



Andrew Jackson's Theory on Decline of the Hedgehog – based on research in the Brackley area

Preliminary Note:

Andrew's work in documenting his theory was not completed before he sadly died in 2023. These notes have been put together by a volunteer that worked closely with him, in order to try and impart some of his findings so that others may be able to take up his hypothesis for further investigation. This is not peer-reviewed scientific research, but observations based on twelve years of studying hedgehogs.

Introduction

It has been well known for quite some time that hedgehog numbers are declining, however it has also been frequently cited that the experts 'do not know why we are losing our hedgehogs'.

The State of Britain's Hedgehogs 2022 report reveals hedgehogs have declined by between 30% – 75% across different areas of the countryside since 2000. Hedgehogs are now classed as vulnerable to extinction.

There are many contributory factors that are suggested: roads, fragmentation, loss of hedgerows, predation of badgers etc. And many actions are commonly suggested such as linking gardens. Such things are positive and will of course help to slow the decline, but do not address underlying cause.

Underlying Cause

Andrew believed that we are losing our hedgehogs because juvenile hedgehogs get sick with parasites such as lungworm¹, and if left untreated they will die. The high death rate among young hedgehogs caused by such parasites means that less hedgehogs reach breeding age, and consequently the hedgehog population does not get replenished.

Sick juveniles

There are more juveniles that are sick with lungworm than both scientists and rescuers typically realise. For example, it is often thought small hedgehogs just need fattening up when in fact they are already sick.

Age determination

Autumn juveniles in particular are often not as young as they are perceived to be. It has been found from the Brackley Hogwatch research that they frequently turn out to be litters from earlier in the year that have got sick and failed to thrive/put on weight. Determination of their age has been evidenced both by microchipping² hedgehogs, and by use of x-rays.³

Under-reporting

Andrew carried out awareness campaigns during which he asked people to contact him with their hedgehog sightings at night (ie not just to report sick ones), he then examined these, and many hedgehogs thought to be healthy were actually found to be sick. Without this type of research study many sick hedgehogs would not get reported and hence scientists are potentially unaware of the scale of the sickness problem.

Life cycle is broken

Increased levels of juvenile sickness and mortality mean that most juveniles now die before they reach breeding age. Therefore, when an adult hedgehog does die it is no longer replaced by a youngster (or not replaced at the rate that sustained the population in previous years). The life cycle is almost entirely broken.

How do hedgehogs get Lungworm?

Hedgehogs most likely catch lungworm from eating an infected slug. Newborn hedgehogs can also be infected with lungworm, passed on in the womb or transmitted from the mother's milk.

Slugs

Slugs and snails are intermediate hosts to lungworm and over the last 20 years there has been a huge increase in the percentage of slugs that carry lungworm, likely due to the expanding of the parasite's geographical range and abundance (Andrew also carried out research on types and quantities of slugs carrying lungworm). His findings showed that most slugs are now 'toxic' to juvenile hedgehogs because they contain lungworm eggs.

Climate change is also thought to alter slug abundance, and it is known that many more invasive species are now present in Britain than in previous years, so they are more numerous in volume and species

The more slugs a juvenile eats the quicker the worm burden inside them grows, until it reaches a fatal level. It would appear that 20 or 30 years ago a juvenile hedgehog could probably eat slugs and thrive, but this is no longer the case, now that more slugs are carriers of lungworm.

How can members of the public help?

If more people fed the hedgehogs they would eat less slugs.

If more of their traditional natural food sources (such as beetles and caterpillars) were available hedgehogs would eat less slugs. Plant gardens that attract such natural food sources, and avoid use of chemicals which destroy natural habitats.

How can scientists help?

Collection of similar data in other areas could help to confirm Andrew's findings.

Scientists need to understand why the juveniles are dying in such large numbers of parasitological infestation. Examples of questions needing further research are:

- Are juvenile's immune systems less able than previously to cope with parasites?
- Has the nature of the parasites changed or are there now increased amounts of parasites in the hedgehog diet?
- Hogwatch found that most slugs are now infested with parasites such as lungworm – is this significant?
- Do hedgehogs rely on slugs for a greater part of their diet? Are other food sources declining?
- We need to understand why the percentage of slugs carrying lungworm has changed, and if it is possible to reverse it.
- Farmers no longer worm their livestock to the same levels as 20 years ago, due to concerns over meds entering our food chain. As a result, most livestock now have 'worms' to some level, meaning their faeces contains worm eggs, which will infect the areas slugs – is this significant?

Further research is needed by the scientific community and Brackley Hogwatch would be pleased to assist in funding research that further investigated Andrew's theory

Notes:

1. Lungworm
A faecal sample is needed for testing under a microscope to determine which parasites are present. When we microscopically examine the poo from these sick hedgehogs we see it is full of lungworm and intestinal worm eggs and larvae. This shows the huge level of adult lungworms and other parasites inside the hedgehog. When they are rescued they have fatal levels of 'worms' (typically *Crenosoma striatum* but also *Capillaria erinacei*, *capillaria aerophile* and *capillaria overreticulata*) continuing to multiply inside them. Once in captivity (rescue) worming medicines from the vet can be used, and it takes about 3 weeks to de-worm a hedgehog, only then do they start to recover.
2. Microchipping
In previous research projects Brackley Hogwatch have found healthy juveniles at night which have been weighed and microchipped. In the Autumn/Winter these exact same hedgehogs have been found sick and having lost weight, often coming out in the daytime, and covered in ticks.
3. Radio tracking
In research projects involving juveniles that have been radio tracked it could be seen in which month they stop growing and start deteriorating.
4. X-ray
X-rays were used to determine age through looking at growth plate closure, which can be used as a reference for hedgehog developmental stages. This study was carried out in conjunction with a vet.

Further Reading:

Please see:

'Summary of key points in Wildlife Trust Hedgehogs talk by Andrew Jackson 23-9-19'

'Appeal for scientists to investigate' – adapted from article by Patti Larard (2019)

'Brackley Hogwatch Research Report – Reasons for Decline' (January 2021)