

The response of red duikers *Cephalophus natalensis* to drive counts

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The response of red duikers to drive counts conducted on three consecutive days was monitored. The disturbance level to the duiker community of this counting method is low, as it is unlikely to have any long-term effects. The red duiker flees rather than hides from the counting line, thereby increasing its chances of being counted.

Key words: *Cephalophus natalensis*, behaviour, drive counts.

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Introduction

Drive counts are one of many techniques used to count animals. The method requires a line of evenly-spaced observers, the counting line, which moves through an area from one side to another. Animals flushed are counted either as they run through the counting line, or as they cross the area boundary (Overton & Davis 1969). One of the assumptions of this technique, the 'all counted' assumption, states that all animals occurring within the area at that time are counted (Collinson 1985).

The degree to which this method disturbs animal communities is often pondered. Is there an upheaval with long-term effects? Are animals driven great distances resulting in a general "mixing-up" of individuals so necessitating the establishment of new home ranges or territories, or is the disturbance of a temporary nature with no long-term implications? The reaction of the animal might be to 'sit tight', undetected in dense vegetation, instead of fleeing.

The aims of this paper are, first to document the response of the red duiker (*Cephalophus natalensis* A. Smith, 1834), a secretive antelope, to drive counts and thereby evaluate the impact of this enumeration method on the red duiker community. Second, to assess the chance that all red duikers are counted during drive counts.

Study area

Kenneth Stainbank Nature Reserve (KSNR; 29°53'45"S-29°55'55"S; 30°55'00"E-30°56'30"E) covers an area of 214 ha and is situated 9 km southwest of the Durban city hall. The vegetation of the moderately undulating topography falls

within Acocks' Veld Type 1: Coastal forest and thornveld, subcategory coastal belt-forest (Acocks 1975). The mean annual rainfall is 1 210 mm with 70 % falling between October and March. The mean annual temperature is 20 °C with a mean daily range of 11 °C.

Methods

Drive counts are conducted annually by Natal Parks Board personnel in KSNR to monitor forest antelope populations. For practical reasons the reserve is divided into manageable counting blocks (Le Roux & Morty 1985). Counting blocks are traversed by a counting line comprising 25-30 observers. Inter-observer distance varies between 10 m and 30 m depending on terrain and vegetation density and each observer counts only to his left.

Two red duikers in KSNR had radio-collars as part of my research on their ecology, this provided an opportunity to investigate the response of these animals to drive counts. Unfortunately, the small sample size (n=2), determined by the number of collared animals, limited the scope of this investigation. Further, logistical constraints allowed one animal to be radio-tracked during the drive counts, sightings only of the second animal by members of the counting line were recorded. The location and extent of the study animals' home ranges were determined earlier with radio-tracking, one home range is shown in Figs. 1-3.

Three drive counts, commencing at about 07:15, were conducted on consecutive days in August 1988. On each of three days the first study animal was tracked from 06:00 until, the counting line having passed by, it had returned home. The position of the counting line was monitored simultaneously. The second animal was monitored by members of the counting line. They kept watch for and noted its exact position during the counting operations.

Results

The response of the radio-tracked red duiker to the counting line is described in Tables 1-3 and illustrated in Figures 1-3. The most severe reaction by the animal was on the first day. In trying to avoid the line it moved > 750 m from the boundary of its home range and took 8 h to return. On the second day it broke back through the line not leaving its home range. The initial relatively high rate of movement within the home range on day 3 was probably caused by the disturbance made by the observers on their way to the assembly point. However, when it eventually left its home range the duiker went only 200 m before doubling back through the line to return within 35 minutes.

The second animal was seen and counted well within its usual home range on each of the three days.

Discussion

These observations indicate that in the case of the red duiker the disturbance by drive counts has only an ephemeral effect on the community, any long-term impact on its arrangement and structure is highly unlikely.

Vegetation characteristics of the area, and behaviour of the animal, are criteria that should be taken into account when counting animals (Collinson 1985). Blue duikers *Philantomba monticola* when pushed forward by the counting line will usually, on reaching their territory boundary, either hastily double back through the counting line or hide, undetected in thick understorey vegetation until the line has passed by. This violation of the 'all counted' assumption was also noted in the suni *Neotragus moschatus* (Lawson 1986).

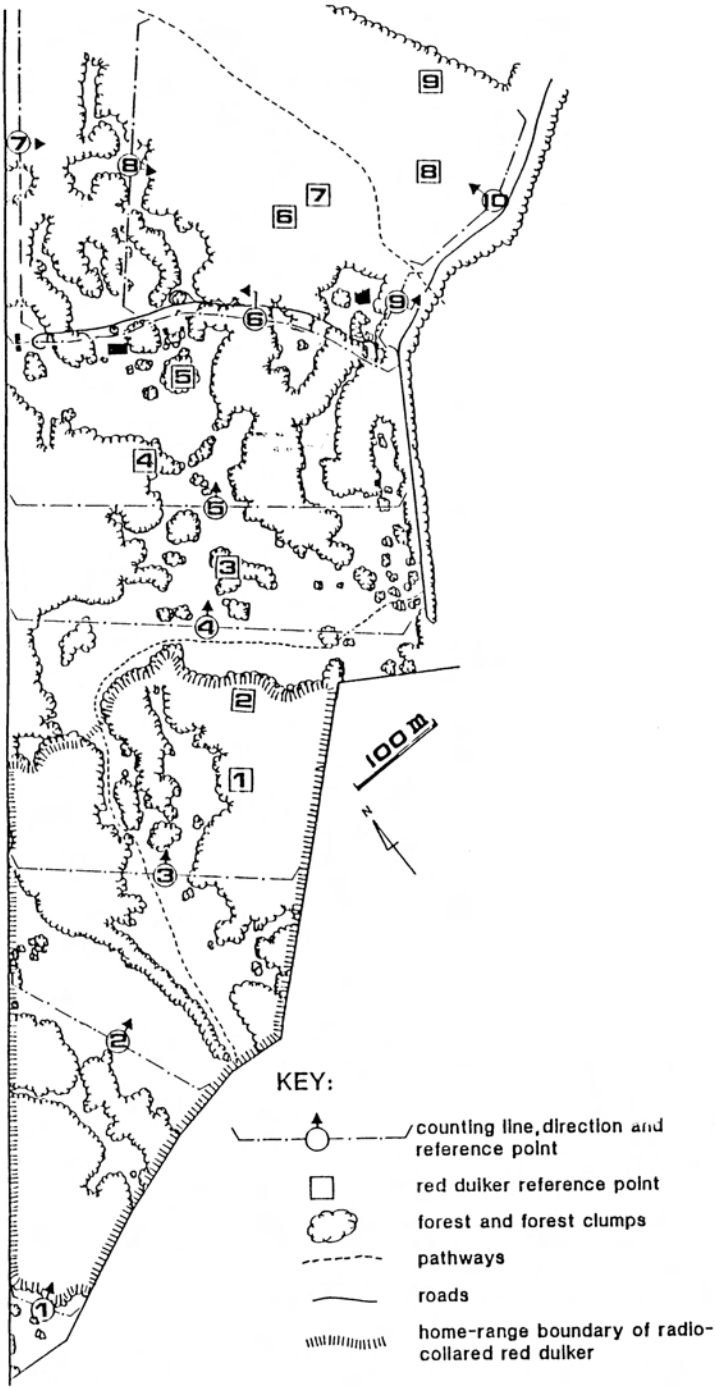


Fig. 1. Map of the southwestern projection of Kenneth Stainbank Nature Reserve showing the response of a radio-collared red duiker to the counting line on the first day of drive counts. Refer to Table 1.

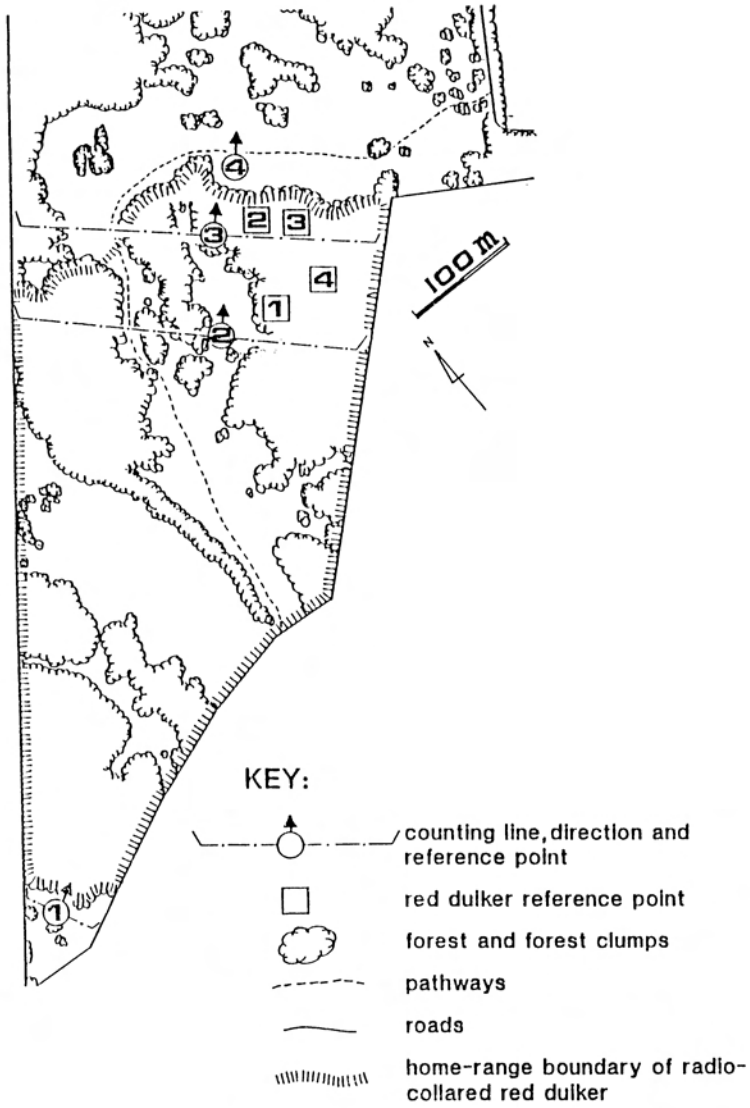


Fig. 2. Map of the southwestern projection of Kenneth Stainbank Nature Reserve showing the response of a radio-collared red duiker to the counting line on the second day of drive counts. Refer to Table 2.

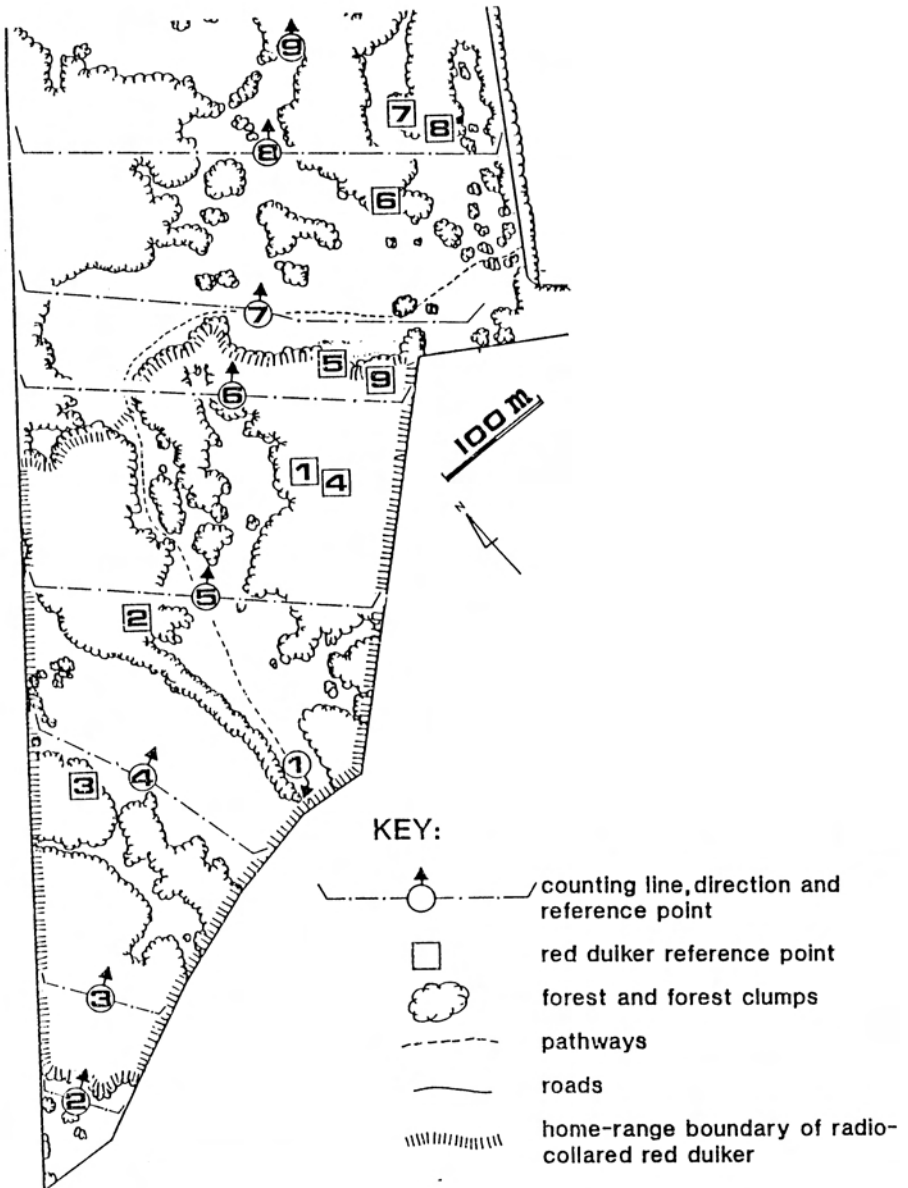


Fig. 3. Map of the southwestern projection of Kenneth Stainbank Nature Reserve showing the response of a radio-collared red duiker to the counting line on the third day of drive counts. Refer to Table 3.

The red duiker, however, appears to flee more readily; on five occasions out of six opportunities it was counted. This behavioural response of the red duiker inhibits the chances of the 'all counted' assumption being violated.

Table 1
Sequential monitoring of a red duiker's response to the counting line on the first day of drive counts

Time	Reference Point (Fig. 1)	Counting Line Activity	Duiker's Reaction
07:15	1	line assembles and count begins	home not far from bed-site
07:40	2	brief stop to re-align	moves away from line to forest edge
07:50	3	moving ahead steadily	leaves home range across open grassland to forest clump
08:00	4	brief stop to re-align	leaves forest clump to shelter in forest
08:10	5	moving ahead steadily	moves away from line to forest clump
08:38	6	end of counting block reassembles at point 7	moves deeper into forest and waits
09:00	7	count resumes	waiting
09:04	8	moving ahead steadily	crosses forest path out of current counting block
09:12	9	end of counting block re-assembles at 10	moves away from path of counting line
09:19	10	re-assembles for next counting block	doubles back across forest path to point 6 unseen and uncounted, commences trek home
13:00	5	counting complete	heading home
14:40	5	-	lingering in forest clump
16:00	2	-	back in home range

Table 2
Sequential monitoring of a red duiker's response to the counting line on the second day of drive counts

Time	Reference Point (Fig. 2)	Counting Line Activity	Duiker's Reaction
07:15	1	line assembles and count begins	near bed-site
07:34	2	moving ahead steadily	moves away from line
07:40	3	moving ahead steadily	moves to home range boundary
07:45	4	moves out of duiker's home	doubles back through counting line, not leaving home range and is counted

Table 3
Sequential monitoring of a red duiker's response to the counting line on the third day of drive counts

Time	Reference Point (Fig. 3)	Counting Line Activity	Duiker's Reaction
07:15	1	<i>en route</i> to point 2	near bed-site
07:25	2	line assembles and count begins	moving around quickly, probably disturbed by observers <i>en route</i> to point 2
07:30	3	moves ahead steadily	crosses open grassland to forest patch
07:38	4	brief pause to realign	moves away from path of counting line
07:42	5	moves ahead steadily	moves to home range boundary,
07:45	6	moves ahead steadily	crosses open grassland to adjacent forest patch
07:50	7	brief pause to realign	moves away to next forest patch
08:10	8	moves ahead steadily	doubles back through counting line and is counted
08:20	9	moves ahead steadily	back in home range

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References

- ACOCKS, J.P.H. 1975. Veld types of South Africa. *Memoirs of the Botanical Survey of South Africa no. 40.*
- COLLINSON, R.H. 1985. *Selecting Wildlife Census Techniques.* Institute of Natural Resources, Monograph No 6. Pietermaritzburg: University of Natal Press.
- LAWSON, D. 1986. *The ecology and conservation of suni in Natal.* Ph.D. thesis, University of Natal, Pietermaritzburg.
- LE ROUX, N.P. and K.E. MORTY. 1985. Monitoring forest-dwelling antelope in Kenneth Stainbank Nature Reserve. Internal report. Natal Parks Board. Unpubl.
- OVERTON, W.S. and D.E. DAVIS. 1969. Estimating the numbers of animals in wildlife populations. Pg. 403-455. In: GILES, R.H. (ed.). *Wildlife Management Techniques.* Washington D.C.: The Wildlife Society.