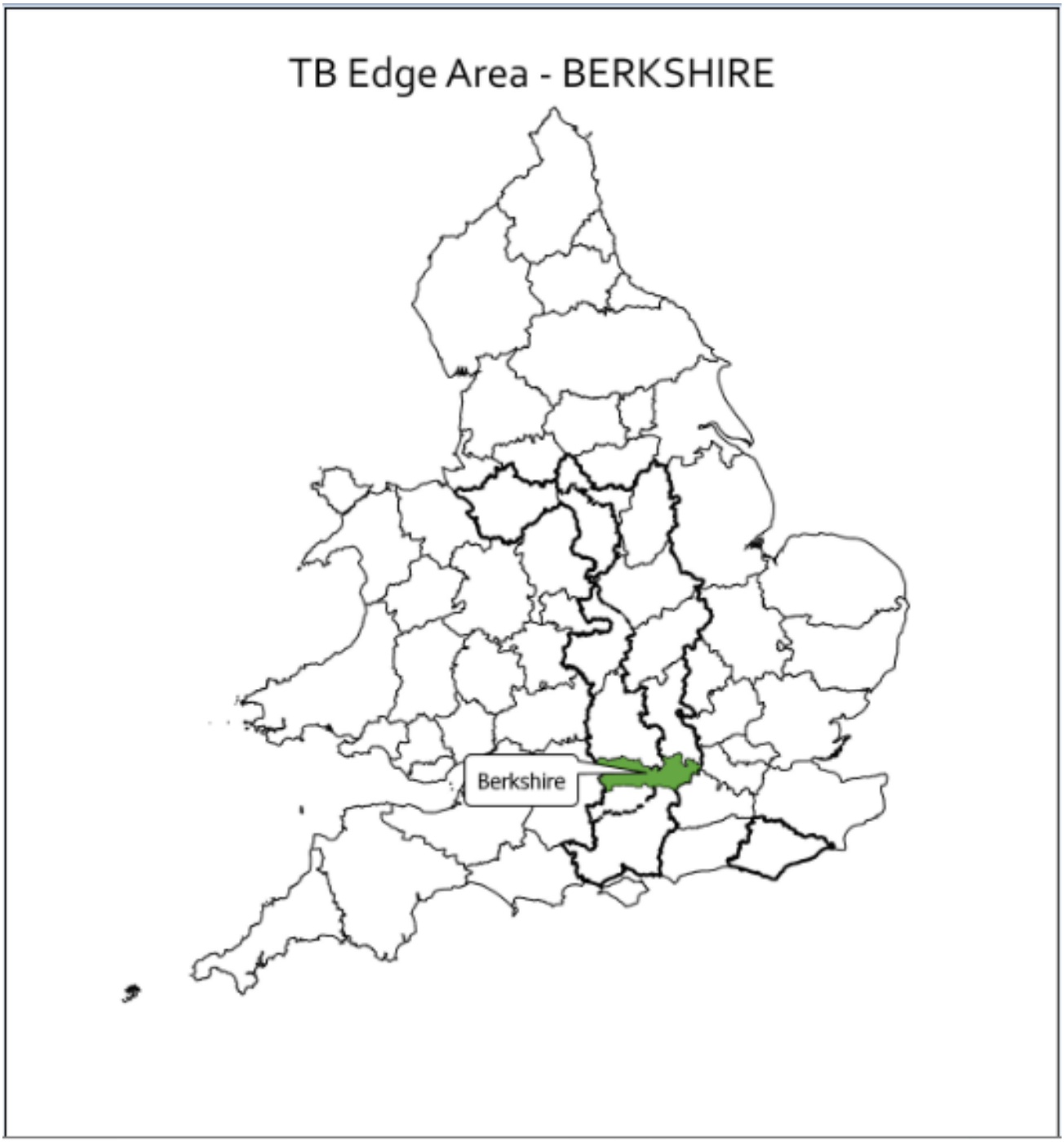
Animal & Plant Health Agency

Year End Descriptive Epidemiology Report: Bovine TB Epidemic in the England Edge Area

Delivery Area: Southern

Name of County: Berkshire

Year-end report for: 2018



Contents

Executive Summary

1. The Edge Area has a low but recently rising incidence of infected herds. **Berkshire** is part of the Edge Area that was established in 2013 as part of the Government's strategy to achieve Officially Bovine Tuberculosis Free (OTF) status for England by 2038. The whole county has been part of the Edge Area since it was established in 2013. This end of year report describes the bovine tuberculosis (TB) epidemic in Berkshire in 2018.
2. **Local cattle industry.** The number of cattle herds in Berkshire has continued to fall.
3. **New breakdowns of bovine TB.** There has been an increase in the overall number of breakdowns in 2018 in Berkshire (39) compared to 2017 (25) but the proportion of those which were Officially Bovine Tuberculosis Free Status Withdrawn (OTFW) has diminished.
4. **Risk pathways for bovine TB infection.** Movement of infected cattle and local infected badgers were the two key sources accounting for over half of the weighted source attribution for all breakdowns in Berkshire in 2018.
5. **Role of other species.** Badgers, and to a lesser extent wild deer, continue to have a role in maintaining endemicity in Berkshire.
6. **Disclosing tests.** Half of the breakdowns in Berkshire in 2018 were disclosed at a whole herd surveillance test (WHT).
7. **Impact of bovine TB, reactor numbers.** Reactor numbers fell to 308 in 2018 from 479 in 2017. There were approximately equal numbers of skin test (152) and interferon gamma test (156) reactors. An additional 54 cattle were slaughtered as direct contacts (DCs) in 2018 compared to 15 in 2017.
8. **Risks to the Low Risk Area (LRA).** There are currently minimal risks to the LRA from infection in Berkshire.
9. **Risks from the High Risk Area (HRA) and/or other adjacent Edge Area counties.** Risks to Berkshire continue to be through purchase of stock especially from markets in the HRA and wildlife infection along the county boundaries.
10. **Forward look.** Achieving OTF status for Berkshire does not look imminent.

Introduction

A key action in the implementation of the Government's objective to achieve Officially Bovine Tuberculosis Free (OTF) status for England by 2038 was to recognise the different levels of TB in different parts of the country and to vary the approach to control accordingly. To this end three management regions or zones were established in 2013. Overall, the Edge Area has a low but recently rising incidence of infected farms and control efforts are seeking to slow down and reverse geographic spread, and reduce the incidence rate, with the aim of obtaining OTF status for this area as soon as possible. This report describes the epidemiology of bovine TB in Berkshire which forms part of the Edge Area (see Appendix 1).

Changes to the Edge Area in 2018

On 1st January 2018 the Edge Area boundary was expanded westwards to absorb the former HRA parts of the five previously split counties of Cheshire, Derbyshire, Warwickshire, Oxfordshire and East Sussex fully into the Edge Area. The reports for those five counties will focus on incidents of bovine TB in the whole county, but noting key differences between the old and new parts where relevant.

On 1st January 2018 annual herd surveillance testing was replaced by six-monthly herd surveillance testing in west Berkshire. Herds in the rest of the county remained on annual surveillance testing supplemented by targeted testing of herds located within a 3km radius of OTFW incidents.

Cattle industry in Berkshire

The highest herd density is in the south and west of the county along the borders with Hampshire and Wiltshire. Berkshire is one of the smallest Edge Area counties in size and cattle population. The number of cattle herds has continued to fall from 206 in 2017 to 197 in 2018, with the majority of cattle holdings being small with 1-50 cattle (55%) and 51-100 (20%) (Figure 1). More than 60% of cattle in the county are beef breeds (Figure 2). Husbandry and feeding practices within Berkshire are very diverse and specific to the size and type of unit. The majority of herds are winter housed (approximately October to April) and summer grazing on rented land is not uncommon. Berkshire does not have any markets or abattoirs.

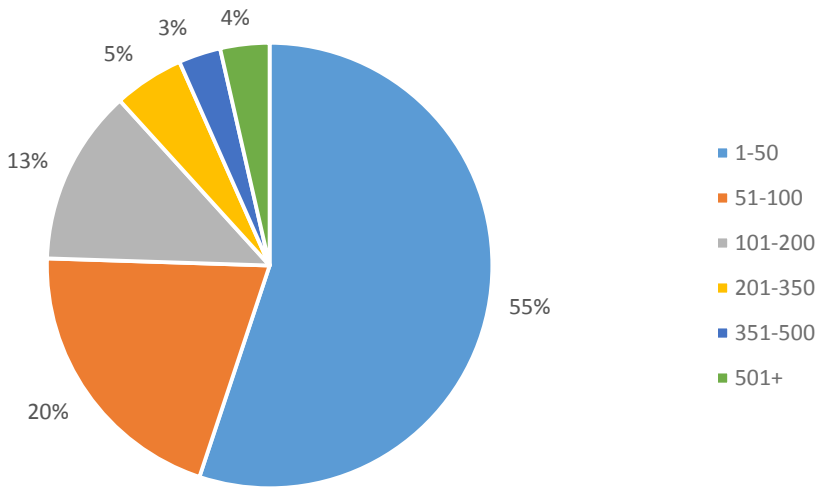


Figure 1: Proportion of cattle holdings by herd size in Berkshire in 2018 (n=197)

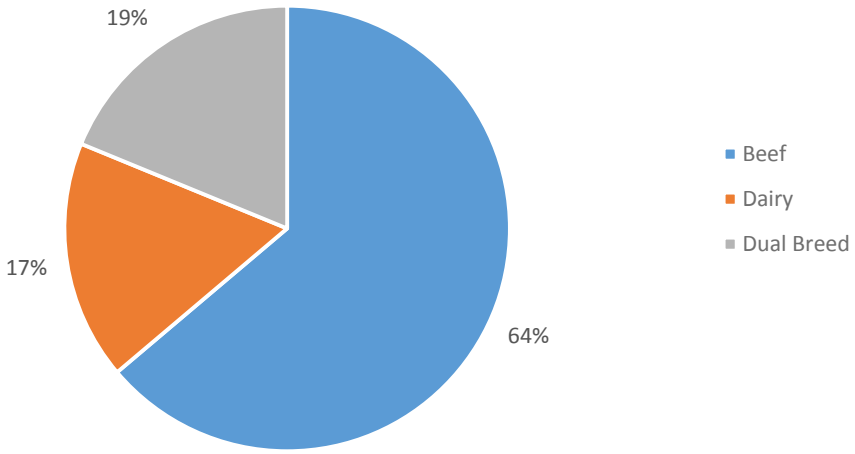


Figure 2: Proportion of cattle holdings by herd type in Berkshire in 2018 (n=283)

(Note: the total number of holdings in Figure 1 varies from the total number of holdings in Figure 2 because holdings are counted more than once when cattle with different breed purposes are present.)

Overview of the bovine TB epidemic in Berkshire

History of bovine TB in Berkshire

Three measures are used to assess the level of bovine TB in this report.

Firstly, the number of new herd breakdowns that were disclosed in each year.

Secondly, the annual herd incidence rate, reported as the number of new incidents per 100 herd-years at risk (100 HYR). This is the number of new TB incidents detected in the year, divided by the time those herds were at risk of contracting TB. The 100 HYR incidence rate is used in this report as it accounts for different intervals between tests in herds that other incidence measures, such as new TB incidents per number of herds or tests do not[1].

Thirdly, the annual end of year herd prevalence. This is the number of herds under restriction due to a TB incident at the end of the reporting year, divided by the number of active herds at that same point in time, and provides a snap shot of the burden of TB on the local cattle industry.

For all three measures, both breakdowns where lesions at post-mortem or *M. bovis* in tissue samples have been identified in one or more animals (officially tuberculosis free status withdrawn, OTFW) and breakdowns where lesions at post-mortem or *M. bovis* in tissue samples have not been identified (officially tuberculosis free status suspended, OTFS) are included. However, TB incidents in Approved Finishing Units (AFU) without grazing are not included in the prevalence and incidence calculations in the Edge Area reports due to the limited epidemiological impact of these cases. Furthermore, herds restricted due to an overdue test rather than a TB incident are also excluded from calculations.

The number of breakdowns in Berkshire continues to rise as can be seen in Figure 3, despite the small reduction in herd numbers. Although the herd incidence rate has fallen slightly from 13.7% to 13.6%

[1]The 100 HYR incidence rate measure is described further in 'Bovine tuberculosis in Great Britain in 2018: Explanatory Supplement to the annual reports' https://www.gov.uk/government/publications/bovine-tb-epidemiology-and-surveillance-in-great-britain-2018

(Figure 4), herd prevalence has risen from 8.7% in 2017 to 13.1% in 2018 (Figure 5). This rise in prevalence was attributable to a number of factors including a reduction in the number of herds, a rise in the number of breakdowns (Figure 5), and a large number of cases being disclosed in the last three months of the year (Figure 10). These figures suggest that the county will not achieve OTF status by 2025.

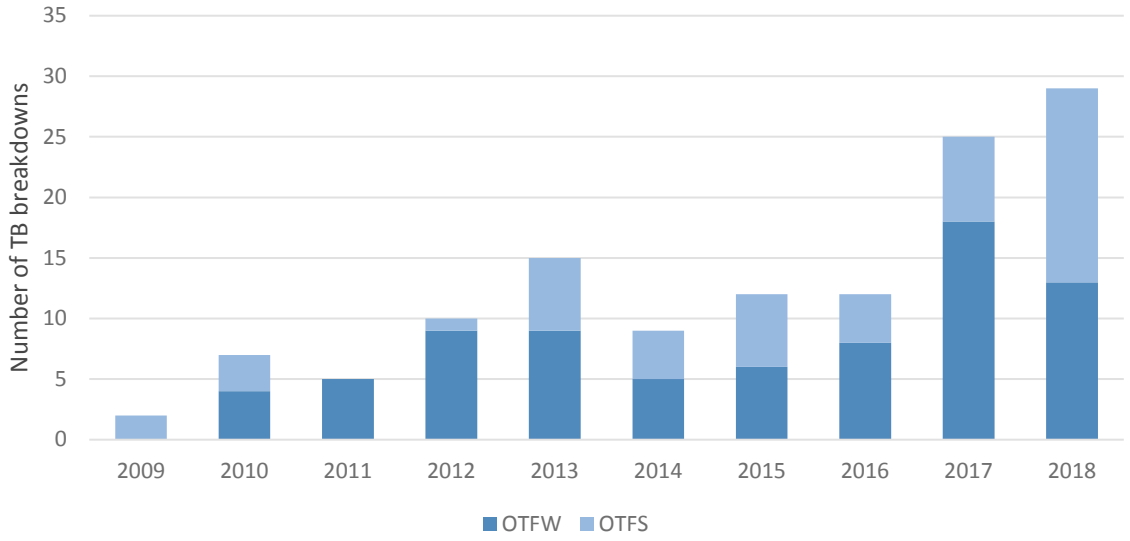


Figure 3: Annual number of new TB breakdowns in Berkshire 2009-2018

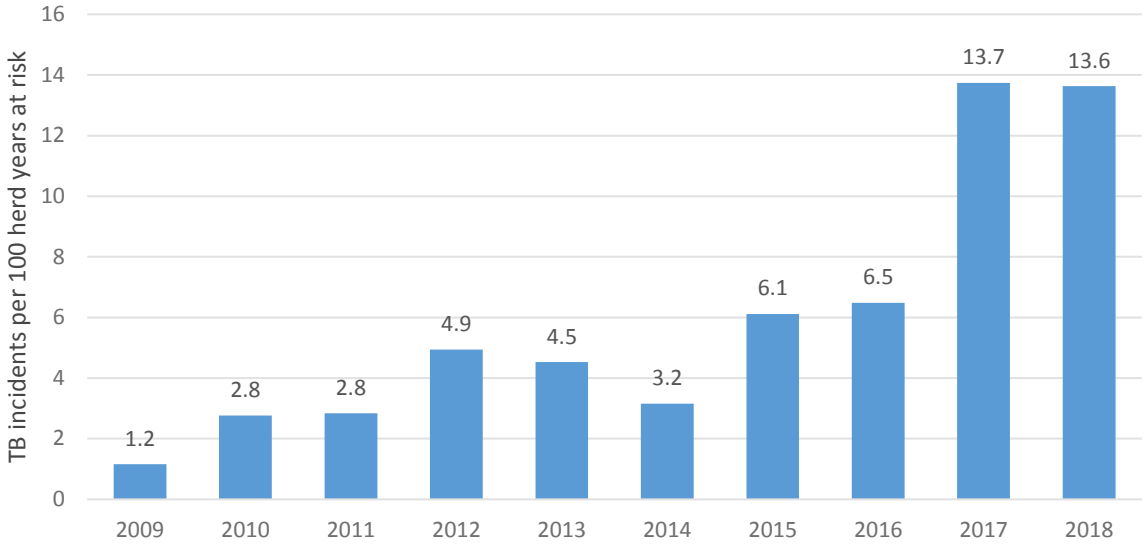


Figure 4: Annual herd incidence rate (per 100 herd-years at risk) for all new breakdowns (OTFW and OTFS) in Berkshire 2009-2018.

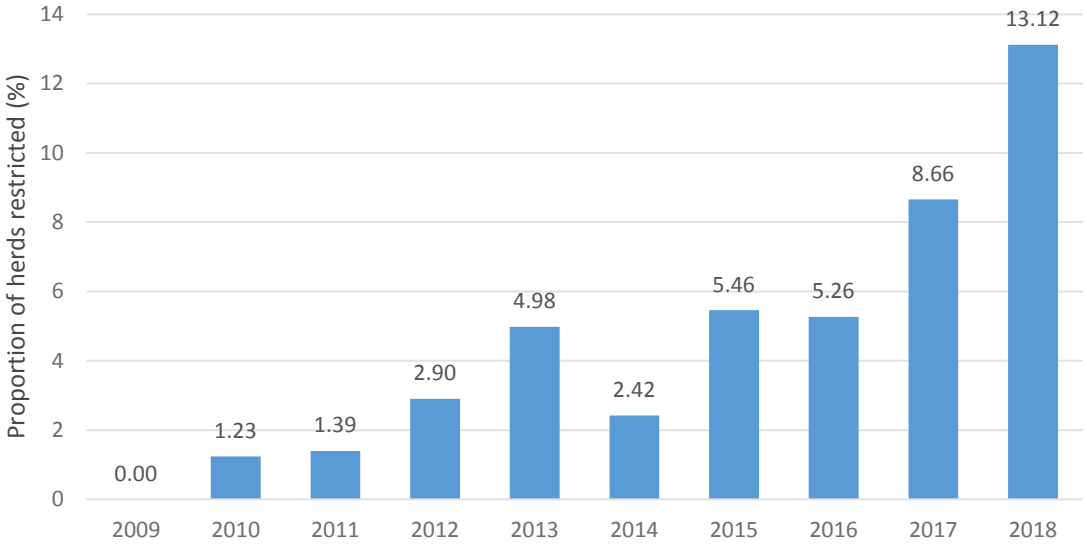


Figure 5: Annual end of year prevalence of restricted herds in Berkshire 2009-2018.

Geographical distribution of bovine TB cases (new and ongoing) in Berkshire

New cases in 2018 of genotypes 10:a and 10:u which were attributed to wildlife sources (Figures 7 and 8) occurred only in the western half of the county. This distribution has been roughly the same over the last four years of reporting with some expansion in certain areas. This geographical clustering of 10:a and 10:u cases over recent years, with no cattle movements or contiguous contact to account for local spread, supports the case vets' conclusions that infected wildlife is most likely responsible for propagating TB in this endemic area. Figure 7 shows new cases with genotype 10:a (probable wildlife source) represented by grey 3km zones (hatched for 2018 cases), clustered in the centre of this area around the junction between the A34 and M4. New breakdowns in 2018 of 10:u (pink 3km zone, hatched for 2018 cases), occupied satellite positions around this cluster especially along the Hampshire border. One 10:u breakdown, south of Reading, suggests considerable spread from previous years in an easterly direction to this endemic area.

Figure 6 shows the positions of four outliers in the east of the county for which purchase of undetected infected cattle was assessed as the most likely route of infection. Genotypes 17:a and 11:e from the two OTFW herds out of these four, confirmed this assessment as they were outside of their home range and not endemic in Berkshire. They illustrate the potential risk of fattening herds continuing to source stock from markets in the HRA.

There were two confirmed cases of *M. bovis* infection in cats near Newbury in 2018 but with differing genotypes isolated. One cat with genotype 10:a, presented with a lump on its throat consistent with infection through a bite wound. This genotype is considered to be endemic in the local wildlife (Figure 7). The other cat with genotype 25:a was part of a cluster of cats, three with this same genotype and rehomed from a house in Dorset. This genotype has never been found in Berkshire and is predominantly found in counties in the north-west Midlands. The original source of infection in the household in Dorset has not been determined.

A case was confirmed with genotype 10:a in a muntjac deer shot in the parish of Bucklebury, northeast of Newbury (Figure 7). In this parish there were two cattle breakdowns with a similar genotype in 2018. There is also a longstanding persistent breakdown (from 2013) in the same parish where genotype 10:a has been confirmed.

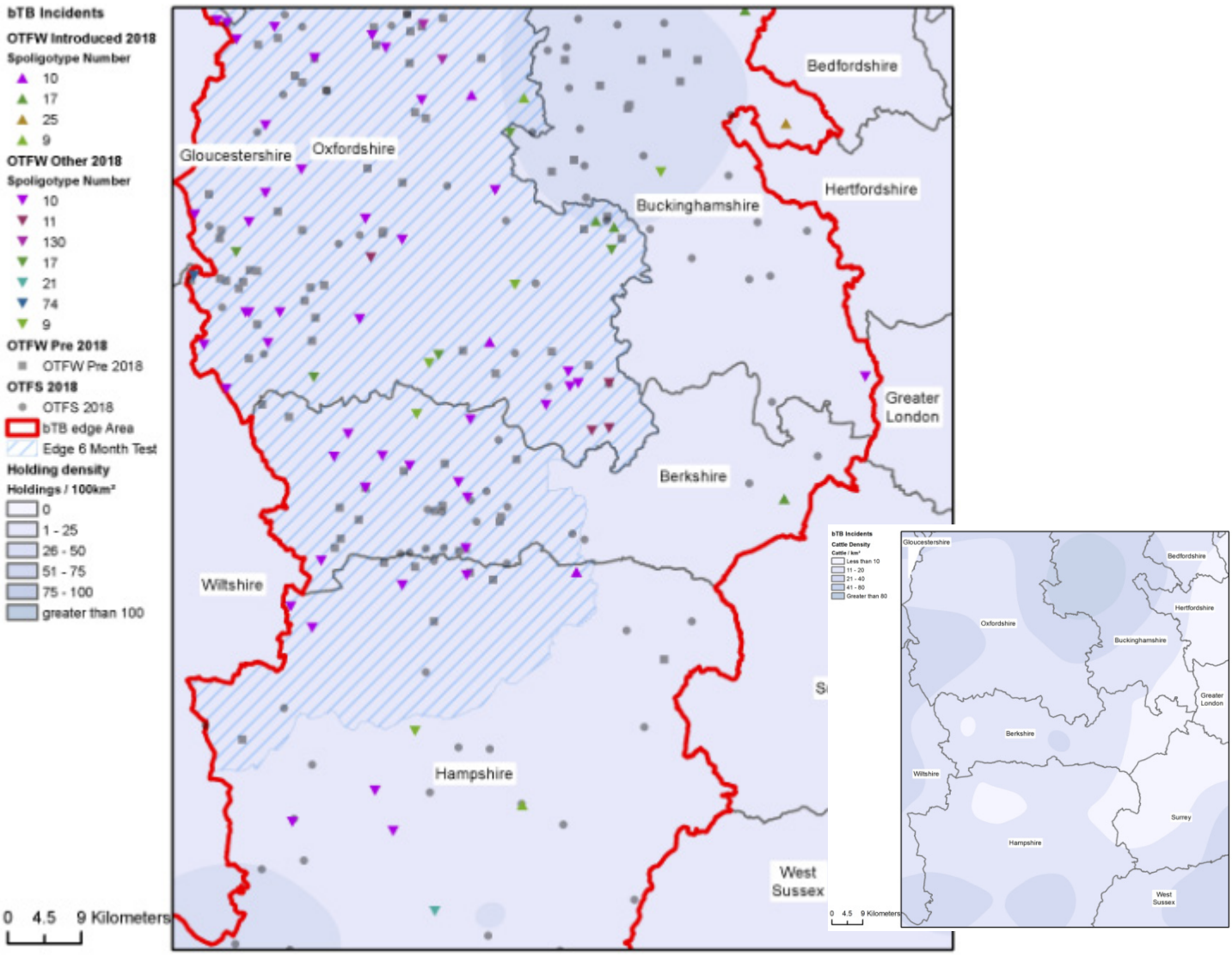


Figure 6: Geographical distribution of all new TB breakdowns (OTFW and OTFS) in 2018 and pre 2018 OTFW breakdowns still ongoing at the end of the report period, overlaid on a cattle holding density map, with a cattle density map for the area inset

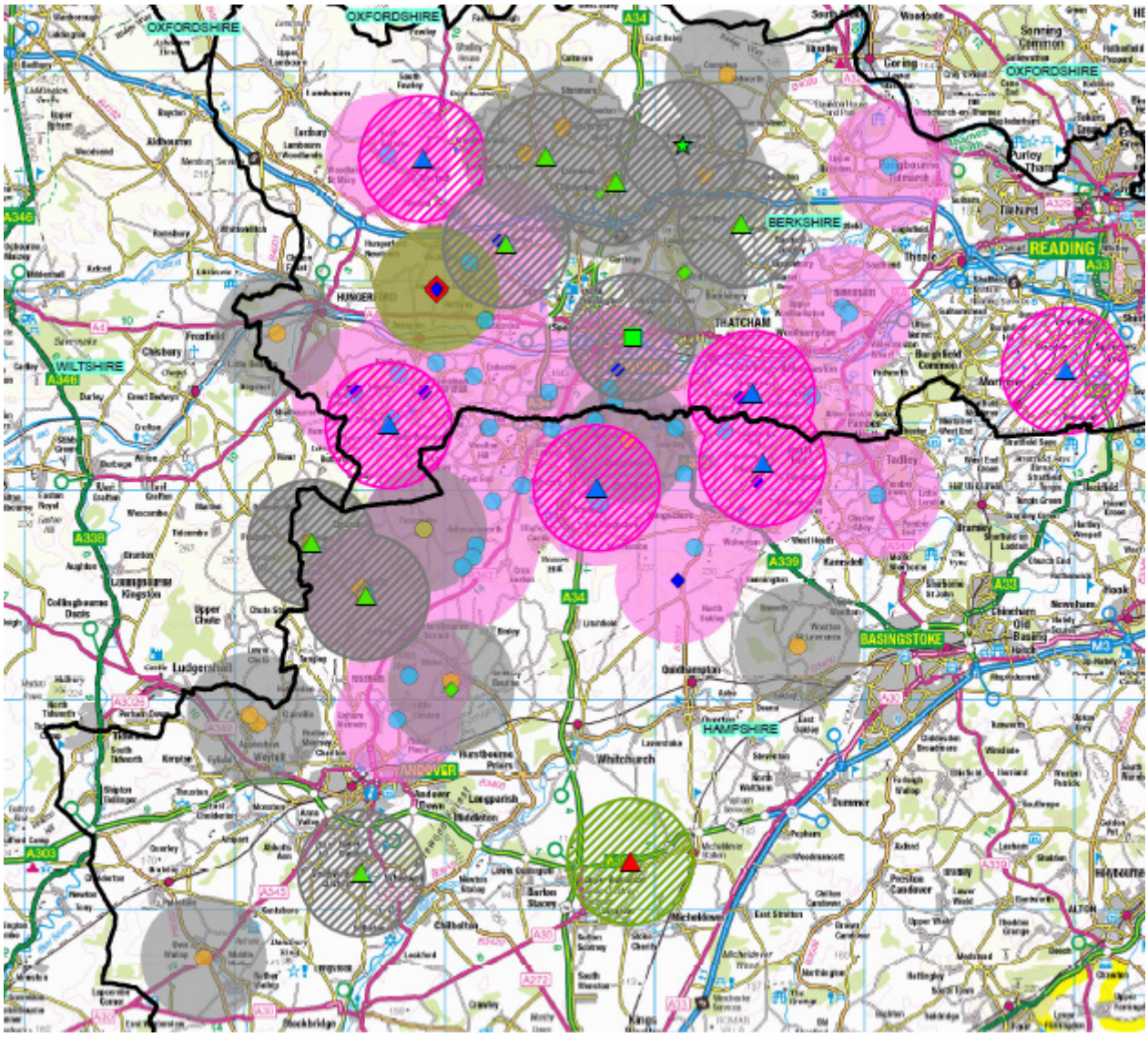


Figure 7 (legend below): Genotypes detected in Berkshire where a wildlife source was attributed as most likely, providing an indication of endemicity within local wildlife populations (OTFW breakdowns only).

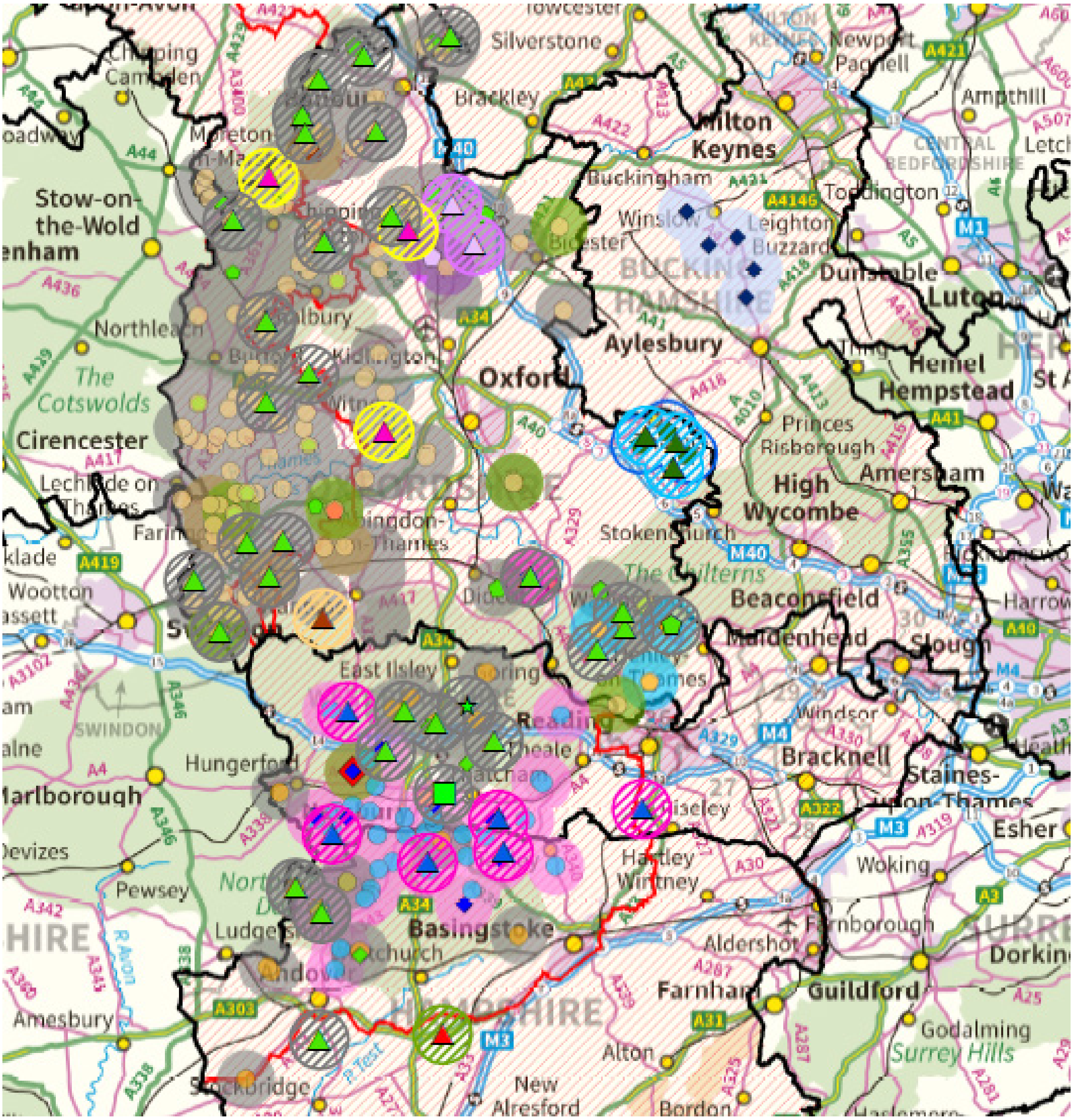
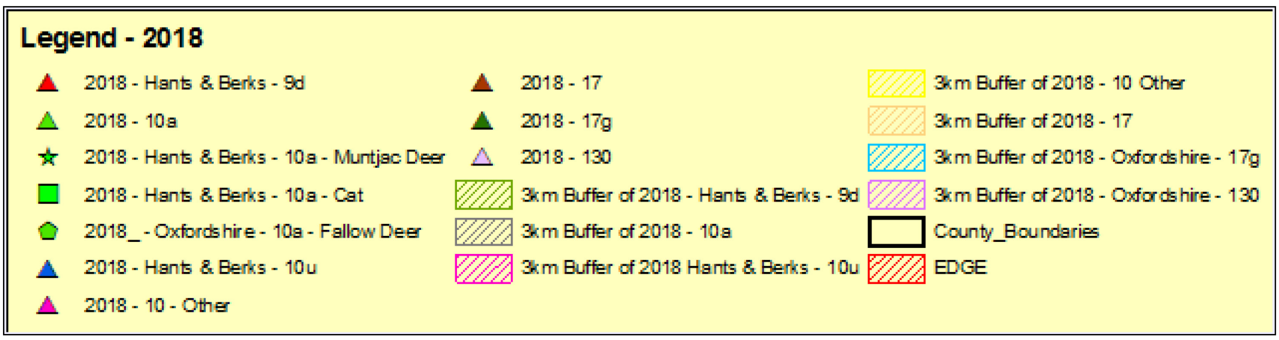
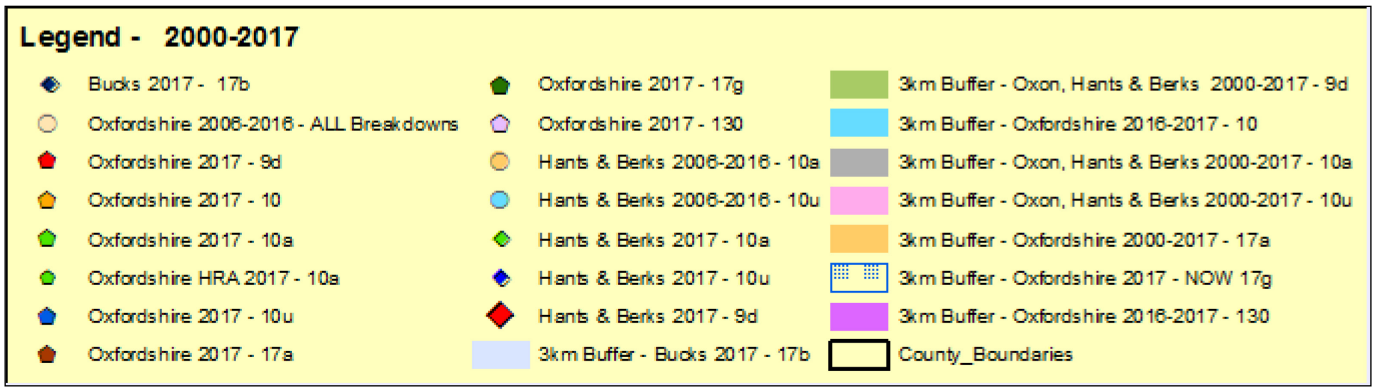


Figure 8 (legend below): Overview of Oxfordshire, Berkshire, Hampshire and Warwickshire genotypes attributed to wildlife source breakdowns (OTFW breakdowns only). Note grey circles (including those hatched for 2018 cases) represent 10:a, pink - 10:u, light blue - 17:g, yellow – genotypes related to 10:a.





Descriptive epidemiology of bovine TB in Berkshire

Characteristics of bovine TB in Berkshire

Larger herds in Berkshire may be more predisposed to infection (Figure 9) with 50% of herds with 351-500 cattle having a TB breakdown in 2018. Although there were only three breakdowns in the six herds of this size range, this follows the national trend of larger herds being more likely to become infected.

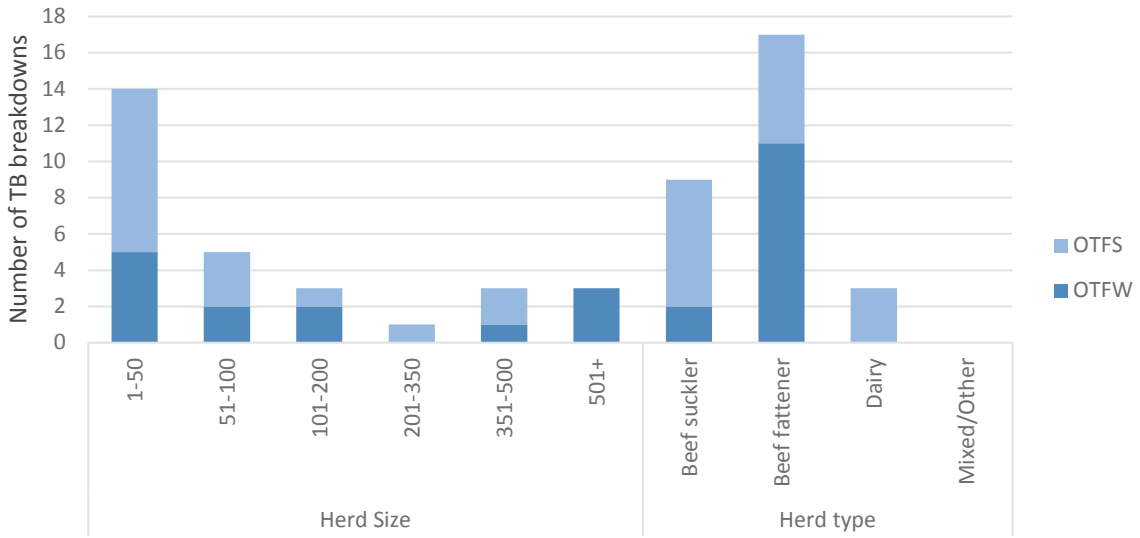


Figure 9: Number of new TB breakdowns (OTFW and OTFS) in Berkshire by cattle herd size and type.

Berkshire had very few breakdowns disclosed in the late winter and early spring months (Figure 10). Only four breakdowns were disclosed in the four months from January to April but an average of four per month were disclosed during the rest of the year.

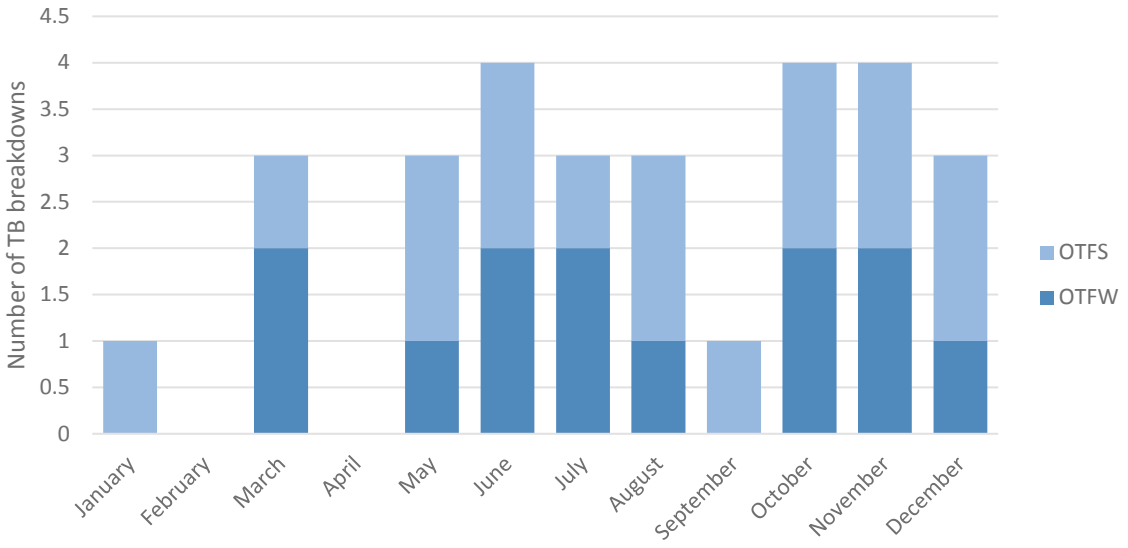


Figure 10: Number of new TB breakdowns (OTFW and OTFS) in the county, by month of disclosure

The genotypes of *M. bovis* found in 2018 mirrored those found in 2017 as would be expected. Genotypes 10:a and 10:u predominate in the western half of the county and constitute 75% of all OTFW breakdowns as seen in Figure 11.

The one exception was an OTFW breakdown with genotype 9:d. This genotype has previously been found in a roe deer in the Whitchurch area in 2010. There were only two OTFW breakdowns in the eastern half of the county. One genotype 11:e breakdown was confirmed in an AFU. The second, genotype 17:a, was isolated in a dairy herd and presumed to be related to movement of undetected infected cattle into the herd though it was not possible to find a direct link to a specific breakdown. Genotype17:a is found most commonly in western counties of England.

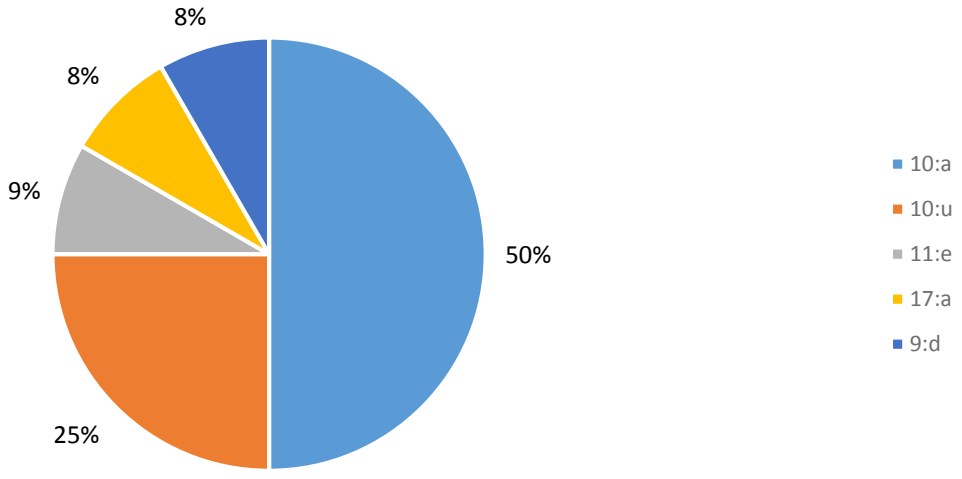


Figure 11: Genotypes of *M. bovis* (OTFW only) identified in the county in 2018 (n=12).

The majority of breakdowns resolved within the 151-240 days or 241-550 days categories (Figure 12). Those in the time interval 151-240 days were likely to have passed either the minimum of two or three short interval tests before restrictions were lifted. This apparent swift clearing of infection from over half the breakdowns in the county is caveated by the possibility of undisclosed infection left in the herd.

One persistent breakdown (more than 18 months under restrictions) which started in December 2016 was resolved in 2018.

Farms are impacted by TB restrictions in various ways depending on their cattle management systems. For dairy herds the issue is often finding an outlet for or having to rear calves which would normally have been sent to market. Those who usually sell stores rather than finished fat cattle have a limited outlet for these cattle, and usually with less of a return. Some, if feasible, adapt their business pattern and continue rearing them. Finishers can sell direct to slaughter or AFUs but are restricted by having to apply for licences to buy in replacement stock.

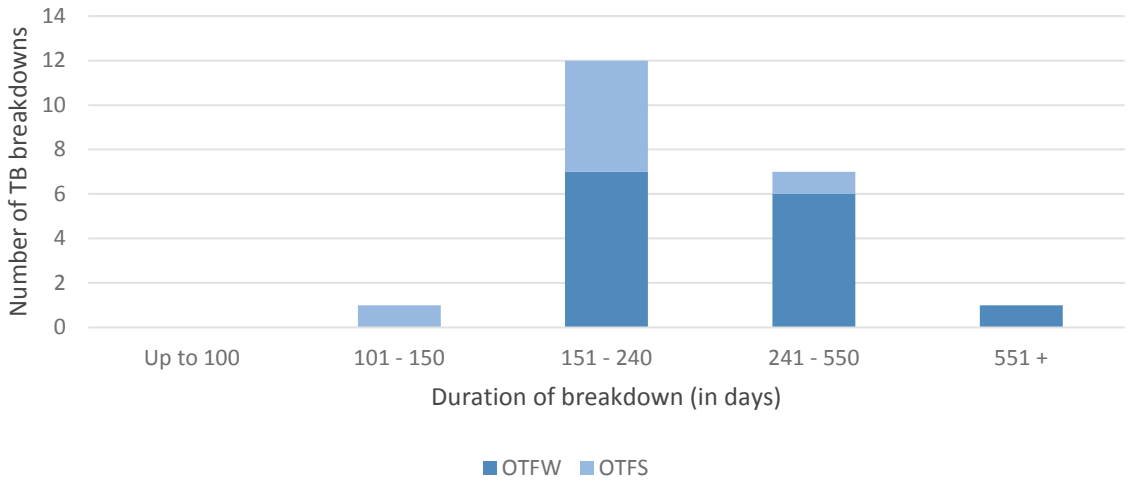


Figure 12: Duration of TB breakdowns (OTFW and OTFS) closed in Berkshire in 2018.

Risk pathways for bovine TB herd infection in Berkshire

Establishing the route of entry of infection into a herd experiencing a new TB incident can be challenging. The Animal and Plant Health Agency (APHA) aims to complete an epidemiological assessment of all TB incidents in the Edge Area (both OTFW and OTFS), including a thorough on-farm investigation. However where resource constraints exist, as many new incidents as possible are randomly selected or triaged for an investigation visit. Scrutiny of routinely collected data such as cattle movements and *M. bovis* genotypes (available for OTFW incidents only), combined with data from the on-farm investigation and knowledge of the local area epidemiological situation provides information which enables APHA case vets to assess and then rank the possible disease pathways.

A mathematical algorithm based on risk pathway data was used for the 2018 period to determine the relative contribution of different sources for each breakdown herd. However, this methodology also included those incidents where certainty about risk pathways was lower because of gaps in the epidemiological evidence. The effect of uncertainty has been increased by the inclusion of OTFS herds, where by definition, no genotype was determined. Therefore the relative proportions of each risk pathway are very approximate, and broad generalisations only can be made from these data.

A more detailed description of this methodology is provided in the Explanatory Supplement.

Movement of infected cattle, and direct or indirect contact with local infected badgers were the two key sources accounting for over half of the weighted source attribution for all breakdowns (Figure 13). Residual infection, where a herd is thought to have not been totally cleared of disease at a previous breakdown due either to a potential lack of sensitivity of the skin test or to testing having occurred

before an immune response could be mounted to the skin test, appeared to be a factor in less than 15% of breakdowns.

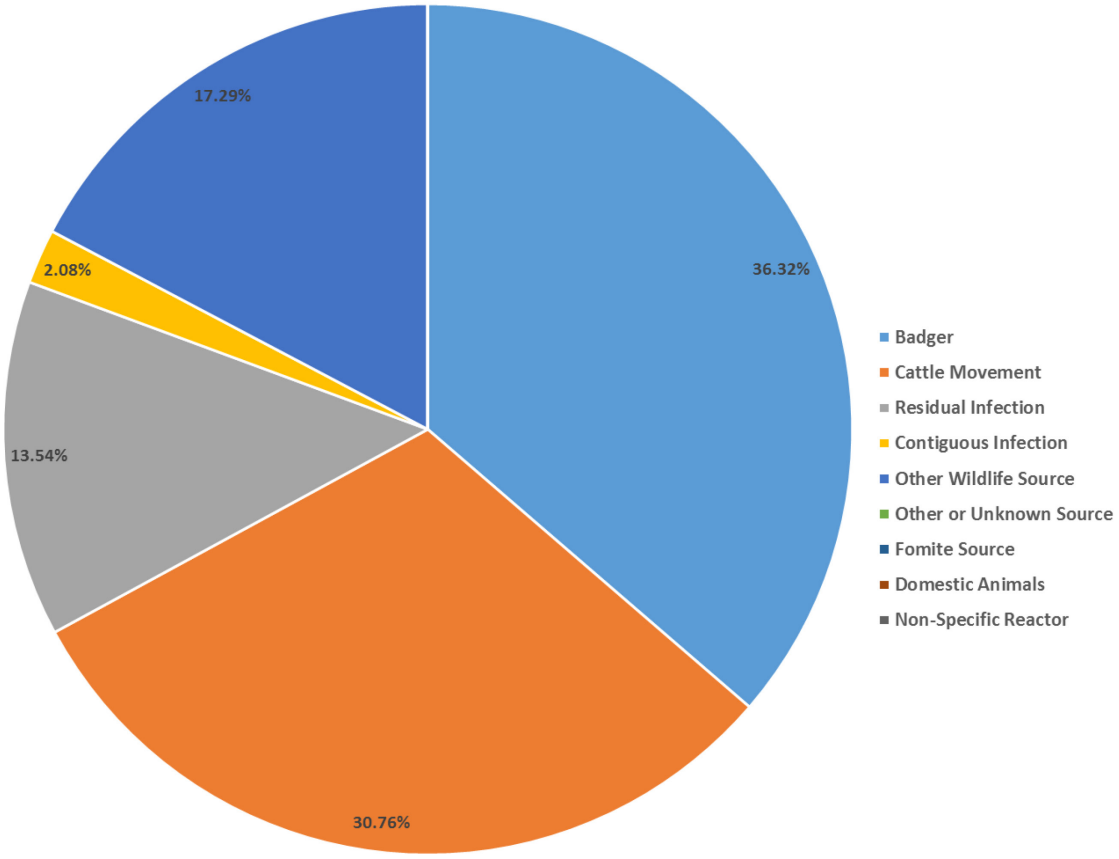


Figure 13: Summary of the weighted source of infection attributed for all incidents (both OTFW and OTFS) in the county that started in 2018

It is difficult to infer anything from Figure 14 as the numbers shown (14 breakdowns) are too small to generalise. However, movements of undetected infected cattle account for nine of the attributions with the highest level of certainty.

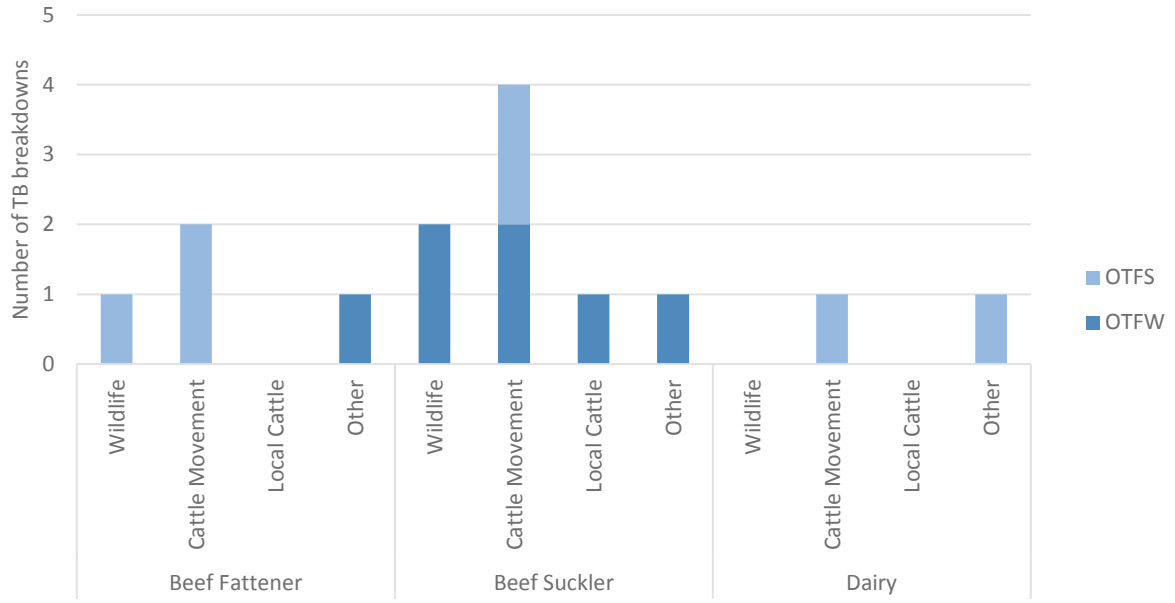


Figure 14: Source of infection recorded with the highest level of certainty for all TB breakdowns (both OTFW and OTFS) in the county by herd type

Role of other species in Berkshire

Badgers and other wildlife

Anecdotally (from discussions with farmers, game keepers, and from local knowledge) badger and deer populations are continuing to increase and are at an all-time high in Berkshire, providing a large potential wildlife reservoir. Genotype 10:a was confirmed in a muntjac deer in the parish of Bucklebury close to a persistent breakdown.

Licensed badger vaccination has taken place on three sites in the county, the biggest of which is Greenham Common where disease has previously been confirmed in cattle grazing the Common.

Other domestic species

Two domestic cats were confirmed with *M. bovis* infection in Berkshire but with different genotypes. See details in 'Geographical Distribution' section above.

Detection of cases in Berkshire

Methods of detection include slaughterhouse surveillance, routine surveillance testing, trace testing from OTFW breakdowns, pre-movement testing, contiguous testing, and radial testing. As shown in Figure 15, exactly half of breakdowns were detected by the annual whole herd surveillance test (WHT). Over a quarter were disclosed by post-breakdown testing (6M and 12M), suggesting a significant problem with recurrence. Also evidenced by 39% (11) of 2018 breakdowns having had a TB breakdown within the previous three years (Figure 16). It should be noted that in the endemic area of Berkshire it is difficult to differentiate between recurrence due to residual infection in the cattle herd and re-infection by wildlife if the genotype is endemic to the locality.

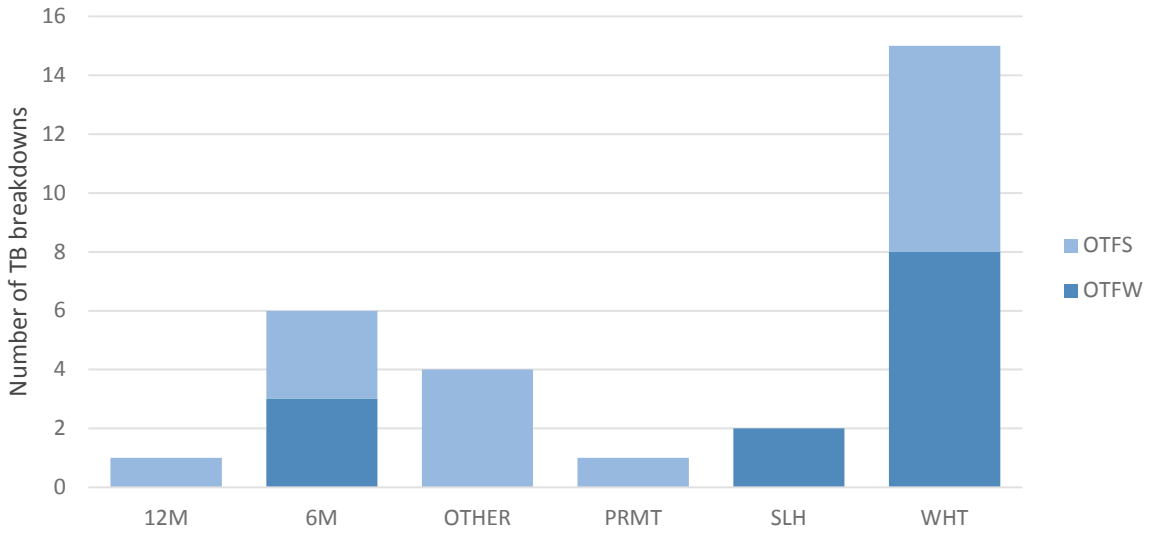


Figure 15: Number of TB breakdowns (OTFW and OTFS) in Berkshire in 2018, disclosed by different surveillance methods (surveillance method types are further described in the Explantory Supplement[1]).

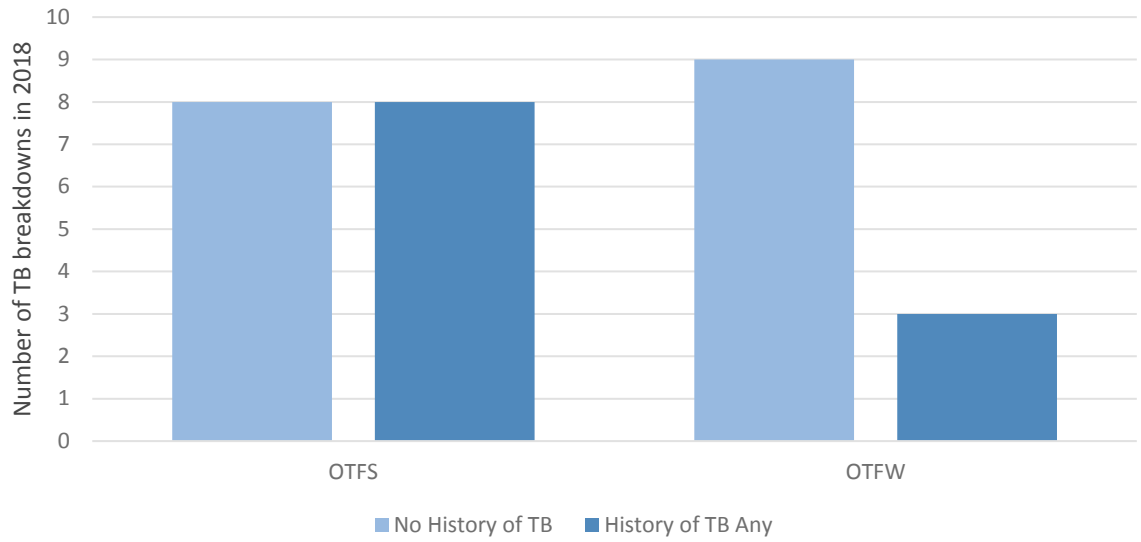


Figure 16: Number of TB breakdowns (OTFW and OTFS) in Berkshire which experienced a breakdown in the previous 3 years.

Burden of bovine TB

There were 308 cattle compulsorily slaughtered due to bovine TB in 2018 (Figure 17). This was significantly lower than in the previous two years: 2017 (479) and 2016 (397), although higher than in 2015. Of the 308 reactor cattle detected in 2018, 152 were skin test reactors and 156 were detected by interferon gamma testing. The average number of reactors detected per breakdown was at its lowest in 2018 at 7.5 compared to 19.2 in 2017 and 33.1 in 2016. This can be explained by the reduction in reactors taken from the two large dairy herd persistent cases where interferon gamma testing has been reduced to a more targeted fashion as the disease situation improves.

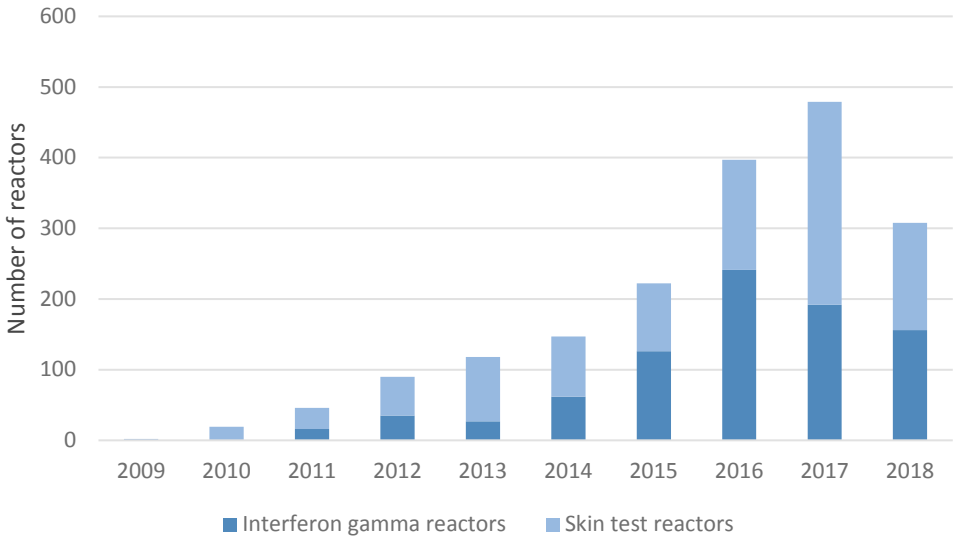


Figure 17: Number of reactors detected by interferon gamma and skin tests in Berkshire 2014 to 2018

Key drivers of the bovine TB epidemic

TB in this relatively small county appears to be driven mostly by endemic wildlife infection and movement of undetected infected cattle from adjacent HRA counties – both causes affect west Berkshire the highest. It is likely that the failure to completely remove infection by current TB control measures leaves residual infection in some herds which causes recurrent breakdowns. Two large dairy herds which have been persistently infected for many years, continue to significantly contribute to the number of reactors found in the county, and the herd prevalence figure.

County summary

The county has one of the highest herd incidence rates in the Edge Area, although this may have levelled off. However, current TB control measures seem unlikely to produce a sustained reduction for the county to achieve OTF status by 2025. Further measures to control cattle movements, and robust wildlife interventions are required.

Summary of risks to the Low Risk Area (LRA) and any mitigating factors

The epidemic front in Berkshire has not advanced in 2018 and so it is still some 35km from the LRA county of Surrey. Its advance to the east may be slowed by the presence of large conurbations such as Reading, Caversham, Wokingham and Bracknell which reduce cattle and wildlife densities.

There are no known business or land (temporary land association) links which could facilitate the spread to the LRA.

On the eastern and south-eastern boundaries of Berkshire the M3 and M25 motorways may act as a physical barrier to spread of infection through wildlife movement to the LRA.

Summary of the risk to the Edge Area from the HRA

There are risks from the adjacent HRA both from cattle movements especially from markets in Wiltshire and endemic wildlife infection along the county boundaries.

Summary of the risk to Berkshire from the adjacent Edge Area counties

Infection in the wildlife in endemic areas in the south of Oxfordshire and north of Hampshire will help maintain endemicity in the wildlife population in the west of Berkshire.

Assessment of effectiveness of controls and forward look

The bovine TB epidemic has continued to grow in Berkshire and shows no sign of levelling off at present though the spread to the east has stalled around Reading.

It is probably too early to assess the effect of six-monthly herd surveillance testing in the endemic area of Hampshire (introduced in January 2018), but this could play a role in earlier detection of disease. This should lead to shorter breakdowns by reducing the amount of cattle-to-cattle spread within herds. It may also reduce the potential for infection of wildlife from infected cattle in the endemic area, although this is thought to be very low likelihood.

Application of more pro-active on-farm biosecurity measures as detailed on the TB Hub[2], recommended by TBAS (TB Advisory Service)[3], and local vets, would help to reduce cattle-badger interactions and transmission. To reduce and ultimately eradicate bovine TB in Berkshire, some wildlife measures will also be needed in the western portion of the county which might be badger population reduction or vaccination on a sustained and large scale. There were limited licensed badger vaccination programmes carried out in Berkshire in 2018 as part of the Badger Edge Vaccination Scheme (BEVS).

The most significant site in terms of area covered and number of badgers vaccinated was that on Greenham Common where breakdowns have continued intermittently in the resident cattle herd.

[2] TB hub website - https://tbhub.co.uk/

[3] TB advisory service - http://www.tbas.org.uk/

APPENDICES

Appendix 1: Overview of risk and surveillance areas of England and Edge Area objectives and controls

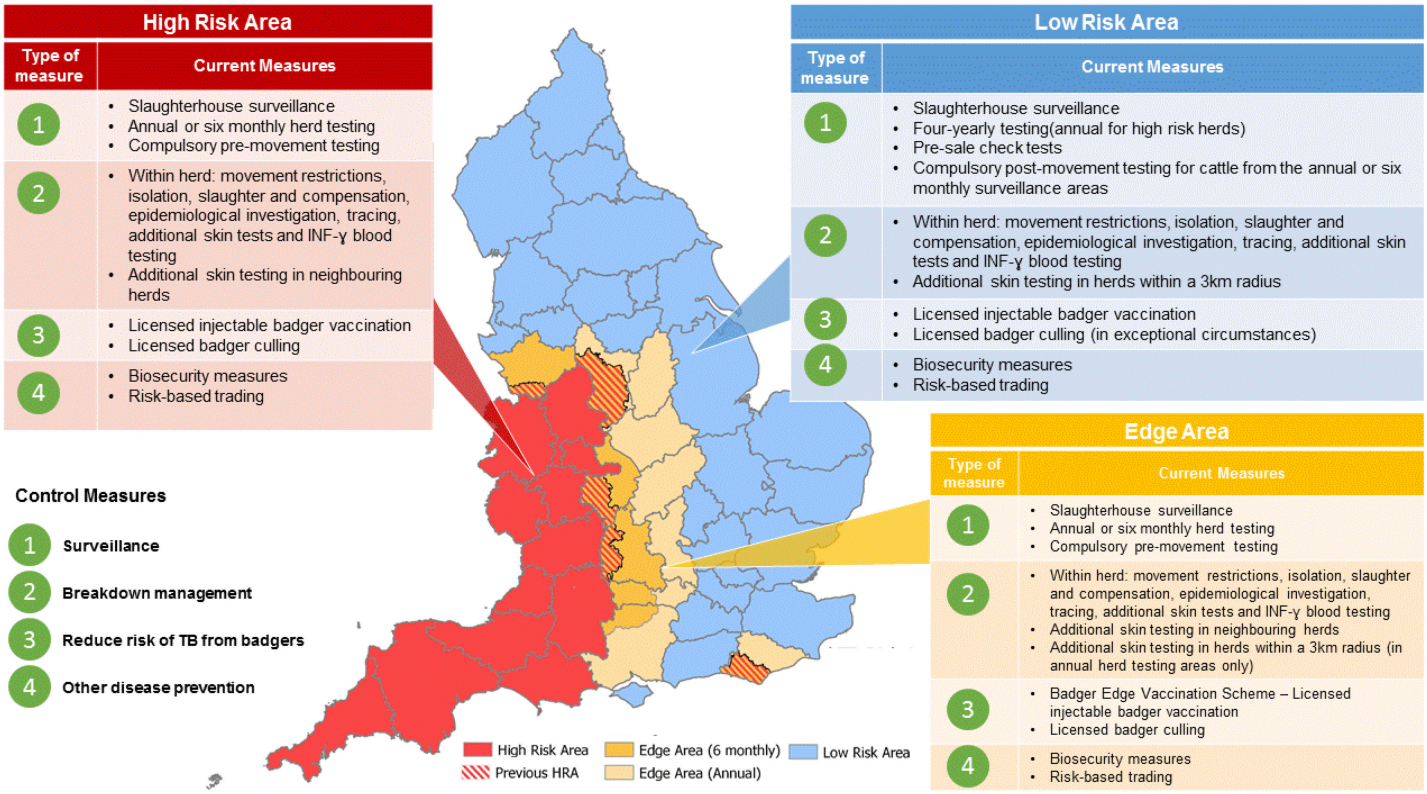


Figure A1: Bovine TB risk and surveillance areas of England effective since January 2018, as set out in the Government's Strategy for Achieving Officially Tuberculosis-Free Status for England[4].

1.1 Policy objectives for the Edge Area:

Short to medium term:

- slow down geographic spread
- maintain crude herd incidence of OTFW breakdowns <2% overall by 2019
- begin to reduce the incidence rate

Longer term:

- reduce geographic spread of bTB and push the Edge Area boundaries westward
- reduce OTFW herd incidence to <1% by 2025
- attain OTF status (crude incidence of indigenous OTFW herd breakdowns <0.1%) for the lowest incidence counties in the Edge Area.

1.2 Key Control Measures

Surveillance:

- six monthly or annual routine herd testing
- additional targeted surveillance of cattle herds located within a 3km radius of new OTFW breakdowns in annual testing sections of the Edge Area (radial testing)
- slaughterhouse surveillance

[4] http://www.tbhub.co.uk/wp-content/uploads/2017/09/infographic-TB-measures.pdf

Management of cases (‘breakdowns’):

- increased sensitivity of breakdown herd testing:
  - all breakdown herds must pass two consecutive short interval skin tests at severe interpretation to regain OTF status, irrespective of post-mortem and bacteriological findings
  - mandatory IFN-gamma parallel testing of herds with OTFW breakdowns
  - enhanced management of herds with persistent breakdowns
- enhanced epidemiological investigation and data analysis
- information sharing - location of breakdown herds publicly available (via ibTB interactive mapping tool)[5]

TB controls in the wildlife reservoir (badgers):

- licensed badger culling in high incidence sections of the Edge Area
- Government grants for licensed voluntary badger vaccination projects using injectable badger BCG (Badger Edge Vaccination Scheme - BEVS)

Other measures:

- compulsory pre-movement skin testing of cattle moved between herds
- promotion of herd biosecurity measures to reduce the risk of new breakdowns

[5] ibTB interactive mapping tool - https://ibtb.co.uk/

Appendix 2: Cattle industry in the Edge Area of the region

Number of cattle premises by size band in the Edge Area of the region at 1 January 2018

(RADAR data)

Cattle per premises	1-50	51-100	101-200	201-350	351-500	501+	All	Mean	Median
Number of premises	108	40	25	10	6	7	197	97.15228	38

Finishing units registered in Berkshire

	Grazing	Non-grazing
Number of Approved Finishing Units (AFUs)	0	0
Number of Pre-movement Testing Exempt Finishing Units (EFUs)	2	2

Common land in the county: There are two major commons in Berkshire: Greenham with Crookham Common and Hungerford Common. They are managed in completely different ways.

Greenham with Crookham Common has a resident herd of cattle owned by six different commoners. They are one epidemiological group and are treated as such in terms of TB testing and breakdown controls.

Hungerford Common differs in that it has two distinct systems. One is that of the ‘Graziers’ who, as a group, purchase cattle to be run on Hungerford Common in the summer months and the cattle are then sold and moved off in the autumn. They have no contact with the graziers’ home herds at any time. The other group are the ‘Commoners’ who rent grazing on separate plots of land close to but not linked to the main Common. They use this land to graze their own stock which are pre-movement tested onto and off the site. Each of these sites are epidemiologically separate for disease control purposes.

Cattle/herd purpose:

	Beef		Dairy		Dual purpose		Unknown		Total
	Number	%	Number	%	Number	%	Number	%	Number
Cattle	14190	74.1	4453	23.3	495	2.6	1	0.0	19139
Holdings	180		49		53		1		

Appendix 3: Summary of the Berkshire headline cattle TB statistics

Herd-level statistics	**2016**	**2017**	**2018**
Total number of cattle herds live on Sam at the end of the reporting period	249	233	223
Total number of herd tests carried out in the period	261	271	328
Total number of OTF cattle herds TB tested during the period for any reason	192	188	181
Total number of OTF cattle herds at the end of the report period (i.e. herds not under any type of TB02 restrictions)	226	205	187
Total number of cattle herds that were not under restrictions due to an ongoing TB breakdown at the end of the report period.	236	212	194
Total number of new TB breakdowns detected in cattle herds during the report period	12	25	29
OTF status suspended (OTFS)	4	7	16
OTF status withdrawn (OTFW)	8	18	13
Of the OTFW herd breakdowns:			
How many can be considered the result of movement, purchase or contact from/with an existing breakdown based on current evidence?	5	4.5	5
New OTFW breakdowns triggered by skin test reactors or 2xIRs at routine herd tests	6	11	8
New OTFW breakdowns triggered by skin test reactors or 2xIRs at other TB test types (forward and back-tracings, contiguous, check tests, etc.)	1	7	3
New OTFW breakdowns first detected through routine slaughterhouse TB surveillance	0	0	2
Number of new breakdowns revealed by enhanced TB surveillance (radial testing) conducted around those OTFW herds (may not be applicable to every county in the Edge Area)			
OTFS	0	0	0
OTFW	0	0	0
Number of OTFW herds still open at the end of the period (including any ongoing OTFW breakdowns that began in a previous quarter)	11	18	16
New confirmed (positive *M. bovis* culture) incidents in non-bovine species detected during the report period (indicate host species involved)	2 pig units	1 cat	1 deer 2 cats

Animal-level statistics (cattle)	**2016**	**2017**	**2018**
Total number of cattle tested in the period (animal tests)	45247	38194	41260
Reactors detected:			
tuberculin skin test	156	287	152
additional IFN-gamma blood test reactors (skin-test negative or IR animals)	241	192	156
Reactors per breakdown	33.1	19.2	7.5
Reactors per 1000 animal tests	8.8	12.5	7.5
Additional animals identified for slaughter for TB control reasons (DCs, including any first-time IRs)	10	15	54
Private slaughters	0	1	1
SLH cases (tuberculous carcases) reported by FSA	5	0	3
SLH cases confirmed by culture of *M. bovis*	0	0	2

Appendix 4: Suspected sources of M. bovis infection for all the new OTFW and OTFS breakdowns identified in the report period

Source of infection	Possible	Likely	Most likely	Definite	Weighted contribution
Cattle movement (e.g. purchase) of infected animal(s)	8	4	3	0	30.8%
Local contiguous infection - lateral spread from neighbouring holdings	0	1	0	0	2.1%
Exposure to infected wildlife	32	2	2	0	53.6%
Exposure to other farmed species	0	0	0	0	0%
Residual infection from a previous TB breakdown	4	3	1	0	13.5%
Infected human source	0	0	0	0	0%
Fomite source	0	0	0	0	0%
Domestic animals	0	0	0	0	0%
Undetermined/obscure	0	0	0	0	0%
Other (explain)	0	0	0	0	0%

Appendix 5: Overview of the bovine TB Control Programme in Berkshire

Summary of TB control measures specific to Berkshire:

5.1 Edge Area Testing Policy

- From January 2018 herds located in the western endemic part of the county became subject to six-monthly routine surveillance testing (previously annually tested).
- From January 2018 additional targeted surveillance of cattle herds located within a 3km radius of new OTFW breakdowns was implemented in the annual surveillance testing area.
- Slaughter of inconclusive reactors (IRs) and direct contacts (DCs) continues to be used as a tool to attempt to shorten breakdowns in Berkshire. This has particularly been used as part of enhanced management of persistent breakdown herds.

5.2 Unusual bovine TB breakdowns

- There continue to be two persistent breakdowns in two large dairy herds in Berkshire. The breakdowns commenced in 2012 and 2013 and have continued in a low level cyclical fashion in 2018. Both these farms were selected for wildlife surveillance by APHA wildlife ecologists from the National Wildlife Management Centre (NWMC) and useful information was imparted to the farmers to assist in reducing cattle-badger interactions such as exclusion measures in cattle housing and feed stores.
- Two cats were confirmed with *M. bovis* in the Newbury area though with differing genotypes. One was found to have the local genotype 10:a and the other 25:a which is generally found in the northwest Midlands counties.

5.3 Other Testing Measures

- No further cases have been detected as a result of radial testing, which suggests that infection has not spread to other cattle from these breakdowns. Radial testing would also be carried out in response to confirmed wildlife and non-bovine cases.
- No routine surveillance testing exemptions were given for fattening herds.
- No potential ‘hotspots’ were identified and declared.
- The case in a wild muntjac deer was within the six-monthly surveillance testing area so no contiguous testing was initiated.
- Overdue testing continued to be at a very low level and was intensively managed by APHA.

5.4 Other Control Measures

- APHA provided representation at regional meetings with farmers and Official Veterinarians when requested. These were co-ordinated by regional National Farmers Union (NFU) representatives.