

# The introduction of captive bred African lions (*Panthera leo*) to a private wildlife reserve in the Limpopo Province, South Africa



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## Abstract

The objective was to utilise a unique opportunity to monitor and explore the social and feeding behaviour, and the reproductive ability of captive bred, and reared African lions (*Panthera leo*) when reintroduced as a founder population on a large private wildlife reserve (hereafter, the Reserve). The study did not aim to justify the captive breeding of lions, but the potential value of such lions was assessed, when recently introduced to a free-roaming scenario, to augment the conservation status of this iconic African predator species. It was hypothesised that the reintroduction of such African lions in a free-roaming scenario would be deemed successful if the following five criteria were met: (i) The ability to form social groups in an extensive wild habitat; (ii) The ability to become self-sustaining with no interference or supplementation by management; (iii) The ability to reproduce by raising offspring to maturity/female sexual maturity and/or dispersal of males from natal prides; (iv) The ability to teach offspring to hunt effectively, interact socially, reproduce, and secure a healthy and viable F2-generation, characteristic of wild managed lions; and (v) Be regarded as suitable potential founders for reintroduction programmes where wild populations have disappeared or need to be augmented. The Reserve was established in the Limpopo Province, South Africa with a vision to include the Big Five of Africa. Therefore, five African lions, bred and reared in captive facilities, were introduced in 2017 to the Reserve. The five lions comprised an adult male (10 years old and previously used for breeding at a captive facility in the Free State Province, South Africa) and four large female cubs (two years old, sourced from a captive facility in the Limpopo Province, South Africa). In preparation for the envisaged introduction of lions, the adult male was moved from the Free State Province in November 2016 and joined with the four large female cubs in a 1-ha camp at their natal captive facility in the Limpopo Province. Four weeks after being joined, the five lions were relocated, and in December 2016 they were released in a boma (4-ha holding facility) on the Reserve to acclimatise. While the five lions were in the boma for a 6-week period, they were fed twice a week blue wildebeest (*Connochaetes taurinus*) or zebra (*Equus quagga*) carcasses. Without pre-release training, the five lions were released from the boma on 27 January 2017, when the gates of the boma were simply opened. The spatial utilisation of the Reserve by the lions were monitored with satellite GPS collars, fitted to a few selected individuals. The ultra-high frequency (UHF) capabilities of the satellite GPS collars also allowed for real-time locating of the lions. The information was used to determine their temporal and spatial utilisation, home range selection, possible group formations, birthing incidences, and successful hunting sites. The ArcGIS Desktop (V. 10.8.1) was used to analyse the data. In addition, visual observations of lions and detected kill sites were done from vehicles and electronically submitted via a WhatsApp group, whereafter it was chronologically logged for analysis. Social behaviour, prey killed, attempted hunts, and body condition of the lions were recorded via the WhatsApp group. Photographs and videos of the events were used to confirm activities. Timelines of temporal activities and incidences were created for the lions, showing important occurrences such as social interaction, mating, births of known litters and hunting. When appropriate, the timelines of different individuals were linked to provide better insight of the social interaction of the lions on the Reserve. When deemed necessary, excess lions were removed from the Reserve to comply with Provincial and National legislation and ensure ecological sustainability of the Reserve. Inbreeding of the lion population was prevented by vasectomising some males and by introducing an unrelated adult male to the Reserve in 2020. The lions showed varying degrees of social bonding and possible reasons for the grouping behaviour are provided. During the study, only two stable groups of more than two adult lions were recorded. The hunting success of the lions could not be accurately determined, because of large areas of dense vegetation and the few access roads, limiting the recovery of the remains of kills before being scattered by scavengers. Furthermore, the dense vegetation of some areas on the Reserve prevented the visual sighting of hunting attempts. Therefore, the hunting success of the lions was determined indirectly by the continuous evaluation of body conditions and the changes in the density of suitable prey species on the Reserve. Since the lions were released from the boma, they were self-sustaining. The cub survival rate was high and comparable to that on small wildlife reserves (<1 000 km<sup>2</sup>). Population growth was high, as was expected for a wild managed population. In the study, most cubs brought from hiding by their mothers, comprising 2, 3 or 4 cubs when first sighted, survived. Subsequently, some young lions dispersed from their natal prides, and became self-sustaining. Two of the lionesses born on the Reserve, namely F1-generation lions, later gave birth to their own litters, namely F2-generation lions. In conclusion, when introduced in a free-roaming scenario on the Reserve, the captive bred, and reared African lions, as well as their offspring (i) formed social groups, albeit it often a single lactating female with cubs; (ii) became self-sustaining by hunting successfully, with no interference or supplementation by management; (iii) reproduced and raised offspring to reach female sexual maturity and dispersal of sub-adult males from natal prides; (iv) taught their offspring to hunt effectively and interact socially, enabling reproduction of the species, thereby securing a healthy and viable F2-generation, characteristic of wild managed lions; and (v) suggested that similar lions may be considered as founders for reintroduction programmes, where wild populations have disappeared or need to be augmented in specific circumstances.

## Keywords

African lions, *Panthera leo*, private wildlife reserve, Limpopo Province, Lions -- South Africa -- Limpopo province, Wildlife management -- South Africa -- Limpopo province, African lions, Wildlife conservation -- endangered species

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