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Behavioural aspects of the raccoon mating system: determinants of consortship success

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We monitored raccoons, *Procyon lotor*, in southern Texas during the 1990–1992 mating seasons to describe mating behaviour and identify factors affecting consortship success. During most of this study, raccoons were spatially aggregated, with female home ranges congregated around permanent water sources and larger home ranges of male groups encompassing each female group. Consortship success varied among males and ranged from zero to six females per male within a mating season. Individual females consorted with one to four different males during an oestrous period; however, most (62%) females consorted with only one male during their oestrus. Dominance through overt conflict appeared to influence male consortship success. During two mating seasons, one male from each group consorted with females on more days than all other males combined. Body weight of males was positively correlated with number of consortship days. As synchrony of oestrus increased, variance in number of consortship days among males decreased, and access to oestrous females increased for subordinate males. Wounding among males increased during the mating season, and was more frequent for males than for females. The mating system, as determined by consortship behaviour, appeared to shift between polygyny and promiscuity, and possibly varied annually as a result of the timing of oestrous cycles.

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Important theoretical advances in mammalian reproductive and social behaviour have emerged in recent years. That mating systems are products of individual reproductive strategies (Clutton-Brock 1989; Sandell & Liberg 1992) has led to the recognition that intraspecific variation in mating systems frequently occurs (see Zabel & Taggart 1989; Lott 1991), alternative strategies exist within the sexes (Herrera & MacDonald 1993; Koprowski 1993), and conflicts may arise between male and female reproductive strategies (Trivers 1972; Hrdy 1979; Packer & Pusey 1983; Koprowski 1993). Descriptions of pair bonding and the competition for such bonds are necessary to identify the strategies that may be employed within a population, as well as identifying the type of mating system exhibited by that particular population (Clutton-Brock 1989; Sandell & Liberg 1992). However, pair bonds and other types of mating behaviour are difficult to observe for many solitary carnivores (Ramsay & Stirling 1986); consequently, our understanding of mating systems for these species is limited.

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Raccoons, *Procyon lotor*, have been described as polygynous (Johnson 1970; Schneider et al. 1971; Fritzell 1978) or promiscuous (Stuewer 1943a) based on sexual dimorphism in physical characteristics (Grau et al. 1970; Johnson 1970; Kennedy & Lindsay 1984; Moore & Kennedy 1985; Ritke 1990) or spatial patterns of home ranges during the mating season (Stuewer 1943a; Fritzell 1978). Male raccoons do not assist in rearing young, and lack of male parental care is a frequent correlate of a polygynous/promiscuous mating system (Trivers 1972; Rowell 1988; but see Ralls 1977). Thus, male raccoons are expected to compete for access to females, but little is known about the factors that affect male and female mating patterns, or if females mate with one or more males. However, raccoons are typical of many carnivores in that their secretive, nocturnal behaviour has precluded direct observations of mating behaviour for free-ranging populations.

In this paper, we quantify consortships for a free-ranging raccoon population in southern Texas, and identify determinants of variation in consortship success for males. In southern Texas, female home ranges are often aggregated, presumably as a response to the patchy distribution of aquatic habitats (Gehrt & Fritzell 1998).

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