interested in participating in the meeting, or if you simply wish to be kept informed of the group's progress, please contact:

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