

CHAPTER 9

POLECAT (*Mustela putorius* L.)

History of the status and distribution of the polecat in Yorkshire

Archival and literature searches provided evidence of past abundance, widespread distribution and subsequent decline and extinction of the polecat (*Musela putorius* L.) in Yorkshire and adjacent counties (Howes 1980a, 1985c). The history of the introduction and use in Yorkshire of the domesticated ferret (*M. furo* L.) was similarly traced (Howes 1980a). Various forms of land-use changes were reviewed as possible causes of the polecat's decline and speculation was made regarding the future status of the ferret as a feral species.

Records of polecats in Yorkshire from 1619 and trends in the numbers surrendered for bounty payments indicate that the polecat underwent a complex pattern of decline. Up to and including the 19th century, polecats were apparently widely distributed throughout Yorkshire.

No literary allusions relating to the polecat in Yorkshire have been encountered which can be dated to earlier than the 19th century, although some of these refer to earlier decades. Therefore, for evidence of its distribution and status from the 17th to the late 18th century, this study has had to rely exclusively on vermin bounty payment records in parish accounts. Howes (1980a) located polecat bounty payments in 20 sets of parish records. The present study has increased this to 52 parishes out of 94 sets examined, abstracting in excess of 5,540 records (52.37% of all carnivora records) of creatures deemed to be polecats (*M. putorius*). Lovegrove (2007) examined accounts from some 36 additional Yorkshire parishes, 21 of which contained evidence of bounties paid for polecats. Since specific dates and bounty numbers are not provided by Lovegrove (2007), only his parish locations, where traced, have been used in this study for mapping purposes (see Figure 9.1).

In certain districts, polecats were indeed shown to be abundant, with bounty records in parish accounts listing up to 84 payments per year as in the case of Cottingham in 1686. For parishes where in excess of 10 years-worth of bounty payments survive, mean annual payments ranged from 0.46 in Tunstall to 14.26 in Masham (see Table 9.1).

Polecat distribution in Yorkshire

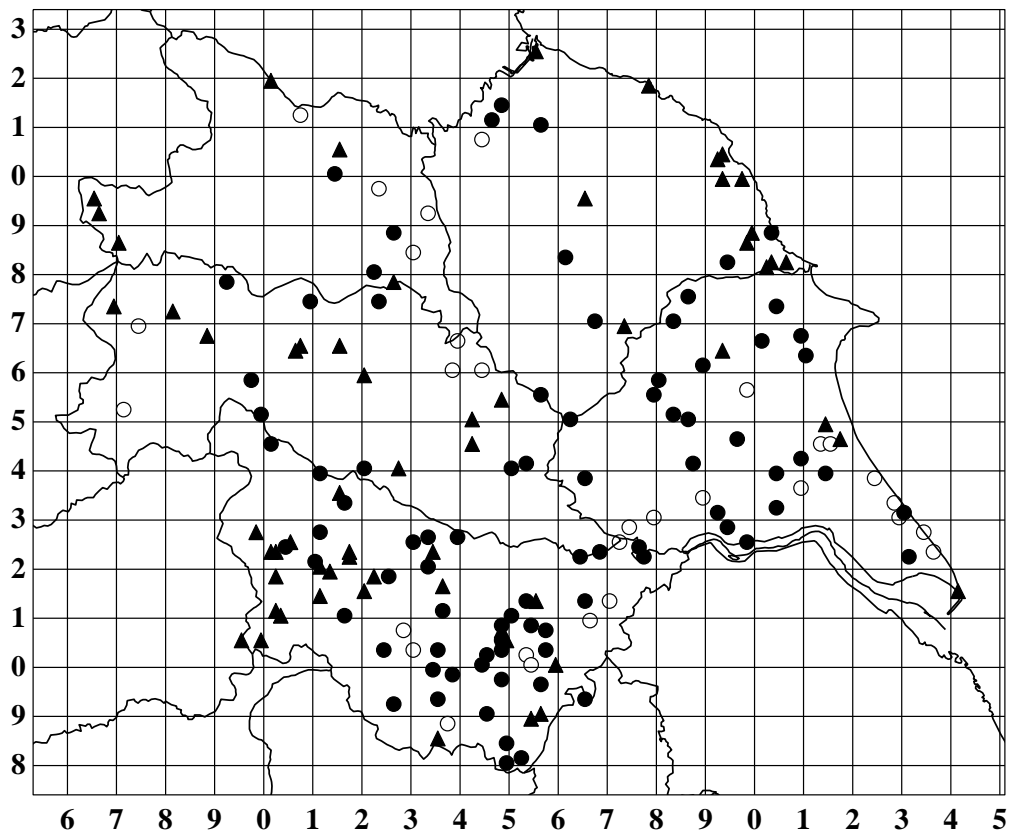


Figure 9.1. Polecat distribution in Yorkshire based on bounty payments in parish and township accounts from the 17th to 19th century and literature references from the 19th and early 20th centuries.

Key: ● = Parish vermin accounts containing Polecat records; ○ = Parish vermin accounts with no Polecat records; Solid triangle = 19th - early 20th century records from literature.

Persecution

The reasons for the decline and evident extinction of polecats is not exactly known; however, a review of the factors associated with their persecution, land-use changes and possible predation/competition pressure from the fox has revealed possible causes which may prove useful in its conservation in areas of Britain where it still survives and within areas where it has recently been expanding its range.

The history of the fur trade in Britain and the use of polecat or ‘fitch’ pelts are discussed by Howes (1980a). Similarly, hunting polecats for sport is also reviewed by Howes (1980a) where in South Yorkshire during the early 1800s, Hatfield (1866) tells of

‘James Thornton and James Taylor of Doncaster who used to hunt the polecat with two or three good terriers. They seldom returned without securing a dozen and not infrequently a score [20] during a visit’. Although this would seem to be an excessively high number, high annual totals in parish records could give credence to these claims provided the animals concerned were indeed polecats; furthermore, during the spring, the destruction of polecat dens containing young would help to achieve these high totals.

Habitat and behaviour

Harting (1891b), repeating the prevailing dogma of 19th century sources, implied that polecats produced one litter of four or five kits per year in spring, judging that this rate of reproduction enabled them to ‘multiply rapidly’. Walton (1977), though confirming the single annual litter, gave a litter size ranging from five to ten kits born in May and June. Hatfield (1866), who derived much of his natural history information from the Doncaster naturalist and taxidermist Hugh Reid (1783-1863), commented that on the Doncaster Carrs it did not restrict itself to game but waged war against the inhabitants of river and pond; amphibians and fish, particularly eels, were taken as prey. Harting (1891b) also listed amphibians and eels as prey items.

Although some late allusions to polecats refer to occurrences in upland Pennine and Cumbrian districts, where stone walls (Macpherson 1892) and ‘rough upland banks’ (Jourdain 1905) were deemed to be favoured habitats, most late 19th and early 20th century data infer polecats to be lowland, or at least valley bottom, specialists. In the Lake District it was regarded as being a lowland counterpart of the pine marten (Macpherson 1892). Jourdain (1905) referred to it as occurring in the ‘tangled willow beds by the sides of streams’. In Lincolnshire, the coastal marshes of the Mablethorpe and Grimsby districts seem to have been a stronghold (Smith 1907) and Cordeaux (1884) claimed to have found evidence of its continued presence in the sand dunes at the Humber mouth at Spurn, East Yorkshire.

Based on the above sources and the analysis of vermin bounty statistics from a relatively small number of churchwardens’ accounts, Howes (1980a) suggested a relationship between polecat population density and altitude, with lowland parishes

recording larger numbers of bounties than those in upland area. In an attempt to investigate this possible phenomenon further, this study has aggregated the vermin bounty data from 54 parishes, for which polecat bounties have been identified, into the four altitude categories. These are based arbitrarily on the altitude of the parish churches as follows, less than 99 ft (18 parishes), 100 to 199 ft (16 parishes), 200 to 299 ft (9 parishes), and 300 ft and above (11 parishes). Polecat bounties are expressed as a percentage of total carnivora bounties within each altitude category. The results are presented in Figure 9.2, which reveals a remarkable negative association with increasing altitude.

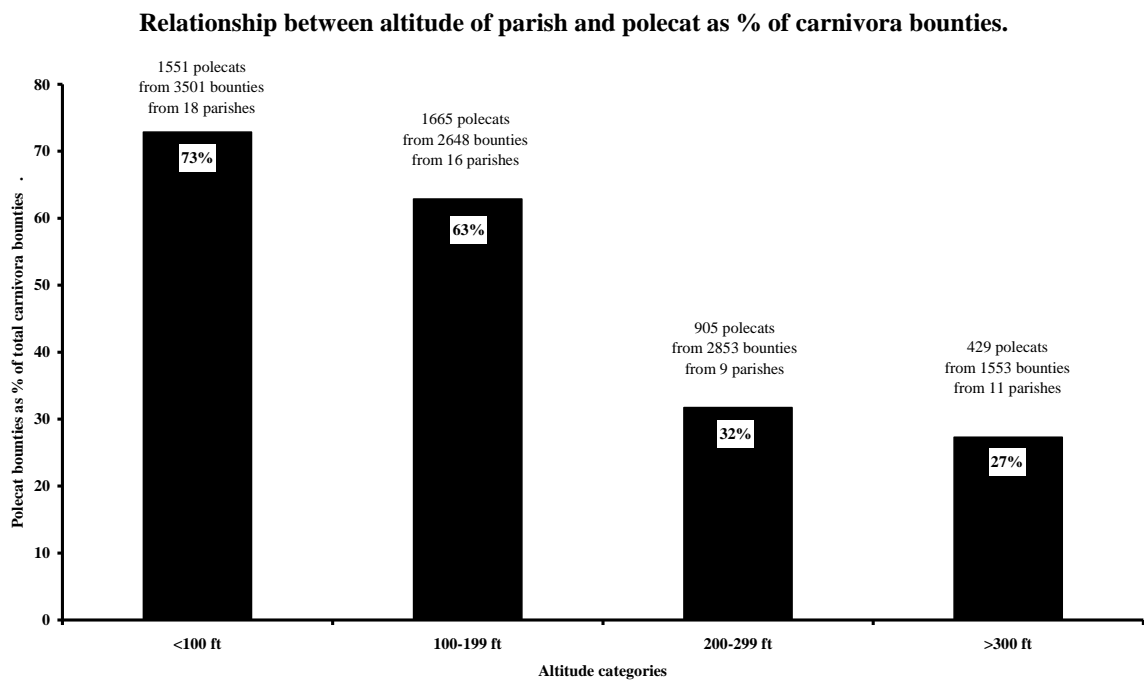


Figure 9.2. Relationship between altitude of parish (as determined by altitude of parish church) and Polecat as % of carnivora bounties.

Change of habitat

The enclosure awards from the mid-18th century to the mid-19th century had a profound effect on the pattern of the Yorkshire landscape, bringing in excess of 1 million acres of common land with mosaics of uncultivated grassland, scrub, woodland and wetland under agricultural or game management (see Figure 3.5 in Chapter 3).

Drainage and land improvement schemes, often a by-product of enclosure award schemes, also flourished during this period. Drainage and first attempts to cultivate the Doncaster Carrs commenced during the mid-1700s, a period when similar schemes were being undertaken in wetland areas throughout lowland Yorkshire, examples being in the Vale of Pickering and the Hull valley (Sheppard 1958). These developments coincided with the disappearance as breeding species of the bittern (*Botaurus stellaris*) ‘which deserted the [Doncaster] Carrs’ about the 1750s (Hatfield 1866) and the marsh harrier (*Circus aeruginosus*) ‘which formerly bred on the wastes around Doncaster and the East Riding’, but was ‘compelled to retreat before the spread of agriculture and the misplaced zeal of the gamekeeper’ (Nelson 1907). With polecats showing a lowland, and often a waterside, preference, preying on a wide range of aquatic vertebrates, they were no doubt hard hit by these revolutionary changes. Hatfield (1866), discussing the decline of the polecat on the Doncaster Carrs, claimed that ‘the cultivation of land has been a most formidable enemy in its destruction’.

In the parish of Wadworth, which encroaches onto the Doncaster Carrs, there were two enclosure awards enacted in consecutive decades, one of 1,962 acres in 1767, the other of 4,000 acres in 1771. Figure 9.3 shows that both of these events coincided with marked increases in polecat bounty payments within the parish suggesting that during these episodes of agricultural disturbance and the denudation of the local fens and willow copses, the local polecats became vulnerable to capture. Furthermore, polecat bounty numbers slumped during the following three decades for which vermin records are available. Similarly, in the lowland parish of Cottingham, East Yorkshire, a 3,000 acre enclosure award was enacted in 1771 and one of 1,532 acres was enacted in 1793. Figure 9.4 shows that these events coincided with relatively high levels of polecat culling, followed by lower numbers recorded during the following three decades to 1833 for which vermin records are available.

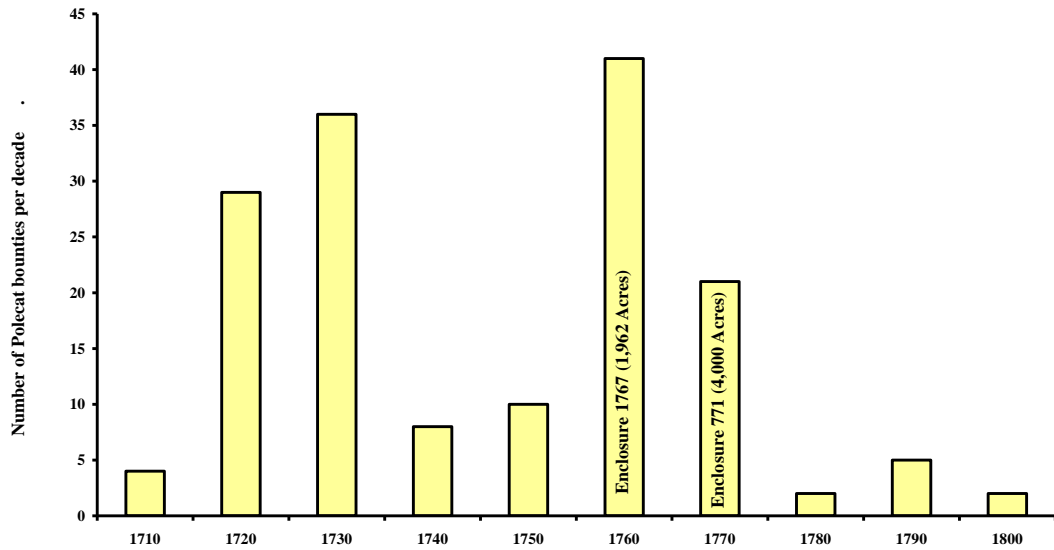


Figure 9.3. Polecat bounties paid per decade in the parish of Wadworth, showing increase in persecution during the Enclosure Awards of 1767 and 1771.

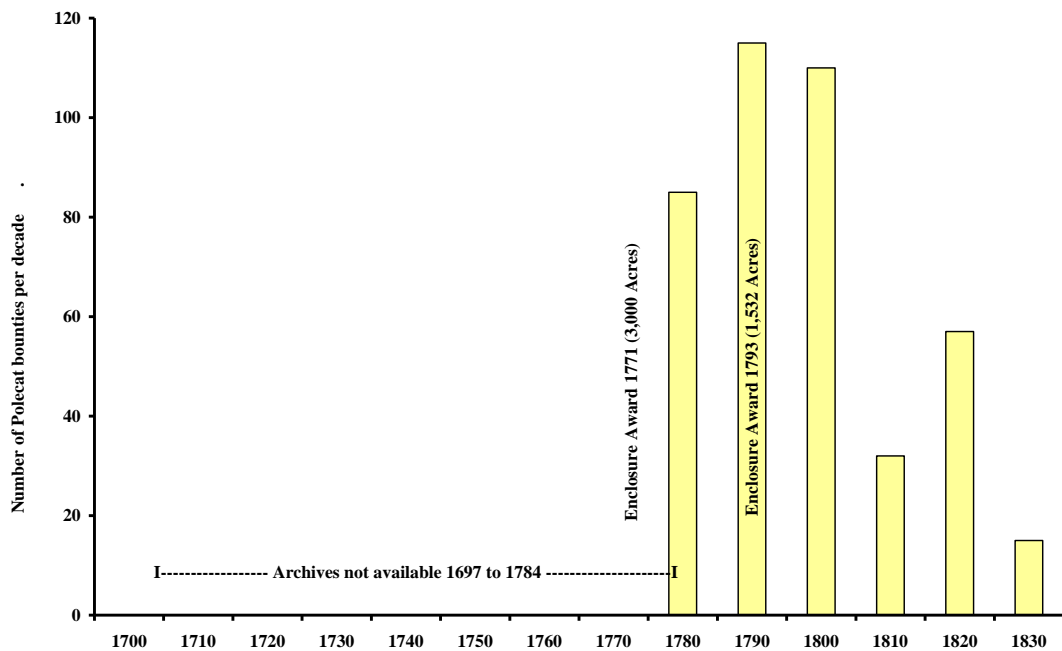


Figure 9.4. Polecat bounties paid per decade in the parish of Cottingham, showing a decline following the Enclosure Awards of 1771 and 1793.

Gamebird rearing and gamekeeping

One effect of the 18th and 19th century enclosure of common land was to prescribe land that had previously enjoyed common access to nominated private ownership. Game management, with the concomitant exclusion of other interests and control of predatory species, became a possibility. Howes (1980a) showed that as early as the 18th century the social standing of a country landowner was enhanced by his ability to provide good and eventful shooting for his guests. For this fashionable pursuit, the craft of gamekeeping evolved. Teams of gamekeepers were employed at estates throughout Britain for the purposes of rearing game birds and for the destruction of their predators, both real and alleged.

The effect of game keeping, and in particularly the rearing of pheasants, is likely to have been a significant influence on the fate of the polecat in Britain. In England, the 'common' pheasant (*Phasianus colchicus*) a native of Asia Minor, had been bred in captivity both for ornament and food since before the Norman Conquest. By the late 15th century it had become naturalised, its sporting potential had been realised and an Act of Parliament granted its protection (Lever 1977). Early evidence of its occurrence in Yorkshire was of pheasants from the Selby Warren being feasted upon at Selby Abbey in 1416-1417 (Harris 1970). Over the next 400 years, several events, as outlined below, elevated the pheasant to being the most important game species in Britain, its management developing into a rural industry.

Indicative of the improvement of game management techniques was the growth of trade between estates in pheasant stocks; indeed stocks were exported to the colonies, e.g. North America in 1790 (Austin 1961), while oriental forms were imported to add interest and vitality to the naturalised population. The 'Japanese' pheasant (*P. c. versicolor*) was introduced in 1741 and the 'Chinese ring-necked' pheasant (*P. c. torquatus*), not uncommon in aviaries in the 1780s, had become established in the wild by the 1820s (Lever 1977) and the 'Mongolian ring-necked' pheasant (*P. c. mongolicus*) was imported into feral stocks during the 19th century (Fisher 1967).

As with pheasant shoots, developments in grouse moor management no doubt played a significant part in polecat eradication in upland districts. Up to the late 1600s, red

grouse (*Lagopus scoticus*) were taken in relatively small numbers, being caught by hawks or flushed into nets. Later, birds were shot either on the ground or after being flushed by dogs. During the 1800s, a technique was evolved whereby grouse were driven before waiting guns and shot on the wing (Nelson 1907). This revolutionary method, which enormously increased the numbers of birds shot, quickly became the vogue and consequently put pressure on gamekeepers to rear sufficient new stock to satisfy the potential of this highly efficient form of shooting. In the process, the predator/prey ecology of the Pennine and North Yorkshire heather moors was radically altered. Upland species like the hen harrier *Circus cyaneus* suffered the ‘onslaught of the gamekeepers’, becoming scarce by 1844 and being reduced to the status of a bird of passage by 1906 (Nelson 1907) and ‘the almost complete loss to the country of the common buzzard (*Buteo buteo*) as a breeding species is another price paid...for the supposed benefits of sportsmen’ (Chislett 1952).

During the mid-1700s, the gin trap was added to the gamekeeper’s armoury and proved to be a landmark in the history of ‘vermin’ control. Before the 1880s, the use of this trap had been legally restricted to those employed in game-rearing; however, the ground game laws of that era made it possible for farmers and their employees to use these traps to protect their crops from the considerable and highly destructive populations of feral rabbits (*Oryctolagus cuniculus*). Paradoxically, with the new found income from rabbit (coney) skins and meat, farm workers were encouraged to conserve rabbits by controlling their predators; thus polecats ‘which inhabit rabbit warrens and are destructive’ (Jourdain 1905) became increasingly targeted for persecution.

‘The stinking polecat, shunned by most people and persecuted by all’, the words of Charles Waterton (1782-1865) of Walton Hall near Wakefield (Hatfield 1966), illustrate the 18th and 19th century attitude towards this predator. On the shooting estate of Sandbeck Park in South Yorkshire in 1860 it was said that ‘polecats make great havoc amongst the birds [pheasants]’ (Tomlinson 1860). The polecat’s reputation as a predator of game birds, particularly of young pheasants, rendered it an obvious target for the gamekeeper; indeed, in some quarters, foxes were encouraged on the pretext that they were thought to kill polecats (Langrigg 1977). Tapper (1992) shows that according to the census of 1871 there were

about 17,000 gamekeepers in Britain, rising to a maximum of over 23,000 by 1911. For most of Yorkshire, he estimated there were between 8 and 16 keepers per 100 km², with between 4 and 8 per 100 km² across East Yorkshire. With the effects of the two World Wars and industrialisation of post-war farming, gamekeeping has been substantially marginalized; Tapper (1992) estimated that in 1981, North Yorkshire, although remaining one of the better kept regions of Britain, only supported between 2 to 4 keepers per 100 km², whereas in the south, west and east of Yorkshire there were fewer than 1 per 100 km²

Significantly, predators were shown to thrive in areas not controlled by gamekeepers or at times when game-keeping was relaxed. Chislett (1952) remarked that the Sparrowhawk (*Accipiter nisus*) fared better 'in areas not kept' and 'gained temporarily in status' during the two World Wars. A small batch of Yorkshire polecat records was claimed soon after the Second World War (see Appendix 9.1); their validity, however, is considered suspect, and the general revival of the species inferred by Batten (1952) appears not to have continued in Yorkshire, although Welsh populations have greatly increased and have spread to adjacent English counties (Walton 1977).

Evidence of status changes

Using standardised mammal status reviews in the series of Victoria County Histories, Langley and Yalden (1977) elegantly illustrated the progressive diminution of range and extinction of polecat populations, county by county throughout Britain from 1800 to 1915. However, the data sources used were inevitably reliant on perceptions of status by county mammal recorders of the time. These perceptions were generally founded on the frequency by which gamekeepers and the apparently ubiquitous fraternity of rural 'men with dogs and guns' were able to trap or bag specimens. By 1880, the Yorkshire population was evidently in decline, and by 1915, apart from problematical records from the Pennine uplands and Holderness, it had evidently vanished.

Howes (1980a) reconstructed the perceived status of the polecat in the regions of Yorkshire prior to its extinction by reviewing key 19th century and early 20th century sources. The present study has located additional sources dating from 1808 to the first decade of the 20th century. These are listed chronologically in Appendix 9.1. In order to

trace the perceived period of extinction in Yorkshire, Figure 9.5 ranks these late records per decade, giving negative scores to reports alluding to decline, rarity or extinction.

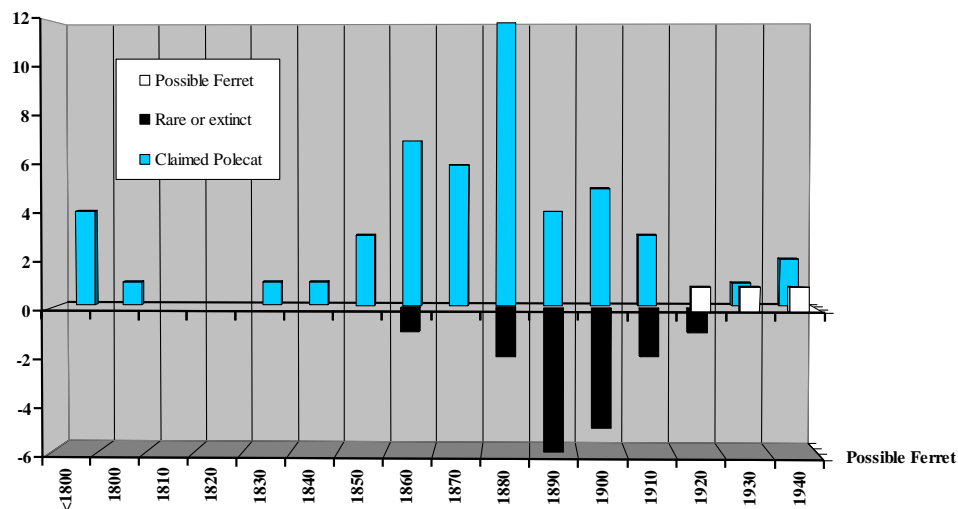


Figure 9.5. Analysis of anecdotal records of the 19th and early 20th century to show dates of perceived regional extinction in Yorkshire.

The polecat ‘era’ was formally brought to a close in Yorkshire literature in 1928 when Fortune (1928) declared that it was ‘now regarded as extinct in the county’, subsequent reports being attributed to escaped ferrets or feral polecat/ferret hybrids. Batten (1952), however, was convinced, by colouration and size, of the validity of specimens killed in the Grimwith district from c.1900 to c.1945 and from Forge Valley c.1945. At best, this exercise only succeeded in documenting the final demise of the polecat in Yorkshire. By abstracting sequences of polecat bounty payments in churchwardens’ accounts from ten Yorkshire parishes dating from the mid-17th to the mid-19th century, Howes (1980a) was able to infer that polecat numbers had commenced their decline in the mid-18th century.

Bounty payments and the use of vernacular nomenclature for ‘vermin’ species

Payments for vermin under a variety of vernacular names, but deemed to refer to *Mustela putorius*, have been located to date, the in the records of 69 out of a sample of 102 Yorkshire parishes for which there are bounty payments for carnivore vermin, dates ranging

from 1619 in Doncaster to 1874 in Luddenden. An examination of the vernacular names for polecat, and the smaller mustelids (stoat and weasel) which it may have been confused with, is necessary in order to make use of the extensive statistics in parish vermin bounty records.

Since the 17th century the preferred vernacular name in the Yorkshire region for what is currently referred to as the polecat (*M. putorius*) has essentially oscillated between two pairs of distinct etymological bases ‘foul mart’ and ‘pole cat’. The earlier form, ‘foul mart’, is based on the etymological components ‘foul’ which refers to the characteristic pungent musky smell of this mustelid, rendering it relatively undesirable as a source of fur for human garments, particularly in the luxury fur market. The term ‘mart’ places this animal with the marten-like members of the Mustelidae. The term foul mart as applied to *M. putorius* separates it from the relatively scentless ‘sweet mart’ or pine marten (*Martes martes*), the pelts of which were highly valued in the fur trade.

In written usage, the term foul mart was generally expressed in the form ‘foumart’. However, from the pens of generations of churchwardens from its earliest traced usage in 1619 in Doncaster to its last in 1837 in Whiston and in isolated and probably insular townships and parishes across Yorkshire, the name was variously permutated, within parish accounts, first element expressed as: foul, fou, fol, fow, ffow, fowl, foo, ffoo, ffo, fo, fool, fu, ffu, ful, fful, full, fulli, fil, filli, fylo and phylo, and the second element as: mart, marrt, mard, mmard, mad, mar, mate, mbort, melt, mert, merd, mmerd, mherd, mer, met, mett, mit, mont, mot, mort, mord, mrod, mrd, mt and murth.

The second form, ‘polecat’ is possibly derived from a different, though equally prejudicial, allusion. According to the Oxford English Dictionary (1989), the etymological root of its first element was suggested by the etymologist W. W. Skeat as being derived from the Old French *poule* (chicken), this being a reference to its farmyard pest status in allegedly predating domestic poultry. Geoffery Chaucer in *The Pardoner’s Tale* of the *Canterbury Tales* (Skeat 1947), written during the 1380s, provides the earliest known English use of the term:

‘And eek there was a polcat in his howe,
That, as he seyde, his capons hadde y-slawe’.

According to the OED, the St Albans Book of 1486 (f. iv b.) lists '*The...pulcatte*' and the Gairdner's edition of the Paston letters (III, 365) of 1490 includes a reference to the practice of rabbit warreners in the parish of Oxenhed, Norfolk, hanging up such '*mysdoers and forfaytours as...Polkattys*' (Gurney 1888). Confusingly, the OED refers to the Porkington Manuscript of 1460 (MS. 10. Lf. 189) which includes as '*bestes of ye stinking fure*' '*the folmard...and the pol catte*' as if they were distinct and separate species.

Spellings and form encountered in Yorkshire parish accounts varied slightly, including polecat, poolcat, pool cat, pool catt, powlcatt and poo catt.

Other possible etymological routes may be from the first element referring to the Old English term *poll* meaning the head, this being a reference to the strong and contrasting patterning on the head, as in the case of the redpoll (*Carduelis flammea*) referring to the patch of red feathers on its forehead. Alternatively, as suggested by Blandford (1987), 'pole' may be no more than a corruption of 'foul'.

In the 52 sets of Yorkshire parish accounts which produced polecat vermin bounty records, the 'polecat' form was encountered on only 137 occasions in 11 parishes, representing fewer than 3% of the allusions to *M. putorius* bounties. This contrasts markedly with detailed studies of 79 parishes in Bedfordshire (Elliot 1936), 22 parishes in Hertfordshire (Oldham 1931) and 15 parishes in Merionethshire (Hope-Jones 1974) where the etymological form polecat was exclusively used. It seems likely, therefore, that the use of this term was imported into the 11 widely scattered Yorkshire parishes where it was encountered by churchwardens or clerics with cultural affiliations rooted in the south of Britain. The usage, however, changed considerably with time. Apart from a small batch of records, including one in 1688 (from Northowram), 14 from 1707 to 1726 (from Thorpe Salvin) and 15 in 1752 and 1753 (from Arksey with Bentley), the majority were concentrated within the period 1780s to 1830s as follows: 1786 to 1819 at Patrington, 1803 to 1830 at Tunstall, 1818 at Bolton on Dearne, 1820 to 1827 at Skipton, 1822 at Adwick le Street and 1832 to 1837 at Whiston. Figure 9.6 illustrates the progressive rise in its use, relative to 'foumart' forms, from less than 10% in the 1780s to over 52% in the 1830s.

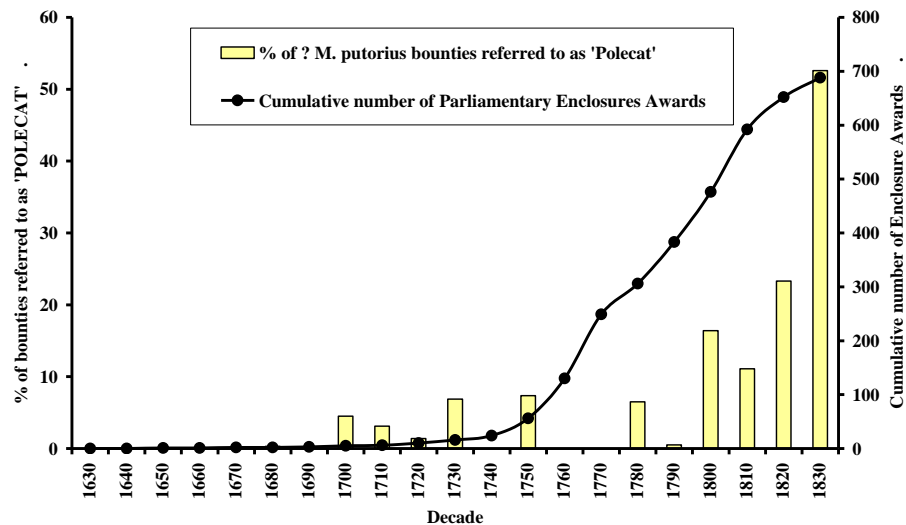


Figure 9.6. Increase in the use of the term Polecat for *Mustela putorius* in Yorkshire parish bounty payment records, compared with the cumulative increase of local Parliamentary Enclosure Awards.

This change may be related to new cultural influences coincident with developments such as the recruitment of agricultural advisers or managers in the wake of local enclosure awards. Table 9.1 shows that in six parishes the use of the ‘southern’ term ‘polecat’ post-dated the implementation of enclosure management. The recruitment of gamekeeping staff to manage shooting estates and hunt servants to manage new packs of foxhounds would also be an influence in the mobility of etymological influences in rural communities.

Brown (2002) infers that the terms ‘polecat’ and ‘foulmart’ both refer to *M. putorius*, but suggests that ‘polecat’ refers to the animal itself and that ‘foulmart’ to its pelt. In addition, Simpson (1772 in the OED) lists Fitchat and Fitchew as regional vernacular terms for polecat, a form which, according to Veals (1966), tends to be used in the context of the fur trade. This was encountered only once in this study where in the churchwardens’ accounts for the Parish of Hook, a bounty of 6d. was paid in 1817 for 3 ‘Fitchats’. Here, the tariff of 2d. per head, particularly at the very late date of 1817 would suggest the term was

Table 9.1. Comparison between the date of parish Enclosure Award and the introduction of the term ‘Polecat’ in parish accounts.

Parish	Enclosure Award	1 st use of the term ‘Polecat’
Adwick le Street	1761	1822
Bolton on Dearne	1761	1818
Patrinton	1768	1786
Skipton	1774	1808
Tunstall	1779	1803
Whiston	1823	1832

being used as a synonym for weasel which throughout the 18th and 19th centuries commanded a bounty of 2d. per head, whereas the larger fowmart or polecat commanded a bounty payment of 4d. (see Table 9.2). In certain geographical locations and at various times, the terms fowmart and indeed polecat evidently did not exclusively refer to *M. putorius*. Clarke and Roebuck (1881) note that in the north-western fells the stoat had been referred to as the ‘polecat’. In Upper Nidderdale they were named ‘powcat’ (Clarke *et al.* 1886) and in Wester Ainsty (an area of the southern vale of York between York and Leeds) the stoat was also referred to as fowmart (Waite 1891).

The extreme scarcity of stoats and weasels in vermin bounty payments in Yorkshire parish accounts raises the possibilities that either (a) these small mustelids were uncommon up to the mid-19th century, (b) they were not perceived to be pests in many parishes and therefore few or no bounties were paid, or (c) the term fowmart referred collectively to *M. putorius*, *M. erminea* and *M. nivalis*. Since stoats and weasels were being killed in large numbers by gamekeepers on game estates from at least the 19th century, propositions (a) and (b) would not seem to be the case. It is therefore puzzling as to why relatively few bounties were paid for them from parish funds. If proposition (c) is indeed the case, the analysis of bounty payments for fowmarts and polecats as providing evidence of the distribution and fluctuating status of *M. putorius* is flawed.

Significantly, when variations of ‘fowmart’ and ‘polecat’ were used by parish officials, the payments associated with their usage were proportionally below the tariff for fox, badger and otter (usually 1s) and for wildcat and pine marten (usually 6d.), but above

**Table 9.2. Differential tariffs paid for ‘weasel’ and ‘foulmart’
in ten Yorkshire parishes.**

PARISH	TAXON	DATE RANGE	TARIFF
Adwick le Street	Weasel	1817	2d.
	Foulmart	1821-1822	4d.
Arksey with Bentley	Weasel	1722-1768	2d.
	Foulmart	1719-1768	4d.
Barnburgh	Weasel	1723	2d.
	Foulmart	1702-1732	4d.
Bawtry	Weasel	1726-1732	2d.
	Foulmart	1723-1737	4d.
Doncaster	Weasel	1619	2d.
	Foulmart	1619	4d.
Great Ayton	Weasel	1790-1794	2d.
	Foulmart	1760-1835	4d.
Rawcliffe	Weasel	1748-1760	2d.
	Foulmart	1722-1760	4d.
Scarborough	Weasel	1776	2d.
	Foulmart	1774-1776	4d.
Worsbrough	Weasel	1726-1727	2d.
	Foulmart	1704-1751	4d.
Yeadon	Weasel	1723	2d.
	Foulmart	1723	4d.

that paid for stoat and weasel (usually 2d.). The smaller *M. erminea* (under variations of its vernacular names of ‘stoat’, ‘ermine’, ‘lobster’ and ‘lobstart’) and *M. nivalis* (under variations of its vernacular names of ‘weasel’ and ‘weevil’) only ever commanded the lower sum of 2d. per head. I have therefore presumed that these taxa, even if proffered to the parish official under the rustic names of foulmarts and polecats, would have been paid for at the proportionally lower tariff and entered in the accounts as stoat or weasel.

The only specific references to stoats in churchwardens accounts are from the parish of Brompton by Sawdon where 2d. was paid for one in 1748, and in 1749 2d. bounties were paid for 3 Clobsters; at the same time, the tariff paid for ‘fomart’ was at a higher rate of 3d.

Weasel has been specifically paid for in 10 sets of parish accounts and in each of these there is a consistent differential between tariffs for both weasel and foulmart (polecat) (see Table 9.2).

Table 9.3. Variations in tariffs paid for foulmarts in Yorkshire parishes.

TARIFF	DATE RANGE	PARISH	TARIFF	DATE RANGE	PARISH
¼d.	1773-1814	Thurstonland	4d.	1735-1741	Thorpe Salvin
2d.	1669-1683	Kildwick	4d.	1736-1741	Ecclesfield
2d.	1672-1672	Beverley	4d.	1740-1772	North Ferriby
2d.	1679-1680	Bradford	4d.	1746-1746	Routh
2d.	1699-1733	Thorpe Salvin	4d.	1753-1780	Hooton Roberts
2d.	1713-1714	Ecclesfield	4d.	1756-1780	Wold Newton
2d.	1716-1788	Whiston	4d.	1759-1777	Harthill
2d.	1788-1798	Bolton Percy	4d.	1760-1835	Great Ayton
3d.	1635-1776	Masham	4d.	1769-1790	Hilton
3d.	1671-1673	Bedale	4d.	1770-1812	Stainton in Cleveland
3d.	1680-1680	Snaith	4d.	1774-1776	Scarborough
3d.	1737-1737	North Ferriby	4d.	1774-1819	Patrington
3d.	1749-1780	Brompton by Sawdon	4d.	1776-1802	Todwick
3d.	1787-1788	Tankersley	4d.	1778-1779	Langtoft with Cottam
4d.	1619-1619	Doncaster	4d.	1782-1782	Hooton Pagnell
4d.	1662-1831	Cottingham	4d.	1784-1799	Brompton by Sawdon
4d.	1696-1704	Peniston	4d.	1792-1824	Whiston
4d.	1698-1698	Hudswell	4d.	1796-1802	Tankersley
4d.	1702-1732	Barnburgh	4d.	1800-1826	Kildwick
4d.	1704-1706	South Cave	4d.	1801-1801	Bolton-on-Deerne
4d.	1704-1748	Worsbrough	4d.	1802-1827	Terrington
4d.	1706-1721	Elloughton & Brough	4d.	1803-1830	Tunstall
4d.	1710-1714	Fishlake	4d.	1808-1827	Skipton
4d.	1713-1805	Wadworth	4d.	1822-1822	Adwick le Street
4d.	1720-1773	Arksey with Bentley	4d.	1822-1822	Hickleton
4d.	1722-1788	Rawcliffe	6d.	1630-1630	Snaith
4d.	1723-1723	Yeadon	6d.	1818-1818	Todwick
4d.	1723-1738	Bawtry	6d.	1833-1837	Whiston
4d.	1724-1724	Helmsley			

Tariffs paid for foulmarts varied between parishes and over time. Table 9.3 shows that rates recorded were 2d. in 7 parishes between 1669 and 1798, 3d. in 6 parishes between 1635 and 1788, 4d. in 40 parishes between 1619 and 1830, and 6d. in 3 parishes between 1630 and 1837. An anomalous derisory rate of ¼d. per head, applied in the parish

of Thurstonand, appears to have been no deterrent to killing polecats, some 285 being accounted for from 1773 up to the late date of 1814.

If both larger polecats and smaller stoats and weasels were being locally referred to by the vernacular terms of 'foulmart' or 'polecat', as suggested by Clarke and Roebuck (1881), Clarke *et al.* (1886) and Waite (1891), one would have expected churchwardens to have varied the tariff according to the size of the animal, thus producing an oscillation of tariff during the same time period within a given parish. Churchwardens did indeed reduce the tariff for small specimens, as in the case of fox cubs. In the parish of Whiston in 1686, when 1s. was the standard payment for a fox, 1s. was paid for 2 young foxes, and in Wadworth in 1724, 2/6 was paid for 4 young foxes. In 1786 in Patrington, when 4d. was paid for a fougard, the payment for 1 old fougard and 3 young was reduced to 1s. Out of thousands of payment records, such examples are extremely rare.

Variations in the tariff within parishes were also recorded, but these did not oscillate but developed sequentially over time in the sense of progressive inflation. In Brompton with Sawdon, 3d. was paid for foulmarts from 1749 to 1780, rising to 4d. from 1784 to 1799; in Tankersley, 3d. was paid from 1787 to 1788, rising to 4d. from 1796 to 1802; in Thorpe Salvin, 2d. was paid from 1699 to 1733, rising to 4d. from 1735 to 1741 and in Whiston, 2d. was paid from 1716 to 1788, rising to 4d. from 1792 to 1824, and to 6d. from 1833 to 1837. This being the case, the current study regards all bounty payments for foulmarts and polecats as referring to *M. putorius*. The distributional and numerical scarcity of stoats and weasels in parish records remains problematical.

Figure 9.7 shows the numbers of sets of annual parish accounts from 1600 to 1875, together with a graph of the mean annual numbers of polecat bounty payments per available datasets, examined. This graph shows the detail of annual bounty oscillations, revealing a relatively high level of bounties during the last 50 years of the 17th century with over 5 bounty payments per year over 17 years, peaking in 1673 with a mean of 8.54 payments per parish. During the period 1700-1749, annual mean figures are substantially lower with a maximum of 4.16 in 1735; from 1750 to 1799, mean figures were even lower, the highest in 1799 only reaching 4.08, after which the highest annual figure was 2.68 in 1808, the sequence then collapsing to below 1, and terminating altogether in 1874.

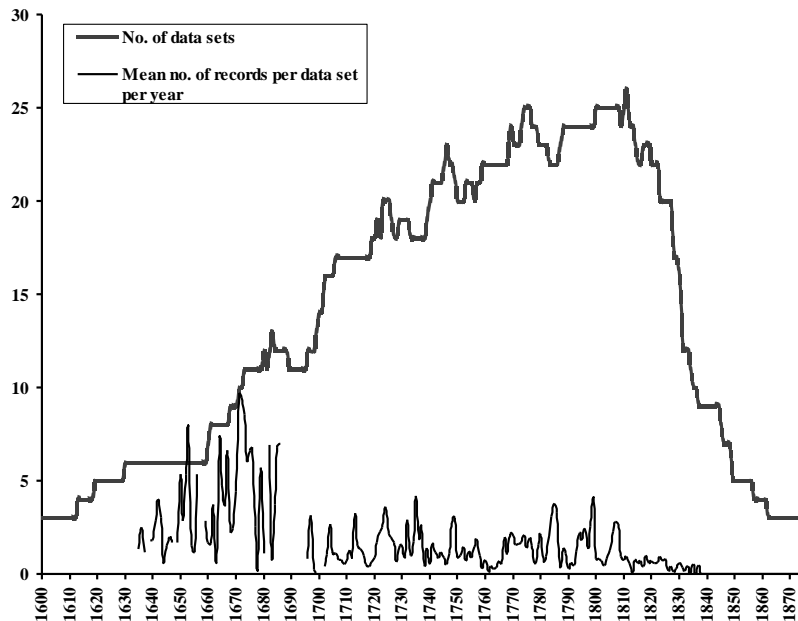


Figure 9.7. Number of datasets compared with the mean number of polecat bounty payments per dataset per year from 1600 to 1875.

In order to smooth the patterns of occurrence in Figure 9.8, the mean number of polecat bounties paid per dataset have been plotted for each decade from 1610 to 1870, illustrating a period of relatively high mean numbers of bounties during the last half of the 1600s, followed by a peak during the decades 1720s and 1730s, a trough in 1760, followed by a peak in 1780 from which numbers descend to zero by the 1840s.

In examining the post 1760s pattern of polecat bounty data, which appears to monitor the species' final disappearance from the Yorkshire landscape, it is justifiable to refer to the potential effects of the Parliamentary Enclosure Awards. Figures 9.3 and 9.4 indicate an increase in polecat culling within the parishes of Wadworth and Cottingham concurrently with enclosure awards affecting those parishes. Thus, it is possible that large scale and widespread landscape disturbance, during the implementation of the Parliamentary Enclosure Awards, may have instigated unsustainable culling of polecats across the Yorkshire region.

Figure 9.8. Mean number of polecat bounties paid per dataset per decade, 1610 to 1879.

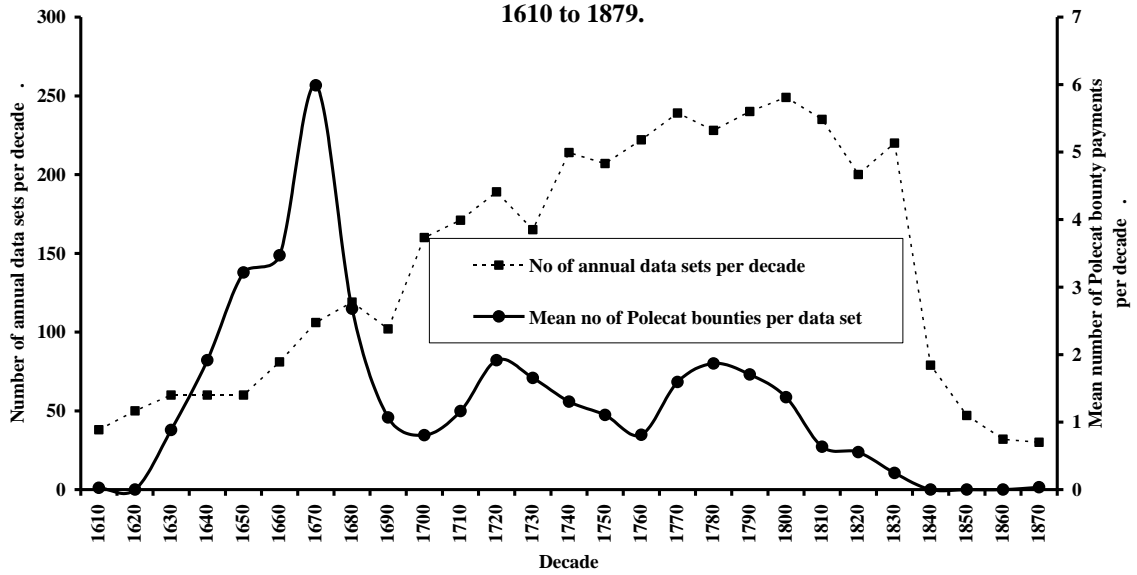
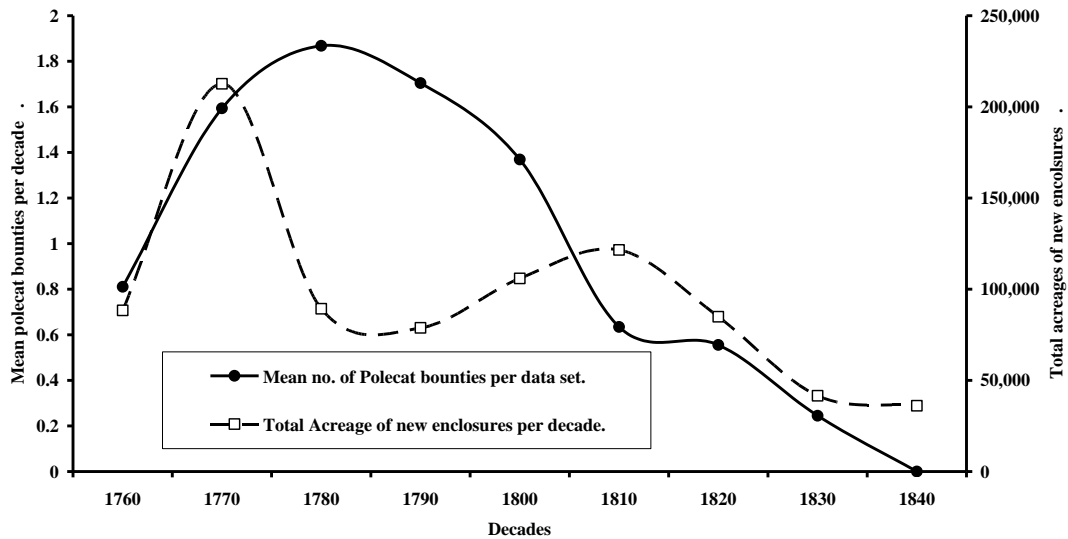


Figure 9.9, compares the mean numbers of polecat bounty payments per data set per decade with an estimation (based data in English (1985) of the minimum acreages of new enclosures in Yorkshire parishes from 1760 to 1849, showing how a rise in polecat bounties was triggered by the onset of enclosures.

Figure 9.9. Mean polecat bounties per data set compared with total acreages of new Parliamentary enclosures per decade 1760 to 1849



Polecat population density

The relatively high incidence of polecat bounty payments, with up to 84 bounties per year in Cottingham and mean annual bounties up to 14.26 for up to 42 years in Masham, suggest that (a) the animals being recorded as polecat actually included other taxa, or (b) culling pressures are unsustainable and could therefore contribute to the reduction or collapse of populations. Proposition (a) has been addressed in discussions on nomenclature and tariffs, and proposition (b) is explored in Table 9.4 and Figure 9.10. By tracing the acreages of the

Table 9.4. Maximum and mean annual numbers of polecat bounties and estimated acres per culled polecat per annum.

(*Acres divided by mean no. of bounty payments.)

Parish	Maximum no. of polecat bounties per year	Year of maximum	Mean bounty payments from first to last record	No. of years polecat bounties paid	Acreage of parish or township	Acres per polecat *
Masham	47	1653	14.26	42	1,606	112
Bedale	63	1673	4.04	22	1,682	416
Cottingham	84	1686	23.47	36	9,831	418
Penistone	26	1704	1.38	31	1,134	821
Barnburgh	12	1723	3.45	31	1,960	568
Arksey with Bentley	64	1724	8.12	56	5,123	632
Thorpe Salvin	12	1727	1.51	43	1,507	998
Bawtry	15	1729	3.86	15	3,020	782
Wadworth	14	1737	1.68	94	3,681	2,191
Rawcliffe	20	1748	2.45	40	4,428	1,807
Worsborough	45	1749	5.7	48	3,613	633
North Ferriby	14	1752	2.72	36	1,974	725
Whiston	22	1757	3.17	116	3,948	1,245
Wold Newton	6	1770	0.6	25	1,960	3,266
Patrington	24	1786	3.39	46	3,693	1,089
Tankersley	4	1788	0.87	16	2,465	2,833
Bolton Percy	4	1789	0.63	11	2,334	3,704
Brompton with Sawdon	24	1798	2.9	51	9,423	3,249
Tunstall	6	1806	0.46	28	1,346	2,926
Terrington	10	1808	1.88	26	2,930	1,558
Skipton	5	1825	0.95	20	4,204	4,425

relevant parishes and townships in 19th century trade directories, it is possible (provided the vermin were caught within the parish in question) to relate culling rate to the size of the parish. In Table 9.4 the parish or township acreage is divided by the mean annual number of polecat bounties giving an index of acres per mean polecat bounty. Table 9.4 shows that the density of mean annual polecat bounties per acre ranges from 112 to 4,425 acres per polecat bounty. Arranging these according to the years of peak annual polecat culling rate (Figure 9.10), this density index demonstrates a progression through time with bounties, and therefore polecats, becoming sparser within their defined culling ranges. The R^2 correlation value of 0.6235 suggests that the analysis of churchwardens' accounts can be used to illustrate the progressive scarcity of polecats across the Yorkshire landscape from the mid-17th to the early 19th century.

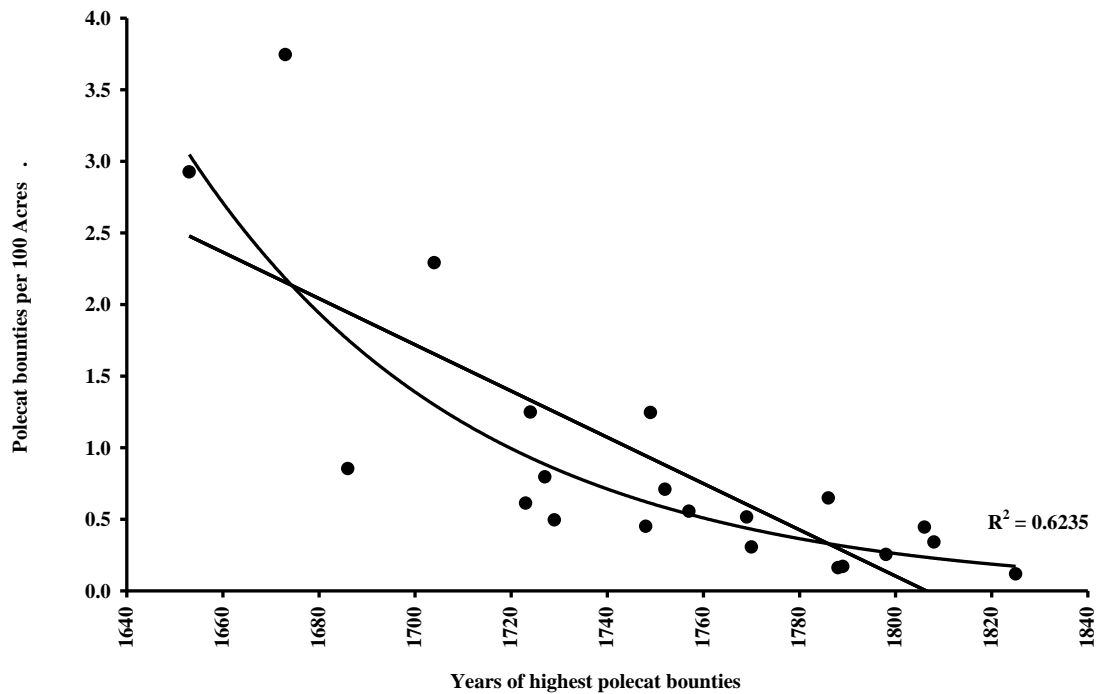


Figure 9.10. Declining density of polecats from the 17th to 19th century as illustrated (arithmetically, $R^2 = 0.6235$, and logarithmically) by plotting the highest annual number of polecat bounties per parish against the acreage of the parish, the results expressed as bounties per 100 acres.

Although the analysis of parish accounts has provided the ability to monitor changes in population density through time, it is not known to what extent the parish culling pressure contributed to these changes. For those 50-year periods where more than 100 bounty payments were recorded (i.e. 1650 to 1849), taxa have been aggregated in order to examine major patterns of change (see Figure 9.11). Due to their relative scarcity, all records of badger, otter, pine marten and wildcat have been amalgamated to form a single group. To accommodate the possibility of polecat bounties also including stoat and weasel, all *Mustela* bounties have been amalgamated in this analysis. The broad trends illustrated here are (a) a progressive decline of the *Mustela* group from 76% of carnivora bounties down to 47% during the period 1650 to 1800 and (b) a concurrent rise in fox bounties from 18% to 53%.

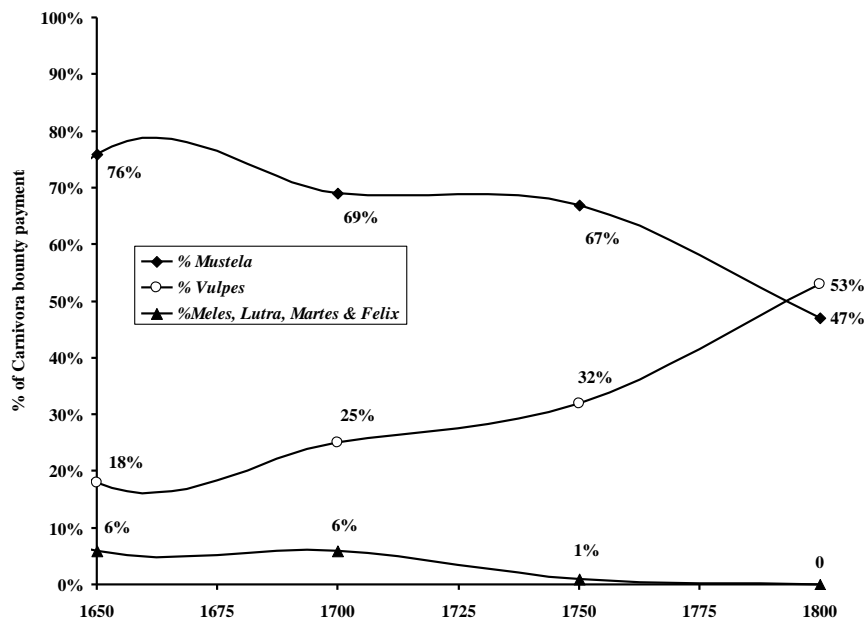


Figure 9.11. Relative frequencies of bounty payments for carnivora in Yorkshire parishes from 1650 to 1800.

A possible cause of the decline in members of the genus *Mustela* generally (see Figure 9.11), particularly polecat, may be seen in the response of the polecat to the presence of fox (see Figure 9.11). By plotting the % frequencies of polecat and fox bounties, the R^2 value of 0.7244 reveals a strong correlation.

Langley and Yalden (1977) correlated the decline of the polecat throughout Britain with the rise in gamekeeping pressure brought about by the development of shooting estates during the 19th century. Although it is highly probable that final extinctions were brought about by the intensity of 19th century gamekeeping, Howes (1980a), using data derived from ten sets of bounty payments in churchwardens' accounts, indicated that the polecat's decline had been in progress since the mid-18th century, therefore at least half a century prior to this significant persecution pressure. The current study has refined and broadly corroborated the earlier findings (see Figures 9.7-9.10).

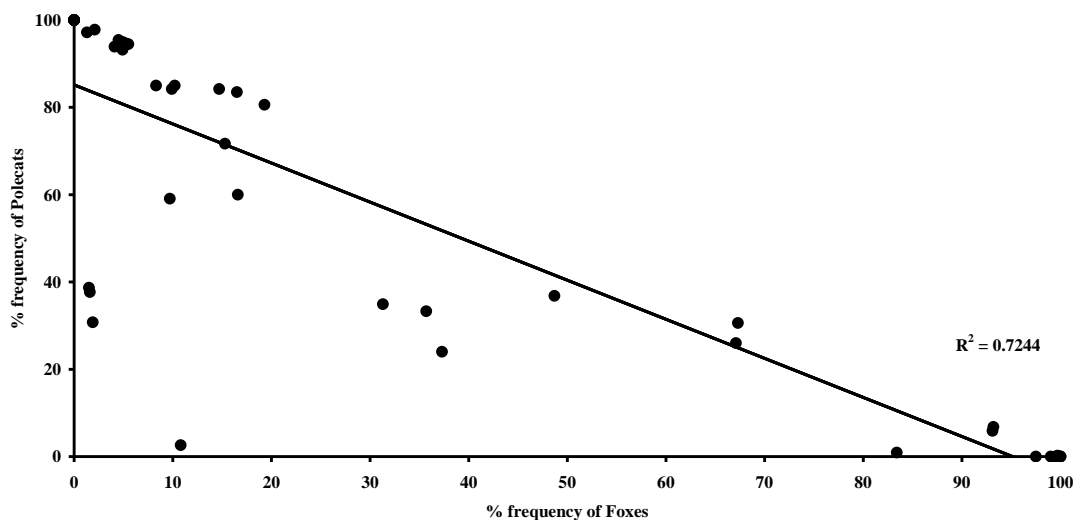


Figure 9.12. Relationship between % frequencies of polecat and fox as shown in bounty payments in Yorkshire parish accounts of the 17th to 19th centuries.

However, in comparing the relative occurrence of polecat and fox bounties in churchwardens' accounts, Figure 9.12 reveals a potential mechanism for the polecats' early decline. Whether polecats are directly affected by foxes in terms of predation on either adults or kits, or whether foxes are direct competitors for food or denning sites, appears not to have been investigated in the field. The contention amongst 19th century gamekeepers that foxes killed and helped to control polecats (Langrigg 1977) may have some basis. That polecats are extending their range in Wales and English border counties in the presence of

elevated fox populations (Birks 1993 and *pers. comm.*) would appear to contradict this proposition.

The series of British Mammal atlases (Walton 1964, 1968, Corbet 1971, Arnold 1978, 1984, 1993) monitored the early stages of the spread of polecats from their Welsh post- 19th century refugium to the adjacent English counties by the early 1990s. Furthermore, the concerted and highly publicised surveys of polecat distribution and status in Britain 1993-1997 (Birks & Kitchener 1999) and 2004-2006 (Birks 2008), organised by the Vincent Wildlife Trust in association with Mammal Society, provide the first evidence of verifiable polecats in and adjacent to the extreme western fringes of Watsonian Yorkshire since the 1940s (see Howes 1980a and Appendix 1).

Of 1,036 post-1989 polecat records gathered during the 1993-1997 Survey of Polecat Distribution in Britain (Birks 1999), one was from the Garsdale area, within north-west Yorkshire. From the 802 verifiable records of true polecats gathered during 2004-2006 survey (Birks 2008), one was from the Ingleton area [SD716749 White Scar Caves nr. Ingleton (Jonathan Sear *pers. comm.*)], within mid-west Yorkshire. This survey (Birks 1999) also recorded true polecats from the following 10 km squares adjacent to Watsonian Yorkshire - NY/72, NY/60 and NY/70 in Westmorland and SD/67 in West Lancashire. The 2004-2006 survey (Birks 2008) also recorded true polecats from additional 10 km squares adjacent to Watsonian Yorkshire - NY/71 and SD/58 in Westmorland, and SD/57 and SD/54 in West Lancashire. All these occurrences are deemed to be part of a population derived from reintroductions into the Cumbrian region since the 1970s. Jones (1992) and Birks (1999) reported that since 1978 a programme involving at least 150 animals released over 15 years at several sites in Cumbria has clearly been successful. Jones (1992) established that, initially at least, the animals released were 'polecat-ferret hybrids'. From the early 1980s onwards, however, pure polecats of Welsh origin were reportedly obtained for release or for captive breeding to generate stock for release. As a result of this exercise the polecat is now widely re-established in Cumbria and has begun to re-colonise adjacent counties of Northumberland, Lancashire, the western extremities of Yorkshire and possibly Durham. Birks (1999) shows that according to the 1993-1997 survey the population had spread to occupy a minimum area of 38 10 km squares. Kitchener *et al.* (1999) report that

whilst many polecat specimens recovered from this area appear to be introgressive hybrids, such animals have apparently become scarcer in recent years, and the majority now conforming to the polecat phenotype.

The 2004-2006 survey (Birks 2008) also recorded true polecats of Welsh origin in adjacent parts of Derbyshire from the following 10 km squares: SK/09, SK/18 and SK/27. Since the survey found that Derbyshire represented the most active region of polecat range expansion in Britain, with some 13 newly colonised 10 km squares between the 1993-1997 survey and the 2004-2006 survey (Birks 2008), it is likely that imminent colonisation of southern Yorkshire will take place from this source. However, since road casualties represent a significant controlling factor for polecat populations (Birks *et al.* 1999), the high density of major roads within the conurbations of south and west Yorkshire may well restrict subsequent colonisation or indeed render colonisation unsustainable.