

Hedgehog rehabilitation- does it work?

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In the absence of a system for regular assessment of the hedgehog population it is difficult to know if its numbers are stable, and almost impossible to prove that it is getting scarcer. However, there is now enough accumulated evidence to be confident that this species is in decline. The numbers killed by gamekeepers (whist trapping for other species) more than halved in 30 years 1960-1990. Numbers counted in structured surveys of road kills fell by some 30% in the 1990s and continued to fall in the early years of this century. Many people now report that hedgehogs no longer visit their garden, whereas they regularly did so in the past. Although somewhat informal, these indicators were sufficient to have the hedgehog added to the UK's formal Biodiversity Action Plan (BAP) list of threatened species in 2008.

The reasons for decline have been identified in a recent PhD study by Anouschka Hof. It appears that population fragmentation, through creation of hedgehog barriers such as motorways or solid fencing has been a significant issue. The change from widespread pastoral farming to intensive arable farming has also been damaging to hedgehog populations, as have the numbers of badgers (*Meles meles*) in this country. Over 10 years ago research at Oxford University (Micol *et al*, 1994) demonstrated that hedgehogs were in danger of local extinction when badger numbers exceeded a certain threshold, a level already reached in several parts of England at that time. Since then badgers have increased substantially in numbers, posing a widespread threat because they eat hedgehogs and also compete with them for similar food. A badger eats about the same amount as five hedgehogs and the same food items cannot be eaten by both.

Hedgehogs appear particularly prone to accidents, falling into things, getting injured by mowing machines and road traffic, eating contaminated food and suffering from serious burns when bonfires are lit that contain sleeping animals. These are all dangers that have been added to natural problems caused by parasites and disease. Yet the hedgehog has evolved largely in the absence of such threats (and when badgers were far less abundant) and it does not breed fast enough to make good these additional losses.

Against this background it is clear that caring for sick and injured hedgehogs and restoring them to the wild is potentially a valuable exercise- if it can be done successfully. Hedgehogs are probably the easiest animals to rescue. They do not run away, bite or resist capture. They are easily taken into care and now probably form the majority of British mammals that are held in animal rescue centres. It is likely that upwards of 5,000 of them are taken into care annually, with a high proportion being later released into the wild.

In 1989 I began a series of studies to find out what happened to hedgehogs released after a period in care. It appeared that rehabilitation and release were being done increasingly often, but with no assurance that the animals did not suffer significant welfare problems. Perhaps they wandered helplessly in an unfamiliar place, maybe they attempted to "home" with increased risk of being killed on roads. Could they find adequate food in an unfamiliar release site, could they build suitable nests and find them again? Maybe "rehabilitation" was a waste of time, even perhaps cruel?

In a pilot study, three hedgehogs were taken from Aylesbury to Malham in Yorkshire, far enough away that they could never have been there before. Fortunately they did not attempt to “home” over 200 miles and they quickly adjusted to their new environment. They mixed freely with local hedgehogs, built nests and found them again each night apparently without difficulty. However, after 16 days only one of the animals had maintained its weight, the others continued to lose weight as though they had failed to find and eat sufficient food. The study had to stop after a fortnight, but indicated that a larger sample was needed, and should be studied for a longer time (Morris *et al*, 1992).

In 1991, eight rehabilitated animals ready for release were taken to Suffolk from the RSPCA in London. They were released at Flatford Mill and radio tracked for three weeks to establish patterns of behaviour and monitor body weights. The study was then suspended for three weeks (to save money), and an attempt was made to relocate the animals six weeks after their release. Again they all seemed to adjust well to their new surroundings and interact normally with local hedgehogs. However, one immediately set off for the local village and within six weeks others had scattered widely (more than a kilometre), including two that had swum the River Stour. It appeared that these animals, all from an urban environment, were dispersing in search of a more familiar habitat to the farmland into which they had been introduced (Morris *et al*, 1993). This suggests that animals should be released into a familiar habitat type if possible, although many rehabilitators are reluctant to restore them to the exact site of origin (often not known anyway) in case the same mishaps befall the animal a second time.

All these animals had been adults, with experience of life in the wild. In practice, large numbers of hedgehogs in care are underweight juveniles that have insufficient fat reserves to survive the winter. Evidence suggests that a *minimum* weight of 450g is necessary for successful hibernation in this species (Morris, 1984). Below this, survival is unlikely. Greater body mass (within reason!) is obviously beneficial and the *optimum* weight to begin hibernation is probably in excess of 500g. Nevertheless, survival cannot be guaranteed, whatever the weight, and over winter mortality is probably quite high in this species. Setting the notional hurdle too high in order to increase probably of survival will result in large numbers of animals being taken into care that would have survived anyway. This is disruptive and a waste of resources. Many juveniles are taken into care in order to build up their weight to a viable level. Often they are hand reared nestlings or very young juveniles that may never have lived alone away from the warmth and support of their mother. Many will never have moved beyond the confines of a small cage or eaten a worm. Most will never have built or even experienced a natural nest. On release at the end of winter, these animals, whatever their weight, face major challenges. If they could survive release then we can be certain that experienced adults would also do well. Thus subsequent studies focused on following up released, inexperienced juveniles.

On a cold night in April 1993 twelve juvenile hedgehogs were released at a grassland farm on the Somerset- Devon border and radio tracked. Some were “soft released” with the benefit of having supplementary food available, although they did not use it. All found their way about remarkably well and built their own nests that they were then able to relocate, sometimes even after an absence of several days. Again weight

loss was evident, with some losing 20-30% of their mass in the first four weeks, apparently the result of slow starvation. However, analysis of the individual weights revealed that the greatest loss was suffered by those animals that had been biggest at the start. Some of these weighed more than 900g, an unprecedented weight for wild hedgehogs less than one year old at the end of winter. In fact they had become somewhat obese in captivity, being fed *ad lib*, and were slimming down to reach a more normal body size. Their weights stabilised after 3-4 weeks. Those animals that had been a more normal weight at release lost relatively little before their mass stabilised (Morris and Warwick (1994).

More seriously, three of the 12 animals were killed and eaten by badgers (in one case the final stages of the meal were actually observed). Three more were killed on local roads, despite the very light traffic they carried. However, given the distances that both hedgehogs and badgers can travel in a night, it is unrealistic to propose that releases should only occur away from roads or badgers. Indeed both are widely distributed across the countryside and those few areas that lack badgers are often unsuitable habitat for hedgehogs too. Thus eight of the young hedgehogs had died by the end of the study (i.e. within eight weeks of release), but focussing on these animals overlooks the fact that if they had not been taken into care the previous autumn, all of them would have died. As it was, one third of this group had been given a second chance at life and one was believed to be pregnant at the end of the study.

A similar follow-up study of inexperienced juveniles on Jersey (where there are no badgers) again showed notable success in adjustment by the animals, dispersal and a good survival rate. By marking her rehabilitated hedgehogs when they are released at other sites in Jersey, Dru Burdon has since found that one third of them survive up to a year and some survive at least three years beyond release. This is greater than the average longevity for the hedgehog.

Despite the evidence that translocated hedgehogs can cope with release in unfamiliar places, even inexperienced juveniles, Scottish Natural Heritage opted for a policy of killing the animals in their attempt to remove hedgehogs from the Hebridean Uist islands, in an effort to reduce predation on ground-nesting birds. They claimed that hedgehogs might suffer a lingering death if transferred to the mainland. So another follow-up study was carried out and showed that hedgehogs translocated from the Uists to a Scottish country park could manage, apparently quite well (Warwick *et al*, 2006). Smaller individuals were at a disadvantage (this study took place soon after hibernation ended) and would perhaps benefit from a longer adjustment period in captivity before being released. Two animals that died within the 4-week study period had suffered a violent death (probably attacked by dogs) and another had drowned. Two others died apparently from causes unrelated to their release.

Releasing rehabilitated hedgehogs is potentially beneficial to isolated small groups (perhaps inbred) that result from habitat fragmentation. The extra animals also augment diminishing local populations. It is now established that rehabilitated hedgehogs can cope with release into the wild, even those with no previous experience of living alone. They can also survive translocation to unfamiliar sites, although it would probably be easier for them if they were released into the same type of habitat as that in which they had lived previously. However, rehabilitation provides

only a second opportunity for extended life. It cannot confer immortality. Deaths must be anticipated and accepted: better that some should survive than none at all.

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