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Bovine Tuberculosis: The Government's approach to tackling the disease and consultation on a badger control policy.

Response from the Royal Society for the Protection of Birds

Introduction

1.1 The RSPB is Europe's largest wildlife charity with over one million members, with more than 920,000 of them living in England. The Society manages one of the largest conservation estates in the UK, covering more than 55,000 hectares in England.

1.2 Livestock grazing is an important component of the RSPB's land management with 8,600 cattle on our nature reserves in England this summer.

1.3 The RSPB's vision is for sustainable systems of farming that produce adequate supplies of safe, healthy food; protect the natural resources of soil, air and water that farming depends on; help to protect and enhance wildlife and habitats; provide jobs in rural areas and contribute to a diverse rural economy.

1.4 The RSPB is sympathetic to concerns within the farming community over the impacts of bovine TB. Bovine TB is an important disease that needs to be addressed. It is also clear that the disease reservoir in wildlife is contributing, at least in part, to the problem. We recognise the costs to the industry from this disease but also to the taxpayer through the testing regime and compensation. There is considerable public interest in this issue and this must be properly taken into account in determining future policy.

1.5 We note that the Government's preferred option for dealing with the wildlife reservoir is a farmer led badger cull with peripheral vaccination.

General Comments

2.1 In these circumstances we think it is appropriate to pose the following questions:

- Are no alternative solutions available?
- Will culling badgers be effective in significantly addressing the problem?
- Has the impact of culling on the conservation status of the target species been properly assessed?
- Is the level of proposed culling publicly acceptable?

2.2 Having carefully considered the Government's preferred approach, as set out in the consultation document and accompanying impact assessment, we are not convinced that the answer is 'yes' to any of these key questions.

2.3 We have based our views on the effectiveness of badger culling in addressing cattle TB on the scientific work that has been carried out on this issue. After almost ten years of detailed study the Independent Scientific Group (ISG), in presenting the results of the Randomised Badger Control Trial (RBCT) to the then Secretary of State for the Environment, concluded that given the high costs and low benefits 'badger culling can make no meaningful contribution to cattle TB control in Britain.' The recent calculations presented by Jenkins et al¹ indicate that, given the modest reductions in herd breakdowns achieved by culling badgers, the benefits would need to persist for approximately 12.5 years after culling finishes to recoup the costs of this exercise. This seems unlikely and poor value for the investment.

2.4 The Government's response to this issue has been to deflect the bulk of cost of a culling operation onto the farming community and to significantly alter the RBCT control protocol to allow the shooting of free ranging badgers. We believe this raises very significant doubts as to whether the Government's preferred approach is sustainable and whether the perceived benefits in terms of significantly reducing bovine TB incidence can be realised (see responses to consultation questions below for further detail).

2.5 The issue of public acceptability revolves around the difference between costs and values. The impact assessment produced on the Government proposals² includes many estimates of costs but very little on values. It states (para 5.34) that 'it is not possible to suggest a reliable estimate of the value the general public would place on avoiding a licensed area cull of badgers' but notes that it 'is a relevant consideration for decision making'. We agree with both these points. We recognise that it would be very difficult to assess precisely how much value society would place on an approach that was based on a non destructive technique (vaccination) that may take marginally longer to have a positive impact above one that involves

¹ Jenkins HE, Woodroffe R, Donnelly CA (2010) The Duration of the Effects of Repeated Widespread Badger Culling on Cattle Tuberculosis Following the Cessation of Culling. PLoS ONE 5(2): e9090. doi:10.1371/journal.pone.0009090

² <http://www.defra.gov.uk/corporate/consult/tb-control-measures/100915-tb-control-measures-annexf.pdf>

the killing of a large proportion of the population of a popular native species over significant swathes of countryside. However, we believe the likely outcome would be against culling and do not believe that the Government has demonstrated that a badger cull is publicly acceptable when the option of badger vaccination is available.

2.6 The consultation document states that the contribution vaccination can play in tackling TB relies on laboratory studies and computer models rather than field trials (but see Q1.13 below). It infers that the outcomes from culling are more certain. However, the culling option favoured in the consultation document, carried out by farming co-operatives or their agents and using shooting of free ranging badgers that is not synchronised across the whole cull area, is so different from the RBCT approach that it is untested. In addition, we believe the costs of free ranging shooting have been considerably underestimated. There is, therefore, a considerable risk that the Government's preferred approach to culling will produce quite different results to that predicted from the scientific work of the RBCT. Indeed, there is a significant danger that the proposed approach will exacerbate perturbation of badger social groups, increase the incidence and spread of TB in cattle, and be abandoned part way through due to unforeseen costs/practical difficulties, or both.

2.7 The consultation outlines how the Government's approach to cattle measures will become increasingly risk based. Unfortunately, the same does not appear to be the case for addressing TB in badgers. At a recent debate on this issue³ Professor Quintin McKellar, Principal of the Royal Veterinary College, stated that the Government's aim was 'a cattle population free of TB and a badger population free of TB'. The work of the RBCT shows that badger culling increases the prevalence of TB in badgers due to the effects of perturbation. Whilst there are significant risks of exacerbating the number of cattle breakdowns through an ineffective, unsynchronised or short lived cull there are no such risks with vaccination. For this reason if the Government is committed to addressing the level of TB in badgers (and therefore cattle TB breakdowns), in advance of an oral badger vaccine being available, we advocate that the Government should **support and encourage** the farming community with a **programme of targeted use of the injectable badger vaccine**.

2.8 The RSPB has advocated the use of vaccination to address bovine TB for over a decade, and we remain concerned at the slow speed of badger and cattle vaccine development and the apparent lack of emphasis that successive Governments have placed on this solution. We were therefore very concerned that the Badger Vaccine Deployment Project announced by the previous Government was substantially trimmed in June this year, when five of the six pilot areas were dropped. We believe that the continuation of these pilots would have provided a useful start to vaccination on a wider scale, especially if they had all been as successful as the remaining pilot near Stroud.⁴

³ Is the Coalition Government's Proposal for a 'Science-led Programme of Badger Control' an effective way to reduce Tuberculosis in Cattle? ZSL, Tuesday 9 November 2010.

⁴ 541 badgers vaccinated on 93 farms over 90 km² in the first year. <http://www.bbc.co.uk/news/science-environment-11875056>

2.9 In view of the proclamation contained in the consultation document that ‘we need to use every tool in the toolbox’ we are surprised that there is no reference to **selective breeding of cattle for TB resistance**. Conservative methods of estimating the heritability of TB resistance in red deer and cattle have indicated substantial heritability. The recent sequencing of the bovine genome opens up avenues for rapid identification of and selection for genes that have large effects on the susceptibility of cattle to TB infection. Although it is already well-known that the progeny of different sires of the same breed can differ markedly in susceptibility to TB infection, efforts to identify the genetic loci responsible for such differences have only begun recently. Even so, there has already been substantial progress. A recent review⁵ concluded that ‘Breeding resistance to BTB in the national cattle herd could relatively quickly produce significant benefits’. A modest effect of increased host resistance on net reproduction number would be sufficient to cause the incidence of TB in cattle to decline. We are aware that Defra has an ongoing research project in this area and we are therefore surprised that this is not part of the package of measures being considered as part of the Government’s strategy.

2.10 It is not clear from the consultation document how the Government’s proposals on culling badgers fit into a strategy to control and then eradicate bovine TB. It is a concern that these proposals have not been assessed alongside further measures to improve the testing and control of cattle movements. Defra’s review of the impacts of pre-movement testing⁶ illustrates the significant effect that cattle measures can have, projecting that this pre-movement testing will have prevented 1500 confirmed new incidents (CFIs) of bovine TB in high TB incidence areas by 2015. However, although Defra is considering further measures to improve cattle measures (para 37-48) we are not aware of any assessment of the impact of these measures, either in conjunction with badger control or on their own.

Responses to the Specific Consultation Questions

Question 1: Comments on the options, costs and assumptions made in the Impact Assessment.

Q1.1 The RBCT showed that, due to the effects of culling on badger social structures and movements (perturbation), for a badger cull to be effective it would have to be carried out over a large area, be carried out efficiently and simultaneously, and be undertaken in a co-ordinated way, for a protracted period of time^{7 8}. This raises significant challenges in terms of costs and

⁵ Allen A R , Minozzi G, Glass E J, Skuce R A, McDowall S W J, Woolliams J A and Bishop S C (2010) Bovine tuberculosis: the genetic basis of host susceptibility. Proc. R. Soc. B 2010, 277, 2737-2745.

⁶ Defra (2010) Bovine TB – a review of the pre movement testing policy in England and Wales. April 2006-March 2009 – Phase 1 Report. September 2010

<http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/documents/pre-movement-testing-review.pdf>

⁷ Bourne et al (2007) Bovine TB the scientific evidence.

http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/isg/report/final_report.pdf

⁸ ISG (2008) Meeting between the Independent Scientific Group on Cattle TB and the Government Chief scientific Adviser, 13th December 2007.

<http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/isg/mtg131207.htm>

organisation. Failure to adequately address these issues risks increasing cattle TB incidence rather than reducing it.

Q1.2 The Government's proposals do not address these requirements adequately. There is **currently no requirement for culling to be carried out simultaneously**. The ISG concluded that 'RBCT data suggest that simultaneous culling is vital'⁹ and Sir David King confirmed that 'conducting badger culls simultaneously over such an area would have to be an essential element of any culling programme that was deemed to have been undertaken competently.'¹⁰ The reason for this is that the ISG found that culls not conducted simultaneously resulted in increases in the prevalence of infection in badgers markedly greater than those prompted by simultaneous culls¹¹.

Q1.3 Carrying out a simultaneous and humane cull over an area of 150 km² (half as large again as the areas controlled under the RBCT) is a huge logistical challenge. Depending on the method used it will either require the purchase of a very large number of cage traps and co-ordinated working by a large number of people or the recruitment and co-ordination of a large number of experienced personnel with the right weapons/ammunition for shooting free ranging badgers. In addition, simultaneous shooting of badgers, at night and on adjoining properties raises potential health and safety issues. Will Defra/NE publish an assessment of the number of cage traps or experienced and adequately equipped shooters that will be required to carry out a simultaneous cull? This information is not available in the consultation document or impact assessment. It appears that the logistics of a co-ordinated cull have not been fully assessed.

Q1.4 Culling that is not simultaneous is likely to increase perturbation beyond that observed in the RBCT and will probably reduce the overall benefits. Other observers have cautioned against assuming that the effects observed in the RBCT can be replicated by other forms of culling e.g. *'It is important to note that the effects described here relate only to culling as conducted in the RBCT, i.e. deployment of cage traps by highly trained staff in co-ordinated, large-scale, simultaneous operations, repeated annually for five years and then halted.'*¹²

Q1.5 The Government is seeking to address **the costs of badger culling** by allowing the shooting of free ranging badgers. This is an untried and untested approach. This appears to be based on the Game Conservancy Trust's conclusion that '**sighting frequency** of badgers was sufficient to be an efficient form of badger control'¹³(our emphasis). We have several concerns

⁹ Bourne et al (2007) Bovine TB the scientific evidence.

http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/isg/report/final_report.pdf

¹⁰ ISG (2008) Meeting between the Independent Scientific Group on Cattle TB and the Government Chief scientific Adviser, 13th December 2007.

<http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/isg/mtg131207.htm>

¹¹ Woodroffe et al (2008) Culling and cattle controls influence tuberculosis risk for badgers. Proceedings of the National Academy of Sciences of the United States of America 103, 14713-14717.

¹² Jenkins HE, Woodroffe R, Donnelly CA (2010) The Duration of the Effects of Repeated Widespread Badger Culling on Cattle Tuberculosis Following the Cessation of Culling. PLoS ONE 5(2): e9090. doi:10.1371/journal.pone.0009090

¹³ The Game Conservancy Trust (2006) Shooting as a potential tool in badger population control. Report to Defra. <http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/documents/badger-gct0806.pdf>

over the effectiveness and implications of this approach (see below and response to question 5).

Q1.6 The impact assessment (para 5.21) estimates the costs of shooting free ranging badgers to be £200/km²/year, compared to £2500/km²/year for cage trapping and shooting and £2,250/km²/year for vaccination (para 5.19 and 5.24). It is not clear how the costs of free ranging shooting have been calculated and the validity of this figure has recently been questioned. Using the GCT data/model and aiming to achieve 70% removal of badgers (as in the consultation document recommendations) by shooting alone, it has been calculated that the costs of labour, transport, equipment and ammunition could not exceed £3.23 per hour for the £200/km² figure to be met.¹⁴ With the national minimum wage at £5.80 per hour keeping costs at this level appears to be hugely over optimistic.

Q1.7 Farmers may want to take on the role of shooting badgers but achieving substantial reductions in badger density will require many nights of work with the likelihood of diminishing returns. This is likely to have significant impacts on the ability of farmers to fulfil their other work and would therefore bring costs. It should be noted that the feasibility study commissioned by Defra suggested that shooting free ranging badgers was likely to be a task for specialists, it concluded:

'In view of the necessity for a centre-fire rifle and good quality telescopic sight, the requirement for a Fire-Arms Certificate, the specialist knowledge required for all use of centre-fire rifles, the extra knowledge required to adjust technique to badgers, the anti-social hours involved in night-shooting, and other specialist equipment required, shooting is a technique likely to be employed by professional operators rather than by landowners and farmers with other demands on their time. Because of the finite number of badgers on any one land-parcel, such specialists would probably need to operate on a roving basis among many different land parcels.'

It is inconceivable that specialists would carry out this work for £3.23 per hour. There is also the issue of whether roving specialists would be able to carry out a simultaneous cull over sufficient area (see above).

Q1.8 There is a further reason why the real costs of shooting may be higher than estimated in the consultation document. The GCT estimates of the time taken to shoot badgers are based on information from Woodchester Park which has a very high density of badgers (28 badgers/km²). Densities of badgers in TB affected areas are often much less than this (5-10 badgers/km²)¹⁵. At typical densities, encounter rates will be lower, culling will take longer and costs will therefore be higher.

¹⁴ Dr Rosie Woodroffe, presentation to 'Is the Coalition Government's Proposal for a 'Science-led Programme of Badger Control' an effective way to reduce Tuberculosis in Cattle? Debate at ZSL, Tuesday 9 November 2010.

¹⁵ Cheeseman C L et al (1981) The population structure, density and prevalence of tuberculosis (*Mycobacterium bovis*) in badgers (*Meles meles*) from four areas in south-west England. *Journal of applied ecology* 18, 795-804.

Q1.9 Ensuring that the estimates of costs are realistic is important for two reasons. In the impact assessment the low estimated costs of shooting result in a positive Benefit Cost Ratio (BCR) for a badger cull whereas the higher costs of cage trapping give a negative BCR. However, probably of more importance is that the true cost of culling to farmers is likely to influence whether culling can be sustained over a period sufficient to make a positive difference.

Q1.10 We note that the impact assessment is clear that the costs to farmers of the culling options (4 and 6) outweigh the savings they would see (para 6.3). This paragraph rightly points out the risk that farmers may wish to abandon a cull part way through when net benefits do not materialise. It should be noted that even if the success of professionally organised RBCT work is replicated over a larger area by groups of farmers and landowners, the majority of breakdowns that would have occurred will continue to do so. In addition, the benefits of culling will not be shared equally. There will still be a significant number of farmers who despite paying for a cull will see no benefit, particularly in the first few years of culling. We think the chance of culls being curtailed is increased by the estimates of costs being too low and if the practicalities of shooting have not been fully thought through. To minimise this applicants will be required to fulfil licensing conditions and adhere to a management plan. However, the consultation document does not outline any plausible sanctions that would be in place to ensure compliance. For example, it is not clear whether Natural England will be expected to fine groups of farmers who wish to abandon a cull part way through. The sanctions for non compliance should be clearly outlined to all potential participants at the time of application. The consultation document states that licences will be revoked at any time if the licensing criteria are not met (para 149). However, if culling has already started cutting the project short could result in an increase in cattle breakdowns due to perturbation. One alternative to this would be for the government to step in and ensure that the cull was completed properly, but Government has clearly ruled out taking on the cull itself and this would potentially encourage other licensed groups to follow suit.

Q1.11 We believe that the consultation document and accompanying papers are unduly negative about the potential effects of vaccinating badgers in comparison to culling. A recent FERA report¹⁶ compared the effects of vaccination and culling on herd breakdowns by means of a model. This study indicated that, even with high compliance with a culling programme, vaccination gave a reduction in the ten-year mean herd breakdown rate that is only modestly smaller than that from culling. However, with low rates of land access for culling, or low culling efficacy, vaccination gave larger, or at least the same levels of reduction in ten-year mean herd breakdown rate as culling. Given our concerns that the methods of culling proposed in the consultation document will be less effective in reducing badger density and have larger perturbation effects than the co-ordinated cage trapping used in the RBCT (and assumed in the FERA model), we suggest that, in practice, vaccination could be more beneficial in terms of impact on cattle TB breakdown rate than culling.

Q1.12 In addition, there are frequent references to culling causing a rapid reduction in the number of infected badgers (e.g consultation document para 8). This pace of reduction is

¹⁶ FERA (2010) Comparing badger (*Meles meles*) control strategies for reducing bovine bTB in cattle in England. <http://www.defra.gov.uk/food-farm/animals/diseases/tb/documents/8control-strat-report.pdf>

contrasted with a slower decline expected from vaccination (para 117). This difference appears to be a key reason for rejecting vaccination as the lead mechanism for tackling TB in badgers. We question the basis for these views. Data from the RBCT show a slow decline in the number of infected badgers over several years, with 3-5 years of annual culls, on average, needed to halve the number of infected badgers caught¹⁷.

Q1.13 The recently published assessment of a clinical field trial showed that badger vaccination reduced the incidence of positive serological test results by 73.8 per cent.¹⁸ The study concluded 'while vaccination of badgers is unlikely to be the sole solution to this disease problem, the advent of the first licensed BCG vaccine for use in wildlife could provide a new and important component of a comprehensive programme of bovine TB control for cattle in the UK and Ireland.' We agree and suggest that now is the time for Government to get behind badger vaccination in a positive and committed way. This should include re-doubling efforts to develop an oral vaccine that will make badger vaccination a more cost effective and practical option.

Question 2: Do we agree with the preferred option.

Q2.1 No. We do not support the proposal for a farmer led cull utilising cage trapping and shooting and the shooting of free ranging badgers. The Bern Convention permits the killing of protected species for disease prevention where no other satisfactory solution exists. We do not object to the killing of small numbers of animals under these circumstances, as long as four tests are met:

- i/ that the seriousness of the problem has been established;
- ii/ that non-lethal measures have been assessed and found not practicable;
- iii/ that killing is effective in addressing the problem;
- iv/ that killing will not adversely affect the conservation status of the target or other non-target species.

In this case, other satisfactory, non-lethal solutions, in the form of vaccination, exist. We also note that the possibility exists of killing a significant proportion of local badger populations under the Government's proposals, indeed the closer culling gets to achieving local extinction of badgers, the better it is for disease control purposes. Conversely, there is a risk that partial or ineffective culling will make the current situation worse, increasing the prevalence and distribution of TB in badgers and cattle. Attempting to achieve a positive outcome utilising culling carries a significant risk of failure. In contrast, no such risk is associated with a co-ordinated programme of vaccination.

¹⁷ Table 4.9 from Bourne et al (2007) Bovine TB the scientific evidence.

http://www.defra.gov.uk/foodfarm/farmanimal/diseases/atoz/tb/isg/report/final_report.pdf

¹⁸ Chambers M A et al (2010) Bacillus Calmette-Gue' rin vaccination reduces the severity and progression of tuberculosis in badgers. *Proc. R. Soc. B* published online 1 December 2010 doi: 10.1098/rspb.2010.1953

Q2.2 We believe that a co-ordinated and Government-sponsored programme of badger vaccination is a more satisfactory and publicly acceptable solution to culling.

Q2.3 We consider that allowing badger culling on a substantial scale when a satisfactory alternative exists, would set a very concerning precedent for other wildlife management issues.

Question 3: Do we agree that this approach, of issuing licences to farmers and landowners, is the most appropriate way to operate a badger control policy?

Q3.1 No. We consider that, if the Government is intent on addressing the wildlife reservoir of TB in advance of an oral badger vaccine becoming available, it should share the costs of a co-ordinated vaccination programme with farmers and landowners.

Question 4: Do we agree with the proposed licensing criteria for culling and vaccination?

Q4.1 Partially. There is reference to a minimum size of 150km² but no indication that this should be continuous and ideally close to circular. Areas that are not circular will have a larger edge to core ratio that will need to be mitigated by either a larger core area or a hard boundary such as the coast: in many areas of high TB incidence, hard boundaries do not exist.

Q4.2 The last criterion refers to ensuring that good biosecurity measures are in place before a cull begins. However, there is no indication as to what these measures are, how they will be assessed and what the sanctions will be if they are not currently being met. Will the whole licence be rejected or just an individual farms participation? If the latter how would this affect the practical application, and effectiveness, of the cull?

Q4.3 We advocate that if culling is to be permitted it should be a requirement to ring vaccinate and this should be carried out in advance of any culling in the core area to allow herd immunity to develop (see Q6 below).

Question 5: Do we agree that the proposed methods of culling are effective and humane?

Q5.1 As stated above shooting free ranging badgers is untested and its effectiveness is open to doubt. The GCT estimates of badger encounter rates and distances between observers and badgers are based upon observations of populations of badgers not subject to shooting for many generations and therefore potentially habituated to vehicles and walkers. It is highly likely that badgers will become increasingly wary and secretive when subject to shooting. This will increase costs and make an efficient cull more difficult. It is also likely that badgers becoming wary of shooters will make culling by free shooting increasingly difficult and potentially inhumane. If badgers are encountered less frequently and first seen at longer average distances because of wariness, shooters may be under pressure to take long shots and this will increase the risk of sub-lethal injuries.

Q5.2 The effectiveness of shooting free ranging badgers in reducing badger densities has not been assessed or compared to cage trapping. The GCT study only considered encounter rates with badgers that were not exposed to shooting. Therefore, we do not consider it a valid assessment of the feasibility of effective control by shooting.

Q5.3 The impacts of shooting free ranging badgers on perturbation has not been assessed or compared to cage trapping. The proportion of badgers that will be injured but not killed outright is not known but may be higher than that reported for deer and foxes if shooting takes place at setts where an injured animal will immediately seek cover. We note that the GCT report states:

In view of the difficulties, shooting at the sett should probably be regarded as a viable ancillary approach, but one requiring considerable care, and certainly not a first choice.

The consultation provides no guidance on shooting techniques to be utilised e.g walking transects, shooting pre-baited areas from high seats or shooting at setts.

Q5.4 Due to the likelihood that an unquantified number of free ranging badgers will be injured and not killed by shooting this represents a less humane option than cage trapping and shooting or vaccination.

Q5.5 If effective culling is implemented using cage trapping, in a similar way to that used in the RBCT, then a very large number of traps would be needed. This would either result in costs being much higher than those suggested in the consultation, and therefore a lack of cost-effectiveness, or in short-cuts being taken in the operation of traps. This is likely to include less frequent checking of traps than is required by law and a consequent negative effect on badger welfare.

Question 6: Do we agree with the proposed use of vaccination, particularly its focus on mitigating the perturbation effects of culling?

Q6.1 We favour the use of vaccination overall. One of the issues with culling is that there will be winners and losers amongst landowners/farmers, particularly in the first few years. Due to the effects of perturbation those farmers just outside core culling areas are likely to see an increase in TB outbreaks in the first few years of culling. They can avoid this either by joining the cull, at their own expense, or by opting for vaccination, also at their expense. Is there a case for Government and/or those farmers located in the core area to provide financial assistance to compensate neighbouring landowners for the increased risk of TB breakdowns? An alternative approach is to phase vaccination and culling (see below).

Q6.2 For vaccination to be most effective it would be advisable for vaccination to take place in the ring around culling before culling starts, to help develop herd immunity in the badger population. The RBCT showed that culling raises the prevalence of TB in badgers in the peripheral area. In addition, the consultation document (para 114) recognises that the larger proportion of infected badgers in the population the longer it will take for vaccination to be effective. In view of this, if culling is to be pursued as a policy, ring vaccination should be carried out over several seasons prior to culling beginning. The consultation document (para 147) recognises that this is desirable, we recommend that this is a specific requirement.

Question 7: Should anything further be done to encourage the use of vaccination?

Q7.1 The Government will save money through reduced compensation payments that would result from a targeted and co-ordinated programme of vaccination. We therefore believe that the Government should share the costs of implementing a co-ordinated vaccination programme with farmers and landowners.

Question 8: Do we agree with the proposed monitoring?

Q8.1 The proposed monitoring covers the key issues but the consultation document provides insufficient detail to assess whether monitoring will be adequate. Detailed monitoring is essential. Before any culling is licensed we advocate that Defra sets out clearly how the status of badgers in culling areas will be determined, how it will determine that the welfare of trapped and/or shot badgers is being safeguarded, how cull levels will be set, how they will be enforced and how local extinctions will be avoided. This should also cover who will carry out the monitoring, how the results of this will be made publicly available, how much it will cost and how this will be funded.

Q8.2 We think it likely that an adequate programme of monitoring to detect and control the potential welfare issues identified in our answers to Q5 would have a severe and negative effect on the relative cost-effectiveness of badger culling.

Q8.3 Further clarification of the monitoring work that will be carried out on SSSIs and SPAs is also needed, due to the potential for consequential effects of badger removal. We question whether, given the potential scale of culling activity in England and overlap with sites designated for their international conservation importance (SPAs and SACs), a programme-level assessment is required of the appropriateness of culling activity. Even if the answer to this question is no, we presume that culling will be assessed as an 'operation likely to damage' for every SSSI that will experience culling activity. For those sites that underpin SPAs or SACs, it is also valid to ask whether culling activity is likely to have a significant effect on SPA/SAC features.

RSPB Countryside & Species Conservation Dept.

8 December 2010