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ADOPTION IN GREATER ONE-HORNED RHINOCEROS (*RHINOCEROS UNICORNIS*)

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Reports of adoption in free-ranging mammals include several primate species (Clarke and Glander, 1981; Hrdy, 1976), mountain zebras (*Equus zebra zebra*; Lloyd and Harper, 1980), elephant seals (*Mirounga angustirostris*; Riedman, 1982; Riedman and LeBoeuf, 1982) and a number of species in the Artiodactyla. Aside from the reference to zebra, however, adoption apparently is rare in the Perissodactyla. Here, we document an instance of adoption in *Rhinoceros unicornis* in Royal Chitwan National Park, Nepal.

Rhinoceros unicornis (hereafter referred to as *Rhinoceros*) has among the lowest reproductive rates known for mammals. Gestation averages 16 months, intercalving interval is about 4 years, and females first give birth as early as about 6.5 years. Females nurse calves to the age of 2 years, but by the age of 2 months the calves begin supplementing milk intake with grass shoots, and by 10 months they graze and browse freely.

As part of a larger study on population and foraging ecology of *Rhinoceros*, we photographed and identified 167 animals in the eastern sector of Chitwan National Park and radio-collared 15 individuals for intensive study. The adoption incident occurred in this sector on Icharni Island, an area of 1.1 km² of riverine forest surrounded by 2.2 km² of 3-m-tall *Saccharum spontaneum* grassland. Icharni Island supports the highest density of *Rhinoceros* within the park; numbers vary monthly but include a minimum of 15 adult females with calves, 1-2 barren adult females, 2 subadult females, 3 subadult males, and 2 dominant males. The island also attracts a few transient, reproductive females that give birth or nurse young calves there then move off.

Although *Rhinoceros* cows guard young calves closely, calves become separated from their mothers when

cows are chased by breeding bulls and occasionally during long grazing bouts (Laurie, 1982). Usually, cows locate their calves within 24 h if separated by less than 1 km.

A radio-collared female, one of the oldest individuals in the population, adopted and began nursing an 8-month-old male calf of unknown parentage. Before adoption, the stray calf associated with two other adult *Rhinoceros*. We first observed it at the age of 3–4 months on 16 January 1986, following another adult female that was accompanied by its own 10–11-month-old calf. On 24 April 1986, the stray calf was observed again 3 km east of the first sighting, but this time was following one of the two dominant males on Icharni Island. Dominant males pose a mortal threat to young calves and juveniles. For example, the other dominant male on Icharni Island killed the 4-day-old male calf of a radio-collared female, a calf it is known not to have sired. Laurie (1978, 1982) also reported several instances of dominant males killing calves. In 1984, the same male killed a 4.5-year-old male and seriously wounded several other subadult males. After 2 days, the dominant male moved off alone, perhaps in response to frequent butting by the calf, a behavior associated with suckling. At no time did the dominant male threaten the calf.

On 27 April 1986, the radio-collared female came into contact with the calf and began to nurse it; within 1 week its own 4.5-year-old male calf moved off. Females usually chase away old calves 1–16 weeks before parturition, but older calves occasionally remain close to or later rejoin the mother and newborn calf (Laurie, 1978). On 24 October 1985, the female attempted to drive off her 4.5-year-old calf, but reunited with it on 9 December 1985 after it had been attacked and wounded by the other dominant male. We speculate that the female that adopted the stray calf aborted sometime between mid-December 1985 and mid-April 1986 or gave birth undetected to us and lost the newborn calf. By coincidence, the orphan calf appeared and took advantage of milk production and maternal disposition. The adoptive relationship between the female and the 18-month-old calf has persisted to the present (June 1987), a duration of 14 months.

Adoption in *Rhinoceros* probably is a rare event because few calves are orphaned and unprotected calves do not survive long as a result of loss of a source of milk, attacks by adult males, and predation. During a 4-year period (1984–1987), only three of at least 80 calves of which we were aware were orphaned before becoming yearlings. Predation by tigers (*Panthera tigris*) accounted for at least 10% of all calf mortality in Chitwan National Park between 1973 and 1985.

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