The Test and Vaccinate or Remove (TVR) Wildlife Intervention Research Project

Year 5 Report – 2018

A living, working, active landscape valued by everyone.

Department of
Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

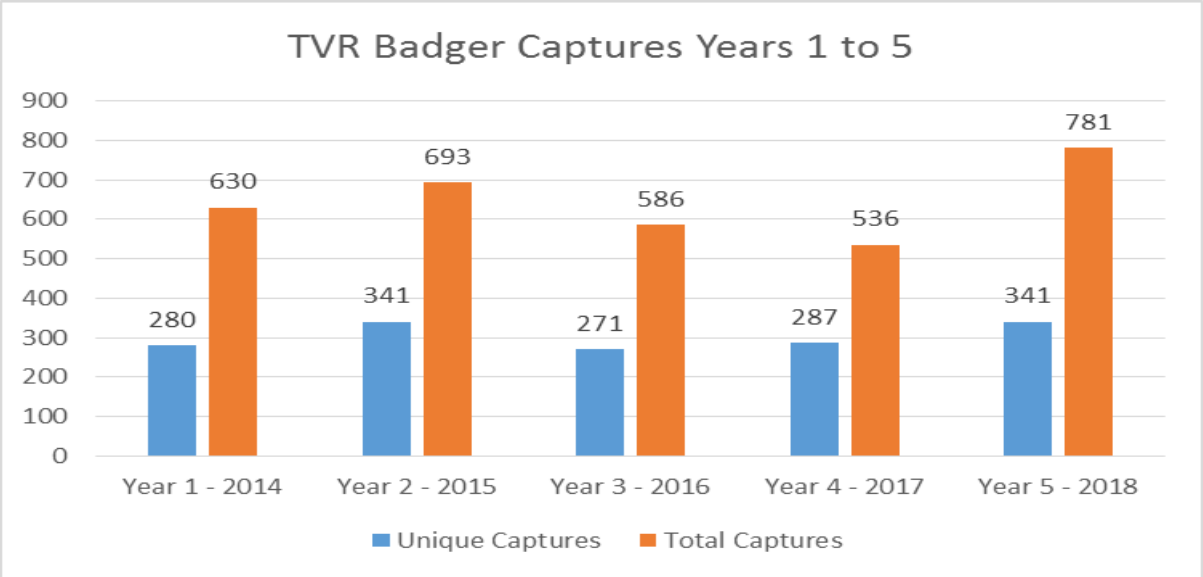
INVESTORS IN PEOPLE

Contents **Page number**

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 5 fieldwork of the test and vaccinate or remove (TVR) wildlife intervention research project commenced on 18 June 2018 and was completed on 18 October 2018. There were 781 capture events, with 341 unique badgers being trapped. This was an increase of 19% in comparison to Year 4 where 287 unique badgers were trapped and sampled (see graph below). This increase may have been partly due to the warm, dry conditions of the early summer period when there was a shortage of natural food sources.



The co-operation of farmers and other landowners in the TVR area was excellent, access to approximately 96% of the land area was granted for the purpose of the project. The TVR Research Project cost £836k to deliver in Year 5, in terms of deployment of personnel, training, consumables/other and laboratory support.

GPS collars were fitted to a subset of captured badgers in year 4 to facilitate the continuous monitoring of badgers movements. However, as this was the final year of field activities, no further GPS collars were deployed and the effort was focused on removal of existing collars from badgers.

During this year, the TVR field activities were visited by: the Ulster Wildlife Trust; Northern Ireland Badger Group; Animal and Plant Health Agency officials, VSAHG policy officials, the Department of Health Animal Scientific Procedures Act Inspector, the TB Eradication Partnership, Queen's University post-graduate students and officials from the Agri-food and Biosciences Institute. All visits were deemed successful and no issues were raised.

TVR was a 5-year research project and not a pilot scheme or deployment trial. This meant that certain information obtained during the project, such as badger bTB infection levels and locations, were kept confidential to reduce premature speculation on project outcomes and so as not to influence project field activities. Such an approach is considered good practice for research projects. As this was the fifth and

final year of TVR field activities, a full analysis will now be undertaken with final reports and outputs of the project published from late 2019 onwards.

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
DVO	Divisional Veterinary Office
GPS	Global Positioning System
NICS	Northern Ireland Civil Service
NIEA	Northern Ireland Environment Agency
TBEP	TB Eradication Partnership
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 the fifth and final year 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 (2014-2018). The badger is a protected species, and interference with badgers for research purposes requires the agreement and issuing of appropriate licences under the Animals (Scientific Procedures) Act 1986 (ASPA) and 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 increased frequency of badger movements between social groups and increased ranging behaviour caused by the removal of badgers hence disrupting their social organization and behaviour patterns of remaining individuals in a population. In theory, this may lead to increased bTB levels in badgers and cattle in the area (referred to 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 was 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 Vet TB test under field conditions;
- 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 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; and
- To develop a critical core of Department experts experienced in badger field work.

Planning and preparation

6. The TVR Research Project was one of the largest bTB initiatives undertaken by the Department. The running of TVR was 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) provided laboratory testing of the samples, including badger post-mortem and genotyping analysis of the badger population.

7. The Department's Veterinary Epidemiology 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 2018 was delivered by VSAHG personnel. A total of 26 field staff from the local Newry Divisional Veterinary Office (DVO) and surrounding DVO's, including a Project Manager, field supervisors and support staff, were charged with implementing TVR on the ground.

Licensing

9. The TVR Research Project operated 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.

10. The ASPA licences are issued to DAERA by the Department of Health (DoH) in Northern Ireland (TVR ASPA project licence number 2767). Licences were also obtained from the NIEA to allow the capture, microchipping, sampling, collaring and removal of badgers. All licences are applied for on an annual basis.

Equipment and vehicles

11. Vehicles and trailers purchased in Year 2 (2015) were maintained and utilised by field staff for Year 5. In Year 1, vehicles were hired.

Vaccine and the bTB test

12. Supplies of Badger BCG vaccine have been unavailable since 2016 and the current supplier, AJ Vaccines, indicated that it would be late 2018 before they would be able to supply Badger BCG again. Badger BCG was used in years 1 – 3 of the TVR project.

13. DAERA decided that, as in Year 4, BCG Sofia vaccine (supplied by Intervax Ltd, which contains the Sofia strain of BCG) would be used for the vaccination element of the project in Year 5. This vaccination is also used by the Republic of Ireland in their badger vaccination programme.

14. The Dual Path Platform (DPP) VetTB test, commonly known as the DPP test, was used throughout the TVR Research Project along with the interferon gamma test and culture of swabs obtained from each captured badger. Continued use of the DPP test helps ensure consistency of approach and protects the integrity of any findings to be achieved from the project.

Implementation of TVR

15. Dedicated DAERA VSAHG personnel commenced Year 5 TVR, field activities, on 18 June 2018, concluding 18 October 2018. There were 781 capture events, with 341 unique badgers being trapped.

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 and cage removal.

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. GPS collars were fitted to a subset of captured badgers in year 4 to facilitate the continuous monitoring of badgers movements. However, during Year 5, the final year of activities, no GPS collars were fitted and captured badgers with previously fitted collars had them removed.

19. All DPP test negative badgers in Year 5 were vaccinated using the injectable vaccine, BCG Sofia, microchipped (if not already identified) 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 bTB culture.

20. Year 5 badger captures increased by 19% in comparison to Year 4. This increase may have been partly due to the warm, dry conditions of the early summer period when there was a shortage of natural food sources leading to greater uptake of bait.

21. Non-target captures were 38 birds, 16 foxes and 13 rabbits. Again there was an increase in capture rates possibly due to a shortage of natural food sources. All non-target captures received a welfare assessment by a Veterinary Officer prior to release.

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 within a social group, where this was 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 ranging behaviour of badgers.

Communications

25. A letter was issued, in June 2018, to landowners and farmers advising them that fieldwork was to recommence on the TVR Research Project in the Banbridge area.

26. Year 5 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 – Ulster Wildlife Trust; Northern Ireland Badger Group; Animal and Plant Health Agency officials, DAERA officials, the Department of Health Animal Scientific Procedures Act Inspector, the TB Eradication Partnership, Queen's University post-graduate students and officials from the Agri-food and Biosciences Institute. All visits were deemed successful.

Cost

27. The cost of the TVR Research Project, based on one intervention area, was originally budgeted to cost no more than £7.5 million for the five years of the project or approximately £1.5 million annually. Costs of the TVR Research Project have been substantially lower than expected, this is mainly due to working pattern efficiency savings achieved by field staff due to experience gained in Years 1 & 2 and also through the use of a real time remote data collection system. A breakdown of costs is set out in Table 1 below:

Table 1: Provisional expenditure for Years 1 - 5 of TVR (£ 000's)

Cost Category	Year 1	Year 2	Year 3	Year 4	Year 5
Staff costs	624	473	389	471	470
Training	18	2	.5	0	0
Laboratory	245	292	289	286	324
Consumables/ Other	143	184	131	99	42
Total	**1,030**	**951**	**810**	**856**	**836**

Quality assurance

28. Day-to-day supervision and management of TVR field personnel was carried out by the field project manager and 3 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.

29. 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 were 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.

30. Prior to the commencement of Year 5 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

31. The Department considers that the fifth and final 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 VSAHG personnel acquired considerable hands-on experience in working with badgers and cage traps as well as carrying out field badger survey work.

32. The confirmed number of unique badgers that were captured and sampled was 341. The number of repeat captures was 440. All DPP test negative badgers were released. All recaptured badgers were released after an identification check and welfare assessment by a Veterinary Officer. GPS collars were removed (if present).

33. The co-operation of farmers and other landowners in the TVR area was excellent, access to approximately 96% of the land area was granted for the purpose of the project.

34. The fieldwork elements for fifth and final year of the TVR Research Project were completed on 18 October 2018. A full picture of test positive badger removal will be provided following analysis of all the relevant samples, data validation and interrogation, with reporting of the findings being published from late 2019 onwards.

Acknowledgements

35. DAERA wishes to thank all farmers and land owners in the TVR area who continued to provide access to their land for this project.

36. The Forest Service expertise into the development and management of the real time, remote data capture system used throughout the TVR research project is especially acknowledged as it was a significant contributor to the project's successful completion of the field work activities.

37. The Department also wishes to thank officers from the NIEA, DoH, the Police Service of Northern Ireland and AFBI for their support and advice during the TVR Research Project.

The Test and Vaccinate or Remove (TVR) Wildlife Intervention Research Project

Year 5 Report – 2018

Contact details:
TBBR.Policybranch@daera-ni.gov.uk

ISBN: 978-1-83887-039-3

A living, working, active landscape valued by everyone.

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

INVESTORS IN PEOPLE

DMS: 19.20.112