



Llywodraeth Cymru  
Welsh Government

# Bovine TB Eradication Programme IAA Vaccination Project – Year 4 Report



## IAA Vaccination Project - Year 4 Report

### Contents

1	Executive summary	2
2	Introduction	3
3	Badger vaccination in the Intensive Action Area	4
4	Scheduling vaccination rounds	4
5	Results	5
	• Area covered	
	• Trapping results	
	• Welfare assessments	
	• Non-target species	
6	Impact of weather	8
7	Quality assurance	9
8	Expenditure and finance	9
9	Conclusions	11
10	Acknowledgements	11
11	References	11
12	Maps	12

## **1 Executive Summary**

1. This report covers the fourth year of the five-year badger vaccination project in the Intensive Action Area (IAA). The project began in 2012.
2. The IAA covers approximately 288km<sup>2</sup> and is primarily located in north Pembrokeshire. The badger vaccination project in the IAA is the largest of its kind within Great Britain.
3. The vaccination field operations for the fourth year were undertaken between April and October 2015.
4. Up to 12 teams, each consisting of a field operative and an assistant, vaccinated a total of 1,118 badgers. A welfare assessment of every badger was undertaken at the time of capture. No badger showed any sign of adverse reaction to the vaccine.
5. All work was carried out by employees of the Welsh Government. The field operatives had successfully completed the Animal Health and Plant Agency (APHA) course relating to the cage trapping and vaccination of badgers.
6. Participation in the project by landowners is voluntary and the Welsh Government is grateful for their cooperation. A total of 651 landowners allowed access onto their land. This amounted to approximately 249km<sup>2</sup> and contained 186 main badger setts.
7. The field operational phase for the fourth year of the project cost £922,012 which is slightly less than Year 3. The cost has remained in keeping with original estimates made in March 2012.
8. The fifth year of the project has been suspended because the supply of BadgerBCG has been interrupted. It is unlikely that suppliers will be able to honour our order of vaccine for 2016. The Deputy Minister commissioned APHA to undertake modelling work to understand the potential for taking the IAA vaccination project forward. APHA's conclusion is that despite not being able to complete the final year, four years of badger vaccination would achieve a reduction in prevalence of TB in badgers in the IAA. The modelling showed that a one year gap after Year four is not different from vaccinating for five consecutive years. The full report is available on the Welsh Government website.

<http://gov.wales/topics/environmentcountryside/ahw/disease/bovinetuberculosis/intensive-action-area/badger-vaccination-iaa/?lang=en>

## 2 Introduction

9. It was announced in March 2012 that the Welsh Government would embark on a five year badger vaccination project within the Intensive Action Area (IAA) as part of efforts to eradicate bovine TB from cattle in Wales. The decision to vaccinate badgers was made following consideration of the Report of the Bovine TB Science Review Group (SF/JG/0333/12).
10. This is the fourth annual report and provides details of the badger vaccination work undertaken during 2015.
11. The IAA is approximately 288km<sup>2</sup> and is primarily located in north Pembrokeshire but includes small parts of Ceredigion and Carmarthenshire (Figure 1). There is a high incidence and prevalence of bovine TB in cattle herds within the area.

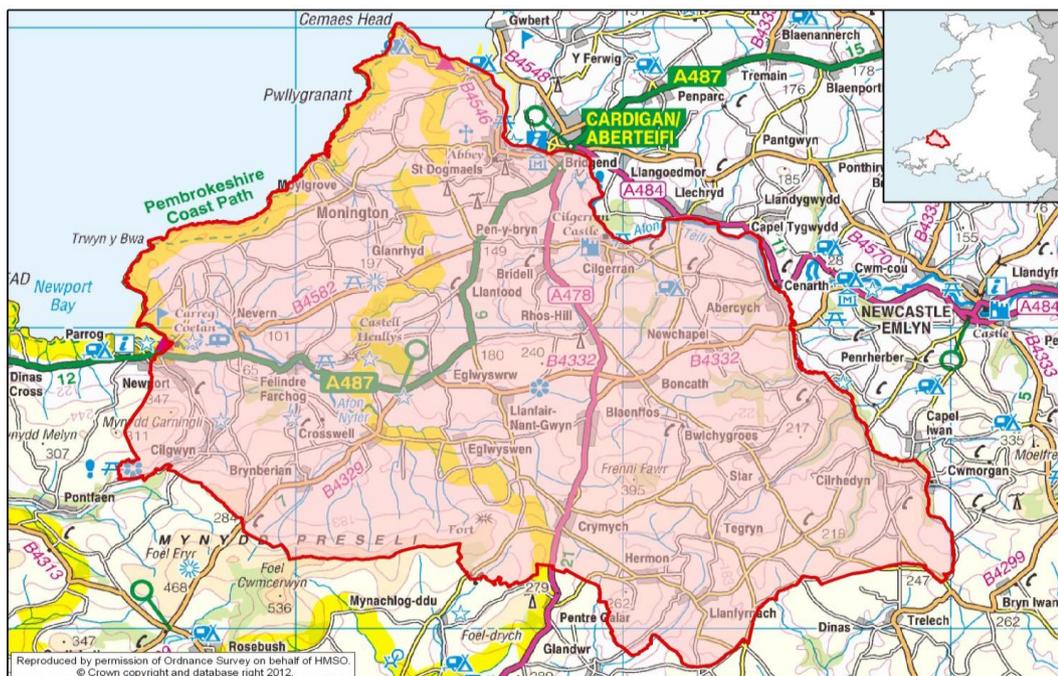


Figure 1: Map of the Intensive Action Area

12. The IAA was established in 2010 as an area where increased measures would be implemented to tackle all sources of bovine TB, in both domestic and wild animal species. The badger vaccination project began in May 2012 and is being carried out alongside the following measures:
  - Additional cattle surveillance and controls
  - Enhanced biosecurity measures
  - A one off check test of all known non bovine herds (goats and camelids) was undertaken in 2011/12.

### **3 Badger vaccination in the Intensive Action Area**

13. The purpose of the project is to trap and vaccinate as many badgers as possible within the IAA each year for five years. This is a field delivery project and while every opportunity is taken to gather data to contribute to the evidence base, it is not intended to be an experiment or trial. The project has not been designed to investigate or assess the effect of vaccination on badgers or measure the level of immunity or impact on badger groups.
14. Any differences observed in terms the number of TB breakdowns in cattle herds (or other TB disease parameters) cannot be attributed solely to the vaccination of badgers but has to be assessed against the whole suite of enhanced disease control measures in place in the IAA. The impact and effect that the combined measures may have on cattle herd breakdowns within the IAA will be assessed annually by APHA. Cattle herd TB incidence levels and other TB disease parameters within the area will be compared with a reference area where the disease picture is comparable. Reports of these annual assessments are available on the Welsh Government website: [www.wales.gov.uk/bovinetb](http://www.wales.gov.uk/bovinetb)
15. A survey of badgers found dead within the IAA is also being undertaken in parallel with the badger vaccination project. The third annual report for examination for *Mycobacterium bovis* in badgers found between 1 May 2014 and 30 April 2015 is available on the Welsh Government website: [www.wales.gov.uk/bovinetb](http://www.wales.gov.uk/bovinetb)
16. A badger population assessment was also undertaken in the IAA this year. The results of this assessment are expected to be published this summer. See paragraph 25 for further information.

### **4 Scheduling vaccination rounds**

17. Participation in the project by landowners is voluntary and it is important that we are allowed access by as many landowners as possible to maximise the area covered by the project. Every effort is made to be flexible and provide sufficient notice to landowners to minimise any disruption to their daily routine.
18. Land ownership details along with the badger capture results from previous years formed the basis for the creation of 81 rounds of work scheduled to be completed over seven cycles. Routinely, a cycle involved 12 teams working simultaneously and covered on average an area of 42km<sup>2</sup>. As in previous years a number of scheduled rounds were changed or amalgamated once the teams had assessed the level of badger activity on the ground. Whilst working in an allocated area, each team also looked to gain access to check for activity on land that had not been previously surveyed.

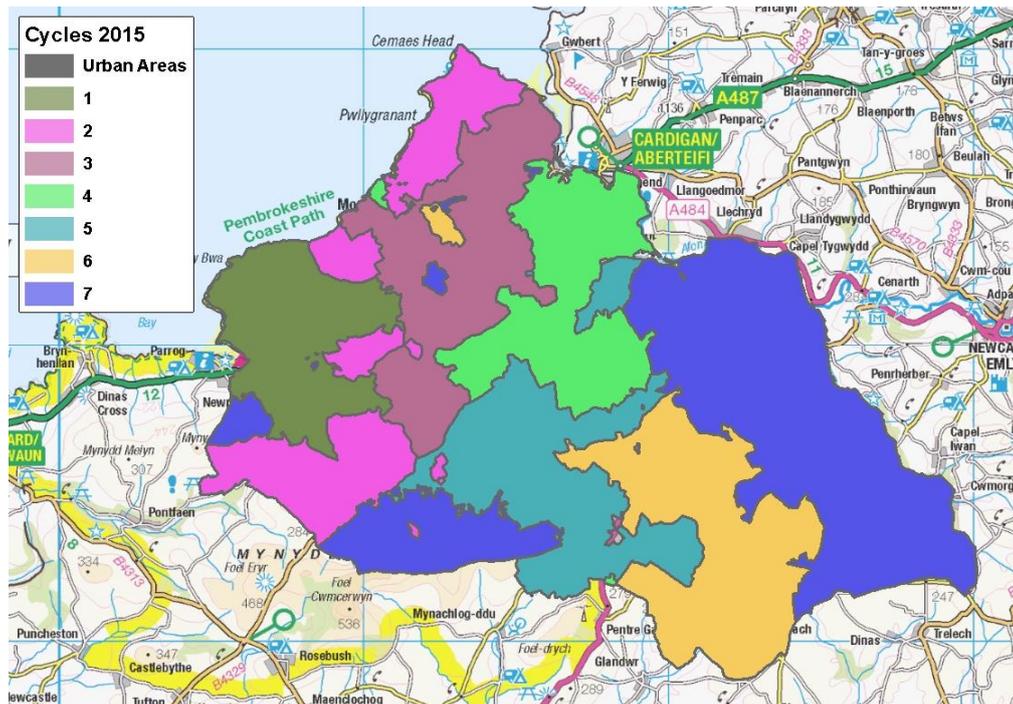


Figure 2: Map showing areas covered by each cycle of work in 2015.

19. Each cycle of work was completed over a three or four week period, depending on the size of the area covered and the level of badger activity identified. A cycle covers the period of time during when field operatives make initial contact with the landowners/occupiers; survey the land to identify badger activity; lay and pre-bait traps; set the traps to catch and vaccinate badgers, and finally; remove the traps.

## 5 Results

### Area covered

20. The IAA is approximately 288km<sup>2</sup>. A total of 651 landowners allowed us access onto their land to survey for badger activity. This equated to approximately 249km<sup>2</sup> or 86% of the IAA.
21. The remaining area of the IAA not surveyed primarily comprises of hard standing, residential properties, roads and rivers. There are however some, mostly small, areas of land where it has not been possible to establish ownership.
22. We were refused permission by 16 landowners who denied us access to 5.79km<sup>2</sup>. We also failed to gain access to some areas where the vegetation was impenetrable, or there were steep slopes.
23. The results show that at the time the land was surveyed there were 692 active setts. 186 of these were classified as main setts. A further 1315 setts were identified but were not active when they were surveyed.

24. The classification of setts is subjective. For each sett the number of active, partially active and inactive holes was recorded and the sett was classified as either a 'main' sett or an 'other' sett. The majority of UK badgers live in social group territories with several setts, with usually only one main sett per territory. In this survey, as in previous national badger sett surveys, it was assumed that only one main sett was present in each territory.
25. There are no current robust estimates of the average number of badgers per social group in the IAA. Welsh Government commissioned APHA to undertake a population assessment exercise during 2015 which will provide a more accurate estimate of the population and will also provide a capture and vaccination rate. The exercise involved collecting hair samples from 550 hair traps laid on 70 main setts and plucking hair samples from all badgers that were cage trapped for vaccination. DNA analysis of these hair samples is ongoing and the results this will be published this summer.

### Trapping results

26. Trapping and vaccinating began in May and was completed in October. Figure 3 details the trapping results by cycle.

Cycle	Date Range	Cycle Duration	Adults	Cubs	Age Unknown	Total	Proportion of total (%)
1	27/04/15 to 22/05/15	4 weeks	182	10	0	192	17.2%
2	25/05/15 to 19/06/15	4 weeks	168	62	0	230	20.6%
3	22/06/15 to 17/07/15	4 weeks	134	49	0	183	16.4%
4	20/07/15 to 14/08/15	4 weeks	119	42	0	161	14.4%
5	17/08/15 to 11/09/15	3 weeks	61	14	0	75	6.7%
6	14/09/15 to 02/10/15	3 weeks	96	13	0	109	9.7%
7	06/10/15 to 29/10/15	4 weeks	143	25	0	168	15%
Totals			903	215	0	1118	100%

Figure 3: Trapping results by cycle.

27. In total 1,118 badgers were trapped and vaccinated in 2015.

28. Generally the earlier 2015 rounds provided the greater return in numbers of badgers caught and vaccinated. 903 of the badgers vaccinated were classified as adult. This is less than previous years, 1061 in 2014, 1,172 in 2013 and 1,193 in 2012. Over 80% of all the badgers vaccinated in 2015 were adults.
29. We caught and vaccinated 215 cubs in 2015. This is a smaller number compared to last year (253 in 2014, 175 in 2013 and 220 in 2012). The majority of cubs were captured in rounds 2 to 4 which collectively accounted for over 71% of the total number of cubs caught during 2015. A similar pattern was seen in previous years. Predictably, the proportion of cubs captured reduced as the summer progressed because cubs born earlier in the year were classified as adults in later rounds.
30. Although we seek to cover as much land as possible within the IAA, access is not always required to trap badgers. Where access to setts was not possible, but there was evidence that the badgers travelled outside these areas to forage, the field operatives were able to set traps remotely on prominent runs on the perimeters of these areas. In 2015 over 61% (681) of vaccinated badgers were trapped remotely.
31. During any trapping operation a number of badgers will be captured more than once. This was the case in the IAA where 432 individuals were recaptured in 2015. This is a decrease on the number of recaptures reported in the previous year (517 in 2014, 500 in 2013 and 320 in 2012).
32. The recaptured individuals were identified by the temporary mark applied to all vaccinated badgers. Following a welfare assessment these badgers were released without any further action. The total number of badgers caught in comparison with previous years is shown in Figure 4.

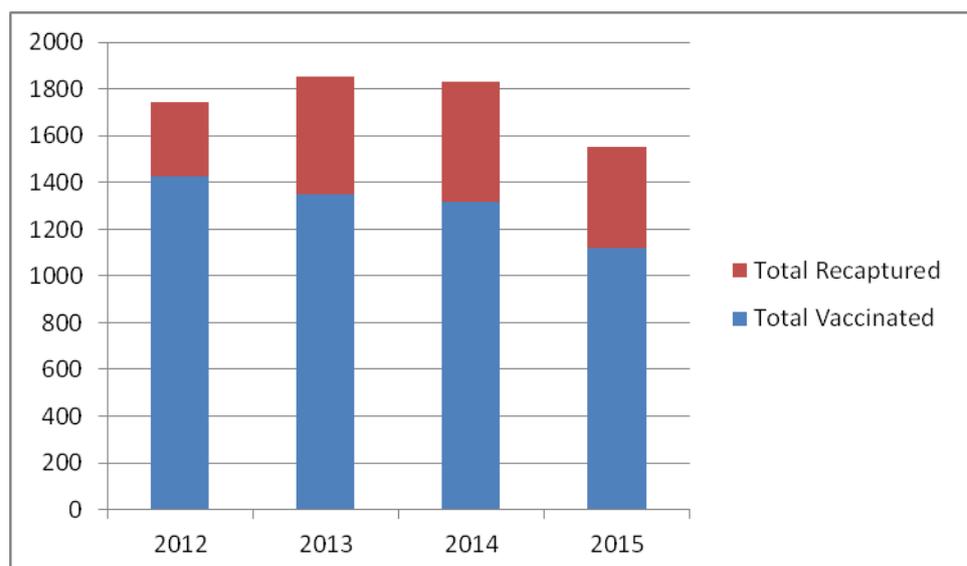


Figure 4: Total badgers caught

## **Welfare assessments**

33. A welfare assessment of every badger was undertaken at the time of capture. Welsh Government veterinary surgeons were the first point of contact if field operatives had concerns over the welfare of badgers trapped or found in the IAA or if any suspected adverse reaction to vaccination occurred. Additional arrangements were made with local veterinary practices to provide a call-out service, so that if any trapped animals appeared unwell or injured prompt veterinary assistance would be available.
34. There were 23 instances where minor injuries were recorded. The majority of the injuries reported were slight abrasions/scratches to the nose or face, with the remainder being older injuries or wounds. All of these individuals were considered to be fit and healthy for release following vaccination. No badger showed any sign of adverse reaction to the vaccine.

## **Non-Target Species**

35. Previous experience from this project and other badger trapping exercises indicates that the trapping of some non-target species is inevitable. A total of 52 animals of non-target species were trapped in 2015 (32 squirrels, 15 foxes and five crows). This compares with 57 in 2014, 34 in 2013 and 51 in 2012.
36. It is a legal requirement that species listed under Schedule 9 of the Wildlife and Countryside Act 1981, which include grey squirrels, must not be released back into the wild if caught in traps. 26 grey squirrels, which formed the majority of the non-target species animals caught, were humanely killed.
37. On one occasion a juvenile fox was found in a trap with a fractured jaw. In line with the procedure outlined in paragraph 34 a local vet was called to assist and examined the fox. Unfortunately, the injuries were severe and the animal was assessed as being beyond treatment and was euthanised humanely. All other non-target species, including a further 14 foxes, were released unharmed following a welfare assessment.

## **6 Impact of weather**

38. The operation to trap and vaccinate badgers is heavily dependent on weather conditions. During adverse weather conditions (such as extreme cold, heavy rain or snow) badgers held in cages are potentially at risk from exposure. If adverse weather was expected, some or all trapping was suspended. We monitored the weather forecasts closely, especially during the nights and days when trapping was being carried out. We also made extensive use of the local online weather forecasts and a decision to proceed or not was made on a daily basis.

39. Overall, we were fortunate to have dry conditions, or only localised light rain showers on most nights when the traps were set. However, we took the decision to not set any traps on 4 occasions, once in August and three times in October. Field operatives also took local weather conditions into account and were careful to ensure that traps were positioned to make maximum use of natural cover to minimise exposure to detrimental weather conditions.

## **7 Quality assurance**

40. All the vaccinators have successfully completed the APHA Cage Trapping and Vaccination of Badgers Course and hold a Certificate of Competence. Their performance was monitored throughout the project. Two field supervisors were appointed and were responsible for monitoring up to 6 teams each. They closely supervised all aspects of delivery and monitored the field operatives to ensure that the Standard Operating Procedures (SOPs) were strictly adhered to. Special attention was given to the setting of traps, the vaccination process and the welfare of trapped animals.
41. Vaccination of wild badgers by lay vaccinators can only take place under the direction of a veterinary surgeon. Welsh Government field operatives who vaccinated badgers worked under the direction of Welsh Government veterinary surgeons, who regularly attended field operations to satisfy themselves that the field operatives undertook their duties competently.
42. As BadgerBCG is a Prescription Only Medicine – Veterinarian (POM-V) it can only be supplied by a veterinary surgeon. Welsh Government veterinary surgeons were responsible for prescribing and overseeing the distribution of the vaccine.
43. To ensure that the field operatives were compliant with the conditions of the licenses to take and mark badgers (Protection of Badgers Act 1992) and to use cage traps to trap badgers (Wildlife and Countryside Act 1981) officers from the licensing authority, the Natural Environment and Agriculture Team (NEAT) of the Welsh Government carried out inspections on two teams on 30 September 2015. NEAT were content that licence conditions were being adhered to in full.

## **8 Expenditure and finance**

44. The cost of delivering badger vaccination in the IAA over 5 years was estimated to be in the region of £5,760,000 (SF/JG/0333/12: Wales Bovine TB Eradication Programme – Decision on Culling Badgers in the Intensive Action Area, 2012 refers).
45. The overall cost for 2015 was £922,012. This is in line with previous years, £929,540 for the third year, and £926,784 for the second year and £945,000 in the first year. The costs cover the delivery of the field operational phase between April and November 2014 and also include expenditure that was

incurred prior to this during the preparation stage, such as the purchase of various items of equipment and consumables and the drafting of the SOP's and Risk Assessments.

46. A breakdown of the costs directly incurred in the preparation and delivery of the field operational phase of the vaccination project in the IAA during 2015 is provided in Figure 5.

Staff costs	£625,111
Training & Personal Development	£5,407
Accommodation costs	£70,701
Equipment, PPE & consumables	£44,917
Vehicle costs	£117,097
Badger BCG vaccine	£20,278
Printing & Publishing	£3,285
<b>Third year costs</b>	<b>£886,796</b>
Annualised Fixed Asset costs	£35,216
<b>Total costs</b>	<b>£922,012</b>

Figure 5: Expenditure in 2015.

47. The staff costs cover both the field staff employed on a seasonal basis and the IAA Management Team, including their time dedicated to the preparation and set up of the project ahead of the field operational phase. There was an increase in staff costs, which include salaries, contributions to national insurance and pensions, and accounted for 67% of the total expenditure. As in previous years this increase was mainly due to incremental progression increases in salaries and the Welsh Government staff pay rise received in 2015.
48. The accommodation costs cover a full twelve month period and include leasing costs, maintenance and utility charges. Equipment costs include consumables, such as the peanuts used as bait, personal protective equipment, footwear, clothing and disinfectant. Vehicle costs include vehicle hire costs, fuel, maintenance, road tax and insurance.
49. In addition to the costs incurred in Year four, a further annualised figure of £35,216 has been included to cover the value of capital assets and equipment such as cage traps, fridges and power washers, some vehicles and trailers already held by the Welsh Government.
50. Based on these figures, the projected cost of a five year project would be in the region of £4.6m (based on the average annual cost of years 1, 2, 3 and 4). This estimation is without any adjustment for inflation or annual uplift.

## **9 Conclusions**

51. We consider that the project continues to be successful in meeting the objective to trap and vaccinate as many badgers as possible within the IAA. The number of badgers caught and vaccinated in 2015 (1,118) is slightly less than in previous years, 1316 in 2014, 1,352 in 2013 and 1,424 in 2012.
52. Our ability to deliver this project remains wholly dependant on the co-operation of landowners/occupiers granting us access to survey, set traps and vaccinate on their land.
53. During 2015 the project slightly decreased the area covered. In total, access was gained to approximately 249km<sup>2</sup>. This equates to 86% of the IAA compared to 90% (260km<sup>2</sup>) in 2014.
54. In previous years, the final cycle provided the least return in numbers of badgers caught and vaccinated. However, this year a much larger number of badgers were caught and vaccinated in the last cycle. This was because owing to annual leave commitments and long term sick leave we had reduced numbers of field teams working over the summer. Additional teams were deployed in the last cycle to make up this shortfall.
55. The variance in capture rates across rounds may be due to several contributing factors, including varying badger density, time of year and size of area trapped. The earlier cycles of 2015 provided the greater return in numbers of badgers with over 54% of the total being caught and vaccinated in the first three cycles. For the fourth year higher levels of badger activity were found in the west of the IAA and lower levels in the south.

## **10 Acknowledgements**

56. The Welsh Government is grateful to all landowners/occupiers who granted permission to access their land to hair sample, trap and vaccinate badgers.
57. The IAA Management Team would like to thank colleagues in other departments of the Welsh Government, APHA and Natural Resources Wales for their cooperation and assistance with the delivery of this project.

## **11 References**

Roper T.J. (2010). Badger. London: HarperCollins.

Welsh Government (2012). SF/JG/0333/12: Wales Bovine TB Eradication Programme – Decision on Culling Badgers in the Intensive Action Area, 2012.

## **12 Maps**

The maps are based upon the Ordnance Survey map by the National Assembly for Wales with the permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office, © Crown copyright. All rights reserved. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Licence Number GD272221.