

The wild rabbit: plague, polices and pestilence in England and Wales, 1931–1955

by John Martin

Abstract

Since the eighteenth century the rabbit has occupied an ambivalent position in the countryside. Not only were they of sporting value but they were also valued for their meat and pelt. Attitudes to the rabbit altered though over the first half of the century, and this paper traces their redefinition as vermin. By the 1930s, it was appreciated that wild rabbits were Britain's most serious vertebrate pest of cereal crops and grassland and that their numbers were having a significant effect on agricultural output. Government took steps to destroy rabbits from 1938 and launched campaigns against them during wartime, when rabbit was once again a form of meat. Thereafter government attitudes to the rabbit hardened, but it was not until the mid-1950s that pestilence in the form of a deadly virus, myxomatosis, precipitated an unprecedented decline in their population.

The unprecedented decline in the European rabbit (*Oryctolagus cuniculus*) in the mid-twentieth century is one of the most remarkable ecological changes to have taken place in Britain. Following the introduction of myxomatosis into Britain in September 1953 at Bough Beech near Edenbridge in Kent, mortality rates in excess of 99.9 per cent were recorded in a number of affected areas.¹ Indeed, in December 1954, the highly respected naturalist Robin Lockley speculated that 1955 would constitute 'zero hour for the rabbit', with numbers being lower by the end of the year than at any time since the eleventh century.²

In spite of the rapid increases in output and productivity which British agriculture experienced in the post-myxomatosis era, the importance of the disease as a causal factor in raising agricultural output has been largely ignored by agricultural historians.³ The academic neglect of the rabbit as a factor influencing productivity is even more apparent in respect of the pre-myxomatosis era, particularly the period before the Second World War. There are, however, exceptions, the most important being the work of John Sheail.⁴ More recently Peter

¹ P. W. J. Bartrip, *Myxomatosis. A history of pest control and the rabbit* (2008), p. 57.

² R. M. Lockley, 'Myxomatosis, a factual survey', *Field* (Dec. 1954), pp. 1174–5.

³ Bartrip, *Myxomatosis*, p. 142.

⁴ The leading historian of the rabbit is John Sheail. See, for example, his *Rabbits and their history* (1971), 'Changes in the supply of wild rabbits', *AgHR* 19 (1971);

'The management of an animal population: changing attitudes to the wild rabbit in Britain', *J. Environmental Management* 33 (1991); 'Wartime rodent control in England and Wales' in B. Short, C. Watkins and J. Martin (eds), *The Frontline of Freedom. British agriculture in the Second World War* (2007). A useful contemporary source is H. V. Thompson and A. N. Worden, *The Rabbit* (1956).

Bartrip's *Myxomatosis: the history of pest control* has appeared, although this focuses primarily on the history of the disease.⁵ A number of issues about the population dynamics of the rabbit have been largely ignored, in particular, the reasons for the long-term increase in numbers which we can attribute to the effects of game preservation and rabbit trapping. Similarly the work of the Oxford Bureau of Animal Population, which, during the 1930s and war years, undertook extensive research into methods of rabbit control, has received scant attention. The most obvious neglect however is the question of how far the changing demand for rabbits as a source of meat influenced their numbers and in turn determined the amount of damage they inflicted on the agricultural sector in the pre-myxomatosis era.⁶

I

The European rabbit was transformed from an animal protected and preserved as a source of meat and fur in the late nineteenth and early twentieth centuries to the status of agricultural pest. Following their initial importation as a captive species in about the twelfth century, rabbits were conserved in warrens or coneygarths in which they were hunted, and later farmed, for their meat and fur.⁷ Here, they were protected by warreners who were employed to ward off both predators and poachers. Those animals which escaped formed feral colonies.⁸ But it was during the agricultural revolution of the late eighteenth and early nineteenth centuries, when the emergence of new rotational field systems provided the rabbit with a constant supply of food throughout the year, that they began to proliferate in the wild.⁹ These changes in the management of the countryside enabled the species to prosper at a time when commercial enclosed warrens were being abandoned. Rabbits thrived in particular on free-draining lighter soils where waterlogged burrows were not a problem, and on estates where game preservation predominated. Not only did gamekeepers protect the rabbits from poachers, but they also ensured that tenant farmers did not engage in their indiscriminate destruction.

It was not until the legislation of the Ground Game Act of 1880, which conferred the right to kill rabbits and hares on the occupiers of land, that the legal monopoly enjoyed by the gentry was finally broken. This legislation was highly significant in that it acknowledged the deleterious effects of game conservation and hunting on the agricultural output of many estates. It stated that 'in the interests of good husbandry, and for better security for the capital and labour invested by the occupiers of land in the cultivation of the soil' that 'further provision should be made to enable occupiers to protect their crops from injury and loss by ground game', which the legislation denoted as rabbits and hares.¹⁰ The indiscriminate or excessive killing of animals by tenant farmers was, however, prevented by 'threats of eviction and half-promises of compensation'.¹¹

⁵ Bartrip, *Myxomatosis*.

⁶ J. Martin, 'The impact of government intervention on agricultural productivity in England and Wales, 1939-45' (Ph.D thesis, University of Reading, 1992), pp. 239-61.

⁷ Sheail, *Rabbits*, pp. 74-80.

⁸ Id., 'Changes in the supply of wild rabbits', p. 175.

⁹ Id., *Rabbits*, pp. 133-41.

¹⁰ Ground Game Act, 1880.

¹¹ J. Sheail, 'The Rabbit', *Biologist* 31 (1984), p. 137.

The subordination of agriculture to shooting and game preservation intensified during the late nineteenth century, reaching its zenith in the golden days immediately preceding the outbreak of the First World War. By this time approximately 50 per cent of the agricultural land of England and Wales was subject to some form of game preservation.¹² Game shooting was the country's most rapidly expanding rural sport, with new participants outnumbering those in fox hunting. In 1911 more than 25,000 full time gamekeepers were in employment and, in many rural parishes, they were twice as numerous as policemen.¹³ Nor were they the only group employed to assist with game conservation. At an extreme, on the 23,000-acre Elveden estate in Suffolk, 70 men were employed in the game department, including 24 liveried men, 30 warreners, 16 horsemen, wire-fence men and others.¹⁴

Sharing the same natural predators as the pheasant and partridge, hares and rabbits benefited from the increased number of gamekeepers and the prevailing system of game preservation. Vermin control on shooting estates eliminated a wide variety of game bird predators, including weasels, stoats, and foxes, which had also kept the rabbit and rat populations in check. While Lord Walsingham and Sir Ralph Payne-Gallwey cautioned against the indiscriminate slaughter of every living creature that might possibly interfere with game preservation, they nevertheless stressed the need to exterminate stoats and weasels which posed a threat to both game birds and rabbits.¹⁵

Rabbits benefited from the fact that whilst they were occasionally killed in large numbers on sporting estates, they were not usually shot during formal battue shooting in the autumn.¹⁶ Targeting low flying birds and ground game at the same time was potentially dangerous to beaters and adjacent guns. There are isolated examples of landowners vying with one another to shoot the largest number of rabbits on dedicated rabbit shooting forays, which usually took place in parks or land where bracken abounded. At Rhiwlas, just west of Oswestry, R. J. Lloyd Price's unstinting efforts to develop rabbit farming as well as game shooting culminated, on a day in 1885, when nine guns killed 5,086 rabbits. The record bag of all time was achieved on the Duke of Marlborough's Blenheim estate on 7 October 1898, when 6,943 rabbits were killed, together with 23 hares and 13 partridges.¹⁷

Rabbits were generally regarded as the prerogative of the gamekeeper. On hunting estates rabbits might be encouraged in order to provide an alternative food supply for foxes, thus distracting them from killing game birds. They were also killed in the late spring and early summer, when their meat was cooked and used as a source of protein for young pheasant and partridge chicks in the rearing pens. Before the development of blended rearing crumbs for pheasants in the 1950s, gamekeepers used a combination of biscuit meal and rabbits which had

¹² R. J. O'Connor and M. Shrubb, *Farming and birds* (1986), p. 232.

¹³ F. M. L. Thompson, 'Landowners and the rural community', in G. E. Mingay, *The Victorian Countryside* (2 vols, 1981), II, pp. 459–62.

¹⁴ G. Martelli, *Elveden Enterprise* (1952), p. 50.

¹⁵ Lord Walsingham and Sir Ralph Payne-Gallwey, *Shooting: Field and Covert* (sixth edn, 1900, repr. 1987), p. 276.

¹⁶ There were some important exceptions such as the Elveden estate where rabbits were shot along with hares on game shooting days. See E. Bujak, 'Sport and the survival of landed society in late Victorian Suffolk', in R. W. Hoyle (ed.), *Our hunting fathers: Field sports in England after 1850* (2007), pp. 78–9.

¹⁷ E. J. T. Collins (ed.), *The agrarian history of England and Wales*, VII, 1850–1914 (2 vols, 2000), I, pp. 799–800.

been cleaned, skinned and boiled before mincing. Even rabbit skins which, in late spring and early summer, were of little value to the fur trade, were not wasted, but placed in small heaps so that they could be attacked by blowflies when ripe, and the maggots shaken out for young poults as a delicious, protein-rich treat.¹⁸

Conventional shooting, as an adjunct to game shooting or rough shooting, although it provided sport for the participants, was a relatively ineffectual and costly means of dealing with rabbits from a pest control point of view, or for commercial gain. Indeed, as the research by the Bureau of Animal Population was subsequently to show, casual shooting had little effect on total numbers. More rigorous control methods were required.¹⁹ While rabbits and hares accounted for two-thirds of the poacher's haul, they were usually acquired by a variety of methods including ferreting, snaring or long netting rather than by shooting.²⁰

The most effective and cheapest way of catching rabbits on a commercial basis was trapping. This was a solitary activity as the Ground Game Acts had specified that, apart from household members and farm employees, landowners were only allowed to employ one trapper.²¹ Professional rabbit catchers operated primarily during the winter and early spring when the demand for meat and the quality of pelts were at their highest. Having low overheads, trappers covered substantial areas of land in order to catch a harvestable surplus. Their strategy was not to exterminate rabbits but to ensure that a viable breeding stock remained.

Spring or gin traps, developed in the late nineteenth century, were specially constructed, spring-loaded steel traps with four-inch steel jaws. The traps were set adjacent to the rabbit's burrow. When an animal or bird touched the pressure-sensitive plate, it caused a trigger release of the jaws, which tightly clasped the animal, often breaking its limbs in the process, and restraining it until the trapper returned to finish it off. Trapping was widely condemned by animal welfare groups as inhumane. One of the indirect consequences of trapping was that a disproportionate number of the rabbit's natural predators such as stoats and weasels were also caught, removing a preventative check on population growth.²² According to estimates provided by Lockley, between ten and fifteen per cent of the daily catch was made up of other species.²³

Trapping using gin traps was cheaper than shooting, and the meat acquired in this manner commanded higher prices as it was not contaminated with lead shot. Shot marks in the carcass became suffused with blood, making them less attractive to the consumer. More importantly pelts punctured by shot were not of sufficiently high quality to be used by the furrier for fashioning gloves, trimmings, coats or linings.²⁴ Much lower prices were obtained for damaged pelts which had to be sold to cutters, who treated them with chemicals, then shaved and

¹⁸ Information from R. Lillywhite, the wartime owner of 'The Wilts' game farm, Andover, Hampshire.

¹⁹ Bureau of Animal Population [hereafter BAP], *Report Number 2, Recommendations for the organisation and technique of rabbit control through the Agricultural Committees during the spring of 1940* (1940), p. 3.

²⁰ D. J. V. Jones, 'The poacher: a study in Victorian

crime and protest', *Historical J.*, 22, (1970), pp. 825–60.

²¹ *Parliamentary Debates (PD)*, Lords, 152, col. 9.

²² R. M. Lockley, *The private life of the rabbit* (1976), p. 126.

²³ *Ibid.*, p. 107.

²⁴ A. V. Campbell, 'The Rabbit problem', *J. Ministry of Agriculture* 46 (1939), p. 287.

cleaned the hair before selling them onto processors who retailed them to hatters. Yields of fur secured in this way were in the region of 7lbs per 120 pelts.²⁵ Premium prices were achieved by killing, gutting and skinning the animals according to specific criteria, and when the colour of the pelts was preserved by cooling and refrigeration.

In spite of the demand for rabbits for fur and meat, population levels continued to increase as a result of their ability to breed rapidly under a wide variety of conditions. Those born in early spring, for example, would produce their own litters before the end of the same year. Changes in land management and ownership initiated by the First World War further contributed to their long-term increase. In an effort to raise wartime agricultural production, game shooting and conservation were often severely curtailed, or even suspended. The number of gamekeepers plummeted as a result of enlistment into the Armed Forces.²⁶ As Mark Rothery has shown, the war years heralded a marked decline in both the number of shoots and the number of game birds shot.²⁷

With the cessation of military hostilities in 1918, there followed a brief revival in the fortunes of game shooting but, in 1921, the abrupt collapse in agricultural commodity prices compelled estate owners to prune their expenditure once more, particularly on extravagant activities such as game conservation. According to F. M. L. Thompson, nearly one quarter of the land of England and Wales was sold between 1914 and 1927, a figure which has been both challenged and maintained.²⁸ The majority of estates were purchased by sitting tenants who did not have the financial resources to continue with game preservation on the scale seen before the war. As the amount of game preservation declined, there are signs that rabbit damage increased.²⁹

By the 1930s the number of full-time gamekeepers had fallen by more than 44 per cent to 14,000.³⁰ Of these more than two in every three worked alone. The rest were either beat keepers working under the jurisdiction of a head keeper and looking after part of the estate, or apprentices in training. Even on a conservative estimate, only about 40 per cent of the agricultural land of Britain was subject to some form of gamekeeping in the 1930s.

A further factor which helps explain the explosion in rabbit numbers during the inter-war period was the resumption of the agricultural depression. This resulted in a rapid fall in agricultural prices, which undermined the viability of conventional methods of farming. It encouraged a switch to low-input methods of extensive production with the aim of economising. One of the most obvious features of this transformation was the reduction in

²⁵ Ibid., p. 286.

²⁶ G. K. Potts, 'The Effects of Modern Agriculture, Nest Predation and Game Management on the Population Ecology of Partridges (*Perdix perdix* and *Alectoris rufa*)', *Advances in Ecological Research* 11 (1980), p. 27.

²⁷ M. Rothery, 'The shooting party: the associational culture of rural and urban elites in the late nineteenth and early twentieth centuries', in Hoyle (ed.), *Our hunting fathers*, p. 114.

²⁸ F. M. L. Thompson, *English landed society in the nineteenth century* (1980), p. 332; D. Cannadine, *The*

decline and fall of the British aristocracy (1990), pp. 704–5 and the debate between John Beckett and Michael Turner, 'End of the Old Order? F. M. L. Thompson, the Land Question and the burden of ownership in England, c.1880–c.1925', and F. M. L. Thompson, 'The land market, 1880–1925: a reappraisal reappraised', both in *AgHR* 55 (2007), pp. 269–300.

²⁹ TNA, MAF 44/33; Campbell, 'Rabbit problem', p. 287.

³⁰ Potts, 'Population ecology', p. 65.

the arable acreage which, in the 1930s, fell by 8 per cent. This contraction was not indicative of economic failure as such, but was more the result of changing patterns of output and the re-allocation of resources between sectors in response to shifts in relative costs and prices. As research by Paul Brassley has shown, the gross output for UK agriculture at current prices increased from an average of £245.57 million for the period 1930–4 to £293.00 million for the period 1935–39. His computations not only seriously challenge the prevailing wisdom about the 1930s being a period of sustained depression, but indicate that agricultural output by value increased by nearly 20 per cent.³¹

The continuing contraction in arable farming, coupled with the increasing dereliction of the countryside, allowed hedges to grow unchecked, favouring the rabbit population. As Richard Hoyle noted in the context of hunting, ‘the new farmers had neither the obligation placed on them to eschew wire nor the labour at their disposal to maintain hedges’.³² Not only did the widespread adoption of barbed wire as a cheap and efficient fencing material undermine the need to maintain hedges, but increased scrubbiness created an environment favourable to the rabbit.

III

By the 1930s the rabbit population in Britain had increased to between 60 and 100 million, two or three for every acre of agricultural land. They were not equally distributed throughout the country, but predominated in areas of lighter soils, particularly in the eastern counties which also had the highest incidence of game preservation.³³

Little attention had been paid to the population dynamics of rabbits. As the leading animal ecologist and head of the Bureau of Animal Population at Oxford, C. S. Elton, noted in 1937, ‘It does not seem to be recognized how very little we know about the interacting populations of wild mammals and game birds’. Moreover, he lamented that ‘there are no authentic figures of the reproductive potential, life expectancy or sex ratio of even the common rabbit’.³⁴ In spite of his concerns, five agricultural bodies refused him funds for research into this area on the grounds that any findings on such a common animal would only be of interest to zoologists.³⁵

The size of the wild rabbit population was determined by a complex set of interrelated variables including predator-prey relationships and, most importantly, prevailing demand for rabbits as a source of meat. Historically rabbits were regarded as ‘poor man’s chicken’. They were consumed primarily by low income groups who were compelled by economic necessity to eat cheaper types of meat, including offal. As a result of mass unemployment caused by the Great Depression (1929–32), rabbit consumption increased.

The market for British wild rabbits in urban areas at this time was undermined by the increasing availability of keenly-priced imported rabbits, mainly from Australia. By the 1930s,

³¹ P. Brassley, ‘Output and technical change in twentieth-century British agriculture’, *AgHR* 48 (2000), p. 86.

³² R. W. Hoyle, ‘Introduction: field sports as history’

in Hoyle (ed.), *Our hunting fathers*, p. 10.

³³ Thompson and Worden, *Rabbit*, p. 60.

³⁴ Sheail, ‘Wartime rodent control’, pp. 204–5.

³⁵ *Ibid.*, p. 204.

TABLE 1. Gross imports, re-exports and net imports of frozen rabbits retained for home consumption

Year	Imports cwt	Re-exports cwt	Retained for Home Consumption	
			number	cwt
1932	546,238	23,354	20,915,360	522,884
1933	470,321	21,885	17,937,440	440,436
1934	508,421	12,330	19,843,280	496,082
1935	245,946	10,915	9,401,240	235,031
1936	162,808	8,499	6,172,360	154,309
1937	123,167	6,516	4,546,040	113,651

Source: A. V. Campbell, 'The rabbit problem', *J. Ministry of Agriculture* 46 (1940), p. 284.

rabbits had reached plague proportions in the Antipodes. As Table 1 shows, in 1932 nearly 21 million frozen or chilled rabbits were imported into Britain, 546,000 cwt by weight.³⁶ These high levels of exports partly reflected the policy of the Australian government to deal with the effect of the Great Depression by increasing exports of all agricultural commodities, including rabbits. Although imports quickly declined, as late as 1937 they amounted to more than 10 per cent of home-produced rabbits. Imported rabbits were not only significantly cheaper than fresh British rabbits, but were also more consistent in terms of quality and size. They were sold mainly in wholesale markets serving urban rather than rural areas, which were still well supplied with locally caught fresh rabbits.

In Britain, a conservative calculation of the number of wild rabbits killed each year in the 1930s, based on the number of home-killed skins available for export combined with those used in the hatter's fur industry, arrived at a minimum figure of 36 million.³⁷ These calculations were broadly confirmed in a speech by Lord Forres to a trade conference in 1941, in which he suggested an annual catch of between 40 and 60 million rabbits.³⁸ In terms of the area of land used for agricultural purposes, this equated to 1.2–2.0 rabbits per acre per year, equivalent to between 2.4 and 4 lbs of meat per acre. Even on pastures with good levels of management, this level of output was insignificant by comparison with the 90 lbs per acre of meat derived from cattle and sheep farming.³⁹ On poorer pastures, and particularly hill grazing, the national average for meat produced per acre was little more than 5 lbs per acre.⁴⁰ But in quantitative terms, the rabbit trade in the 1930s was a minor part of the meat trade as a whole, accounting for approximately only half the meat obtained from poultry production.⁴¹

During the years 1931–6, faced with an abundance of low-priced imported rabbits, shot

³⁶ Campbell, 'Rabbit problem', p. 284.

³⁷ *Ibid.*, p. 284.

³⁸ Reported in the *Shooting Times*, 15 Nov. 1941, p. 405.

³⁹ T. H. Middleton, *Food Production in War* (1923),

pp. 58–9; K. A. H. Murray, 'Food supplies in peace', *Lloyds Bank Rev.* (Oct. 1938), p. 486.

⁴⁰ Middleton, *Food Production*, p. 79.

⁴¹ K. A. H. Murray, *Agriculture* (History of the Second World War, 1954), p. 375.

rabbits could not be sold for more than 2d. or 2½d. a pound.⁴² Even in the late 1930s, when the demand for fresh rabbits was more buoyant, Wentworth Day had noted that a brace of shot rabbits was still worth less than 12d.⁴³ Rabbit consumption, like pork, was also very seasonal, with demand concentrated mainly in the autumn and winter months, when fewer, less appetising, 'milky' does, which were suckling young, were available. Given the rapid rate at which rabbits bred, the numbers killed in the 1930s were insufficient to prevent increases in the overall rabbit population.

By the 1930s rabbits were Britain's most serious vertebrate pest of both cereal crops and grassland. According to contemporary estimates, they reduced agricultural output by about 5 per cent. Crop damage by vermin amounted to an estimated £50 million per annum, or slightly more than 10 per cent of the annual output of British agriculture. Approximately half of this damage was caused by rats, 40 per cent, or in the region of £20 million, was attributed to rabbits and the remaining 10 per cent caused by other pests, primarily pigeons.⁴⁴

Subsequent research by Lockley indicated that this was a rather conservative estimate. Before the war, crop damage caused by rabbits alone was costing at least £20 million, possibly even as much as £50 million per annum. This was completely out of proportion to the income generated from the sale of dead rabbits and fur which he estimated at less than £2 million each year.⁴⁵ But even his figure for the loss of agricultural output was a conservative estimate of £20 million, which simply took into account the actual physical reduction in the yields of existing crops, and excluded the reduction in the area of land devoted to growing cereals or intensely-managed grassland because of the threat of rabbit damage. Not all farmers were able to distinguish adequately between crop damage caused by rabbits and that caused by leatherjackets.⁴⁶ Even the Ministry admitted that rabbit damage probably outweighed all other causes of loss.⁴⁷ In areas of lighter, drier soils where up to 16 rabbits per acre were recorded, damage was substantially more extensive than these national figures indicate.

Rabbits were also the cause of indirect problems for both cereals and grassland. The intensive grazing of winter cereals by rabbits seriously undermined the yields which could be obtained, and often discouraged farmers from pursuing tillage farming. Rabbit-infested fields were frequently subject to the total removal of crop cover for the first 15–20 yards from the boundary hedge where the burrows lay, allowing the incursion of weeds and a variety of plant parasites. Rabbits changed the composition of grassland by their close cropping of the best clovers and grasses, leaving behind unpalatable species.⁴⁸ Intensive close grazing by rabbits favoured the persistence of inferior species such as *Agrostis* which could flower at the height of a few centimetres.⁴⁹ As Sir George Stapledon acknowledged,

⁴² R. M. Lockley, 'Some experiments in rabbit control', *Nature* 145 (1940), p. 768.

⁴³ J. Wentworth Day, *Poison on the land* (1957), p. 68.

⁴⁴ Estimate undertaken for the Ministry of Agriculture by a Mr R. Genover in 1941. See TNA MAF 44/33.

⁴⁵ Lockley, *Private Life*, p. 127. Forres gave the pre-war value of the rabbit fur export trade as £930,000: *Shooting Times*, 15 Nov. 1941, p. 405.

⁴⁶ D. Moreton, 'Leatherjackets or rabbits?', *Farmer*

and *Stock Breeder*, 21 Mar. 1944, p. 471.

⁴⁷ 'Rabbits, wireworm, leatherjackets – caused most damage to crops in 1940', *Farmers Weekly*, 27 Dec. 1940, p. 17.

⁴⁸ R. G. Stapledon and W. Davies, *Ley farming* (1942), pp. 19–29.

⁴⁹ W. M. Phillips, 'The effect of rabbit grazing on a reseeded pasture', *J. British Grassland Society* 8 (1953), pp. 169–81.

rabbits were an important but largely ignored factor accounting for the general poor state of English grasslands.⁵⁰

Officials recognized that grassland improvement was of little value without adequate measures being implemented to control rabbits. One correspondent to the Ministry of Agriculture commented it was 'useless ploughing and reseeding run out, rabbit-ruined, and unproductive grassland just to feed more rabbits'.⁵¹ But the message was not fully endorsed by the farming community. In Wales, there was little concern about the damage caused by rabbits since 'they had become an accepted evil' and an endemic problem.⁵²

The key question was whether the problem should be tackled from the standpoint of extermination or control. Rabbit clearance was considered as a solution.⁵³ Instances have been noted of private individuals or organizations combating rabbit damage by protecting the perimeters of their holdings with rabbit-proof fences. Initiatives of this type were only cost-effective on larger blocks of land which could be economically fenced.⁵⁴ Given the ravages rabbits could inflict on young tree seedlings, the Forestry Commission actively pursued such a policy. Plantation land was initially cleared of rabbits, then close-mesh, rabbit-proof fencing was erected in an effort to prevent reinfestation.⁵⁵

An ambitious approach to reducing rabbit damage was adopted on the Elveden estate. Following the death of Lord Iveagh in 1926, his successor embarked upon a scheme to revive agricultural activities on the extensive heathlands, sandy brecks and tracts of bracken and heather where rabbits were particularly abundant. During the shooting season of 1921/2, 128,856 rabbits were killed, amounting to nearly six rabbits for every acre. In the late 1920s, in order to reconcile farming activities with the needs of shooting, thirty miles of rabbit-proof fencing were erected over two years as part of a policy of containment.⁵⁶

The most systematic pre-war attempt to deal with rabbits under commercial conditions was undertaken by the brothers A. J. and F. N. Hosier, who farmed in Wiltshire and Hampshire. Their overriding priority was to maximize profitability by exploiting economies of scale through a low-cost system of outdoor milk production. Hedges and even external boundaries were grubbed out and barbed-wire, stock-proof fences erected to increase the amount of land which could be used for crop production. This had the added benefit of reducing the number of rabbits on their holdings but did not prevent infestation from adjacent land. In an effort to address this issue, the Hosiers erected an eight-mile long, four-foot high, small-mesh fence, dug one foot into the ground, round part of the lands they farmed. This proved expensive to maintain, and the mesh was too large to keep rabbits out. Consequently they continued to employ two or three full-time rabbit catchers to keep populations in check.⁵⁷ Eradicating rabbits throughout the summer months, rather than killing them in the autumn and winter when demand was buoyant, frequently necessitated the burial of thousands of dead rabbits

⁵⁰ Stapledon and Davies, *Ley farming*, pp. 19–29.

⁵¹ TNA, MAF 44/19.

⁵² *Farmer's Weekly*, 15 Nov. 1940, p. 17.

⁵³ Campbell, 'Rabbit problem', p. 283.

⁵⁴ A. J. and F. H. Hosier, *Hosier's farming systems* (1951), pp. 109–110.

⁵⁵ Thompson and Worden, *Rabbit*, p. 162.

⁵⁶ Throughout most of the nineteenth century Elveden was primarily a sporting estate renowned for its excellent shooting. See B. P. Martin, *The Great Shoots* (1987), pp. 126–41; Martelli, *Elveden Enterprise*, p. 96.

⁵⁷ Hosier and Hosier, *Hosier's Farming System*, p. 105.

for which they had not been able to find a purchaser.⁵⁸ A more selective response to the rabbit problem by fencing was pursued by the progressive dairy farmer George Odium of Manningford, Wiltshire. On his farm, close-mesh, rabbit-proof fencing was used solely as a stop-gap measure on those boundaries where the adjacent land was heavily infested with the animals.⁵⁹

For many farmers there was, as S. J. B. Thorburn noted, 'a temptation to resign themselves to the inevitable' as, at a time of low agricultural prices, they were able to generate an income from the rabbits in the short term, either directly or by selling the trapping rights.⁶⁰ The pursuit of rabbits was also an entertaining leisure activity.⁶¹ There were plenty of farmers' sons dependent on rabbits for pocket money in lieu of wages.⁶² So long as the rabbits generated an income, there was a tendency to ignore their real costs.

III

The attitude of the state to the agricultural sector changed radically during the First World War. The Corn Production Act of 1917 established the principle of guaranteed prices for wheat and oats in order to encourage increases in output. In an effort to deal with the problem of pest damage, an Order in Council in March 1917 allowed the Board of Agriculture to authorize such action as was deemed necessary to prevent or reduce damage by game birds, hares or rabbits. War Agricultural Executive Committees were empowered to authorize entry onto any land to kill rabbits.⁶³ The Corn Production Act conferred similar powers on the Board of Agriculture and Fisheries with the proviso that the cost of such measures was to be recovered from the owners of the land. While Sheail acknowledges that these developments were 'unprecedented', lack of documentation means that it is not possible to ascertain how they operated in practice.⁶⁴ What is evident, however, is that the legislation was of short duration, as the need for financial retrenchment following the international crisis of 1921 and the collapse in cereal prices led to its repeal.⁶⁵

In wartime conditions rabbits might be redefined as vermin, but in peacetime the view of rabbits as property tended to reassert itself. Rabbits remained protected, both legally and informally, often with draconian penalties imposed upon transgressors. For example, at Lancaster County Sessions at St Helens in 1927, John Ramsbottom and Samuel Seddon were fined £10 and £5 respectively for trespassing with three long nets and for catching three rabbits. Despite questions being raised in the House of Commons about the severity of their fines, the Home Secretary, Sir W. Joynson Hicks, explained that it was not simply 'ordinary trespass' as the culprits were repeat offenders.⁶⁶

⁵⁸ Ibid., p. 110.

⁵⁹ *Odium v Stratton. Verbatim report of proceedings* (1946), p. 44.

⁶⁰ J. B. Thorburn, 'The rabbit racket', *The Countryman*, 30 (1944), p. 262.

⁶¹ A. W. Ashby, 'The farmer in business', *J. Proceedings of the Agricultural Economics Soc.* (Feb. 1953), p. 93.

⁶² Thorburn, 'Rabbit racket', p. 262.

⁶³ Bartrip, *Myxomatosis*, p. 27.

⁶⁴ Sheail, *Rabbits*, p. 197; Bartrip, *Myxomatosis*, p. 27.

⁶⁵ E. C. Penning Rowsell, 'Who "betrayed" whom: power and politics in the 1920-1 agricultural crisis', *AgHR* 45 (1997), p. 176.

⁶⁶ *PD, Commons*, 213, cols 1785-6.

Nonetheless, attitudes to rabbits were shifting. In an effort to alleviate the problem of crop damage caused by rabbits, a bill was presented to Parliament as early as 1922, authorizing local authorities to implement appropriate control methods. By 1930 no fewer than eight private members' bills to this purpose had been proposed, all of which failed to pass into law.⁶⁷ Measures were also introduced which would make the control of rabbits more difficult. In 1935 a campaign to abolish the use of the gin trap on humanitarian grounds, headed by Major C. W. Hume, chairman of the University of London Animal Welfare Society, resulted in the presentation of a private member's bill in the House of Lords.⁶⁸ It was narrowly defeated by a majority of 46 votes to 42, mainly due to opposition from rabbit trappers and the fur trade, who argued that there was no effective alternative method to the gin trap. The Ministry of Agriculture remained unsure of the most appropriate strategy to pursue.

The failure of so many private members' bills to reach the statute books prompted the House of Lords to establish a select committee in 1937 to investigate the effects of rabbit damage.⁶⁹ The two opposing sides on the committee were the large estate owners whose game preservation practices ensured a buoyant rabbit population, and enlightened farmers and foresters who resented the excessive damage caused by rabbits.⁷⁰ Humanitarian reservations about rabbit trapping were raised by the Committee. It suggested that traps might result in less physical suffering if they had rubber jaws instead of steel teeth. Extensive field trials run by the Ministry of Agriculture concluded that this was not a practical solution.⁷¹ But the experiment confirmed that using the gin trap in the open was considerably more indiscriminate in trapping and maiming a range of animals than if it was confined to the lip of the rabbit's burrow.

The possibility of controlling rabbits through the use of *Myxomatosis cuniculi* was also considered. This lethal virus had originated in South America in 1898, and appeared in California in 1930. Then, in 1933, at the invitation of the Australian authorities, Sir Charles Martin, the internationally renowned physiologist and pathologist, carried out a series of experiments on the virus and potential methods of transmission.⁷² His investigations, conducted under the auspices of the Cambridge University Department of Experimental Pathology, revealed that, in an enclosed paddock area of 500 square yards, the disease was 100 per cent fatal to wild rabbits.⁷³ More extensive experiments on the rabbit-infested island of Skokholm off the Pembrokeshire coast, however, had shown that the strain of the virus used required intimate contact between infected and healthy rabbits in order to ensure transmission of the disease.⁷⁴ The lack of suitable vectors to spread the disease, coupled with the tendency of the infected animals to isolate themselves and to squat in the open during the most contagious

⁶⁷ Editor's Diary, *Farmers Weekly*, 4 Aug. 1939, p. 2.

⁶⁸ *PD, Lords*, 97, cols 2–48.

⁶⁹ *Report of the Select Committee of the House of Lords on Agriculture (Damage by Rabbits) together with the proceedings of the committee and minutes of Evidence* (1937).

⁷⁰ TNA, MAF 44/18.

⁷¹ Anon, 'The control of rabbits' in *Agriculture* 46 (1939), p. 588.

⁷² C. J. Martin, 'Observations and experiments with *Myxomatosis cuniculi* (Sanarrlli) to ascertain the suitability of the virus to control the rabbit population' (Fourth Report of the Institute of Animal Pathology, University of Cambridge, 1934–5), pp. 16–38.

⁷³ Lockley, 'Some experiments in rabbit control', p. 768.

⁷⁴ Martin, 'Observations and experiments'.

period of infestation, was responsible for the failure of this experiment.⁷⁵ Martin concluded that the virus was not a viable way of dealing with the common rabbit.

Doubts were also expressed about the level of suffering inflicted on the animals before their death. In 1938 the Universities Federation for Animal Welfare undertook more field trials on Skokholm's rabbit population. These showed that the traditional method of gassing (by pumping smoke from a cartridge containing sulphur), caused a painful death. It could be more humanely undertaken by the use of calcium cyanide in the form of dust sold under the trade name of 'Cyanogas'.

Proof of the extensive damage caused by rabbits was also highlighted during these experiments. Following an estimated 96 per cent decline in their numbers, white clover proliferated where it had been rare, and the previously stunted grass grew much longer. Fields which had not been cut since the land had last been farmed in the nineteenth century yielded up to four tons of hay per acre. One hundred sheep were imported to graze down the aftermath, but these proved inadequate and the surplus grass was eventually beaten down by winter storms.⁷⁶ One significant finding of the trials was that the rabbits' reproductive rate was commensurately higher following depletion of their numbers. Under favourable conditions of abundant food supply, they continued to breed throughout the year rather than solely during the summer months.⁷⁷

There followed a number of legislative measures introduced by the government. The Destructive Animals Act 1938 gave local authorities the power to request the control of rabbits on private land. But it was not until May 1939 that the Prevention of Damage by Rabbits Act finally passed through both Houses of Parliament and received Royal Assent. The legislation specified that gin or spring traps should only be set within rabbit holes and not in the open. The editor of the *Farmers Weekly* heralded it as 'an end to the Rabbit Plague'.⁷⁸ Local authorities were empowered to compel owners or occupiers of land to destroy their rabbits when they were becoming a nuisance to their neighbours. Landowners who fell foul of the new law were liable to a £25 fine, in addition to a further £5 a day until necessary steps were taken. Section 4 of the act authorized the gassing of rabbits underground.⁷⁹

IV

The outbreak of the Second World War heralded an unprecedented shift in the state's relationship with the agricultural sector. Domestic food production had to be raised to compensate for reduced levels of imported feedingstuffs, which declined from 22 million tons in 1938 to 11 million tons by 1944.⁸⁰ The aim was to maximize the production of carbohydrate foods, particularly wheat and potatoes, which were regarded as the staple components of a

⁷⁵ Ibid., pp. 10–39; id., 'Observations on Myxomatosis cuniculi (Sanarelli) made with a view to the use of the virus in the control of rabbit plagues', *Bull. Council for Scientific and Industrial Research (Australia)* 96 (1936).

⁷⁶ Lockley, 'Some experiments in rabbit control',

p. 768.

⁷⁷ Ibid., p. 768.

⁷⁸ *Farmers Weekly*, 4 Aug. 1939, p. 10.

⁷⁹ Prevention of Damage by Rabbits Act 1939.

⁸⁰ R. J. Hammond, *Food: The growth of policy* (1951),

p. 5.

wartime diet. In contrast, the livestock sector, which was less efficient in terms of producing calories, was required to contract. The effect of wartime restrictions was particularly noticeable in the pig and poultry sectors, where output in 1944–45 was little more than 35 per cent and 65 per cent respectively of their pre-war levels.⁸¹

The newly established Ministry of Food took responsibility for purchasing agricultural commodities at the farm gate and for organizing the distribution of food to consumers. The Ministry of Agriculture continued to be responsible for coordinating production on the farm. The Defence of the Realm Act 1939 empowered the Minister of Agriculture to:

preserve and maintain agricultural land solely for the production of food, to control, by order, the cultivation, management and use of the land in order to secure maximum production of food from the farms: to terminate any tenancy of agricultural land where it is considered that the land was being neglected or badly cultivated: to introduce special measures for the destruction of birds, rabbits deer, vermin and pests.⁸²

In order to coordinate the food production campaign at local level, a County War Agricultural Executive Committee (CWAEC) was established for each county, with the task of implementing national policy objectives by encouraging farmers to carry out their directives. The terms of reference under which they had been established required them to take responsibility for the control of rabbits, rats, mice and other pests that reduced agricultural productivity.

In the early stages of the war, CWAECs experienced administrative difficulties in coordinating the pest control campaign. The Rabbits Order 1939 gave CWAECs new powers under Regulation 63 of the Defence Regulations to enter and take rabbits upon any land.⁸³ The Ministry of Agriculture was very circumspect about implementing this Order. In a circular letter sent to all CWAECs on 13 October 1939, they instructed that action should, as far as possible, be taken under the Prevention of Damage by Rabbits Act and, if it was necessary to resort to the Rabbits Order, details of each case must first be sent to the Ministry.⁸⁴

The powers of the CWAECs were subsequently extended⁸⁵ and, following the recommendation of the Bureau of Animal Population, Rabbit Control Officers were appointed to coordinate the task of destroying rabbits.⁸⁶ During the initial stages of the war, the Bureau continued to research and develop more effective methods of rabbit control. In the spring of 1941, Douglas Middleton, a leading researcher at the Bureau, embarked upon a twelve-month, half-time project with the Norfolk CWAEC to record and advise upon a large rabbit control campaign to establish the cost and effectiveness of cyanide under field conditions. According to the conventional wisdom this method proved so successful that the Bureau abandoned further

⁸¹ Murray, *Agriculture*, p. 375.

⁸² 'Britain eats to fight', *Fortune*, 27 (4), Apr. 1943, p. 162.

⁸³ The 1939 Rabbits Control Order transferred powers given to the Local Authorities to the War Agricultural Executive Committees under Section 63. The correct number was 66 not 63 as given so, in effect, by statute the WAECS had not been legally entitled to the right of entry onto private land.

⁸⁴ Circular letter to County WAECS in England and Wales, 13 Oct. 1939, WAC1151, Serial No. 41. See also BAP Report no. 12, 'An enquiry into County Organisations and Procedure for dealing with Rats and Rabbits in England and Wales', (1940), pp. 1–10.

⁸⁵ Ibid., p. 10, Ministry's Circular letter, 10 Jan. 1940.

⁸⁶ BAP Report no 2, *Recommendations*, p. 1.

research on the rabbit.⁸⁷ But pressure of work, particularly the need to expand the rat control study that was being undertaken at the same time, meant that the data had not been analysed by May 1942 when the work was suspended. Middleton was seconded to work full-time on what was deemed to be the more pressing problem of rat infestation.⁸⁸ In the following year the Bureau concluded that, while the rabbit remained a 'serious pest', it had 'made sufficient contribution to the control methods, for the rabbit problem to become mainly a human and administrative problem, which has not been completely mastered'.⁸⁹

The most popular gas used for rabbit destruction was Cymag, a derivative of cyanide which had been used in the 1930s.⁹⁰ This method was not always successful on dry, sandy soils that could not maintain a lethal density of the gas in the burrow.⁹¹ Experiments also revealed that its effectiveness was also limited by a tendency for rabbits to bunch themselves in the extremities of their burrows, enabling them to remain unharmed by the gas.⁹² Gassing was also unpopular amongst the farming community as dead rabbits could not be recovered easily, and there were concerns about whether the meat was fit for human consumption.⁹³ Despite assurances from the Ministry of Health that rabbits killed in this way were not contaminated, there remained widespread opposition to eating them.⁹⁴

The wartime decline in the incidence of rabbit damage was very impressive. As Table 2 shows, in July 1942, 46 per cent of the 296 crop reporters classified the decline as substantial and important, 69 per cent as measurable but not large, and only a mere 11 per cent as insignificant. A very similar response was provided in the following year. Sixty-five per cent of responses identified the decline as substantial, 28 per cent as measurable and only 7 per cent as insignificant. The accuracy of these responses is questionable, being based on the reporter's subjective assessments of the particular pests they observed, coupled with surveys of damage caused to particular crops. By 1944 according to officials, the survey had served its purpose and no further surveys were undertaken.⁹⁵

Quantifying the precise significance of these responses is rather problematic, since rabbits were not uniformly distributed throughout England and Wales. Data extracted from a random sample comprising 14 per cent or 40,000 of the 300,000 holdings investigated by the National Farm Survey, showed that 9 per cent of holdings (forming 12 per cent of the total area of crops and grass), were affected by rabbits or moles. The low incidence of infestation can be explained partly by the subjective assessments of damage that were carried out. Rabbits were not classified as having reached pest status until they were sufficiently numerous to affect production significantly, or until their presence imposed a limit on the range of crops that

⁸⁷ A. D. Middleton, *The control and extermination of wild rabbits* (1940); P. A. Crowcroft, *Elton's ecologists. A history of the Bureau of Animal Population* (1991), pp. 23–6; Sheail, 'Rodent control', p. 59.

⁸⁸ BAP, Report No. 21A, *Report by the Director upon progress in research during 1941–42*, p. 2.

⁸⁹ BAP, Report No. 21B, *Report by the Director on progress in research during 1943*, p. 8.

⁹⁰ TNA, MAF 131/5.

⁹¹ Anon, 'The control of rabbits', 588.

⁹² For a detailed analysis of the use of this gas see BAP, Report 12, *Enquiry into county organisations*, p. 6.

⁹³ Martin, 'Impact of government intervention', p. 249.

⁹⁴ BAP Report no. 2, *Recommendations*, p. 3.

⁹⁵ MAF 44/33.

TABLE 2. Responses of 296 crop reporters to the Ministry of Agriculture, August 1941–August 1943

<i>Improvement in rabbit damage</i>	<i>Percentage of crop reporters responding to each category</i>		
	<i>1941</i>	<i>1942</i>	<i>1943</i>
Substantial and important	46	69	65
Measurable but not large	41	20	28
Insignificant	13	11	7

Source: TNA, MAF 44/33.

could be grown.⁹⁶ Farmers had a vested interest in under-recording the extent of damage in case it incurred the wrath of their local CWAEC. What is clear is that the war brought about a significant decline in the incidence of rabbits. The debatable issue is the relative importance of the causal mechanisms which brought about this decline.

The Ministry of Agriculture and the CWAECs must take some of the credit for persuading farmers to address the rabbit problem, as they distributed a number of instructional pamphlets. These were prepared by the Bureau of Animal Population, who also organized courses for Pest Control Officers.⁹⁷ The campaign materials also included instructional films.⁹⁸ Campaigns were initiated for the widespread destruction of rabbits by trapping, snaring and ferreting, followed by gassing in an effort to eradicate any surviving pockets of rabbits. Individuals and groups under the jurisdiction of the CWAECs also played their part, although not all wartime activities were beneficial. For example, on the Elveden estate, which was used for tank manoeuvres, the military authorities pulled up some 25 miles of the estate's rabbit-proof fencing and left it in huge dumps along the main roads, allowing the rabbits to gain unfettered access to the growing crops.⁹⁹

The relaxation of pre-war restrictions on poaching also contributed to the reduction in the rabbit population. There was a tendency for some estate owners to pursue a less draconian approach to such illicit activities. However, it is easy to exaggerate the extent to which this took place nationally. A detailed scrutiny of local newspapers reveals that, even during the war, rabbit poachers were assiduously pursued as the authorities wanted to demonstrate that the old order still had its hand on the rural tiller.

Opportunities for poaching were increased through the 65 per cent reduction in the number of gamekeepers during the war, which meant that estates were less well preserved than in the past.¹⁰⁰ Unlike most other forms of agricultural employment, gamekeeping was not a reserved occupation. Recruitment had a disproportionate affect on younger men, leaving older, less

⁹⁶ 'Rabbits, wireworm, leatherjackets – caused most damage to crops in 1940', *Farmers Weekly*, 27 Dec. 1940, p. 17.

⁹⁷ BAP, *Report No. 21C*, 'Report by the Director on progress in research during 1944', p. 2.

⁹⁸ BAP, *Report No 2, Recommendations*, p. 3; *Farmers Weekly*, 13 Sept. 1940, p. 20. For an example of the films

produced, see *The Rabbit Pest* (1941), produced by Plant Protection Ltd, a copy of which is held by the Museum of English Rural Life, University of Reading, TR MAFF PH6/295.

⁹⁹ Martin, *Great shoots*, p. 134.

¹⁰⁰ Martin, 'Impact of government intervention' pp. 240–2.

active gamekeepers in charge of estates. Moreover many gamekeepers who retained their positions were required to undertake other forms of war work such as enlisting in the Home Guard, which distracted from their role in game preservation.

Enlistment or conscription into the armed forces also affected shooting. Dwindling numbers of paying guests and wartime shortages of petrol for private motoring caused rentals on the larger, more isolated estates to plummet. A shoot on a 2,500 estate near Salisbury with a keeper was being advertised for £170 in the summer of 1941, whereas before the war its rental value was £400.¹⁰¹ In contrast, the demand for rough shooting, which offered the opportunity to secure game and, more often, rabbits, was at a premium. By 1943, Scolopax, the renowned contributor to *The Field*, was advising his readers that 'It is a waste of time and money looking for rough [shooting] in the Home Counties – unless you are especially favoured. I have tried it and I know'.¹⁰²

Shooting activities were also disrupted by wartime restrictions on the production of cartridges.¹⁰³ In 1943 a quota was introduced which restricted each sportsman to 50 per cent of the number of cartridges he had purchased in the previous year. This particularly affected members of the forces who had been engaged on active service in 1942 and had purchased few, if any, cartridges. The rationale for this reduction was not necessarily prompted by a desire to curtail shooting but by the wartime shortages of gunpowder, and the need to prevent limited supplies from being diverted away from military purposes.¹⁰⁴ By this stage, however, there had been important and subtle changes in the motives for shooting, which changed from an activity the participants undertook primarily for sport or pleasure to a means of securing additional sources of meat. Consequently there was a more liberal approach to shooting etiquette, in particular the willingness to pursue a wider variety of methods such as trapping and snaring in order to achieve the objective.¹⁰⁵

This shift was prompted by the fact that, by 1943, meat output in Britain had fallen to 69 per cent of its pre-war level.¹⁰⁶ These quantitative changes obscured an even more fundamental qualitative change in the type of meat available. When consumers went to the butcher with their rationing coupons, they were given meat whose origin was not specified in terms of country. Nor was the type of animal from which it had come divulged, nor whether it was fresh, chilled or frozen. Many consumers purchased what was denoted as beef, but in reality the meat originated from dairy cows or other nondescript animals which had been culled as part as the wartime rationalization of the livestock sector. Rabbit, therefore, became an attractive form of meat. As the headline in *The Field* exclaimed, 'Once a Pest, Now a

¹⁰¹ *The Field*, 30 Aug. 1941, p. 1.

¹⁰² Scolopax, 'Rough Shoot Wanted!', *The Field*, 7 Aug. 1943, p. 135.

¹⁰³ Cartridge production was severely curtailed during the early stages of the war. In the days after Dunkirk, and in response to a feared German invasion, large numbers of 12-bore cartridges were loaded with a 16-bore size single ball which could be fired without damage by a 12-bore choked barrel. Such loads were completely useless for normal shooting and their

accuracy was impeded.

¹⁰⁴ Written communication from the Eley Company, 19 Dec. 1985. They had no surviving records of the war period but were confident that the output of shotgun cartridges for game shooting was seriously curtailed in response to the need to produce ammunition for war purposes.

¹⁰⁵ Scolopax, 'Rough Shoot Wanted!', p. 135.

¹⁰⁶ A. S. Milward, *War, economy and society* (1977), p. 252.

Necessity for the Larder'.¹⁰⁷ Not surprisingly, the prize-winning recipe in the wartime cookery competition organized by the *Farmer and Stockbreeder* in the spring of 1940 was for Baked Rabbit.¹⁰⁸ It has been claimed that wild rabbit was the only meat that some countrymen ate during the war years.¹⁰⁹ Such a claim about the increased popularity of rabbit meat is difficult to square with the view that the supply of rabbits declined rapidly during this period.

According to the official statistics, reproduced in Table 3, following a short lived increase in the supply of wild rabbits in the first year of the war, output had fallen by more than 60 per cent by the end of military hostilities in 1945. Based on the average rabbit weighing slightly less than 2¼ lbs when skinned and gutted, this would suggest an annual pre-war kill of less than 39 million for the UK as a whole in 1939, whereas from 1942 onwards the number of rabbits killed for meat was less than 14 million a year. However MAF openly acknowledged that these figures were subject to a wide margin of error. It is not clear, for example, how they were collated, or if they related exclusively to agricultural land. Wartime meat shortages encouraged a buoyant black market, resulting in large numbers of rabbits not being recorded in the officially collated statistics. (The 4 June returns omit rabbit production.¹¹⁰) But even if the official statistics fail to reveal the true dimensions of the trade in rabbit meat, they do show that throughout the war rabbits remained an important form of livestock production. In Pembrokeshire, for example, an area ideally suited to rabbits, the estimated production of rabbit meat in 1945 was 1460 tons compared with 2910 tons of beef, 352 tons of veal, 557 tons of sheep meat and 190 tons of pigmeat.¹¹¹

After 1940, rabbit meat was subject to a Maximum Price Order.¹¹² This fixed the price at a mere 6d. a pound in order to foster the complete destruction of the wild rabbit population. As the Deputy Prime Minister, Clement Attlee, explained to the House of Commons: 'the maximum price encourages the complete destruction of rabbits during the breeding season by gassing, any decontrol of the price might encourage the retention of a breeding stock'.¹¹³

The food production campaign of the Second World War has conventionally been hailed as bringing significant increases in agricultural output and, by inference, productivity.¹¹⁴ Explanations have focused on increased levels of investment in agricultural machinery and other infrastructure improvement such as drainage, raised crop yields per acre, and the expansion in the use of artificial fertilizers.¹¹⁵ The extent to which the decrease in rabbit damage contributed to the wartime increase in food production has received little attention.

According to contemporary estimates, the 40 per cent reduction in pest damage, over half of which can be attributed to rabbits, was equivalent to at least one million tons of food

¹⁰⁷ *The Field*, 14 Feb. 1942, p. 181.

¹⁰⁸ *Farmer and Stockbreeder*, 16 Apr. 1940, p. 893.

¹⁰⁹ J. Davies, *The wartime kitchen and garden* (1993), p. 183.

¹¹⁰ Martin, 'Impact of government intervention', p. 254.

¹¹¹ Lockley, *Private life of the rabbit*, p. 129.

¹¹² R. J. Hammond, *Food, I, The growth of policy* (History of the Second World War, 1951), p. 185.

¹¹³ *PD, Commons*, 389, col. 1728.

¹¹⁴ For a detailed critique of the wartime changes in agricultural output, see J. Martin, *The development of modern agriculture since 1931* (2000), pp. 47–56.

¹¹⁵ For a detailed critique of the main explanations for the wartime increase in agricultural production, see P. Brassley, 'Wartime productivity and innovation, 1939–45' in Short *et al.* (eds), *Frontline of Freedom*, pp. 36–55.

TABLE 3. Estimated quantity of the output and value of rabbits from agricultural holdings in the United Kingdom, 1936–9 to 1945–6

	<i>Pre-war average</i>	1939–40	1940–41	1941–2	1942–3	1943–4	1944–5	1945–6
Quantity of Rabbits (000 tons)	39	44	29	19	14	14	14	14
Value (£000)	1820	2670	1894	1507	1111	1111	1111	1111

Note: the Ministry decided not to try to differentiate the last four years of the war.

Source: Ministry of Agriculture and Fisheries, Department of Agriculture for Scotland, Ministry of Agriculture for Northern Ireland, *Agricultural Statistics, United Kingdom, 1949*, pt 2, p. 24.

and feedstuffs.¹¹⁶ The calculated increase in cereal output caused the Permanent Secretary of the Ministry of Agriculture to lament that from a ‘psychological point of view’ it would be unfortunate if publicity caused the public to attribute the increase in output entirely to pest destruction rather than the government’s agricultural policy as a whole.¹¹⁷

More detailed research undertaken after the war by W. M. Philips in West Wales suggests that these official figures for rabbit damage were conservative estimates. Experimental plots of herbage which were free from rabbits produced between two and eight times the amount of herbage per acre, depending on the season, compared with those grazed by rabbits.¹¹⁸ Subsequent research revealed that the food requirements of a sheep weighing 120 lbs was equivalent to that of ten adult rabbits weighing about 40 lbs in total.¹¹⁹ However, sheep were three times more effective than rabbits in converting herbage into meat. This marked difference reflected not only the biological difference between the digestive systems of the two animals, but also the fact that sheep were managed so that lambs were slaughtered before their feed conversion ratio began to significantly decline. Conversely the majority of rabbits, when not subject to sustained culling, would reach adulthood with longer periods of low conversion rates. As Lockley’s pioneering pre-war research into rabbit control on Skokholm Island had shown, rabbits, under favourable conditions of abundant food supply, had the ability to increase their depleted numbers by breeding throughout the year rather than solely during the summer months.¹²⁰ Hence, while the rabbit population may have been reduced by culling, its rapid reproduction rate was sufficient to allow for compensatory gain via an increase in the number of litters each adult produced throughout the year. In effect the ‘harvestable surplus’ of rabbits which could be killed without seriously depleting population levels was greater than contemporary accounts of its population dynamics suggested.

The wartime reduction in rabbit damage was sufficient to account for a significant part of the wartime increase in agricultural output measured in financial terms at constant 1945–46

¹¹⁶ Sheail, ‘Rodent damage’, p. 57.

¹¹⁷ *Ibid.*, p. 57.

¹¹⁸ Philips, ‘Effect of rabbit grazing’ pp. 165–81.

¹¹⁹ Lockley, *Private life*, p. 129.

¹²⁰ R. M. Lockley, ‘Some experiments in rabbit control’, *Nature* 145 (1940), p. 769.

TABLE 4. Expenditure on pest control and estimated reduction in level of damage

Year	Expenditure on pest destruction by the Ministry of Agriculture (£)	Reduction in pest damage (%)	Financial equivalent (£m)
1939	9000		
1940	8000		
1941	11,000		
1942	24,000	20	9
1943	29,000	41	19
1944	52,000	40	18

Source: TNA, MAF 44/33.

prices, which were calculated by the official history as being in the region of 15 per cent.¹²¹ Even taking into account the conservative bias inherent in these official calculations, the wartime reduction in pest damage raised agricultural output by somewhere in the order of 3 to 4 per cent. Martin's revisionist critique has suggested that the figure was substantially less.¹²² This revised calculation has been supported by research carried out by Brassley.¹²³ Taking into account these revisions, the wartime decline in rabbit damage appears to be the single most important factor accounting for the wartime increase in agricultural output.

In economic terms the wartime expenditure on pest control appeared to be very cost effective, amounting, according to Murray, to a mere £52,000 in 1944–5, whereas the reduction in pest damage was estimated at approximately £18 million.¹²⁴ As Table 4 shows, a conservative estimate would suggest that a reduction in pest damage of this magnitude benefited the country by £19 million by 1943 for a mere additional cost of £29,000. In the region of 50 per cent of this could be attributed to the decline in the incidence of rabbit damage. But the cost effectiveness of these figures is not quite as impressive as it may appear at first sight. This decline was not simply the result of activities of personnel under the jurisdiction of the WAECs, but also the efforts of a multitude of rural inhabitants who responded to the increased demand for rabbit meat.¹²⁵

V

In 1947 the Agriculture Act transferred the powers of the Rabbits Order 1939 to the County Agricultural Executive Committees. The new legislation introduced grant aid to assist farmers and landowners with the costs incurred in controlling rabbits through the establishment of Pest Destruction Societies. Lack of publicity, however, meant that there was little awareness amongst

¹²¹ Murray, *Agriculture*, p. 243.

¹²² Martin, *Development of modern agriculture*, pp. 56–7.

¹²³ Brassley, 'Wartime productivity and innovation',

p. 54.

¹²⁴ Murray, *Agriculture*, p. 384.

¹²⁵ BAP Report No. 21A, p. 2.

farmers that financial assistance was available or what procedures were to be followed to secure it.¹²⁶ As Sheail has noted, 'Behind the rhetoric of the bargain struck between government and industry which offered guarantees of economic stability in return for higher productivity, little had been absorbed as to the detail by which such technical and organizational aspirations might be achieved'.¹²⁷

Pressure on the rabbit population was intensified by the post-war meat shortages. By the late 1940s, when austere and stringent rationing controls were worse than at any time during the war, the demand for illicit fresh meat, including rabbit, was at its highest. Indeed in towns such as Leicester the shortage of fish resulted in fishmongers reclassifying their stalls as Fish and Rabbit stalls.¹²⁸ This encouraged rural inhabitants of all descriptions to see rabbits not only as a desirable addition to their own pot, but also as providing a pleasurable activity which could be undertaken for commercial gain.

The revival of game rearing and battue shooting of the type which had prevailed before the war was slow to reappear. In particular the artificial rearing of game birds did not increase rapidly until the latter part of the 1950s.¹²⁹ In contrast rough shooting proliferated, with rabbits being regarded as a legitimate quarry not only by the shooting fraternity but also by poachers.

In his pioneering study of post-war poaching, Tom Shakesheff discussed several former poachers who felt that their activities had made them 'local celebrities' and the first point of call for fresh meat.¹³⁰ Indeed, the immediate post-war period was best remembered for the opportunities it provided for the illicit taking of game and rabbits.¹³¹ While newspapers and accounts of the petty court sessions provided occasional graphic accounts of prosecutions of those caught poaching, not only in game preserves but also on farmland, landowners' ability to prevent poaching had been undermined by the reduction in the number of gamekeepers.

Given these pressures on the rabbit population, the damage they inflicted was at considerably lower levels than had prevailed before the Second World War. Measuring either the magnitude of the rabbit population or the extent of the damage they inflicted on agriculture is problematic, with estimates of the latter varying from the widely quoted figure of £50 million per year cited by the Ministry's own Myxomatosis Advisory Committee to less than £20 million per year according to the Labour peer Lord Archibald.¹³²

What is clear, however, is that in the autumn of 1953, pestilence in the form of myxomatosis devastated the rabbit population. The disease was introduced into France by the bacteriologist De Paul Armand Delille, who used the virus to rid his private estate of rabbits in June 1952. By 1954 it had killed 90 per cent of the wild rabbits in France. In the first English outbreak

¹²⁶ TNA, MAF 44/5.

¹²⁷ Sheail, 'Rodent control', p. 66.

¹²⁸ Interview with Thomas Mattock, farmer and member of the Leicestershire War Agricultural District Committee, 16 Jan. 1991.

¹²⁹ Hoyle, 'Introduction: field sports as history', pp. 20–1.

¹³⁰ T. Shakesheff, 'For profit and pleasure: poaching

in post-war Herefordshire, 1945–52', paper presented to the Social History Conference, Belfast (2003), p. 5.

¹³¹ Ibid., p. 3.

¹³² For a detailed critique of the different figures see Bartrip, *Myxomatosis*, pp. 134–5. The Myxomatosis Advisory Committee was established by the Minister of Agriculture, Thomas Dugdale on the appearance of the disease in England. Bartrip, *Myxomatosis*, p. 78.

at Bough Beech near Edenbridge, Kent, in October 1953, mortality rates in excess of 99.9 per cent were recorded.¹³³

By the end of 1954, myxomatosis had been reported in eight localities in four south-eastern counties. It spread relatively slowly with the average advance being about 1.5 miles per month.¹³⁴ By 1957 it had been recorded in 34 counties, while six years later there was only one county in England and one county in Wales without any known cases of the disease.¹³⁵ By 1955 it had killed in the region of 95 per cent of the country's rabbits and it was initially feared that it could lead to their extinction.¹³⁶ The decimation of the rabbit had profound implications on the balance of nature.¹³⁷ Primarily it encouraged the spread of more palatable herbage and flowering plants.¹³⁸

Myxomatosis has been widely acknowledged as the main causal factor accounting for the decline of the rabbit population. For the first time farmers realised what tolerating the rabbit plague had really cost them in terms of reduced levels of production. In an effort to ensure complete eradication, the government established mandatory Rabbit Clearance Societies in a number of areas to coordinate their clearance. Members contributed money on an acreage basis and the Ministry of Agriculture matched their contribution. Each society employed a roving team of rabbit catchers, who used ferrets or gas to deal with local infestations. Non-compliance could lead to rabbit destruction squads undertaking the task themselves, with costs being recoverable from the landowner, and fines in accordance with those specified by the Agriculture Act 1947.¹³⁹ In spite of the number of Societies increasing to 717 by 1964, they only covered 23 per cent of farm and woodland in England and Wales.¹⁴⁰ Even in areas under their jurisdiction, complete eradication of the promiscuous rabbit proved elusive. Having a gestation period of only 28 days, the ability to breed at six months and to produce four to six litters a year, with between three and nine offspring (kittens) in each litter, the rabbit's rapid reproduction rate ensured its long-term survival.¹⁴¹

Rabbit populations were also adversely affected by changes in agricultural practices in the post-war period, in particular cleaner farming, the grubbing up of hedgerows, scrub clearance and the state-directed emphasis on maximizing agricultural output. In addition, the Pests Act (1954) made the use of the gin trap illegal. This came into effect from July 1958 and led to an increase in the numbers of predators such as stoats and weasels. But following the low point of the mid-1950s, the rabbit population gradually revived after the initial single destructive strain of myxomatosis was replaced by a multitude of strains differing widely in virulence.¹⁴²

¹³³ C. J. Armour and H. V. Thompson, 'Spread of Myxomatosis in the first outbreak in Great Britain', *Annals of Applied Biology* 43 (1955), pp. 511–18; Bartrip, *Myxomatosis*, p. 57.

¹³⁴ A. R. Mead-Briggs, 'Rabbits and Myxomatosis', in *Agriculture*, 73 (1966), p. 197.

¹³⁵ For a detailed account of the spread of the disease see *ibid.* p. 197.

¹³⁶ *Ibid.*, p. 199; H. N. Southern, 'A Britain without Rabbits', *Discovery* 16 (1955), pp. 186–9.

¹³⁷ H. N. Southern, 'Myxomatosis and the balance of nature', *The Listener*, 16 Feb. 1956, pp. 247–8.

¹³⁸ Philips, 'Effects of Rabbit Grazing', p. 137.

¹³⁹ Bartrip, *Myxomatosis*, p. 110.

¹⁴⁰ *Ibid.*, p. 120.

¹⁴¹ B. Vesey Fitzgerald, *British Game* (1946), p. 169.

¹⁴² J. Ross and M. F. Saunders, 'Changes in the virulence of myxoma strains in Britain', *Epidem. Inf.* (1978) 98, pp. 113–7.

VII

The period from the early 1930s to the mid-1950s witnessed a fundamental reappraisal in the state's approach to the common rabbit. This study illustrates that rabbit population dynamics were changing even before 1953, a factor which has received scant attention.

By the 1930s, rabbits, which were initially regarded as perquisites of the landowning and sporting fraternity, had reached plague proportions. They were having a significant impact on domestic food production, the magnitude of which was not fully acknowledged by contemporaries. The decline in the rabbit population during the Second World War and its immediate aftermath played a major role in accounting for the increase in agricultural output. The success of the state-directed campaign to kill rabbits reflected both a growing recognition of the damage they inflicted on field crops, including grass, but also their contribution as a valuable supplementary source of meat for a population engulfed by austerity and rationing. As the Ministry of Agriculture acknowledged, disseminating the benefits of the unprecedented wartime decline in the extent of rabbit damage would have been politically unwise in that it would have cast serious doubts on the effectiveness of the wartime control of agriculture. This has inadvertently established a tradition which has continued to resonate amongst agricultural historians who have focused on eulogizing the more conventional explanations for the increases in agricultural output during the pre-myxomatosis era.