

Local habitat and road features

Little is known about the way in which landscape features affect the road casualty rates of individual mammal species and so, as part of the *Mammals on Roads* project, a study was undertaken of the possible effects of such features.

Road characteristics that might be important include width, the local speed limit, whether the road bends or not and the volume of traffic. Habitat features that were looked at included boundaries (such as a fence or hedge), 'linear features' running perpendicular to the road (such as a hedgerow or tree-line) and the presence of habitats such as arable or woodland close to the road.

Over a hundred 60 mile stretches of road were surveyed, recording casualties and information about the route in the same way that volunteers do in the main *Mammals on Roads* survey. In addition, at the site of each casualty, habitat and road features that were visible within 100 m were noted.

Six environmental characteristics were found that have the potential to influence the overall frequency of mammal road casualties in the UK (shown in the box). For individual species though, those habitat and road features that had an effect were often different and did not necessarily act in the same way for different species.

Greater road width was associated with increased numbers of rabbit and hedgehog casualties but the two species differed when it came to other features. The presence of hedges, tree lines and arable habitat, and the width of the road verge were all associated with an increase in the number of hedgehog casualties but not rabbit casualties. The presence of linear features running perpendicular to the road increased the probability of rabbit casualties but hedgehogs were less likely to be killed near such features.

This is only a snapshot of the some of the work behind the *Mammals on Roads* project but these studies have given the survey a real strength and we hope, in turn, an impetus for everyone involved to continue their efforts in years to come.



**Habitat and road-related variables that had an effect on the frequency of mammal road casualties (taking into account all species).**

- o road width
- o presence or absence of bends in the road
- o quantity of arable habitat in the vicinity
- o quantity of cliff habitat in the vicinity
- o quantity of woodland habitat in the vicinity
- o landclass group

Details of *HogWatch* and the Tracking Mammals Partnership can be found at [www.hogwatch.org.uk](http://www.hogwatch.org.uk) and [www.trackingmammals.org](http://www.trackingmammals.org).



Find out more about UK mammals

● Mammals UK £5.00 inc p&p ● Spotting Wild Mammals £3.00 inc p&p  
Mammals UK has information about 62 current and extinct British species, while Spotting Wild Mammals describes those that are encountered most often, and includes tips for recognising field signs.

To order either title, please call 020 7498 5262 or email [enquiries@mtuk.org](mailto:enquiries@mtuk.org).

Mammals Trust UK  
15 Cloisters House, 8 Battersea Park Road  
London, SW8 4BG  
Tel: 020 7498 5262 Fax: 020 7498 4459  
E-mail: [enquiries@mtuk.org](mailto:enquiries@mtuk.org)  
[www.mtuk.org](http://www.mtuk.org)



# Mammals on Roads Newsletter

MAMMALS ON ROADS SURVEY

JULY 2006

Counting mammal road casualties may seem macabre but the insight that such counts gives us is essential if we want to know how populations are faring regionally and nationally. In this respect, *Mammals on Roads*, through the work of the many hundreds of volunteers that have taken part in its first five years, represents a unique and huge achievement. Thank you to everyone who has taken part. It is a thank you that we repeat each year – but it is no less heartfelt or appreciative for that. Thank you!

Mammals Trust UK is a member of the Tracking Mammals Partnership (TMP), a collaboration of twenty-five organisations interested in British mammals. *Mammals on Roads* is part of the TMP Surveillance and Monitoring Programme that involves the efforts of many thousands of volunteers. The pilot-stage of the survey, which carried out the work described here, was part-funded by the Joint Nature Conservation Committee.

Wild populations naturally undergo 'blips' from one year to the next, when, because conditions differ slightly, numbers rise or fall. Looking at the longer term picture over numerous years is a better indication of how a population is doing. Nevertheless, in a comparatively short time, the many thousands of records each year in the *Mammals on Roads* survey have sounded an alarm-call for a much-loved native mammal.

For some time, anecdotal reports have suggested that hedgehogs are less frequent visitors to our gardens than they once were and that they are becoming scarcer in the countryside. Over the last thirty years, for example, gamekeepers have reported fewer hedgehogs killed accidentally each year. The best evidence of a decline that we have to date though is *Mammals on Roads*.

Counts of hedgehogs along roads in England decreased by 7.5% each year for the first four years of the survey and showed a similar decline in Wales. If the trend continues, it is equivalent to a high Red Alert decline, a term used by conservationists to refer to a loss of half the population in twenty-five years.



This finding by *Mammals on Roads* has spurred the People's Trust for Endangered Species, the parent charity of MTUK, and the British Hedgehog Preservation Society to launch a new survey, *HogWatch*. This survey will establish where hedgehogs are present in the UK. Central to the project is a volunteer survey to establish where hedgehogs are present in the UK. *Mammals on Roads* can monitor annual changes in hedgehog abundance at a country and regional level; the aim of *HogWatch* is to create a distribution map of hedgehogs, showing their presence or absence in each 1-km grid square of the UK map.

Despite the vital importance of the road-kill monitoring, there is more to the *Mammals on Roads* project behind the scenes. These other aspects have been absent from past newsletters and so this year's, after the completion of the first full report of the project by Royal Holloway, University of London, highlights some of their findings.

Together with road counts, *Mammals on Roads* has looked at:

- o the behaviour of hedgehogs and rabbits in response to roads and traffic
- o the effect of environmental features – those of the local habitat and of the road itself, and
- o how counts of road casualties correspond to the actual number of animals in the surrounding landscape.

This work has been essential in assessing the usefulness and reliability of counts as a measure of abundance. It gives us confidence that the survey method really does work.



### Hedgehog responses to roads

About 15,000 hedgehogs are killed annually on our roads. *Mammals on Roads* records almost a thousand hedgehogs each year, equivalent to about one individual per 100 km surveyed. In response to most predators such as foxes and cats, hedgehogs characteristically roll up into a ball, protected by 6,000 or so spines but how do they behave when they encounter roads and traffic? Do they avoid crossing roads or change their behaviour? Do they perceive oncoming traffic as a threat and, if they do, from what distance?

To find out more, nocturnal trials were carried out on a 5 m wide stretch of unused road in Windsor Great Park. Hedgehogs were 'recruited' from local urban areas where they were accustomed to people and vehicles and, after their evening's work, were safely returned to where they had been caught. In order that their movements could be followed during the test, a small phosphorus light was temporarily attached to each animal's back.



Each hedgehog was placed in an open box on the grass verge, with the open end facing the road. Branches and leaves were used to loosely cover the opening so as to provide a more natural setting. The hedgehogs' behaviour was recorded from the time that an individual left the box to when it had either crossed the road or had moved a certain distance along a fence that marked the boundary of the verge. Behaviours included walking, running, pausing, freezing and hunching.

In a second experiment, a car was driven at a steady 20 mph along the road towards the box once the hedgehog had left it.

In the first experiment, hedgehogs were just as likely to cross the road as they were to continue along the grass verge. The decision to cross a road may depend on the type of habitat on the other side and it is likely that roads that are wider, busier or are lit by street lamps are avoided more. On average, hedgehogs moved twice as fast on the road as they did on short grassland. Before crossing, individuals would pause at the road edge and raise their body posture slightly when running across and it has been suggested that this is an aversion to the synthetic surface of the road.

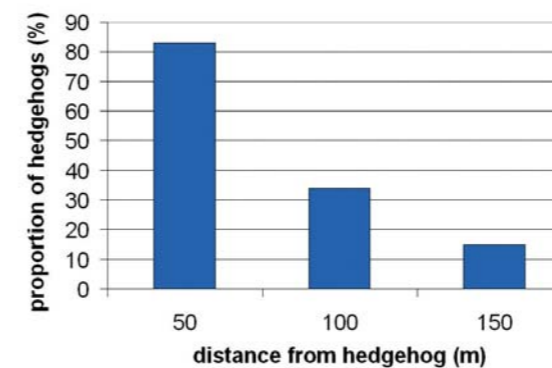


Fig. 1 The effect of distance to vehicle on the proportion of hedgehogs showing a reaction to the engine starting.

When an oncoming car was present, all the hedgehogs in the study either froze or ran away (with equal likelihood) but the response was at a relatively short distance from the perceived threat. Eighty percent of hedgehogs reacted to an engine starting 50 m away (Fig. 1) but the average distance of those reacting to an approaching car was only 17 m, and those that ran away began to do so, on average, when the car was only 8 m away.



The short reaction distances mean that running is unlikely to be any more effective as an escape response than freezing and because hedgehogs are taller when they run than when they crouch, they are more likely to be struck by a vehicle's undercarriage if fleeing than if freezing in a hunched position.

Such behaviour goes a long way to explaining why such large numbers of hedgehogs become road casualties but more work needs to be done to look at different types of roads in different habitats and the associated responses shown by hedgehogs.

### Rabbit responses

A second study, looking at the alarm responses of rabbits to roads and vehicles, was also undertaken. Behaviour was recorded for three and a half hours in the evening at twelve roadside sites, four of each road type ('A', 'B' and minor), each site having a grass verge on both sides of the road.

The type and duration of each behaviour was noted along with information about the traffic at that time. Different types of behaviour included grazing, scent-marking, grooming and three alarm responses: running (without stopping to feed or interact with other individuals), drumming their hind feet, and standing in an alert posture with their head raised and front feet off the ground.

The maximum distance that vehicles were perceived as a threat was 250 m and on average alarm responses were shown when the vehicle was 161 m away. At this distance, a rabbit has six seconds to get away from a car approaching at 60 mph. No rabbits in the study attempted to cross the road, instead staying on the grass verge. Many of these reacted to approaching vehicles by freezing in the alert position and if they did this on the road itself, the time available to escape would be even less.

Rabbits did seem to discriminate between fast and slow moving vehicles though and responded to the former at a greater distance. Reacting sooner to a faster moving car is clearly a good idea but only if the response is appropriate -- freezing in the road might be woefully inadequate if the threat is a car.

A rabbit adopts an upright posture.