TB and Wildlife Research and Studies – Projects Currently Underway	Estimated Project length
TB Biosecurity Study The key aim of the TB Biosecurity Study is to compare farm characteristics in herds that have recently had a TB breakdown and those that have had no recent history of a breakdown in a TB high incidence area in County Down. Consideration of selected cattle and wildlife factors are key elements of the research. The fieldwork element of the Study completed in July 2011. A survey of on-farm buildings and a farm boundary survey were carried out and some badger sett survey work was also undertaken on and around participating farms. Collation and analysis of the data gathered is underway. The Study findings should add to our knowledge of TB risk factors. The Study should also contribute to the development of best practice and biosecurity advice that can be rolled out to all herdkeepers to help reduce the level of bovine TB here. It is expected that the findings will be available later in 2012.	**2 years** (Survey took place 2010/11)
Gamma Interferon (IFN-g) Project The key aim of the gamma interferon project is to undertake an evaluation of the IFN-g test as currently implemented in Northern Ireland in order to quantify the usefulness of the test to detect additional bTB infected animals. This will include an evaluation of factors that influence test results. The criteria for defining an animal as positive using the IFN-g test will be re-assessed to identify if this could be further optimised and the implications of doing so in terms of test performance. An assessment will also be made on how other factors influence the IFN-g test. The overall outcomes of the project will be recommendations on the optimisation and best use of the IFN-g test to aid control and eradication of bTB in Northern Ireland.	**3 years** (Project started 2011)
Badger-Cattle Proximity Study The principal objective of the Badger-Cattle Proximity Study is to examine and describe the extent of badger-cattle and cattle-cattle interactions, through the use of proximity loggers and GPS devices, at pasture and within cattle houses in the Downpatrick / Lecale area of County Down. The Study should also examine and develop strategies to mitigate the extent of badger-cattle contact in both a housed and a grazing environment. The Study will provide information on the extent of interactions within and between badger and cattle populations and the ecology of badgers at farm and local level in an intensively farmed area that has a high incidence of TB and relatively high badger density. This may add to the current TB eradication strategy in the region.	**3 years** (Study started 2011)

Badger Road Traffic Accident Survey Badgers are a protected species in Northern Ireland and culling for TB control purposes is not permitted. *Ad hoc* surveys, using badgers killed by cars, have been undertaken in the past but a province-wide survey has been ongoing since the mid 1990's. An interim report has been published which noted the following: • The prevalence of *M. bovis* in badgers was 17%. • TB infection is geographically widespread in badgers with no evidence of clustering and no apparent association, *at regional level*, with the distribution of infection in cattle. • Herds immediately adjacent to infected badger carcases did not have a higher risk of infection compared to those adjacent to TB-negative animals. However, a higher proportion of herds within 3km of a positive carcase had TB compared to those within 3 km of a negative carcase and the difference was statistically significant. The provisional conclusions arising from the survey was that there did appear to be a link between the distribution of infection in both species, although this did not indicate causality, i.e. direction of spread. Two RTA papers have been published so far: (1) Survey for Mycobacterium bovis in Road-Traffic-Accident Badgers in Northern Ireland - presented at ISVEE in 2003, and (2) Mycobacterium bovis surveillance in European badgers (Meles meles) killed by vehicles in Northern Ireland: an epidemiological evaluation. - presented at the 2011 International Conference on Animal Health Surveillance (ICAHS), Anses France, 17 - 20 May 2011	**On-going**

TB and Wildlife Research and Studies – Projects Recently Completed	Estimated Project length
Literature Review on cattle-cattle transmission, risk factors and susceptibility: The key objective of the Literature Review is a comprehensive review of transmission, within and between herds, of bovine TB with particular reference to cattle to cattle spread (a) in cattle housing, (b) at pasture, and (c) any other significant circumstance or location such as during transport or at markets. This review should also seek from published work or work nearing completion to identify, summarise and rank those factors that influence susceptibility to bovine TB. The review should similarly seek to identify, summarise and rank those practical management actions that could best mitigate the risk of transmission in housing and at pasture and identify any other factors likely to commend further beneficial study. http://www.dardni.gov.uk/afbi-literature-review-tb-review-cattle-to-cattle-transmission.pdf	**1 year** (Posted on the DARD website January 2012)
Literature Review on badger-cattle transmission The key objective of the Literature Review is a comprehensive review of transmission of bovine TB with particular reference to badger to cattle spread (a) in cattle housing, and (b) at pasture. This review should also seek from published work or work nearing completion to identify, summarise and rank those badger/cattle interfaces most likely to lead to bovine TB transmission. The review should similarly seek to identify, summarise and rank those practical management actions that could best mitigate the risk of transmission in housing and at pasture and identify any other factors likely to commend further beneficial study. http://www.dardni.gov.uk/afbi-literature-review-tb-review-badger-to-cattle-transmission.pdf	**1 year** (Posted on the DARD website January 2012)
Literature Review on cattle bTB tests and effective deployment: The key objective of the Literature Review is a comprehensive review of the published work or work nearing completion to inform an understanding of which tests for use in cattle provide the greatest sensitivity and specificity, and in which circumstances, and how this can be applied in order to improve TB control in Northern Ireland per se and, also, to best inform the most practical and cost-effective deployment of test resources in what may become a more constrained economic environment. http://www.dardni.gov.uk/afbi-literature-review-tb-review-diagnostic-tests-cattle.pdf	**1 year** (Posted on the DARD website January 2012)

TB and Wildlife Research and Studies – Projects Recently Completed	Project length
Literature Review on bTB tests in badgers The key objective of the Literature Review is a comprehensive review of the published work or work nearing completion on what tests could be conducted on blood or other samples collected from (a) live badgers trapped and released, (b) live badgers trapped, anesthetised and released, and (c) badgers trapped, euthanized and post-mortemed, to provide a better understanding of bovine TB infection in the local badger population, the efficacy of specific tests or combinations of tests, the practicality of a test and release (test -ve)/cull (test +ve) approach, and to provide a comparative assessment of the likely results of such testing between a lethal and non lethal intervention. http://www.dardni.gov.uk/afbi-literature-review-tb-review-diagnostic-tests-badgers.pdf	**1 year** (Posted on the DARD website January 2012)
Literature Review on the BCG vaccination against tuberculosis in European badgers The key objective of the Literature Review is a comprehensive review of the published work or work nearing completion on the potential efficacy of injectable and oral badger vaccine; on the current understanding how best to administer vaccine (means, frequency, dosage, etc) to achieve the most beneficial cattle TB outcomes and with reference to cost effectiveness. The review should seek to establish whether there are any aspects likely to commend further study or have particular applicability to NI conditions. http://www.sciencedirect.com/science/article/pii/S0147957112000100	**1 year** (Completed and published February 2012 on-line in Compartive Immunology Microbiology and Infectious Diseases Journal)

TB and Wildlife Research and Studies – Projects Completed

Badger Population

To date, two country-wide surveys have been completed to allow a fuller understanding of the number and distribution of the undisturbed badger population in NI.

The first survey was in 1994. The badger population in Northern Ireland was estimated in 1994 at 38,000 with a mean sett density of 3.51/km^2. It was found that a high preponderance of setts occurs in hedgerows and it was postulated that this increases the proximity of badgers to cattle, and therefore, the potential for inter-species transmission[1].

The second survey was in 2007/2008. The badger population in NI during 2007/2008 is estimated at 33,500 animals in 7,500 social groups giving a mean estimated density of such groups as 0.56 per square kilometre. It was observed that there was a positive association between areas of improved grassland and arable agriculture, and cover. Density was correlated with land class, the highest densities found in drumlin farmland areas and marginal uplands. Due to the prevalence of favourable landscape features, Counties Down and Armagh had the highest density of badger social groups.

http://www.dardni.gov.uk/badger-survey-of-ni-2007-08.pdf

Deer Surveys

There are 3 species of wild or feral deer in Northern Ireland: *Dama dama* (fallow deer), *Cervus nippon* (sika deer) and *Cervus elaphus* (red deer). A proportion of the red deer are enclosed. A survey carried out in 1995, in which deer of the three species were sampled, demonstrated a prevalence of 5.8% (397 deer sampled).

A small surveillance exercise carried out in 2009, in which fallow and sika deer were sampled, revealed a prevalence of 2% (146 deer sampled). The low number of deer (less than 3,500 estimated), their restricted range, limited contact with cattle, and the enteric nature of the infection, suggests that their role in the epidemiology of bovine TB is likely to be limited if not entirely insignificant.

http://www.dardni.gov.uk/wild_deer_tb_surveillance_2008_2009

[1] Feore S.M. (1994) The distribution and abundance of the Badger *Meles meles* in Northern Ireland. PhD thesis. Queens University of Belfast.

TB and Wildlife Research and Studies being considered for 2012/13	Estimated Project length
Literature Review on the role of slurry in spreading TB The key objective of the Literature Review is a comprehensive review of the published work or work nearing completion on the role of slurry in spreading TB and whether it should be treated or disinfected prior to spreading.	**1 year**
Analysis of Molecular Strain Typing Data The key objectives of this project are to analyse existing data, including geographical clustering of strains, associations between cattle and badger isolates, effect of cattle movement, extent of latent infection, genetic factors, etc. to determine how this tool can be best applied practically in the Northern Ireland TB eradication programme and to provide a better understanding of bovine TB transmission in Northern Ireland.	**1 year**
Risk factors associated with multiple reactor and chronic herds The key objective of this project is to investigate the risk factors for herds with persistent and/or chronic infection in order to further reduce disease in those herds.	**3 years**