

THE SPATIAL ANALYSIS OF ELEPHANT DENSITY AND DISTRIBUTION PATTERNS IN THE KRUGER NATIONAL PARK..... ERROR! BOOKMARK NOT DEFINED.

FIGURE 1: ELEPHANT DISTRIBUTION IN THE AENP IN RELATION TO BROAD SCALE LAND CLASSES. NOTE THAT THE CLASSIFICATION OF THESE HABITATS IS BASED ON THE EXPECTED PRE-EUROPEAN VEGETATION STRUCTURE FOR THE REGION. WATERHOLES ARE SHOWN BUT NOT ALL OF THEE WILL HAVE PERMANENT WATER AVAILABLE TO ELEPHANT.....35

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FIGURE 1: DISTRIBUTION OF ELEPHANT IN THE MARAKELE NATIONAL PARK IN RELATION TO VEGETATION UNITS AND DRAINAGE LINES.....79

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AFRICAN ELEPHANT DISTRIBUTION IN THE ADDO ELEPHANT NATIONAL PARK.

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Since the park was established in 1931 and fenced in 1954 the number of elephant have been increasing at a rate nearing *6% per annum*. In 2003 56 elephant were translocated to the north of the existing elephant camp by herding selected family units across the intervening road and rail line. The figures below do not show these distributions since the elephant have only been present in this area for approximately 1.5 years and their density is currently in the region of 0.44 elephant / km².

Distribution patterns of elephant in the AENP are derived from annual aerial surveys and represent an annual snapshot of potential distribution patterns. It is unlikely that any inferences could be made between consecutive years and hence all the distribution records were amalgamated to present an overall indication of elephant distribution in the park between 1996 and 2004.

The distribution of the elephant is displayed in relation to some of the more permanent waterpoints in the park although water at these sites is not available perennially. The distribution of elephant in the park is influenced by rainfall during which time substantial surface water throughout the park results in the elephant dispersing widely throughout the park habitats.

From the indications in Figure 2 it may be possible to argue that the elephant make infrequent use of the previously cleared or transformed areas (particularly unit 16) where there might be limited forage opportunities.

Figure 1: Elephant distribution in the AENP in relation to broad scale land classes. Note that the classification of these habitats is based on the expected pre-European vegetation structure for the region. Waterholes are shown but not all of these will have permanent water available to elephant.

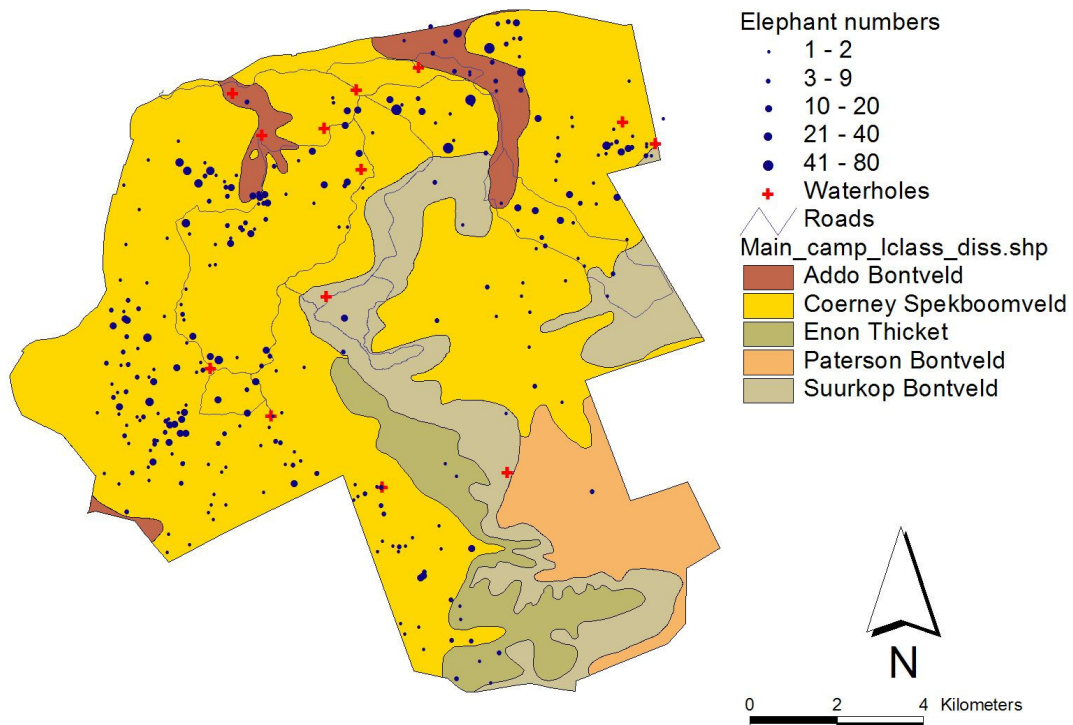


Table 1: Characteristics of the selection units identified for the study area in the Addo Elephant National Park.

Unit	Vegetation type	Management history	Area (ha)
1	Spekboomveld	Incidental botanical reserve, not grazed by elephants since 1954	165
2	Spekboomveld	Incidental botanical reserve, not grazed by elephants since 1954	416
3	Spekboomveld	Botanical reserve, not grazed by elephants since 1954	367
4	Bontveld	Botanical reserve, not grazed by elephants since 1954	49
5	Spekboomveld	Original elephant camp, fenced in 1954; exposed to elephants for the last 42 years	1906
6	Spekboomveld	Overgrazed section of original camp around waterholes; exposed to elephants for the last 42 years	428
7	Spekboomveld	Exposed to elephants for the last 20 years	1362
8	Karoo-Bushveld	Exposed to elephants for the last 20 years	205
9	Spekboomveld	Exposed to elephants for the last 15 years	578
10	“False” Karoo-Bushveld	Cleared in 1950s to provide habitat for springbok; exposed to elephants for the last 15 years	592
11	Spekboomveld	Exposed to elephants for the last 13 years	986
12	Mixed Shrub and Grassveld	Exposed to elephants for the last 13 years	90
13	Bontveld	Exposed to elephants for the last 13 years	328
14	Spekboomveld	Incorporated private land; exposed to elephants for the last 13 years	879
15	Spekboomveld	Incorporated private land; exposed to elephants for the last 6 years	1491
16	Degraded land (originally Spekboomveld?)	Incorporated private land (cleared for agriculture); exposed to elephants for the last 5 years	2187

^a Vegetation types are according to Archibald (1955). South African National Parks provided management history (current to the end of 1996). Note that one botanical reserve has been divided into two units (units 3 and 4) on the basis of vegetation type. The configuration of the units is shown in Fig. 2.

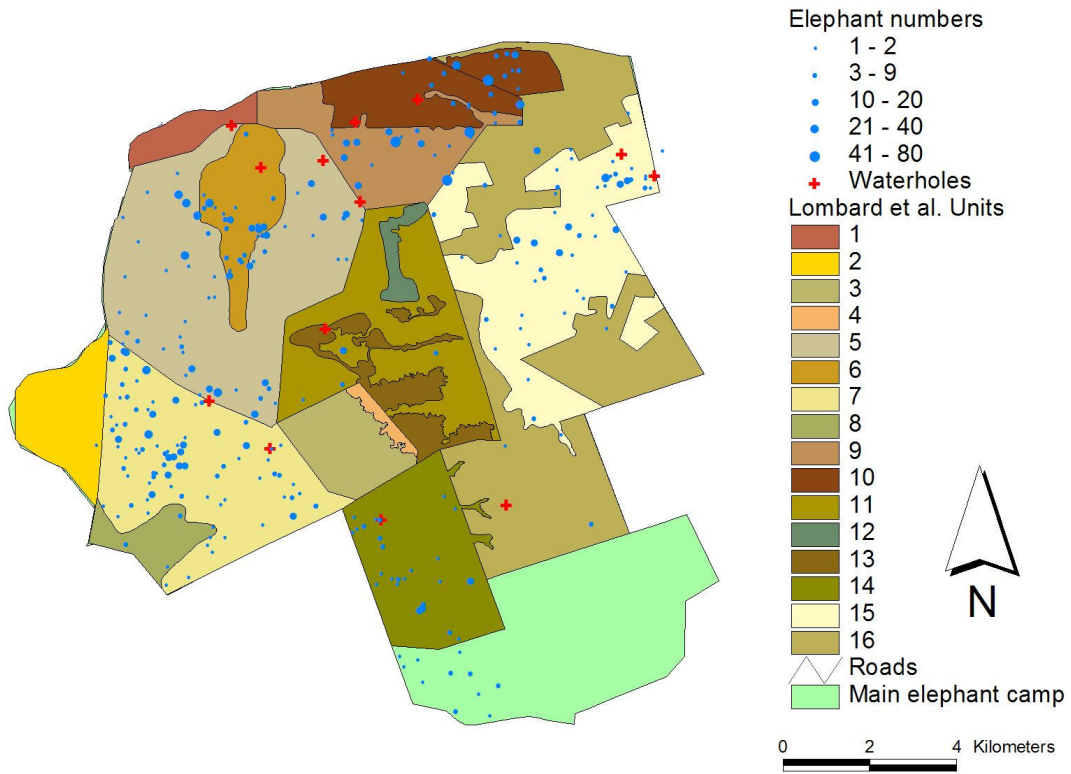


Figure 2: Distribution of elephant within the AENP in relation to vegetation units described by Lombard et al. 2001. The figure should be seen in the context of Table 1 above that describe each of the vegetation units and outlines the length that these units have been under some level of elephant pressure.

DISTRIBUTION OF ELEPHANT IN THE MARAKELE NATIONAL PARK.

The accompanying figures depict the distribution of elephant within the Marakele National Park (MNP). The points are plotted from aerial surveys conducted between 1998 and 2003. Unfortunately no survey was completed in 2004 (Figure 1, 2).

It must be remembered that the points represent a snapshot view of the elephant distribution across the landscape. Although there are additional intensive projects that have been initiated to monitor the impacts of the elephant (see also Bezuidenhout 2004), records of elephant distribution from these is not available.

In general the elephant distribution in the MNP has shifted from south to north over the past 4 years. The elephant were initially confined to the southern sourveld slopes in the Waterberg range pending the consolidation of properties to the north in the low lying areas. After this consolidation was completed and the fences were dropped the elephant moved northwards into the sweeter low lying habitats to the north east. The Matlabas River runs to the southwest of the low lying areas and is a focal point for elephant, particularly bigger bulls.

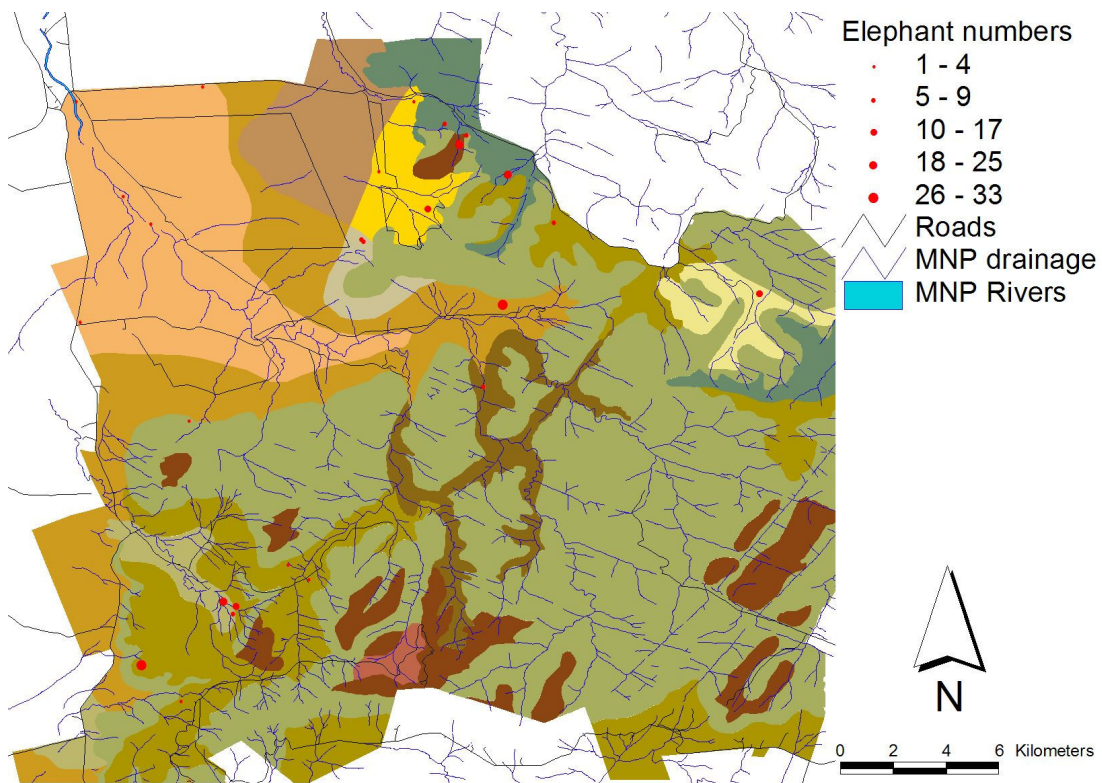
The distribution of elephant may also have been affected in the short term by the bush clearing activities that took place in the contractual area of the park.

Of importance to the management of elephant in the MNP is the future likelihood that the park will be joined with the Welgevonden Private Game Reserve. This property already carries a number of elephant and the nature of the habitats (sour grasslands) suggests that these elephant may migrate to the sweeter areas in the MNP once the fences have been dropped.

Estimated carrying capacities for elephant and other herbivores have been discussed in the management plan for the park (Hall-Martin 2003). Elephant were reintroduced into the park in 1996 (39 animals from the Kruger NP), 1999 (12 animals of Tuli origin) and 2001 (21 animals from the Kruger NP). Additional large bulls have been brought into the park in recent years. The maximum number of elephants within the MNP is placed at 174 individuals in the three primary eco-regions (lowlands – 87, midslopes – 18, uplands – 69). The release of elephant into the park has not been without problems and a number of elephant have broken out of the park on various occasions. At present the numbers of elephant (n=93) exceed the recommended densities for the lowland areas and this problem may be exacerbated should the fence with Welgevonden be dropped soon.

References:

- Bezuidenhout, H. 2004. Report on the impact of elephants on the vegetation of the Zwarthoek section, Marakele National Park. Internal report, Arid Ecosystems Research Unit. SANParks.
- Hall-Martin A.J. 2003. Management and Development Plan for the Marakele National Park. Conservation Services, South African National Parks.



MNP vegetation

-  Low closed grassland - *Fuirena pubescens* and *Aristida junciformis*
-  Low closed shrubland - *Alomarlothii* and *Acacia erubescens*
-  Low closed shrubland - *Acacia erubescens* and *Grewia flava*
-  Low closed woodland - *Acacia mellifera*, and *Grewia flava*
-  Low closed woodland - *Dicrostachys cineria* and *Acacia erubescens*
-  Low closed woodland - Sandy *Terminalia sericea* and *Burkea africana*
-  Low open shrubland - *Protea welwitschii* and *Tristachya leucothrix*
-  Low open woodland - *Protea caffra* and *Rhus dentata*
-  Low open woodland - *Terminalia sericea* and *Combretum zeyheri*
-  Short closed grassland - *Andropogon schirensis* and *Dicoma anomala*
-  Short closed woodland - *Acacia karroo* and *Eragrostis chloromala*
-  Short closed woodland - *Faurea saligna* and *Setaria sphacelata*
-  Short thicket - *Syzigium cordatum* and *Miscanthus junceus*

Figure 1: Distribution of elephant in the Marakele National Park in relation to vegetation units and drainage lines.

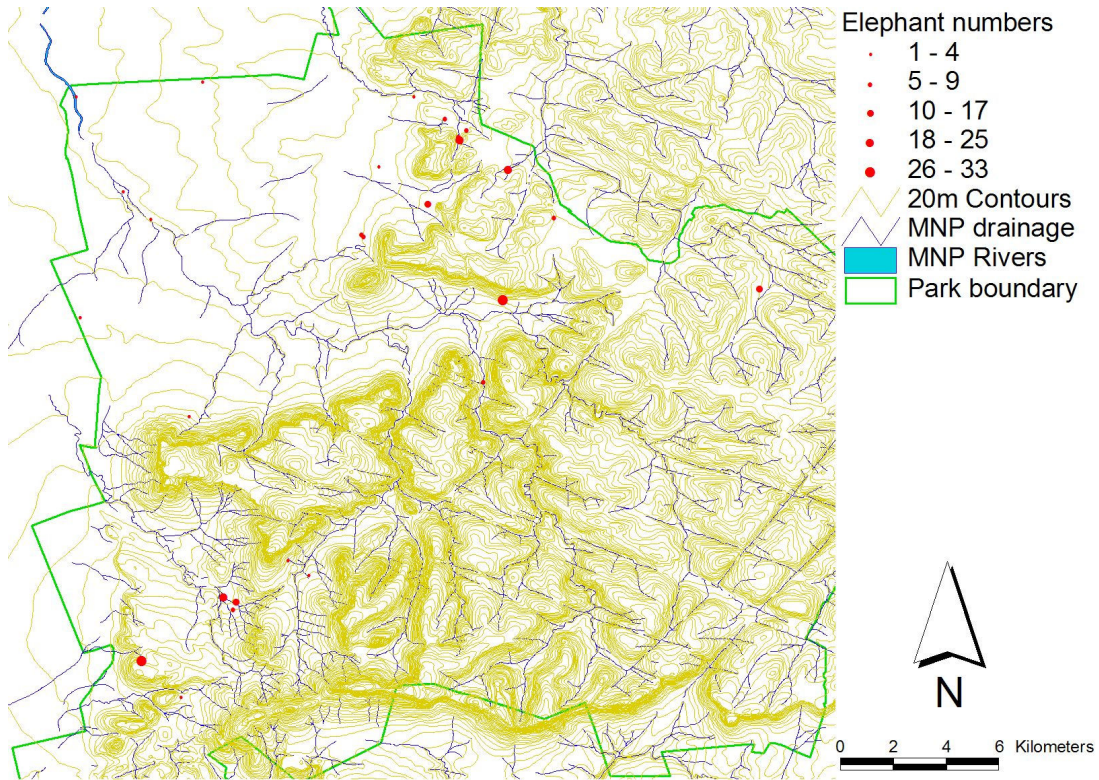


Figure 2: Distribution of elephant in the Marakele NP in relation to topography and drainage lines.