Department for Environment Food & Rural Affairs

NATURAL ENGLAND

Summary of badger control operations during 2018

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Natural England Chief Scientist's advice on the outcome of badger control operations

Effectiveness of Industry-led culling

The outcome of this year's operations indicates that industry-led badger control continues to deliver the level of effectiveness required by the policy to be confident of achieving disease control benefits:

- Areas 1 and 2 are currently in their second year of licensed Supplementary Badger Control. Data from these areas will be available in due course.
- Nineteen existing areas (Areas 3 to 21) applied an appropriate level of targeted effort across their respective areas to maintain the population at a reduced level.
- Eleven new areas (Areas 22 to 32) effectively applied lessons learned from badger control operations in previous years to make a successful start to their operations. Ten[1] areas applied an appropriate level of targeted effort across their respective areas to achieve their minimum number.

As in previous years, minimum and maximum numbers were updated as initial estimates of badger abundance were refined by actual circumstances observed in the field once badger control operations were underway. This being necessary despite the widespread use of sett surveys to provide field evidence of the un-culled badger population.

Safety of Operations

Operations across all areas were carried out to a high standard of public safety. No significant incidents affecting public safety were reported in relation to the use of firearms.

Humaneness of controlled shooting

Contractors continued to show high levels of discipline and compliance with the Best Practice Guide. The level of accuracy of controlled shooting continued to compare favourably with the range of outcomes when other control activities, currently accepted by society, have been assessed.

Dr Tim Hill

Chief Scientist, Natural England

[1] The remaining area (Area 32 – Cumbria) did not have a minimum number.

UK Chief Veterinary Officer's advice and conclusions on disease control benefits

Although Natural England's Chief Scientist is responsible for assessing the effectiveness and humaneness of culling, I am still responsible for assessing the disease control benefits of the operations.

Given the ongoing reduction in badger population estimates in Areas 3 to 21 since the start of their licences, these areas will see the benefits of reduced disease in cattle over their four-year cull period. The initial cull areas are starting to see these benefits, with the number of new confirmed cattle breakdowns dropping by around 50%[2]. In Area 1, the incidence rate has dropped from 24% to 12% in the twelve months following its fourth year of culling. Similar results were observed in Area 2, which dropped from 10.4% to 5.6%. A full analysis of the data, similar to that of Brunton *et al*. in 2017[3] is underway and will be published in due course.

These areas should take future action to maintain the level of reduction in the badger population achieved to maximise the expected disease control benefits. I therefore agree with Natural England's Chief Scientist's assessment that culling should continue in these areas for the duration of their licences (one year for Areas 4 to 10, two years for Areas 11 to 21).

As concluded by the Chief Scientist above, the ten new areas (Areas 22 to 31) in the High Risk Area have conducted an effective cull. Effective culls need to be carried out in 2019 and a further two years, for disease control benefits to be realised.

As the aim of badger control in Area 32-Cumbria was to prevent disease spreading within the wildlife and aid eradication of disease I was responsible for monitoring the first year of this cull. Approximately 90% of land within the 190km^2 cull area was accessible for culling or within 200m of accessible land. The company applied an appropriate level of targeted effort and sett coverage across the cull area and so have been considered to have achieved a successful first year of their cull. As part of the operations, APHA has carried out disease surveillance operations. Tissue samples were taken from cage-trapped badger carcases and are being cultured in an attempt to isolate *M. bovis*. Results of this will be available in due course and used to inform future operations in the area alongside evidence from cattle surveillance and whole genome sequencing.

Christine Middlemiss

UK Chief Veterinary Officer

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[2] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/750986/bovine-tb-in-cattle-badger-control-areas-monitoring-report-2013-2017.pdf.

[3] https://onlinelibrary.wiley.com/doi/full/10.1002/ece3.3254.

Background

On 13 September 2018, Defra announced[4] that as part of the government's 25-year strategy to eradicate bovine tuberculosis and protect the livelihoods of dairy and beef farmers, Natural England had licensed and authorised local farmers and landowners to carry out Badger Disease Control operations across 30 areas in Cheshire, Cornwall, Cumbria, Devon, Dorset, Gloucestershire, Herefordshire, Somerset, Staffordshire, and Wiltshire in 2018.

Badger control operations, lasting at least six weeks, took place in each area, between 3 September and 1 November 2018. This document sets out the outcomes from those areas.

The two areas licensed to carry out Supplementary Badger Disease Control are not reported here and the data will be available in due course.

Effectiveness

Estimates of the badger population in each control area were supplied by Defra for the purpose of giving advice to Natural England on setting the minimum and maximum number of badgers to be removed in the licences. The estimates, methodologies and rationale used were published by Defra in September 2018[5].

As in previous years, Natural England monitored the progress in each control area closely. The levels of contractor shooting effort, number of cage-traps set and number of badgers removed were recorded on a daily basis in all accessible land parcels. This provided Natural England with regular information on the amount of effort deployed by each control company and its spatial distribution. This enabled a detailed assessment of the progress that each control company was making towards achieving their minimum and maximum numbers, and allowed Natural England to assess whether resources were being effectively deployed across all accessible land.

Updating minimum and maximum numbers

As set out in Section D of Defra's advice to Natural England on setting of minimum and maximum numbers, daily data collected about the level of effort being applied across each area and the number of badgers removed, were reviewed as operations progressed to

[4] https://www.gov.uk/government/publications/bovine-tb-authorisation-for-badger-control-in-2018.

[5] https://www.gov.uk/government/publications/advice-to-natural-england-on-setting-minimum-and-maximum-numbers-of-badgers-to-be-controlled-in-2018.

assess whether the badger population in each control area was higher or lower than the initial estimate suggested.

Based on an assessment of the data on Day 28 in 27 control areas and Day 38 in one other control area (Area 8 – Dorset), Defra advised Natural England to adjust the minimum and maximum numbers upwards in 15 control areas and downwards in the other 13 control areas to better reflect the evidence on the ground of badger abundance. Details of the calculations can be found in Annex A1.

Progress towards minimum and maximum numbers

All 29 control areas in 2018 achieved their minimum number and did not exceed their maximum number, see Table 1. The remaining area (Area 32 – Cumbria) did not receive minimum and maximum numbers as these are of less utility in the Low Risk Area given the different aim of the operation.

Table 1: Number of badgers removed by Areas 3 to 32.

Area	Updated minimum number[6]	Updated maximum number[6]	Badgers removed		
			Total	By controlled shooting	By cage-trapping
Area 3 – Dorset	109	329	325	277	48
Area 4 – Cornwall	184	250	189	105	84
Area 5 – Cornwall	264	358	278	159	119
Area 6 – Devon	611	829	642	332	310
Area 7 – Devon	164	223	173	135	38
Area 8 – Dorset	921	1250	1088	894	194
Area 9 – Gloucestershire	826	1121	880	682	198
Area 10 – Herefordshire	262	356	289	266	23
Area 11 – Cheshire	426	578	472	405	67
Area 12 – Devon	1115	1513	1135	585	550
Area 13 – Devon	774	1050	809	271	538
Area 14 – Devon	408	553	444	249	195
Area 15 – Devon	464	630	495	201	294
Area 16 – Dorset	2446	3319	2924	2326	598
Area 17 – Somerset	775	1051	921	705	216
Area 18 – Somerset	494	671	544	406	138
Area 19 – Wiltshire	1397	1896	1475	1174	301

Table 1: Number of badgers removed by Areas 3 to 32 (continued).

Area	Updated minimum number[6]	Updated maximum number[6]	Badgers removed		
			Total	By controlled shooting	By cage-trapping
Area 20 – Wiltshire	801	1087	819	535	284
Area 21 – Wiltshire	977	1325	1083	834	249
Area 22 – Cornwall	3063	4157	3327	1312	2015
Area 23 – Devon	1946	2642	2238	1271	967
Area 24 – Devon	719	976	743	271	472
Area 25 – Devon	717	973	796	268	528
Area 26 – Devon	759	1029	867	485	382
Area 27 – Devon	251	341	265	98	167
Area 28 – Devon	431	584	470	209	261
Area 29 – Gloucestershire	1316	1787	1459	848	611
Area 30 – Somerset	2433	3301	2870	2200	670
Area 31 – Staffordshire	3367	4569	3979	2929	1050
Area 32 – Cumbria	N/A	N/A	602	205	397

More data on these areas can be found in Annex A2. Natural England will use the data on effort levels and numbers of badgers removed to inform its requirements for future badger control operations.

Accuracy of controlled shooting

Shooting accuracy was used as a proxy measure for ‘humaneness’ and was assessed using observations from Natural England Monitors of badgers being shot at under controlled shooting conditions.

Summary of controlled shooting observations

Monitors observed 89 badgers being shot at using controlled shooting, of which six appeared to be missed and three appeared to be hit but were not retrieved. In such cases, the use of firearms carries an element of risk with regard to the wounding of individual animals. While the contractor has control over the condition of the firearm, ammunition

[6] The minimum and maximum numbers presented for Areas 4, 6, 12, 13, 18, 30, and 31 include an additional increase of 1.5% per operational day given continuation in those areas beyond 42 days, see Annex A1.

used, zeroing of the rifle and shooting technique, once the trigger is released, external parameters outside of the contractor's control come into play. Wounding can result for a number of reasons, with movement of the target species simultaneously with trigger release being the most common.

The non-retrieval rate observed in 2018 (10.1%, 95% confidence interval 5.1%–17.6%[7]) is similar to that observed during the operations in the last five years.

As with 2016 and 2017, post-mortem examination of badgers removed by controlled shooting would only have been carried out by exception in Areas 3 to 31. This year none were requested.

More details on compliance monitoring conducted during badger control operations can be found in Annex B.

Safety of the operations

Operations in all 30 control areas were carried out to a high standard of public safety. All existing badger control companies' contractors continued to receive training prior to the commencement of operations in 2018, on the requirements of the published Best Practice Guides[8], lessons learned and safety training.

In relation to the use of firearms in all 30 control areas, no significant incidents affecting public safety were reported. Contractors continued to show high levels of discipline and adherence to the Best Practice Guides, see Annex B.

Conclusions

The results from 2018 indicate that all 30 badger control companies have delivered the level of badger removal required to be confident of disease control benefits and that the operations were carried out to a high standard of public safety.

The levels of controlled shooting accuracy achieved in this year's operations were similar to those in the previous five years. The likelihood of suffering in badgers is comparable with the range of outcomes reported when other control activities, currently accepted by society, have been assessed. Licensed farmers and landowners will need to continue to ensure that their contractors receive rigorous training to maintain high standards of effectiveness, humaneness and safety.

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[7] Estimates of confidence intervals for proportions were produced using a "Modified Jeffries interval" (Brown and others, 2001).

[8] https://www.gov.uk/government/publications/controlled-shooting-of-badgers-in-the-field-under-licence-to-prevent-the-spread-of-bovine-tb-in-cattle--2 and https://www.gov.uk/government/publications/cage-trapping-and-dispatch-of-badgers-under-licence-to-prevent-the-spread-of-bovine-tb-in-cattle.