

# Natural England Board



Meeting: 94  
Date: 26 February 2020

**Paper No: NEB 94 05**

**Title: bTB update**

**Lead/s: Tim Hill, Chief Scientist**

## 1. Purpose

- 1.1 To update the Board on the Government's imminent response to the Godfray Review and highlight implications for Natural England.
- 1.2 To provide an overview of planning underway for 2020 operations and highlight key risks and issues for delivery in 20/21.
- 1.3 To provide advice from NESAC following their review of available evidence relating to the use of lethal control and vaccination of badgers as measures to prevent the spread of bovine tuberculosis (bTB) in cattle.

## 2. Role of the Board

- 2.1 The Board is accountable for approval of policies and strategies involving potential significant impact on the environment, the organisation or Natural England's reputation.

## 3. Recommendations

### The Board is asked to:

- Note the Government's response to the Godfray report on bTB and that it will have implications for NE in its roles as licensing authority and statutory advisor to government.
- Agree that Board should discuss and sign off any consultation response on new policy guidance to Natural England.
- Note advice from NESAC and consider how this might be used to inform any future advice to Government, and in support of Natural England's continued role as licensing authority and conservation advisor.
- Note the ongoing operational risk of the expanded culling programme planned for 2020 and the limited expansion of vaccination.

## 4. The Godfray Review and Government's response

- 4.1 In 2018, the Government commissioned an independent review of England's 25-year bTB eradication strategy by an expert panel chaired by Prof Charles

Godfray<sup>1</sup>. This far-reaching report covered nine different aspects of the bTB policy including disease in wildlife and vaccination. The key findings and recommendations from this review are presented in Annex 1.

4.2 Key points to note from a wildlife perspective were:

- While badgers are only responsible for a small proportion of new outbreaks in cattle (<6%), the Review confirmed that the evidence shows that badgers do transmit bTB to cattle and contribute to the persistence of the disease. The Review concluded that there is no one right way to tackle bTB, and Ministers have to decide whether the benefits to farming outweigh the animal welfare and environmental concerns of other stakeholders. This decision must be informed by scientific evidence but inescapably involves a judgement call by ministers.
- There is evidence that culling badgers perturbs the animal's social structure leading to increased risks of herd breakdowns in adjacent non-culled areas. If a decision is made to cull, then it is correct to carry it out over sufficiently large geographic areas with natural barriers to manage this risk.
- Moving from lethal to non-lethal control of the disease in badgers is highly desirable, although more work is needed to understand the efficacy of vaccination.
- If this uncertainty continues then the report suggests that after four years of culling government should consider a programme in which badgers are vaccinated in half of the areas and, after a two-year pause, intensive culling resumes in the other half. The outcomes should be monitored and adaptively managed so should it become clear that vaccination is providing comparable benefits to culling then all areas should adopt it, with the opposite happening if vaccination fails to provide protection.

4.3 The Government's response to the Review has now been finalised. It began Cabinet write-round on 11 February, with publication now expected around the first week of March 2020.

4.4 The Government response will be focussed on three main priorities:

- a. **Accelerating work to develop a deployable cattle vaccine**, aiming for 2024.
- b. **Evolving the badger control policy** - the expectation is that the current intensive culling policy will begin to be phased out over the next few years, gradually replaced by government-supported vaccination and surveillance. Culling would remain an option where epidemiological assessment indicates that it is needed.
- c. **Improving diagnostic testing** to root out bTB more effectively, with deployment of more sensitive tests for surveillance supported by greater use of on-farm movement restrictions of cattle with inconclusive test results.

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<sup>1</sup> The review team were: Professors Charles Godfray, Christl Donnelly, Glyn Hewinson, Michael Winter and James Wood.

4.5 Key aspects of the government response that will have implications for Natural England's work on disease control in badgers will include:

- Developing an exit strategy from the four year intensive culling of badgers which involves deploying badger vaccination. The Government proposes to pilot this approach in 2020 with some areas that have completed their four year intensive cull, while others are authorised to continue or start licensed Supplementary Badger Culls (SBC). This phasing-in period may also allow the Government to monitor the effect of SBC versus vaccination on cattle herd bTB breakdowns during the transition phase.
- The intention to retain the ability to introduce new cull zones where the disease is rife, but only where the epidemiological evidence points to badgers posing a significant disease risk. Otherwise, the badger cull phase of the strategy would wind down by the mid to late 2020s.
- The continued support for badger vaccination projects (Badger Edge Vaccination Scheme, BEVS) in areas where the prevalence of disease is low, aiming to create locally protected badger populations which reduce any spread of bTB by badgers.
- Investigation of the potential for projects where adjacent vaccination and culling could complement each other in controlling disease.
- Development and consultation of new Guidance to Natural England on licensing badger control (which currently permits SBC after 4 years of intensive culling)
- Improved governance arrangements through establishing a new 'Bovine TB Partnership' between government and industry to encourage shared ownership, coordination and decision making.

4.5.1 Given that any new Guidance to Natural England is likely to be notably different from the existing guidance, and likely to be contentious, **we recommend that Board should sign off Natural England's response to any Government consultation.**

4.6 This refreshed approach raises a number of key issues for Natural England to consider:

4.6.1 If vaccination is to be successful in enabling the winding down of intensive culling then it will take time to implement, and might need to be phased in, particularly given that some 57% of the High Risk Area (HRA) is now subject to a licensed cull of badgers (2013-2019). A phasing-in period will also allow government to monitor the effect of SBC versus vaccination on cattle herd bTB breakdowns during the transition phase.

4.6.2 Notwithstanding the potential benefits of a successful vaccination programme, NE officers believe that it is not possible to begin a viable programme of vaccination pilots that follow the 4 year intensive cull until 2021 due to practical constraints, Specifically:

- The 7 areas that completed their fourth year of intensive badger control in 2019 are already in the process of applying for a licence to start SBC in June 2020. They are unlikely to want to switch to a vaccination route instead.
- Defra will need to consult on a series of changes to the Guidance to Natural England which currently permits SBC after 4 years of intensive culling (which is currently seen as more desirable by cull companies). This

process and re-issuing of guidance to NE, including a 12 week public consultation period, is unlikely to be concluded before August 2020.

- It is anticipated that considerable effort will be needed to generate interest and uptake with cull companies and participating landholders to encourage them to use vaccination.
- It will take time to identify suitable and willing areas, and put in place training, funding, surveys and traps.
- Companies who have completed four years of culling have raised concerns with Defra on whether subsequent vaccination would be practical on the ground given the prevalence of trap-shy badgers that remain following a four year intensive cull. In the existing SBC areas only approximately 20% – 25% of the badgers dispatched have been trapped.

4.6.3 The risk of vaccination being ineffective due to trap-shy badgers was also identified by NESAC, who advised that vaccination should also be piloted in areas that had not been intensively culled. Natural England may wish to consider proposing this as necessary to properly evaluate vaccination as an alternative to culling.

4.6.4 Continued culling for the foreseeable future risks ecological effects that are poorly understood. This evidence gap needs to be addressed or we risk further legal challenge

## 5. Advice from NESAC

5.1 At its November Board meeting in response to Paper NEB 92 03, Board commissioned NESAC to review the available evidence relevant to Natural England's roles focusing on four key themes: badger numbers; impact on the badger population; badger vaccination, and wider ecological effects of the cull. The advice from NESAC is reproduced in full at Annex 2.

5.2 Board are invited to note the advice from NESAC and consider how this might be used to inform any future advice to Government, and in support of Natural England's continued role as licensing authority.

## 6. Natural England Resourcing issues 20/21

6.1 Natural England currently assess and issue culling and vaccination licences based on the Guidance to Natural England, dated May 2012<sup>2</sup>.

### 6.2 Expected Badger cull licensing 2020:

6.2.1 Natural England has issued licences to 11 new areas in each of the preceding three years and there are currently 11 areas in the pipeline to start licensed badger control in 2020.

6.2.2 The 7 areas that completed their fourth year of intensive badger control in 2019 are all in the process of applying for a licence to start Supplementary

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<sup>2</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/71053/7/tb-licensing-guidance-ne.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/71053/7/tb-licensing-guidance-ne.pdf)

Badger Control (SBC) in June 2020. This is a significant increase in workloads for SBC, from the 3 current SBC licences.

- 6.2.3 The culmination of this licensing work in 2020 would result in operations involving a total of:
- 43 licensed badger control areas;
  - 1 licensed Low Risk Area (LRA) badger control area; and
  - 10 licensed SBC areas
- 6.2.4 Our budget for licencing the Intensive Cull (IC) policy has been frozen since 2016 and, having made significant reductions in cost per area, we have now exhausted the efficiencies we can realise within the risk level that Defra/minsters are comfortable with. We have therefore indicated to Defra that we need more funding to deliver a continued expansion of intensive culling in 2020.
- 6.3 Vaccination Licensing – current picture
- 6.3.1 Since 2015, Natural England has issued 64 licences to take and mark badgers (to enable vaccination) to prevent the spread of disease. During the 2019 open season, across the 247 sites under the 29 licences, a total of 1,098 badgers were cage-trapped, of which 882 were vaccinated.
- 6.3.2 Changes to the policy are likely to represent a significant increase in vaccinated-related work. For example, proposals from Defra to proceed with three limited badger vaccination pilots in 2020<sup>3</sup> could result in a 70% increase in the total area where badger vaccination is licensed.
- 6.3.3 The scope and scale of any expansion of vaccination will need more staff (and budget). We cannot estimate this with any confidence until we have the information from Defra to allow us to do a proper impact assessment. But, to be practical, this would need to be a very limited trial to prepare for broader roll out in 2021 and beyond.
- 6.3.4 Even if there were to be a scaling back in licensing new intensive cull areas, to allow diversion of resources and budget to vaccination, it is probably already too late to plan and execute anything major this year.
- 6.3.5 In summary, expanding our operation to include these limited vaccination pilots alongside the expanded intensive cull and SBC licensing requires significant additional funding from Defra and would be challenging to deliver successfully.
- 6.3.6 **Board is asked to note these resource challenges and that we have highlighted them to Defra**

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<sup>3</sup> one in East Sussex of approximately 20 to 50 km<sup>2</sup>; one in East Cumbria of approximately 100km<sup>2</sup>; and one with the National Trust of approximately 50 km<sup>2</sup>

## **Annex 1. The Godfray Review summary of key findings & recommendations**

In February 2018, the then Secretary of State for Environment, Food and Rural Affairs announced an independent review of England's 25-year BTB eradication strategy. The key findings from Sir Charles Godfray were published in November 2018<sup>4</sup> and are set out below:

### **Governance**

- Create a centralised body to takeover disease control functions performed by APHA, NE and local authorities. DEFRA retain high-level policy making.
- Support private veterinarians in advising farmers on safe trading practices, on-farm controls and bio-security.

### **Surveillance and diagnostics**

- More sensitive testing (Single Intradermal Cervical Test, SICT) for surveillance in HRAs and EAs – to detect infection as early as possible.
- Once outside the EU the SICT or caudal fold test (CFT) used for herd screening. Interferon Gamma Test can retest reactor animals, reducing number of false positives.
- A combination of the interferon Gamma Test and IDEXX ELISA should be considered, to reduce false negatives. Infected animals can immediately be removed.
- Invest in better tuberculin quality control. Aim to replace tuberculin by defined antigens, providing a DIVA (differentiating infected from vaccinated animals) function.
- Use whole-genome sequencing of bTB routinely to identify disease transmission pathways with greater accuracy.

### **Vaccination and genetic resistance in cattle**

- DIVA tests should be the aim. Advantages of different models of vaccination deployment should be re-examined. Taking into account international and UK trade and business.
- Support the genetic selection of cattle for their bTB resistance.

### **Risk-based trading**

- Support and implement Livestock Information Service (LIS) – provides information on all movements of cattle in the UK linked to electronic identification tags.
- Infection risk from LIS should be mandatorily available before purchase and at market ring-sides.
- Analysis of regulatory and economic drivers for movement of cattle in the UK to discover if there are perverse incentives for this movement.
- Disincentivise risky trading by reducing compensation (or insurance payments).

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/756942/tb-review-final-report-corrected.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/756942/tb-review-final-report-corrected.pdf)

## OFFICIAL SENSITIVE

- Consider extending post-movement testing to at least the EA using the most sensitive test, Reducing movement of cattle from HRAs to LRAs.

### **Disease in wildlife**

- Periodic culling more promising than continuous culling, beyond four years.
- Government should address the uncertainty of the effectiveness of vaccination and culling if not resolved by analysis.
- After four years of culling consider vaccinating badgers in half the areas and, after a two year pause resume intensive culling in the other half. Outcomes should be monitored to see if vaccination provides comparable benefits to culling. If it does, vaccination should be adopted, if not culling should continue.
- Collect more information on the prevalence of the disease in other wild or feral animals (deer, fox and wild boar).

### **The disease in non-bovine managed animals**

- Regulations concerning non-bovines (e.g. alpacas) should be improved as they can contract bTB.

### **Biosecurity**

- Stress the importance of industry taking greater ownership of the disease, increase the take up of biosecurity. Private veterinarians and other trusted advisors should give clear unambiguous advice on biosecurity.
- Accreditation schemes and supermarkets should mandate biosecurity measures for their suppliers to adhere to.
- Consider insurance of animals rather than compensation for those slaughtered.
- Creation of compulsory insurance programme partially supported by government with premiums and compensation to reward behaviour that reduces disease risk.
- Obtain more evidence on the transmission route of bTB being dispersed by slurry spreading or manure on the land, find mitigation methods.

### **British farming after the CAP Common Agriculture Policy**

- Use LIS to collect data on short distance cattle movements.
- Consider if reducing short distance movements in EAs is justified.
- Encourage long term investment into reduction of bTB risk and disease control in short-term farm tenancies.

### **Research**

- More research into; novel diagnostics, vaccines, genetic resistance and farmer behaviour.
- Create a funding forum to better link research funders with the needs of customers of the more applied research.



Annex 2 – Advice from Natural England Science Advisory Committee (NESAC)

**Badgers and bovine tuberculosis**

**Natural England Science Advisory Committee (NESAC) advice to Natural England Board**

February 2020

**Purpose**

To summarise NESAC's consideration of the evidence relating to the use of lethal control and vaccination of badgers as measures to prevent the spread of bovine tuberculosis (bTB) in cattle.

To present advice from NESAC to the Natural England Board that can inform future discussions relating to Natural England's dual roles as conservation advisor and licensing authority.

**Background**

The policy for the lethal control of badgers by culling has been in place since 2013 and, as implementation of the cull has progressed, a series of evidence needs and gaps has emerged that go beyond the scope that provided by the Randomised Badger Culling Trial (RBCT).

Publication of the report of the *Bovine TB Strategy Review*<sup>1</sup>, chaired by Professor Charles Godfray, in October 2018, and the awaited Government response, make this an appropriate time for Natural England to consider its dual roles of conservation advisor and licensing authority in the light of current evidence.

The Natural England Board commissioned NESAC to review the available evidence relevant to Natural England's roles focusing on four key themes: badger numbers; impact on the badger population; badger vaccination, and wider ecological effects of the cull.

The NESAC discussion took place on 18 December 2019 and was informed by presentations from Professor Charles Godfray (Oxford University), Professor Rosie Hails (National Trust), Professor Robbie Macdonald (University of Exeter) and Professor Rosie Woodroffe (Zoological Society of London). All contributed to the discussion. Our discussion focused on evidence, recognising that broader issues outside the scope of this advice play a part in any decisions made by Natural England.

For each of the four themes a number of evidence statements are presented which summarise the evidence that NESAC heard. NESAC considered this evidence and produced a series of advice statements for the Board's consideration.



## Estimating badger population size & cull numbers

### Our goal

- As licensing authority, to be confident that licences deliver a contribution to effective disease control and are based on appropriate numbers

### Evidence

1. The methodology for setting cull targets is complex and reliant on significant assumptions, giving rise to concerns about the accuracy of minimum and maximum numbers. On balance, it was felt that setting numbers is probably less useful now than it was originally.
2. An effort-based model may be more effective, although it may be difficult to obtain robust effort data necessary to parameterise such an approach.
3. New technologies and novel methods (e.g. the 'random encounter' approach) may offer options for assessing badger numbers but these methods have not been validated for badgers.
4. The critical issue is not the number of badgers killed, but understanding the level of culling (or equally vaccination) required to tip the *basic reproductive number* ("R0") below 1, and so lead to declining prevalence of bTB in cattle<sup>5</sup>.

### Advice

- It is worthwhile exploring the data collected by cull companies and Natural England to see what it can tell us about the response of the badger population to culling and whether this information could improve or replace the current approach to setting cull numbers.

## Impact of culling on badger populations

### Our goal

- As conservation advisor, to provide government with robust advice on the impact of the cull for the local and national badger population and any measures needed to avoid long-term detrimental effects.

### Evidence

1. There is no agreed view or definition of a healthy badger population or one that meets international commitments.
2. It is uncertain if reducing the badger population by up to 95% for an open-ended period satisfies the Bern Convention commitment to keep the population 'out of danger'.
3. There is a need to improve understanding of the population response of badgers to sustained culling (e.g. productivity of surviving badgers).
4. The impact of culling on the badger population is likely to be greater than originally envisaged because cull areas are larger and culling is continuing over a longer period of time.

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<sup>5</sup> R0 is a quantity used in epidemiological studies that indicates whether a disease will increase or decline in frequency. In the simplest cases the quantity indicates the average number of secondary infections arising from a single introduced infection. If this quantity is greater than one, the disease will spread, while if it is less than one it will decline

5. Natural England's advice to the Secretary of State, provided prior to the onset of the two Pilot Culls, that the badger population would recover after four years of culling needs reviewing given the continuing and expanding nature of cull.

Advice

- a) Natural England is advised to develop a view on what constitutes a healthy badger population. A possible approach would be to use Natural England's 'Favourable Conservation Status Definition' methodology.
- b) Natural England should provide revised advice to the Secretary of State on measures to keep the badger population 'out of danger' (the Bern Convention commitment).
- c) Natural England should advise that the UK seek to ensure that the badger population remains in the 'Least Concern' category at national and regional biogeographical scales.

**Badger vaccination**

Our goals

- To give advice on the implications of both culling and vaccination focused policies on conservation issues, and
- As licensing authority, to assess the capability of vaccination contributing to TB control, and to identify the sorts of measures (e.g. size of area, frequency and duration of vaccination) that would be required to maximise the effectiveness of this approach

Evidence

1. Evidence shows that TB cannot be eradicated from badgers by culling alone, but there is insufficient evidence to determine whether TB can be eradicated from badgers by vaccination.
2. Small scale vaccination deployment has limited success (e.g. only c.50% of badgers on a farm come from setts on that farm) so it is preferable to vaccinate larger areas.
3. The use of vaccination in the Low Risk Area may be advantageous as there is negligible risk of spreading disease through perturbing surviving badgers.
4. There is no evidence so far that the 'test and vaccinate or remove' approach is more effective at disease control than either culling or vaccinating alone, and this approach could make the situation worse (through perturbation of badger populations).
5. Vaccination suffers from being seen as an 'alternative' to the established practice of culling. Vaccination is impressive for badgers (unimpressive for cattle) and there are no downsides, except how to deliver a programme.
6. An adequate assessment of vaccination would need to control for the known effect that culling increases bTB in the remaining badgers, so fewer will benefit from the vaccine, and that trap-shyness will affect the ease of vaccinating those remaining badgers.
7. Critical evidence from badger vaccination research in Northern Ireland is expected to be published soon.

Advice

- a) Natural England is advised to present vaccination as a positive contribution to the future strategy, noting the need to further develop the evidence base.
- b) With respect to any new governance arrangements, Natural England needs to retain a strong advisory role on the conservation implications of the policy.

**Wider ecological effects of badger culling**

Our goals

- As conservation advisor, to assess and advise on the wider ecological implications of culling badgers; and
- As licensing authority, to issue licences that are suitably conditioned to avoid adverse effects on protected sites and populations of species of conservation concern.

Evidence

1. There has been little new research on the ecological effects of culling since the RBCT. Furthermore, it may be unsafe to rely on RBCT findings as an evidence-base as cull areas are larger (on average x5) and culling is now open-ended.
2. The RBCT demonstrated significant effects on foxes (declined) and hedgehogs (increased).
3. Impacts on birds during the RBCT research and in subsequent studies have so far proved inconclusive, but there may be other taxa that merit investigation (e.g. pollinators and/or invertebrates more generally).
4. The impact of culling (and our ability to measure it) may be influenced by the degraded state of agricultural ecosystems.
5. The investigation of ecological effects needs long-term study or specific experimental interventions.
6. The Committee considered Natural England's current position on ecological effects to be robust and defensible.
7. Long-term data from Wytham Woods (Oxford University field study site) may provide an insight into the response of other species to increases in badger population.

Advice

- a) Long term data collection and assessments are needed to explore the effects of culling. It is recommended that further studies focus on specific species and habitats (e.g. those of particular conservation concern) rather than selecting those that are most amenable to research.
- b) Natural England should encourage government to increase funding for research on ecological impacts in view of the geographical scale and duration of culling.

**General observations and additional evidence needs**

There is a need for care in use of terminology (for example, in use of the term 'reservoir for the disease') and in interpreting messages due to the complexity of the evidence (for

example, in the RBCT it is estimated that 5.7% (95% CI 0.9–25%) bTB transmission to cattle herds was due to badgers<sup>ii</sup>, but culling badgers can reduce new confirmed incidents in cattle by around 50%<sup>iii</sup>).

It is recommended that there is a combination of empirical and modelled data approaches to address evidence gaps.

There remain gaps in the behavioural science evidence available to inform strategies for TB control. Natural England could contribute to addressing these gaps given our social science expertise in the environment sector.

It is recommended that Natural England develops partnerships with bodies such as the National Trust, who are developing their own guidance and support for farm tenants affected by TB. Such collaboration provides an opportunity for experimental learning.

## Conclusions

NESAC recommends that Natural England

- Considers whether there is a better alternative to estimating badger populations & cull numbers;
- Develops a view on what constitutes a healthy badger population and advises the Secretary of State on such measures as are necessary to ensure the badger population remains in the IUCN ‘Least Concern’ Red List category;
- Supports the wider use of badger vaccination as part of the Government’s policy for bTB control in cattle; and
- Calls on the Government to fund research on the wider ecological effects of culling as there is currently no evidence of the effects of badger removal at the scale it is now taking place.

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<sup>i</sup> Godfray, C., Donnelly, C., Hewinson, G., Winter, M. & Wood, J. 2018. Bovine TB strategy Review. October 2018. Defra. <https://www.gov.uk/government/publications/a-strategy-for-achieving-bovine-tuberculosis-free-status-for-england-2018-review>

<sup>ii</sup> Donnelly, C.A., Nouvellet, P. 2013. The Contribution of Badgers to Confirmed Tuberculosis in Cattle in High-Incidence Areas in England. PLOS Currents Outbreaks. Edition 1, <https://doi.org/10.1371/currents.outbreaks.097a904d3f3619db2fe78d24bc776098>

<sup>iii</sup> Downs, S.H., Prosser, A., Ashton, A. et al. 2019. Assessing effects from four years of industry-led badger culling in England on the incidence of bovine tuberculosis in cattle, 2013–2017. Sci Rep 9, 14666. <https://doi.org/10.1038/s41598-019-49957-6>