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Range use by a striped hyaena (*Hyaena hyaena*) in the Negev desert

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Introduction

Little is known about habitat utilization by striped hyaenas *Hyaena hyaena* in Israel. Macdonald (1978) suggested that small territories around breeding dens are surrounded by large home ranges and Kruuk (1976) estimated home range size for a female radio-tracked in the Serengeti (East Africa) at 44 km^2 and for a male at 72 km^2. The present paper reports on range use by a female striped hyaena radio-tracked in the Syrian-African Rift Valley near Hazeva. The region (Negev Desert) is extremely arid with sparse vegetation surviving in dry river beds and around oases. It is inhabited by a variety of other carnivores, caracal *Felis caracal*, wolves *Canis lupus*, and foxes *Vulpes vulpes*.

Material and methods

A female hyaena (28 kg), sedated with Sernlayn (Biocentic Laboratories—see Skinner, 1976) 6 days after placing drugged bait at an established carnivore feeding station maintained by the Nature Reserve Authority, was fitted with a radio-collar. She was held in captivity until fully recovered from the effects of the drug ($\approx$60 hours) and following release at the capture site was radio-tracked using a directional Yagi antenna. The accuracy of radio-fixes varied from 2° to 6° ($\bar{x}=3{\cdot}8°$; $n=10$) at 1·0 km, a distance never exceeded when fixing the location of the animal by triangulation at 5-6 day intervals while driving along roads traversing the study area. Home range size was estimated as the area of the minimum convex polygon included by the outermost radio-locations.

Results and discussion

Information from radio-tracking suggests that an area of 60·9 km^2 was used over the period 22 January to 11 August 1985 (Fig. 1). Calculated range size increased rapidly over the first three months of observation, but remained constant thereafter, suggesting that the observation time and the number of fixed locations ($n=47$) were sufficient for describing range size.

The home range of the tracked female overlapped that of at least two other adult striped hyaenas, all of which may have been members of the same group (see Macdonald, 1978).

Two cubs, estimated to be about three months old, were seen at the female's den from 14 April to 11 August, when observations terminated. Remnants of food carried to the den included the horns

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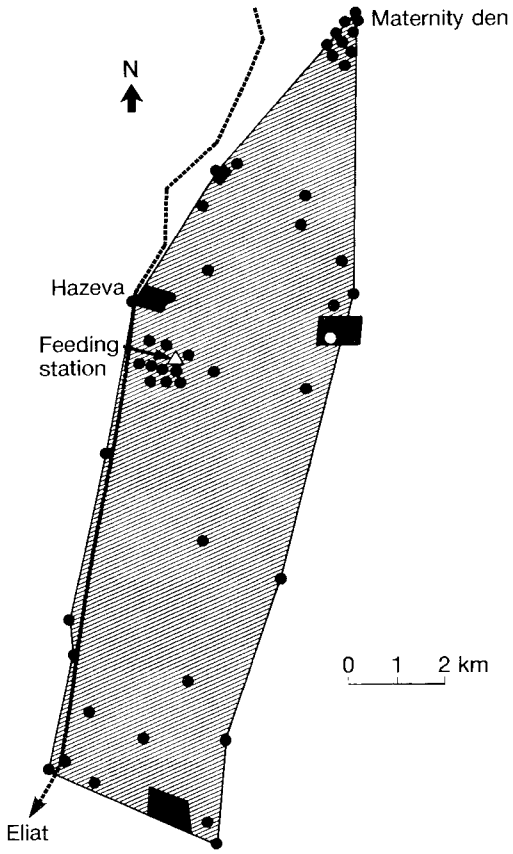

FIG. 1. Home range of a pregnant lactating striped hyaena estimated over a period of eight months in Israel. ● Radio locations; ■ residential areas; – – – – main road.

of an ibex (*Capra ibex nubiana*), a dorcas gazelle (*Gazella dorcas*) and pieces of a sheep skin (*Ovis aries*). Food-carrying to the den has been described previously by Kruuk (1976) and Ilani (1975).

Records obtained through radio-tracking and direct observations indicate that the female spent most of her time at night close to, or at, the artificially created feeding station and at refuge sites close to the communal farms and other residential areas within her home range. Range use is thus apparently a factor of range modification through development by man. This is in agreement with the suggestion of Skinner & Ilani (1979) that striped hyaenas have adapted to co-exist with man.

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The distribution of faeces by the Spanish lynx (*Felis pardina*)

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Introduction

Little is known of the behaviour and ecology of the Spanish lynx (*Felis pardina*), which is confined to small areas of Spain and is a seriously endangered species (I.U.C.N., 1978). It preys mainly on rabbits (*Oryctolagus cuniculus*), but mallards (*Anas platyrhynchos*) are important in spring, and young deer are eaten in autumn and winter (Delibes, 1980).

Faeces are important for scent communication in many carnivores (Macdonald, 1985), and felids such as the wildcat (*Felis silvestris*) (Corbett, 1979), bobcat (*Felis rufus*) (Bailey, 1974), and northern lynx (*Felis lynx*) (Lindermann, 1955 in Macdonald, 1985) leave faeces on trails.

The aims of this paper are to describe the spatial distribution of faeces in the Spanish lynx, in areas of home range overlap.

Study area

The study was carried out during October 1985, in the 7000 hectare Biological Reserve of Doñana, within the Doñana National Park, in south-west Spain. The vegetation in the area was Mediterranean scrubland consisting mainly of dense thickets of *Hallimium* spp., *Erica* spp. and *Calluna* sp. and was traversed by 2-3 m wide tracks, traditionally used for the harvesting of cork, but maintained as fire breaks and to facilitate travelling through the vegetation. These tracks were intersected by numerous narrow trails made by red deer (*Cervus elaphus*), fallow deer (*Dama dama*) and wild boar (*Sus scrofa*). Lynx were known to use the tracks and deer trails for travelling within their ranges (Delibes, pers. obs.).

Methods

Searches for faeces were made on tracks in areas where the home ranges of lynx overlapped with those of other lynx. Tracks were surveyed by slowly walking along them looking for lynx faeces, which were distinguished from those of other carnivores by their size, shape and smell. Their

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