

HISTORY OF THE BLUE DUIKER *Cephalophus monticola*
POPULATION IN THE TSITSIKAMMA FORESTS,
REPUBLIC OF SOUTH AFRICA

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Abstract — Blue duiker *Cephalophus monticola* appear to have been historically plentiful in indigenous forests of the southern Cape, Republic of South Africa. There was a marked decline in their abundance during the late 1940's, a prolonged dry period in which caracal *Felis caracal* became more frequently observed. Numbers of blue duiker remained low throughout the 1950's and 1960's in spite of an apparent reduction in numbers of caracal. Following the proclamation of the Tsitsikamma National Parks in 1964 and strict control of poaching and access by dogs, numbers of blue duiker increased markedly from the mid 1970's. Only four sightings of blue duiker were recorded during a two-year period in the mid 1960's, whereas for an equivalent time interval in the early 1980's there were 651 sightings representing at least 49 individuals.

Introduction

The blue duiker *Cephalophus monticola* is found only in forests or thickly wooded areas (Maberly 1960; Bourquin, Vincent & Hitchins 1971; Dorst & Dandelot 1970; Haltenorth & Diller 1980; Hanks 1974; Kenmuir & Williams 1975; Smithers 1966; Williams 1967; Zaloumis & Cross 1974). It occurs in

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western, eastern and southern Africa (Dorst & Dandelot 1970; Haltenorth & Diller 1980), but in the latter region is restricted to the indigenous forests and thickets that extend along the southern Cape, Transkei and Natal coasts and northwards through Swaziland, central Mozambique and eastern Zimbabwe (Bourquin *et al.* 1971; Hanks 1974; Kenmuir & Williams 1975; Smithers 1966; Zaloumis & Cross 1974). In the Republic of South Africa, it is recorded from the Tsitsikamma Forest (TFNP) and Tsitsikamma Coastal (TCNP) National Parks (Robinson 1976), but not from any other national park, although it occurs in several of the Natal and Cape game and nature reserves (Bourquin *et al.* 1971). It is listed in the *South African Red Data Book – Large Mammals* as rare (Skinner, Fairall & Bothma 1977).

The present paper traces the history of the blue duiker population in the Tsitsikamma and adjacent forests and discusses possible reasons for trends in population size.

Methods

Comments relating to blue duiker, bushbuck *Tragelaphus scriptus*, Cape grysbok *Raphicerus melanotis* and poaching activities have been extracted from reports of the nature conservator or warden of the Tsitsikamma National Parks for the period 1964 to 1976, as well as from other unpublished manuscripts of the National Parks Board of Trustees. For the period 1 June 1980 to 31 May 1982 one of us (RJMC) kept records of all blue duiker seen or reported. In addition we have examined the published literature for further information concerning blue duiker. From data supplied by the Weather Bureau, Pretoria, we have extracted longterm trends in rainfall at Bloukransbos, situated in close proximity to TCNP (Fig. 1), and compared this with the published rainfall analysis of Van Rooy (1980).

History of the blue duiker population in the Tsitsikamma and adjacent forests

Blue duiker apparently were plentiful in the forests of the southern Cape prior to the 1940's. Steedman (1835; cited in Skead 1980) reported an abundance of game "from elephant (*Loxodonta africana*) and buffalo (*Syncerus caffer*) to blue duiker" between Knysna and Plettenberg Bay in 1831. As interpreted by Skead (1980) this may be taken to mean from the largest to the smallest game animals. Liversidge (1966) wrote: "In recent times the bloubokkie [blue duiker] was very common along the southern forested regions from George through Witelsbos. So much so, that it was sometimes possible to see as many as half a dozen grazing together in an open glade." Close reading of his paper indicates that the phrase "recent times" referred to a period before 1946.

Numbers in the Tsitsikamma vicinity are reported to have decreased markedly in the late 1940's and early 1950's. Liversidge (1966) commented on blue duiker: "During the period 1946 to 1950 this small antelope dwindled away to become a rarity and in most localities the disappearance has been fairly abrupt." Skead (1980) cited Mr Hjalmar Thesen (*in litt.* 1952): "Grysbuck [Cape grysbok] and bluebuck [blue duiker] are decreasing rapidly due to the recent arrival of the caracal [*Felis caracal*]. Ten or twelve years ago [*i.e.* c. 1940-1942], before the advent of this animal, grysbuck and

bluebuck [blue duiker] were extremely plentiful. The caracal, previously unknown, appeared suddenly in the district.”

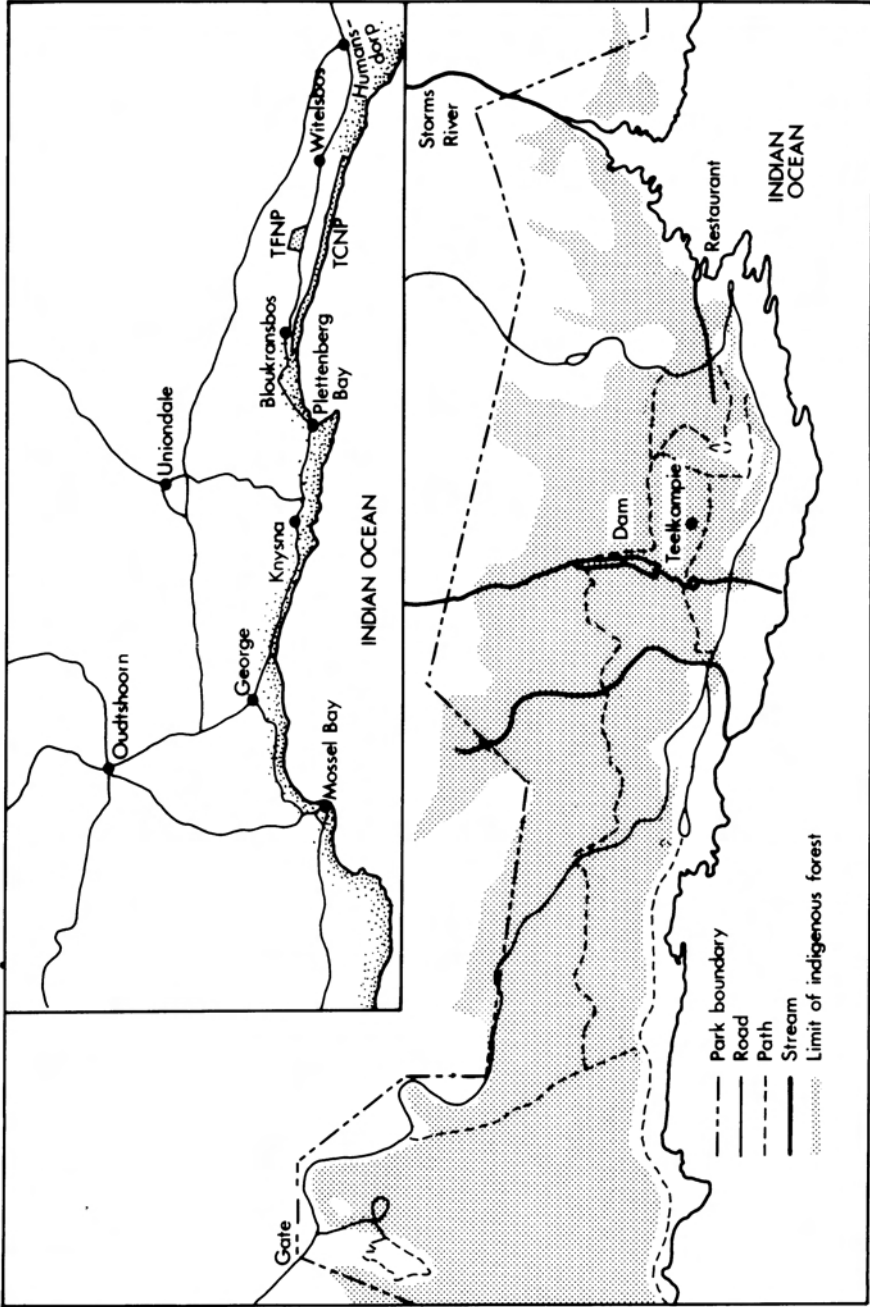


Fig. 1. The Storms River Mouth region of the Tsitsikamma Coastal National Park. Inset shows positioning of the Tsitsikamma Forest (TFNP) and Coastal (TCNP) National Parks along South Africa's southern Cape coast.

It appears that numbers of blue duiker remained depressed throughout the 1950's and 1960's. Van der Merwe (1970; cited in Skead 1980) estimated that only two blue duiker lived in the Goukamma Nature Reserve, situated 9 km west of Knysna (Fig. 1), and Thesen (1969) wrote: "The blue buck [blue duiker] . . . is hardly to be seen. Has the lynx [caracal] almost exterminated him, or is he the newest species which man's coming has tipped downward on the long slide into extinction." Liversidge (1966), the first nature conservator of the TNP's (which were proclaimed in 1964), saw two blue duiker and received reports of only two others during the two-year period 1964-1966. Records of the wardens indicate that blue duiker continued to be infrequently observed in the TNP's until 1974 (Table 1).

Numbers seen increased during 1974 and 1975, the trend being attributed to the exclusion of dogs from the TCNP (Table 1). Dearlove (1974) wrote: "Sporadic sightings have been made in the Tsitsikamma National Park of blue duiker . . . Efforts are being made to promote the increase of this species as the total blue duiker population has in recent times dwindled alarmingly." The efforts included the introduction in 1974 of a nucleus herd of four (two male and two female) blue duiker from the Queens Park Zoo, East London (Robinson 1976). The four animals were held in an enclosure erected in the forest and constructed in such a manner as to exclude access by predators (Anon. 1974). The two rams died shortly after arrival and postmortems suggested capture myopathy as a likely cause of death (Robinson 1976). The two females survived longer but also died within one year of arrival (Robinson *pers. obs.*).

In 1975 a second, larger dam was constructed across a small river near the Storms River Mouth rest camp, TCNP, to increase the water supply to the camp (Fig. 1). In anticipation that the rising water level would swamp neighbouring areas a game drive was undertaken in July 1975. One blue duiker was caught and transferred to the holding enclosure, where it died two days later (National Parks Board *unpubl. ms.*). No other blue duiker appear to have been encountered on the game drive. Writing on blue duiker Robinson (1976) noted: "Recently more observations have been recorded", and Skinner *et al.* (1977) cited a personal communication from Robinson, then park warden, indicating an increase in their number in the TCNP. All available records therefore indicate that a population recovery was initiated in the mid 1970's.

In the two-year period 1 June 1980 to 31 May 1982 one of us (RJMC) sighted blue duiker in the TNP's on 251 occasions. During the same period reliable reports of 400 sightings by other persons were received, making a total of 651 observations. Many of the sightings were probably of the same individuals, but reports were received from a number of widely separated localities in the forests of the TNP's and a preliminary analysis suggests that at least 49 different individuals were involved. *Cephalophus* spp. are generally territorial in behaviour (Haltenorth & Diller 1980). Sightings of blue duiker in the immediate vicinity (*i.e.* within 280 m) of the larger of the two dams near the Storms River Mouth rest camp, TCNP, were frequent between 1980 and 1982 (Table 2). At least three inhabited the area. The maximum count immediately west of the dam was three (29 August 1980) and that immediately east of the dam three (21 July 1981), suggesting that six individuals may have occupied the region. Three lambs were observed in the vicinity of the Storms River Mouth rest camp in 1981 (Crawford 1984).

Table 1

Comments in reports of wardens of the Tsitsikamma National Parks concerning blue duiker *Cephalophus monticola*, bushbuck *Tragelaphus scriptus*, Cape grysbok *Raphicerus melanotis* and illegal hunting of animals, November 1964 – January 1976

Year	Blue duiker <i>Cephalophus monticola</i>	Bushbuck <i>Tragelaphus scriptus</i>	Cape grysbok <i>Raphicerus melanotis</i>	Illegal hunting
1964				
1965				
1966				
1967		Shooting of bushbuck at De Plaat, TFNP, Jan.		Shooting of bushbuck and trapping of game at De Plaat, TFNP, Jan.
1968	Seen, December	1 ram seen at Big Tree, TFNP, Nov. 1 ram seen at Storms River Mouth, TCNP, Dec. Present, Aug. Seen on trails, Sep. Group of 7+ seen near Oakhurst, TCNP, July 1 found dead in snare, Apr. Often seen June - Aug.	Ram killed by stray dogs, Nov.	Cape grysbok ram killed by stray dogs, Nov.
1969				
1970				
1971		1 found dead at Nature's Valley, TCNP, between Aug. and Oct.		Bushbuck killed in snare, Apr. Bushpig <i>Potamochoerus porcus</i> found near Guano Cave, TCNP, Nov. with missing leg - attributed to dogs
1972	1 with lamb on pass, TCNP, June. Noted as unusual occurrence with comment 'The buck is no more seen in the Tsitsikamma and the reason for the disappearance in the strip remains a mystery.'	Seen on pass, TCNP, July Seen on pass and in caravan park, TCNP, between Nov. 1972 and Jan. 1973		
1973	2 observations between May and July	Seen regularly between May and July		
1974	Evidence of small population in indigenous forest, Feb. - Apr. Frequently seen near 'teelkampie' and 1 seen on pass, TCNP, between May and July between Nov. 1974 and Jan. 1975 relatively frequently seen, including group of 5 in Storms River Mouth area, TCNP. Reported to have increased in numbers	Regularly sighted between Feb. and Oct. Seen between Nov. 1974 and Jan. 1975	Regularly sighted between Feb. and Oct. Seen between Nov. 1974 and Jan. 1975	
1975	Regularly seen between Feb. and Apr. for period Aug. to Sep. reported to have definitely increased, especially near Storms River Mouth, TCNP - attributed to exclusion of dogs entering TCNP	Regularly seen between Feb. and Apr.		
1976	Constantly seen between Oct. 1975 and Jan. 1976	Constantly seen between Oct. 1975 and Jan. 1976		

*'Teelkampie' is Afrikaans for breeding camp and is where the blue duikers brought from Queens Park Zoo, East London, (Robinson 1976) were held on arrival (Fig. 1).

Table 2

Sightings of blue duikers Cephalophus monticola in the immediate vicinity of the dam near Storms River Mouth, TCNP, June 1980 – May 1982

Date	West	East	Total	Date	West	East	Total
9 Jul. 80	1	–	1	27 Jul. 81	2	1	3
16 Jul. 80	–	2	2	29 Jul. 81	1	–	1
29 Aug. 80	3	–	3	10 Sep. 81	1	–	1
19 Sep. 80	–	1	1	11 Sep. 81	–	1	1
11 Nov. 80	–	1	1	30 Sep. 81	1	–	1
9 Dec. 80	1	–	1	5 Oct. 81	–	1	1
21 Dec. 80	1	–	1	14 Oct. 81	–	2	2
22 Dec. 80	2	–	2	12 Nov. 81	–	1	1
24 Dec. 80	1	–	1	17 Nov. 81	–	1	1
30 Dec. 80	1	–	1	23 Nov. 81	1	–	1
14 Jan. 81	2	–	2	27 Nov. 81	1	–	1
16 Jan. 81	–	1	1	4 Dec. 81	–	1	1
20 Jan. 81	2	–	2	4 Dec. 81	1	–	1
20 Jan. 81	2	–	2	31 Dec. 81	–	1	1
2 Feb. 81	2	–	2	5 Jan. 82	1	–	1
28 Feb. 81	–	1	1	7 Jan. 82	–	1	1
4 Mar. 81	1	1	2	15 Jan. 82	1	–	1
16 Mar. 81	1	–	1	18 Jan. 82	1	–	1
16 Mar. 81	–	1	1	26 Jan. 82	2	–	2
29 Apr. 81	–	1	1	1 Feb. 82	–	1	1
1 May 81	–	1	1	4 Feb. 82	2	–	2
5 Jun. 81	–	1	1	9 Feb. 82	2	–	2
5 Jun. 81	–	1	1	27 Mar. 82	–	1	1
9 Jun. 81	–	1	1	1 Apr. 82	–	1	1
6 Jul. 81	–	1	1	13 Apr. 82	2	–	2
14 Jul. 81	–	1	1	14 Apr. 82	–	1	1
14 Jul. 81	1	–	1	15 Apr. 82	–	1	1
21 Jul. 81	–	3	3	7 May 82	1	–	1

Van Rooy (1980) demonstrated that rainfall over a large part of southern Africa, including the whole of the southern Cape from Mossel Bay to East London, was extremely low for the five-year period July 1944 to June 1949 (Fig. 2). The longterm record of rainfall at Bloukransbos supports this finding (Fig. 3). Mean annual rainfall at the station for the 90-year period 1890 to 1979 was 9 821 mm. The three lowest values occurred during 1949 (5 589 mm), 1946 (6 871 mm) and 1945 (7 101 mm). Only two other years (1969 and 1927) had lower totals than that for 1944 (7 266 mm). The period 1895 – 1901 also appears to have been relatively dry, but for four of these years the record for one month is missing. During other periods rainfall was generally considerably higher. It exceeded 12 000 mm on seven occasions and 11 000 mm on 16 others.

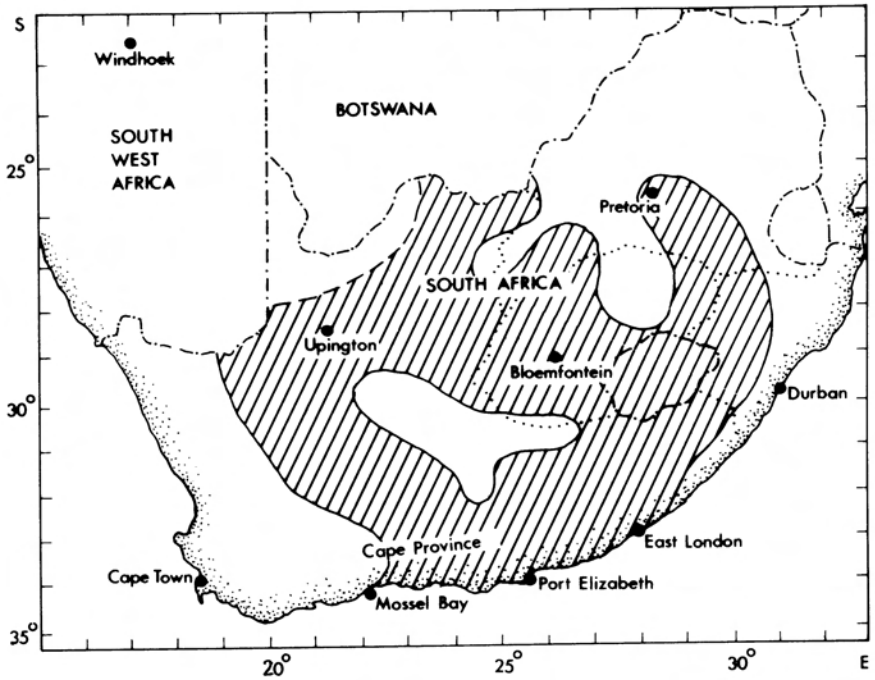


Fig. 2. The area of South Africa having extremely low rainfall during the five-year period July 1944 to June 1949 (modified from Van Rooy, 1980).

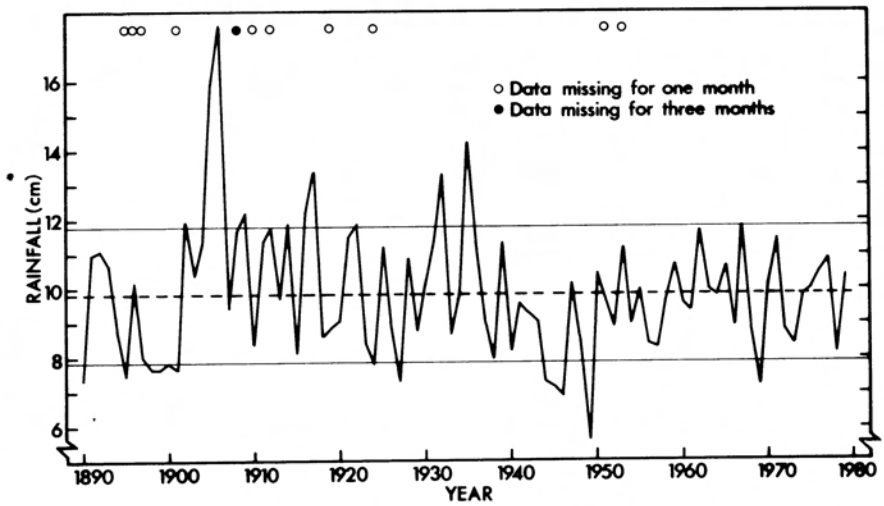


Fig. 3. Trends in the annual rainfall at Bloukransbos, 1890-1979. Horizontal lines indicate the mean and one standard deviation above and below the mean.

Discussion

Liversidge (1966) considered disease, poaching and predation as possible reasons for the abrupt decrease in numbers of blue duiker in the forests of the southern Cape during the late 1940's. Regarding disease he believed that an epidemic would have been required to bring about the widespread and rapid population reduction, but none of the local residents that he interviewed had observed the carcass of a blue duiker. However, Thesen (1959) reported that one reliable authority had found numbers of uneaten carcasses of blue duiker in the forest. The carcasses were disfigured, especially about the face and eyes, a condition which apparently caused blindness.

Liversidge (1966) observed that blue duiker are easily shot, snared, and killed by dogs. Their susceptibility to being caught in snares on account of using regular trails has been noted by other authors (Maberly 1960; Kenmuir & Williams 1975). Liversidge (1966) was uncertain as to the role of hunting on the population decrease during the late 1940's, but believed that hunting had been responsible subsequently for maintaining the population at a low level. Skinner *et al.* (1977) listed hunting and poaching as reasons for a decrease in numbers of blue duiker in the Republic of South Africa.

Thesen (1959), Liversidge (1966) and Skead (1980) all quote sources attributing the decrease in the numbers of blue duiker to an increased abundance of caracal during the late 1940's. Liversidge (1966) reported that one man trapped five caracal near his poultry house within three months.

It is noteworthy that the decrease in numbers of blue duiker during the late 1940's (Liversidge 1966) coincided with exceptionally dry weather (Fig. 3). The widespread nature of the drought (Van Rooy 1980; Fig. 2) may have promoted an influx of caracal to the forests of the southern Cape as a result of prey becoming less abundant in neighbouring habitats. In the Cape Province caracal have been recorded from all major vegetation types but appear to be most abundant in lowland and mountain fynbos, Karoo and succulent Karoo vegetation and the mixed thornveld/grassland regions of the eastern Cape (Stuart 1981). Pringle & Pringle (1979) reported that caracal in the eastern Cape feed mainly on hyraxes *Procavia capensis*, but that when hyraxes become less abundant they adapt by preying on domestic stock. They further observed that from 1965 there was an increase in numbers of caracal in the eastern Cape, caracal spreading to areas where they previously had not been encountered. Skead (1980) also commented on the tendency of caracal to move to different areas: "Sheep farmers in the Eastern Cape find that it [caracal] suddenly appears in an area after an absence of many years, attacks stock for a year or so unless hunted, and then disappears as suddenly as it had come." The prolonged period of relatively dry weather in the Tsitsikamma region may have led to a decrease in cover available to blue duiker, thus enhancing their susceptibility to predation by caracal.

It is possible that food may have become limiting in the southern Cape forests during the late 1940's on account of the poor rainfall. A population crash of nyala *Tragelaphus scriptus* and mortality of red duiker *Cephalophus natalensis* in the Ndumu Game Reserve, Natal, in October 1970 followed overpopulation and a period of unusually low rainfall, during which vegeta-

tion had poor nutritional value and there was a gradual deterioration in condition of nyala (Keep 1973).

Populations of mammalian herbivores are capable of massive eruptions when an agent of mortality (predation, poaching, culling, disease) is withdrawn, and the speed of eruption is especially fast for small animals (Caughley 1970, 1983). However, numbers of blue duiker in the forests of the southern Cape remained at a depressed level throughout the 1950's and 1960's (Liversidge 1966; Dearlove 1974; Table 1) in spite of caracal becoming less numerous. During a two-year period in the mid 1960's not one report of caracal was received (Liversidge 1966). We conclude, as did Liversidge (1966), that hunting and poaching were the main reasons for the lack of any sign of recovery by the blue duiker population prior to the 1970's. This is borne out by the fact that, once poaching was successfully controlled in the TNP's, blue duiker and other antelope increased noticeably in numbers from the mid 1970's (Table 1). A number of young blue duiker were seen in the forests of the TNP's during the early 1980's (Crawford 1984), including a small, solitary animal probably not more than a few days old that allowed approach to within three metres and photography before moving from its lying position (Crawford *pers. obs.*). It is believed that such young animals would fall easy prey to hunters using packs of dogs.

The extent of the recovery of the blue duiker population since the mid 1970's is difficult to quantify because of an absence of adequate assessments in earlier years. However, two reasons lead us to believe that the recovery has been substantial. During two years in the TNP's Liversidge (1966) saw two blue duiker and received reports of only two others. In an equivalent period in the early 1980's one of us (RJMC) sighted blue duiker on 251 occasions and obtained reports of a further 400 sightings. At least 49 different animals are believed to have been involved. By virtue of his interests as an ornithologist (*e.g.* Skead & Liversidge 1967) and duties as nature conservator of the TNP's, Liversidge is likely to have spent a considerable amount of time in the forests of the TNP's. The number of observers may have been greater during the 1980's, the collection of information more systematic and blue duiker may have tamed following proclamation of the TNP's, but the discrepancy in number of sightings (651 compared with four) is remarkable. Secondly, a game drive in the vicinity of the larger of the two dams near the Storms River Mouth rest camp in 1975 resulted in only one blue duiker being caught or sighted. Between 1980 and 1982 at least three blue duiker, and possibly as many as six, lived in the immediate vicinity of this dam (Table 2).

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