Notes on Ocelot Movement and Activity in the Pantanal Region, Brazil

Although ocelots (*Felis pardalis*) have recently been the subject of several field studies (Navarro 1985; Konecny, in press; Ludlow & Sunquist 1987; Emmons 1987, 1988), natural history data on which to base conservation plans for the species are still badly needed. While engaged in a study of jaguars (*Panthera onca*) in the Pantanal region of Mato Grosso, Brazil (Crawshaw & Quigley, 1984), we collected information on three radio-collared female ocelots. This paper reports our findings on spatial use and activity patterns of our study animals.

The study was conducted on a section of the Miranda Ranch, a privately owned cattle ranch in the southern Pantanal (19°57'S, 56°25'W), in the state of Mato Grosso do Sul, Brazil. Over 90 percent of the 730 ha study area consisted of marginally flooded, semideciduous forest. Three other habitat types occurred in the area: marsh, grassland, and riverine forest (for description of Pantanal habitat types, see Prance & Schaller 1982).

The climate is seasonal, with a marked rainy season from October through March, and a dry period from April through September. Average annual rainfall is 1213 mm. During our study, average monthly minima ranged from 16°C to 25°C and maxima from 26°C to 37°C.

Traplines were established along cattle trails or on trails cut into the forest. Three female ocelots (two adults and one subadult) were captured with padded leg-hold traps and live-traps (Hav-a-hart®, Box 551, Ossining, NY) baited with live chickens. Trapped ocelots were allowed to feed on the bait, which we believed helped to reduce stress of the animal while in the trap. Trained dogs were used to tree another adult female. Captured animals were immobilized with either Tilazol (CI-744; Parke-Davis, Detroit, MI) at a rate of 7 mg/kg of body weight, or a pre-mixed combination of Ketamine hydrochloride (Parke-Davis) and Xylazine hydrochloride (Rompun; Miles Lab., Shawnee, KS) at a rate of 3.3 mg of Ketamine/0.3 mg Xylazine per kg of body weight. Radio-collared animals were monitored from the ground, from an airplane, and from a boat.

Two types of information were gained from the radio-collared animals: activity readings and locations. Each transmitter incorporated a reset activity monitor set on a two-minute delay. Movement of the animal caused the signal pulse rate to change from a base rate (approximately 75 bpm) to a faster pulse rate (approximately 100 bpm). When radio contact was made with one of the study animals, the signal was classified as active or inactive and noted as such, along with time of day and date. To counteract a slight bias toward activity with this activity monitor, a recheck of the pulse rate was made one to four minutes later, as described by Quigley *et al.* (1979) and Garshelis *et al.* (1982). On occasion, attempts were made to remain in radio contact with collared animals for at least 24 hr (range 15 min–72 hr), recording activity (active or inactive) at 15-min intervals. Since diel activity monitoring was usually done from one station, changes in location of the animal were not recorded. For analysis of diel activity patterns, all readings were grouped into hourly intervals and expressed as percent active. Large variance in the number of activity readings per hourly interval precluded seasonal comparisons of activity levels.

Locations were obtained by ground triangulation or from an airplane and plotted on a grid overlaying a mosaic of aerial photographs (1:12,000); each grid quadrat was 0.39 ha. Ocelot habitat use was expressed as the percent of the pooled number of locations in which individuals were found in the different habitat types. No attempt was made to quantify availability of the different habitats in the individual home ranges.

Home range size was calculated through the minimum convex polygon method (Mohr 1947) using the Mcpaal computer program (National Zoological Park, Washington, D.C.).

One 3.6 kg subadult female (#6) and two adult female ocelots (#7 and #8, with body masses of 8.2 kg and an estimated 8.0 kg, respectively) were radio-collared. A third adult female was also captured but was sacrificed for necropsy due to her very poor condition. She was extremely emaciated (5.2 kg), her tail and limbs had lost most of the fur, and her skin was dry and almost black. Results of the necropsy indicated a pneumonic condition and the presence of ancylostomid and strongiloid parasites (Dr. F. Simon, Sao Paulo Zoo, pers. comm., 1982).

When subadult #6 was captured, circumstantial evidence (*e.g.,* tracks, claw marks on the outside of the trap) indicated that an adult animal was with her at the time of capture. Adult #7 was captured at the same site four days later, while #6's signal indicated she was in the vicinity. This fact, together with the young age of #6 (who still retained her milk dentition), suggested that they were mother and semi-independent daughter.

A total of 78 locations was obtained for the three ocelots. The subadult female, #6, utilized an area of 147 ha (39 locations from 10 April to 26 November 1982). Female #7 had a home range of 157 ha (14 locations between 14 April and 31 August 1982), while #8 occupied an area of 76 ha (25 locations from 12 May to 9 October 1982). Given the limited number of locations, home range sizes are minimum estimates, since no asymptote had been reached in the cumulative area curves (Odum & Kuenzler 1955).

The area occupied by the subadult female overlapped that of her suspected mother by 78.5 percent. The average

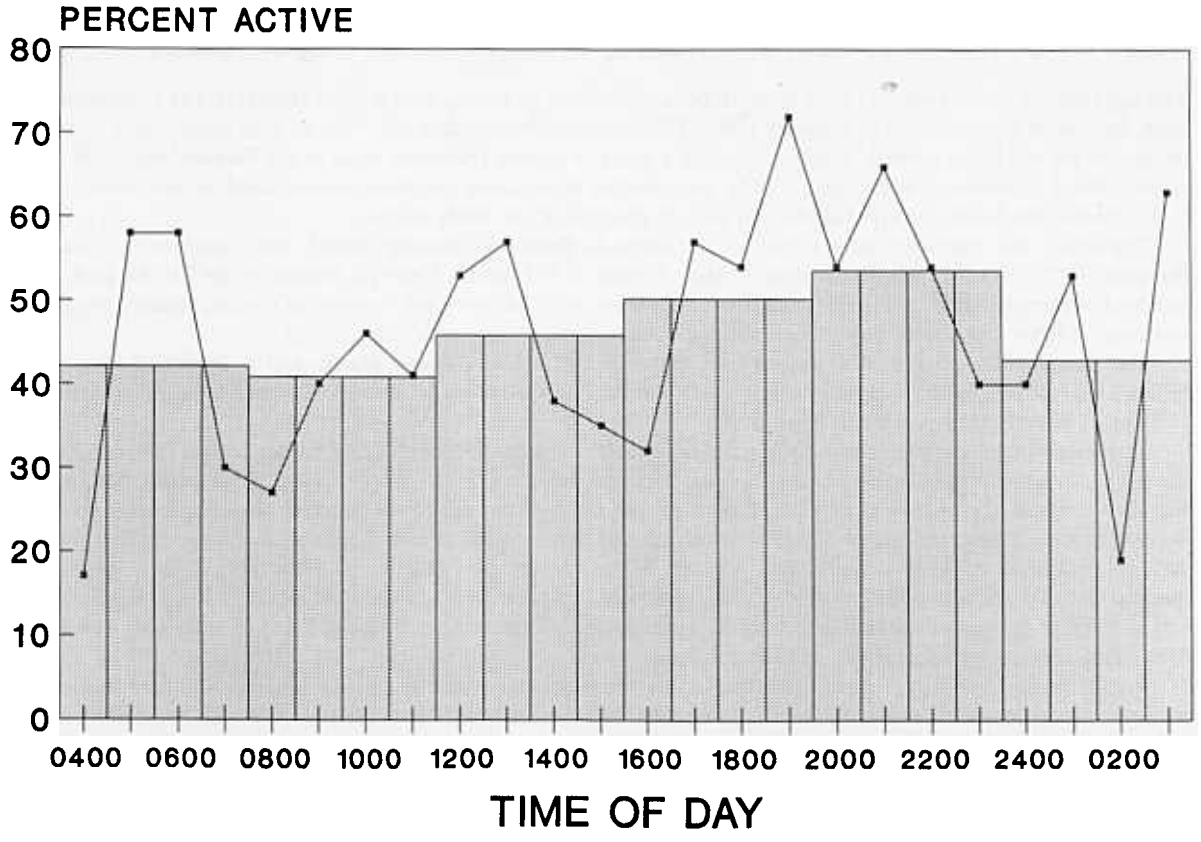

FIGURE 1. Diel activity pattern for three female ocelots in the Pantanal, Brazil, April–November 1982. Data points are percent of pooled readings per hour in which cats were active. Total number of readings = 1025; mean number of readings/hr = 46, range = 17–122. Shaded bars: activity readings were pooled in four-hour blocks.

distance in 11 pairs of simultaneous locations between these females was 0.5 km ± 0.4 km (0.6–1.5 km). There was no overlap between their home ranges and that of female #8. The smallest distance between their home ranges was 2.0 km. Mean distance between #6 and #8 in 11 simultaneous locations was 3.9 km ± 0.7 km (2.8–4.9 km), while that between #7 and #8 was 4.0 km ± 0.6 km (3.1–4.6 km; $N = 6$).

In 88.1 percent of 59 locations in which habitat type was recorded, the radio-collared ocelots were found in semideciduous forest, 15.2 percent in marsh, 10.1 percent in riverine forest, and 1.7 percent in grassland. Although not quantified, these percentages seemed to be approximately proportional to habitat availability in the area.

The diel activity pattern for the pooled activity readings for the three ocelots ($N = 1025$) is shown in Figure 1. Seventy-four percent of the total number of readings was obtained from the subadult female. The animals could be active at any time of the day, but there was a peak in activity between 1700 and 2200 h. When activity readings were divided in four-hour blocks, activity levels of the radio-collared ocelots increased steadily from a low of 40.8 percent between 0800 and 1200 h to 53.6 percent between 2000 and 2400 h (Fig. 1).

Considering the total number of daytime (0500 to 1759 h) and nighttime (1800 to 0459 h) readings, the study animals were significantly more active at night (51.6 percent of 312 readings) than during the day (43 percent of 713 readings; $z = 2.58$, $P < 0.01$, binomial test of proportions using normal approximation, Ott 1984).

The results on spacing and activity of our female ocelots seem to generally agree with those obtained in other studies (Ludlow & Sunquist 1987; Emmons 1987, 1988; Konecny, in press). Although the small sample sizes and short monitoring period in our study do not allow generalizations about ocelot behavior and ecology in the Pantanal, they do provide a basis for comparison to studies in other parts of the species' range.

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