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# Bovine TB Eradication Programme IAA Badger Vaccination Project Year 1 Report



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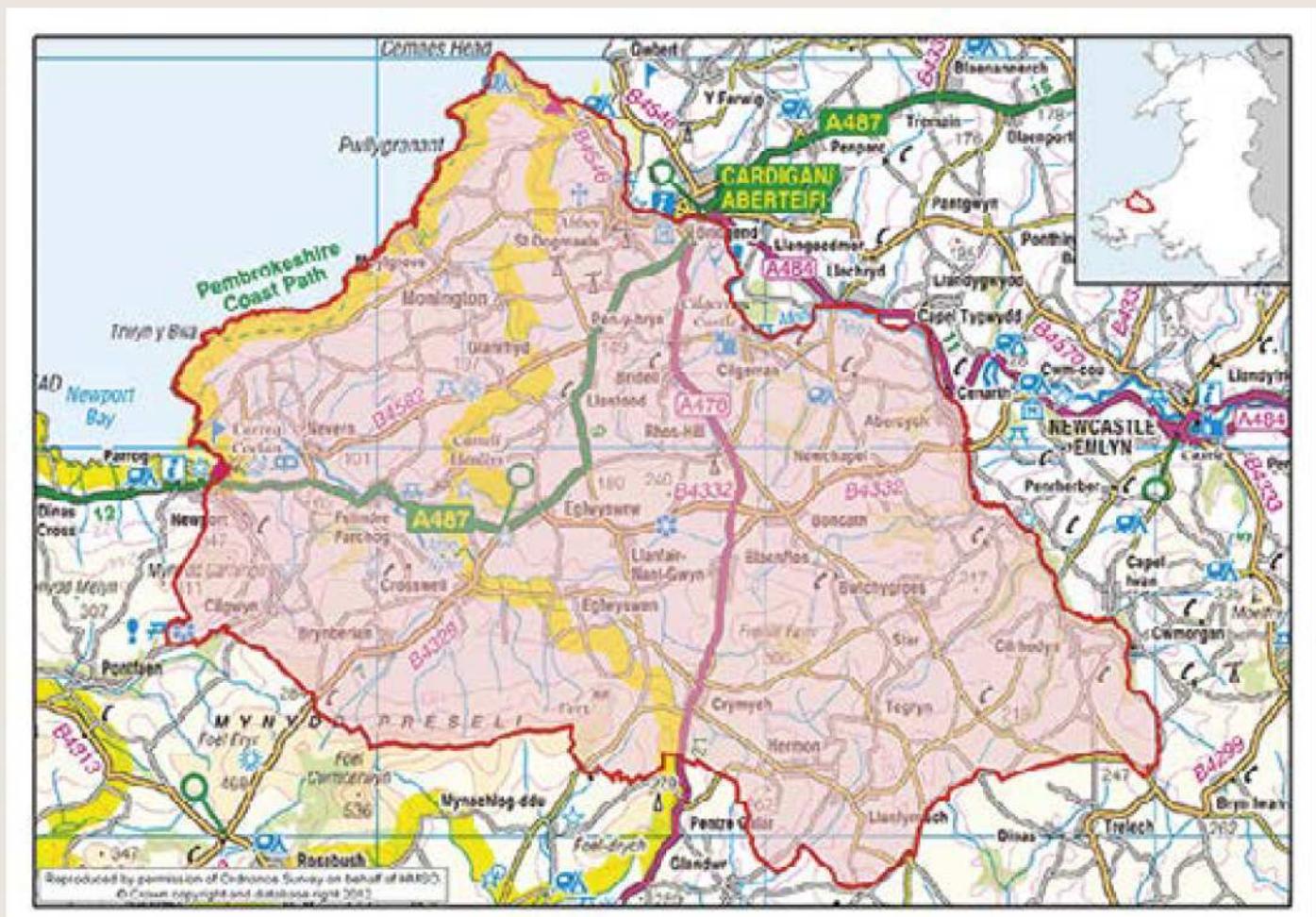
# 1. Executive summary

1. The Minister for Environment and Sustainable Development, John Griffiths, announced in March 2012 that the Welsh Government would undertake a badger vaccination project within the TB Intensive Action Area (IAA) in west Wales as part of the bovine TB Eradication Programme in Wales.
2. The IAA covers approximately 288km<sup>2</sup> and is primarily located in north Pembrokeshire. This is the first time that a project to cage trap and vaccinate badgers on such a large scale has been carried out.
3. Field operations began in May 2012 and the majority of vaccination was completed by the end of October. Some additional vaccination, in some small areas within the IAA, was undertaken during November.
4. Ten teams of two field operatives caught and vaccinated a total of 1,424 badgers. A welfare assessment of every badger was undertaken at the time of capture and none were found to be seriously injured, nor was it necessary to call for veterinary assistance. No badger showed any sign of adverse reaction to the vaccination.
5. All the vaccination work was carried out by employees of the Welsh Government who had successfully completed the Food and Environment Research Agency (Fera) course relating to the cage trapping and vaccination of badgers by injection. The work was achieved without incident or injury to staff during one of the wettest summers on record.
6. Participation in the project is voluntary and the Welsh Government is grateful for the cooperation and assistance shown by farmers and landowners. A total of 472 landowners allowed access onto their land. This amounted to approximately 241km<sup>2</sup> and contained 313 main badger setts.
7. The project cost around £943,000 to deliver, which is in keeping with the original estimates provided in March 2012.

## 2. Introduction

8. On 20 March 2012 the Minister for Environment and Sustainable Development announced that the Welsh Government would embark on a five year badger vaccination project within the bovine TB Intensive Action Area (IAA) as part of efforts to eradicate bovine TB from cattle in Wales. This report provides details of the badger vaccination work undertaken in 2012 and is the first in a series of annual reports that will be produced over the life of the project.
9. 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). Bovine TB is endemic in the area. The total amount of compensation paid to TB breakdown herds within the IAA in the last full year (2011) was £1,747,764 and accounted for 13.7% of the total TB compensation paid for cattle slaughtered across Wales (SF/JG/0333/12: Wales Bovine TB Eradication Programme – Decision on Culling Badgers in the Intensive Action Area, 2012).

**Figure 1: Map of the Intensive Action Area**



10. 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 existing measures:
  - Additional cattle surveillance and controls
  - Enhanced biosecurity measures
  - Additional surveillance and controls for non bovines (goats and camelids)
11. The decision to vaccinate badgers in the IAA was taken by the Minister for Environment and Sustainable Development following consideration of the Report of the Bovine TB Science Review Group (SF/JG/0333/12: Appendix 4).
12. The Science Review reported that "It is logical to assume, based on experimental evidence, that a significant percentage of wild badgers that are vaccinated will become resistant to infection and/or disease". The Group went on to conclude that "In the medium to long term, repeated vaccination is likely to reduce the level of bovine TB infection and disease in the local badger population thus reducing the risk to local cattle from badger-to-cattle transmission".
13. The vaccine used in the IAA, 'BadgerBCG', is an injectable Bacille Calmette-Guérin (BCG) vaccine, which is a live naturally attenuated (weakened) strain of *Mycobacterium bovis*, the bacterium that causes bovine tuberculosis. The vaccine was issued with a Limited Marketing Authorisation (LMA) for use via intramuscular injection for use in badgers from the Veterinary Medicines Directorate (VMD) in March 2010.

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

14. Year 1 of vaccination began in mid May 2012 and concluded in mid November.
15. The purpose of the project is to vaccinate the maximum number of badgers as possible within the IAA each year for five years. This is a field delivery project and while every opportunity will be 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 social groups.
16. The impact and effect that badger vaccination may have on cattle herd breakdowns within the area will be assessed annually by the Animal Health and Veterinary Laboratories Agency (AHVLA). Cattle herd TB incidence levels and other TB disease parameters within the area will be compared with "reference areas" where the disease picture is comparable. Any benefits observed in terms of a reduction in the number of TB breakdowns in cattle herds (or other TB disease parameters) will need to be carefully considered as a combination of disease control measures are in place in the IAA.
17. Other projects such as the Badger Vaccination Deployment Project (BVDP) in Gloucestershire and the National Trust at Killerton Estate in Devon are currently using an injectable vaccine in wild badgers. However, this is the first time that a project to cage trap and vaccinate badgers on such a large scale has been carried out. It is intended that the project will last for five years but this will be subject to review.



## 4. Acting under the direction of a veterinary surgeon

18. The Veterinary Surgery (Vaccination of Badgers Against Tuberculosis) Order 2010 permits people who are not veterinary surgeons (lay vaccinators) to vaccinate badgers by injection against tuberculosis, subject to the following conditions set out in the Order:
  - The person is 18 years old or over
  - The person has successfully completed an approved training course
  - The person holds a valid certificate of competence granted by the course provider
19. 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.
20. 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.
21. The 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 in the event 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.

## 5. Planning and preparation

22. A dedicated IAA Management Team was established, within the Welsh Government's Office of the Chief Veterinary Officer, to manage and deliver the project.
23. Following the Minister's announcement on 20 March 2012, the IAA Management Team put the following arrangements in place to enable vaccination to start during May:
  - Recruitment of a work force
  - Sourcing and arranging training courses, training venues and accommodation
  - Obtaining the necessary licences and consents
  - Sourcing and providing specialised Personal Protective Equipment
  - Sourcing vehicles
  - Planning and scheduling the work
  - Developing a database to capture results
  - Managing communications

### Recruitment of a work force

24. In addition to the existing IAA Management Team, a seasonal work force was recruited to enable delivery of the project. The additional work force comprised 20 field operatives, two field supervisors, two administrative assistants and a database developer responsible for creating and maintaining a project database.

### Training

25. The appointment of the field operatives and field supervisors was confirmed following their successful completion of the approved training course to become accredited and certified as "lay vaccinators". All 20 field operatives and the two field supervisors were fully trained as lay vaccinators.
26. An "approved course" as defined by the Veterinary Surgery (Vaccination of Badgers Against Tuberculosis) Order 2010, is a course relating to the vaccination of badgers by injection, approved by the Secretary of State after consultation with the Royal College of Veterinary Surgeons. At present the only approved course is run by the Food and Environment Research Agency (Fera). The four day, Lantra accredited course consists of both theoretical and practical sessions covering, among other topics, the relevant legislation, cold chain storage for vaccines, badger trapping, badger welfare and administration of vaccine. Successful completion of the course requires passing both a written and practical assessment.
27. The training course to date has been delivered within the Badger Vaccination Deployment Project (BVDP) area in Gloucestershire. However, in collaboration with Fera, the IAA Management Team developed a bespoke three week training package which was delivered in



the IAA. The extended course included additional and extensive instruction on the recognition and identification of badger activity and trap placement. The area trapped and the badgers vaccinated during the training formed the first round of work within the IAA.

28. Other training provided to field operatives and field supervisors included:
  - Emergency First Aid at work
  - Manual handling
  - Introduction to the IAA Badger Vaccination Project Standard Operating Procedures (SOPs)
29. The main role of the field supervisors was to manage the day-to-day activities of the field operatives while ensuring they adhered to the requirements set out in the SOPs.

## Licensing of field staff

30. In addition to the accreditation and certification requirements for vaccinating badgers, licences are required under the Protection of Badgers Act 1992 (to take and mark badgers) and the Wildlife and Countryside Act 1981 (to use cage traps to trap badgers). In Wales, the Welsh Government is the responsible licensing authority and applications are considered by the Land, Nature, Forestry and Marine (LNFM) Division. All Welsh Government employees working in the IAA were appropriately licensed.

## Working in Sites of Special Scientific Interest

31. A number of Sites of Special Scientific Interest (SSSI) were identified within or partially within the IAA. Many SSSIs support wildlife and habitats which are internationally important. Some are subject to additional designations in recognition of their importance as the very best examples of natural heritage sites in Wales, the UK and Europe. Each SSSI is protected by law from damage through development or unsuitable management or activities.
32. Assent by the Countryside Council for Wales (CCW), under section 28H of The Wildlife and Countryside Act 1981 (as amended) was required to carry out badger vaccination operations within SSSIs. In some cases site meetings were required with CCW ahead of vaccination work to identify particularly sensitive areas, agree suitable points of access and discuss other site-specific conditions.

## Equipment and vehicles

33. The Welsh Government already had a depot available and held in stock certain items of equipment such as cage traps, vehicles and trailers. These had been acquired when the Welsh Government was preparing for a cull of badgers. The IAA Management Team secured further storage facilities within the IAA, sourced suppliers and procured all the equipment and services necessary to deliver the project.

34. A range of equipment was required for the digging-in and setting of traps such as spades, string, garden wire, buckets and rucksacks, along with peanuts for bait. Field operatives were provided with Personal Protective Equipment and waterproof clothing and footwear capable of being cleansed and disinfected to comply with biosecurity procedures. Equipment required specifically for vaccination included syringes, needles, safety carrying boxes, safety glasses, face masks and disposable gloves.
35. As BadgerBCG is a live attenuated vaccine it must be stored between 2-8°C to remain viable and must not be frozen. Specialised equipment was purchased to store and transport the vaccine including calibrated laboratory standard fridges, max-min temperature recording thermometers, data loggers and portable fridges.
36. Along with those already available, additional vehicles were leased to enable field operatives and supervisors to transport equipment to setts and trapping locations.



## 6. Scheduling vaccination rounds

37. An area of 242km<sup>2</sup> of the IAA had been covered by a sett survey undertaken in 2010 as part of the preparations for a cull of badgers. Only the landowners where badger activity had been found during the 2010 survey were initially contacted to request access to their land for vaccinating in 2012. Participation in the project by landowners was voluntary and it was crucial that consent was gained from as many landowners as possible to maximise access to setts. Every effort was made to be flexible and provide sufficient notice to landowners to minimise any disturbance or disruption.
38. The results of the sett survey formed a basis for the creation of nine rounds of work. Routinely, a round involved 10 teams working simultaneously, in land adjacent to each other. Each round covered an average total area of 30km<sup>2</sup>. Based on Fera's advice and experience, the work allocated to a team per round comprised three or four main setts and associated subsidiary setts. A number of scheduled rounds were changed or amalgamated once the teams had assessed the level of badger activity on the ground, or where additional land that had not been surveyed in 2010 was added. The area covered by each round varied slightly and in some cases involved land controlled by a number of different landowners.
39. Rounds of work were completed over three or four week cycles. A cycle covered the period of time during which field operatives made initial contact with the landowners/occupiers, surveyed the land to identify badger activity, laid and pre-baited traps and finally set the traps to catch and vaccinate badgers. The duration of cycles varied between three and four weeks depending on the size of the areas to be covered and the level of badger activity found.

## 7. Database and data collection

40. The Welsh Government's Land Nature Forestry and Marine Division's (LNUFM) Geographical Information unit was commissioned to design, create and maintain a multi-user database to collect, store and report on the vaccination project. Built in to the database are several layers of validation to minimise the potential for user input error, as well as many levels of customisation to make data entry as efficient as possible.
41. In addition to the database which stored the textual data, a tailored geodatabase was created to allow the entry of geographical data such as sett and trapping locations. Both the database and geodatabase were customised to mirror the paperwork being used on the ground by field operatives.



## 8. Communications

42. An Industry Advisory Group made up of cattle keepers and veterinary surgeons from the IAA along with farming union representatives was established in 2010. The group participated in the development of the IAA cattle control measures and was kept informed of developments with the vaccination project.
43. A communications plan was also developed which included engagement with landowners, wider stakeholders including tourism and conservation organisations and the general public. To support the communications plan a Question and Answer (Q&A) information leaflet and a short video demonstrating the badger vaccination process was produced. These are available on the Welsh Government website: [www.wales.gov.uk/bovinetb](http://www.wales.gov.uk/bovinetb).
44. Notification letters were sent to all known landowners/occupiers where setts had been found during the 2010 sett survey, along with a landowner consent form and the Q&A information leaflet. As participation in the project is voluntary, landowners were asked to confirm access to their land by signing the consent form. The IAA Management Team contacted landowners by phone to arrange visits by the field operatives and discuss access where written consent had not been obtained.

## 9 Project Methodology

### Field operations

45. In keeping with Fera methodology, field operatives worked in two person teams. Each team met with landowners/occupiers on their round before entering land and beginning trapping operations. This initial meeting provided an opportunity to affirm that consent had been given to access land, check the boundaries of the holding and to discuss the results of the sett survey. To minimise disruption, access points and routes to sett locations were agreed with landowners/occupiers to avoid contact with livestock or areas of arable or forage crops. Other site-specific issues were discussed including any health and safety hazards and specific biosecurity requirements.
46. Field operatives undertook a survey of the land identifying signs of activity such as main and associated setts, latrines and runs used by badgers. This information, along with the 2010 sett survey, provided the basis for deciding trapping locations.
47. Traps were securely positioned either at, or close to, active setts or along runs. Traps were sited to make maximum use of natural cover and to minimise exposure to extreme weather conditions. Attached to all traps were two bilingual waterproof/laminated information labels explaining the purpose of the traps and warning that it was an offence under the Animal Health Act 1981 to tamper with them. Welsh Government contact details were also included should further information be required.
48. Animal grade peanuts were used as bait. Traps were baited for a number of days to encourage badgers to enter the traps before they were set to catch. Cage trap doors were securely fixed open with wire during the pre-baiting period so that badgers could enter and exit freely without being accidentally trapped.
49. Following pre-baiting, traps were set to catch badgers on two consecutive nights; although this was extended for an additional night on some occasions in order to maximise capture opportunities. The traps were checked at first light the following morning with all captured badgers being assessed, vaccinated and released as quickly as possible.
50. Prior to vaccination, field operatives carried out a welfare assessment of each captured badger. Following vaccination, a temporary mark was created by clipping a small area of dark guard hairs on the back of the badger and spraying the lighter area exposed with general-purpose livestock spray. This allowed vaccinated badgers that were re-caught on a subsequent night during the trapping session to be readily identified and released without repeat vaccination.
51. At the end of each trapping round all equipment was removed from the trapping locations, cleansed and disinfected. No traps were moved between premises without prior cleansing and disinfection.



## Vaccine storage

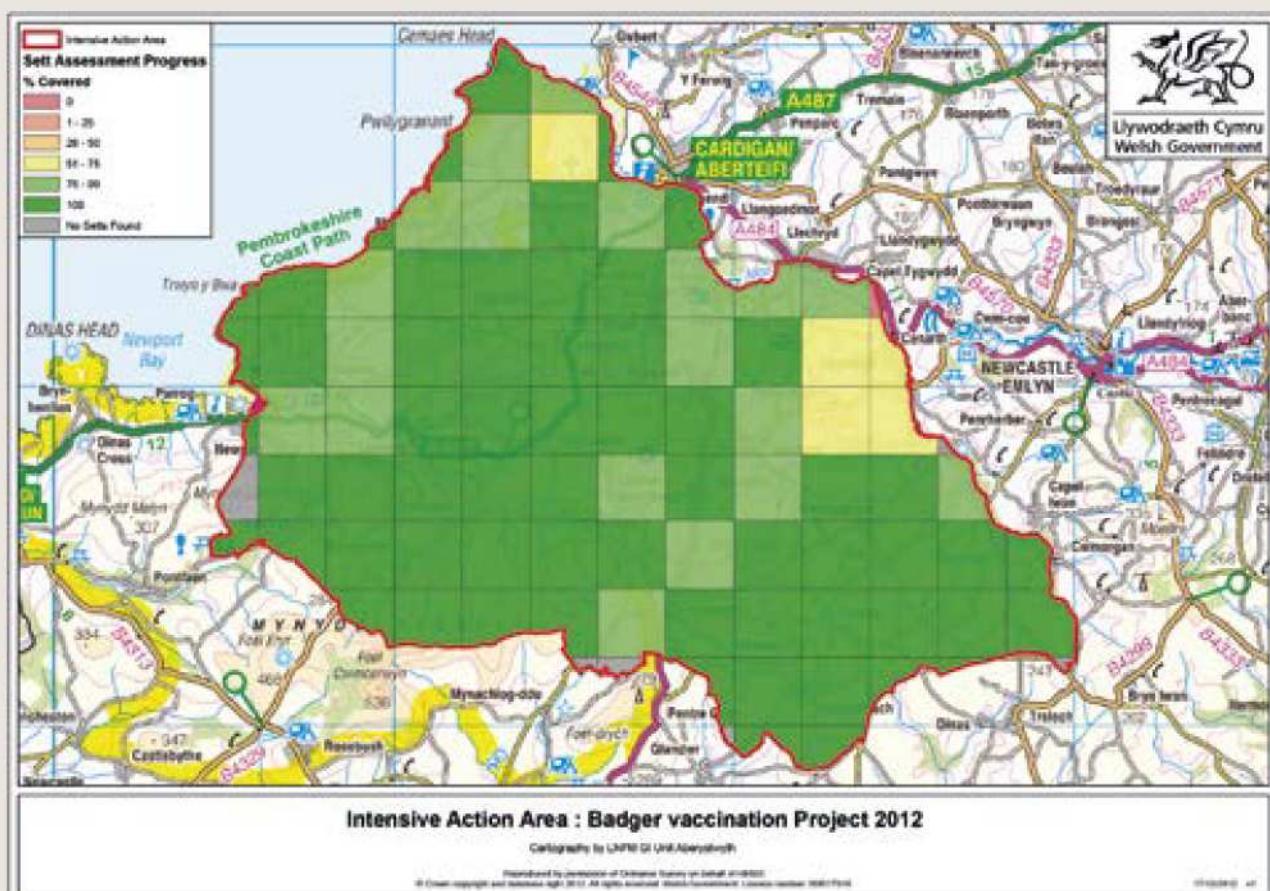
52. BadgerBCG must be stored between 2-8°C to remain viable and it is essential that the cold chain is maintained. Cold chain instructions were included as part of the Fera training course. These instructions were strictly adhered to and accurate temperature monitoring records were maintained at all times.
53. Portable fridges were used for transporting vaccine to the field. Where the correct storage temperature was not maintained in the field, the vaccine was disposed of. This happened on two occasions with the loss of four doses. Regular stock takes and record keeping checks, including audits of cold chain maintenance logs, were made by the Welsh Government prescribing veterinary surgeons.
54. As part of the Welsh Government's authorisation to prescribe and use the vaccine there is a requirement to report any Suspected Adverse Reaction (SAR) in badgers to the Veterinary Medicines Directorate. There were no SARs.

# 10. Results

## Area covered

55. The IAA is approximately 288km<sup>2</sup> and ownership or occupier details have been established for 264km<sup>2</sup>. The difference primarily comprises residential areas, roads and rivers. There are however some, mostly small, areas of land and woodland where it has not been possible to establish ownership. Within the area of known ownership, 242km<sup>2</sup> had been covered by the sett survey undertaken in 2010. The remaining area comprised land where access was not granted by the landowners.
56. A total of 472 landowners allowed access onto their land to trap and vaccinate badgers. This equated to approximately 241km<sup>2</sup>, or 84%, of the IAA and 91% of the area held by known landowners. Fourteen landowners, owning a combined area of approximately 7km<sup>2</sup>, whose land was surveyed in 2010, refused access for trapping and vaccinating. Based on the results of the 2010 sett survey this prevented access to 190 setts. In addition, it was not possible to access a further 22 setts identified in the 2010 sett survey because of difficulties in making contact with the landowners. The Welsh Government will endeavour to gain access to these areas to maximise coverage in 2013.

**Figure 2: Map displaying the percentage coverage of the setts identified in the 2010 sett survey that were re-assessed in 2012**



57. (It should be noted that access to all areas is not always required to trap badgers. Where landowners had not granted access, or where ownership was not known, field operatives were able to set traps remotely along prominent runs radiating out from those areas).
58. Validation of the 2010 sett survey results indicated that 1,190 setts were active; 278 as main setts and 912 as annex or subsidiary setts. A further 35 new main setts and 170 other active setts were also identified.
59. It is difficult to be precise about the population of badgers within the IAA. Recent research combining the results of a number of surveys across the country estimates that social groups typically contain between 4 and 8 adults (Roper, 2010). Therefore, assuming each main sett has an associated social group of 4 to 8 badgers, the 313 main setts (as at paragraph 58), within the 241km<sup>2</sup> surveyed area of the IAA could have an estimated population of between 1,252 and 2,504 adult badgers, with a mid range figure of approximately 1,878.

## Trapping results

60. Field operatives began trapping and vaccinating in May 2012. The majority of the work was completed by the end of October. Some additional work was undertaken in November on areas outstanding from previous rounds. All field work was completed by 20 November 2012. Figure 3 details the trapping results by round of work and cycle.

**Figure 3: Trapping results by round**

Round	Date Range	Cycle Duration	Adults	Cubs	Age Unknown	Total	Proportion of total (%)
1	01/05/12 to 18/05/12	3 wks	116	12	1	129	9.06%
2	21/05/12 to 14/06/12	4 wks	97	46	3	146	10.25%
3	18/06/12 to 12/07/12	4 wks	101	59	0	160	11.24%
4	16/07/12 to 02/08/12	3 wks	119	35	3	157	11.03%
5	06/08/12 to 23/08/12	3 wks	134	16	2	152	10.67%
6	28/08/12 to 13/09/12	3 wks	182	14	1	197	13.83%
7	17/09/12 to 04/10/12	3 wks	214	23	1	238	16.71%
8	08/10/12 to 25/10/12	3 wks	190	8	0	198	13.90%
9	29/10/12 to 20/11/12	4 wks	40	7	0	47	3.30%
<b>Totals</b>	-	-	<b>1193</b>	<b>220</b>	<b>11</b>	<b>1424</b>	-

61. In total, 1,424 badgers were trapped and vaccinated. The first round completed in May was also used to train the field operatives.
62. Nearly 84% of all the badgers vaccinated were adults. The majority of cubs were captured in rounds 2, 3 and 4 where they collectively accounted for nearly 30% of the total number caught in that period. It is not always easy to differentiate between well-grown cubs and adults therefore for a small proportion (<1%) of badgers, the age was recorded as unknown. Predictably, the proportion of cubs captured reduced during the summer as cubs born earlier in the year were classified as adults in later rounds.
63. It is not possible to determine the proportion of the population that was vaccinated with any certainty without knowing the precise population figure. Although a total of 1,424 badgers were vaccinated, in line with Roper (2010) the capture rates represented in Figure 4 below are based solely on the number of adult badgers captured and vaccinated.

**Figure 4: Badger capture rates**

Average no. of adult badgers per main sett (313 setts)	Estimated adult population	Vaccinated adult badgers	Capture rates
4	1252	1193	95.3%
6	1878	1193	63.5%
8	2504	1193	47.6%

64. As a result of the welfare assessment of every badger captured it can be reported that no badgers were found to be seriously injured and on no occasion was it necessary to call for veterinary assistance. There were 13 instances where minor injuries were recorded, nine had slight abrasions/scratches to the face, two had a cut claw, one had an old abrasion on its back and one was reported as being very agitated. All of these individuals were released following vaccination. No badger showed any sign of adverse reaction to the vaccine.
65. Normally, during any trapping operation a number of badgers will be captured more than once, and this was the case in the IAA where 320 individuals were recaptured. The recaptured individuals were identified by the temporary mark applied to all vaccinated badgers. Following a trap-side check to assess their welfare these badgers were released without any further action.

## Impact of weather

66. The ability to trap and vaccinate badgers is heavily dependent on weather conditions. When adverse weather conditions are expected (such as extreme cold, heavy rain or snow), badgers held in cages are potentially at risk from exposure. In these cases trapping may be suspended. The IAA Management Team monitored the weather forecasts closely, especially during the nights and days when the traps were set, and a decision to proceed or not was made on a daily basis.

67. Although the IAA was subject to very wet conditions during the summer of 2012, there were sufficient breaks in the weather to proceed. None of the scheduled trapping rounds had to be postponed or delayed due to inclement weather conditions. Individual teams also took into account local conditions and on two occasions did not set certain traps which were exposed to strong winds.

## Non-target species

68. Experience from other badger trapping exercises indicates that the trapping of some non-target species is inevitable. Field operatives were provided with guidance on how to minimise the number of non-target species trapped and how to deal with any non-target species that were trapped.
69. A total of 51 non-target species were trapped. It is a legal requirement that species listed under Schedule 9 of the Wildlife and Countryside Act 1981 must not be released. The majority of the non-target species caught were grey squirrels; these were humanely killed. All other species, including 6 foxes, a crow and a piglet were released unharmed following a welfare assessment. The piglet was part of a free-range herd that had been allowed to forage in woodland where trapping was taking place. No domestic pets were captured.

## 11. Quality assurance

70. Field operatives' performance was monitored throughout the vaccination project. The two field supervisors were responsible for monitoring five teams each. They closely supervised all aspects of delivery and monitored the field operatives to ensure that the SOPs were strictly adhered to. Special attention was given to the setting of traps, the vaccination process and the welfare of trapped animals.
71. Welsh Government veterinary surgeons also regularly attended field operations to satisfy themselves that the field operatives undertook their duties competently and adhered to the SOPs.
72. As part of the requirements of the certificate of competence, Fera undertook an audit of five vaccination teams on 1 October 2012. The purpose of the audit was to assess whether processes were fit for purpose and to ensure practices were in accordance with the SOPs. Fera reported that those field operatives that were audited appeared highly motivated, competent and committed to ensuring high standards were being met. Fera's audit report included some recommendations for improvements which will be carried forward to future operations.
73. As the licensing authority, the LNFN Division of the Welsh Government carried out three inspections to ensure that 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). LNFN was content that licence conditions were being adhered to in full.

## 12. Expenditure and finance

74. The cost of delivering badger vaccination in the IAA, over five years, was estimated to be in the region of £5,760,000 (SF/JG/0333/12) refers.
75. Costs directly incurred in the preparation, set-up and delivery of the vaccination project in the IAA during 2012 are detailed in Figure 5.

**Figure 5: Expenditure 2012**

Staff costs	£569,061.58
Training & Personal Development	£72,599.44
Annual Accommodation Costs	£40,835.25
Equipment – consumables and PPE	£71,093.14
Vehicle costs	£63,522.87
Badger BCG Vaccine	£25,988.32
Legal costs	£7,488.59
Printing and publishing	£2,670.57
<b>Sub total</b>	<b>£853,259.76</b>
Contribution of existing benefits	£91,868.75
<b>Total</b>	<b>£945,128.51</b>

76. The staff costs, which include pay, travel and subsistence, accounted for the majority of expenditure. Training costs include the Fera training course, accommodation for Fera trainers and cost of the certificates of competence issued by Fera to field operatives upon successful completion of the training course. Equipment costs include consumables, such as the peanuts used as bait, and personal protective equipment, footwear and clothing. Vehicle costs include vehicle hire costs, fuel, maintenance, road tax and insurance.
77. The figure of £853,259.76 does not reflect the full costs of delivering badger vaccination in the IAA in 2012. The Welsh Government already held in stock certain items of equipment such as cage traps, some vehicles and trailers. This equipment, with a value of approximately £180,000 was purchased in advance of the proposed badger cull in 2010. A further £19,000 had also been spent in purchasing capital items such as fridges and power washers. In addition, the vaccination project benefitted from other costs involved in preparing for the badger cull, including a comprehensive sett survey of the IAA. The total value of benefits received from existing equipment and services provided amount to almost £460,000. This figure should be annualised across the five years of the project at £91,869 per year. It is also probable that certain items of the equipment could potentially be used for other projects in the future. The value of these capital items will depreciate by 20% annually over five years.
78. Based on these figures the projected cost of the five year project is in the region of £4,725,000 without adjusting for inflation or any annual uplift.

## 13. Conclusions

79. The Office of the Chief Veterinary Officer considers that the first year of this project was successful in meeting the objective to trap and vaccinate as many badgers as possible within the IAA. The confirmed number of badgers caught and vaccinated is 1424, which was achieved without incident or injury during one of the wettest summers on record. Solid project management and the dedication of the entire team contributed to this outcome.
80. This year's success depended on the co-operation of landowners and occupiers granting access to land to set traps and vaccinate captured badgers.
81. Round 9 which was undertaken in November, covered a smaller area than previous rounds and resulted in proportionally fewer badgers being trapped. The lower trapping rate is likely to be due to the extremely poor weather conditions experienced during November and the fact that badgers become less active during winter months.
82. The variance in capture rates across rounds may be due to several contributing factors, including varying badger density, time of year and size of areas trapped.
83. During 2012, the project delivered badger vaccination in areas that had been surveyed in 2010. It is intended to expand the project where possible into previously un-surveyed areas to further increase coverage in future years. Increasing the duration of a cycle of work and increasing the number of field operatives will also be considered to ensure vaccination can be delivered over a wider area.
84. It is difficult to make inferences based on a single year's data, but as the project progresses there should be increased scope to interrogate the dataset and reach meaningful conclusions.

## 14. Acknowledgements

85. The Welsh Government is grateful to all landowners/occupiers who granted permission to access their land to trap and vaccinate badgers.
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## 15. References

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