

RECOLONISATION OF BURNT HEATH BY LIZARDS

Lacerta vivipara Jacquin

By

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INTRODUCTION AND METHODS

A study area at Strensall Common (SE 637601) was visited at least twice weekly from March to October inclusive. Strensall Common is a largely unreclaimed fragment of the lowland heath developed on the York moraine complex, and lies six to seven miles north of York. Soils are sandy, with a high water-table, and the climax vegetation of birch-oak woodland has been traditionally denied by grazing and burning schedules and also, since late last century, by military use. A gorse-heather heath has resulted (Fig. 1).

A standard route was used to cover the area as fully as possible during short visits in suitable weather conditions; totalling some 150 hours per season. Lizards were caught by hand, code-marked at initial capture by toe-clipping, and described for size, gross morphology, weight, sex and breeding condition at initial capture and at each succeeding recapture.

The locations of 'territories' and of hibernacula shown on the sketch-plans were established by the repeated recapture there of a known individual; those of the deposition of the young were inferred from repeated observations of the same gravid female at one point as well as capture of the young before they had dispersed. In several cases observation established the identity of parents and it was noted that the aggressive behaviour typical of 'territorial' encounters was later displayed by gravid females towards their erstwhile mates.

TABULATED RESULTS

<i>Season</i>	<i>Total Hours (approx.)</i>	<i>Estimate of Population (Sept.)</i>	<i>Number of Litters</i>	<i>Average size of Litter</i>	<i>Litters in 1965 Centre</i>
1965	110	84	6	5.2	4
1966	160	38	4	5.8	0
1967	150	60	7	5.2	0
1968	150	88	8	5.3	1+

Table I: Summarised results of population investigation.

+---three other litters nearby, in new locations.

N.B.---numerical estimates of population are based on the ratio of recaptured to fresh captures at different stages of the season and are considered more likely to be under-estimates than over-estimates.

<i>Locations</i>	<i>Recaptures</i>				<i>Notes.</i>
	1965	1966	1967	1968	
Burnt	17	1	1	1	The same individual 65-68
Unburnt	6	4	5	2	

Table II: Survival of 1965--marked individuals in the burnt and unburnt parts of the Study Area compared. See Figs 2 and 3.

DISCUSSION OF RESULTS

Throughout the study there have been two main foci of lizard distribution;-- the 1965 centre and along an arc from the fence to the southern-most bushes (compare Figs 2 and 3). Both foci offered undisturbed cover and the relative proximity of suitable hibernacula; and whilst some individuals were occasionally seen in the open, no 'territory' was taken up which did not include some deep scrub cover. In this respect it is significant that the burnt area was not re-populated until the ground flora had recovered sufficiently to provide some retreats.

The westward movement in 1966-68 was piecemeal and achieved by lizards taking up 'territories' progressively outward in all directions from the fence focus. It was clear from the 1966 recaptures that individuals tended to maintain their 'territories' of the previous season and that males in their first season of sexual maturity tended to 'leap-frog' these. Often they were followed by females whose offspring tended to be few in number; suggesting that they, also, were newly mature. Males are known to become sexually mature at 22 months (Smith, 1954), and so we might expect the 1967 litters to include the first offspring of the two 1965 litters born in the unburnt area and so providing a sudden increase in the number of litters over that of the year before. This was confirmed by the marking scheme (compare Table II with Figs 2 and 3).

The Study Area is effectively isolated from other known centres of distribution of *Lacerta vivipara* in the neighbourhood, due to the natural barriers of unsuitable habitats. Although the heath extends to the east, at present there is a broad and open stretch which has no lizard population before another favoured locality is reached. The conclusion is therefore offered that natural repopulation and breeding of *Lacerta vivipara* can in three seasons restore a population reduced to a third or a quarter of its numerical strength.

SUMMARY

Investigations of the distribution, population density and breeding success of viviparous Lizards on a four-acre strip of sandy lowland heath were started in 1965. Late in the season about two acres, including the areas most favoured by the lizards, were severely burnt for over eighteen hours and subsequent search indicated that most of the population had perished. Recovery of the flora, mainly grasses (*Graminae*), Heather (*Calluna*), and a shrub element of Gorse (*Ulex*) and Black-berry (*Rubus*), restored ground cover by the end of the 1966 season. Lizard recolonisation was from the unburnt area, where a minority of the 1965 population had been found.

The recovery and re-distribution of the lizard population was followed by plotting the movements of marked individuals from re-capture data. From 1966 to 1968 locations favoured for breeding sites and hibernacula, as well as the "territories" (*sensu lato*) of individual lizards, increasingly approximated to those used in 1965. Population increase, based on estimates only, indicates that three breeding seasons were required to reach a level comparable to that of 1965, and there are clear signs that most of the recovery was brought about by young lizards in their first breeding seasons. Similar stations were taken up by the newcomers to those used by the 1965 population for basking, deposition of the young, and for hibernation, despite a changed flora in some of these situations. This suggests that functions of aspect and of micro-geomorphology might be of critical significance.

The author has been unable to find reference to any previous observations on this subject.

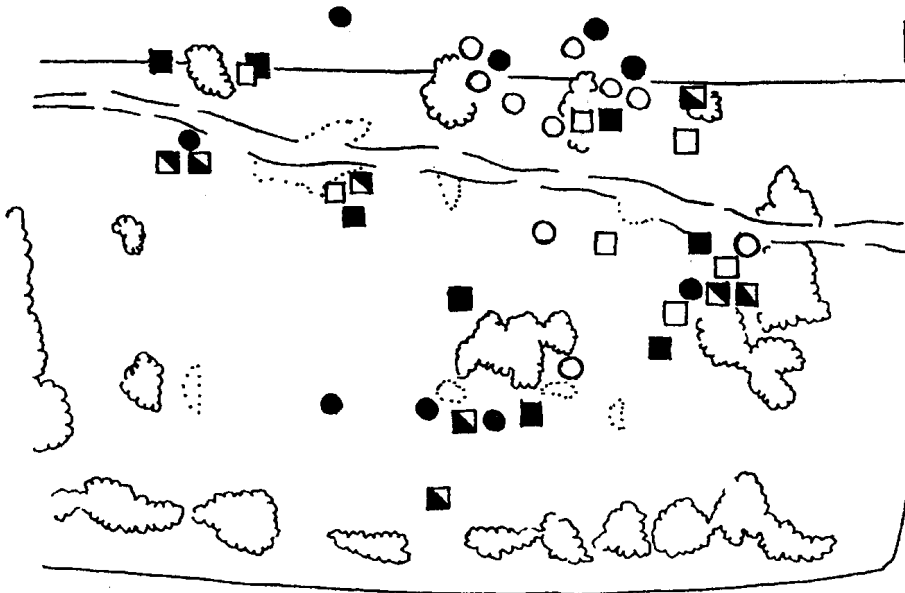
ACKNOWLEDGMENTS

Much of the fieldwork was carried out during the course of a morphological investigation of *Lacerta vivipara* at the Yorkshire Museum, York. Mr. P. R. Balch has given considerable and patient assistance in the field.

REFERENCE

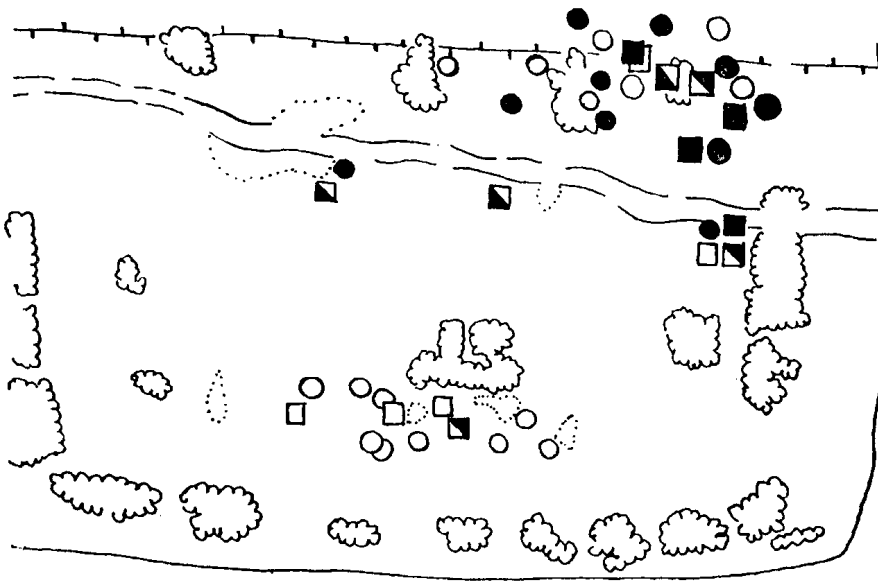
SMITH, M. "The British Amphibians and Reptiles," Collins, London. Revised Edition, 1954, p. 199.

FIG. 1 THE 1967 and 1968 DISTRIBUTIONS.



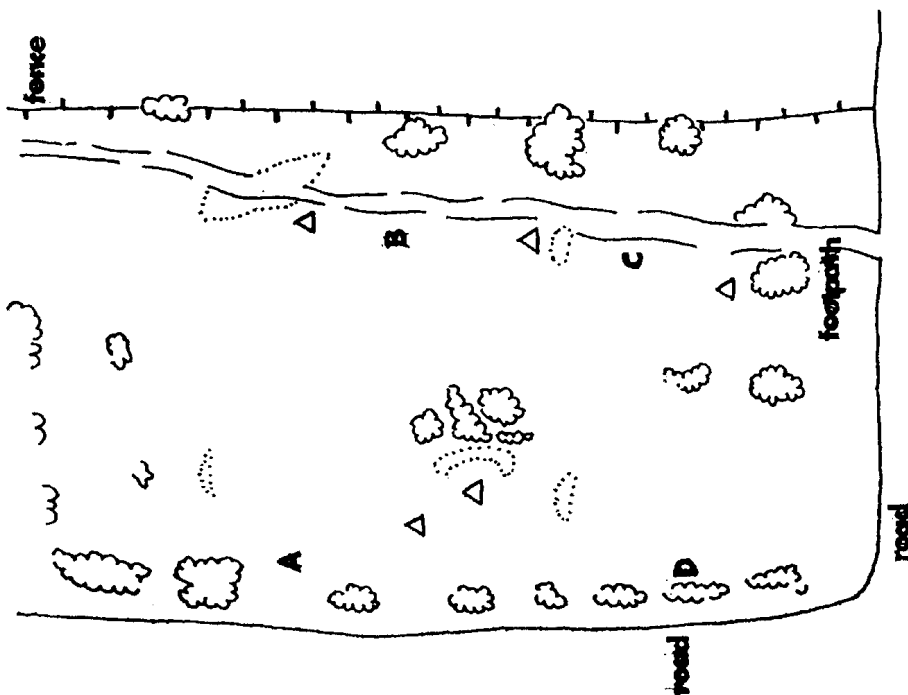
- 1967 'territories.'
- 1967 'breeding territories.'
- ▣ 1967-68 hibernacula.
- 1968 'territories.'
- 1968 'breeding territories.'
- ▤ 1968-69 hibernacula.

FIG. 2 THE 1965 and 1966 DISTRIBUTIONS.



- 1965 'territories.'
- 1965 'breeding territories.'
- ▣ 1965-66 hibernacula.
- 1966 'territories.'
- 1966 'breeding territories.'
- ▤ 1966-67 hibernacula.

FIG. 3 THE STUDY AREA, 1965. SE 637 601.



○ feet 20

- ☉ : shrubs; Ulex, Rubus, Salix.
- △ : hillocks and ant-hills.
- : wet hollows.
- ABCD : burnt heath, mainly Calluna and grasses.