

Controlling the Spread of Bovine Tuberculosis in Cattle in High Incidence Areas in England: Badger Culling

A consultation document issued by the Department for Environment, Food and Rural Affairs

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Nobel House

17 Smith Square

LONDON SW1P 3JR

Telephone 020 7238 6000

Website: www.defra.gov.uk

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Defra

1a Page Street

London SW1 4PQ

Email address: bTB.consultation@defra.gsi.gov.uk

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Executive summary

1. Bovine TB is endemic in some parts of Great Britain and increasing at a rate of 18% a year. The disease has implications for the farming industry, wildlife, animal and public health. The Government has decided further measures should be implemented now to reduce cattle to cattle spread. But international experience indicates it is not possible to contain and eradicate bovine TB if its background presence in wildlife is left unaddressed.
2. The main wildlife reservoir for the disease in Britain is in badgers. New results from the proactive part of the Government's Randomised Badger Culling Trial¹, combined with other scientific evidence, has led the Government to conclude that an open consultation is needed to inform a decision on whether or not to introduce badger culling as a bovine TB control measure. This document considers the scientific evidence, cost benefit analysis and animal welfare and conservation issues. **The consultation will close on 10 March 2006.**
3. The question of whether or not to cull badgers as a measure to control bovine TB in cattle is contentious. A major programme of cattle controls is already in place and new cattle measures have been announced alongside this consultation, however, these will not address the reservoir of infection in the badger population. The scientific evidence shows that intensive culling of badgers over large areas can be effective in helping to prevent the spread of bovine TB in cattle and vets advise that without badger culling satisfactory control and reduction of the disease in cattle is unlikely to be achieved.
4. In deciding whether to introduce a badger culling policy, the Government will take into account scientific evidence, how successful a cull would be in reducing bovine TB in cattle, cost effectiveness, practicability and sustainability.

¹ Donnelly, C.A. , Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Ferve, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

5. Your views are sought on whether or not to introduce a cull of badgers to help control bovine TB in cattle in England.
6. While the scientific advice suggests that badger culling can reduce bovine TB in cattle, there is uncertainty about the relative benefits of particular badger culling options. There is evidence that some options may bring little benefit or even make matters worse because of badger perturbation leading to an increase in bovine TB in herds at the edge of culling areas. However, any measures to reduce the incidence or control the spread of bovine TB is likely to benefit the general health of wildlife, including badgers, as well as cattle.
7. The Government has identified three potential options, all using some form of licensing, that could be used were badger culling to be introduced:
 - I. *Individual licensing to help control bovine TB*

Issuing individual licences to kill badgers to prevent the spread of bovine TB as and when an application is made under the Protection of Badgers Act 1992.
 - II. *General cull over large areas*

General culling over large areas, through either farmer/landowner co-ordinated groups or a combination of state and farmer/landowner involvement. This would cover high incidence areas but not be linked to a specific farm or landholding.
 - III. *Targeted culling over specific areas linked to herd incidence*

Targeted culling would involve designating an area based on affected farms, and therefore, close to herds which have a history of bovine TB. This option could be managed and the cull implemented by local landowners, farmers or their agents operating in co-ordinated groups.
8. As well as consulting on the principle of culling, your views are sought on which of these options could form the basis for an effective and humane culling policy to control the spread of bovine TB in cattle. The Government would welcome your views on culling methods.

9. Any culling policy would need to be monitored both in terms of protecting the badger, its humaneness, the effect on other species and observing the effect of control measures (cattle and badger) on bovine TB in cattle.

Summary of Consultation Questions

The full list of questions including where they can be found in the document is below.

The Principle

Question 1. In light of the evidence presented as part of this consultation, on balance, do you think a policy to cull badgers should be part of the approach to help control the disease in cattle in high incidence areas? 29

Considering the Options for a Badger Culling Policy

Question 2. Comments are invited on the options considered and the costs and assumptions made in the Partial Regulatory Impact Assessment. 31

Individual licensing to cull badgers to help control bovine TB

Question 3. Under what circumstances should the Government grant licences to cull badgers for the purpose of preventing the spread of bovine TB under the Protection of Badgers Act 1992? 32

Question 4. What qualifying geographic criteria would be appropriate, achievable and reasonably likely to be an effective disease control measure? 32

General Cull

Question 5. How could farmers ensure sufficient coverage to deliver a sustained cull over a large area? 33

Question 6. What qualifying disease history would be appropriate? 35

Question 7. What could be included in the criteria to define those farmers eligible for a licence to cull badgers? 35

Targeted Cull

Question 8. Would it be practical for primary herd owners to recruit neighbours and adjoining landowners to achieve, say, 75% coverage within 1km of the boundaries of their holding? If not, what might be achievable and reasonable? 36

Question 9. Over what size of area could self co-ordinated groups of farmers and landowners be expected to manage a cull consistently and efficiently for up to 5 years, with a high degree of coverage? 36

Question 10. Are there other methods of culling which should be considered?38

Methods of Culling

Gassing

Question 11. Is gassing appropriate for use under licence by groups of farmers, landowners and their agents? 39

Question 12. Would there be a need for training of licensees? If so, what form should this take? 39

Question 13. How could this training be best provided? 39

Shooting of free running badgers (under licence)

Question 14. Would permitting the shooting of free running badgers (under licence) be practical and acceptable? 39

Snaring

Question 15. What features should be included in the design and use of the body snare? Are there particular features which should be avoided or included? 39

Question 16. What inspection intervals for checking snares would meet welfare considerations and be practical? 39

Question 17. What skills and competencies for culling are required to ensure body snares are safely and effectively deployed? 39

Question 18. Is there a need for training for farmers or licensees? If so, what form should this take? 40

Question 19. How could this training be best provided? 40

Disposal of carcasses

Question 20. What methods of disposal would be suitable to minimise risk of disease transmission, assist in monitoring a cull of badgers and be practical?40

Monitoring

Question 21. Do the proposals for monitoring the impact on wildlife (paras 93 - 95) look at the right issues? If not, what else do you think should be monitored? 42

Introduction

Purpose of the Consultation

1. The *Government Strategic Framework for the Sustainable control of bovine TB in Great Britain* (2005)², recognised the importance of the views of stakeholders and wider society in reaching decisions on bovine TB controls and on badger culling in particular. This consultation takes the commitment to consider these views one step further. It aims to explain the complexities and involve the wider public in the decision making process on badger culling as part of the overall approach to control the spread and achieve a sustained reduction of bovine TB in cattle in England. The consultation will close on **10 March 2006**.
2. The purpose of the consultation is to ask for specific views on:
 - **the principle:** whether, in light of all available evidence, to cull badgers to help control the spread of bovine TB; and
 - **the delivery options:** the possible ways that a proposed policy to cull badgers could be implemented.
3. This document sets out the background and evidence available on the badger reservoir of bovine TB and what it appears to suggest for a culling policy. It goes on to present the possible options for delivering a cull. There are questions within the document on whether a policy to cull badgers should be introduced, and, if so, how this could be delivered (a summary of the questions is on pages 7 - 8).
4. The evidence this document is based on and a list of references is at Annex A.

Scope

5. Animal health and welfare is a devolved responsibility and this consultation is specific to the management of bovine TB in England only. The Scottish Executive and Welsh Assembly Government are responsible for developing bovine TB control strategies within their own jurisdictions.

² The Strategic Framework can be found at: www.defra.gov.uk/animalh/tb/strategy/newstrategy.htm

Responding to this Consultation

6. Responses are welcome from anyone with an interest in this issue and have been invited from a range of organisations (see Annex C) from all sides of the debate. Consultation responses should be submitted electronically where possible.
7. All responses to the consultation must be with Defra by 1700 GMT on **10 March 2006**, sent to:

e-mail: bTB.consultation@defra.gsi.gov.uk

Or by post to:

Bovine TB and Badgers Consultation

Defra

1a Page Street

London SW1 4PQ

8. Clarification questions relating to this consultation should be addressed to the same address.

Publication of Responses

9. In line with Defra's policy of openness, at the end of the consultation period copies of the responses we receive may be made publicly available through the Defra Information Resource Centre, Lower Ground Floor, Ergon House, 17 Smith Square, London SW1P 3JR.
10. The information that responses contain may also be published in a summary of responses. If you do not want your response to be made publicly available, you must clearly request that your response be treated confidentially. Any confidentiality disclaimer generated by your IT system in e-mail responses will not be treated as such a request.
11. Defra cannot guarantee the confidentiality of your response as there might be circumstances in which the Department will be required to communicate information to third parties on request in order to comply with its obligations under

the Freedom of Information Act 2000 (FOI) and the Environmental Information Regulations (EIR). Any queries about FOI or EIR should be directed to

accesstoinfo@defra.gsi.gov.uk .

12. The Information Resource Centre will supply copies of consultation responses to personal callers or in response to telephone or e-mail requests (tel: 020 7238 6575, e-mail: defra.library@defra.gsi.gov.uk). Wherever possible, personal callers should give the library at least 24 hours' notice of their requirements. An administrative charge will be made to cover photocopying and postage costs.

Comments/Complaints

13. Please direct any comments or complaints you have about the consultation process (as opposed to comments which are the subject of the consultation) to Defra Consultation Co-ordinator, Area 7D Nobel House, 17 Smith Square, London SW1P 3JR or email: consultation.coordinator@defra.gsi.gov.uk

The Consultation Timetable

Consultation Issued:	15 December 2005
Consultation responses due by:	10 March 2006
Summary of responses published	By 28 April 2006

The Principle

14. This section discusses and presents the evidence on the principle of whether or not to cull badgers to help control the spread of bovine TB (*Mycobacterium bovis*) in cattle in high incidence areas. It gives the background to bovine TB and its impact on Great Britain, including England. It looks at the role of badgers in the prevalence of the disease including the Randomised Badger Culling ('Krebs') Trial and puts this in the broader context of the Government's commitment to take action to control bovine TB in cattle. The issues are based on the points set out in the *Government Strategic Framework for the Sustainable control of bovine TB in Great Britain (2005)*³ and cover:

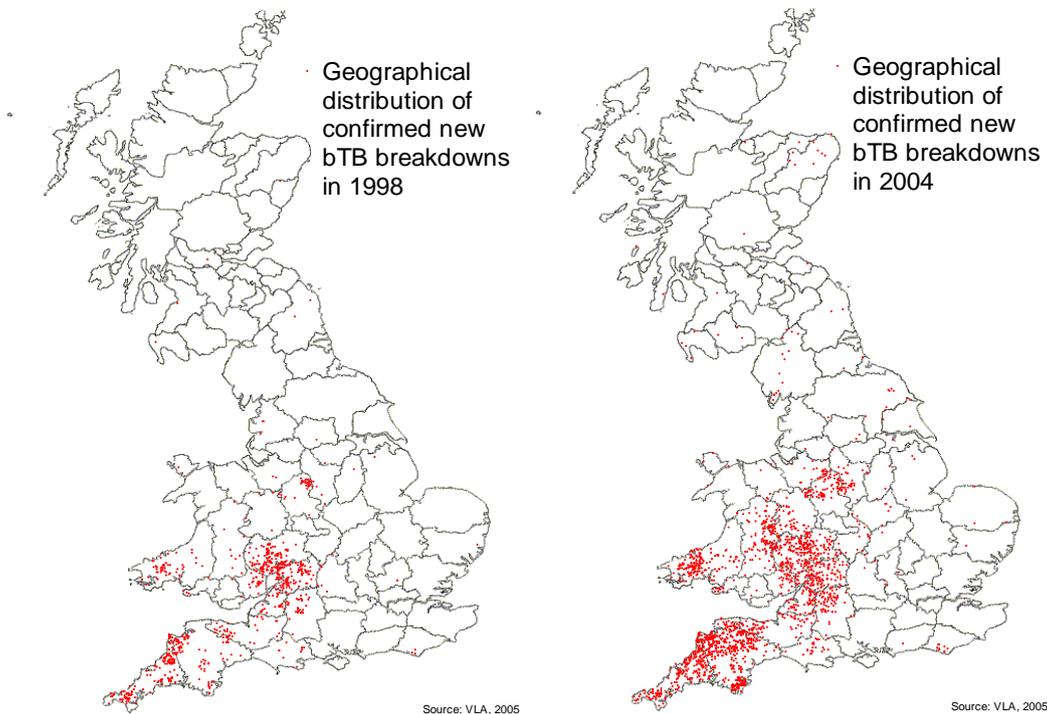
- **The background of Bovine TB in Great Britain:** the trend of the disease and the costs to farmers and the taxpayer.
- **Action taken to control bovine TB:** any wildlife management policy must form part of a holistic approach to bovine TB that balances cattle and wildlife controls.
- **Scientific evidence and veterinary advice:** the evidence base for policy.
- **Conservation:** policy must take account of wildlife (including badger) conservation objectives and legislation.
- **Public attitudes:** policy must take into account the views of wider society on bovine TB controls and wildlife culling in particular.
- **Effectiveness (cost and delivery of culling):** policy must balance, as far as possible, the costs (including the animal welfare costs – see below) and benefits of whether or not to cull and the options for culling.

³ [Government Strategic Framework for the sustainable control of bovine tuberculosis \(bTB\) in Great Britain](#) (Defra, 1 March 2005), pp 33-35

Bovine TB in Great Britain

15. Bovine TB is a serious infectious disease of cattle that can be transmitted to humans and other animals. As Figure 1 shows the disease is a significant and worsening problem in cattle in some areas of Great Britain. The evidence collected from the bovine TB surveillance programme of cattle herds in Great Britain shows that there has been an overall, sustained and continuing increase in the number, duration, severity and geographical distribution of bovine TB incidents in Great Britain. The number of cattle compulsorily slaughtered in connection with bovine TB has risen from 638 in 1986; to 5,884 in 1998; and to 22,571 in 2004⁴. 3.2% of GB herds are currently under movement restriction due to a TB incident. The surveillance programme shows that the long-term trend in Great Britain has been an 18% annual increase in confirmed new herd incidents and a 20% increase in the number of cattle culled following a positive result (known as 'reactors') to the tuberculin skin⁵ test.

Figure 1: Geographical distribution of new bovine TB breakdowns confirmed in 1998 and 2004 (Source: VLA)



⁴ Bovine TB statistics <http://statistics.defra.gov.uk/esg/statnot/tbpn.pdf>

⁵ The tuberculin skin test involves injecting a sterile extract obtained from the tubercule bacterium (tuberculin) into the skin of the animal. In most cattle injected with TB the animals immune system will react and cause a swelling where the injection has taken place. For more information see <http://www.defra.gov.uk/animalh/tb/control/P4skin.htm>.

16. The increased incidence is particularly marked in some areas of the country where bovine TB is endemic, but disease has also emerged in several new areas. These endemic bovine TB areas pose a constant threat of infection for the 60%⁶ of herds in the relatively 'clean' parts of Great Britain where bovine TB remains a sporadic occurrence because those outbreaks are associated predominantly with the movement of infected cattle. In England the problem is much worse in the south west and west of England. In the Government's view this situation cannot be allowed to deteriorate any further.

The Cost of bovine TB

17. Bovine TB is a growing financial burden on Great Britain's economy. In 2004/05 the disease cost the taxpayer £90.5 m. As illustrated by table 1 public expenditure on bovine TB has grown rapidly and is forecast to continue to grow unless new action is taken.

Table 1: Breakdown of Government's expenditure on tackling TB in cattle (£m)

Activity	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
Cattle Testing	17.6	13.3	5.4	24.7	33.2	36.4
Compensation	5.3	6.6	9.2	31.9	34.4	35.0
Culling Trial	4.6	6.6	6.0	6.6	7.3	7.2
Other Research	3.8	5.3	6.1	6.5	7.0	5.7
VLA	2.4	3.5	3.7	4.1	5.3	4.9
HQ/Overheads	4.5	0.9	0.1	0.7	1.0	1.3
TOTALS	38.2	36.2	30.5	74.5	88.2	90.5

18. Incidents of the disease result in significant costs for farmers and taxpayers across Great Britain. The average cost of one confirmed incident of bovine TB is estimated by Defra at about £22,500, divided roughly 70:30 between taxpayers and farmers respectively⁷.

⁶ Total of herds on 3 and 4 year testing

⁷ Estimated post compensation change

19. In addition to the costs to taxpayers, Defra estimates that the net costs to British farmers will be in the region of £20 million a year if the disease continues at its present levels⁸. The worst cases can be ten times more costly and the broader impact when a herd is under restriction has been demonstrated by the stress this places on farm families⁹.
20. The high disease incidence and rising costs illustrate the need to improve the measures used to control bovine TB in cattle.

Risks to Human Health

21. Bovine TB is a disease that is transmissible both to man and to a wide variety of mammals including domestic pets. If the incidence of bovine TB in the national cattle herd continues to rise then the exposure of infection to man and domestic animals will also increase.
22. For the overwhelming majority of the British public, the risk of contracting bovine TB infection from animals and animal products remains extremely low. However, the increasing trend in the numbers of cattle and other animals affected with bovine TB, presents a higher risk of infection for certain segments of the rural population in Great Britain, through, for example, on-farm consumption of unpasteurised cows' milk (and milk products) and exposure to airborne infection from tuberculous animals and their carcasses. Reports of cases of bovine TB spillover to other farm animals, wildlife and pets are becoming more common and monitoring of occupational health and incidents of all forms of the disease in humans continues.
23. Any general increase in cases of bovine TB increases the risk of human exposure to the TB organism whether from cattle or from other infected species. It follows that taking effective action to reduce the incidence of bovine TB in the national herd will reduce this risk.

⁸ This figure includes £13 million in costs of TB breakdowns plus £7 million in costs to cover cattle handling and vets.

⁹ Sheppard, A, Turner M; [An Economic Impact Assessment of Bovine TB South West England](#) (Exeter University, May 2005)

Badgers and Bovine TB

24. In the 1997 report on bovine TB in cattle and badgers, Sir John Krebs and his Independent Scientific Review Group advised that, “*the sum of evidence strongly supports the view that, in Britain, badgers are a significant source of infection in cattle. Most of this evidence is indirect, consisting of correlations rather than demonstrations of cause and effect; but in total the available evidence, including the effects of completely removing badgers from certain areas, is compelling. It is not, however, possible to state quantitatively what contribution badgers make to cattle infection*”¹⁰.

25. This broadly remains the position today. Experts¹¹ have demonstrated that badgers are a maintenance host for bovine TB and although existing research does not quantify the specific contribution badgers make to the appearance of bovine TB in cattle, patterns of infection in cattle and badgers are closely associated¹². It has not been determined to what extent cattle infected with bovine TB can infect badgers. However, there is good evidence that contact between cattle and infected badgers and their excretions can contribute to the incidence of TB in cattle¹³. Such contact may be direct between infected individual badgers and susceptible stock or indirect, through, for example, contamination of fields, cattle housing and feed stores and troughs.

¹⁰ Krebs, J R et al; *Bovine tuberculosis in cattle and badgers: report to the Rt Hon Dr Jack Cunningham MP by the Independent Scientific Review Group* (HMSO, London 1997)

¹¹ Donnelly, C.A. , Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Ferve, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

¹² Donnelly, C.A. , Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Ferve, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

¹³ Donnelly, C.A. , Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Ferve, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

Bovine TB and Other Wildlife

26. The Government recognises that other wildlife such as wild deer carry bovine TB and can present a threat to cattle. Existing legislation requires the reporting of suspected bovine TB in cattle and deer only. However, the new Tuberculosis (England) Order (which will come into force on 20 February 2006), will introduce a duty to notify the presence of lesions in carcasses and, the isolation of the organism *M. bovis* from samples in any mammalian species (other than man).
27. Experts¹⁴ believe that generally wild deer present less of a risk to cattle than the badger. However, more information is needed about the role of deer and the prevalence of bovine TB in the population and to further develop our understanding of this threat. In order to inform future policy developments, Defra has commissioned two quantitative risk assessments. The first of these, which is considering the role of deer in perpetuating the disease, is expected to report in February 2006. The second project will look at the threat posed by infected deer and is due to report in December 2006. It will include a review of archived data as well as focused discussions with a sample of stalkers.

Action to Control Bovine TB

28. In 2005, following consultation with stakeholders, the Government published the *Government strategic framework for the sustainable control of bovine tuberculosis (bovine TB) in Great Britain (2005)* which established a 10 year vision for tackling the disease.

“Overall Vision: *To develop a new partnership based on the Animal Health and Welfare Strategy so the Government and stakeholders can work together to reduce the economic impact of bovine TB and maintain public health protection and animal health and welfare. We aim to slow down and prevent the geographic spread of bovine TB to areas currently free of the disease, and achieve a sustained reduction in disease incidence in cattle in high incidence areas.*”¹⁵

¹⁴ Central Science Laboratory, [The risk to cattle from wildlife species other than badgers in areas of high herd breakdown risk](#) (Defra Project SE3010, February 2004)

¹⁵ [Government Strategic Framework for the sustainable control of bovine tuberculosis \(bTB\) in Great Britain](#) (Defra, 1 March 2005), p 17

29. The Government recognises that cattle-to-cattle transmission, and badger-to-cattle transmission are both contributors to the high incidence of bovine TB in cattle. For these reasons this consultation document has been issued as part of a comprehensive series of measures to control bovine TB and supplement the major programme of cattle controls already in place or proposed. The existing control programme is based on regular testing of cattle herds, culling of reactor animals, slaughterhouse checks and movement restrictions including tracing and contiguous testing.

30. Any policy on badger culling requires a clear commitment that the cattle farming industry will adhere to good biosecurity practice¹⁶ and will take reasonable steps to reduce the risks of introducing bovine TB into their herd. The new measures were developed following consultation¹⁷ and comprise:

- **Pre-movement testing to reduce the spread of bovine TB through cattle movements.** Pre-movement testing of cattle will be introduced in England from 20 February 2006. Cattle moving out of herds in high-risk areas will be subject to testing to help farmers reduce the risk of TB spreading to low risk 'clean areas'. It will also reduce the risk to endemic areas. The measure will be introduced in two steps first for animals over 15 months (from 20 February 2006) and second for all animals over 6 weeks old (from 1 March 2007). This approach is to allow time for herd owners and Local Veterinary Inspector practices to adjust to the new requirements. Pre-movement tests must be arranged and paid for by the herd owner, except where the routine herd test meets the requirement. It is expected that approximately 450,000 cattle movements will be subject to testing at a cost to the farming industry of £5 million per annum. This intervention is expected to prevent up to 700 new incidents per annum (out of a total of about 3,000 across Great Britain in 2004) with benefits in both low and high incidence areas.

¹⁶ Examples of good biosecurity practice can be found in MAFF/Defra booklets: [TB in Cattle Reducing the Risk](#) and [Farm Biosecurity: Protecting Herd Health](#)

¹⁷ Pre-movement testing was developed based on recommendations by a core group of stakeholders in accordance with the Strategic Framework. Information about the compensation consultation held in 2004 can be found at: www.defra.gov.uk/corporate/consult/cattle-compensate/index.htm

- **Compensation: replacing individual valuation for infected cattle with a table valuation system.** From February 2006 the Government will put in place a compensation system that is fair to cattle owners and the taxpayer. There is now robust evidence to show that the current TB compensation arrangements have resulted in farmers being over compensated for the value of their animals to the extent of some even making a net financial gain¹⁸. The new compensation system (eventually covering 4 cattle diseases including bovine TB), whilst reducing total annual payments to farmers by between £9m and £13m, will still provide fair compensation for animals compulsorily slaughtered for disease control reasons. Farm businesses will continue to have to manage any consequential losses. However, the industry will benefit from the incentive for all farmers to take steps to prevent introduction of bovine TB into their herd.

31. The Government is also urgently pursuing scientific research into measures to combat bovine TB. This includes continuing research into improved diagnostics; vaccine development; and epidemiology. Development of an effective vaccine for badgers is one of the long-term aims of the research programme. It is likely to be at least 10 years before widespread vaccination using an oral bait formulation could be introduced as part of a practical policy. Work on developing and testing candidate vaccines for cattle is also underway. However, the disease trend means it is likely that vaccination alone would not be sufficient to control the increasing incidence of infection in cattle. Vaccination even when available would probably have to be used in conjunction with other possible methods of controlling the disease, such as, culling of badgers and/or cattle, in order to be effective.

32. Control measures that reduce the incidence or control the spread of bovine TB are likely to benefit the general health of wildlife, including badgers, as well as cattle.

¹⁸ This evidence includes: a review [Compensating Farmers for Bovine TB in Wales](#) (NAO, Wales, 2003) and two university studies (Bennett, Richard; [Assessment of the economic impacts of TB and alternative control policies](#) (Defra Project SE3112, Reading University 2004) and Sheppard, A, Turner M; [An Economic Impact Assessment of Bovine TB South West England](#) (Exeter University, May 2005) both of which noted that significant numbers of farm businesses made a net financial gain following a TB breakdown.

Scientific Evidence

33. The Government is committed to evidence-based policy making. Defra has worked with the Independent Scientific Group (ISG), its own scientists and others, to put in place a science base to inform policy decisions. This has been particularly important in considering the role of badger culling in the control of bovine TB in cattle. The 1997 Krebs report¹⁹ advised that to build an evidence base a scientific culling trial (the Randomised Badger Culling Trial) should be set up and overseen by the ISG in order to look at the impact and potential effectiveness of a badger cull on the spread of bovine TB in cattle.

Randomised Badger Culling ('Krebs') Trial

34. In February 1998 the Independent Scientific Group (ISG) on Cattle TB was set up to advise on implementation of the Krebs Report on bovine TB in cattle and badgers. The terms of reference given to the Group were:

'To advise Ministers on implementation of the Krebs report on bovine TB in cattle and badgers by:

- *overseeing the design and analysis of the Randomised Badger Culling Trial to test the effectiveness of badger culling as a means of controlling bovine TB;*
- *regularly monitoring progress and outputs from the trial and assessing any important differences in results between treatments;*
- *monitoring data on the M. bovis situation in areas and species outside the trial;*
- *reporting to Ministers on progress;*
- *advising, as requested, on related issues.'*

35. The Randomised Badger Culling Trial started in 1998. The original recommendation from the Krebs report was to quantify the impact of culling badgers and to evaluate the efficiency of culling by comparing three strategies²⁰. As the ISG developed the Trial they recognised that due to practical considerations

¹⁹ Krebs, J R et al; *Bovine tuberculosis in cattle and badgers: report to the Rt Hon Dr Jack Cunningham MP by the Independent Scientific Review Group* (HMSO, London 1997)

²⁰ Krebs, J R et al; *Bovine tuberculosis in cattle and badgers: report to the Rt Hon Dr Jack Cunningham MP by the Independent Scientific Review Group* (HMSO, London 1997)

it was not possible to collect the required data set to be able to accurately quantify the contribution that badgers make to the incidence of bovine TB in cattle. Hence the Randomised Badger Culling Trial became a test of two badger culling options: government operated localised reactive culling and large scale proactive culling through cage trapping and shooting.

36. The design of the Trial involved selection of thirty 100km² areas in England in areas of historically high cattle TB incidence. The thirty trial areas comprised ten triplets, with each of the three triplet areas being subjected to: localised culling where there was a recent cattle TB herd breakdown (reactive), proactive culling over whole triplets, and survey-only areas.
37. Culling efficiency, which has recently been estimated by Defra at approximately 20 – 60%, was limited by incomplete landowner consent, wildlife welfare considerations (which influenced the method of capture and the imposition of a closed season for culling) and activities by animal rights activists may have had some impact.
38. The reactive cull element of the Randomised Badger Culling Trial was suspended by Ministers earlier than planned when, in October 2003, the ISG advised that “the incidence of herd breakdowns in reactively culled areas has been consistently greater than expected”²¹ and that reactive culling could not be considered to contribute to the control of cattle TB. This increase was estimated to be 27%²² (confidence interval (CI) 4.3-52%²³). The most recent analyses²⁴, which includes an additional calendar year of data (to August 2004) indicate an overall 25% increase (CI 3-52%) in herd breakdowns in reactive cull areas compared with survey-only areas, comprising a 33% increase (CI 10% decrease – 96% increase) before the end of the first reactive cull, which reduces to a 21% increase (CI 1.0% decrease – 48% increase) if incidents before culling started are ignored. This

²¹ Advice from the Independent Scientific Group on Cattle TB (ISG) to Defra Ministers (29 October 2003) – www.defra.gov.uk/animalh/tb/isg/advice.htm

²² Donnelly, CA *et al*, Impact of localised badger culling on tuberculosis incidence in British cattle, *Nature* 2003 Dec 18;426(6968):834-7. Epub 2003 Nov 23.

²³ Confidence interval indicates a 95% certainty that the effect falls within this range.

²⁴ Le Fevre, A. M. *et al*. The impact of localised reactive badger culling versus no culling on TB incidence in British cattle: a randomised trial (<http://www.defra.gov.uk/animalh/tb/isg/pdf/lefevre1005.pdf> 2005)

provides some evidence that culling as carried out in the reactive part of the trial and over the timescale of the observations is unlikely to reduce herd breakdowns. However, the 33% has not been explained although the confidence intervals are wide.

39. One potential, but as yet unproven, explanation for the apparent adverse effect of reactive culling on cattle herd TB breakdowns was disruption of badger territorial behaviour leading to increased contact with cattle (“perturbation”). However, at this stage it is not possible to rule out other possible contributing factors such as cattle management differences between treatment areas.
40. Recently, the preliminary analysis from the proactive culling treatment of the Randomised Badger Culling Trial have been published²⁵. These show a decrease in cattle herd breakdowns over the areas culled, averaging 19% (CI 6-30%) after the first cull to 23% (CI 6.5-36%) after the first follow-up culls²⁶. Results from areas outside the trial but within 2 km of the boundary of proactively culled areas, show a 29 % (CI 5-58%) initial increase in herd breakdowns and a strong trend to an increase of 22% (CI 6.9% decrease - 59% increase) in breakdowns after the first follow-up cull²⁷. Further analyses of the data will be undertaken once the Randomised Badger Culling Trial is complete.
41. There is evidence that culling of badgers causes perturbation, that is, disruption of their territorial organisation exemplified by expanded ranging behaviour of those remaining²⁸. A recently published ecological study²⁹ of badgers indicates that

²⁵ Donnelly, C.A. , Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Fevre, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

²⁶ Donnelly, C.A. , Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Fevre, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

²⁷ Donnelly, C.A. , Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Fevre, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

²⁸ Woodroffe, R. et al (2005) Effects of culling on badger *Meles meles* spatial organization: implications for the control of bovine tuberculosis. *Journal of Applied Ecology*, doi: 10.1111/j.1365-2664.2005.01144.x.

²⁹ Woodroffe, R. et al (2005) Effects of culling on badger *Meles meles* spatial organization: implications for the control of bovine tuberculosis. *Journal of Applied Ecology*, doi: 10.1111/j.1365-2664.2005.01144.x.

perturbation following culling can be rapid. This effect may increase the probability of bovine TB being transmitted from infected badgers to cattle. The edge effect observed in the preliminary proactive cull analysis has implications for the area which a cull should cover to be effective. Any edge effect would be expected to be greater around small areas of culling, be magnified within a large area with low and patchy landowner consent, and reduced by more efficient culling. Badger immigration and changes in birth rates post culling would further complicate the picture.

42. In order to inform any future policy, Defra wishes to better understand the possible edge effect and the badger perturbation / cattle transmission issue raised in these findings. A meeting of scientific experts in this area will be held during the period of this consultation.

Republic of Ireland – East Offaly and Four Areas Trial

43. In two studies of widespread culling (over areas ranging from 188-528 km squared) carried out in the Republic of Ireland, where culling resulted in greater reductions in badger densities than achieved in the Randomised Badger Culling Trial, beneficial effects on cattle herd breakdowns were observed. In the first study, although perturbation of badgers was recorded in the trial in East Offaly, Ireland³⁰, this was not associated with an increase in herd breakdowns, a decrease in breakdowns of 26% being recorded³¹.

44. In the more recent Four Areas badger culling trial³², the authors report a 60 – 96% decrease in the rate at which herds were becoming the subject of confirmed restrictions. The total number of confirmed herd restrictions in the removal areas (average size 245km²) for the study period was almost 58% lower than in the reference area. However, there are significant differences between conditions in the UK and Ireland, including, in the Irish Trial, more efficient culling using body

³⁰ O'Corry-Crowe., Hammond R., Eves J & Hayden, T J; *The effect of reduction in badger density on spatial organisation and activity of badgers Meles meles L. in relation to farms in central Ireland* Biology and Environment: Proceedings of the Royal Irish Academy 96B, (pp 147 –158, 1996)

³¹ Eves, J A; *Impact of badger removal on bovine tuberculosis in east County Offaly*, Irish Veterinary Journal 52, (pp 199 – 203 1999)

³² Griffin, J M et al; *The impact of badger removal on the control of tuberculosis in cattle herds in Ireland*, Preventative Veterinary Medicine 67, (pp 237 – 266, 2005)

snares, lower overall badger densities, differing ecology and cattle husbandry practices.

45. Crucially, the four areas studied were specifically chosen in areas geographically isolated from nearby badger and cattle populations by geographical features such as coastline and major rivers. These features probably helped foster more efficient badger removal, and would be expected to reduce the edge effects detected in England. For this reason the authors themselves argued that their results must be generalised with care if used to predict the likely effectiveness of a similar policy applied in much less isolated areas³³.

Literature Review of International Evidence

46. In September 2005, Defra's Chief Scientific Adviser received a literature review (the Wilsmore Review) commissioned to inform Defra on the evidence relating to culling badgers since the Krebs report was published³⁴. This concluded that international evidence shows clearly that bovine tuberculosis in cattle cannot be eradicated by cattle controls alone when there is a secondary reservoir of infection from wildlife. Thus, on the basis of this evidence, some form of intervention in the wildlife domain is necessary if bovine TB in cattle is to be controlled, although population reduction of the wildlife host does not by itself reliably control bovine TB in cattle.

47. Though a number of species have been implicated as potential wildlife reservoirs in the UK, such as deer, the badger has, to date, been identified as the most significant reservoir of infection in English conditions and contributes to the disease in cattle.

³³ O'Corry-Crowe., Hammond R., Eves J & Hayden, T J; *The effect of reduction in badger density on spatial organisation and activity of badgers *Meles meles* L. in relation to farms in central Ireland* Biology and Environment: Proceedings of the Royal Irish Academy 96B, (pp 147 –158, 1996)

³⁴ Wilsmore, T, and Taylor Nick; [*A review of the international evidence for an interrelationship between cattle and wildlife in the transmission of bovine TB*](#) (Reading University, September 2005)

Veterinary Advice

Uncertainty and Disease Control

48. Removing sources of infection is a fundamental principle of infectious disease control. Culling of infected badger social groups can reduce the likelihood of both direct and indirect transmission of bovine TB to cattle. However, the uncertainty about the specific contribution badgers make to bovine TB in cattle means that it is difficult to estimate with certainty the full impact culling will have (and this is likely to vary between different parts of England). In this respect bovine TB is no different from the control of any other infectious disease for which it is often necessary to make decisions to take action to remove or reduce sources of infection in the face of uncertainty over the ultimate effectiveness of the control measures.
49. For bovine TB controls to be effective veterinary advice³⁵ is that measures to reduce the risk of transmission from badgers to cattle should include both culling of badgers and cattle; and altering farm management practice to reduce direct and indirect contacts between cattle and badgers (biosecurity³⁶).

Conservation

50. Effective disease control measures involving culling badgers needs to be weighed up against the conservation of the species. Any badger culling policy related to the control of bovine TB ought to be restricted to that which is necessary to help manage and reduce the disease in cattle.
51. Badgers are listed as a protected species under Appendix III of the Bern Convention. In Great Britain protection is provided by the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981. However, badgers are not an endangered species and the Bern Convention allows regulated management of protected species providing this is not 'detrimental to the survival of the population

³⁵ *Veterinary Advice on Methods Likely to Reduce the Transmission of bovine TB from Badgers to Cattle* can be found on the pages for this consultation at: www.defra.gov.uk/corporate/consult/current.htm

³⁶ Examples of good biosecurity practice can be found in MAFF/Defra booklets: [TB in Cattle Reducing the Risk](#) and [Farm Biosecurity: Protecting Herd Health](#)

concerned'³⁷. A closely monitored and controlled cull of a proportion of badgers could be carried out without threatening the viability or natural range of the population.

52. The Randomised Badger Culling Trial has shown that culling of badgers increases fox and hedgehog numbers and reduces the numbers of brown hares (a species important to England's biodiversity³⁸). The consequences for these and other wildlife of removing badgers, a key species, would need to be monitored.

53. Conservation considerations do not, as such, prohibit culling badgers but must be a key consideration when developing a badger culling policy.

Public Attitudes

54. An indication of public attitudes to bovine TB and badgers has been provided by research undertaken through Reading University in 2003-04³⁹ to assess the economic value of changes in badger populations. The work involved focus groups and collected useful information on public attitudes in relation to the importance of controlling TB in cattle. 92% agreed that controlling bovine TB in cattle was important, but, views were divided on whether this should involve management of badgers (38% agreed, 36% disagreed and 23% did not give a view). When focus groups were asked about killing badgers the issue became more emotive and 87% only agreed on controlling bovine TB through management of badgers if it was done without killing them⁴⁰.

55. This consultation aims to contribute to and inform wider society of the issues that need to be considered. It aims to give stakeholders and the general public an opportunity to be involved in whether or not there should be a cull of badgers to

³⁷ Bern Convention, Article 9 – allows exemptions to the provisions of Articles 4, 5, 6, and 7 to prevent serious damage to livestock. www.conventions.coe.int/Treaty/en/Treaties/Html/104.htm

³⁸ Brown Hares are listed as a species of principal importance for the conservation of biological diversity in England under the Countryside and Rights of Way Act 2000, section 74.

³⁹ Bennett, Richard; [Assessment of the economic impacts of TB and alternative control policies](#) (Defra Project SE3112, Reading University 2004)

⁴⁰ Bennett, Richard; [Assessment of the economic impacts of TB and alternative control policies](#) (Defra Project SE3112, Reading University 2004)

help control the spread of bovine TB in cattle and, if so, how this should be carried out.

Summary

56. While the Randomised Badger Culling Trial has been ongoing it has been the Government's policy not to issue licences under the Protection of Badgers Act 1992 to take or kill badgers living wild or interfere with their setts for bovine TB control purposes. With the end to the proactive culling element of the Trial and publication of interim results⁴¹ the Government believes it should begin the process now to decide on an effective and proportionate response to the continuing risk of badger-to-cattle transmission of bovine TB.

57. Professor Godfray's independent review of the Randomised Badger Culling Trial⁴² and the ISG's response⁴³, highlighted the inherent risks associated with trying to achieve scientific certainty to make policy. However, both the scientific evidence and veterinary advice suggest the need for a balanced approach that tackles the reservoir of infection in badgers as well as in cattle to achieve a sustained reduction in TB in cattle in high incidence areas in England. This is supported by evidence from other countries⁴⁴ which shows that, in the face of a wildlife reservoir of disease, measures to prevent cattle-to-cattle transmission will not, on their own, be successful.

Question 1. In light of the evidence presented as part of this consultation, on balance, do you think a policy to cull badgers should be part of the approach to help control the disease in cattle in high incidence areas?

⁴¹ Donnelly, C.A., Woodroffe, R., Cox, D.R., Bourne, F.J., Cheeseman, C.L., Clifton-Hadley, R.S., Wei, G., Gettinby, G., Gilks, P., Jenkins, H., Johnston, W.T., Le Ferve, A.M., McInerney, J.P. & Morrison, W.I. (2005) *Positive and Negative effects of widespread badger culling on cattle tuberculosis*. Nature, doi.10.1038/nature04454 (<http://www.doi.org/>).

⁴² Godfray, H C J et al; *Independent Scientific Review of the Randomised Badger Culling Trial and associated epidemiological research* (HMSO, London, 2004)

⁴³ *Response of the ISG to the Report of the Independent Scientific Review of the Randomised Badger Culling Trial and Associated Epidemiological Research* (www.defra.gov.uk/animalh/tb/isg/pdf/isgresp.pdf)

⁴⁴ Wilsmore, T, and Taylor Nick; *A review of the international evidence for an interrelationship between cattle and wildlife in the transmission of bovine TB* (Reading University, September 2005)

Considering the options for a culling policy

58. The scientific evidence shows that intensive culling of badgers over large areas can be effective in helping to prevent the spread of bovine TB in cattle and vets advise that without any such culling satisfactory control and reduction of the disease in cattle is unlikely to be achieved. Defra's cost benefit analysis shows that a badger cull could save money compared to doing nothing⁴⁵.

59. On the other hand, the scientific data is not available to reliably quantify the beneficial effect of particular badger culling options on bovine TB in cattle. Nor can the possibility that badger perturbation following culling could make the disease worse be disregarded. Culling over large areas may compensate for the potential negative effects of perturbation. However, there would need to be a high level of landowner consent to cull in order to minimise internal edge effects.

60. The Government has sought to balance these considerations and has identified three potential options, all using some form of licensing, that could be used were badger culling to be introduced:

- i) Individual licensing to cull badgers to help control bovine TB
- ii) General cull over large, loosely specified areas
- iii) Targeted culling over specific areas linked to herd incidence

61. This section seeks your views on these options. All three would have a direct impact on how effective a cull could be and conservation objectives. The level of government involvement would also effect how extensive a cull could be and the balance of costs and benefits.

Partial Regulatory Impact Assessment

62. A partial Regulatory Impact Assessment (RIA) is attached at **Annex B** looks at several options based on sources available including the reactive element of the Randomised Badger Culling Trial. Following the Independent Scientific Group's

⁴⁵ *Cost Benefit Analysis of badger management as a component of bovine TB control in England* (see www.defra.gov.uk/corporate/consult/current.htm)

recent results from the proactive element of the Randomised Badger Culling Trial and other sources⁴⁶ this consultation document has reconsidered and combined the options within the partial RIA to formulate the three potential ways to deliver a culling policy (below).

63. The costs within the partial RIA are based on Defra's Cost Benefit Analysis which was completed before the initial results from the proactively culled areas of the Randomised Badger Culling Trial became available.

64. The partial Regulatory Impact Assessment and Defra's Cost Benefit Analysis will be revised in the light of the recent results, any further information arising from the Trial and responses to the consultation.

Question 2. Comments are invited on the options considered and the costs and assumptions made in the Partial Regulatory Impact Assessment.

i) Individual licensing to cull badgers to help control bovine TB

65. Under the Protection of Badgers Act 1992, the Government may grant licences to kill badgers including for the purpose of preventing the spread of disease (which includes bovine TB). However, during the Randomised Badger Culling Trial, the Government's policy has been to refuse licences to kill badgers in the wild for the control of bovine TB (the purpose of the Trial was to gather scientific evidence to support or exclude culling).

66. Continuing a policy of refusing bovine TB related applications could be justified if the Government believed that there were adequate alternatives for reducing transmission from badgers to cattle and/or that killing badgers would have little or no bovine TB prevention benefits and could even make matters worse.

67. One option might be a return to issuing individual licences to kill badgers to prevent the spread of bovine TB if and when an application is made under the Protection of Badgers Act 1992 (as well as the necessary licence(s) under the Wildlife and Countryside Act 1981). The Government would need to set out clearly under what circumstances such licences would be granted. Under this option, without any

⁴⁶ See list of references in Annex A

level of co-ordination, there is likely to be an increased risk from perturbation due to a patchy level of participation.

Question 3. Under what circumstances should the Government grant licences to cull badgers for the purpose of preventing the spread of bovine TB under the Protection of Badgers Act 1992?

ii) General Cull

68. A general cull would aim to achieve the coverage of large areas which could be designated, for example, by geographic boundary (rivers, motorways), specific area (at least 100km²) or by county. This would cover high incidence areas but not be linked to a specific farm or landholding.

Question 4. What qualifying geographic criteria would be appropriate, achievable and reasonably likely to be an effective disease control measure?

69. Such an option would require some level of government involvement to ensure a cull had adequate coverage of the land area involved and minimise the risk from perturbation. This could be achieved through state delivery of the cull. However, the cost benefit analysis⁴⁷ shows that a state operated cull of badgers using live cage traps, as in the Randomised Badger Culling Trial, is too expensive to be cost effective. While a state operated cull using snares could be more efficient than a cull using cage trapping, it would be an extremely high cost option and one that would be slow to deliver because of the level of resources that would be required and the land area that would need to be covered to deliver an efficient cull in high incidence areas in England.

70. State co-ordination of culling by farmers, landowners, or their agents could help achieve the coverage needed. However, it is not clear whether it could deliver a high enough participation rate to ensure an effective cull over a large area. Experience from the Randomised Badger Culling Trial suggests that not all landowners will consent to a cull on their land, which will increase the risk of edge effects.

⁴⁷ *Cost Benefit Analysis of badger management as a component of bovine TB control in England* (see www.defra.gov.uk/corporate/consult/current.htm)

71. Issue of licences for culling over large areas could attract applications for licences from farmers and landowners who may be situated in areas where high levels of consent and/or compliance are not achievable. In large areas, it is also uncertain whether co-operative working between licence holders could be achieved. If co-operation over large areas cannot be achieved then it is unlikely to deliver the benefits intended.

Question 5. How could farmers ensure sufficient coverage to deliver a sustained cull over a large area?

72. The impact on conservation objectives of badger culling for a prolonged period will be more pronounced over large areas. As noted above, the Bern Convention – in summary - allows regulated management of protected species on the basis that it would not be detrimental to the survival of the population concerned. Therefore, any proposal for culling badgers over large areas could run the risk of being detrimental to the survival of the badger population and conflict with international wildlife commitments, if it was carried out efficiently.

iii) Targeted Cull

73. A targeted cull would involve designating an area based on affected farms and, therefore close to herds which have a history of bovine TB. The potential benefits of badger culling are greater if it is targeted where there is high incidence of bovine TB in cattle and where land use involves a high density of cattle enterprises.

74. Sustained culling over a targeted area for a period of, for example, up to 5 years, would have less of a conservation impact of badger culling, as activity would be concentrated on the vicinity of herds where a badger reservoir of infection was believed to be a significant contributor to the disease in cattle.

75. This option could be managed and the cull implemented by the local farmers and landowners (or their agents). The cost benefit analysis shows that culling by private operators (farmers, landowners, their agents) is substantially cheaper than a state cull. Licences could be issued under the Protection of Badgers Act 1992 to permit the culling of badgers in target areas defined by disease history.

76. For this option to be effective in controlling bovine TB in cattle and reducing the risk of perturbation it would require farmers to operate in a co-ordinating group. The dependence on voluntary participation in a cull either directly or by association

may mean that sufficient coverage could not be achieved. However, because the targeted area would be based on disease incidence the benefits would fall to those landholders who have the greatest incentive to organise into groups, and apply for licences and carry out a cull. The process for licensing could also allow government to prioritise specific areas based on the incidence of bovine TB. This could mean that any cull would be rolled out on a phased basis.

77. For example, one possibility is that applications to cull badgers under licence could be invited from cattle and dairy farmers whose holdings are within 1-2 year testing parishes with a disease history of 2 or more confirmed new incidents in 4 years and/or having been under movement restrictions for more than 24 months in the last 4 years ('primary herds').

Question 6. What qualifying disease history would be appropriate?

78. Licences would be granted for an area extending from the boundaries of land associated with the infected herd to between 1 and 3 km. The intention would be to allow a sustained, continual cull (except for a close season 1 February to 30 April) for up to, say, 5 years, subject to monitoring of the effect of the policy. Licences would only be granted if:

- It appeared that there could be active, sustained culling over, for example, at least 75% of the land within 1km of the primary herd land;
- All cattle farmers participating in the cull would agree to:
 - Maintaining certain bio-security measures⁴⁸; and
 - Their herd being subject to the range of available diagnostic tests, in the event of a breakdown, to identify all potential cattle carriers. This would be at the discretion of Divisional Veterinary Managers.

Question 7. What could be included in the criteria to define those farmers eligible for a licence to cull badgers?

79. Placing the responsibility for managing the badger populations on the farmers and landowners in the affected area of high incidence of bovine TB this option could encourage good biosecurity and is also likely to help manage and reduce the incidence of bovine TB in cattle. This approach is consistent with the Animal Health and Welfare strategy which aims to work in partnership and share responsibility with the farming industry and promote the benefits of animal health and welfare (prevention is better than cure).

⁴⁸ Examples of good biosecurity practice can be found in MAFF/Defra booklets: [TB in Cattle Reducing the Risk](#) and [Farm Biosecurity: Protecting Herd Health](#)

Question 8. Would it be practical for primary herd owners to recruit neighbours and adjoining landowners to achieve, say, 75% coverage within 1km of the boundaries of their holding? If not, what might be achievable and reasonable?

80. Of the badger culling options considered in the Cost Benefit Analysis, the issue of licences to farmers and landowners (or their agents) that form a co-ordinating group was the one where benefits were most likely to exceed costs.

Question 9. Over what size of area could self co-ordinated groups of farmers and landowners be expected to manage a cull consistently and efficiently for up to 5 years, with a high degree of coverage?

81. The main risk of this option is the perturbation effect suggested by the Randomised Badger Culling Trial results. If badger perturbation, associated with low level of removals including infrequency of the culling method, is responsible for the results achieved in the Randomised Badger Culling Trial, culling over small areas may not deliver the benefits intended by the policy.

82. However, a targeted cull could allow areas to build up (coalesce) and potentially cover more land if needed. Figure 3 and Figure 4 show the areas this could include if the land covered was over 1km or over 2.5km from the boundaries of specific farms and landowner participation was 100% (which is unlikely). A targeted cull could therefore help minimise the risk of spread of bovine TB to cattle from badger perturbation by having a focused but less rigid definition of the area that needed to be covered.

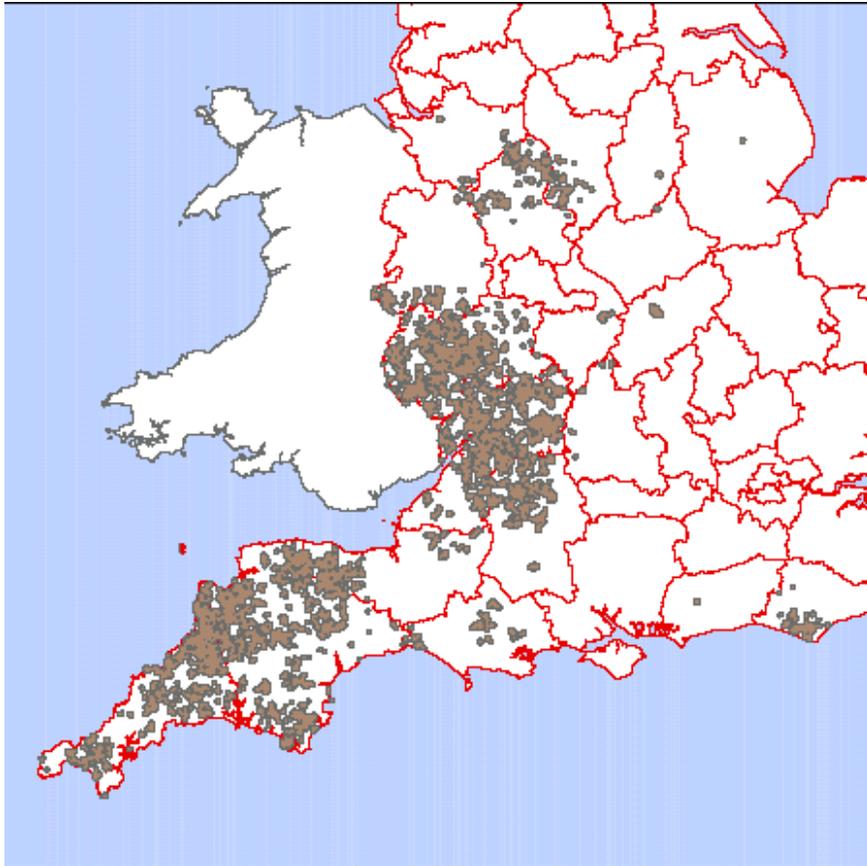


Figure 3: Example of coalescence: over 1km areas from boundaries of farms in high incidence areas in England (Source: Defra)

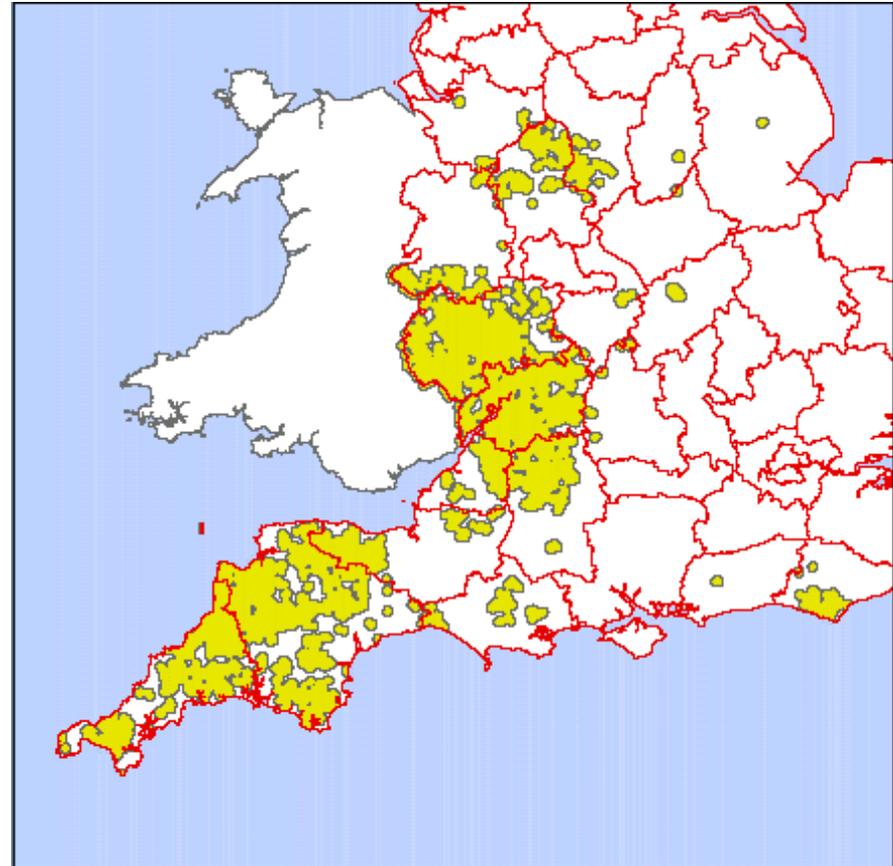


Figure 4: Example of coalescence: over 2.5km from boundaries of farms in high incidence areas in England (Source: Defra)

Methods of Culling

83. Government has been considering the evidence on the effectiveness, environmental impact, humaneness and feasibility of culling methods⁴⁹ and believes that humane capture and killing of badgers is possible. Under section 11(2) of the Wildlife and Countryside Act 1981 the use of certain methods (including gassing and use of traps and snares) for the purpose of taking or killing badgers is prohibited. However, the Wildlife and Countryside Act 1981 does have the provisions for granting licences to allow these methods to be used for certain purposes, including preventing the spread of disease. In addition, the Protection of Badgers Act 1992 permits licensing to kill badgers for same purpose. Nevertheless, section 2 of that Act prohibits, amongst other things, cruel ill-treatment of badgers.

84. The methods of culling that government has considered are:

- Gassing;
- Shooting free running badgers;
- Snaring; and
- Use of cage traps.

Question 10. Are there other methods of culling which should be considered?

Gassing

85. Gassing was used as a method of culling in the past but there were doubts over the humaneness of hydrogen cyanide⁵⁰. A recent review⁵¹ has concluded that carbon monoxide is a relatively humane gas but questions remain regarding the manner of its production and use. Research is being done into how carbon monoxide can be generated at the appropriate level of toxicity; how the gas could

⁴⁹ *Review of effectiveness, environmental impact, humaneness and feasibility of lethal methods for badger control* (see www.defra.gov.uk/corporate/consult/current.htm)

⁵⁰ Stopped in 1981

⁵¹ *Review of effectiveness, environmental impact, humaneness and feasibility of lethal methods for badger control* (see www.defra.gov.uk/corporate/consult/current.htm)

be made to reach all parts of the sett; the risk of the gas reaching the animal but not being enough to kill; and the consequences of such sub-lethal exposure to the gas and any associated compounds. This research is necessary to determine whether gassing meets the requirements for humaneness.

Question 11. Is gassing appropriate for use under licence by groups of farmers, landowners and their agents?

Question 12. Would there be a need for training of licensees? If so, what form should this take?

Question 13. How could this training be best provided?

Shooting of free running badgers

86. Shooting of badgers which are not restrained could be permitted under the Protection of Badgers Act 1992. However, if rifles were to be used, firearms certificates would need to be amended to cover badgers.

Question 14. Would permitting the shooting of free running badgers (under licence) be practical and acceptable?

Snaring

87. The design and application of a proposed body snare for capturing and holding a badger differs from neck snares used for foxes or rabbits. The aim would be to catch badgers around the body so that they can be held for a short period, without injury, until they could be humanely killed. To reduce the potential for badger escapes and to avoid possible cruel treatment inspection of the body snares would be required to be carried out at specified intervals. Trials and field testing of the humaneness of the body snare would be carried out. Specific competencies would be required by those setting body snares for badgers, and guidance would need to be produced on their use.

Question 15. What features should be included in the design and use of the body snare? Are there particular features which should be avoided or included?

Question 16. What inspection intervals for checking snares would meet welfare considerations and be practical?

Question 17. What skills and competencies for culling are required to ensure body snares are safely and effectively deployed?

Question 18. Is there a need for training for farmers or licensees? If so, what form should this take?

Question 19. How could this training be best provided?

Use of cage traps

88. The Government would not propose to licence the use of cage traps as the shooting of the captured animal can only be carried out safely and humanely with a handgun, an option not generally available to farmers. Cage trapping has also proved inefficient in the Randomised Badger Culling Trial and, because the state would be the most likely option to implement the cull using this method, it would be the most expensive way to cull.

Close Season

89. If it was decided to instigate a cull of badgers a close season (1 February to 30 April), to protect dependent cubs, would be considered.

Disposal of Carcasses

90. If a policy to cull badgers was to be implemented decisions would need to be taken on how badger carcasses should be disposed of. Possible methods for the disposal of badger carcasses could include:

- On site burial
- Transport to an incineration or rendering plant.

Question 20. What methods of disposal would be suitable to minimise risk of disease transmission, assist in monitoring a cull of badgers and be practical?

Monitoring

91. Any policy to cull badgers will need to be monitored both in terms of protecting the species and observing the effect of control measures (cattle and badger) on bovine TB in cattle.

Impact on Wildlife

92. The importance of the badger as a wildlife reservoir of bovine TB depends on a number of factors, including the pathology of the disease in badgers, badger ecology relative to cattle, and the density of badgers. As part of the management of bovine TB it will be crucial to monitor changes in badger populations to quantify how effective the control operations have been and monitor recolonisation and understand how changes in badger numbers relates to changes in cattle TB patterns.

93. As well as the implementation of control measures at a farm scale, it is proposed that the following would be monitored:

- the impact of culling on the status of the badger population at a large scale;
- the direct impacts on badger populations within licensed areas compared to unlicensed areas;
- impacts on other species.

94. The current national badger population dataset cannot be used as a basis for monitoring population change in response to badger management although it does give us an indication of badger numbers. We propose using nocturnal spotlight surveys to estimate relative density and to monitor changes in population size within culling areas over time.

95. At present, Defra does not propose to monitor the presence of disease in badgers. Post-mortem testing and culture of body parts does not justify the costs since, as the results of the RTA Survey showed⁵², accurate determination of the local prevalence of disease in badgers is not straightforward.

Question 21. Do the proposals for monitoring the impact on wildlife (paragraphs 93 - 95) look at the right issues? If not, what else do you think should be monitored?

Monitoring Bovine TB in Cattle

96. The incidence of bovine TB in cattle within and around badger culling areas will be monitored through active surveillance as at present.

Policy Review

97. The policy is intended to be sufficiently flexible so it can be adjusted in the light of new evidence including any further analysis emerging from the Randomised Badger Culling Trial. The policy would be kept under review as necessary and changed if required.

⁵² which were published on the internet by the Independent Scientific Group in August [website]

ANNEX A: References

Below is the list of references referred to in the text and supplementary evidence which has formed the basis of this consultation document.

A review of the evidence for culling-induced social perturbation and disease transmission in badger (*Meles meles*) population
(<http://www.defra.gov.uk/corporate/consult/badgers-tbcontrols/index.htm>)

An Assessment of the Potential Impact of the Large-scale Removal of Badgers(see
(<http://www.defra.gov.uk/corporate/consult/badgers-tbcontrols/index.htm>)

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http://www.defra.gov.uk/science/project_data/DocumentLibrary/SE3112/SE3112_1428_FRP.doc

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Consultation with English Nature on licensing of control of badgers for the purposes of preventing the spread of disease (bTB)
(<http://www.defra.gov.uk/corporate/consult/badgers-tbcontrols/index.htm>)

Cost benefit analysis of badger management as a component of bovine TB control in England (<http://www.defra.gov.uk/corporate/consult/badgers-tbcontrols/index.htm>)

Countryside and Rights of Way Act 2000 <http://www.defra.gov.uk/wildlife-countryside/cl/index.htm>

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Donnelly, C. A. et al. *Impact of localized badger culling on TB incidence in British cattle*. Nature 2003 Dec 18, 426(6968), 834-837 Epub 2003 Nov 23.

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Dunnet, G. M., Jones, D. M. & McInerney, J. P. *Badgers and bovine tuberculosis: review of policy* (H.M.S.O., London, 1986).

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Information on the tuberculin skin test:
<http://www.defra.gov.uk/animalh/tb/control/P4skin.htm>

Information on the Krebs Trial / Randomised Badger Culling Trial:
www.defra.gov.uk/animalh/tb/culling/index.htm

Information on compensation for cattle -
<http://www.defra.gov.uk/corporate/consult/cattle-compensate/index.htm>

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Kirkwood, J. K. Humaneness of MAFF's badger despatch procedures. (<http://www.defra.gov.uk/animalh/tb/publications/auditor/report.htm> 2000)

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Summary of the principles of providing the best practical welfare standards for different methods of killing/ slaughter of animals for human consumption or killing for disease control purposes and euthanasia of domestic and farmed animals outlining their possible application to badgers.

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Veterinary Advice on Methods Likely to Reduce the Transmission of bovine TB from Badgers to Cattle (<http://www.defra.gov.uk/corporate/consult/badgers-tbcontrols/index.htm>)

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ANNEX B: Partial Regulatory Impact Assessment

[SEE SEPARATE DOCUMENT

<http://www.defra.gov.uk/corporate/consult/badgers-tbcontrols/index.htm>]

ANNEX C: List of Organisations Invited to Respond

This is a public consultation and anyone is welcome to respond. However, there are organisations which represent the main stakeholders on both sides of the debate and they have been directly invited to respond to the consultation.

Below is the list of organisations which have been specifically asked for their views.

Animal Health and Welfare Strategy England Implementation Group

Association of Chief Police Officers

Badger Trust

British Association of Shooting and Conservation

British Cattle Veterinary Association

British Deer Farmers Association

British Deer Society

British Limousin Cattle Society

British Pest Control Association

British Veterinary Association

British Cattle Veterinary Society/ Bay Veterinary Group

Cabinet Office Better Regulation Executive

Cattle Health Certification Standards

Central Association of Agricultural Valuers

Centre for Ecology and Hydrology

Country Land and Business Association

Countryside Alliance

Countryside Council for Wales

Department for Culture, Media and Sport

Department of Agriculture and Rural Development Northern Ireland

Department of Environmental Science and Technology

Department of Health

English Nature

Environment Agency

Farmers Union of Wales

Forestry Commission

Food Standards Agency

Foodaware

Game Conservancy Trust

Implementation Group, Farming and Food Strategy

Independent Scientific Group

League Against Cruel Sports

Livestock Auctioneers Association

Local Authorities Co-ordinators of Regulatory Services

Meat and Livestock Commission

National Beef Association

Natural Environment Research Council

National Farmers Union

National Farmers' Union (Wales)

National Gamekeepers Organisation

NERC Centre for Population Biology

NFU

Office of Science and Technology, DTI

Royal College of Veterinary Surgeons

Royal Commission on Environmental Pollution

Royal Institution of Chartered Surveyors

Royal Society

Royal Society for the Protection of Animals

RSPCA

Small Business Service

South West Rural Development Agency

State Veterinary Service

Tenant Farmers Association

The Deer Initiative

The Wildlife Trusts

Universities Federation for Animal Welfare

University of Oxford

Wildlife Trusts