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# Tsavo East and Ngulia rhino populations counted

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A rapid census<sup>1</sup> to ascertain the numbers and distribution of rhinos in Tsavo East and Tsavo West National Parks in Kenya was conducted between 26 September and 22 October 2001.

## **Tsavo East**

The rhino population in Tsavo East was free-released and currently is estimated to range over about 4000 km<sup>2</sup> of the park, making conventional monthly sighting of individual rhinos demanding. Based on the records available such as the number of known introductions and the recorded births and deaths since the population was established, the Tsavo East population had likely increased to 53 rhinos by September 2001. Six rhinos from this population were, however, lost through poaching between 24 November 2001 and 30 January 2002.

## **Ngulia Rhino Sanctuary (Tsavo West)**

The black rhino population in Tsavo West is confined to the 65-km<sup>2</sup> Ngulia Rhino Sanctuary within the park. The population in the sanctuary is now thought to be 53, based on known introductions, removals, births and deaths since the sanctuary was established. Annual night waterhole counts have been done since 1992. Usually these counts are done for three consecutive nights during each full-moon period, about three or four times between July and October. The waterhole counts have provided much valuable data on individuals and population growth over the years (table 1).

## **Carrying out the census**

Both aerial and ground census techniques were used. The census was planned to coincide with the regular waterhole counts, which were therefore a third census technique in Ngulia. Both Tsavo East and Ngulia Sanctuary were divided into counting blocks. Two-

Table 1. Waterhole count and estimated total numbers of rhinos in Ngulia Rhino Sanctuary, 1992–2001

| Year | Counted | Estimated |
|------|---------|-----------|
| 1992 | 11      | 17        |
| 1993 | 22      | 23        |
| 1994 | 25      | 26        |
| 1995 | 27      | 27        |
| 1996 | 32      | 34        |
| 1997 | 36      | 39        |
| 1998 | 39      | 41        |
| 1999 | 38      | 46        |
| 2000 | 47      | 48        |
| 2001 | 51      | 53        |

hour flights per day were carried out systematically from a fixed-wing aircraft. It took seven days to cover all the blocks by air in Tsavo East and one day to cover Ngulia; thus 14 hours were flown in Tsavo East and 2 hours in Ngulia, giving a search effort of 285.7 km<sup>2</sup>/hr in Tsavo East and 32.5 km<sup>2</sup>/hr in Ngulia. The coverage in Ngulia was therefore almost nine times more intensive than that in Tsavo East.

Ground census was done mainly by foot patrols with vehicles used only to carry the patrol teams to starting points at the beginning of the census and, when necessary, to collect them at end points. It took 31 men, divided into six patrol teams, 10 days to cover Tsavo East, and 20 men, in five patrol teams, 2 days to cover Ngulia. This translates to a search effort of 100 km<sup>2</sup> per patrol day in Tsavo East compared with 6.5 km<sup>2</sup> per patrol day in Ngulia, indicating a level of search 13.4 times higher in Ngulia. The area covered per man-day was 12.90 km<sup>2</sup> in Tsavo East and 1.08 km<sup>2</sup> in Ngulia, again with a search intensity in Ngulia 11.9 times that in Tsavo East. Throughout the census, the search effort expended per unit area in Ngulia was substantially higher than that put into the much larger area of Tsavo East. This further highlights the difficulty of monitoring Tsavo East, as mentioned above.

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<sup>1</sup> Census, used here in its wider meaning, is synonymous with a count or survey of a population.

A general foot patrol was conducted without tracking spoor of individual rhinos. Night census using image intensifiers was conducted simultaneously from three fixed points (waterholes) for two consecutive full-moon nights in Ngulia. In this case, two additional night counts had been done as usual by the Ngulia staff in July and August. When the rest of the census team arrived, the Ngulia staff had already done one night of the September–October count. Thus the rest of the census team participated only in the remaining two nights of the count.

In Tsavo East, 25 rhinos were sighted and in Ngulia, 20 were counted. However, the two night counts done in Ngulia recorded 48 rhinos, almost two and a half times the number seen in the aerial and ground counts. The night waterhole count produced a number that was close to the expected population size. This means that a higher proportion of the population can be seen from the waterhole counts than by the ground or aerial surveys. But it should be noted that daytime ground sighting data if routinely collected over an extended period and analysed using mark-recapture statistics can be used to produce reasonably accurate population estimates (better than minimums seen) provided there are enough sightings.

Aerial counts of black rhinos are known to produce highly variable and significant undercounts of true population size. The minimum numbers seen on these aerial counts are therefore likely to be gross underestimates of true numbers, and in part reflect the search effort put in.

Although the distribution maps are still being processed at the Kenya Wildlife Service GIS section, rhinos in Tsavo East were observed to range the entire area south of the Galana River that is part of the Yatta Plateau.

One rhino carcass (the only known death in 2000), which had been reported, was picked up in the Ngulia count; five elephant carcasses were recorded in the Tsavo

Table 2. Rhino numbers seen and estimated in counts in Tsavo East and Ngulia, 26 September–22 October 2002

| Type of count                         | Tsavo East | Ngulia       |
|---------------------------------------|------------|--------------|
| Aerial count                          | 21         | 16           |
| Ground count<br>(by foot and vehicle) | 4          | 4            |
| Night census<br>(at waterhole)        | not done   | 48           |
| Rhino signs < 48 hr old               | 109        | not recorded |
| Estimated                             | 53         | 53           |

East counts and their GPS (global position system) locations recorded. No new rhino carcasses were sighted even after a thorough foot patrol in areas of high rhino density. Although only 25 rhinos were sighted in Tsavo East, numerous fresh signs distributed south of the Galana River indicated the presence of many more. However, while we could be confident that there were around 53 rhino in Ngulia, the exact number of rhinos in Tsavo East remains much more uncertain. More work is therefore required to produce improved population estimates for this park. However, the census did provide valuable information about the extent of the distribution of the Tsavo East population. Other animal species of interest counted in Ngulia Sanctuary included elephants (161), giraffes (32) and lesser kudus (11).

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## SADC regional programme for rhino conservation—update

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The SADC Rhino Programme has continued to support rhino conservation projects for black and white

rhinos (*Diceros bicornis minor*, *D. b. bicornis*, *Ceratotherium simum simum*) within the southern Af-