

THE TEST AND VACCINATE OR REMOVE (TVR) WILDLIFE INTERVENTION RESEARCH PROJECT

YEAR 4 REPORT – 2017



Department of
**Agriculture, Environment
and Rural Affairs**

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Contents	Page number
Executive summary	3
Abbreviations	4
Introduction	5
Aims and Objectives	6
Planning and preparation	6
Implementation of TVR	7
Data collection	9
Communications	9
Cost	10
Quality assurance	10
Conclusion	11
Acknowledgements	11

Note: On 8 May 2016 the number of government departments in Northern Ireland was reduced from twelve to nine. This report refers to the Northern Ireland Departments as they were named and structured prior to then, including in 2015, and when the Year 2 field activities of the TVR project were concluded on 22 October 2015. In relation to the specific departments that are referred to in this report, the changes are as follows; the relevant functions of the Department of Agriculture and Rural Development (DARD) are now part of the Department of Agriculture, Environment and Rural Affairs (DAERA); environmental functions, including those of the Northern Ireland Environment Agency (NIEA) are also now the responsibility of DAERA; and the functions carried out by the Department of Health, Social Services and Public Safety (DHSSPS) are now discharged by the renamed Department of Health (DoH).

Executive summary

Year 4 fieldwork of the TVR wildlife intervention research project commenced on 19 June 2017 and was completed on 19 October 2017. There were 551 capture events, with 287 unique badgers being trapped.

To facilitate the continuous monitoring of badger movements, further GPS collars were fitted to a range of captured badgers in Year 4 before they were released. The data gained from the GPS collars recovered from captured badgers in the previous 3 years is providing a movement and ranging profile of each badger to establish their normal movement patterns.

The co-operation of farmers and landowners in the TVR area was excellent with approximately 95% of land DAERA requested access to, being available for operations. The TVR Research Project cost £856k to deliver in Year 4, in terms of deployment of personnel, training, procurement and laboratory support.

TVR is a 5-year research project and not a pilot scheme or trial. This means that certain information obtained during the project, such as badger bTB infection levels and locations, will be kept confidential to reduce premature speculation on project outcomes, especially where derived from interim conclusions or incomplete data. This approach is standard practice for research projects. It is anticipated that following the completion of TVR field activities in late 2018, a full analysis of data will be undertaken and it is likely that a final concluding report should be available in late 2019.

Abbreviations

AFBI	Agri-Food and Biosciences Institute
ASPA	Animals (Scientific Procedures) Act 1986
AWERB	Animal Welfare Ethical Review Body
bTB	Bovine Tuberculosis
DAERA	Department of Agriculture, Environment and Rural Affairs
DARD	Department of Agriculture and Rural Development
DHSSPS	Department of Health and Social Services and Public Safety
DoH	Department of Health
DOE	Department of the Environment
DPP	Dual Path Platform
GPS	Global Positioning System
NICS	Northern Ireland Civil Service
NIEA	Northern Ireland Environment Agency
TVR	Test and Vaccinate or Remove
VEU	Veterinary Epidemiology Unit
VSAHG	Veterinary Service Animal Health Group

Introduction

1. The purpose of this report is to provide an overview of Year 4 of the Test and Vaccinate or Remove (TVR) Wildlife Intervention Research Project. The Department's long term aim is to eradicate bovine tuberculosis (bTB) in cattle in NI. However, due to the complexity of bTB it is unlikely that there could be any single solution which could lead to its eradication. A considerable amount of research is ongoing to identify any new measures that might substantially reduce bTB in cattle.
2. The TVR wildlife intervention research project was designed to run for a 5 year period, in order to provide the best possible opportunity to observe a statistically significant reduction in bTB prevalence in the badger population. The badger is a protected species, and any direct intervention on the badger population in Year 4 required the issuing of agreement and appropriate licencing from the Northern Ireland Environment Agency (NIEA).
3. The full TVR approach involves the capture, micro-chipping, sampling, vaccination and release of test negative badgers. All bTB test positive badgers would be removed. However, in Year 1 no badgers were removed as normal badger movement data had to be obtained through the fitting of GPS collars to a selection of badgers. Badger movement data collection was necessary to see if there is evidence of perturbation when bTB test positive badgers are removed during years 2-5 of the project. Perturbation is the substantial disruption to the social organization and behaviour patterns of individuals in a population and it may be accompanied by an increase in the frequency of movements of individuals between social groups and the increased ranging behaviour of individuals. This may lead to increased disease levels in the area through what is commonly known as the perturbation effect.

Aims and Objectives

4. The aim of the TVR project is to describe the effects of implementing a “Test and Vaccinate or Remove” (TVR) intervention on badgers in an area of high badger and cattle density and with high levels of bTB in cattle. TVR is not a policy or pilot but it is a 5-year research project. As much scientific data as possible will be collected to inform disease transmission and economic modelling as well as quantifying costs and field logistics of implementation.
5. Specific objectives and outcomes resulting from the proposed TVR approach are:
 - To provide data that will improve the accuracy of bTB modelling applied to the NI disease situation in cattle and wildlife;
 - To assess the use of the Dual Path Platform VetTB test under field conditions;
 - To provide data on the degree of clustering of infection and how this changes (if at all) over years and also inform the development of potential intervention strategies;
 - To provide information on the logistical issues and costs relating to the large scale implementation of any future wildlife intervention strategy;
 - To provide data on badger populations and movements within an area (in conjunction with genetic profiling) as possible indicators of changed movement and social behaviour in badgers;
 - To create a bank of serum samples from captured badgers for use in other future projects (bTB related or otherwise);
 - To monitor the effect of TVR on badger bTB prevalence in the intervention area over time;
 - To monitor the effect of TVR on cattle herd bTB breakdowns over time; and
 - To develop a critical core of Department experts experienced in badger field work.

Planning and preparation

6. The TVR Research Project is one of the largest bTB initiatives undertaken by the Department. The running of TVR is overseen by the TVR Steering Group, which is made up of a number of senior Departmental representatives from the Veterinary Service and Animal Health Group (VSAHG) and Science Evidence and Innovation Policy Division. The Agri-Food and Biosciences Institute (AFBI)

is providing laboratory testing of the samples, including badger post-mortem and genotyping analysis of the badger population.

7. The Department's Veterinary Epidemiological Unit (VEU) set the design guidelines for the TVR research project and the VEU will carry out most of the data analysis.

Field personnel

8. Field work in 2017 was delivered by VSAHG personnel. A total of 26 field staff, including a Project Manager, field supervisors and support staff, were charged with implementing TVR on the ground.
9. Minimal training was required in Year 4 for regular TVR field staff as they have gained experience in working with badgers from the previous year's fieldwork activities. The project did, however, allow the opportunity to train other VSAHG staff on fieldwork processes and techniques.

Licensing

10. The TVR Research Project operates under the Animals (Scientific Procedures) Act 1986 (as amended), otherwise referred to as 'ASPA'. This is the UK legislation that regulates procedures that are carried out on 'protected animals' for scientific research.
11. The ASPA licences are issued to DAERA by the Department of Health (DoH) in Northern Ireland. Licences were also obtained from the NIEA to allow the capture, sampling, collaring and removal of badgers. All licences are applied for on an annual basis.

Equipment and vehicles

12. Vehicles and trailers purchased in Year 2 (2015) were maintained and utilised by field staff for Year 4. These had been hired during Year 1.

Vaccine and the bTB test

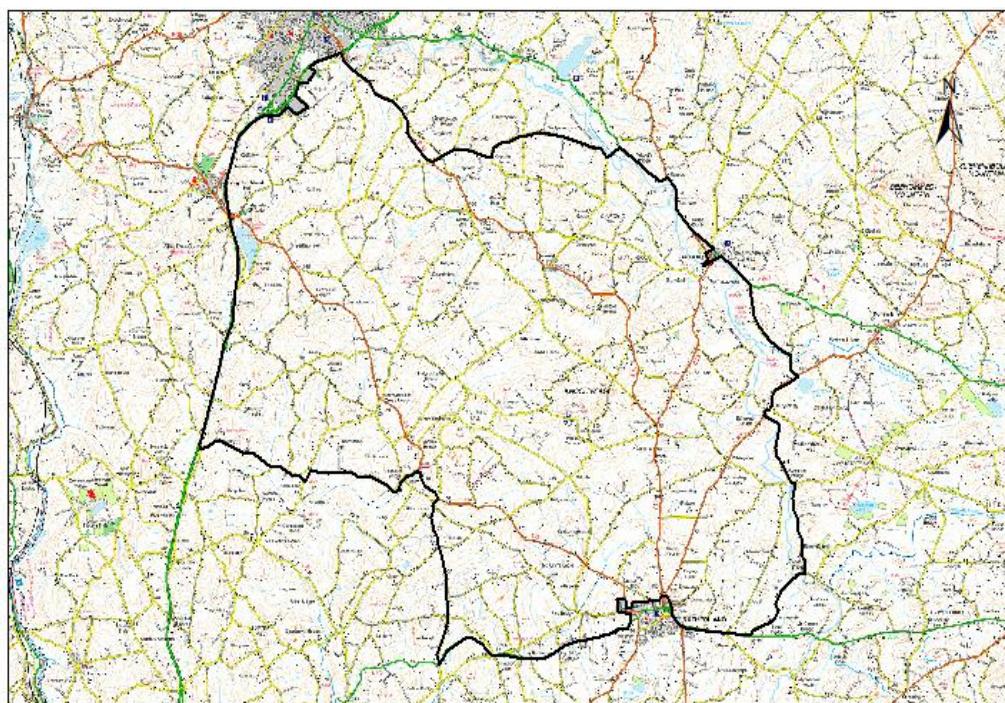
13. The current supplier of Badger BCG, Statens Serum (SSI), has been unable to fulfil any order of the vaccine in since 2016 and have indicated that it would be late 2018 before they are able to supply Badger BCG again. Badger BCG was used in years 1 – 3 of the TVR project.
14. DAERA decided that in order to continue with TVR in year 4, human BCG (Sofia) vaccine would be used for the vaccination element of the project. This vaccination is also used by the Republic of Ireland in their badger vaccination programme.
15. The Dual Path Platform (DPP) VetTB test, commonly known as the DPP test, was used again in Year 4 of the TVR Research Project along with interferon gamma testing and culture of swabs obtained from each captured badger.

Continued use of the DPP test ensures consistency of approach and protects the integrity of any findings to be achieved from the project.

Implementation of TVR

16. Dedicated DAERA, Veterinary Service and Animal Health Group personnel commenced Year 4 TVR, field activities, on 19 June 2017, concluding 19 October 2017. There were 551 capture events, with 287 unique badgers being trapped. Over 50% of badgers were captured on more than one occasion.
17. A three week period was required for each trapping cycle. Week 1 involved making contact with farmers and land owners in the TVR area, to obtain land access permissions; and the digging in of badger trapping cages. Week 2 consisted of pre baiting to encourage the badgers to enter the traps and Week 3 was the badger capture period.
18. Following capture, badgers were anaesthetised by a veterinary surgeon. The physical characteristics of badgers were measured, such as age, sex, weight, body condition, length, external parasite burden, lactating/non-lactating females, presence of testes, tooth wear, abnormalities observed, including assessment of any trapping injuries. Swabbing and blood sampling was carried out on all captured badgers in preparation for diagnostic testing.
19. While the badgers were under anaesthesia, a number of GPS collars were fitted to badgers from different social groups within a sub-area to establish baseline movement data. In Year 3 of the project previously fitted GPS collars were recovered for repair and redeployment.
20. All test negative badgers in Year 4 were vaccinated using the injectable vaccine, BCG Sofia, microchipped for identification and released. Captured badgers were also clip-marked and sprayed, so they could be easily identified and released following recapture on any subsequent nights. Test positive badgers were euthanized and removed for post mortem testing and bovine TB culture. In addition to sampling, field activities also involved the collection of ecological data
21. The ability to trap badgers can be heavily dependent on favourable weather conditions. Year 4 fieldwork was conducted in challenging weather and ground conditions and trapping was suspended on 2 occasions due to adverse weather warnings.
22. Non target captures were limited to 2 cats, 8 birds, 8 foxes, 3 rabbits, 1 pheasant and 1 hedgehog.

Figure 1: Map of TVR area in County Down (Banbridge area)



Data collection

23. Hand held data loggers were used by field personnel to record the geographical and badger related information with real time remote capture of the information to a centralised database.
24. Ranging behaviour of badgers is being collected using Global Positioning System (GPS) collars. GPS collars were placed on badgers within different social groups that were within the same sub-area. The collars were fitted to fully grown adults, both to male and female from each social group, where possible.
25. This information combined with measurements of changes in genetic relatedness within social groups, may provide an indication as to whether the future removal of bTB test positive badgers may cause changes in the range of movement and social behaviour of badgers.

Communications

26. A meeting was held for landowners and farmers during June 2017 in Banbridge. This was to provide information and update interested parties on how Year 3 of the project had gone.

27. Year 4 of TVR, again, generated considerable levels of interest from stakeholders. Given the breadth of interest, authorised field visits were arranged for interested parties, such as - NI Badger Group, DAERA officials and DOH (NI) ASPA inspector. All visits were deemed successful and no issues were raised by any attendees of officials on site.

Cost

28. The cost of the TVR Research Project, based on one intervention area, was originally estimated to be up to £7.5 million for the five years of the project or approximately £1.5 million annually. Costs of the TVR Research Project have been lower than expected, this is mainly due to working pattern efficiency savings achieved by field staff due to experience gained in Years 1 & 2. A breakdown of costs is set out in Table 1 below:

Table 1: Provisional expenditure for Years 1 & 2 of TVR (£ 000's)

Cost Category	Year 1	Year 2	Year 3	Year 4
Staff costs	624	473	389	471
Training	18	2	.5	0
Laboratory	245	292	289	286
Procurement	143	184	131	99
Total	1,030	951	810	856

Quality assurance

29. Day-to-day supervision and management of TVR field personnel was carried out by the project manager and 3 field supervisors. They closely monitored and guided all field aspects of delivery and ensured that Standard Operational Procedures were followed. Each team had an Assigned Veterinary Surgeon to carry out the sedation, sampling, identification, vaccination and euthanasia of the captured badgers.
30. In Northern Ireland, the DoH is responsible for ensuring that all research involving animals, including wildlife, is properly carried out under the requirements set out in the Animals Scientific Procedures Act 1986 (as amended). During TVR field activities, an officer from the DoH carried out an inspection to assess the TVR field activities taking place. A satisfactory report was received. An annual return is completed summarising ASPA related findings to the DoH. Animal Welfare Ethical Review Body (AWERB) meetings are held before commencement and after completion of each season's activities and on an ad hoc basis if an issue requires consideration. These are also a requirement of the ASPA legislation.

31. Prior to the commencement of Year 4 activities, the NIEA granted a licence under Article 18(1) (a) of the Wildlife (NI) Order 1985 (as amended). A report is filed annually with NIEA under the terms of the licenses issued.

Conclusion

32. The Department considers that the fourth year of the TVR Wildlife Intervention Research Project was successfully implemented. Field work was completed on time, to the required standard and under budget. DAERA Veterinary Service and Animal Health Group personnel acquired considerable hands-on experience in working with badgers and in the placing and digging in of cage traps.
33. The confirmed number of unique badgers that were captured, sampled and micro-chipped was 287. The number of repeat captures was 264 and all test negative badgers were released after an identification check and collar removal (if applicable).
34. The uptake by farmers and land owners in the TVR area continues to be excellent with approximately 95% of land being available for field operations.
35. It is anticipated that Year 5 of the TVR Research Project will start in June 2018.
36. It is anticipated that following the completion of TVR field activities in late 2018, a full analysis of data will be undertaken and it is likely that a final concluding report will be available in late 2019.

Acknowledgements

37. The DAERA wishes to thank all farmers and land owners in the TVR area who continue to provide access to their land for this project.
38. The Department also wishes to thank officers from the NIEA, DoH the Police Service of Northern Ireland and the AFBI for their continuing support and advice during the TVR Research Project.