



## ***Social behaviour of the African lion (Panthera leo).***

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### **Introduction:**

Lions are the largest African carnivore, and the second largest of the “great cats” (lions, leopards, tigers and jaguars). Great cats are distinguished from other cats by their ability to roar. The African lion can range from 90-250 cm in length, plus an additional 100 cm for the tail. The length ranges from the smallest for the females to the largest for the males. They are about 120-125 cm high at the shoulder and the males weigh, on average 260 kg, while the females weigh about 126 kg. The lionesses are generally about 40 % smaller than the males.

### **Social behaviour:**

Lions live in a matriarchal social group called a pride. Schaller defined a pride as “resident females with their offspring and attending males, sharing an area and interacting peacefully”. The studies of e.g. Mac-Donald 1983, Van Orsdol 1985, Bothma 1998 and Stuart and Stuart 1997, finds that the core-concept of lion social organisation is the pride as the highest level of organisation. The studies indicates that a pride of 10-20 lions is composed of groups of 3-6 lions with varying composition that may regularly be observed together, so-called fission-fusion. A pride typically has a territory, defended by 1-3 males for 2-4 years against nomadic males.

Females within a pride usually stay together for life. These natal females are related to each other.

Male cubs are evicted when they reach sexual maturity, at 2-4 years of age. These evicted males form groups called coalitions, which roam in search of another pride. Coalitions can range from 2-7 males, and they are usually related to each other. The reason males form coalitions is for defence, hunting, companionship and greater number means a greater chance of taking over a pride.

Males are only temporary fixtures in the pride, and they are typically in their prime, from 5-7 years of age. They come from other prides, and stay as long as they can defend the territory. Resident males will eventually lose their pride in a coalition takeover. The new males of the pride will, after the takeover, kill or chase away the old male or males. If the females of the pride have suckling offspring by the former male, the new males will kill them also. This is because the new males want to spread their own genes into the group. The females will not mate if they have suckling cubs, so then the new males would have to wait until the next breeding season to mate, which can be 2 years away, since females do not breed every year. By killing the cubs, they force the females into estrus, and can copulate immediately.

H. Bauer, H. H. De Iongh and I. De Silvestre studied the social behaviour of lions in relation to ecological conditions in West and Central Africa, based on information from three study areas in the Soudano-Sahelian savannah belt; Nikilo Koba National park in Senegal, Pendjari NP in Benin and Waza NP in Cameroon.

In their study areas, lion group size was defined as the number of lions observed together on an encounter, excluding cubs (under the age of 2).

In Nikolo Koba NP, group size was assessed by road transects with total length of 23,000 km in 1995-1997.

In Pendjari NP group size was assessed from lion encounters by tourist guides and by means of 70 calling stations along road transects in 2001 and 2002.

In Waza NP, two types of data were obtained. 5 lions, which all first were encountered alone, were tagged with radio collars. They were tracked and observed 291 times from 1998 to 2001. Secondly, occasional encounters between 2000 to 2002 were used to assess the group size for the entire park and for the three vegetation zones separately; floodplain, Acacia-shrubland and woodland.

With this study, they found that mean group size in the three West and Central African study areas was significantly lower than group sizes in East and Southern Africa. Solitary lions of both sexes and solitary females with cubs were regularly encountered. If there was a level of organisation higher than the small groups, their interactions were rare and hardly ever observed. Overlap between the home ranges of the 5 radio collared lions in Waza NP was substantial. Yet these lions were hardly ever observed together, The three females were observed together once, and one female was not seen with any other lion afterwards. The two other females were observed together 11 times, but seen 71 times solitary. They were both observed without each other, but with male 1 for one and to short mating periods, respectively. Male 2 was not seen in the presence of any other lion, despite his home range overlap with all the others.

If we consider Schallers definition of a pride, male 1 and the three females could be considered members of a pride. Male 2 would have to be considered a nomad who later took over a different pride. They found, however, this definition not entirely satisfactory. For example, the core area of male 1 does not overlap with the overlap of the three females' core areas. Male 1 was not observed patrolling or seeking conflict with male 2 inside his pride range, despite his hypothetical status as a pride male. In addition the number of and frequency of interactions between pride members is extremely low. They conclude that the use of the word pride is not useful in describing the observed social system, or that it should, at least, be redefined.

The climate of the West and Central African savannah is within the range of climates in East and Southern African lion habitats. Studies in these areas have shown larger home ranges than elsewhere, and the relation between rainfall, prey density, lion density and range size has already been established. On the bases of this, they formulated three hypotheses about the influence of ecological factors on lion social organisation in West and Central Africa.

Firstly, small lion group size could be caused by low prey density. Wildlife density in West and Central Africa are generally low. When they exclude the elephant, which rarely serve as prey, the density is even lower.

Secondly, low mean prey body size could explain small lion group size. The hypothesis is that, in the absence of large prey species, the advantage of co-operative hunting is outweighed by the cost of aggression during feeding. This could not be proved based on the Southern and Eastern studies, where there are up to 9 large prey species. In West and Central Africa however, there are only 4 large prey species, and they rarely occur together and rarely in high densities. Mean prey body size is therefore likely to be smaller here than in southern and eastern Africa, where the previous studies have been done.

Thirdly, small lion group size may be result of high per capita livestock consumption. Human livestock conflict is a regional problem, and this shows that the interface between cattle and lion is large. Since stock-raiding usually is done by 1-2 lions, this is another possible explanation of small group size.

While the two first hypothesis are based on ecological conditions, and are natural, the third hypothesis is based on relatively recent man-made situation. One would have to do some historical research in order to find out its importance.



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### **References:**

Bauer et al. (2003) Mamm biol 68: 239-243

<http://www.lioncrusher.com/animal.asp?animal=59>