

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

YEAR 2 REPORT - 2015



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

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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 Affairs (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 2 fieldwork of the TVR wildlife intervention research project commenced on 15 June 2015 and was completed on 22 October 2015. There were 692 capture events, with 341 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 2 before they were released. The data gained from the GPS collars recovered from Year 1 captured badgers 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 DARD requested access to, being available for operations. The TVR Research Project cost £950k to deliver in Year 2, in terms of deployment of personnel, training, procurement and laboratory support (a reduction of £80k from Year 1).

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
BCG	Bacillus Calmette-Guérin
bTB	Bovine Tuberculosis
DARD	Department of Agriculture and Rural Development
DHSSPS	Department of Health and Social Services and Public Safety
DOE	Department of the Environment
DPP	Dual Path Platform
GPS	Global Positioning System
NIEA	Northern Ireland Environment Agency
TVR	Test and Vaccinate or Remove
VEU	Veterinary Epidemiology Unit

Introduction

1. The purpose of this report is to provide an overview of Year 2 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 2 required the agreement of the Department of the Environment (DOE), Northern Ireland Environment Agency (NIEA), and issue of the appropriate licences.
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 Animal Health and Welfare Policy Division, the Veterinary Service 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 2015 was delivered by Veterinary Service personnel. A total of 24 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 2 as many of the field staff have gained experience in working with badgers from the previous year's fieldwork activities.

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 were issued to DARD by the Department of Health, Social Services and Public Safety (DHSSPS) in Northern Ireland. Licences were also obtained from the NIEA to allow the capture, sampling, collaring and removal of badgers.

Equipment and vehicles

12. A sizeable procurement exercise took place from April 2015 to acquire vehicles and trailers to assist with TVR activities. These had been hired during Year 1.

Vaccine and the bTB test

13. To maintain viability of the BadgerBCG (Bacillus Calmette-Guérin) vaccine, it was stored in refrigerated conditions at the central depot, and transported in portable refrigerators, to maintain the required cold chain, during field activities.
14. The Dual Path Platform (DPP) VetTB test, commonly known as the DPP test, was used again in Year 2 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.

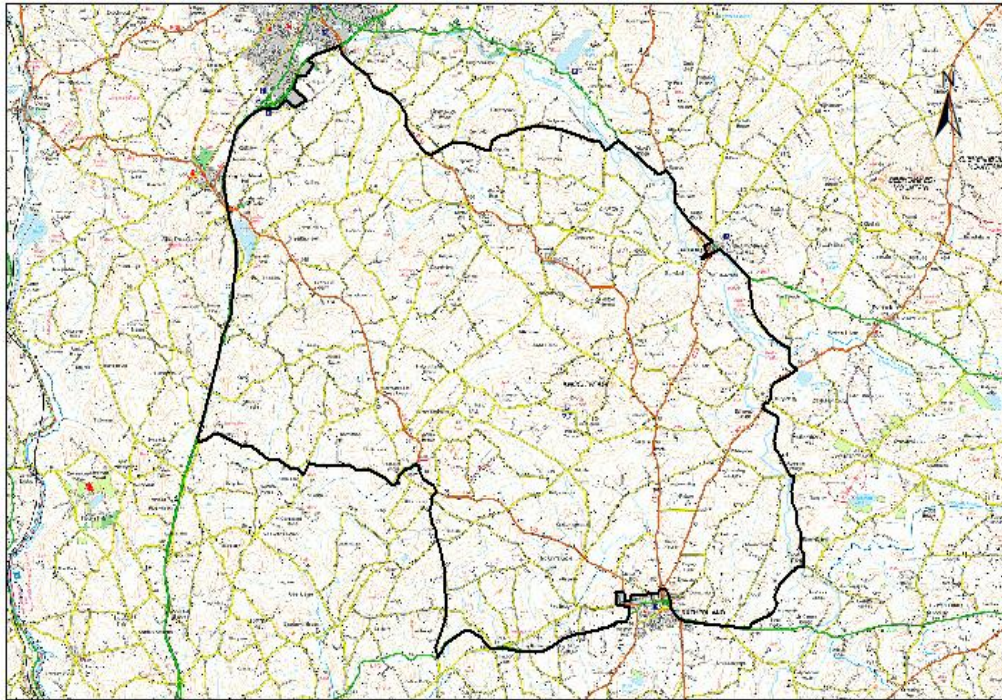
Implementation of TVR

15. Dedicated Veterinary Service personnel commenced Year 2 of the TVR Research Project, field activities, on 15 June 2015 concluding on 22 October

2015. There were 692 capture events, with 341 unique badgers being trapped. Over 50% of badgers were captured on more than one occasion.

16. 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 prebaiting to encourage the badgers to enter the traps and Week 3 was the badger capture period.
17. 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.
18. 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 2 of the project previously fitted GPS collars were recovered for repair and redeployment. All test negative badgers in Year 2 were vaccinated using the licensed injectable vaccine, BadgerBCG, and released. Test positive badgers were euthanased and removed for post mortem testing and bovine TB culture.
19. In addition to sampling, field activities involved the collection of ecological data, administration of a microchip for identification purposes and vaccination of badgers before release. Captured badgers were also clip-marked and sprayed, so they could be easily identified and released following recapture on any subsequent nights.
20. The ability to trap badgers can be heavily dependent on favourable weather conditions. Overall the weather conditions during Year 2 field activities were good, and no trapping nights had to be postponed.
21. Non target captures were limited to 5 birds and 10 foxes.

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



Data collection

22. 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.
23. 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.
24. 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

25. A meeting was held for landowners and farmers during May 2015 in Banbridge. This was to provide information and update interested parties on how Year 1 of the project had gone. During Year 2 of the TVR Research Project considerable interest was shown from local politicians, other Government Departments, the media and environmental and farming stakeholders. Given the breadth of interest, authorised field visits were arranged for interested organisations and

stakeholders, such as - NI Badger Group, DHSSPSNI Inspector, Police Service of Northern Ireland (PSNI), NIEA and Queens University, Belfast (QUB).

Cost

26. 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 to date for the second year of the TVR Research Project have been lower than expected, with a provisional outturn just over £950k. This is mainly due to working pattern efficiency savings achieved by field staff due to experience gained in Year 1. A breakdown of costs is set out in Table 1 below:

Table 1: Provisional expenditure for Years 1 & 2 of TVR

Cost Category	Year 1	Year 2
Staff costs	£624,000	£473,000
Training	£18,000	£2000
Laboratory	£245,000	£292,000
Procurement	£143,000	£184,000
Total	£1,030,000	£951,000

Quality assurance

27. 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.
28. In Northern Ireland, the DHSSPS 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 DHSSPS 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 DHSSPSNI. 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.
29. Prior to the commencement of Year 2 activities, the NIEA provided DARD with a licence, granted under Article 18(1)(a) of the Wildlife (NI) Order 1985 (as

amended), to undertake Year 2 of the TVR Research Project. A report is filed annually with NIEA under the terms of the licenses issued.

Conclusion

30. The Department considers that the second year of the TVR Wildlife Intervention Research Project was successfully implemented. Field work was completed on time, to the required standard and under budget. Department Veterinary Service personnel acquired considerable hands-on experience in working with badgers and in the placing and digging in of cage traps.
31. The confirmed number of unique badgers that were captured, sampled and micro-chipped was 341. The number of repeat captures was 351 and all test negative badgers were released after an identification check and collar removal (if applicable).
32. 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.
33. With only two year's data being collected, it is too early to draw any meaningful conclusions with regards to badger movements and bTB infection levels in badgers. A final concluding report is unlikely to be available until completion of the TVR field activities, in late 2018, and following an analysis of the collated data. Completion of the final report is anticipated for late 2019. It is anticipated that Year 3 of the TVR Research Project will start in June 2016.

Acknowledgements

34. The Department of Agriculture and Rural Development wishes to thank all farmers and land owners in the TVR area who continue to provide access to their land for this project.
35. The Department also wishes to thank officers from the Northern Ireland Environment Agency, Department of Health, Social Services and Public Safety, the Police Service of Northern Ireland and the Agri-Food and Biosciences Institute for their continuing support and advice during the TVR Research Project.