

The Wildlife Trusts'

Badger Vaccination Progress Report 2011-13



Executive summary

In 2011, Gloucestershire Wildlife Trust became the first non-governmental organisation to begin deployment of the injectable badger BCG vaccine, to demonstrate the viability of badger vaccination as part of a wider set of measures to tackle bovine Tuberculosis (bTB) in cattle.

Ten Wildlife Trusts are now running badger vaccination programmes on nature reserves and in the wider countryside, in partnership with farmers, vets and other landowners.

A further three Trusts are preparing to embark on badger vaccination programmes, or support existing initiatives, both in England and in Wales.

Through our vaccination programmes, The Wildlife Trusts have demonstrated that vaccination is a practical and cost-effective option, with one vaccination 'trap round' taking approximately two weeks to complete.

Cost of delivery is variable and depends on the size, nature and accessibility of the sites involved. Vaccination across large areas of land or adjoining land units will reduce delivery costs if equipment and resources can be shared, and will also provide greater disease control benefits.

Landowners and farmers in the Edge areas of Cheshire and Derbyshire have demonstrated a demand and willingness to pay for a badger vaccination service. Cheshire Wildlife Trust has estimated that such a service could be provided at a cost of approximately £2,000 per km².

There is a need for a national strategy to enable a coordinated approach to badger vaccination, with firm support and leadership from Government.

Badger vaccination alone is not the solution to bTB but it is an important element of an overarching TB eradication strategy, and should be deployed in conjunction with a comprehensive package of cattle measures.



Tom Marshall

Introduction

The Wildlife Trusts have been working on the issue of bovine TB (bTB) and its links to badgers for many years. We work very closely with the farming community, as well as being significant farmers and landowners in our own right, and we are very conscious of the hardship that bTB causes in the farming community.

However, culling badgers is not the answer. There is a significant body of scientific evidence that culling will not result in a significant long-term reduction in the prevalence of bTB in cattle and could even make the situation worse, due to the perturbation effect. The largest study of bTB in badgers ever undertaken (the Randomised Badger Culling Trial, or RBCT) concluded that ‘badger culling can make no meaningful contribution to cattle TB control in Britain.’

It is vital that we find the right mechanisms to control the disease and the emphasis of all our efforts should be to find an effective, long-term solution.

A coordinated programme of badger vaccination can make a viable contribution to the Government’s TB eradication strategy by reducing the exposure of cattle to badgers potentially infected with bTB. Vaccination reduces the severity of the disease, the shedding of bacteria from infected individual badgers and therefore the disease’s prevalence in badger populations¹. A strategic and sustained vaccination programme is expected to result in ‘herd’ immunity in vaccinated badger populations after five years².

Organisations, including The Wildlife Trusts, are already running badger vaccination programmes, with more than 180 trained and certified lay vaccinators in England and Wales. The Wildlife Trusts currently have 31 trained lay vaccinators. Our work on nature reserves and in partnership with farmers, vets and other landowners has demonstrated that vaccination is a practical, cost-effective option.

However, we recognise the limitations of what we can achieve, even when working strategically with partners. To maximise the effectiveness of badger vaccination, it must be deployed on a larger scale – which will require Government leadership and industry support to develop and deliver a national badger vaccination

strategy - and in conjunction with measures to tackle the disease in cattle.

Evidence indicates that vaccination will make a vital contribution to tackling bTB prevalence in wildlife reservoirs. However, the latest research suggests that the most important route of bTB transmission occurs between cattle³, with only 5.7% (range: 0.9 - 25%) of transmission in ‘High Risk’ areas caused by direct contact with badgers⁴.

It is therefore vital that the main focus of the Government’s strategy to eradicate bTB remains on cattle measures, including:

- Better biosecurity, or disease risk management: all possible measures should be pursued to prevent disease transmission on-farm
- Stricter movement controls: to minimise the risk of spreading disease when cattle are transported
- Improved TB testing: to increase detection of the disease - currently, many infected cattle are missed
- Cattle vaccination: prioritise the development of a cattle vaccine and the necessary changes to EU regulation to permit its commercial deployment

This report outlines our progress with badger vaccination so far, what we’ve learned and what needs to happen next.

1 Chambers et al. (2010) Bacillus Calmette-Guérin vaccination reduces severity and progression of TB in badgers. *Proceedings of the Royal Society B-Biological Sciences* 278: 1913–1920
Lesellier et al. (2011) Protection of Eurasian badgers (*Meles meles*) from tuberculosis after intramuscular vaccination with different doses of BCG. *Vaccine* 29: 3782–3790
Carter et al. (2012) BCG Vaccination Reduces Risk of Tuberculosis Infection in Vaccinated Badgers and Unvaccinated Badger Cubs. *PLoS ONE* 7(12): e49833

2 Animal Health and Veterinary Laboratories Agency (AHVLA)

3 Brooks-Pollock, Roberts & Keeling (2014) A dynamic model of bovine tuberculosis spread and control in Great Britain. *Nature* 511: 228-231

4 Donnelly & Nouvellet (2013) The contribution of badgers to confirmed tuberculosis in cattle in high-incidence areas in England. *PLoS Currents Outbreaks*. 2013 Oct 10. Edition 1

How to vaccinate a badger

A licence under the Protection of Badgers Act is required to permit the trapping of badgers for vaccination, and the vaccine can only be administered by a qualified vet or a trained 'lay vaccinator'.

1. Active badger setts are identified and mapped to determine the best locations to set up cage traps.
2. Cage traps are then carefully positioned ('dug in') in appropriate locations. Each trap is numbered and clearly identified as being part of a badger vaccination programme.
3. Traps are initially locked open, baited with peanuts and left in position for at least a week to familiarise the badgers with the traps - this is known as 'pre-baiting' the traps.
4. Traps are activated the night before vaccination is to take place. To minimise the risk of catching other mammals or large birds, peanuts are placed under a heavy stone. When the stone is moved by a badger trying to access the peanuts, the trap will close.
5. Traps are revisited early the next morning, to make sure that any trapped badgers can be released as soon as possible.
6. A visual assessment is made of the trapped badger to ensure it is fit to be vaccinated.
7. Trapped badgers are then vaccinated. This involves an injection into the badger's rump, which is administered by a fully trained and certified 'lay vaccinator'.
8. Once vaccinated, the badger is recorded and humanely marked by clipping fur and spraying with stock marker. This clearly identifies it as a vaccinated animal to avoid it receiving a further dose if recaptured.
9. After checking for any suspected adverse reaction, the badger is released.
10. Traps are reset and baited with more peanuts in the afternoon, ready for a second round of vaccination the next morning.
11. Traps are revisited at first light and any unmarked badgers are vaccinated, marked, recorded and released. If any marked badgers are re-captured, they are released after a health and welfare assessment.
12. All traps are then removed, cleaned, disinfected and either relocated or returned to store.

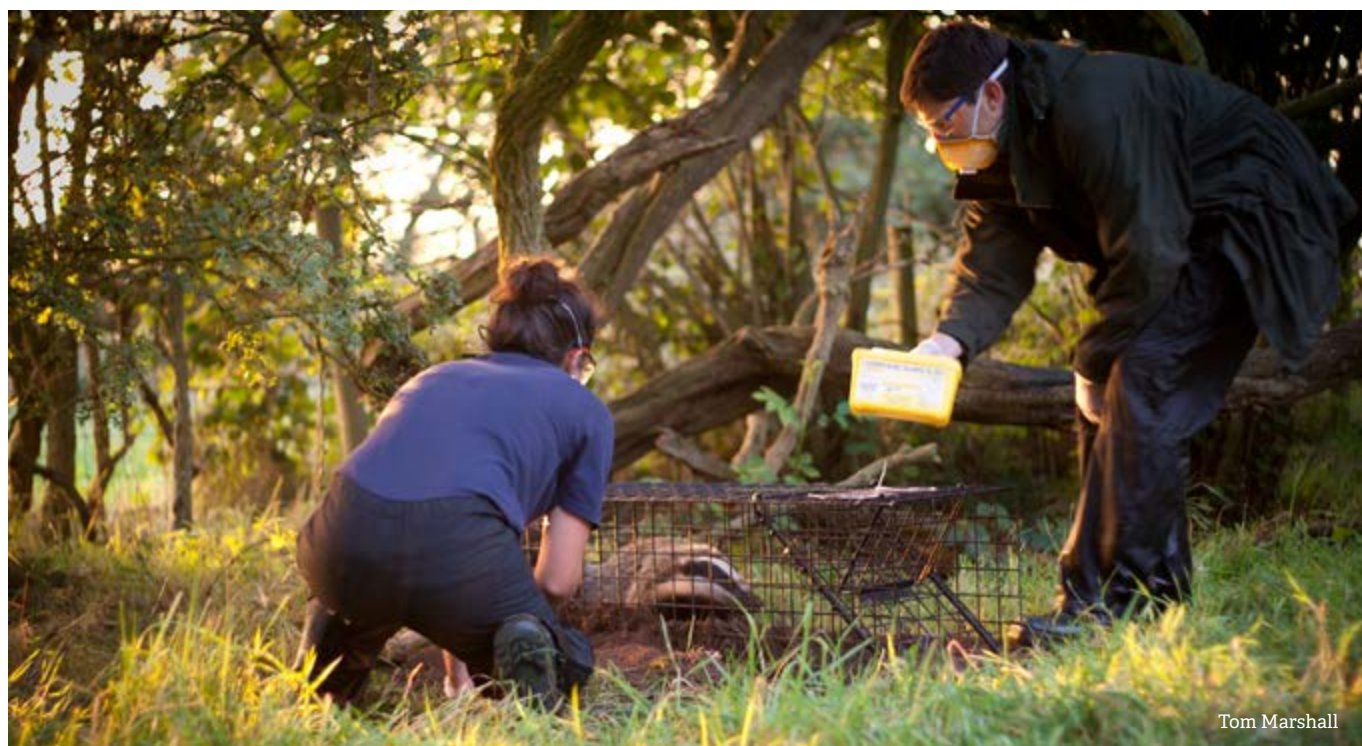
The schedule below demonstrates the typical timescales involved, based on expert opinion and experience in the field. It was developed by the *Animal Health and Veterinary Laboratories Agency (AHVLA - formally FERA)* and is used to advise and train lay vaccinators.

Schedule

Surveying for setts 1km ² ~1 day/2 persons	Week 1
Checking sett activity	
Digging in traps ~5 setts /day/2 persons	
Prebaiting of traps for 7 days	Week 2
Setting traps ~5 setts per day	
Vaccinating badgers ~5 setts/day/2 persons <i>A sett trapped for 2 nights</i>	Week 3
Cleaning and disinfecting	

Resources and schedules are a guide and will vary depending on badger density, terrain, resources and area to be covered

Badger vaccination is repeated annually to build up 'herd immunity' within the local badger population. The aim is to increase the proportion of vaccinated animals within the population and so reduce the incidence of disease. Research has shown that vaccinating more than one third of adult badgers in a social group reduces the risk of infection to unvaccinated cubs by 79%⁵. Based on an average badger lifespan of 3-5 years and an estimated annual population turnover of 30%, the AHVLA has estimated that it would take five years to vaccinate a sufficient proportion of badgers to achieve 'herd immunity' within a social group⁶. For this reason, The Wildlife Trusts' badger vaccination programmes all run for period of five years.⁵



Tom Marshall

⁵ Carter et al. (2012) BCG Vaccination Reduces Risk of Tuberculosis Infection in Vaccinated Badgers and Unvaccinated Badger Cubs. PLoS ONE 7(12): e49833

⁶ AHVLA Badger Vaccination Q&A

⁷ It is worth noting that strategies to cull badgers would also be repeated annually for at least four years.



Vaccination on Wildlife Trust reserves

Eight Trusts are running vaccination programmes on their reserves, in order to:

- Explore the practicalities and cost of deploying the badger BCG vaccine in a range of circumstances;
- Use our demonstration deployments to engage stakeholders such as farmers and landowners;
- Provide recommendations to inform future vaccination programmes;
- Protect their cattle, and those belonging to neighbouring landowners, by reducing the potential risk of disease transmission

High Risk Area

Gloucestershire Wildlife Trust

Started: **2011**
No. vaccination seasons: **3**
No. doses deployed: **121**
No. sites: **7**
Area: **200 ha**
No. vaccinators trained: **4**

“Vaccination offers a sustainable long term solution to tackling the disease in both badgers and cattle. Gloucestershire Wildlife Trust has led the way in mounting small scale badger vaccination programmes on its reserves. I would wholeheartedly support its expansion in the hope that eventually there will be a co-ordinated badger vaccination programme across all affected areas.”

Professor Chris Cheeseman

Gloucestershire Wildlife Trust pioneered The Wildlife Trusts' approach to badger vaccination when it embarked on a five-year programme in June 2011. Now in its fourth year, the programme is focused on two main areas selected using the following criteria:

- evidence of badgers present on site
- grassland on site or immediately adjacent, where cattle are present
- recent presence of bTB in cattle in the surrounding area

The first area is a cluster of six Trust nature reserves in the Stroud Valleys, whose steep banks, dense woodland cover, thick hedgerows and small pastures form ideal badger habitat. The second site is Greystones Farm, a small dairying unit whose rich wildflower meadows are grazed by cattle belonging to local graziers.

The cost per hectare for the Stroud Valley reserves, which ranged in size from 5 to 24 hectares with access by foot, was calculated at £56; whilst the cost for Greystones Farm, which is 66 ha and has good vehicular access, was £41 per hectare. The annualised five-year cost of the programme is approximately £8,656 and the cost per farm holding is £2,856.

The programme will be extended in 2014, in partnership with Stroud District Council and neighbouring farmers and landowners.

The Trust has produced two reports outlining the practicalities of vaccination, costs involved and recommendations to aid vaccination programmes in the future. These are available on the Gloucestershire Wildlife Trust website.

Dorset Wildlife Trust

Started: **2013**
No. vaccination seasons: **1**
No. doses deployed: **11**
No. sites: **1**
Area: **30 ha**
No. vaccinators trained: **4**
Amount raised: **£28,073**
Target: **£45,000**

A five-year programme of badger vaccinations has started on a nature reserve in west Dorset, which is in close proximity to cattle. The area covered will be expanded in 2014.

Programme costs:

Year 1 capital and set-up costs: £6,355
Year 1 implementation costs: £6,801
Years 2-5 total cost: £30,000

Shropshire Wildlife Trust

Started: **2012**
No. vaccination seasons: **2**
No. doses deployed: **8**
No. sites: **1**
Area: **20 ha**
No. vaccinators trained: **1**
Amount raised: **£25,000**

In autumn 2012, Shropshire Wildlife Trust commenced a five-year badger vaccination programme on Meverley Meadows in the north of the county, as part of a cross-border project with Cheshire Wildlife Trust. The reserve is grazed by tenant cattle and is within the 'High Risk' area for bTB in England.

A significant proportion of time has been invested in training local volunteers who support the fieldwork but do not undertake the vaccination. The Trust has also gone a long way to engage other stakeholders, in particular by hosting an annual 'Badgers and bTB' forum to share the latest research with farmers, vets, landowners and local badger groups. The forums have been supported by the NFU, Animal Health Veterinary Laboratories Agency (AHVLA) and The Welsh Assembly Government.

Chester Zoo provided a grant to help set up this project and a successful fundraising appeal will cover the costs of running the programme for five years.

Shropshire Wildlife Trust is working closely with the AHVLA, who are monitoring this work to assess its effectiveness. A local veterinary practise has been raising awareness of badger vaccination amongst the farming community and promoting it as a service to clients.

Year 1 cost: £4,464
Year 2 cost – £1,950
Years 3-5 predicted total cost: £6,000

Staffordshire Wildlife Trust

Started: **2013**
No. vaccination seasons: **1**
No. doses deployed: **21**
No. sites: **2**
Area: **18.5 ha**
No. vaccinators trained: **2**
Amount raised: **£15,700+**
Target: **£25,000**

Staffordshire Wildlife Trust is working on a five-year badger vaccination programme on two of its nature reserves.

The first vaccinations took place in October 2013, with 21 badgers vaccinated across three setts, none of which would have been possible without the support given to our appeal to raise £25,000. Trust volunteers also helped with all aspects of the vaccination programme.

Year 1:
Set-up costs: £3,000
Vaccination costs: £5,200
Volunteer hours: 260+

Edge Area

Leicestershire Wildlife Trust

Started: **2013**
No. vaccination seasons: **1**
No. doses deployed: **23**
No. sites: **4**
Area: **238 ha**

The Trust decided in early 2013 to undertake a small scale vaccination programme at two sites using a combination of volunteers and contractors. The sites were selected for different reasons: Charnwood Lodge was chosen because it includes the farm at which the Trust's cattle (used for conservation grazing) are housed. Towards the end of 2012 a neighbouring farm had a confirmed TB case and this reinforced the decision to vaccinate here. The second location was chosen after consulting AHVLA officers and is a collection of three small reserves at Holwell just north of Melton Mowbray, where there is a high density of badgers in a relatively small area, and a number of confirmed bTB outbreaks in the area.

Both locations had active volunteer groups who were trained to survey the sites and pre-bait the setts. The Trust then employed a certified contractor (Brock Vaccination) for ten days to locate and pre-bait traps, then vaccinate trapped badgers.

The first year cost just over £8,000 and the Trust obtained support from Defra's Badger Vaccine Fund, which covered half of these costs.

Hampshire and Isle of Wight Wildlife Trust

Started: **2013**
No. vaccination seasons: **1**
No. doses deployed: **13**
No. sites: **4**
Area: **211 ha**
No. people trained: **4**
Amount raised: **£45,000**

The Trust employed a licensed contractor (Brock Vaccination) to initiate small-scale vaccination of badgers on four sites in Hampshire, which were identified as the highest risk areas for bTB: Blashford Lakes, Broughton Down, Linwood and Noar Hill.

Four staff members have now been trained as lay vaccinators to allow the vaccination programme to be delivered in-house (and at reduced cost) from 2014 onwards. Detailed surveys have identified 40 setts to be vaccinated across 16 reserves over the next five years.

Year 1 costs: £15,500

Spanning both Edge and High Risk Areas

Berks, Bucks and Oxon Wildlife Trust (BBOWT)

Started: **2012**
No. vaccination seasons: **2**
No. doses deployed: **11**
No. sites: **1**
Area: **249 ha**

In 2012, BBOWT worked with the Oxfordshire Badger Group to commence a five-year vaccination programme at the Trust's Chimney Meadows nature reserve in Oxfordshire. Badger Group volunteers vaccinated six badgers in 2012 and five in 2013, at a cost of £30 per badger.

Four Trust staff will undertake vaccination training in August 2014 and vaccination will then be extended to further BBOWT reserves in Oxfordshire, part of which is considered a High Risk area, and Berkshire, which is an Edge area. The Trust has a part time Mammal Project Officer and a full time Mammal Project Assistant who are responsible for overseeing the badger vaccination programme. BBOWT is also making sure that biosecurity is fully enforced on reserves where cattle are grazed and is restricting cattle movements between reserves in Oxfordshire as a precaution.

Warwickshire Wildlife Trust

Started: **2012**
No. vaccination seasons: **2**
No. doses deployed: **18**
No. sites: **4**
Area: **150 ha**
No. vaccinators trained: **8**
Amount raised: **£15,982**

The first badger vaccinations were undertaken at the Trust's headquarters at Brandon Marsh nature reserve in November 2012. The programme is now in its third year and has extended to a further three sites: Snitterfield Bushes, Goldicote Cutting, and a private land owner in Stretton on Fosse. These sites were chosen for their location within the higher bTB incidence area and within a landscape characterised by livestock farming.

The Trust has benefitted hugely from the efforts of a key volunteer who is a trained lay vaccinator and has been instrumental to the successful delivery of the programme.

Year 1 cost: £8,262
Year 2 cost: £5,404

Vaccination in the wider landscape

Three Wildlife Trusts are currently taking a strategic, large-scale approach to vaccination by providing a service to local farmers and landowners, as well as vaccinating on their own nature reserves. The aim is to:

- Explore the practicalities of deploying a large-scale badger vaccination programme;
- Develop partnerships with local landowners and farmers, and provide a badger vaccination service;
- Contribute to the development of a 'firewall' of vaccinated badgers in the 'Edge Area' to reduce the potential risk of disease transmission.

Cheshire Wildlife Trust, in partnership with Shropshire Wildlife Trust

Started: **2012**
No. vaccination seasons: **2**
No. doses deployed: **86**
No. sites: **6**
Area: **1,000 ha**
No. people trained: **1**
Amount raised: **£20,000**

In October 2012, Cheshire Wildlife Trust began a five-year programme of badger vaccination at Bickley Hall Farm – the Trust's headquarters and conservation-grazing base, home to herds of native-breed Longhorn and Dexter Cattle. Twelve badgers were vaccinated, with an estimated 75% success rate of capture. Funding for initial capital costs of £4,410 was received from Chester Zoo's Conservation and Research Funding Support Grant, and a successful fundraising appeal raised an additional £20,000.

In 2013, the programme was expanded in partnership with Shropshire Wildlife Trust to vaccinate badgers on five privately-owned farms, covering 1,000 ha of land in Cheshire. The farmers were charged a fee to cover labour, consumables and transport, and the total cost of delivery was approximately £9,700. The year one charges were artificially low to encourage 'early adopters' and future charges will be in the region of £2,000 per km².

The Trust has worked with the NFU and AHVLA to identify vaccination focus areas within the 'Edge Area' of Cheshire and has employed a full-time Badger and bTB Officer to co-ordinate and deliver the expanding programme from 2014 onwards.

Cheshire Wildlife Trust sits on the local TB Eradication Board and is also supporting a study to test road killed badgers for bTB in Cheshire, undertaken by a team based at the University of Liverpool's Leahurst veterinary campus. The study hopes to establish presence or absence of the disease, geographic distribution and genotypes which could help to form larger studies and inform TB control measures.

Year 1 costs: £7,036
Year 2 costs: £14,115

Derbyshire Wildlife Trust

Started: **2014**
No. people trained: **2**
Amount raised: **£50,787**

In May 2014, Derbyshire Wildlife Trust embarked on a five-year programme of strategic badger vaccination on its reserves and in partnership with neighbouring landowners, at an estimated annual cost of £10,000.

The Trust will operate two teams, each consisting of a lay vaccinator supported by volunteers: one team in the north of the county (which is within the 'Edge Area') and one in the south (which is considered 'High Risk').

The northern programme will begin with vaccination on Trust reserves close to a number of dairy farms, followed by a farm on land owned by Derbyshire County Council. The Council is working in close partnership with the Trust to secure badger vaccination on Council-owned land and has also provided two depots for storage of vaccination equipment, which will operate as the Trust's vaccination centres in the north and south of the county. The Trust is also working with the NFU to raise awareness of the programme with local farmers and eight farms have confirmed for vaccination so far.

In the south, sett surveys are underway in the Woodside/Shipleigh Country Park area. This work is being supported by local badger groups, who will also assist with placing and baiting traps once vaccination is underway. Volunteers will play a key part in the programme and more than 30 people attended the Trust's first field training day.

Preparing to vaccinate/supportive

Cornwall

Cornwall Wildlife Trust is supporting the vaccination of badgers across 200 km² of the Penwith Peninsula as part of an initiative led by Andrew George MP and Professor Rosie Woodroffe of the Zoological Society of London (ZSL). The project began in November 2013 with a small-scale pilot on four farms, the results of which will inform the large-scale rollout of vaccination in 2014.

Somerset

Somerset Wildlife Trust is working with the Somerset Badger Group to build a robust evidence base of badger populations on Trust nature reserves. Three Trust staff have been trained as lay vaccinators and are regularly monitoring badger setts on reserves located within the buffer zone of the current West Somerset badger cull area. The Trust's position is under constant review and current policy is to vaccinate badgers in active setts within this buffer zone.

The Welsh approach

The Welsh Government announced in March 2012 that it would undertake a five-year badger vaccination project within the 'TB Intensive Action Area' (IAA) in west Wales as part of its TB Eradication Programme, which also includes a package of extra cattle measures in the area. The third year of this project has just begun and reports from the second and first years are available on the Welsh Government website.

The IAA is relatively extensive, covering 288 km² and includes a number of nature reserves belonging to the Wildlife Trust of South and West Wales (WTSWW). As well as working in partnership with Welsh Government in these sites, WTSWW has hosted display information about the project in its Welsh Wildlife Centre visitor centre on its Teifi Marshes nature reserve, again within the IAA. In this way WTSWW hopes to promote the importance of badger vaccination, their support of the vaccination policy in Wales and the progress of the Welsh Government's Eradication Programme to date.

The Welsh Government has also allocated £1.25 million, over five years, to establish the Badger Vaccination Grant. Successful applicants receive up to 50% of the total costs of their vaccination project (in contrast to the Defra fund in England, which only provides 50% of first year costs). This is available to agricultural beneficiaries across Wales, outside the IAA.

WTSWW applied for and received Welsh government funding to vaccinate badgers at a flagship nature reserve in Carmarthenshire, which is in close proximity to rare breed cattle. The full funds have been raised for the five year project, with the Welsh Government grant matched by funds raised through WTSWW's badger appeal and financial support from the players of People's Postcode Lottery. WTSWW will be working in partnership with EcoCon, a badger vaccination specialist, to deliver this work.

Summary of delivery for the period 2011 - 2013

No. vaccinating Trusts*: 9
 Total no. vaccination seasons completed: 17

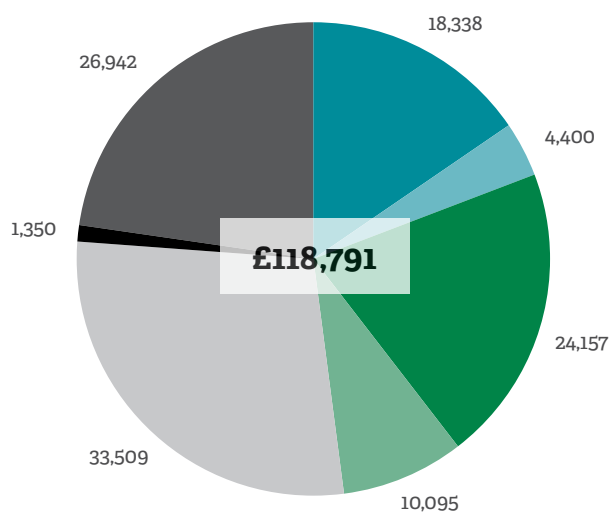
Total area covered: 1899.5 ha (19 km²)
 No. doses of vaccine delivered: 312
 No. lay vaccinators trained: 31

Total expenditure: £118,791
 • Training and certification: £22,738
 • Equipment: £34,252
 • Delivery: £61,801

Cost per dose: £380
 Cost per km²: £6,252

N.B. The average values for cost per dose, and per km², should be used with caution. Cost of delivery is variable and depends on the size, nature and accessibility of the sites involved. First year costs are generally much higher than ongoing costs due to training, certification and capital equipment requirements. Vaccination across large areas of land or adjoining land units will reduce delivery costs if equipment and resources can be shared, and is expected to provide greater disease control benefits within badger populations.

Breakdown of delivery costs 2011-13



- Training and certification – cost
- Training and certification – staff time
- Equipment – capital
- Equipment – consumables inc. vaccine
- Delivery – fieldwork
- Delivery – volunteer coordination
- Delivery – contractors

Lessons learned

Practicalities

Vaccination is a practical tool, with one 'trap round' taking approximately two weeks to complete.

Vaccination across large areas of land or adjoining land units has been shown to be more cost effective than on small isolated sites, providing greater potential benefit for disease control within badger populations and reducing delivery costs if equipment and resources can be shared.

Well trained, local volunteers can reduce the overall costs of a vaccination programme (one Trust halved the staff time required to vaccinate a reserve due to the use of volunteers) but also require a significant investment in time for recruitment, training and ongoing support.

Experience of practical deployment has led to increased engagement in strategic discussions and has been instrumental in gaining some Wildlife Trusts a position on local TB Eradication Boards.

Stakeholders

Farmer advocates are hugely valuable in communicating the practicalities of badger vaccination to fellow farmers.

Engaging landowners in the High Risk Area has been more difficult due to uncertainty about future badger culling.

Engaging all local stakeholders is key to vaccinating over large contiguous areas of ground but has proven difficult in the absence of a Defra strategy for vaccine deployment.

Funding

Wildlife Trust fundraising appeals to support badger vaccination programmes have been successful and well supported by Trust members and the public. However, there is a limit to the amount of funding that can be raised in this way and a more sustainable, long-term business model would be required in order to deploy a coordinated programme of vaccination on a larger scale.

What needs to happen next?

We firmly believe that vaccination offers the most effective, long-term and sustainable approach to bTB in badgers, and there is a strong scientific evidence base supporting this view. We are therefore calling for Government leadership and industry support to coordinate, fund and deliver a national badger vaccination strategy in the 'High Risk' and 'Edge' areas.

However, it is important to recognise that addressing the disease in badgers can at best make a limited contribution to the eradication of bTB in cattle, as the majority of disease transmission occurs between cattle. Badger vaccination therefore represents just one element of an overarching strategy that should focus primarily on cattle measures. This is where the most significant disease-control gains will be made, and where the majority of Government and industry effort should focus.



