

The Management of Problems Involving Badgers (*Meles meles*)

Protection of Badgers Act 1992

licensing cases 1997–1999

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A report by the National Wildlife Management Team of the Rural Development Service of the Department for Environment, Food and Rural Affairs (Defra)

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Summary

Work carried out by statutory Wildlife Management Advisers in England concerning licence applications to the former Ministry of Agriculture Fisheries and Food (MAFF) under the Protection of Badgers Act 1992 was recorded on an Access database from 1997 to 1999 inclusive. Individual applications were recorded differently from previous years but the mean number of cases dealt with per year was similar in 1997 to 1999 to that dealt with in 1994 to 1996; 538 (range 517–558) compared to 527 (range 508–551) respectively.

The regional distribution of enquiries varied widely. Some counties had no badger licence applications whilst the highest had 254 (average of 85 per year). Seasonal fluctuations in numbers of enquiries, with monthly highs from March to June/ July and a low in December, were similar to those seen in previous years.

As in previous years around half of the applicants were farmers and a wide variety of problem types were reported. By far the largest group of problems were caused by setts (95%) and the most frequently reported problem amongst these (23%) involved the prevention of serious damage to productive land (including risks to livestock and machinery). Approximately half of the reported problems caused by setts resulted from setts over 5 years old.

The majority of applicants had not tried to resolve their problems prior to the visit by a statutory Wildlife Adviser. The actions most frequently recommended by Wildlife Advisers were directed specifically at setts and mainly involved using one-way badger gates. The majority of problems caused by setts resulted in a licence being granted.

The prevention of damage remained the most common reason for granting licences. Licences to allow agricultural operations more than doubled and the number of licensed operations to carry out forestry operations also showed a marked increase, whilst the number of licensed operations to maintain or improve existing watercourses fell.

No licences were granted to kill badgers between 1997 and 1999, but two licences were granted to take (translocate) badgers.

Wildlife Advisers monitored 16% of licence records with one or more site visits. Of those records where breaches or compliance with licence conditions was recorded around 11 percent noted breaches of licence conditions. Where success was evaluated the majority (86%) were considered fully successful. Estimates of costs were difficult to assess but the indications were that the solutions recommended by Wildlife Advisers were cost effective.

Introduction

This report presents data on work carried out by the statutory Wildlife Management Advisers of the Farming and Rural Conservation Agency (FRCA), now part of the Defra National Wildlife Management Team, on behalf of the then Ministry of Agriculture Fisheries and Food (MAFF), under the Protection of Badgers Act 1992. For the remainder of this report these advisers are referred to simply as Wildlife Advisers. This report covers the period from 1997 to 1999 inclusive. A previous report ('The Management of Problems Involving Badgers', Wilson & Symes, 1998), which dealt with the period 1992 to 1996 explained the background to this work. That report presented data for the south west of England only for 1992 and 1993, and for the whole of England for 1994 to 1996. The present report deals with records for England as a whole, unless specifically stated otherwise. Records for Scotland and Wales are not included.

In virtually all of the badger licensing cases covered in this report a Wildlife Adviser carried out a site inspection in response to an application for a licence under the Act. On the basis of information supplied by the applicant and gathered during the site inspection, the Wildlife Adviser then submitted a report and recommendations to MAFF, the licensing authority. During the site visit potential licensing options and alternative solutions would be discussed with the applicant. Thus almost all of the data presented is based on at least one site visit and assessment by a statutory Wildlife Adviser.

Recording the Data

Most of the data for the earlier report by Wilson and Symes (1998) was recorded on Microsoft Excel Spreadsheets. However, during 1996 this was transferred to a Microsoft Access database, BROCC (Badger Records Of Casework), and 1997 was the first complete year recorded in this way. An important change from the previous system is that BROCC is based on records whilst previously information was based on cases. A record is defined in this context as an action, actual or proposed, at a sett, or involving a badger(s). For example a single sett may have two actions affecting it such as partial closure for prevention of damage and agricultural operations to allow ploughing over the whole sett. This would generate two records, whereas previously it would have been one case. Similarly partial sett closure might be carried out at three separate setts on one farm and thus have three records. An exception to this is where forestry or agricultural operations licences were granted to cover areas of land which might have contained more than one sett. These were recorded on a single record as affecting a 'multi-sett area'.

Consequently numbers of records presented here are not directly comparable with numbers of cases given in Wilson & Symes (1998).

Records were entered on BROCC when a licence application had been received. Complaints or requests for advice about damage by badgers and/or their setts, which were not followed up with an application, were not included. Thus the many enquiries concerning badger feeding damage to gardens which were dealt with by Wildlife Advisers over the telephone were not recorded on BROCC.

Individual records were normally entered by Wildlife Advisers following completion of their written report and updated as necessary, for example if a licence was granted, monitoring carried out or a licence return received.

Records were included in this report if the enquiry was made between 1 January 1997 and 31 December 1999 inclusive. In most, but not all instances, this meant that the work was also carried out within this period.

Percentages in this report have been rounded to the nearest whole percent and so totals may not always add up to exactly 100 percent.

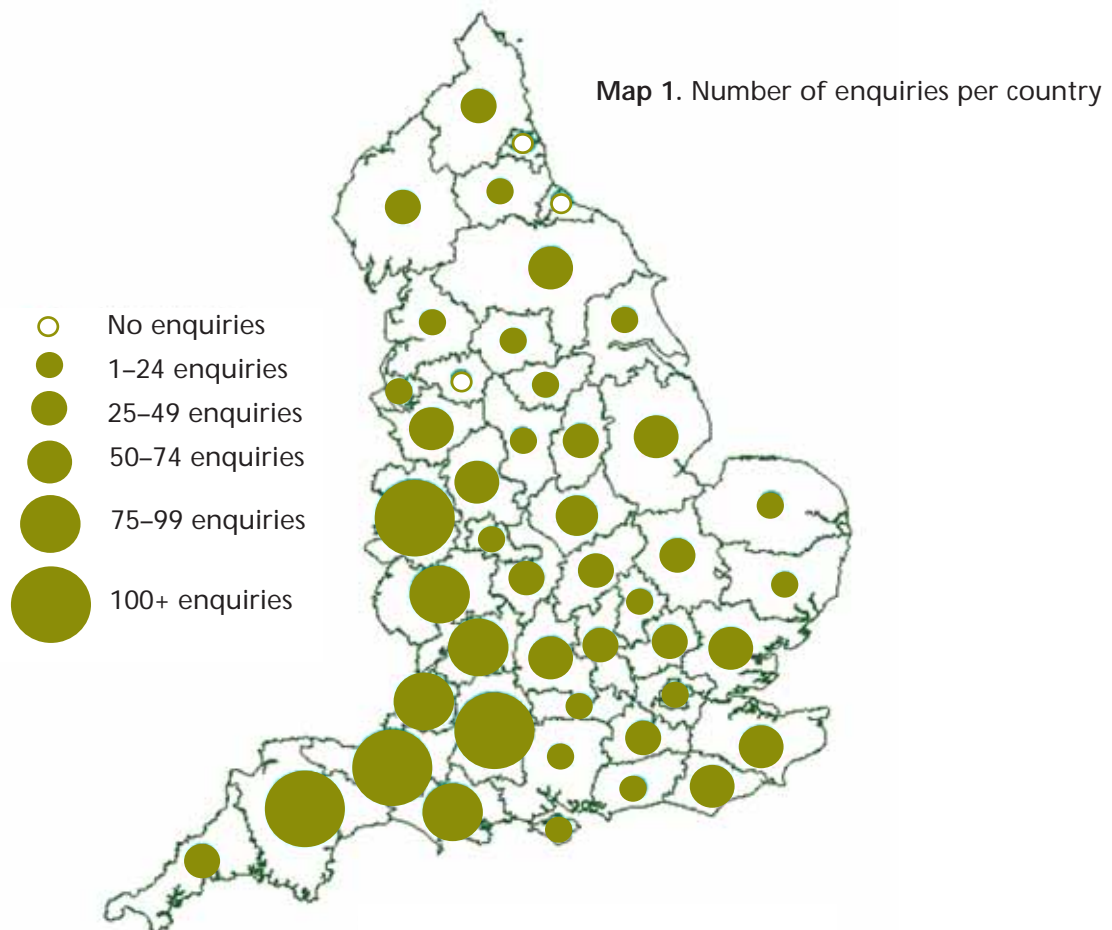
Numbers and Sources of Enquiries

For the reason outlined in the previous section, the number of records of licence applications presented here is not directly comparable with the number of cases recorded for previous years (Wilson & Symes, 1998). The number of records for the period covered by this report was 768 in 1997, 676 in 1998 and 761 in 1999, giving a total of 2,205 records over this 3 year period. However, due to the record numbering system it was possible to estimate the approximate number of cases these records would equate to under the case system as defined in Wilson & Symes (1998). This is equivalent to approximately 539, 517 and 558 for the years 1997 to 1999 respectively. Compared to a mean of 527 (range 508-551) per year for the period 1994 to 1996 this indicates a relatively stable number of cases per year throughout the period from 1994 to 1999.

Badger licence applications were not distributed evenly across the country, being weighted heavily towards the south-west. Over half the enquiries came from just eight counties (Wiltshire, Somerset, Devon, Shropshire, Avon, Hereford & Worcester, Gloucestershire and Dorset). The number of enquiries per county varied widely. Cleveland, Greater Manchester and Tyne & Wear, had no records, whilst Somerset (the highest) had 254 records (Map 1).

As in previous years almost half of the applicants were farmers (45%), with householders and forestry interests the next two largest groups, accounting for 14% and 9% of applicants respectively. Voluntary Conservation Groups (including Badger Groups) and Professional Ecological Consultants accounted for about 4% and 3% of records (Fig.1).

Map 1: Number of enquiries per country*



Seasonal Occurrence of Problems

It was assumed that the earliest record of notification reflected the time of year when a problem arose. However for some records this may not hold true, as some enquiry dates may have been influenced by enquires realising that licences for some situations were more likely to be granted outside the badger breeding season or by their having waited for other reasons, for example, until they were able to do the work. However, the seasonal fluctuations in numbers of enquiries was similar to that of previous years with monthly highs from March to June/July and the lowest number of enquiries in December (Fig.2).

Fig 1: Applicant type (n=2205)

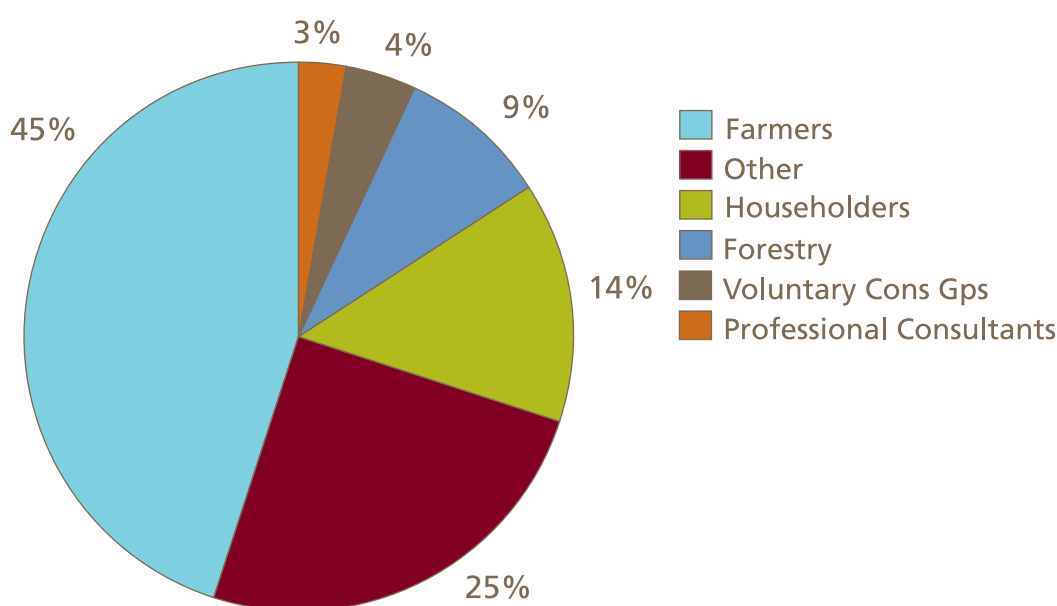
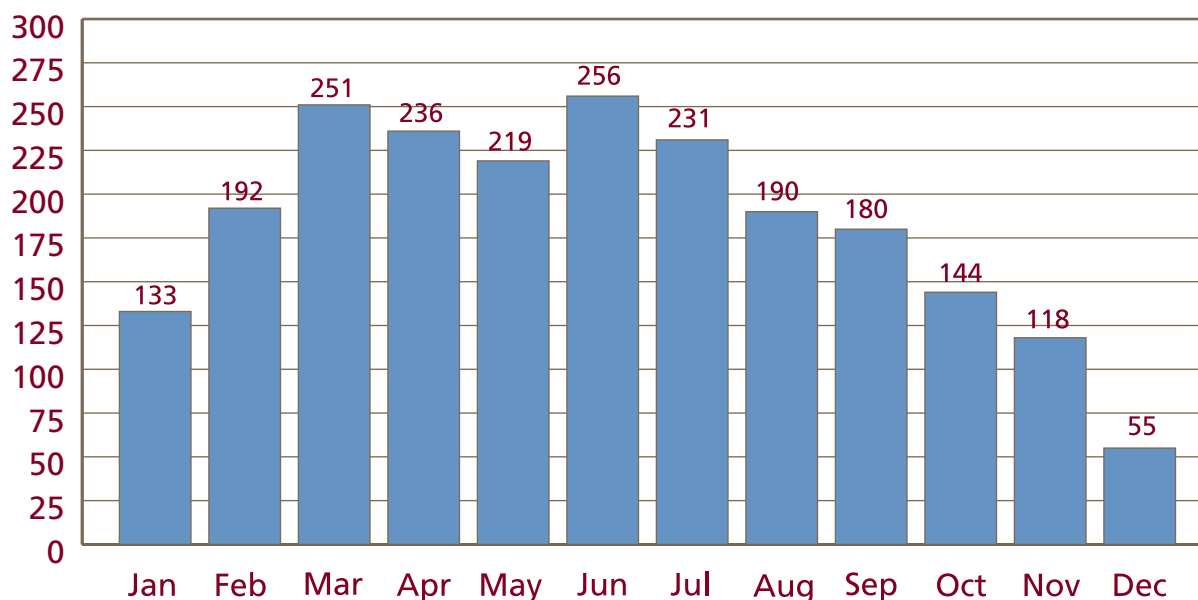


Fig 2: Monthly distribution of applications (n=2205)



Problems Types

As in previous years a wide variety of problem types was reported. This included problems caused directly by badgers, such as feeding damage, or indirectly by badger setts, for example tunnels undermining buildings. Where more than one problem occurred only the main problem which prompted the licence application was recorded. Thirty five records of problems reported by applicants as being caused by badgers or their setts were not considered to be so caused by the Wildlife Adviser. These included cases where, for example, a fox earth may have been mistaken for a badger sett by the applicant.

Direct Badger problems

There were 85 records of problems caused directly by badgers, rather than their setts. Damage to pasture or grassland, gardens and predation accounted for the majority of these applications (74%). Only eight complaints of damage to crops, vegetables or fruit were received.

Sett-caused problems

A total of 2,084 records (94.5%) concerned applications to interfere with badger setts.

By far the most commonly reported type of sett caused problems, accounting for nearly a quarter of sett-caused complaints (23%), involved productive land (not including applications to carry out agricultural operations). Most of these were related to the prevention of damage to land or property such as livestock and machinery on such land. Some also concerned a threat to human safety, especially for personnel operating farm machinery near setts. However, there is no provision under the Protection of Badgers Act 1992 for granting licences to prevent personal injury or for the purpose of preserving public health or public safety.

Applications concerning agricultural operations accounted for 17% of records and those concerning forestry operations 13%. In most of these the sett was not a problem in itself but a licence was required to allow normal agricultural or forestry operations, such as ploughing or tree-felling, close to the sett.

Other problems included setts affecting roads (6%), tracks or paths (6%), buildings (9%), gardens (9%) and watercourses (7%). Problems concerning railways and amenity land accounted for less than 2% each. There were 14 applications to interfere with badger setts to recover dogs believed to be stuck in setts and only one application to interfere with a sett for the purpose of fox control.

Around half of the sett caused problems resulted from setts believed to be over 5 years old. Setts between 2 and 5 years old caused 18% of problems, those between 1 and 2 years old caused 14% of problems, and those less than a year old caused 15% of problems. This type of data was not recorded prior to 1997.

Problems Types

The majority of situations were reported to Wildlife Advisers fairly quickly after they were perceived as becoming a problem. Over half of the situations had been a problem for less than one year and most (over 80%) had been a problem for less than 2 years before being reported.

Excavating a sett tunnel back into a flood bank (Photo: H M Brown, FRCA)



Resolution of Problems: Action/FRCA Recommendation

Pre-licence action

The majority of applicants (78%) had not tried to resolve their problems before submitting their licence application. However, 474 recorded some pre-licence action. Some of these actions may have been carried out under a previous licence, whilst others may have been carried out without one.

Attempts had been made to block the sett in 116 records, fencing the sett off (i.e. from livestock, not badgers) had been tried in 56 records, the property being damaged had been proofed in 25 records, deterrents or repellents had been used in 22 records, all or part of the sett had been dug out in 10 records, badgers had been killed or taken in 2 records and 243 reports of 'other' action were recorded.

Advice given by Wildlife Advisers

As BROCC was an FRCA database this section is based on Wildlife Advisers' recommendations to MAFF. Although Advisers' recommendations were usually accepted by MAFF, this was not always the case and the recommended actions may not necessarily have been licensed by MAFF or carried out by the licensee.

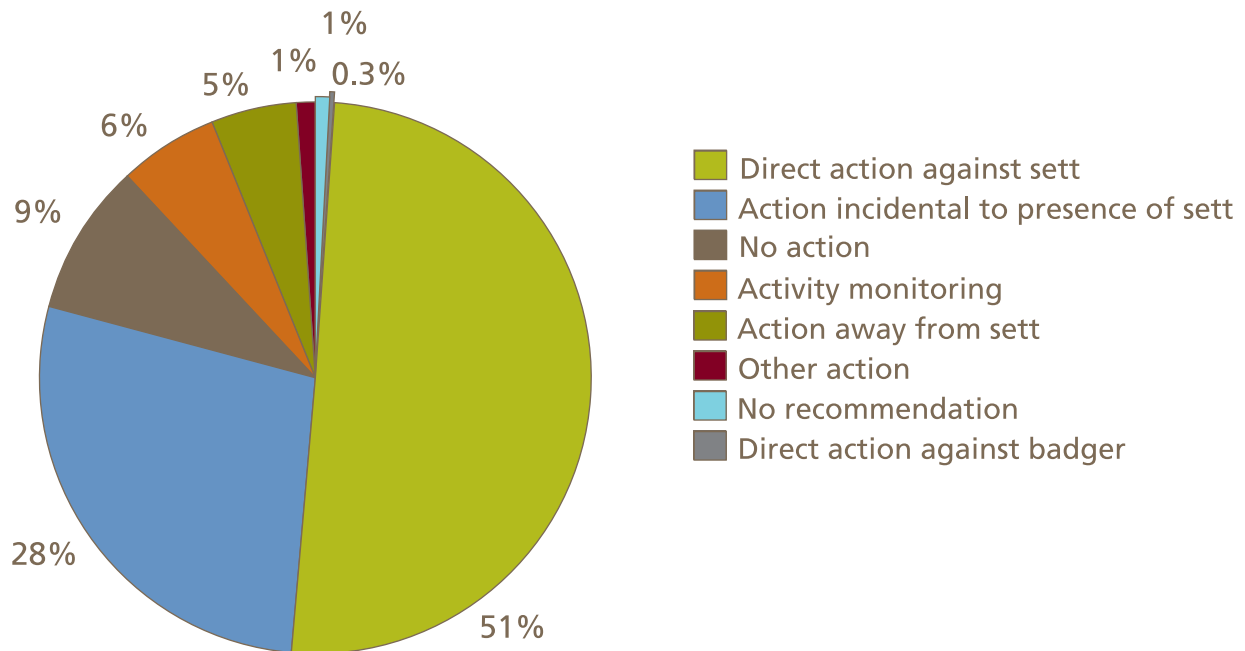
Sixteen records out of 2205 had no recommendation recorded and for 188 it was recommended that 'no action' be taken. Thus for 2001 records positive actions were recommended.

Of these 6 were aimed directly at badgers (and are dealt with below), 18 were recorded as 'other', a further 617 involved sett disturbance incidental to the recommended operation (e.g. forestry or agricultural operations) and 107 recommended action away from the sett (e.g. proof property). The remainder 1253 recommendations were directed specifically at the sett or sett vicinity, including 128 which were only to assess activity by soft blocking or other methods.

Recommendations for licences for agricultural or forestry operations were mainly aimed at minimising the impact of the proposed work on the sett, whilst allowing the operations to continue, rather than allowing actions specifically targeted at the sett (Fig. 3). Most of the actions recommended specifically at setts (69%; 861) involved using one-way badger gates (with or without electric fencing) indicating the importance of the use of one-way gates as a method for resolving problems with badger setts.

Resolution of Problems: Action/FRCA Recommendation

Fig 3: Recommendations made to MAFF by Advisers (n=2205)



Other solutions recommended by Wildlife Advisers and directed at the sett were to dig into a potentially occupied sett (94 records; so called "live-digs", see below for details), to use an approved animal repellent at the sett (7 records), to enter dog(s) into the sett (1 record) and 'other' solutions, details of which were not recorded on BROCC (162 records).

Recommended actions not directed at the sett included proofing or fencing the property vulnerable to damage (74 records), controlling food species such as leatherjackets (*Tipula* spp.) (11 records), using an approved repellent (not at a sett) (7 records).

Recommended actions aimed directly at badgers were to trap and translocate badger(s) (1 record), to shoot a badger (1 record) and to trap and kill badger(s) (4 records).

Where no action was recommended (188 records) this was usually because the application had been withdrawn by the applicant (66 records) or because the proposed actions were considered not to need a licence (78 records). In addition 18 records concerned problems which were not considered serious enough to warrant licenced action and 26 records were not specific.

Total sett closures

It is assumed that total sett closures have the potential for greater impact on badger social groups than partial closures and interference with main setts may have more impact than that involving other sett types. It is likely that there is a matrix of potential impact with total closure of main setts having the most adverse effect and partial closure of an outlier sett the least.

Table 1: Number of records for different sett types where total or partial sett closure was recommended. This does not include records where soft-blocking was used (as this is typically a monitoring, not a closure technique) nor are forestry or agricultural operations included as these would not usually involve deliberate sett closure.

Wildlife Adviser's Recommendation	Sett Type				Total
	Main	Annexe	Subsidiary	Outlier	
Total Closure	132	78	147	225	582
Partial Closure	260	14	51	17	342
Sum	392	92	198	242	924

Over half of the recommended sett closures were for total closure and of those 132 were for main setts (Table 1). Thus 14% of recommendations for sett closures were in the "maximum potential impact" category. With an estimated 50,000 social groups of badgers in England (Wilson et al, 1997) and assuming one main sett per social group, this suggests an average of less than 0.5% of social groups being affected by main sett closures each year.

Live-digs

Unlike much of the interference licenced, which posed little direct risk to badgers, live-digs pose a greater potential short term risk. Live-digs involve digging into a sett which may still be occupied by badgers. Licences for live-digs were recommended where there was insufficient time to exclude badgers from a sett before an urgent problem needed to be dealt with, where badgers persistently re-occupied a sett which was subject to closure, or where a partial closure had been carried out but there was a risk that badgers could still be present. The greatest risk of badgers being disturbed during such a dig is likely to be at a main sett and during total rather than partial excavation of the sett.

Resolution of Problems: Action/FRCA Recommendation

Most recommended live-digs were for partial excavation of main setts (Table 2).

Table 2: Live Digs: Number of partial and total excavations carried out at different sett types.

Wildlife Adviser's Recommendation	Sett Type				Total
	Main	Annexe	Subsidiary	Outlier	
Total Excavation	2	1	1	4	8
Partial Excavation	56	1	8	6	71
Sum	58	2	9	10	79

(A further 12 records of live-digs recorded the action as 'in the vicinity of the sett' or on the 'damaged area', indicating possible but not inevitable sett interference. One record did not specify whether it was partial or total closure and 2 records were at abandoned setts).

Resolution of Application: MAFF Licences

Out of 2205 records 2084 (95%) cited problems with badger setts as the main concern and 85 (4%) problems caused directly by badgers. The cause of 35 (1%) were considered not to be badger related and 1 record was not clear whether it was badgers or the sett that was the main problem.

Licences to interfere with badger setts

Out of the 2205 records of applications there were 1790 records of licences to interfere with setts, 229 applications were refused, and 118 were withdrawn. The outcome of 68 records is "unknown" or "other" (some of these will be due to the application not having been determined by the end of 1999). (Fig. 4). The broad purposes for which licences were issued and the sections of the Protection of Badgers Act 1992 under which they were issued were as follows (Fig.5):

Prevention of spread of disease (s.10(2)(a) of the Act)

No licences for the prevention of the spread of disease were granted. Applications specifically for the control of the spread of bovine tuberculosis were made to the State Veterinary Service and would not normally be handled by Wildlife Advisers or recorded on BROCC.

Prevention of damage (s.10(2)(b) of the Act)

This was the main reason for applications and licences granted under this section of the Act accounted for 1065 (almost 60%) of licences granted.

Agricultural Operations (s.10(2)(c) of the Act)

Licences were granted to allow agricultural operations to be carried out at 345 setts/multi-sett areas (19% of licences granted). This is more than double the number of licences granted between 1994 and 1996.

Forestry Operations (s.10(2)(c) of the Act)

Licences were granted to allow forestry operations to be carried out at 243 setts/multi-sett areas (13% of licences granted). This was a noticeable increase over previous years. A further 14 licences (1%) were granted under s.10.(2)(c) of the Act, but the records are not clear as to whether these were for agriculture or forestry purposes.

Resolution of applications: MAFF licences

Watercourses/drainage/flood defences (s.10(2)(d) of the Act)

One hundred and twenty three actions were licensed under this section of the Act for the purpose of operations to maintain or improve existing watercourses or drainage works, or to construct new works required for the drainage of land (7% of licences granted). This is a lower number than in previous years.

Controlling foxes to protect livestock/ game (s.10(3) of the Act)

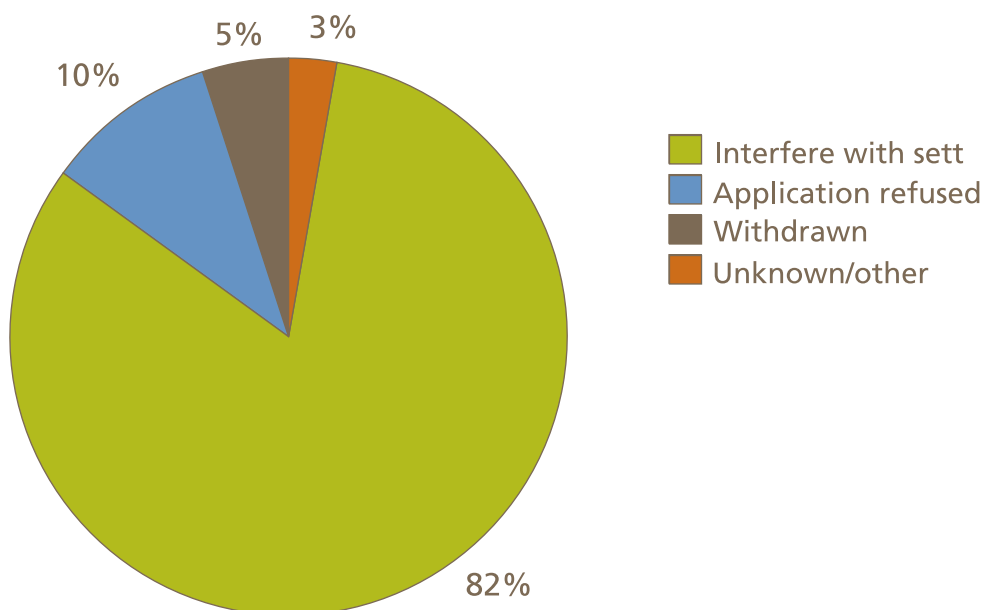
One application was received to enter dogs into a badger sett for the purpose of controlling foxes in order to protect livestock. No licences were granted.

Licences to kill badgers or take them from the wild

Eighty five records cited problems resulting directly from badgers. Fourteen of these were considered not to need a licence for the proposed action, 21 were judged not to be serious enough to warrant licensed action and it was thought 32 could be solved using other (non-licensed) methods. Five applications were withdrawn by the applicant, 6 resulted in sett interference licences being granted and the outcome of the remaining 7 was recorded as 'other'.

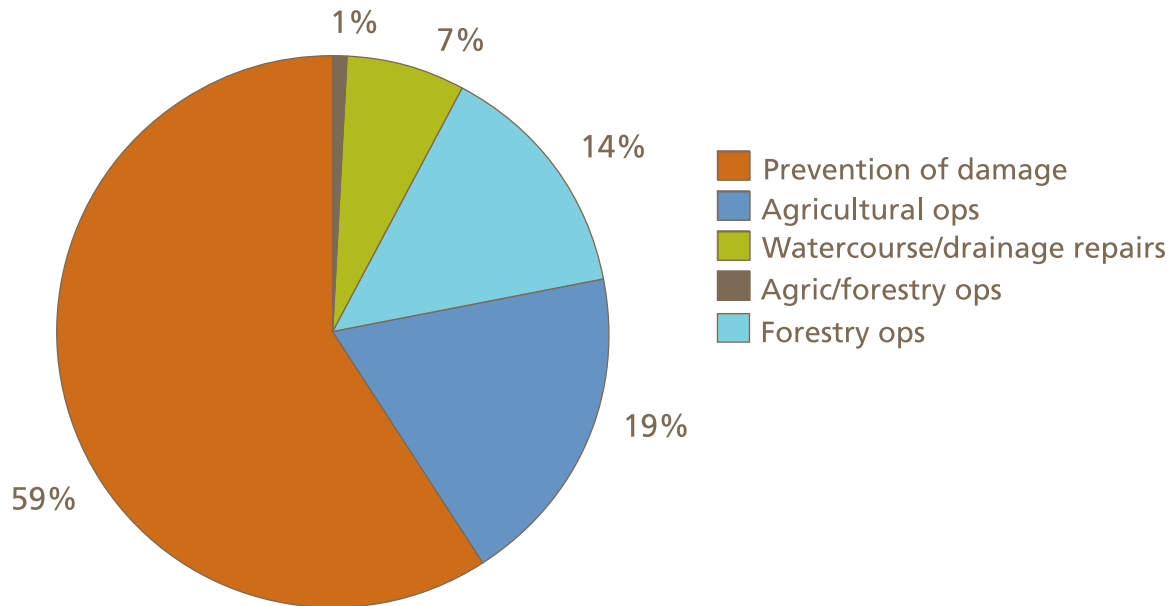
No licences were granted to kill badgers between 1997 and 1999.

Fig 4: Outcome of application (n=2205)



Resolution of applications: MAFF licences

Fig 5: Purpose of License (n=1790)



Two licences to take (translocate) badgers were granted between 1997 and 1999. Both of these were cases where the enquiry was received prior to 1997 and so are not included in the above statistics. However as they had not been determined at the end of 1996 when the previous report was written, they were not included in that report either and so have been mentioned here (see 'Brief Notes on Some of the more Unusual Cases', below).

Monitoring

Of the 1,790 records which had licences granted, Wildlife Advisers carried out one or more monitoring visits at 286 (16%). The majority had one visit each, although up to 8 visits per site were carried out. Monitoring by telephone was carried out for 458 records (26%).

Licence Breaches

Records noted as having licence conditions breached amounted to 72, against 568 records noted as having none. For most records it was unknown whether or not breaches occurred. Licence breaches account for around 11% of those records where this data was recorded by the Wildlife Adviser.

Breaches were recorded where the licensee was required to notify the licensing authority when certain licensed actions were to take place, but failed to do so (25), where methods used did not comply with licence conditions (26), where the timing of operations did not comply with licence conditions (11) and 'other' reasons (10).

Success

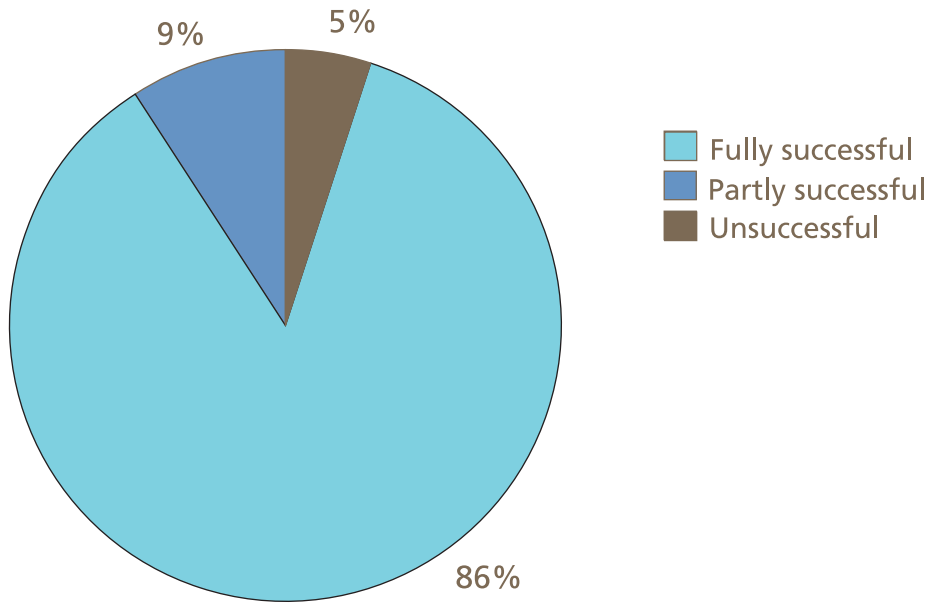
Assessments of success were made during Wildlife Advisers' monitoring visits or from information gathered by telephone, or reports submitted by the licencees after expiry of their licences. The overall success of each licensed operation was judged by the Wildlife Adviser handling the case. Assessments were not recorded for all cases.

Of the 864 records for which an assessment of the success of the licensed action was made, 745 were considered fully successful (86%), 76 were considered partially successful (9%) and 43 unsuccessful (5%) (Fig. 6). Half of the operations (27) considered to be failures were at main setts, 4 were at annexe setts, 7 at subsidiary setts and 5 at outliers. This is consistent with the expectation that closures at main setts would be the most likely to fail, being the most important sett type to a social group of badgers and thus that which they would be most reluctant to leave or most persistent in their attempts to re-enter.

As only 16% of licenced actions were directly monitored it is not possible to say with certainty whether the failures were generally due to inappropriate advice by the Wildlife Adviser, inappropriate licence conditions, or failures by the licensee to carry out the work correctly. However, it appears that the great majority of problems were successfully resolved following the advice given by the Wildlife Adviser.

Monitoring

Fig 6: Success of licensed action (n=864)



Cost Identified

Estimates of the economic costs of any damage already caused, action taken (i.e. cost of closing sett etc.), and estimated value of damage prevented from occurring by taking such action, were recorded. Records were placed in a 'costs band' as illustrated below. Hence exact costs are not computable and minimum and maximum calculations can only provide a broad range. The cost bands were: zero, £1–100, £101–500, £501–£1,000, £1,001–5,000, £5,001–10,000, £10,000+. The true costs of problems estimated to cost over £10,000 were not recorded and, in some cases, could have been many times in excess of £10,000. As the actual amount for these £10,000+ records was not recorded an upper limit is impossible to estimate. However a conservative average of £15,000 each for records in this category was used to estimate the values below.

No economic damage was recorded in 1,041 records. This included records where no damage would be expected due to the nature of the application (e.g. the 602 forestry and agricultural operations) but also cases where the application was for the prevention of damage, but damage had not yet occurred.

In 1,051 records some economic damage was reported to have already taken place. The total cost of this was estimated between £131,000 and £440,000, giving an estimate of between £125 and £420 per record where damage had occurred.

The cost of the action taken to resolve problems was recorded for 2,068 records and totalled between £230,000 and £790,000, giving an estimate of between £110 and £380 per record. These figures include all records where the cost of action taken was recorded not only those where a cost of damage was reported.

With the cost of the action taken much the same as that of the cost of damage reported this may not seem to be cost effective. However, without preventive action it is assumed that damage might have continued, incurring further economic costs, and perhaps requiring further remedial action in the long term.

Estimates of the value of potential damage prevented were based on the assumption that no preventive action was taken. There were 1,302 records where it was believed further economic damage would be prevented. Of these, 144 (11%) were estimated to have prevented in excess of £10,000 of damage each. The total estimated prevented damage for the 1,302 records was between 2 million and 4.25 million pounds, or between £1,500 and £3,000 of prevented damage per record, suggesting that the preventative action was cost-effective.

Other non-economic damage may have occurred, such as the loss of enjoyment of gardens or stress, but is so difficult to quantify that it was not recorded.

Brief Notes on some of the more Unusual Records

- Because a limited number of problem types could be listed in the database some had to be recorded simply as 'other'. These included potential damage to a sett whilst erecting a footbridge, emergency repairs to underground electric cables damaged by badgers, a sett threatening to breach the bank of a slurry lagoon, removal of hay bales in a stack used as a day-bed by badgers and badgers unearthing human remains in churchyards/ cemeteries.
- Fourteen records concerned dogs stuck in badger setts. In such cases the enquirer is usually advised to allow 24 to 48 hours for the dog to emerge of its own accord before any action is taken to interfere with the sett. In some cases dogs have been known to emerge from setts after several days underground. Following this period a licence may be granted to interfere with the sett if the approximate location of the dog in the sett can be determined. In four records dogs came out unaided, six were rescued by digging into the sett and four were not found. Although the latter four dogs disappeared in the vicinity of the setts it was never certain that they had actually entered the setts.
- One application for sett interference was received from a Pest Control company in Shropshire to allow dogs to be entered into a sett to flush out foxes for fox control. The application was based on the reported loss of two lambs to foxes believed to be living in a nearby badger sett. The application was refused on the grounds that other methods were available to resolve the problem.
- Somerset Translocation (enquiry received prior to 1997)

Following problems at an urban site in Somerset over several years and the granting of sett interference licences, MAFF granted a licence to take badgers from a sett in residential gardens, to be released into the wild at a rural site elsewhere in Somerset.

Four adult female badgers and 10 cubs were caught by use of cage traps. No adult male badgers were caught, but it was thought by the licensee that a single badger remained on site. A subsequent licence allowed the use of a stopped snare to try to catch this animal, but no more badgers were caught. The trapped badgers were taken to the release site and held in an outdoor enclosure pending TB testing before being released. None of the animals tested positive for TB.

Unfortunately difficulties were encountered in monitoring the badgers, following their translocation, because of problems in getting access to the release site. It was found that four badgers died within six weeks of the release, but because of the lack of monitoring, the fate of the other badgers is unknown.

Following the badgers' removal from the site the sett was gated and filled with approximately 76 cubic meters of concrete under a separate sett-interference licence. The area has since been proofed and no reports of damage reoccurring have been received. The cost of the whole operation is estimated to have been between £50,000 to £100,000.

Brief Notes on some of the more Unusual Records

- Gloucestershire Translocation (enquiry received prior to 1997)

Over several years setts made by this social group had caused problems, damaging land, a garage, a tree and gardens. Following several attempts to close (under licence) the setts causing problems, whilst leaving the badgers in the area, which only resulted in badgers excavating setts close by which caused more problems, a licence was granted to take (translocate) the social group of badgers.

These badgers chose to dig a sett in a suburban garden and to live within a few metres of human habitation and so were already habituated to human presence prior to capture. Therefore it was felt that keeping them in close proximity with people after capture would not be unduly stressful for them. Indeed it was felt preferable to expecting them to adapt to the new foraging strategies that would be required if they were released into an unfamiliar countryside environment.

Five badgers were caught and translocated to a permanent enclosure at a wildlife park where it was intended to keep them permanently and an English Nature licence had been obtained to do so.

The empty sett was then gated and subsequently excavated with a mechanical digger. No badgers were found during the excavation. An underground barrier was put in to help prevent badgers from neighbouring groups moving in. No further problems with badger setts have been reported in the area.

Discussion

Around 30% of “sett-caused problems” were instances where no direct action against the sett was intended (i.e. forestry and agricultural operations) but incidental disturbance was likely to occur whilst applicants carried out otherwise lawful operations in the vicinity. It was presumed that such operations would not result in significant damage to or abandonment of the badger setts affected. A small number of these cases were monitored by follow up site visits to try to determine if this was the case but further data is required before it will be possible to confirm this.

For the first time the estimated age of setts involved in problems was recorded. It was expected that new setts would cause the majority of problems but this was not the case. A sizeable proportion of problems (nearly a third) were caused by setts believed to be less than 2 years old, but more (about half) were caused by setts believed to be 5 or more years old. This suggests that the expansion of established setts is at least as important a cause of problems as the creation of new setts.

Monitoring was, for the most part, targeted at difficult or sensitive cases, with only a small percentage of more routine cases being included. High priority situations for monitoring included, for example, where there had been a history of problems, complicated cases, where particular care was needed to successfully complete the licensed operation, or ‘live-digs’. These were often observed by a Wildlife Adviser whilst the work was being done, thus helping to pre-empt technical breaches or mistakes which might otherwise have occurred.

A sample of other licensed sett interference sites were visited as time and other work commitments allowed. As licenced operations may only take 3 to 4 weeks to complete but licences often allowed a 3 or 4 month window for the work (12 months in the case of agricultural or forestry operations) the information gained from these visits was highly dependent on their timing. Much of the monitoring relied on talking to the licensee by telephone rather than an on-site assessment of the situation by the Wildlife Adviser. The limitations of monitoring carried out in this way must be borne in mind when drawing conclusions.

A greater number of licences for agricultural operations was granted in the period covered by the report compared to previous years. The reason for this is not known, but there is a strong likelihood that growing awareness of the requirement for such licences contributed to this. Only 35 out of the 47 counties in England had applications for licences to interfere with setts for the purpose of carrying out agricultural operations. About half of these only had 1 or 2 applications each per year. It is strongly suspected that this does not truly reflect the number of routine agricultural operations carried out over setts and such applications may continue to rise as farmers become more aware of the requirement for such licences.

From January 1997, repeat licences for agricultural operations were automatically granted by MAFF in advance of a Wildlife Adviser's visit. A visit was then made after the licence had taken effect. These types of licences usually lasted for 12 months and allowed various operations to be carried out at any time during the licence period. It was therefore not possible to target visits to monitor specific actions. The effect of carrying out normal agricultural operations over or close to badger setts is often presumed to be minimal.

Discussion

However this assumption is based on anecdotal and ad hoc evidence, such as the number of repeat licences indicating that the setts still exist and are active year after year of having agricultural operations carried out over them.

Moore et al (1999) attempted to assess the extent and economic impact of badger damage to agriculture generally in England and Wales. However the records presented here are the first attempt specifically to quantify the costs resulting from badger problems involved in licence applications and therefore likely to be of a particularly serious nature.

Costs are often difficult to assess and the figures quoted should be taken as an indication of the general magnitude of the costs, rather than actual values. This is especially true of 'prevented costs' which involve some extrapolation or prediction of what damage would have been likely to occur if action had not been taken. The amount of the 'prevented cost' was limited to damage /costs likely to have occurred within one year. Although 'prevented costs' may be one of the most difficult costs to put a figure on it is also one of the most important as the majority of licences granted were for the prevention of serious damage. 'Action costs' included a rate for labour, even when the applicant carried out the work themselves, as their time was considered to be a resource input. A comparison of 'action costs' with 'prevented' and 'damage costs' has, for the first time, allowed an evaluation of the overall cost-effectiveness of the techniques recommended by Wildlife Advisers.

Proofing and fencing to keep badgers out of gardens following sett closure – (Photo: A J Matthews, FRCA)



References & Acknowledgments

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