

## FIELD NOTES

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# Black rhino population dynamics and the hidden cost of poaching at Solio Game Reserve, central Kenya

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### Introduction

At the beginning of 2009, Solio Game Reserve (SGR) in Central Kenya was home to 68 black rhinos at a density of 0.99 per square kilometre (km<sup>2</sup>). This represented a very high density for a region where 0.3 rhinos/(km<sup>2</sup>) was more typical and had been thus for over a decade.

There were three main outcomes from this high density: i) an ability for the rhinos to co-exist without excessive aggression (leading to deaths); ii) a depletion of the preferred, better quality food species such as *Acacia drepanolobium*; iii) an extended inter-calving interval at over three years. Since the “Mission” of SGR was to breed rhinos for translocation to other protected areas/reserves in order to develop the national population, this latter outcome was of major concern.

The black rhino management strategy of SGR was to reduce the population to fewer than 50 individuals through a programme of translocations and expected losses due to a high ratio of ageing to younger individuals.

On 9 June, 2009 an unexpected event happened - the death due to poachers of an adult male black rhino – the precursor to a further 15 black rhino and 44 white rhino poaching deaths up to the end of 2014. Furthermore, 7 black rhino individuals died as the after effects of poaching.

In addition, 13 more individuals died from ‘natural causes’ and another 13 were translocated.

This paper details the changes to the SGR black rhino population between 2009 and the end of 2014 in Solio Game Reserve.

Currently, the adult males are located in three breeding male territories, which only covers one-third of the area of the reserve. The remaining two-thirds of the reserve have no clear breeding male.

### Breeding males

Poachers killed seven breeding males.

Two breeding males were translocated on the grounds of safety as they were regularly seen from a main road that ran parallel to the fence line.

Three breeding males died from fighting injuries – an older male fought with two younger males. As the territorial males surrounding the territory of the older male died, so the older male increased its ranging as it sought to compensate for the deaths of four females in its territory. In doing so it came across the two competitor males and acted aggressively - after one fight its long rear horn was snapped down leaving just the triangular base. All three males succumbed to their injuries.

One breeding male moved out of its territory to a limited area near to water. The change in its behaviour suggests that its vision had become severely restricted.

### Current breeding potential

Only one male has been seen breeding and has a well-defined range.

An older male who had surrendered its ‘breeding rights’ to a younger male which was subsequently

Table 1: Black Rhino Population Dynamics in Solio Game Reserve 2009 to 2015

Population	2009	2015	Change %
<b>Males</b>			
Adult	16	10	-38%
Sub-adults/Calves	19	13	-32%
<b>Sub-total males</b>	35	23	-34%
<b>Females</b>			
Adult	20	16	-20%
Sub-adults/Calves	13	10	-23%
<b>Sub-total females</b>	33	26	-21%
<b>Total</b>	68	49	-28%
<b>Poaching</b>		16	
<b>Poaching after effects</b>		7	
<b>Natural causes</b>		13	
<b>Trans-located</b>		13	
<b>Sub-total reduction</b>		49	

poached, has been seen back in its former territory, as it now has no competition. Whether it is capable and accepted for breeding has yet to be observed.

One young male changed its range from the east of the river to the far north-west after being observed fighting with territorial males so, along with two other males of similar age, the territory of the previously mentioned visually impaired male will hopefully be covered.

Two young males of 7.5 to 8 years old range in the territory of the older male killed by fighting and could take over as the breeding males.

## Breeding females

Poachers killed seven breeding females.

No breeding females were translocated but four sub-adult females were moved to help start a new population in western Kenya.

Four breeding females died – two of old age, one from a wound probably caused by fighting and one was euthanized having been wounded when charging a monitoring patrol.

## Current breeding potential

Nine mature females have calves although three of the females have not been seen for over 20 months.

Four younger females have calves. Two young females, who were expected to calve and who had been highly visible, have not been seen for over a year. One of these is possibly an unidentified sub-adult female killed by lions in 2014.

One young female of breeding age has yet to have a first calf. It changed its home range from the south-east to the south-west of the reserve possibly in order to find a satisfactory mate or to avoid the unwelcome attention of two young males.

## Main Range Changes in the Period

Young male no.40 changed area from the south-west of the river to the south-east of the river when around 8 years old.

Young male no.54 changed area from south-west of the river to the centre-east of the river when around 9 years old.

Young male no.55 changed area from centre east of the river to the far north-west of the reserve when around 7.5 years old.

Young male no.53 extended its range eastwards such that included an area across the river when around 10 years old. This range extension was enabled by the deaths of competitor males in the new area while allowing for the male to avoid other males in its normal range.

Although there were no direct observations of fighting recorded by monitoring patrols, it is likely that the reason for the changes in area for all these young males was due to being ejected from their former ranges by the territorial male as they had reached an age and size to become competition.

Young female no.44 changed her area from south-west of the river to south-east of the river when around 7 years old. She had had her first calf at around 5.5 years old but lions killed the calf when she was 3 months old. Soon after the death of the calf, the territorial male no.1 was always seen with the female for some five months until he suddenly changed range when, the next day and for the next two months, he was with the territorial male no.35 of the new area.

Female no.44 had her second calf around 14 months after she was observed to have moved range so it was not clear which of the two males was the father but the possibility exists that the change of range was to seek out a different male for breeding.

Young female no.43 changed her range from the centre-east of the river to the centre-west of the river when around 8 years old. She immediately consorted with the territorial male no.39 suggesting she was looking for a different mate to the territorial male in her former range.

Young female no.61 changed her range from south-east of the river to south-west of the river when around 7 years old. Following a poaching incident there was no breeding male in her former range and it is likely that the range change was due to the female seeking a mating opportunity.

## The hidden cost of poaching summarised

As stated previously, the loss of seven territorial males resulted in around two-thirds of the reserve area not being covered by breeding males.

The loss of seven breeding females resulted in the loss of potentially nine new calf births in the period and more in subsequent years. It also led to increased aggression among males seeking breeding rights over the remaining females resulting in the deaths of three males from fighting injuries.

As poaching pressure increased over the period, so did the need for increased security. This led to the secondment of a large contingent of Kenya Wildlife Service armed rangers within the reserve, which required transport and camping facilities. There was a need for night vehicle patrols, ambushes and daytime logistics travel around the reserve. The unfortunate noise and disruption caused by these manoeuvres, plus the poaching resulted in previously easy to monitor rhinos becoming secretive and hard to find. Ten individuals plus three calves have not been seen for over a year, two individuals of which have not been photographed since 2010. It is not certain therefore, that all of these individuals are still alive and have not been taken by the poachers.

It is clear that the 'Mission' of SGR – to breed rhinos for relocation to other reserves in order to develop the national population – has been more seriously compromised by the incidence of poaching than simply the deaths of 14 breeding black rhinos. The recent escalation of poaching has not only resulted in the loss of nine potential new births, but has had an impact on rhino behaviour. (See Plate 12; centre page vii)