

## ECOLOGICAL EFFECT OF THE SIKA DEER ON LUNDY'S EAST SIDELANDS

By

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### INTRODUCTION

The damage inflicted by herds of deer to their habitat is something which is of concern to many landowners. Both private parks, farmland and large wooded areas, such as land owned by the Forestry Commission are at risk. On Lundy Island the area available to the deer is very limited, and in the past the size of the Lundy herd has reached quite significant proportions. As would be expected these herbivorous creatures have often tangled with the interests of the Lundy farm, both by inflicting crop damage and by competing with the domestic herds of sheep and cattle on the northern half of the island. However, this problem seems to have been reduced to a minimum by reducing the size of the herd and carefully monitoring its activities. (Bathe and Scriven 1975) Apart from the obvious effect of the deer culls in 1961 and 1973, these events have also resulted in making the Lundy Sika deer unusually shy and secretive. This in its own way has helped to keep the cultivated areas of the island relatively free from deer damage.

There is, however, another aspect of the deers' activity which, as yet, has attracted very little attention. Apart from the cultivated land on the island the deer must have a significant effect on the ecology of the eastern seaboard. It has been noticed (personal observation) that the behaviour of the deer at certain times of the year, involves a certain amount of disturbance to the habitat. Throughout the year the deer require food and during the summer months this provides little problem to the animals, as grass is easily available. However, during the winter and early spring the deer are forced to turn to food sources other than grass. These alternative food sources include a significant proportion of bulbs and shoots as well as the rhizome system of the bracken (*Pteridium aquilinum*), and the deer may be seen to dig, both with their hooves and antlers, to expose these items. In the spring large areas of ground on the eastern slopes could be seen to have been disturbed in such a manner.

During the late summer months the stags use the rhododendron thickets and the tall bracken to remove the velvet from their newly formed antlers. The branches of such low bushes and shrubs may be seen to be frayed and broken by the powerful thrashing of the stags. Also, as the rut approaches in September, the stags may be seen to congregate below Tibbett's Hill in preparation for the rut. Here the antlers are sharpened and cleaned by driving them into the earth, loosening the topsoil. During the rut itself, the hooves of the stags also churn up the ground and thus rutting platforms are developed.

In this study a series of line transects were taken from specific regions of the eastern slopes to determine whether the various activities of the deer mentioned above, leave any permanent effects on the island's floral ecology.

### METHOD

Line transects were used to sample the variety and proportions of plant types for five areas of varying deer activity on the eastern slopes of Lundy. The type of vegetation was recorded at 10cm points over a 10 metre distance, and this was repeated five times for each of the selected study sites. The data was recorded on a dichaphone and transcribed at a later stage.

The study sites were chosen after five weeks of observations of the deer's behaviour on Lundy, both in the spring and summer of 1987, and are as follows:-

- Transect 1 North end — low intensity grazing (Below Tibbetts)
- Transect 2 North end — high intensity grazing (Frenchman's Landing)
- Transect 3 North end — Rutting slopes (South of Tibbetts)
- Transect 4 South end — Low intensity grazing (Above Ladies Beach)
- Transect 5 South end — High intensity grazing (Above Quarter Wall Bay and Sugar Loaf Hill) (See Figure 1)

**RESULTS** The results are in the form of pie charts, (see Figures 2 and 3).

Figure 1

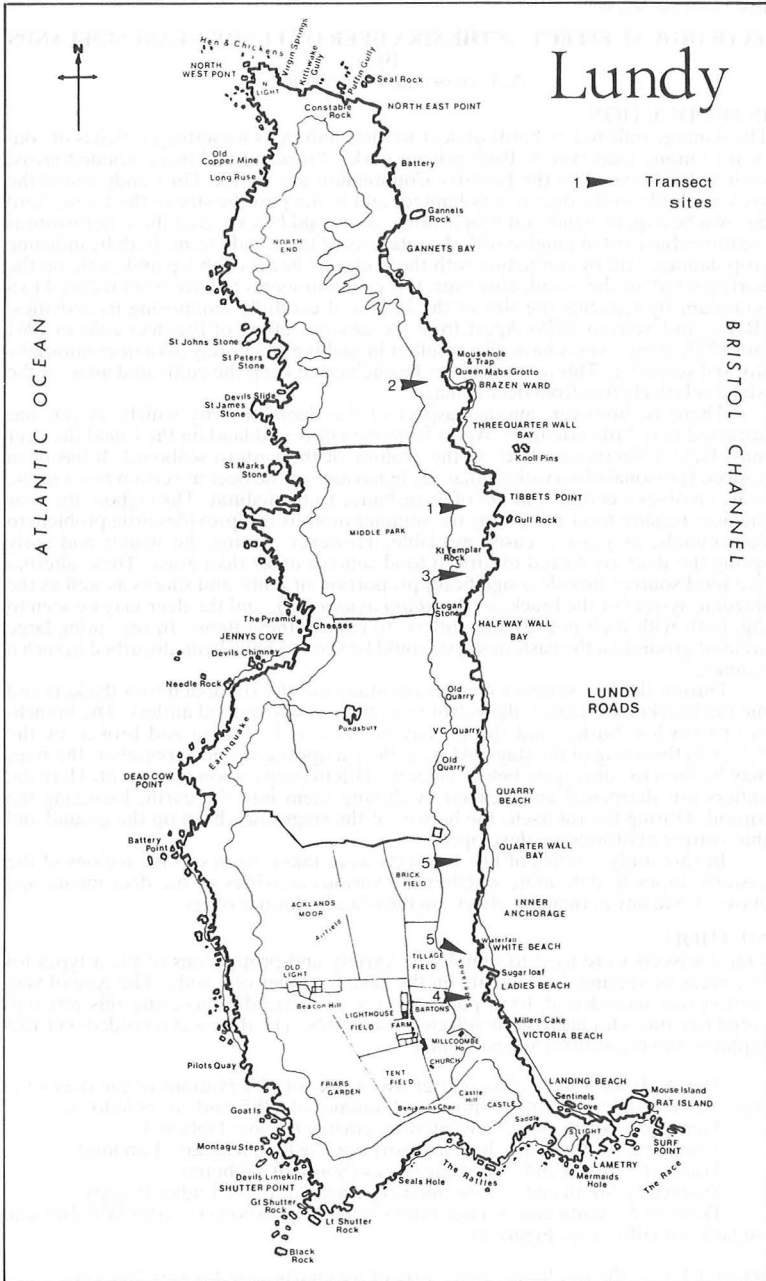
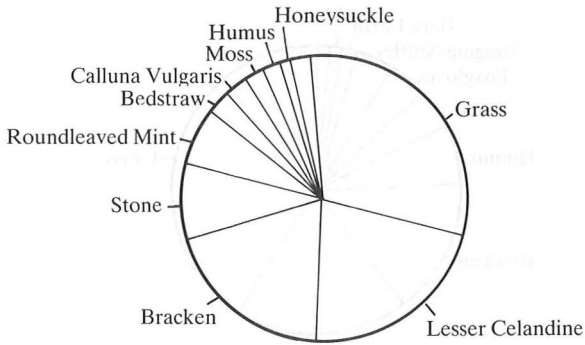
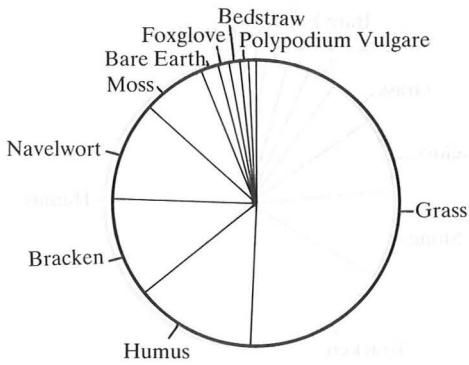


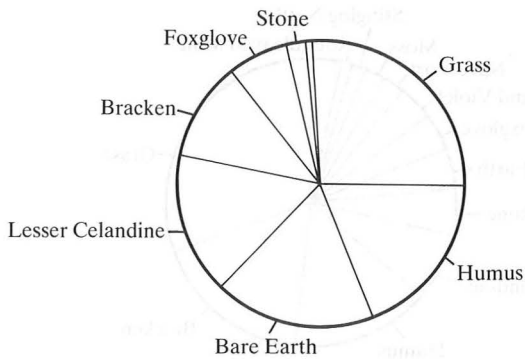
Figure 2



Transect #1: North End (Below Tibbetts) Low Intensity Grazing

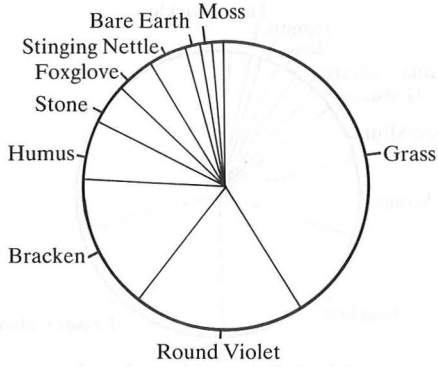


Transect #2: North End (Frenchmans Landing) High Intensity Grazing

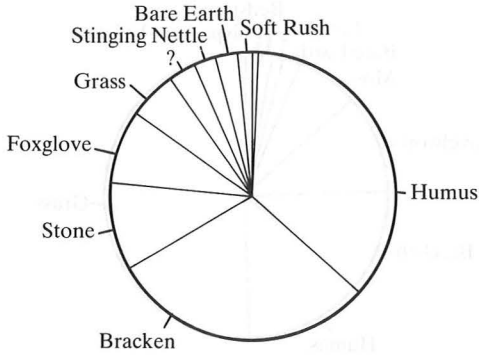


Transect #3: North End (South of Tibbetts) Rutting Slopes

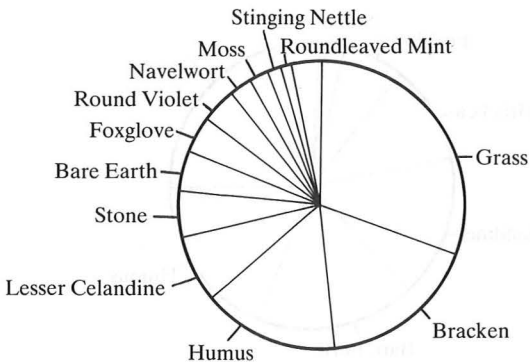
Figure 3



Transect #4: South End (Ladies Beach) Low Intensity Grazing



Transect #5: South End (Quarter Wall Bay/Sugar Loaf) High Intensity Grazing



Overall Percentages Of Ground Foliage

## DISCUSSION

In the analysis of the data a distinction has been made between 'humus', i.e. bare ground containing a rich quantity of decaying plant material which has not been disturbed, and 'bare earth' — soil which has been broken up by erosive agents, such as soil found on the rutting slopes to the south of Tibbetts. It is of interest to note that, in the north of the island it is only the rutting slopes which show a significant proportion of disturbed ground (18% bare earth). The areas of high grazing activity, which will have been churned up by the deer in the spring in search of roots, bulbs and young shoots, show little sign of permanent damage (1.8% bare earth) by the end of the growing season when these transects were taken (September 1987.). It would be of interest to examine the vegetation around the rutting platforms, before the stags begin to dig up the area, to see the extent to which the deer affect the slopes. It would also be of interest to try and determine the amount of regrowth and recolonisation on the rutting platforms before the rut begins the following year.

The proportion of grass available to the deer in the north seems to be closely linked to the amount of time deer spend grazing in the area. The area of high intensity grazing, just below the rhododendron thickets in Frenchman's Landing, has a very large proportion of grass (50.4%), while the area of low intensity grazing, and the rutting slopes, have a lower proportion of grass (30.4% and 25.8% respectively).

In the southern part of the deer's range the amount of disturbed soil is very small. (Low intensity grazing = 1.4% bare earth, and high intensity grazing = 2.2% bare earth.) This again is primarily due to the time of the year that the transects were taken, as the growth and recolonisation of any bare soil, exposed in the winter and spring, has had time to take place.

It is of interest, however, that the amount of grass available in the highly grazed areas of the south end (5.4% grass) is much less than that available in the low grazed areas (41.2% grass). There seem to be two possible explanations for this. First, the area available to the deer in the south is more limited than it is in the north. For this reason the overall grazing intensity is higher in the south, especially as most of the deer seem to frequent this region of their range. As a result there will be more competition for the edible plants in the south, and the grass will suffer. Second, the southern region of the deer's range is also the area most often visited by humans. One would expect the deer, therefore, to avoid areas which are particularly exposed or accessible to humans, preferring the more secluded areas, and the regions close to the safety of the rhododendron thickets.

It would seem, therefore, that the safety factor in the south was as important, or more important, than the quality of the available food. Hence the area of high grazing may not provide the most nutritious food source, but it may provide the safest grazing ground.

Of major importance to the stability of the soil on the east coast of Lundy are the large expanses of bracken (*Pteridium aquilinum*). The immense rhizome system of the plants are certain to ramify throughout the topsoil, helping to provide a stabilising factor against erosion. As may be seen from the overall percentages of the ground foliage on the eastern sidelands, bracken supplies the second largest element (17.5%). The most common plant on the east side is grass (30.6%), and this also is known to play an important role in soil binding and the prevention of erosion.

The suggestion that the plant species diversity is enhanced by occasional disruption of the soil in an area of land is also of interest. This is thought to prevent one species of plant from over-running a whole area, and allows new and more varied colonization to occur.

Concern has been expressed about the possible contribution of the Sika deer to the recent landslide observed on the south side of the Sugarloaf promontory, where the cliff edge has fallen away. The deer are known to spend a great deal of their time right at the edge of these precarious cliffs as they are often able to pass over the first horizon and remain hidden from human beings. It is conceivable that the deer may have used a track, as they often do, close to the edge of the cliff at this point. This in turn might have helped to loosen and dislodge this mass of rock, or at least to have opened up a crack through which the erosive elements of the weather

might work. However, on close examination of the area around the landslide, no clear deer activity could be seen to have occurred.

It must also be noted that the slide took place on the interface between the overlying slate that once covered most of the island, but is now only found in the south east corner, and the predominant granite. The join of this slate with the granite of the north of the island, forms a distinct line from the Sugarloaf to the Rattles.

#### CONCLUSION

In conclusion it would seem that the herd of Sika deer on Lundy do affect the habitat in which they live. A certain amount of soil is exposed each year, and the harsh weather conditions, plus the steepness of the slopes on the eastern sidelands, inevitably produce a certain amount of erosion. However, from the results of this study it must be noted that there are a number of plants which provide a strong anti-erosive factor on the east coast. The large proportions of bracken and grasses, as well as the large areas of rhododendron cover, all help to bind the top soil and protect it from the elements.

A balance must be reached between the preservation of the island in its present form, and the management of the richness and diversity of its flora and fauna in its constantly changing state. There is no easy solution to this task, and only through the continued monitoring and conservation of this dynamic ecosystem will a balance be maintained.

#### REFERENCES

Bathe, G.M. & Scriven, N.J. 1975. *The Japanese Sika Deer of Lundy*. The Lundy Field Soc. Ann. J.

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