



THE CURSE OF RABBITS IN CORNISH HEDGES

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What rabbits do / history of the rabbit / they "breed like rabbits" / the notorious gin trap / gin traps banned / myxomatosis arrives / other control measures / control by good hedging.

Our Cornish hedges make ideal homes for wild rabbits. Older people, who knew Cornwall before the rabbit disease myxomatosis struck in 1953, remember what a dreadful scourge rabbits were to most farmers. Then, dying rabbits were seen everywhere, and within two years they all but vanished. Nowadays they have bounced back in some places to more than half the old numbers, but with the difference that myxomatosis is now endemic and sporadic outbreaks reduce local populations, which then slowly return, before the cycle repeats itself.

Most breeding is between January and July, with up to five litters each consisting of 4 or 5 young. With young does maturing within three months, a single pair of rabbits may result in 50 offspring each year, and may live for eight years. With plenty of food and without disease, accident or predation, a pair of rabbits and their young could theoretically produce more than



Typically, these young rabbits are feeding among the stones which have fallen from this neglected hedge, allowing access for burrowing.

five million offspring in four years. Obviously this does not happen, but the problem in Cornwall is not so much numbers as that, apart from the crops they eat, they find our hedges irresistible for excavating their holes, to the ruination of the hedge structure. The cost of repairing the damage to farmers' hedgebanks far outweighs the rabbits' value for meat and fur.

In the typical hedgebank, rabbits, if permitted, make holes in the sides and top about every 10 yards (3m); these holes are inter-connected by tunnels which run the whole length of the hedge. As the burrow is extended and soil drops into the tunnels, it is

excavated out through the nearest hole, and gradually the earth core of the hedge is transferred from inside to outside. Without the support of the earth core, the outer cladding of stone becomes dislodged. The hedge eventually slumps into an anonymous strip of earth and stones. This low mound, because of the poorer drainage, is less attractive to the rabbits, and they move on to the more intact hedges.

Rabbits eat almost anything, even young bracken, but not wild violets or primroses. They browse rather than graze and are especially fond of new coppice growth and young trees, so newly planted trees have to be fitted with plastic collars up to a height of 2ft (60cm). Rabbits, like pigs, are fond of acorns, and fatten well on them. Ten rabbits eat as much grass as one sheep but convert it into only a quarter of the meat. In winter wheat, rabbit grazing can cause a 1% loss in crop yield per rabbit per hectare, or about 65kg of wheat per rabbit. Grazing causes uneven ripening of arable crops with a reduction in crop quality. The national crop loss is estimated today to exceed £1 million annually.

Rabbits provide food for predators but can cause serious damage to other conservation interests. Predators include foxes, whose favourite food is rabbit, and stoats. Baby rabbits are eaten by badgers, weasels and rats. Young rabbits above ground are prey to crows, owls and buzzards, being so important to the latter that in Cornwall the buzzard population is directly related to the number of rabbits, our hedges being the favourite hunting ground. The same applies to feral cats, which are seldom seen even to look at a bird. They spend their whole time in the hedge bottom after rabbits, the most meat for the least effort, and will kill one nearly as big as themselves. Like the buzzard, they follow the rabbit as local populations wax and wane. In the loss of foxes since the mange epidemic and the hunting ban, which has resulted in many more being shot, feral cats perform a valuable service in rabbit-control. It is the well-fed domestic cat, allowed to roam through the cat-door at will, that amuses itself by making inroads on the birds, especially in the nesting season.



Typical rabbit damage to a neglected Cornish hedge, with earth from the inside of the hedge structure mined out into the field.

HISTORY OF THE RABBIT

The Cornish word for rabbit is *cynin*, which comes from the same linguistic root as the Roman *cunicus*, and pre-dates the mediaeval name *cony*, which appears in the King James' bible: 'The conies are a little people yet they make their homes among the rocks.' These may have been some other rodents besides rabbits, but "coney" was the popular name for a rabbit in this country, and the statement is certainly true where Cornish hedges are concerned.

Rabbits were probably in Cornwall before the last Ice Age but were then killed out by the cold. They survived in the warmer countries surrounding the western Mediterranean. The first century BC poet Catullus wrote in jocular form: "cuniculose Celtiberia", meaning that Spain was full of both mines and rabbits (cuniculose has both meanings). The Roman emperor Hadrian had a rabbit pictured on some of the coins struck for Roman Spain and in 250 AD the Romans took live rabbits to Italy. The presence of rabbit bones in Romano-British remains

suggests that they were brought into Britain before 450 AD. Baby rabbits are easily tamed, can be carried by travellers without problem, and were likely to have been brought into Cornwall by sea in much earlier times. Again, because they easily thrive in captivity, the cottager's traditional rabbit-hutches may have originated in very early times.

The first known written record of rabbits in England was about 1100 AD, and in Cornwall on Scilly in 1176, when the Bishop of Exeter confirmed a grant by Richard de Wicha, for the good of his soul, of the tithes of rabbits on Scilly to the monastery there.

Rabbits at this time could not survive well in the open countryside because the original rabbit imported into Britain was a surface scrub dweller which did not dig its own burrow. Rabbits' ears are quite unlike most burrow-dwellers, being more akin to surface-living browsers, eg deer family, and it seems likely that it acquired its burrowing propensity quite late in its evolution, leaving its cousin, the hare, above ground. When it was introduced, the non-burrowing rabbit had so many natural enemies that it had to be kept in purpose-made artificial warrens, and remained so for over 1,000 years. As a valuable source of meat and skins they were, until the 18th century, kept in this way. Rabbits do not like to live on wet ground. The sand dunes, *towans*, in Cornwall were natural warrens and were probably the first to be used to breed wild rabbits in the county. The hare has failed to make use of the towans or the Cornish hedges for burrowing, contributing to its near extinction in Cornwall. In a chase, it is quickly cornered against a Cornish hedge.

As with other man-made landscape features, eg quarries, there is no mention of warrens in the Domesday Book, although they were then profitable. The yearly catch on Lundy Island in 1274 amounted to about 2,000 rabbits, Lundy being a natural warren free of most of the usual predators, and as with other islands, safe from escape. John Leland recorded in c.1536 that there were rabbits kept on St Michael's Mount, on *Inispriunen* (probably Mullion Island) and on St Nicholas Isle (Looe Island). A landowner was not supposed to construct a warren on common land, nor to let rabbits loose on a common, but there was no penalty for building a warren on land which might previously have been common. So precious were rabbits that to poach one from a warren was a serious offence. Care has to be taken in the interpretation of the term warren. Sir Francis Drake in 1631 founded Werrington Park, the king allotting him "to lands in the parish of Warrington, and St Stephens, near Launceston, with grant of free warren therein". In this instance the term "free warren" probably referred to the general sporting rights and not to warrening rabbits. Other warrens which may not have been exclusively rabbits were recorded in 1311 as being at Cargoll, Penryn, Tregear (St Germans), St Germans, and Lawhitton.

In 1480 a survey, probably in Lanherne Manor, recorded that "John Ricard holds the farm of rabbits there and pays this year..", meaning that he had the profits from catching rabbits, perhaps paying a fee for taking them from a warren. In a letter written between 1532 and 1540 by Sir Thomas St Aubyn to his wife's sister Honor, Lady Lisle, he thanked her for the gift of "Conyes" which gave him "myche pleasure for myne owne Conyes at Clewyn bee dekayed". There were two warrens or burrows, of 35 acres each, recorded in 1589 in the estate of the Penhale, Hilton and Wadfast Manors; their exact location is not known. At Godolphin within the deer park are the remains of several pillow mounds built in the early 17th century. These are rectangular flat-topped mounds a metre high which were made to provide homes for the rabbit.

Carew in 1602 noted in his *Survey of Cornwall* that "Of conies, there are here and there some few little warrens, scantily worth the remembering". Before 1700 the rabbit was only really common in areas of light soil, often living close to the artificial warrens which had originally been introduced in the Middle Ages. There are reputed to be names inferring rabbit warrens at St Hilary, Mawgan-in-Meneage, Newquay, St Dennis and St Anthony, also recorded in 1790 at Landulph, east of Kilkhampton, St Breock, Bodmin moor, Truro, and Loepool. As late as c.1840, John Vigurs "purchased Rosehill, Penzance, where he made great improvements and

constructed a rabbit warren", but by 1726 Marshall had "observed only one Rabbit Warren in this District [east Cornwall and west Devon] that is now stocked; with a small one that has been diswarrened. Nevertheless, there appears to me to be much land in the West of Devonshire &c. which would pay better in a state of Rabbit warren, than in any other state of occupation. I mean the higher weaker lands, and where the sides of the hills have a sufficiency of loose rubble for the Rabbits to burrow in. The markets of Plymouth, and its Dock, would not fail to take off the produce. An objection to Rabbits, in or near the inclosed land, lies in their being destructive to the large hedge mounds [turf hedges] of this District; in which they burrow, and become a species of vermin, difficult to extirpate; scooping out the inside; where they make their lodgements; generally with an entrance on each side, and a third or perhaps a fourth, on the top. But if warrens were sufficiently fenced in the Yorkshire manner, and the fences properly attended to, this objection would lose much of its weight. The warren I saw, on the skirts of Dartmoor, had no sufficient fence to prevent the Rabbits from straying." He saw very clearly the problems that would arise should rabbits be allowed to escape into the turf hedges he was observing in West Devon and East Cornwall.

THEY "BREED LIKE RABBITS"

Eventually the situation was to become the problem Marshall forecast. Rabbits reached plague numbers outside warrens by the end of the 19th century due to the change in rabbit behaviour so they now, as he noted, dug their own burrows. In Cornwall the increasing rate of re-enclosure of commons and cliff land created many miles of new Cornish and turf hedges and meant that now everywhere in Cornwall there was a ready-made dry habitat just waiting for rabbits to move into. There is no doubt that, with the fluctuating enthusiasm for warrening, many rabbits escaped, or were deliberately set free when a warren was abandoned or its inhabitants became overcrowded.

In 1822, Bond reported a disused warren in "a field in Kilminorth, not far from the house, called The Warren, surrounded by a circular stone wall about eight feet high." Two years later Hitchen and Drew wrote that "In St Merryn, Perran Sand, and some other places where sand has covered the soil, there are warrens well stored with rabbits ... Some others have been attempted on the southern coast, where the appearance of vegetation afforded a more flattering prospect. But the proprietors not finding them to answer their expectations, they have been abandoned, and the ground has been applied to more profitable purposes." By the middle of

the 19th century the Perranporth towans were seen by King as having "rabbits countless as the sands themselves." Today there are stone hedges and walls to be identified as fragments of boundaries of former warrens. A wall at Trewoofe, near Lamorna, may be one of these.

By 1854 rabbits were common in cultivated parts. Bottrell wrote in 1870: "When we wished to have a few rabbits for a pie one had only to go out with the dog, and half-a-dozen nets to set in the gaps round a barley arrish [stubbles], and come back in an hour with as many rabbits as were wanted for a week." In 1880 John



Once rabbits gain access and begin breeding in a Cornish hedge they can soon reach sufficient numbers to damage the structure seriously. Four young pictured here from one litter of six.

Boaden, a farmer on the Lizard, noticed that "on many farms a full tenth of the grass and corn crops were destroyed by rabbits." In 1906 rabbits were reported as being abundant.

Rabbits have even been involved in election politics. Colonel Deakin, the owner of Werrington estate on the Cornish border in 1874, was standing for election to Parliament when he learnt that his opponents were saying that he was preserving the rabbits on his farms to the detriment of his tenants. On hearing this, he announced in public that each tenant was at liberty to destroy the rabbits on his farm. Although he easily won the election and became an MP, he was taken to court, accused of bribery about the rabbit concession, found guilty and lost his seat.

Nichols wrote for the Old Cornwall Society's Journal of "holes running through the walls surrounding game parks, about eighteen inches from the ground and carefully shored up. The old men knew them as "Rabbit Boxes" - rabbits, which served the purpose of keeping undergrowth in check, could thus pass to and fro while the game remained in the park. The boxes were also the waller's means of trapping himself a rabbit without finding a game bird in his gin." This seems a little dubious, as a game bird could probably hop up to a hole at that height more easily than a rabbit. The hedges to be built in the enclosure of Viverdon Down, Callington, in 1894 had to include, at intervals of 50 yards, a hole through the base of the hedge. This was to be properly built in with stone so as to allow hares to use it. The purpose for these holes was presumably that the hares were coursed by greyhounds and the holes meant the hares would make a more exciting chase than if they had to get over the top of the hedge, when they would have been caught very quickly. Another reason may have been that hares would better evade foxes, in the interests of preserving the hares for coursing.

Rabbits shunning damp ground obviously found holes in hedges to their liking, being much drier than the adjoining fields. Where there is a choice, they will always prefer a hedge for their burrows. By the beginning of the 20th century they had become a serious pest in hedges throughout the county. A vicar in East Cornwall was so fed up with being given rabbit in his meals at one farmhouse he visited regularly that he wrote a wry 'grace':

"Of rabbits young and rabbits old,
Of rabbits hot and rabbits cold,
Of rabbits tender, rabbits tough,
I thank thee Lord, we've had enough."

THE NOTORIOUS GIN TRAP

By the start of the 20th century, it was estimated that 60-100 million wild rabbits were being killed annually in Britain, most of those from Cornwall being sent by rail to urban markets upcountry. The majority of these were caught by the steel gin-trap, a horribly inhumane invention developed from the infamous man-trap which had been used by landowners to catch and maim poachers on their estates. Its pair of toothed jaws closed by a strong spring. The gin, if put in exactly the right place, caught the rabbit by both front legs. A lesser number of rabbits were caught by snares, perhaps slightly less cruel than the gin, being a wire loop which caught the rabbit around its neck, sometimes strangling it. Snares, being much cheaper, were used by people who could not afford to buy traps. Both the gin and the snare were secured by a peg into the ground to stop the rabbit dragging it along and getting back into its hole. This did not always work in wet ground and badly-caught rabbits took the trap or snare back into their hole, to die later.



The black museum. Gin traps, rightly outlawed for their cruelty. Left to right: traps for fox, rabbit, rat.

Most farmers employed rabbit trappers to reduce their numbers of this pest. Otherwise, with their small fields, they would often find that half their grass and corn had been eaten by rabbits coming out from the hedges. The author remembers his father's trapper, Mr. Tripp, during the 1939-45 war. He used a bicycle for the twelve-mile round trip from Helston to Bonallack Barton, between Gweek and Constantine, where he had set about 250 gin traps; on his six-mile return journey he had to push his bike, because of the several dozen rabbits he was carrying heaped on it, to the railway station at Helston for sending upcountry. The son

of another trapper, Len Neale told the author how in his youth he helped his father move his 900 gins on farms at Trewint. They picked up and relaid 300 traps each day, Monday to Saturday, so each gin was moved on average every third day except Sundays, when they were only looked at, rabbits removed and the traps re-set in the same place. The rabbits were sold to a local dealer who put them on the train.

The money the trapper received from the rabbits was not all profit. Apart from his own costs, the trapper had to pay a fee to the farmer for being able to trap his land. Many farmers used their rabbit money to pay their rent, as their profits from grass and corn were so little. Others used to divide the sale money from the rabbits in two, one half for the farmer, one half for the trapper. Although the table below shows that Len Neale's gross sales of £652 may be favourably compared with farm wages which were at that time less than £250 per annum (equivalent about £11,000 in 2005), the comparison is more realistic if they are divided in half, allowing for the farmer's share. The table shows how many rabbits Mr Neale caught in one year shortly before myxomatosis struck. The seven farms are on the east side of Bodmin Moor and the table shows how relatively few rabbits (5.6 per trap for the year) were caught by the 900 gins which had to be taken up and re-set in a new place every third day. Trapping was not an easy way of making a living.

TRAPPING RECORDS for Mr Len Neale, Trewint for the season 1951-52							
Farm Name	Farm size (acres)	Rabbits (per year)	Rabbits (per acre per year)	Weight (lbs)	Price per lb (shillings)	Receipt (£)	£ per acre
Trezibbett	110	626	5.7	1532	1/-	77	0.7
Inner Treselland	80	381	4.8	973	1/2d	56	0.7
Outer Treselland	160	428	2.7	1093	1/2d	63	0.4
Hendra	140	751	5.3	1902	1/2d	110	0.8
Trerithic	220	1960	7.7	4192	1/1d	226	1.0
Trelawn	100	516	5.1	1242	1/-	52	0.5
Alternun	60	673	11.2	1623	1/-	68	1.1
Total rabbits caught = 5065 in 1 year				Weight = 5.5 tons		Sales = £652	

The author himself, like many another country boy, was given the task of catching rabbits during the war, when food was rationed. The traps used to be set along a length of hedge, with a trap in every run and at the entrance to every hole. Each trap was set into the ground so that its top was level with the surface, the spring being covered with thin turf and the foot-plate with sifted earth. Most rabbits were caught during the first night and, after a day or two, the traps were moved on. In this way, the farmer hoped that all the rabbits in that section of hedge would be dealt with. But, once all was quiet again, rabbits moved in from other untrapped hedges. Naturally it did not pay the trapper to move his traps to a hedge until it had plenty of rabbits, so really he was only reducing the population, not eliminating it.

There were several types of gin trap. Some had longer-lasting springs, and there was a make called Li-lo which fitted lower into the ground so that the rabbit was less likely to see it. When both front legs were caught, there was less disturbance to the run so that the reset trap would have a better chance of catching another. The teeth of most new gins closed tightly together which meant that they often broke the bone of the rabbit's leg(s) and sometimes the rabbit would escape leaving part of its leg behind. To lessen this risk the author remembers, when he had to use new traps, hitting and bending the jaws so that they did not quite meet.

Although the Ground Game Act 1880 required that the traps should be set only in the hole entrance, this was usually ignored, as here the rabbit was at its most cautious and likely to detect the trap. Within a few years this law was a dead letter and traps continued to be set in the runs at the hedge bottom where the rabbit was jumping down off the hedge and less likely to detect the trap. This meant that cats and dogs were also caught, but this was reckoned to be the animal owner's fault for letting them stray. Many a farm cat lived for a large part of its life with only three intact legs. Another adverse result of setting gins in the open was that proportionally more rabbit-predators were caught than rabbits. The Protection of Animals Act 1911 made it compulsory to inspect gins and snares every day between sunrise and sunset, which most trappers did anyway because rabbits left in the traps for longer were often killed and eaten by foxes and other predators.

During the Second World War, and afterwards, temporary permits were issued by the Ministry of Agriculture and Fisheries allowing traps to be set in the open where trapping in the entrances of burrows was shown to be uneconomical. This merely legalised what most trappers were already doing.

GIN TRAPS BANNED, MYXOMATOSIS ARRIVES

The gin trap was made illegal about sixty years ago and considerable expense and effort was put into inventing an alternative humane rabbit trap which would instantly kill the rabbit. It also had to be practicable for the commercial trapper in ease of setting, and of being carried around the farms in hundreds in all weathers. Several designs emerged, the most favoured being the Sawyer trap and the Fenn trap which were supposed either to kill the rabbit instantly, or miss it altogether. Since gins were made illegal, only legally-approved spring traps could be used. They had to be set in the



Fenn trap (left) and Sawyer trap were brought in as hopefully more humane than the gin trap.

mouth of the burrow, so were often ineffective as the rabbits avoided them. Spring traps and snares had to be visited at least once daily.

The costs of replacing gins with more humane alternatives would not be too much for the trappers, it was thought, if done over several years. In the event, trapping was made redundant by the introduced myxomatosis disease which, in Britain, is carried from rabbit to rabbit by its fleas. Diseased rabbits become blind before dying, and it was easy for infected rabbits to be caught alive and deliberately moved across Britain to new areas, the idea being to benefit the commercial farmer. The lethal effects of the disease in local rabbit populations caused trappers to lose their livelihood almost overnight, as over 99% of the rabbits died. The sudden cessation of rabbit grazing on many cliff and other un-farmed habitats had a profound effect on some wild flower and insect species. Fox raids on poultry soared, and the buzzard population declined.

The effect of the first myxomatosis epidemic (1953-55) on hedges in Cornwall was immediate, and excavation of the core of the hedge ceased. The perpetual need for hedge repair of fresh rabbit damage virtually ceased. This lucky state of affairs for hedges continued for some 20-30 years but gradually the inter-relation between the disease and the rabbits changed. Infected rabbits, disorientated by blindness, tend to live and die above ground, thus reducing the transfer of the disease-carrying fleas, while a degree of immunity developed; more rabbits survived to pass the disease on to others, a classic example of a disease surviving by not totally eliminating its host. Oliver Rackham suggests that 'the terrible selection imposed by the disease has produced a tough unsociable rabbit which lives on the surface and so does not infect its colleagues.' Many people agree with him, thinking that the rabbits' natural defence against myxomatosis has been by living above ground where they would not pick up the fleas, and that this has re-selected the ancient strain of rabbit which lived naturally above ground. This makes rabbits easier for foxes and other predators to catch, so as the disease lessens, those rabbits that escape the foxes by going underground are of the naturally burrowing strain. It may be that the two strains cycle with the disease.

Nowadays myxomatosis is endemic in our rabbit population. Locally rabbit numbers increase until in many places they are again inhabiting the hedges and eating substantial amounts of the farmers' crops, then the disease usually strikes again, reducing numbers. People have noticed that each time the disease strikes, it seems to do so with less vigour, leaving more survivors than in earlier outbreaks. In some areas, rabbits have become so plentiful that there is

again serious excavation of some hedges and, with the less certain effects of myxomatosis, farmers are again seeking ways of control. The problem is made worse by lowered numbers of predators, fox, stoat etc, which take longer to recover as the rabbit populations fluctuate with the disease. Research is needed into the causes of rabbits becoming liable to burrow, as against living above ground.

With myxomatosis now much less effective, some populations are locally over half of the pre-myxomatosis levels. Rabbit Haemorrhagic Disease (RHD) arrived in Britain in 1994, and has been spreading. Its ecological effect is not known but is not thought



Rabbit suffering from myxomatosis. Typically it is wandering on the road verge (as indicated by the infestation of heliotrope and the plastic litter) in broad daylight. A high proportion of road deaths are likely to be infected rabbits. [Photo: Mark Ventham.]

to be dramatic except perhaps locally. Unlike myxomatosis, an RHD-infected rabbit dies within 30 hours, so is less likely to be seen wandering above ground, and has less scope to pass on the disease except to its nearest neighbours.

OTHER CONTROL MEASURES

In the days before myxomatosis, many Cornish farmers contained the rabbit problem by care of their hedges. Hedges which had had many holes and been excavated out by rabbits during the Depression Years before the war were rebuilt, taking one field at a time. Year after year, good farmers looked after their hedges by regular trimming of the sides and prompt attention to loose stonework, while keeping an open top with scrubby or tree growth. This sufficiently discouraged the invasion of rabbits and the odd hole started in the top was easy to see and deal with; these entrances were filled in with stones and a sod and stamped down. Failure in this vigilance and neglect of small repairs, especially the routine hammering-in of loose stones in the hedge side, was the main cause of infestation, which then led to the search for other methods of control.

In theory phosphine gas, snares and long netting may be effective, but these methods were available and commonplace before myxomatosis and seemed no better than for controlling rabbits. Electric netting is a useful temporary measure, especially for high value crops. Wire netting is costly, requires regular maintenance and has a limited life. Although both protect crops, they do little to stop deterioration of the hedges, unless rabbit-fenced on both sides which is unusual and costly. Today cauliflower crops are often netted around temporarily against rabbits.

Snares are superficially attractive because they are inexpensive, but their success relies on the diameter and height at which they are set. Their humaneness is questionable and they ensnare non-target species. They must not be self-locking which strangles the rabbit. The snare has to be set to the size of the rabbit using the run, otherwise it gets knocked aside. For an adult rabbit, the wire should be set four fingers-width above the grass, and for a young one, two fingers. They are not very effective except in a well-used run where the rabbits are travelling fast. In Devon is the sensible custom of a hedge-owner's right to set snares for a distance of one landyard, 18ft (5.5m), out from his hedge in his neighbour's field. Obviously the disturbance of setting snares or traps on only one side of a hedge encourages the rabbits to go out on the other side.

The last generation of professional trappers and the domestic and catering market for wild rabbit vanished with the onset of myxomatosis and there is no worthwhile reward for a new generation. The author's experience with the Sawyer spring trap was that it was not easy to set correctly, and frequently missed its quarry. The Fenn trap was no better and neither may be available today. Advertised today (2006) is the Springer Multi-purpose No. 6 Rabbit Trap (cost £8) which is similar to the Sawyer and Fenn and may suffer from the same disadvantages. Other Defra-approved spring traps include the Imbra, Jubu, Victor Conibear and the BMI Magnum. Each consists of a pair of steel arms, triggered by the rabbit treading on a plate, which clamp around the rabbit's neck. Spring traps must be set only within the overhang of a rabbit-hole or an artificial tunnel, to avoid catching domestic pets.

On the market are several pit-fall or drop-box traps, of a type which has been in use since at least the 18th century. They have a box which is set into the ground, and a ground-level tunnel containing a simple trapdoor. It is set alongside a long stretch of rabbit netting. This can be a permanent fence around the field, or a 100m length of nylon net, at least 50cm (20") high with a 6cm (2¼") mesh, that is positioned temporarily between the rabbit-infested hedge and the

crop. For a fortnight, the trapdoor is locked so that rabbits learn to travel over it in safety, then for several nights, the trapdoor is set so that the rabbits fall uninjured into the pit underneath. Then it is locked again for the next fortnight for the new incoming rabbits to get accustomed to travel over it safely. It can be left there, being reset every fortnight, for the duration of the crop. The practical disadvantage is that when the farmer has his length of wire netting which keeps the rabbits off his crop, there is less reason why he should buy and set the trap, with the added task of disposing of the rabbit carcasses after he has killed them. Where eradication of rabbits in an area is required, or where a netting fence is not totally rabbit-proof, this method is probably as effective and humane as any, and once installed is not too time-consuming. The cost of a hot-dipped galvanised drop-trap was about £60-£70 in 2002. An alternative is the above-ground cage trap which is made of steel mesh and is baited with carrot, but is able only to catch one rabbit at a time and is prone to vandalism. This trap may be useful to gardeners.

Long netting involves the erection of long lengths (50m-100m) of net (mesh 5cm for young rabbits) about 90cm high, on posts placed about 4m apart between grazing rabbits and the hedge. This is erected during the day, with the netting strung up and suspended above the ground. Then in the late evening after the rabbits have come out into the field, the cord is pulled which allows the netting bottom to fall to the ground, so the driven rabbits run into the net and become sufficiently entangled to be caught. It is a useful method where rabbits are plentiful but more of a sport than an effective control measure.

Gassing, using aluminium phosphide tablets which release phosphine gas on contact with moisture, may reduce rabbit populations by 80% when done properly. One of the problems is the stopping of every hole, including those not used and grown over, and outlying rabbits need to be driven in first. So gassing can realistically be done only in the late winter after growth has died back, and there are fewer rabbits living above ground. After the tablets have been put in, the blocked holes are examined 2 days later, and those which have been opened are blocked, with more tablets put inside. As time goes by, neighbouring rabbits move in, and odd holes will be opened. These should be blocked again before the rabbits have a chance to settle down and breed. Whether gas is used each time the holes are blocked is a matter of choice.

Persistent blocking of all holes is required for gassing, and as this action itself eventually

drives rabbits away and prevents incoming rabbits from settling down, it is a question whether the gas is actually needed. Cymag, which produced hydrogen cyanide gas, is no longer an approved product. Aluminium phosphide, which is sold under the trade names of Talunex and Phostoxin as being suitable for gassing rabbits, rats and moles, is allowed under the Prevention of Damage by Rabbits Act 1939. The Health & Safety information is that aluminium phosphide is 'very toxic if swallowed and by inhalation, harmful in contact with skin and highly flammable'. It is a dangerous chemical and there are statutory instructions and precautions on how it should be used. There is no guarantee that gassing ensures a humane death, particularly in view of the difficulty of making sure all ventilating holes and fissures are blocked. Indeed, if not instantly effective it would be extremely inhumane.

Intoxicants have been tried unsuccessfully, including parsley soaked in brandy, which were supposed to make the rabbits easy to catch by hand. Rabbit repellants, which are covered by the Control of



Where stones have fallen out of the hedge, even quite high up, rabbits will take the opportunity to make a hole.

Pesticides Regulations 1986, are variable in effects and expensive to apply. They may be cost-effective for town gardens but repeated applications are usually necessary. Hole-blocking combined with first placing inside old-fashioned mothballs or a piece of cloth soaked in creosote or paraffin to make an unpleasant smell are probably more effective in causing rabbits to disappear from the burrow.

Some farmers still use the traditional methods of ferreting and lamping. Today these are usually employed more for their sporting entertainment than in seriously reducing numbers. For any method to earn the name of control, it has to be employed at sufficiently frequent intervals. Lamping, with a battery-powered light and a good lurcher dog, has always been popular in Cornwall, and was used with good effect by Len Neale, among many others. His dog used to bring to him as many as 65 rabbits in one night's lamping, and he said that he got tired before the dog did. It is undoubtedly the most humane way to catch a rabbit as, without preliminary fears, it is dazzled by the light while the dog takes it swiftly and painlessly. Lamping using shotguns and the headlights of a pick-up truck may be exciting but is unsafe especially if done by amateurs. Any use of a rifle at night is positively dangerous, a 0.22 rifle bullet kills at one mile. Often more rabbits are wounded by shooting, later to die, than are killed cleanly.

Hunting rabbits with ferrets has been transformed by the use of radio-location, whereby a laid-up ferret can be easily and exactly located in the hedgebank. This means that usually the careful removal and replacement of just one or two stones gives direct access to the ferret. Line-ferrets are no longer required. One small easily-seen white jill is all that is now needed, excepting in a wide hedge with more than one tunnel running the length of the hedge which may need several ferrets to get the rabbits to bolt. Ferreting is really only effective in winter with less plant growth and fewer baby rabbits.

Taking rabbits by ferreting using purse nets is time-consuming and needs two people to work a hedge. Often the side and top growth on a hedge prevents some holes from being set with purse nets. There is usually a tunnel running the length of the hedge, so if only part of the hedge is netted the rabbits will get away. Even without nets, bolting rabbits will run along the top of the hedge, under the growth, and the alternative of shooting them becomes dangerous. The most simple and effective humane method is, as always, to ferret without nets but with a ring of half-a-dozen good rabbiting dogs, who watch the holes ready to pick up the rabbits as they bolt out, and kill instantly and cleanly.

Enclosure by hedges largely put paid to the art of falconry where falcons are mainly flown at birds. The hedges provided cover for the quarry to put in. The art was introduced into Britain in AD 860 and until the middle of the 17th century was 'followed with an ardour that perhaps no English sport has ever called forth, not even fox-hunting' [Encyclopaedia Britannica]. It has not died out and today there are about 150 falconers living west of Taunton. One part of the sport which has survived is that of using hawks with ferrets against rabbits in Cornish hedges. Traditionally goshawks have been used in this role. Nowadays the Harris hawk, which was introduced from Arizona around the mid 1970s, has revolutionised hawking in Britain because it is an easier bird to look after, superseding the goshawk in popularity even though a good goshawk will usually out-perform a good Harris hawk. A Defra license is needed for a goshawk, but not for a Harris hawk because it is not native to Britain. To purchase, it is only half the cost of a goshawk. It is related to our buzzard and, because it enjoys some of the buzzard's easy-going temperament, is much easier to train than the goshawk. It stands about 60cm high, with a wing span of about 80cm, is simple to breed and is a lot less demanding in day-to-day care.

In hunting, the falconer stands on top of the hedgebank, so that the bird can see the field on both sides of the hedge, while helpers each side look after the ferret. The bird is aware of the bolting rabbit before it emerges from a hole, but the falconer waits until the rabbit is well clear of the hedge before releasing the hawk. This is to avoid the hawk's flying into the wire fence which

usually runs along the hedge, or mistakenly seizing the ferret which is likely to be emerging from the hole. Whereas a goshawk should be flown four or five times a week, a Harris hawk needs only to be flown once at weekends (although the more often it is flown, the fitter it will be) and it can be exercised without hunting. It can also be hunted in groups, either by several falconers, or even with two birds on the same wrist. A fit bird will take seven or eight rabbits in a day's hunting. The season runs from October to February to reduce the chances of the hawk taking baby rabbits, as this makes it lazy, and then it will refuse to take full-grown rabbits. The Harris hawk will also take pheasant and partridge, thus providing an alternative enterprise for a game shoot.

RABBIT CONTROL BY GOOD HEDGING

The place of the rabbit in the ecology of the Cornish countryside may not be properly appreciated, but a benign tolerance is allowing rabbits to wreak havoc in our hedges again. They should be kept out of our prehistoric hedges, a valuable part of our heritage and an enhancement to the tourist industry. Farmers are well aware of both the loss of their crops and the structural damage to the hedges. Repairing hedges used to be the main work in winter for many farm workers. Once a length of hedge had been repaired, including filling in the rabbit holes and putting back all the stones, the better farmers would make sure that a watch was kept for rabbits trying to come back into the hedge from elsewhere on the farm or from a neighbour. Even water is no barrier, as rabbits are quite well able to swim.

With a well-built Cornish hedge in good repair, the only way to dig a burrow into the hedge is from the top. This means that when the rabbit travels to and from the feeding area in the field, it has to go down and up the side of the hedge, exposing itself to predators. When



An open invitation to rabbits where the builder of a new hedge has left ill-fitting gaps between stones. If they will admit a hand they will admit a rabbit.

building new Cornish hedges, the placing of a length of plastic-covered wire netting below the top layer of turf and soil effectively prevents rabbits from starting a new hole from above. When well-knitted into the hedge, it also reduces the risk of the hedge top being broken down and a gap started.

A problem today is that new hedging is too often inexpertly built, with grounders (foundation stones) set too shallow, and leaving spaces between the stones that are an open invitation to rabbits. A hole about the size of a man's fist is big enough to let a rabbit in, and it needs only one opportunity.

Another of today's problems is that time and labour are at a premium, but it is well worth fitting in hole-blocking. Control of rabbits by prevention of holes has a double benefit in that it keeps the hedge in repair relatively painlessly on the principle of "a stitch in time". Obviously if the hedge is already in a rabbit-infested and tumble-down condition there will be an initial effort of trouble and expense; a few repeated sessions with lamp and dog, and gradual re-building of the worst sections of hedge. After that, an inspection about once a month is enough to detect the first holes which should be promptly filled in with stones and turf, and stamped down. The rabbits will try to re-open the hole, but are discouraged by its being blocked again.

To rid a whole farm of rabbits just by blocking holes, and keeping them blocked, may seem fanciful or unrealistic, but it works, especially if combined with mothballs put into each hole before blocking. Like any wild animal, a rabbit dislikes being hustled and as long as fresh holes are stopped up, and a watch kept on them for a few days, the rabbits will go away. Within a year there will be no evidence that there were ever rabbits there. The trick is to work gradually outwards, perhaps over several years, from a convenient central point on the farm, making sure that both sides of each hedge are dealt with at the same time. Incoming rabbits usually start opening up holes at the same locations, so effective control is maintained by just keeping a eye on those places, and blocking up the few new holes each time. Field clearance stones or the farm's stockpile of hedging stone provide suitable stone for hole-blocking. The cost of time in stopping these holes is recouped by increased crop yields and fewer and far less costly hedge repairs.



Hedge carelessly built on the surface of the ground instead of setting the grounders in to a proper depth allows rabbits to enter at ground level.

With turf hedges, rabbits will usually start their holes at field level. Where there are existing holes, naturally they will be opened up first. As with Cornish hedges, the best deterrent is to block up the holes as soon as they are dug. It is a perpetual war of attrition and the secret is to continue even when rabbit numbers drop. To many landowners today, this might seem to be a waste of valuable time when there are so few workers on farms; but the alternative is likely to be a gradual return to pre-myxomatosis levels of rabbit infestation, with serious crop losses and eventual ruination of the field hedges. As the hedge gets excavated into the field, there is a migration of hedging stones from the hedge into the field which have to be picked up by hand to prevent damage to forage harvesters and other equipment. On livestock farms, the gradual reduction of the height and density of the hedge means farm animals will be able to see into the next field and think they can easily climb over, even using the excavated soil as a ramp. Whereas previously a single strand of barbed wire each side sufficed, now two or three strands and extra posts become necessary.



Typical rabbit entry in an old, poorly built hedge, as found on many 19th century miners' smallholdings. Easily blocked by knocking in a stone.

For a farm to be relatively freed of rabbits by following these points of hedge maintenance may take several years, but is reflected in its value. When tenanted farms are returned to their landlords, the dilapidation compensation for rabbit damage to hedges, and the costs of getting rid of the rabbits and repairing the hedges, may far outweigh the value of any growing crops which the landlord is taking over, and can swallow all the tenant's savings for his retirement. This burden may be lessened by the Landlord and Tenant Act which limits dilapidations to the amount by which the value of the farm is diminished.

The attitude of an individual landowner to a rabbit problem varies from a purely short-term policy of profit this year, to a long-term ambition of making and keeping good hedges. With the move towards protection of wildlife, voices are heard supporting this potentially dreadful pest, the rabbit, as being necessary for buzzards, stoats and foxes, while very many people see it as an innocent, charming-looking creature (as indeed it is) much loved for its place in children's literature. This conflicts with the 1954 Pests Act which requires that all occupiers must control rabbits living on, or resorting to, their land and to prevent damage to neighbouring land. There may be no objection to a few rabbits, say a half-dozen per hectare, but they can increase into a plague far too quickly. The issue is how to keep them in check with the least expense to the farmer and minimal suffering to the rabbit. Serious conservationists support humane control of rabbits as a necessary measure in maintaining the balance of species where this is upset by too great an increase in numbers.



A rabbit-hole like this in the side of a Cornish hedge is easily blocked with a stone to discourage entry. Repeated blocking causes rabbits to move out.

Unrestricted rabbit infestation leads inexorably towards an urge for more hedge-removal instead of proper maintenance. Hedges are left to run down and become a nondescript scrub-covered line of stones and earth with little semblance of the original hedge. This can too easily be bulldozed or even ploughed out with ordinary farm machinery. Legislation to prevent the removal of hedges is very difficult to enforce when there is little or no hedgebank remaining. However even these hedge remnants are of considerable value to wildlife, being fenced on each side on livestock farms, and only need to be side-trimmed on arable farms. They will also keep much of the historic significance and scenic value of the landscape, and should be retained. Limited funding under Defra environmental schemes is sometimes available for their restoration but no money is available for restraint of the rabbit population.

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