An annotated check list of the land mammal fauna of the West Coast National Park

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Some 4 000 Barn Owl pellets with small mammal remains have been collected over a period of nine years from two locations at the south end of the Langebaan lagoon. Two small samples of bones from archaeological sites on the Churchhaven peninsula provide evidence for past mammal occurrences. The remains of small mammals from the owl pellet collections provide an initial list of 18 species that occur within theWest Coast National Park. Subsequent conventional censusing by means of trapping and observational techniques to assess the small and large mammal species diversity of the area were conducted during 1989. This study documents the definite occurrence of 63 mammal species in the park, seven of which are exotics. The presence of a further five species requires confirmation. Interesting insight is gained into how direct censusing and owl pellet analyses augment each other in establishing the presence of small mammal taxa of an area.

Key words: archaeological sites, Barn Owl, *Tyto alba affinis*, census, mammals, West Coast National Park.

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Introduction

Little has been published on the distribution of mammals in the southwestern coastal region of the Cape Province. Shortridge (1942) described the results of an expedition to the area between Lambert's Bay and Calvinia and as far south as Citrusdal; Stuart, Palmer & Munnik (1978) included Rocher Pan (32° 42'S; 18° 14'E) in their preliminary survey of Cape provincial nature reserves. Grindley, Siegfried & Vernon (1973) recorded the findings of an analysis of owl pellets collected during 1955 within the confines of the present park. Some of the published identifications in their sample are doubtful, given the ranges of the species concerned, but since the samples were not retained (C.J. Vernon, *in litt.* 1977) it was not possible to re-examine them. In view of the paucity of information from the area and of the fact that the West Coast National Park (WCNP) was recently proclaimed, it seems useful to place on record information gained from subsequent owl pellet analyses, augmented by direct censusing of the mammals from the area now covered by the park.

The WCNP (centred at 33° 10'S; 18° 05'E), is situated about 100 km north of Cape

Town, and was proclaimed on 30 August 1985. The surface area of the WCNP in 1989 was 18 700 ha with the core of the park 5 700 ha of the Langebaan lagoon including the intertidal and Admiralty zones, and four small islands (Schaapen, Malgas, Marcus and Jutten). The area under the sole jurisdiction of the National Parks Board has recently been increased by the acquisition of the farms Geelbek, Bottelary, Schryvershoek, Flamingo Farms, a section of Langefontein, Abrahams Kraal, Wilde Varkens Vallei and the sand dune area of De Hoek, Yzerfontein and Papenkuilsfontein as far south as Yzerfontein (Fig. 1). The conservation of the Postberg Nature Reserve (PNR) (1 851 ha) has been negotiated by contractual agreement between the National Parks Board and the landowners. Although the Donkergat military area at the northern extreme of the peninsula is not part of this contractual agreement, it is managed as a conservation area by the South African Defence Force.

The area receives about 250 mm rainfall per annum, mainly during winter. Topographically the park consists of low granite hills interspersed with sandy flats, the latter with a few fallow fields. Vegetation is West Coast Strandveld (Acocks 1975; Boucher & Jarman 1977; McDonald & Nel 1986). Of particular importance are the extensive salt marshes concentrated at the south end of the lagoon, where the blue-green salt-marsh succulents and dense stands of bullrushes, reeds and fresh-water bog vegetation along the verges of the tidal mud flats provide a habitat for some mammal species.

Material and methods

Pellets cast by African barn owls *Tyto alba affinis* have been collected from the farm Geelbek (33° 12'S; 18° 08'E) at the southern end of the Langebaan lagoon. The first collections (in December 1979, March 1980 and September 1983) were made in thebase of grain silos near the main farmstead. This site was subsequently abandoned by the owls, possibly in favour of a derelict house about 1,5 km northeast of the original site where another roost was located. Collections at this site were made in August 1984 and September 1985, and, thereafter, regular monthly collections as part of another project from November 1985 to March 1988, when the house was demolished. Some 1 000 pellets have been processed and the mammalian contents identified. The likelihood that such a derived species list is reasonably comprehensive (at least in the size range of Barn Owl prey which is up to about 160 g and includes juvenile Cape molerats), was tested by conducting conventional surveys. Bird remains occurred in a large number of the pellets, either alone or with mammals, and frog remains were not infrequent; neither of these categories has yet been identified.

In addition, two small samples of bones from archaeological excavations on the Langebaan peninsula were examined. One sample came from a seventeenth-eighteenth century building on the PNR (33° 07'S; 18° 00'E) (Schrire 1987); the other was recovered from a shell midden approximately 1 500 years old at Stofbergsfontein (33° 10'S; 18° 04'E) (Robertshaw 1978). Further information concerning the mammalian fauna of the Saldanha area during the recent past was obtained from historical records (Skead 1980) and bones (ca. 800 BP) recovered from excavations at Kasteelberg (32° 48'S; 17° 56'E) on the Vredenburg peninsula some 30 km north of the WCNP (Klein & Cruz-Uribe 1989).

In 1989 small mammals were censused using conventional collecting techniques (i.e. livetrapping, pitfalls, mistnetting and hunting) during regular visits focusing on other research, as well as by two concerted collecting endeavours from 18-25 October and from 20-31 December. In May 1989 a helicopter was used for an aerial census of large animals within the West Coast National Park. The area was divided into sectors and flown in strips, while counting animals on either side within 150 m of the line of flight. Average flying speed and height above ground were 95 km/h and 30 m respectively. Records obtained are supplemented by sightings and records obtained while focusing on another project, including a night count from a vehicle.

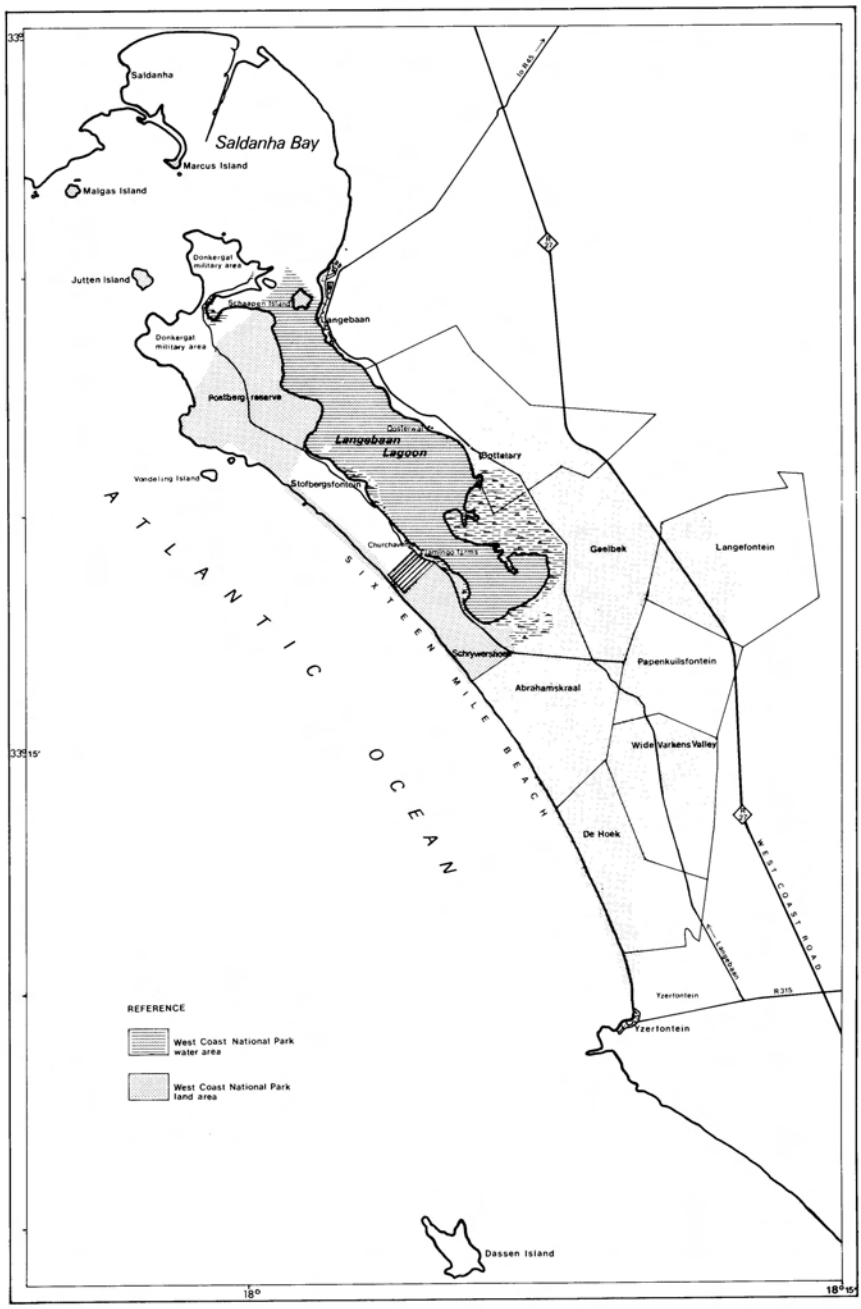

Fig. 1. Situation of the West Coast National Park and localities mentioned in text

Voucher specimens of owl pellet analyses were deposited in the archaeological collection of the South African Museum (SAM), whereas voucher specimens obtained by conventional survey work have been deposited in the mammal collection of the Transvaal Museum (TM). The total number of specimens of each species present in the owl pellets has not yet been determined and is therefore not presented. Taxonomic arrangement and use of colloquial names follow Meester, Rautenbach, Dippenaar & Baker (1986).

Results

Table 1 lists the trap successes achieved at various localities during the three trapping sessions of 1989. Our data do not allow analysis of seasonal population fluctuations. Even accepting the fact that *Otomys* spp. are notoriously trap-shy, it is evident that *Rhabdomys pumilio* is by far the most common rodent, with a definite predilection for undisturbed Strandveld which offers suitable cover. *Myosorex varius* is particularly common in the freshwater marshes at Bottelary, but it has also been recorded at lower population densities in Strandveld and on the slopes of Konstabelkop. Judging by the low trap success for *Tatera afra* relative to the number of fresh burrows encountered, this species may also be trap-shy. The poor trap success for *Gerbillurus paeba* cannot be explained as abundant suitable habitat is available.

Table 1
Percentage trap success achieved in trapping small terrestrial mammals at various localities during three visits to the WCNP.

Date	Locality	TN	TS	Taxa and no. of specimens recorded
Feb 1989	PNR-Konstabelkop	200	4.5%	2 *Rhabdomys*; 2 *Mus*; 5 *Myosorex*
Oct 1989	PNR-Strandveld	500	4.6%	20 *Rhabdomys*; 3 *Otomys*
	PNR-Old fields	100	1.0%	1 *Dendromus*
	PNR-Konstabelkop	300	3.7%	6 *Rhabdomys*; 5 *Myosorex*
	Bottelary-Marsh	200	18.0%	36 *Myosorex*
	Bottelary-Marsh edge	200	11.5%	7 *Myosorex*; 3 *Otomys*; 13 *Rhabdomys*
Dec 1989	Geelbek-Strandveld	200	4.5%	4 *Gerbillurus*; 5 *Rhabdomys*
	Geelbek-Old fields	200	0.5%	1 *Tatera*
	PNR-Coastal dunes	100	3.0%	3 *Rhabdomys*
	PNR-Old fields	200	2.0%	1 *Tatera*; 3 *Rhabdomys*

TN = Trapnights; TS = Trap success; PNR = Postberg Nature Reserve;
WCNP = West Coast National Park

Mistnetting with macronets resulted in exceptionally poor returns, with only one specimen netted. This can in part be ascribed to low population numbers as well as to cold and windy weather conditions prevailing during netting efforts.

Table 2 summarises the mammal species-richness recorded from the WCNP, and indicates the techniques by which individual occurrences have been established. An annotated list of the species found to occur in the WCNP follows, including taxa whose occurrence is likely but as yet unconfirmed.

Table 2

List of land mammal species recorded for the West Coast National Park. The first column indicates those species recorded from owl pellet analyses, the second those from direct censusing techniques, the third identifies past occurrences based on historical and archaeological records, accepted occurrence based on sight records and/or relevant literature records are given in the fourth column, the fifth identifies those species that can reasonably be expected to occur based on indirect evidence and/or overall distribution, and the sixth denotes our view whether species are exotic (X) or natural (N) to the WCNP

Species	Owls	Direct Census	Hist./ Arch.	Sight/ Lit.	Expected	Exotic/ Natural
Myosorex varius	#	#				N
Crocidura cyanea		#				N
Suncus varilla	#	#				N
Chrysochloris asiatica	#					N
Eremitalpa granti	#					N
Nycteris thebaica		#				N
Rhinolophus clivosus		#				N
Rhinolophus capensis		#				N
Eptesicus hottentotus	#					N
Eptesicus capensis		#				N
Tadarida aegyptiaca		#				N
Papio ursinus					#	N
Otocyon megalotis				#		N
Vulpes chama				#		N
Canis mesomelas				#		N
Mellivora capensis				#		N
Ictonyx striatus				#		N
Genetta genetta				#		N
Genetta tigrina		#		#		N
Cynictis penicillata				#		N
Galerella pulverulenta				#		N
Atilax paludinosus				#		N
Proteles cristatus					#	N
Hyaena brunnea					#	N
Crocuta crocuta			#			N
Panthera pardus			#			N
Panthera leo			#			N
Felis caracal				#		N
Felis nigripes					#	N
Felis lybica				#		N
Loxodonta africana			#			N
Diceros bicornis			#			N
Equus burchellii				#		X
Procavia capensis				#		N
Orycteropus afer				#		N
Connochaetes gnou				#		X
Connochaetes taurinus				#		X
Alcelaphus buselaphus			#			N
Damaliscus d. dorcas				#		X
Sylvicapra grimmia				#		N
Antidorcas marsupialis				#		X
Raphicerus campestris				#		N

Table 2 Continued

Species	Owls	Direct Census	Hist./ Arch.	Sight/ Lit.	Expected	Exotic/ Natural
Raphicerus melanotis				#		N
Pelea capreolus			#	#		N
Oryx gazella				#		N
Tragelaphus strepsiceros				#		X
Taurotragus oryx				#		N
Hystrix africaeaustralis		#				N
Bathyergus suillus		#		#		N
Cryptomys hottentotus	#	#				N
Georychus capensis	#					N
Parotomys brantsii				?#		?N
Otomys laminatus				?#		?N
Otomys saundersiae				?#		N
Otomys irroratus	#	#				N
Otomys unisulcatus	#	#				N
Gerbillurus paeba	#	#				N
Tatera afra	#	#				N
Dendromus melanotis	#	#				N
Dendromus mesomelas	#					N
Steatomys krebsii	#					N
Rhabdomys pumilio	#	#				N
Mus musculus	#					X
Mus minutoides	#	#				N
Aethomys namaquensis				?#		?N
Rattus rattus					#	X
Lepus capensis		#				N
Elephantulus edwardii		#	#			N

Order Insectivora

Family Soricidae

Myosorex varius (Smuts, 1832) Forest shrew

It is common throughout the park, particularly in moist areas. Owl pellets containing this species were common, being represented in all the Geelbek collections. Grindley *et al.* (1973) lists *M. cafer* as a WCNP resident, but since this species is known only from the eastern parts of southern Africa (Meester *et al.* 1986; Smithers 1983) it is very likely that the specimens should be referred to *M. varius*. Live specimens have been collected from the slopes of Konstabelkop to the freshwater marshes at Geelbek. Although the taxonomy of this genus is more complex than would appear from the literature (*unpubl. data*), the identity of specimens from the WCNP has been verified by karyotypic analyses.
Material examined: 17 (TM); owl pellets (SAM).

Crocidura cyanea (Duvernoy, 1838) Reddish-grey musk shrew

Remains of two individuals were recovered which are referable to *Crocidura* Wagler, 1832. On the basis of size and distribution these would be *C.c. cyanea* (Duvernoy, 1838), but more specimens are preferable for the identification to be confirmed.
Material examined: owl pellets (SAM).

Suncus varilla (Thomas, 1895) Lesser dwarf shrew

The regurgitated skulls of this small shrew are assigned to *S. v. tulbaghensis* Roberts, 1946, initially described from Tulbagh and later recorded from Eendekuil (Meester *et al.* 1986), and recently also collected at Port Nolloth and Brand se Baai (unpublished records). The species was seldom recorded in autumn and winter samples. Grindley *et al.* (1973) list *S. lixus* but since this species does not occur south of the Transvaal (Smithers 1983) this record is rejected. Their specimens were almost certainly misidentified *S. varilla*.
Material examines: 3 (TM); owl pellets (SAM).

Family Chrysochloridae

Chrysochloris asiatica (Linnaeus, 1758) Cape golden mole

This western Cape endemic occurred in pellets between August 1986 and January 1987, and again in September 1987. It was also represented in the earlier collections which indicates that it occurs regularly, although it may only be taken by barn owls at certain times of the year.
Material examined: owl pellets (SAM).

Eremitalpa granti (Broom, 1907) Grant's golden mole

St Helena Bay has been cited (Meester *et al.* 1986; Smithers 1983) as the southernmost limit of this species, with *E. granti granti* (Broom, 1907) being the southern subspecies. The present record from Geelbek therefore constitutes a slight southward extension of the recorded range of the species. As for *C. asiatica* this species appears to be taken predominantly during the spring months.
Material examined: owl pellets (SAM).

Order Chiroptera

Family Nycteridae

Nycteris thebaica E. Geoffroy, 1813 Egyptian slit-faced bat

A single specimen was collected on Stofbergsfontein during December 1989 while it was nightroosting. This and the next species are dependent on cool and moist caves and cave-like structures as daytime roosts.
Material examined: 1 (TM).

Family Rhinolophidae

Rhinolophus clivosus Cretzschmar, 1828 Geoffroy's horseshoe bat

Two specimens were collected by day in October 1989. They were roosting in the farmstead at Bottelary.
Material examined: 2 (TM).

Rhinolophus capensis Lichtenstein, 1823 Cape horseshoe bat

One specimen was collected where it roosted together with the two *R. clivosus* mentioned above. A second specimen was netted after dark over a water trough on the PNR during December 1989.
Material examined: 2 (TM).

Family Vespertilionidae

Eptesicus hottentotus (A. Smith, 1833) Long-tailed serotine bat

On the basis of size and distribution these owl pellet specimens are assigned to *E. h. hottentotus* (A. Smith, 1833) (Rautenbach, Schlitter & Braack 1984). It was found

in owl pellet collections from December 1985, January 1986 and March - April 1987, and earlier collections.
Material examined: owl pellets (SAM).

Eptesicus capensis (A. Smith, 1829) Cape serotine bat

A single immature individual was collected where it roosted in the Geelbek homestead.
Material examined: 1 (TM).

Family Molossidae

Tadarida aegyptiaca (E. Geoffroy, 1818) Egyptian free-tailed bat

Two individuals were collected from a resident colony at Geelbek.
Material examined: 2 (TM).

Order Primates

Family Cercopithecidae

Papio ursinus (Kerr, 1792) Chacma baboon

No historical or recent records of occurrence from the WCNP could be traced. However, since the WCNP falls within its recorded range (Smithers 1983), and the species has a wide habitat tolerance, it appears very likely that the chacma baboon occurred here during historical times. Skead (1980) was unable to trace any records of its former occurrence in the Saldanha area, but presented many records of its occurrence in surrounding districts from Cape Town to the mountain ranges west of the West Coast National Park. Neither is it represented in the Kasteelberg samples (Klein & Cruz-Uribe 1989). However, considering the intensity of agriculture in the area referred to above, it is still possible that baboons occurred previously but were extirpated at an early stage.

Order Carnivora

Family Canidae

Otocyon megalotis (Desmarest, 1822) Bat-eared fox

The presence of the bat-eared fox has been recorded by McDonald & Nel (1986) and Lourens & Nel (1990) from the PNR, and subsequent personal observations. It appears to be a fairly common canid in the WCNP, with a preference for open areas with short grass and much bare ground such as old fields. Groups were observed to be active both by day and night.

Vulpes chama (A. Smith, 1833) Cape fox

A fairly secretive small carnivore, but it has occasionally been observed in the WCNP, both on old fields and in natural vegetation (J.A.J. Nel *pers. comm.*). One was observed at PNR during the aerial census. It is an opportunistic feeder with an apparent preference for small vertebrates (Smithers 1983).

Canis mesomelas Schreber, 1775 Black-backed jackal

Although the black-backed jackal is occasionally seen in the WCNP, it appears to be an unobtrusive and rare resident (A. Spies and S. Lourens *pers. comm.*).

Family Mustelidae

Mellivora capensis (Schreber, 1776) Honey badger

Mr. C.H. Hutchinson, owner of the farm Soutpan adjoining the WCNP, reported the sighting of three honey badgers on his property during the summer of 1989.

Ictonyx striatus (Perry, 1810) Striped polecat

A resident of the reserve, but of uncertain status because of its retiring habits. One was observed at night at PNR during a night count in October 1988. No less than three polecats have been trapped in the Port Nolloth district in traps set for the Namaqua dune molerat *Bathyergus janetta*, suggesting that this small and particularly aggressive mustelid either hunts these large fossorial rodents or at least takes refuge in their tunnel systems.

Family Viverridae

Genetta genetta (Linnaeus, 1758) Small-spotted genet

This genet has been seen at PNR and Marcus Island where it presumably preys on the chicks of nesting seabirds. A roadkill seven km north of Langebaan was positively identified but was not fit for preservation as voucher specimen.

Genetta tigrina (Schreber, 1776) Large-spotted genet

The presence of the large-spotted genet in the WCNP is based on sight records. A specimen from Marcus Island in the South African Museum collection has been identified as belonging to this species but was not available for confirmation. Verification will, however, be necessary in view of the extensive sympatry of these two closely related and similar-looking genets, as well as the fact that the WCNP is on the north-western edge of this species' range.

Cynictis penicillata (G. Cuvier, 1829) Yellow mongoose

One of the more common diurnal small carnivores of the park. The yellow mongoose occurs in most areas, although McDonald & Nel (1986) state that it avoids areas of thick bush.

Galerella pulverulenta (Wagner, 1839) Small grey mongoose

The most common small carnivore in the park. McDonald & Nel (1986) found it to have a wide habitat tolerance, occurring in densely vegetated as well as open country. Material examined: 1 (TM).

Atilax paludinosus (G. Cuvier, 1829) Water mongoose

McDonald & Nel (1986) found this species mostly in close association with water, where it capitalises on the cover afforded by lush semi-aquatic vegetation such as at Bottelary, and where it preys mostly on crustaceans. However, individuals are on occasion seen in other habitats away from their preferred semi-aquatic environment.

Family Protelidae

Proteles cristatus (Sparrman, 1783) Aardwolf

Although the park falls within the recorded range of the aardwolf (Smithers 1983), its presence in the WCNP requires confirmation. Individuals have been observed at Piketberg (J.A.J. Nel *pers. comm.*) and Pakhuis Pass (Rautenbach & Nel 1980), and there is one specimen in the South African Museum collection that was collected in the Hopefield district 25 km east of the West Coast National Park.

Family Hyaenidae

Hyaena brunnea Thunberg, 1820 Brown hyaena

Skead (1980) could find little irrefutable evidence of its historical occurrence in the area of the present-day WCNP; neither was it recorded from Kasteelberg

(Klein & Cruz-Uribe 1989). It is to be expected, however, that it would have occurred in the area at one time, given the breadth of its previous distributional range and known habitat tolerance.

Crocuta crocuta (Erxleben, 1777) Spotted hyaena

Skead (1980) presents evidence that the spotted hyaena occurred on the Cape peninsula as well as in Namaqualand, and therefore presumably also along the coast to at least the Saldanha area.

Family Felidae

Panthera pardus (Linnaeus, 1758) Leopard

Skead (1980) provides evidence to confirm the historical occurrence of leopard in the Saldanha area. Remains have also been recovered from Kasteelberg (Klein & Cruz-Uribe 1989).

Panthera leo (Linnaeus, 1758) Lion

It occurred in the Saldanha area prior to the advent of civilisation (Skead 1980).

Felis caracal Schreber, 1776 Caracal

This secretive carnivore is presently the largest predator in the West Coast National Park. Apart from taking natural prey such as dassies, it is reputed by the PNR owners to prey on springbuck introduced to the reserve.

Felis nigripes Burchell, 1823 Black-footed cat

The former warden (A. Engelbrecht *pers. comm.*) has observed individuals fitting the detailed description of the black-footed cat. Its occurrence is possible since the WCNP is on the brink of the species' range. However, considering the possibility of this species' interbreeding with domestic cats *Felis catus* and such hybrid offspring being mistaken for *F. nigripes,* it is preferable to collect a voucher specimen in order to confirm this record with results from cytotaxonomic procedures.

Felis lybica Forster, 1780 African wild cat

The African wild cat is not uncommon in the park. Throughout its range this species interbreeds with domestic cats, consequently it is of no avail to speculate on the integrity of the WCNP genepool.

Order Proboscidea

Family Elephantidae

Loxodonta africana (Blumenbach, 1797) Elephant

An elephant molar found at the Oude Post archaeological site has been examined, confirming claims of the earlier occurrence of herds of up to 300 elephant during the 1730s (Skead 1980).

Order Perissodactyla

Family Rhinocerotidae

Diceros bicornis (Linnaeus, 1758) Black rhinoceros

Skead (1980) provides evidence of the historical occurrence of black rhinoceros in the Saldanha district, and also argues that white rhinoceros *Ceratotherium simum* never occurred this far south. This is supported by the fact that only *D. bicornis* was recorded from Kasteelberg (Klein & Cruz-Uribe. 1989).

Family Equidae

Equus burchellii (Gray, 1824) Burchell's zebra

A few individuals were introduced to the PNR and Abrahams Kraal before these areas were part of the West Coast National Park. The area is far outside the natural range or preferred habitat of the species (Smithers 1983).

Order Hyracoidea

Family Procaviidae

Procavia capensis (Pallas, 1766) Rock dassie

Although not particularly common, dassies and their droppings and distinct urine markings on selected rock perches are encountered on Konstabelkop and the rocky outcrops at Kreeftebaai.
Material examined : 1 (TM).

Order Tubulidentata

Family Orycteropodidae

Orycteropus afer (Pallas, 1766) Aardvark

An individual was seen at night on the Postberg Nature Reserve.

Order Artiodactyla

Family Bovidae

Connochaetes gnou (Zimmermann, 1780) Black wildebeest

Only two black wildebeest were present in May 1989. Both were at PNR, where they were introduced far outside the natural range of the species. One is a solitary individual, whereas the other associates with a herd of blue wildebeest.

Connochaetes taurinus (Burchell, 1823) Blue wildebeest

A herd of blue wildebeest was introduced to PNR in spite of the fact that this reserve falls outside the natural range of the species.

Alcelaphus buselaphus (Pallas, 1766) Red hartebeest

Although this species does not occur in the WCNP at present, its re-introduction could be considered on the basis of its occurrence during historical times (see evidence provided by Skead, 1980). Remains of this species have also been recovered from Kasteelberg (Klein & Cruz-Uribe 1989).

Damaliscus dorcas dorcas (Pallas, 1766) Bontebok

This species was introduced to PNR although there is no evidence to indicate that it occurred in the region during historical time. Like the majority of introduced large herbivores, the bontebok herds at PNR show a predilection for the old lands. There were 32 animals at PNR in May 1989.

Sylvicapra grimmia (Linnaeus, 1858) Common duiker

The common duiker still occurs naturally throughout the WCNP. A total of 72 common duiker were counted during the aerial census.

Antidorcas marsupialis (Zimmermann, 1780) Springbok

Springbok is at present the most abundant of the antelope species occurring in the

WCNP. It was introduced to PNR and Abrahams Kraal. No records of its former occurrence in this area could be traced. There were 140 springbok recorded during the aerial census.

Raphicerus campestris (Thunberg, 1811) Steenbok

Steenbok still occur naturally, and in fair number, throughout the park. This species was the most abundant of the small antelope recorded in May 1989 when 110 were counted.

Raphicerus melanotis (Thunberg, 1811) Grysbok

Grysbok are still to be found, albeit in low numbers, in the WCNP, which falls within its natural range. Only 12 grysbok were counted during the aerial census, making it the rarest of the small solitary antelope. This census technique tends to underestimate grysbok numbers more than the other species.

Pelea capreolus (Forster, 1790) Grey rhebok

According to G. Thomsett (*pers. comm.*) grey rhebok still occur naturally in the WCNP. None were counted during the aerial census and this claim requires confirmation. Whereas this species does occur in the southwest Cape, the few isolated granite hills in the WCNP hardly offer suitable or sufficient montane habitat for grey rhebuck, and raises the question how this species could have dispersed from the mountain ranges in the east. However, Skead (1980) presents historical evidence of its occurrence at Saldanha. This species thus qualifies as a good candidate for introduction.

Oryx gazella (Linnaeus, 1758) Gemsbok

A herd of gemsbok was re-introduced to the PNR by the syndicate owners. Skead (1980) presents evidence of its historical occurrence in the Saldanha district.

Tragelaphus strepsiceros (Pallas, 1766) Kudu

A small herd of kudu cows was regularly observed at or near Konstabelkop, while a bull was on occasion seen near Kreeftebaai. Six kudu were counted during the aerial census, but this was an underestimate as there were known to be ca. 13 animals. The kudu has a wide range and habitat tolerance, yet no historical evidence for its natural occurrence in the WCNP area could be traced, neither was it recorded from Kasteelberg (Klein & Cruz-Uribe 1989).

Taurotragus oryx (Pallas, 1766) Eland

The herd on the PNR was re-introduced. There were 74 counted during the aerial census. Skead (1980) cites evidence of its historical occurrence from the Saldanha district, and it was recorded from Kasteelberg (Klein & Cruz-Uribe 1989).

Order Rodentia

Family Hystricidae

Hystrix africaeaustralis Peters, 1852 Porcupine

Quills found on the reserve indicate the presence of this large rodent.

Family Bathyergidae

Bathyergus suillus (Schreber, 1782) Cape dune molerat

Although this large fossorial rodent occasionally ventures on the surface (two specimens were thus caught), its size places it beyond the potential prey spectrum of barn

owls. It is extremely common and occurs throughout the WCNP, but in sandy areas.
Material examined: 11 (TM).

Cryptomys hottentotus (Lesson, 1826) Common molerat

Remains of the common molerat were recovered from Oude Post and this species is recorded by Grindley *et al.* (1973) from Oosterwal but, unexpectedly, it has not been found in the Geelbek sample. Four live specimens were collected on the PNR on the edge of a seasonal pan in hard compacted sand. It has a very wide habitat tolerance and is found from areas of loose or compacted sands to gravel amongst boulders on hill slopes.
Material examined: 4 (TM); owl pellets (SAM).

Georychus capensis (Pallas, 1779) Cape molerat

The Cape molerat is only represented by two immature individuals recovered from owl pellets, one from the 1983 collection and one from January 1987. The latter record indicates that the individual was born in December or January.
Material examined: owl pellets (SAM).

Family Muridae

Parotomys brantsii (A. Smith, 1834) Brant's whistling rat

Brant's whistling rat is recorded for Oosterwal (Grindley *et al.* 1973). Since it is cranially very similar to *Otomys unisulcatus*, and since these two species have not been recorded in the park from the same locality, it is necessary to confirm the presence of *P. brantsii* in the WCNP by means of voucher specimens. Its presence is quite likely, given the fact that it has been recorded in square 3218Cc (Davis 1974), just north of the West Coast National Park.

Otomys laminatus Thomas & Schwann, 1905 Laminate vlei rat

This species is listed for Oosterwal (Grindley *et al.* 1973) but has not been found further south in the WCNP. Apart from a relict population in the Paarl valley (3319Cc) this would be the only record of this species in the western Cape Province. In view of its preference for grassland (Smithers 1983), of which there is little in the area, the identification should be confirmed.

Otomys saundersiae Roberts, 1929 Saunders's vlei rat

It is very difficult to distinguish cranial material of this species from that of *O. irroratus*. It is mainly a matter of size difference and there appears to be an area of overlap in the ranges (*pers. obs.*). At Geelbek there are a few individuals that may belong to *O. saundersiae* but the situation will need confirmation with trapped specimens. *Otomys saundersiae* has been listed from Oosterwal (Grindley *et al.* 1973). Until biochemical and other analyses can be conducted on trapped specimens the presence of this species should be regarded as unconfirmed.
Material examined: owl pellets (SAM).

Otomys irroratus (Brants, 1827) Vlei rat

This is the major mammalian prey species for the Barn Owl at Geelbek and is well represented in all samples. Remains of two very young individuals were recovered, one in December 1986 and the other in July 1987. The former specimen was found in the same pellet as postcranial remains possibly belonging to its mother. This could indicate that it was still nipple-clinging and therefore born ca.

two weeks prior to capture (Smithers 1983). The evidence of both individuals indicates that reproduction takes place in summer and winter, as has been reported for the eastern Cape Province (Perrin 1980). Three specimens were livetrapped within and around the fringes of the freshwater marshes on Geelbek.
Material examined: 3 (TM); owl pellets (SAM).

Otomys unisulcatus F. Cuvier, 1829 — Bush Karoo rat

This species tends to be absent in owl pellets during late summer and autumn. Conceivably, the higher proportions during winter months are related to the fact that breeding has been noted at this time of the year on the Churchhaven peninsula (Vermeulen & Nel 1988). Very young individuals from pellets collected in July and September 1987 support the breeding data of Vermeulen *et al.* 1988. Of the few specimens from Oude Post most were referable to this species, which is also probably represented at Stofbergsfontein. Five specimens were livetrapped on Postberg Nature Reserve.
Material examined: 5 (TM); owl pellets (SAM).

Gerbillurus paeba (A. Smith, 1836) — Hairy-footed gerbil

Material from WCNP appears to be distinct from the nominate race (Schlitter & Rautenbach *unpubl. data*). Remains of this species tend not to occur in pellets during late summer and autumn. Personal observations on the habitat preference of this taxon suggest it has a predilection for loose sand such as that on dunes adjacent to beaches. This species is also recorded from Oosterwal (Grindley *et al.* 1973) and the four trapped specimens were acquired in loose sand on Geelbek.
Material examined: 4 (TM); owl pellets (SAM).

Tatera afra (Gray, 1830) — Cape gerbil

This species appears to be represented in pellets during the same period of the year as *G. paeba,* but the reason for this is not understood. This species comprises 58 % of the mammalian prey at Oosterwal (Grindley *et al.* 1973), a much higher proportion than at Geelbek. The two trapped specimens were acquired from old fields on Bottelary and PNR.
Material examined: 2 (TM); owl pellets (SAM).

Dendromus melanotis A. Smith, 1834 — Grey climbing mouse

From owl pellet remains it appears that this species occurs in much smaller numbers than *D. mesomelas*. Its presence is confirmed by a live-trapped specimen from an old field on PNR.
Material examined: 1 (TM); owl pellets (SAM).

Dendromus mesomelas (Brants, 1827) — Brants's climbing mouse

On the basis of distribution, owl pellet material is assigned to *D. m. mesomelas* (Meester *et al.* 1986), with Langebaan lying at the western extremity of the range (Smithers 1983). This species is well represented and occurs in all Geelbek pellet collections.
Material examined: owl pellets (SAM).

Steatomys krebsii Peters, 1852 — Krebs's fat mouse

The subspecies *S. krebsii pentonyx* (Sclater, 1899) is recognised for our material on the basis of distribution (Meester *et al.* 1986). It was not present in pellets during late

summer and autumn in either 1986 or 1987.
Material examined: owl pellets (SAM).

Rhabdomys pumilio (Sparrman, 1784) Striped mouse

This species is by far the most common rodent in the WCNP and occurred in the majority of Geelbek owl pellet samples, although in smaller numbers that are to be expected of a diurnal species. Relatively high proportions in December 1986 and February/March 1987 suggest there may have been an unusually high number at those times. Two individuals are represented in the Stofbergsfontein sample, and the species is also listed for the Oosterwal sample (Grindley *et al.* 1973). Livetrapping results confirm the presence of this species throughout the park.
Material examined: 10 (TM); owl pellets (SAM).

Mus musculus Linnaeus, 1758 House mouse

The house mouse was represented in two owl pellet samples from the main Geelbek farmstead and by one individual each in the October/November 1986 samples from the abandoned cottage. In the latter case it is to be expected that the species would be less regularly represented since it is closely confined to occupied dwellings or storage barns (Smithers 1983). The species is not represented in the sample for Oude Post, thereby suggesting that its introduction to the region occurred at a later date.
Material examined: owl pellets (SAM).

Mus minutoides A. Smith, 1834 Pygmy mouse

Small numbers of pygmy mice were recorded periodically from owl pellets, with some slight tendency towards the summer months. One individual is also listed for Oosterwal (Grindley *et al.* 1973). The four individuals livetrapped were recorded from the slopes of Konstabelkop.
Material examined: 4 (TM); owl pellets (SAM).

Aethomys namaquensis (A. Smith, 1834) Namaqua rock mouse

Only one individual from an owl pellet is listed for Oosterwal (Grindley *et al.* 1973) but none has been recovered from Geelbek. Extensive trapping in typical habitat on hillsides at PNR has failed to produce any specimens.

Rattus rattus (Linnaeus, 1758) House rat

Although we failed to obtain specimens of the house rat, its presence in the WCNP is a foregone conclusion, especially since Davis (1974) recorded it from the Saldanha area. Considering its confinement to ports, the apparent absence of *R. norvegicus* from the Saldanha and Langebaan townships (Davis 1974) is strange.

Order Lagomorpha
Family Leporidae

Lepus capensis Linnaeus, 1758 Cape hare

The Cape hares on the reserve are remarkably tame and regularly emerge before sunset to graze. Individuals have been encountered throughout the reserve in both natural and disturbed areas.
Material examined: 1 (TM).

Order Macroscelidea
Family Macroscelididae

Elephantulus edwardii (A. Smith, 1839) Cape rock elephant-shrew

One right maxilla from the Oude Post, and one left maxilla from the Stofbergsfontein archaeological sites are probably referable to this species but no remains have come from the owl pellet samples. Trapping on the slopes of Konstabelkop proved this species to be present in large numbers in suitable habitat.
Material examined: 6 (TM).

Discussion

This study unambiguously demonstrated the value of examining owl pellet remains in conjunction with conventional censusing techniques when determining the small mammal species diversity of an area. Of those 27 recorded species with body masses small enough to be within the prey spectrum of barn owls, only 10 were recorded both by means of owl pellet analyses and conventional trapping techniques. The presence of 20 species (16 fall within the prey spectrum of barn owls) was confirmed by means of trapping, mistnetting or drift fence/pitfall combinations, whereas the occurrence of 18 species was established by means of owl pellet analyses. These figures are somewhat distorted as they include six species of bats, which are only rarely preyed upon by owls. However, although barn owls concentrate on terrestrial small mammals, they proved valuable in confirming the presence of the long-tailed serotine bat. The barn owls also proved to be capable of catching both species of golden mole. This is particularly useful in the case of Grant's golden mole which is virtually impossible to trap. Small numbers of diurnal animals are not exceptional in the diet of barn owls, since both the owls and such diurnal prey are at times active outside their normal activity regimes.

Klein & Cruz-Uribe (1987, 1989) have analysed Holocene faunal remains from various archaeological sites along the Cape west coast. At Kasteelberg they found the following species, which do not occur naturally in the area today, to have been present during the period immediately preceding the arrival of Europeans: *Herpestes ichneumon, Panthera pardus, Loxodonta africana, Diceros bicornis, Alcelaphus buselaphus* and *Taurotragus oryx*. In addition, the following species occurred within the last 1 500 years in the Elands Bay area some 80 km north of the WCNP, but are no longer found there: *Atelerix frontalis, Hippopotamus amphibius, Syncerus caffer* and *Potamochoerus porcus*. Conversely, of some significance is our finding that *Mellivora capensis*, which was not present at Kasteelberg more recently than about 800 years ago, now occurs in the West Coast National Park.

Equus burchellii, Connochaetes gnou, C. taurinus, Damaliscus dorcas, Antidorcas marsupialis and *Tragelaphus strepsiceros*, all exotic to the area (Skead 1980; Smithers 1983), were introduced to the PNR by the corporate owners prior to the contractual conservation agreement, whereas *E. burchellii* and *A. marsupialis* have been introduced to Abrahams Kraal. With the exception of the black wildebeest, populations of all the other exotic species are increasing (albeit relying on old fields and occasionally supplementary feeding for their survival). Their presence in the WCNP is contentious in view of the emphasis the National Parks Board places on "natural character" (National Parks Board (1987)) and the policy of maintaining natural structural and species diversity of its parks (Joubert 1986). On the other hand, available evidence of historical occurrences suggest that the re-introduction of *Oryx gazella* and *Taurotragus oryx* onto the PNR was justified, as is the possible re-introduction

of *Alcelaphus buselaphus* and *Pelea capreolus*. Similarly, *Loxodonta africana, Panthera leo* and *Diceros bicornis* occurred during historical time, but it is dubious whether re-introducing some or all of these species would be feasible.

Based on established habitat requirements and natural distributions, some species may have occurred in the area which is today the WCNP, but no archaeological, historical or other verification could be found, viz. *Papio ursinus, Crocuta crocuta, Hyaena brunnea* and *Acinonyx jubatus*. Common species like *Tadarida pumila, Saccostomus campestris, Lepus saxatilis* and *Macroscelides proboscideus* all have wide habitat tolerances and distributional ranges, and could in time be found to occur in the West Coast National Park.

Rautenbach (1978a) mathematically tested the acceptability and credibility of the previously empirically derived biotic zones of southern Africa, and found that a total of six (including three that were formerly regarded as subzones) are viable biogeographic entities of full zonal status. The WCNP falls within the South West Cape biotic zone but, probably due to the isolation of the low granite hills on the reserve, lacks some of its typical montane or rupiculous species, i.e. *Laephotis wintoni, Myotis lesueuri, Sauromys petrophilus, Pelea capreolus, Acomys subspinosus, Myomyscus verreauxi, Graphiurus platyops, G. ocularis, Oreotragus oreotragus* and *Pronolagus rupestris*. The results of this study and that of Rautenbach & Nel (1980) should be considered together to gain a better (and in some cases amended) insight into the mammal diversity of the western regions of the South West Cape biotic zone. The South West Cape is characterised by a depauperate mammal fauna which is probably to be expected in view of a general decline in species-richness from the tropics southward (Rautenbach 1978a, 1978b; Udvardy 1969), and a superimposed east-west decline within South Africa (Nel 1975). It is furthermore our impression that specific densities of small mammals were particularly low with an overall trap percentage of 5,2 %, but this may be the result of seasonal and other cyclic phenomena.

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