

SHORT NOTE

Utilization of *Aloe littoralis* by herbivores in Etosha National Park

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Etosha National park is aiming to maintain or in special cases increase biotic diversity of the local biota (Anonymous 1985). The major concern relating to plants is the maintenance of alpha heterogeneity as well as the structural dimension of plant communities. To determine the extent of goal attainment monitoring techniques have been developed and applied.

Aloe littoralis is common in SWA/Namibia. In Etosha National Park this species is represented primarily by two large colonies. The first, numbering approximately 1500 plants, is east of Okaukuejo and the other colony of 1300 plants is situated on the Poacher's Point peninsula. During 1984, these colonies along with several smaller colonies of *A. littoralis* were monitored as part of a long term vegetation monitoring programme.

The *A. littoralis* at Poacher's Point are scattered along the edge of the peninsula, with only a few plants growing on the steep rocky incline which slopes down to the edge of the pan. The *A. littoralis* growing on the incline are inaccessible and well protected, while those on the open grassland on the ridge of the peninsula are easily accessible to herbivores.

Density estimates obtained from the initial survey (1984) were tested for precision and repeatability and found to be unreliable. The majority of plants formed dense clusters and the unreliable efficiency was due to the difficulty in determining the number of plants per cluster.

Therefore, a sample of the population was monitored during July 1985 using a modification of the point centre quarter method (Cottam and Curtis 1956) with permanently marked transect lines. This method was found to be repeatable. The height of the closest plant within each quarter and its distance from the point were measured. Points were located 12 m apart and the distance from the point was restricted to 6 m. Previous utilization by herbivores was also noted. This involved the utilization of flowers by insects or herbivores and whether the plant successfully produced seed. This sample of the population was remonitored during June 1986.

The total number of plants in each height class, for the baseline and follow-up survey, is presented (Table 1). Significant declines ($P < 0,05$) in height were observed within the 0,51 - 1,00 m and 1,01 - 2,00 m height classes. Some of these plants were destroyed while others were merely pushed over resulting in an increase in the number of plants between 0,00 - 0,51 m, although the difference between the baseline and follow-up surveys was found to be non-significant.

The distance from point observations to plants (x) within each quarter was found to be significantly different ($P < 0,01$) between surveys. The decline from

$x = 4,7$ m in 1985 to $x = 5,6$ m in 1986 depicts a drastic decline in the density of plants.

TABLE 1. Number of *Aloe littoralis* in each height class in baseline (1985) and follow-up (1986) surveys.

	HEIGHT CLASSES (m)			
	0,00-0,50	0,51-1,00	1,01-2,00	>2,00
1985	19	70	26	1
1986	26	29	0	0

The majority of plants $>0,5$ m were found to be severely utilized. The beard and green leaves were scattered around and the inner cores of accessible stems had been chewed. *Commiphora glandulosa* trees in the vicinity also showed signs of utilization. Distinct bite marks, often up to 1 cm deep, were found in major stems and branches.

In the two month period prior to the follow-up survey, a herd of 150 *Oryx gazella* were observed in the vicinity of the *A. littoralis* population on several occasions (P. Burgher, pers. comm.). Also, during the follow-up survey, numerous fresh *O. gazella* tracks were found

amongst the plants. During 1985 and 1986, only 9,5 and 3,6% respectively, of the plants had produced seed since the flowers were eaten, possibly by *O. gazella* or *Struthio camelus*.

The decline in density and reduction in height of plants is regarded as a deviation from the predefined goals. A problem has thus been identified. We recommend that half the population be protected against further utilization by large herbivores. This management action will allow us to gain insight into the possibility of reclaiming such a population to its previous density and height structure. Moreover, the unprotected area can be assessed to determine its resilience under the pressures of herbivore utilization.

REFERENCES

ANONYMOUS

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