

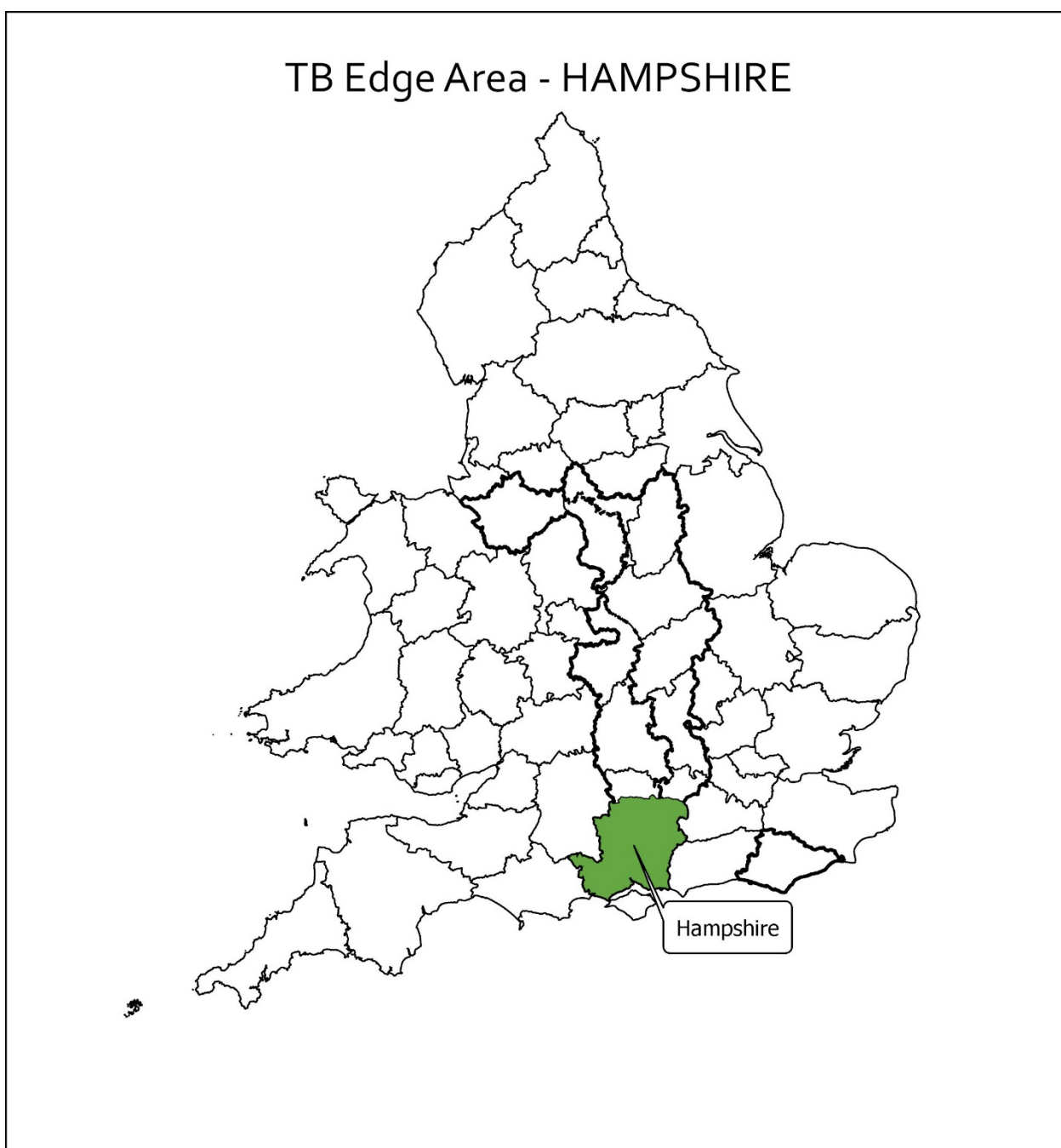


Year End Descriptive Epidemiology Report: Bovine TB Epidemic in the England Edge Area

Delivery Area: Southern

Name of County: Hampshire

Year-end report for: 2018



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Executive Summary

1. The Edge Area has a low but recently rising incidence of infected herds. **Hampshire** 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 Hampshire in 2018.
2. **Local cattle industry:** There have been only minimal changes to the cattle herd numbers, type and structure in Hampshire in 2018.
3. **New breakdowns of bovine TB:** There has been a small increase in the number of both Officially Bovine Tuberculosis Free Status Withdrawn (OTFW) (13) and Officially Bovine Tuberculosis Free Status Suspended (OTFS) (29) breakdowns in 2018 in comparison to 2017 OTFW (11) and OTFS (25).
4. **Risk pathways for bovine TB infection:** Movements of undetected infected cattle accounted for 36% of breakdowns in Hampshire in 2018. The remainder being assessed as recrudescence, wildlife source and contiguous spread.
5. **Role of other species:** Badgers and possibly other wildlife such as deer continue to play a role in TB transmission in endemic areas in north-west Hampshire.
6. **Disclosing tests:** Almost half of breakdowns in Hampshire in 2018 were detected by annual whole herd surveillance testing (WHT). Over a quarter were disclosed by post-breakdown testing (6M and 12M).
7. **Impact of TB, reactor numbers:** Relative cost to taxpayers was higher in 2018 than 2017. Average number of reactors removed per breakdown was at its highest level in three years.
8. **Risks to the Low Risk Area (LRA):** The risk of spread into the LRA from the advance of the endemic front is low due to the low density of cattle to the east of the front and an urban barrier.
9. **Risks from the High Risk Area (HRA) and/or other adjacent Edge Area counties:** Risk from the HRA and Edge Area counties remains constant.
10. **Forward look:** The possibility of reaching OTF county status by 2025 for Hampshire appears to be very remote.

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 have been established. 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 Hampshire 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 north-west Hampshire. 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 Hampshire

There were a total of 780 cattle herds in Hampshire (Figure 1), with a predominance for beef rearing (Figure 2). There are no livestock markets in Hampshire, which means that to purchase or sell stock farmers have to rely on markets in neighbouring counties. The markets predominantly used are in the HRA such as Frome (Somerset) and Salisbury (Wiltshire), therefore there is a flow of cattle especially for fattening from the HRA into Hampshire. There is one medium-sized abattoir in Hampshire at Farnborough. Feeding and husbandry practices vary greatly within the county depending on herd type, herd size and soil type. Winter housing takes place on most premises from October to April. Summer grazing on temporary grazing is not uncommon and cattle are present on the common land of the New Forest all year round. Nearly 60% of herds have fewer than 50 cattle and these are mostly beef suckler or beef fattening units.

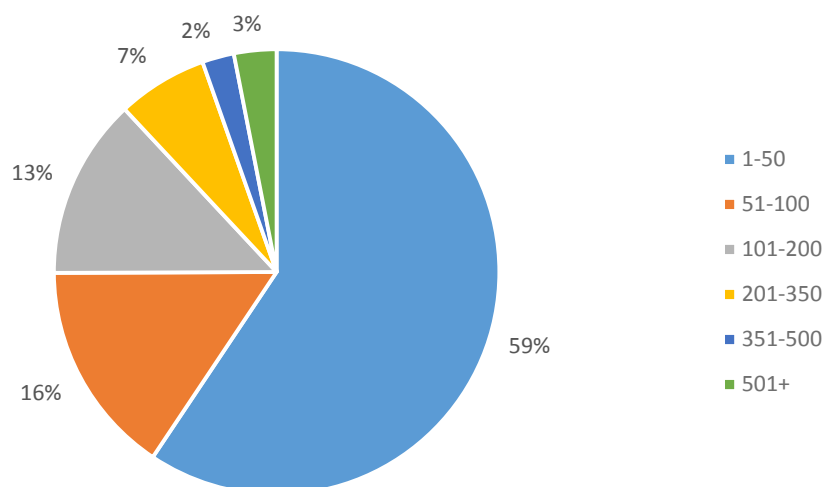


Figure 1: Proportion of cattle holdings by herd size in Hampshire in 2018 (n=780)

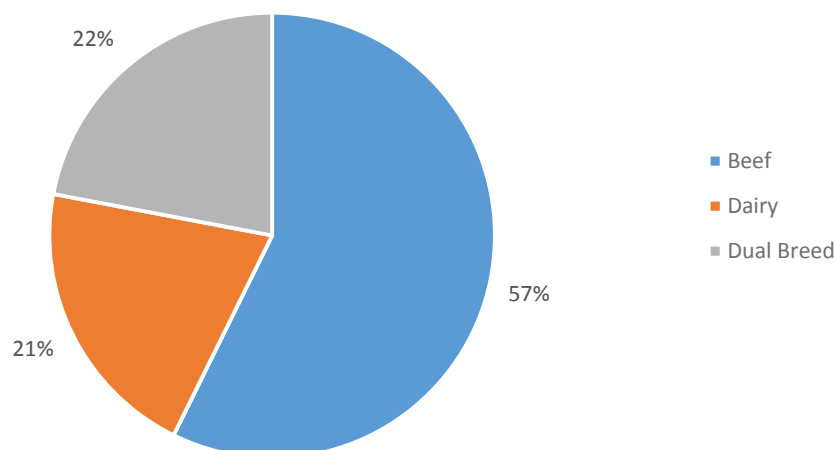


Figure 2: Proportion of cattle holdings by breed purpose in Hampshire in 2018 (n=1200)
 (Note: the total number of holdings in Figure 1 varies from the total number of holdings in Figure 2 because holdings are counted more than once when cattle with different breed purposes are present)

Overview of the bovine TB epidemic in Hampshire

History of bovine TB in Hampshire

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 do not, such as new TB incidents per number of herds or tests¹.

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 (AFUs) 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 annual number of new breakdowns (Figure 3) appears to have levelled off following steady rises from 2009 to 2016 with the exceptions of 2012 and 2015. This trend may be partially the result of the

¹The 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>

enhanced surveillance and control measures in cattle implemented in the Edge Area. Hampshire is a long way off achieving OTF status of less than 1% incidence and has little chance of achieving this by 2025.

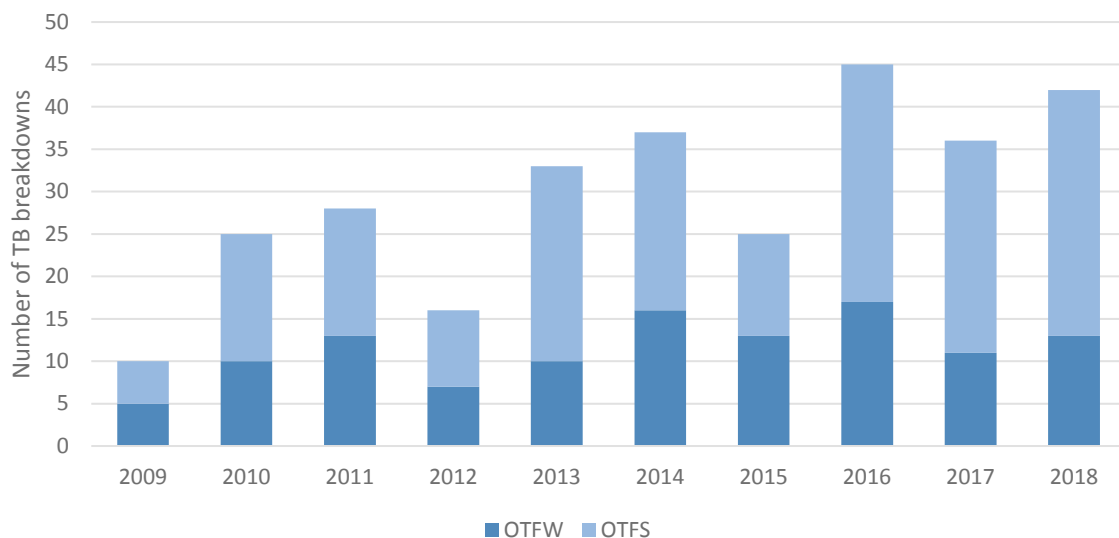


Figure 3: Annual number of new TB breakdowns in Hampshire 2009-2018

The trends of annual herd incidence rate and prevalence mirror that of annual outbreak numbers (see Figures 4 and 5) with 2018 figures for all three measures marginally greater than 2017. Prevalence was at the highest recorded level for the county at the end of 2018 with 2.5% of herds under restriction.

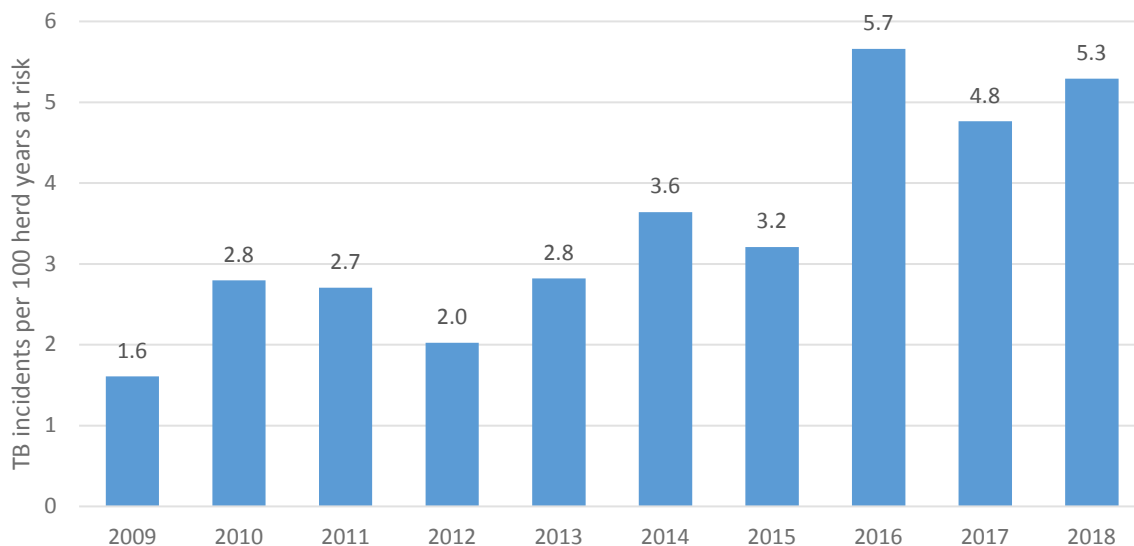


Figure 4: Annual herd incidence rate (per 100 herd-years at risk) for all new breakdowns (OTFW and OTFS) in Hampshire 2009-2018.

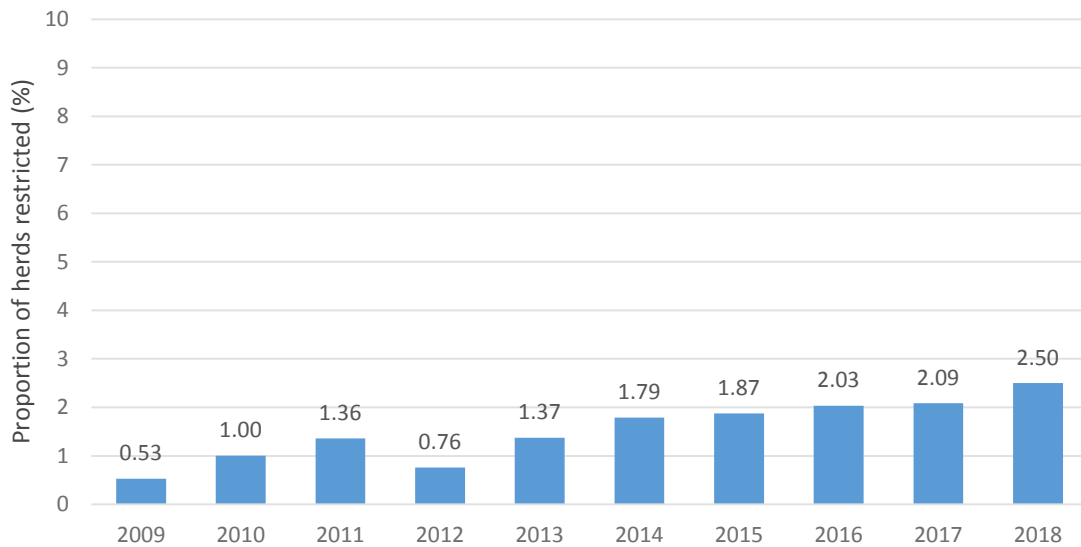


Figure 5: Annual end of year prevalence of restricted herds in Hampshire 2009-2018.

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

There is very little correlation between cattle or holding densities and TB breakdowns. The geographical spread appears to be random (Figure 6) and evenly spread across the county with no clustering apart from the north-west presumptive endemic area.

There have been no noticeable changes in husbandry practices or risk factors in Hampshire since the last report.

There have been no cases of TB in domestic or wild animals confirmed in Hampshire during the reporting period.

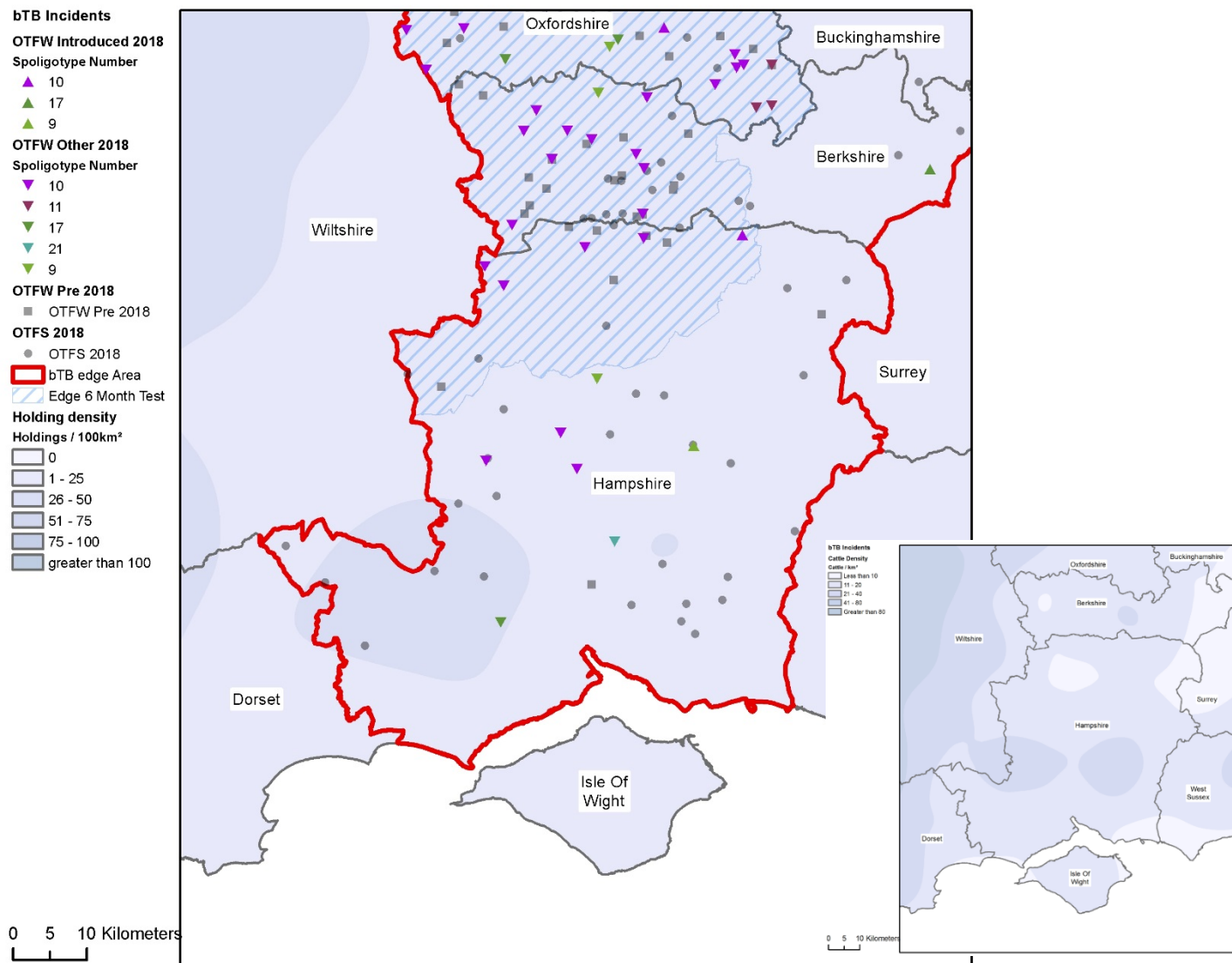


Figure 6: Geographical distribution of all new TB breakdowns (OTFS and OTFW) in 2018 and pre 2018 OTFW breakdowns still ongoing at the end of the report period, overlaid on a cattle holding density map, with a cattle density map for the area inset.

The genotypes found in 2018 mirror that of previous years with genotype 10:u being confirmed in the north along the border with Berkshire, genotype 10:a in the north western quadrant and other genotypes (9:d, 9:f, 17:a and 21:a) to the centre and south. Referring to Figure 7 (all breakdowns attributed to infected wildlife as most likely source), this remains consistent with previous conclusions of genotype 10:u (pink 3km zones – hatched for 2018) being endemic along the Hampshire/Berkshire border, genotype 10:a (grey km zones – hatched for 2018) having historically spread into north-west Hampshire from Wiltshire and other genotypes (Figure 6) being attributable to movement or purchase of stock and occurring in non-endemic areas. A breakdown for which genotype 10:a was isolated near Andover may indicate further spread southwards of the endemic area into the annual surveillance testing area of the county and beyond the six monthly surveillance testing area located in the endemic north western sector. A larger overview map in Figure 8 shows how this pattern of spread from the west is mirrored further north in Oxfordshire also involving genotype 10:a.

Genotype 10:a has been at a steady level of four cases per year for the past four years apart from 2017 when this genotype was not isolated in Hampshire. Geographically it is a concern that at least two cases of this genotype have occurred outside its presumed endemic area within the six-monthly surveillance testing area.

Genotype 10:u has declined from a high of seven cases in 2014 to level out at three cases per year for 2017 and 2018. It has remained in an area along the Hampshire/ Berkshire border and has spread east rather than south.

In 2018 3km radial testing of cattle herds was introduced around all OTFW breakdowns detected in the annual surveillance testing areas. In one case this involved creating five zones because the owner of the breakdown herd that triggered the radial testing is a conservation grazer who operates over multiple sites in Hampshire.

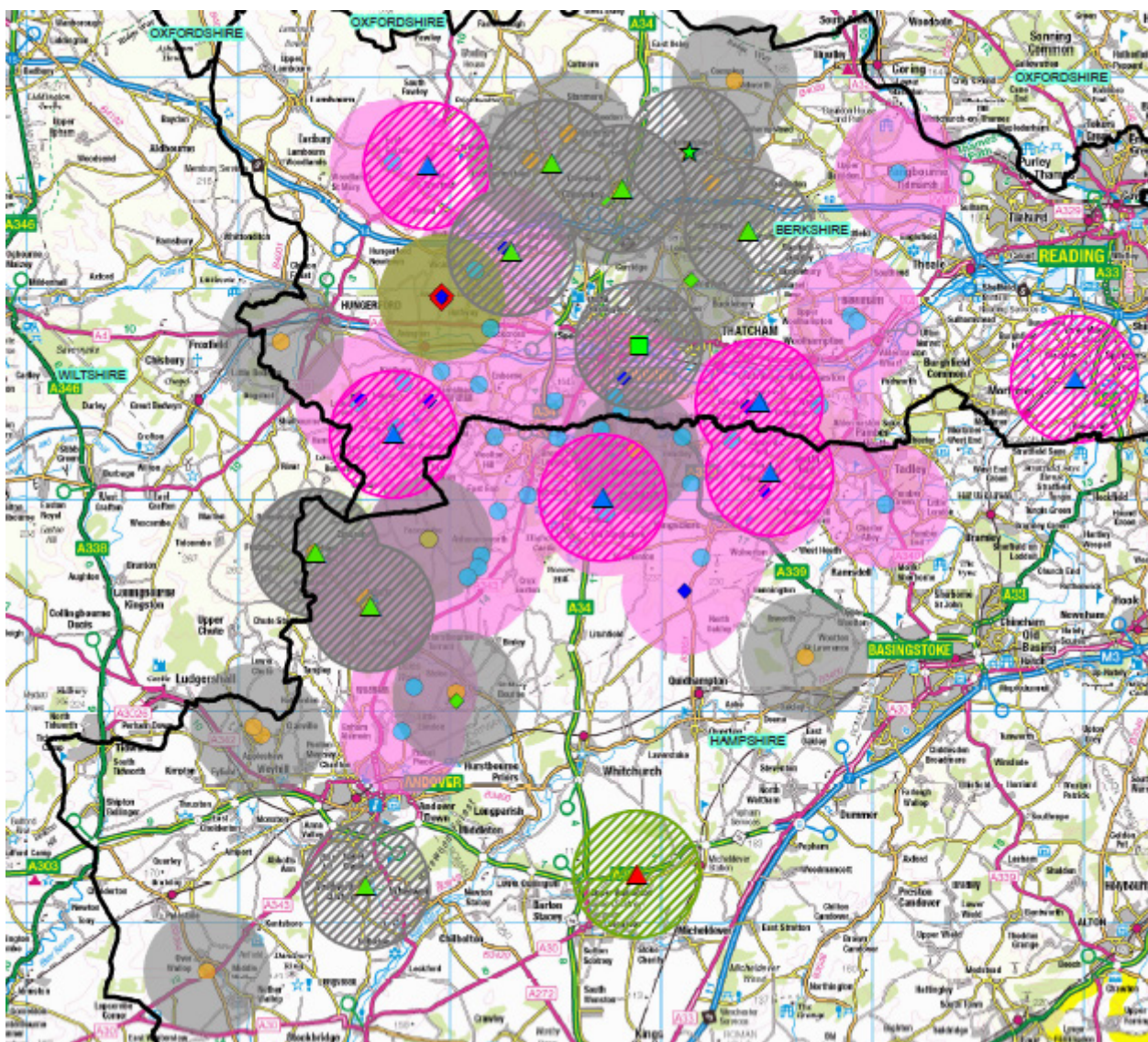
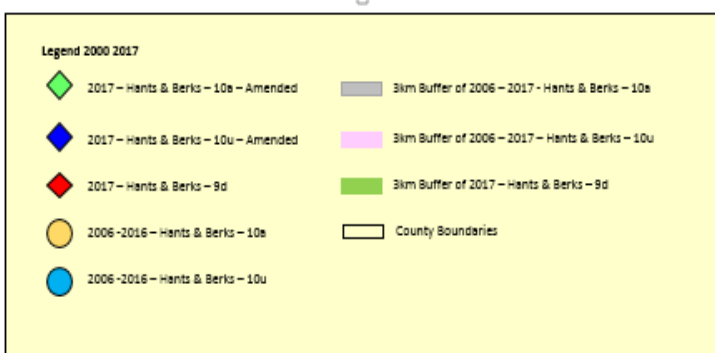
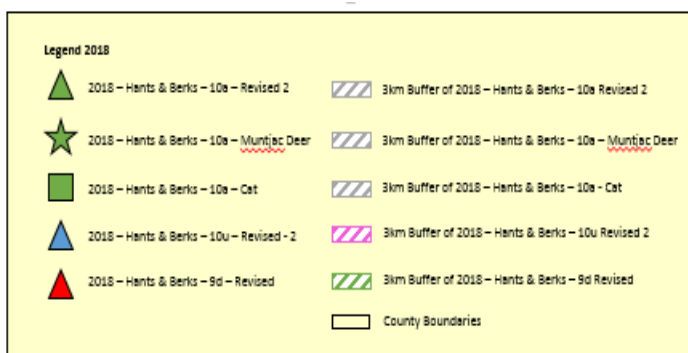


Figure 7 (legend below): Genotypes detected in Hampshire where a wildlife source was attributed as most likely (75% certainty), providing an indication of endemicity within local wildlife populations (OTFW breakdowns only) – only north-west of the county apparently affected.



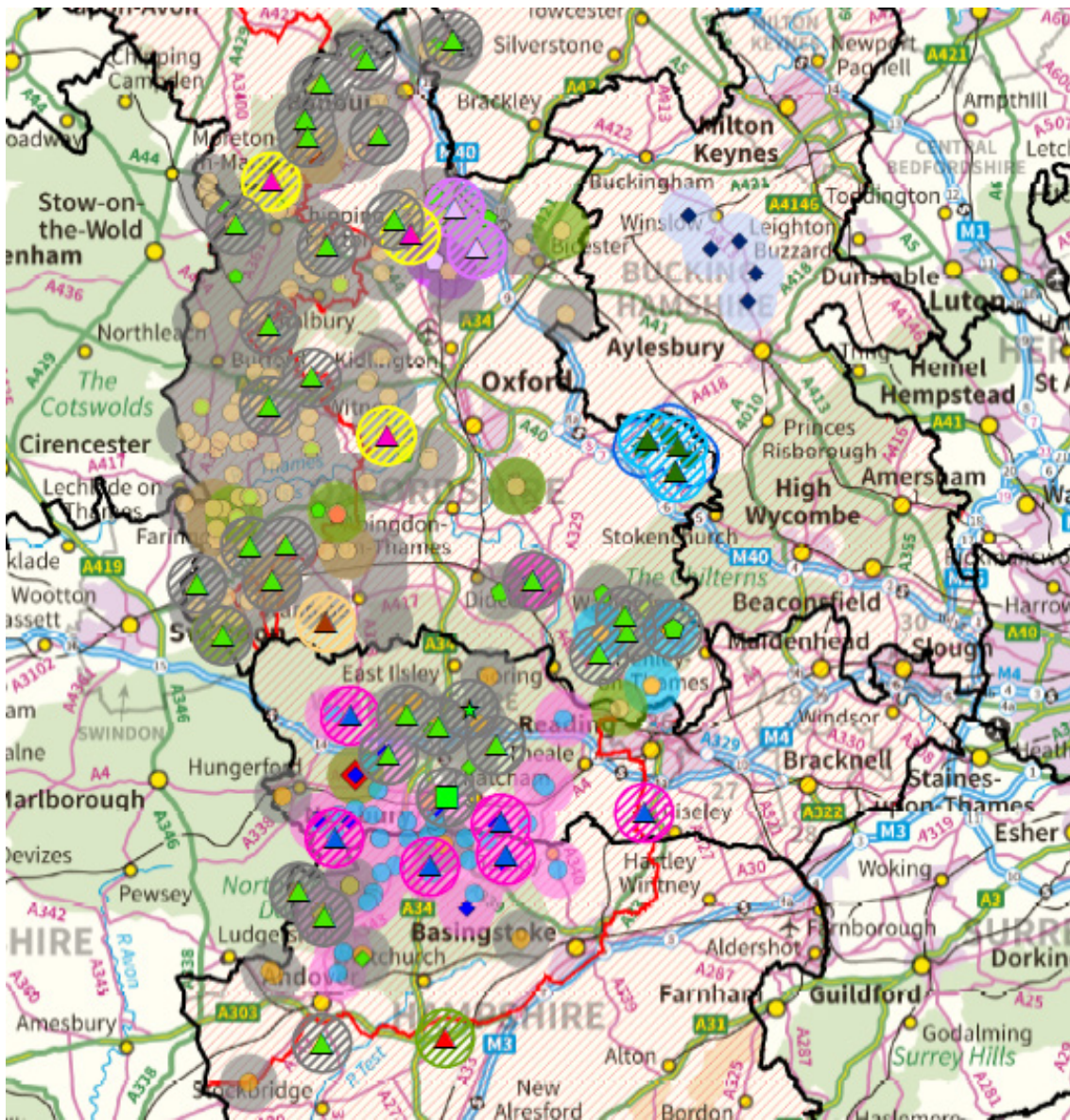
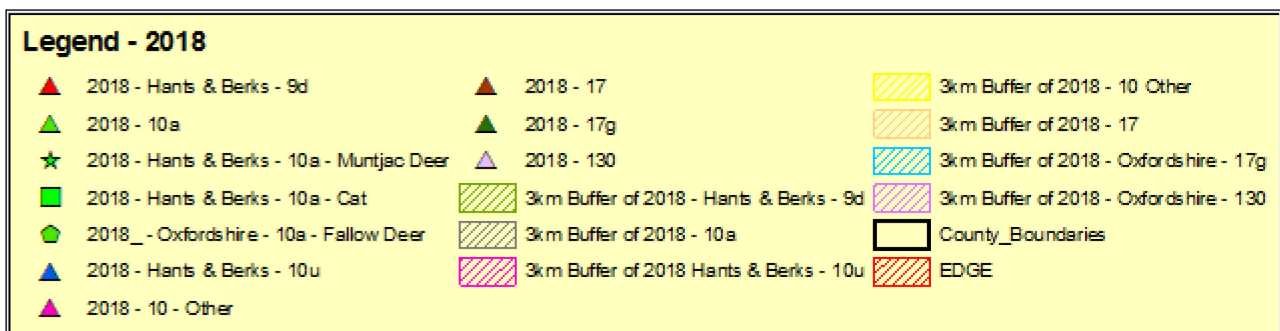
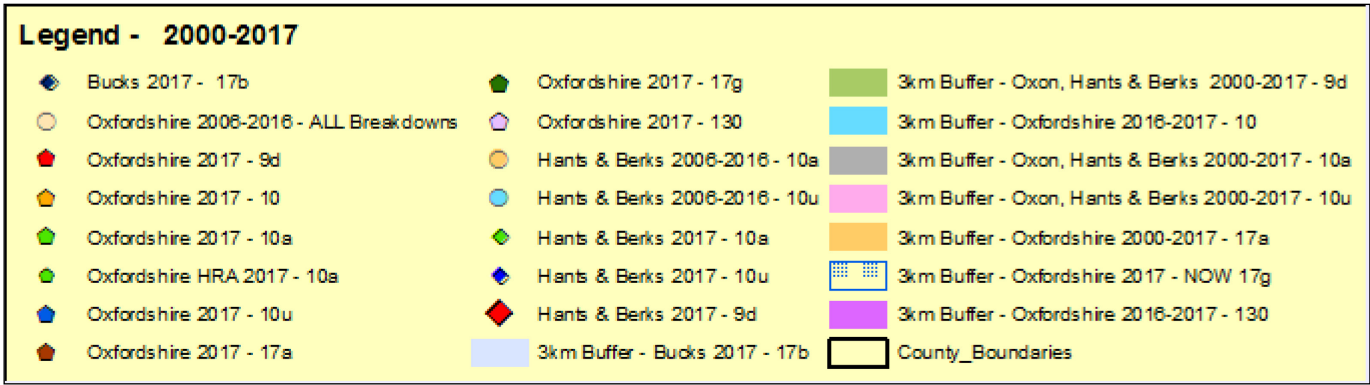


Figure 8 (legend below): Overview of Oxfordshire, Berkshire, Hampshire and Warwickshire genotypes attributed to wildlife source breakdowns (OTFW breakdowns only). Note grey circles (including those hatched representing 2018 cases) represent 10:a, pink - 10:u, light blue - 17:g, yellow – genotypes related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





Descriptive epidemiology of bovine TB in (Hampshire)

Characteristics of bovine TB in (Hampshire)

There was a high proportion (over 50%) of breakdowns in larger herds (>200 cattle, which comprises 12% of all herds). This is consistent with large herd size being a predisposing risk factor for TB breakdown (Figure 9).

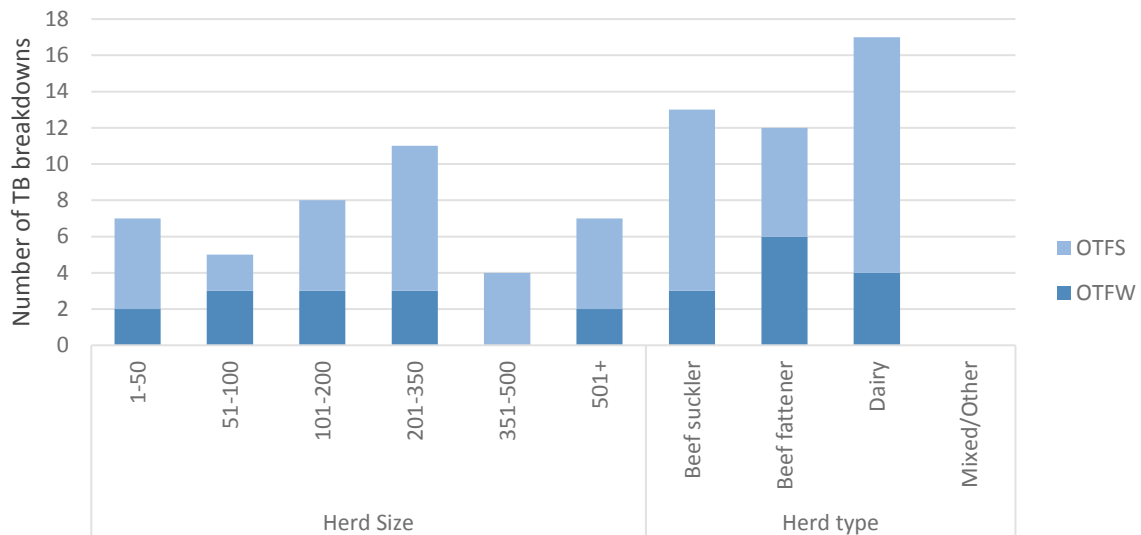


Figure 9: Number of new TB breakdowns (OTFW and OTFS) in Hampshire, by cattle herd size and type.

The monthly pattern of breakdowns (Figure 10a) tended to mirror when most TB testing was carried out (Figure 10b). The peaks in March and April may also relate to cattle becoming infected during the winter housing period.

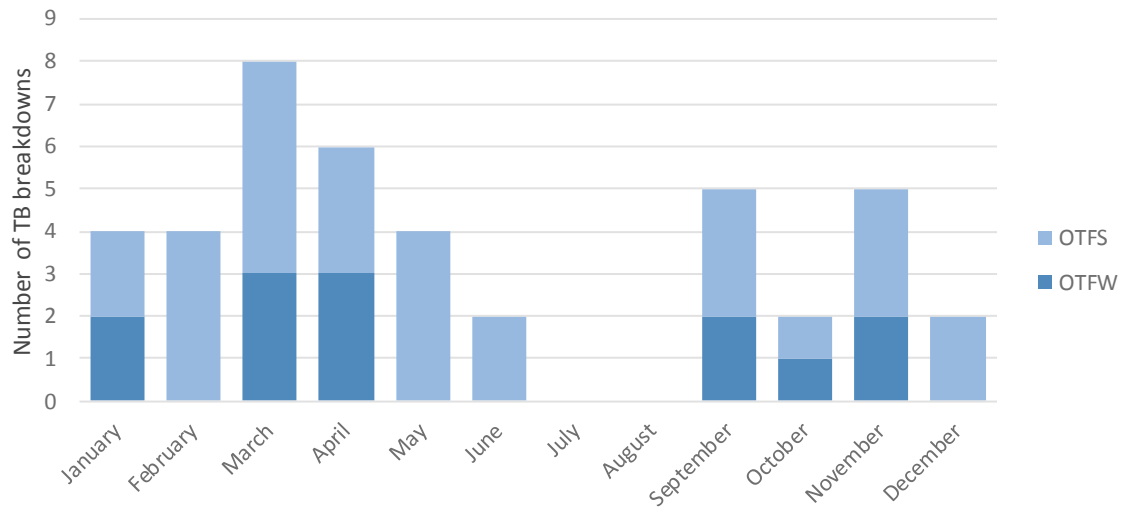


Figure 10a: Number of new TB breakdowns (OTFW and OTFS) in the county, by month of disclosure.

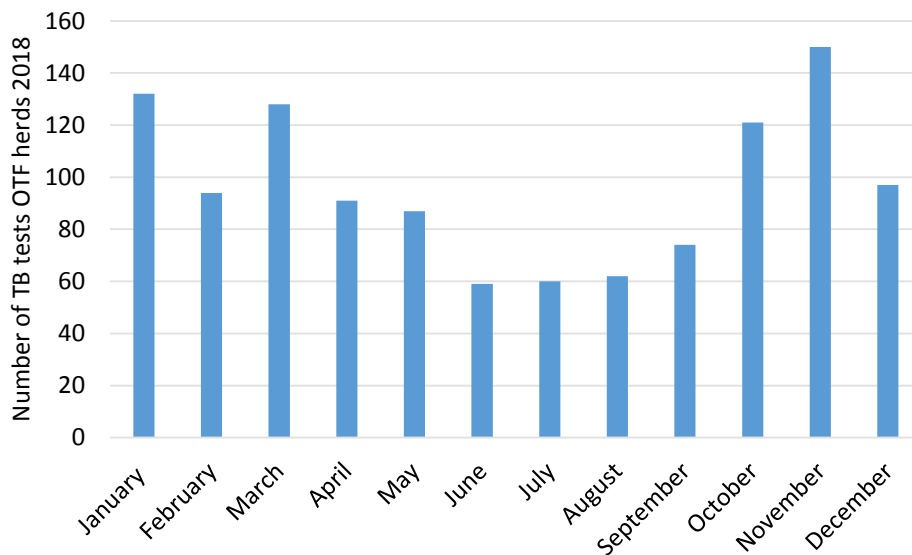


Figure 10b: Monthly number of TB tests carried out on OTF herds in 2018

Referring to Figure 11, the two genotypes 10:a and 10:u, which are endemic in areas of north and west Hampshire, continue to constitute over 75% of the total number of genotypes detected. The other three genotypes isolated in 2018, 21:a, 9:d and 9:f are likely to be the result of movements of infected cattle.

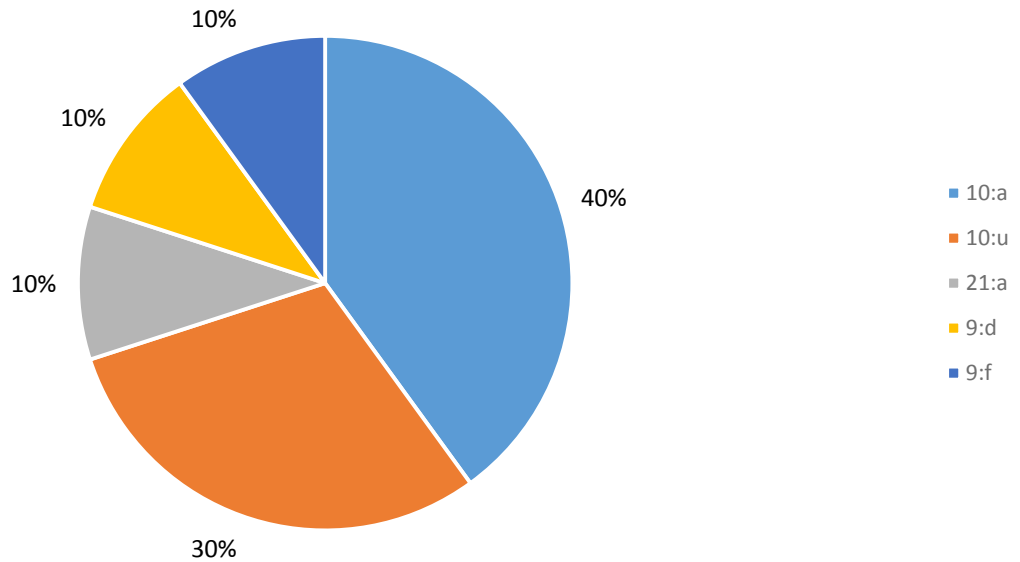


Figure 11: Genotypes of *M. bovis* (OTFW only) identified in the county in 2018

As shown in Figure 12, the majority of breakdowns resolved within 151-240 days or 241-550 days. Those which resolved within 151-240 days were likely to have passed either the minimum of two, or three short interval tests before restrictions were lifted. Infection appeared to be cleared fairly swiftly from over half the breakdowns in the county. However, this observation is caveated by the possibility of left-over non-disclosed infection for some herds at the end of breakdowns which contributes partially to the relatively high recurrence rates (Figure 16). One persistent OTFS breakdown (more than 18 months under restrictions) which started in July 2016, 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 limited outlets for these cattle and usually with less of a return, or if feasible are forced to 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.

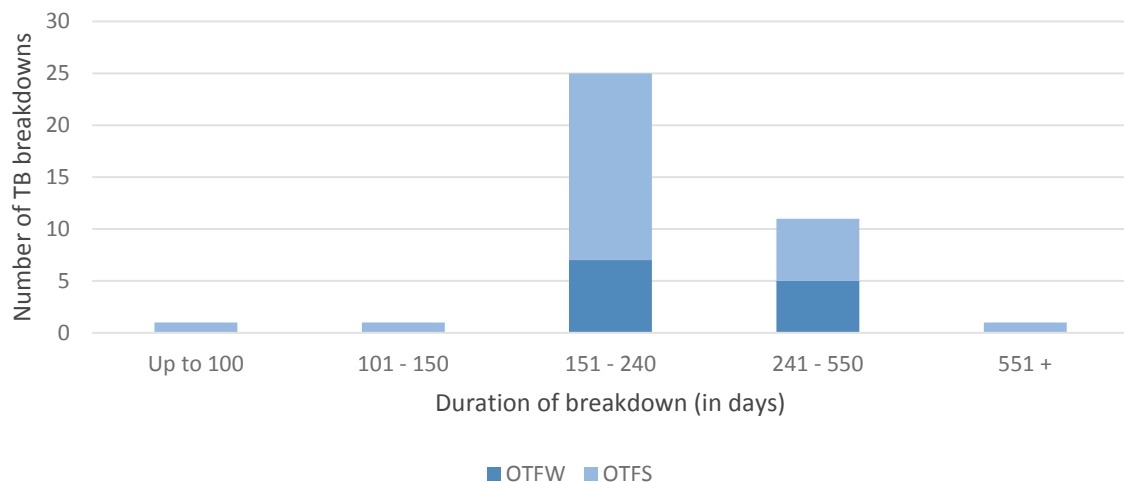


Figure 12: Duration of closed TB breakdowns (OTFW and OTFS) in the county in 2018

Risk pathways for bovine TB herd infection in Hampshire

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 infection sources accounting for over half of the weighted source attribution for all breakdowns, as shown in Figure 13. Residual infection where a herd is thought not to have been totally cleared of disease at a previous breakdown appeared to be a significant factor in about a fifth of breakdowns.

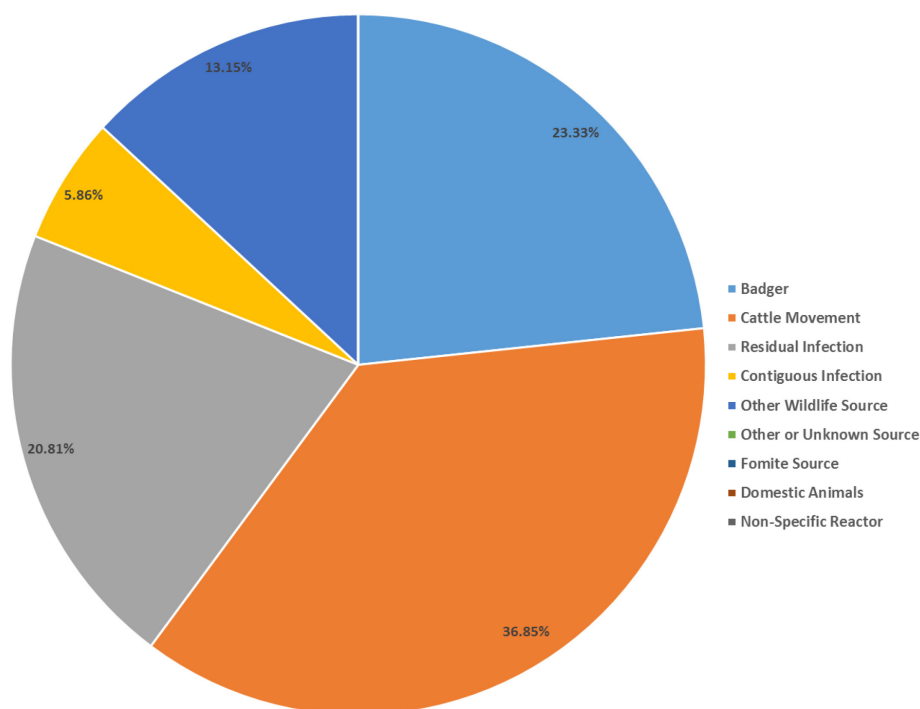


Figure 13: Summary of the weighted source of infection attributed for all incidents (both OTFW and OTFS) in the county that started in 2018

Role of other species in Hampshire:

Badgers and other wildlife

Anecdotal evidence suggests that badger and deer populations are continuing to increase. There are no known feral populations of pigs in Hampshire.

There was no evidence for spread of endemic infection from the HRA counties of Dorset and Wiltshire into Hampshire, with no new breakdowns with endemic genotypes occurring in 2018 along the previously unaffected sections of county borders. Confirmed breakdowns of genotype 10:a remain stable in the parishes along the Wiltshire border. The Defra-funded Found Dead Badger Survey in Hampshire failed to reach its intended target numbers and it would be difficult to draw conclusions from the findings. No report of the survey has been published.

Other domestic species

No cases were reported in other domestic species in 2018.

Detection of cases in Hampshire

Methods of detection include slaughterhouse surveillance, routine testing, trace testing from OTFW breakdowns, pre-movement testing, contiguous testing and radial testing, as shown in Figure 15. Almost half of breakdowns were detected by the annual whole herd test (WHT). Over a quarter were disclosed by post-breakdown testing (6M and 12M) suggesting a significant problem with recurrence as also evidenced by 36% of 2018 breakdowns having had a TB breakdown within the previous three years (Figure 16). It should be noted that in the endemic area 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 in the area. It is too early to see what impact six-monthly routine surveillance testing has had in the north-west of the county.

Only a small number of breakdowns were detected by slaughterhouse surveillance, radial and pre-movement testing suggesting that the 12 month testing interval in the majority of the county is adequate to detect disease early.

Over the last three years the epidemic appears to have plateaued in Hampshire in relation to overall numbers of breakdowns: 45 in 2016, 36 in 2017, and 42 in 2018. There is concern regarding a genotype 10:a breakdown confirmed outside the endemic area which does not seem to have been related to cattle movements. This could point to an extension of the wildlife endemic area around Andover.

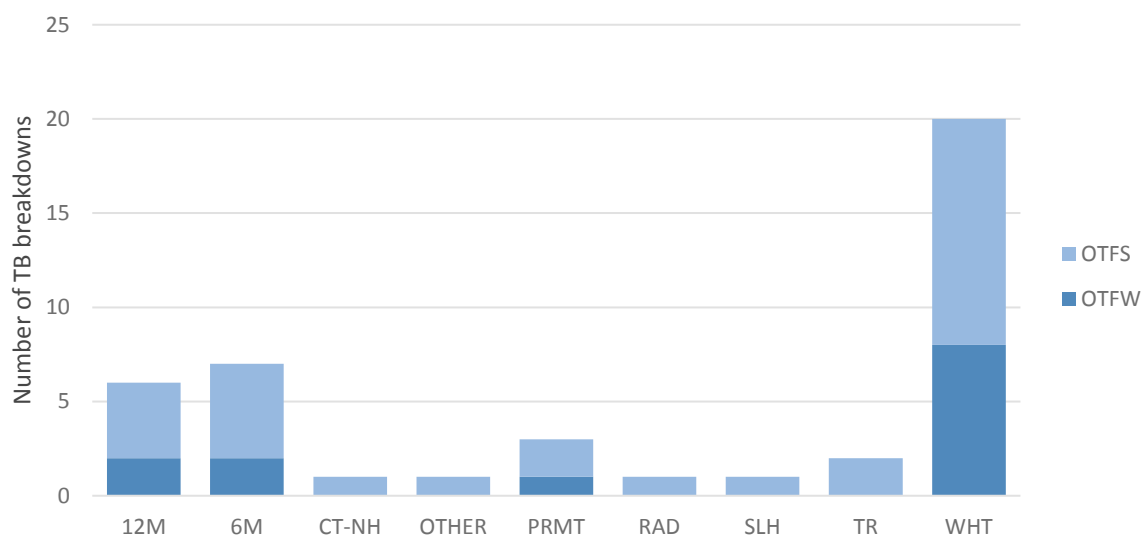


Figure 15: Number of TB breakdowns (OTFW and OTFS) in Hampshire in 2018, disclosed by different surveillance methods (surveillance method types are further described in the Explanatory Supplement¹).

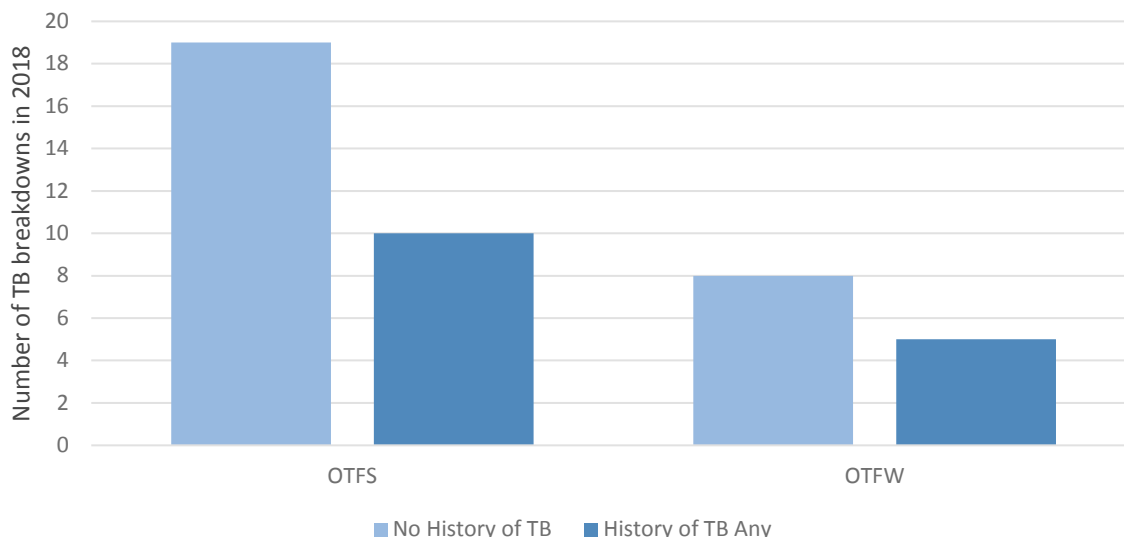


Figure 16: Number of TB breakdowns (OTFW and OTFS) in Hampshire which experienced a breakdown in the previous 3 years.

Burden of bovine TB

In Hampshire there were 328 cattle compulsorily slaughtered due to bovine TB in 2018 (Figure 17). This was higher than in previous years, although similar to 2016 (304). Of those 328 cattle, 177 were skin test reactors and 151 were detected by interferon gamma testing. The average number of reactors identified and removed per breakdown was also highest in 2018 at 7.8 compared to 3.9 in 2017 and 6.8 in 2016, with some farms severely affected by reduced stock numbers and difficulties in replacing those removed.

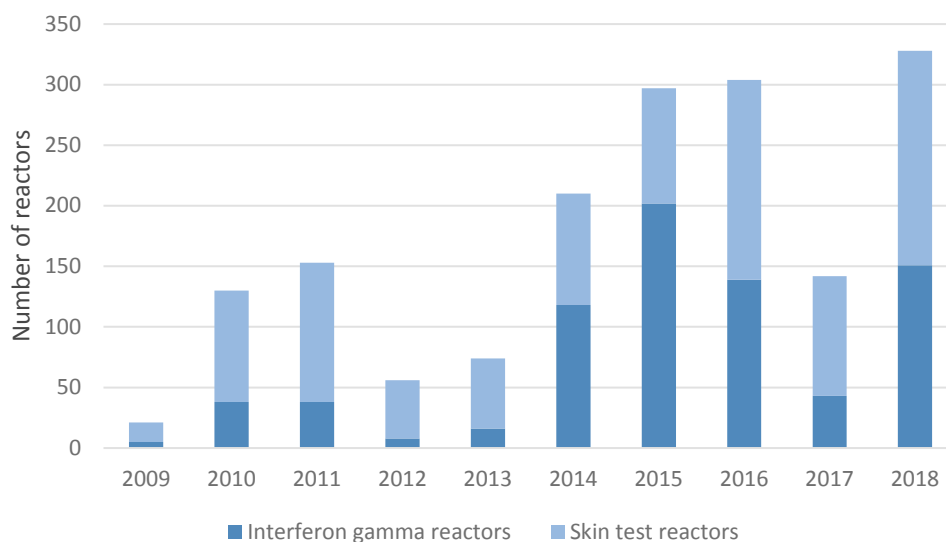


Figure 17: Number of reactors detected by interferon gamma and skin tests in Hampshire 2009 to 2018

Key drivers of the bovine TB epidemic

Two factors are driving the epidemic in Hampshire. One is farmers purchasing cattle from the HRA either as calves or as stores to fatten. These cattle were sourced either directly from farms or more often through HRA markets such as Salisbury (Wiltshire), Frome (Somerset) or even as far west as Sedgemoor (Somerset). The other is the continuing presence of a reservoir of infection in wildlife in the northwest of the county. In order to reduce and eventually eradicate TB, both of these drivers need to

be addressed by control measures. Encouragement is required for farmers to employ responsible purchasing by taking into account TB risk when buying cattle. On-farm biosecurity measures are required to reduce both direct and indirect badger-cattle interactions, and consideration of wildlife interventions in the form of badger vaccination and/or culling.

County summary

The number of new breakdowns, annual herd incidence rate, and herd prevalence were marginally greater in 2018 than in 2017. Prevalence was at the highest recorded level for the county at the end of 2018 with 2.5% of herds under restriction. Hampshire is a long way off achieving OTF status and has little chance of achieving this by 2025. Further measures to control cattle movements, and robust wildlife interventions are required.

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

The closest distance to the LRA from the genotypes 10:a and 10:u endemic area in the north west of the county is Surrey, about 20km along the northern boundary of Hampshire. However in the path of this infection front, if it continues to spread, is the large conurbation running south to north comprising Farnham, Aldershot, Farnborough and Camberley. This may present a geographical barrier to wildlife spread and also has low cattle density.

There is not a large trade in cattle from Hampshire to the Isle of Wight (LRA) as there is no market in Hampshire and the cost of ferry transportation is often prohibitive. Purchasers on the Isle of Wight are more likely to have purchased stock from HRA markets. The lack of a market in Hampshire may therefore increase the likelihood of infected animals reaching the island.

Conservation grazing is a high risk operation as it often involves multiple moves of cattle through the grazing season over large areas of the county. This often involves Wildlife Trusts or the National Trust who either have their own herds or allow a third party to graze their land. This may be a route whereby infection moves closer to the LRA through cattle movements.

There were no OTFW herds close to the LRA which would give rise to concerns.

Summary of the risk to the Edge Area from the HRA

Purchase of cattle from markets in the HRA for rearing in Hampshire poses the threat of introduction of infection including the introduction of genotypes different from those already endemic in the county.

Movement of infected wildlife across the county border from Wiltshire and Dorset has been a threat for many years. However, the epidemiological picture from cattle infections suggests that this has only happened in the north west border with Wiltshire.

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

The endemic area of genotypes 10:a and 10:u in the north-west of the county is the southern tip of a large area that extends through the Edge counties of West Berkshire and into Oxfordshire (and is continuous with the HRA counties of Wiltshire and Gloucestershire to the west). Spread of endemic infection from Berkshire is likely to continue as this large endemic area expands.

Assessment of effectiveness of controls and forward look

Although the county incidence rate for TB in cattle has increased marginally in 2018 compared to previous years, the increasing trend over the last decade appears to have levelled off. This is most likely associated with several factors. These include the apparent low rate of spread of the endemic

area in the north-west, anecdotally more cautious buying behaviour of beef rearers, badger controls in adjacent HRA counties, and saturation effect for infection of farms in the endemic area.

It is probably too early to assess the effect of six-monthly routine surveillance testing in the northwest endemic area of Hampshire 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.

One online auction site based in Hampshire is trying to assist buyers in informed purchasing by providing a link to the ibTB interactive map² of TB breakdowns in England and Wales. This allows buyers to see the density of TB breakdowns in the area they are purchasing from, and the TB history of the farm selling the stock. This sort of initiative is crucial to reduce the amount of infection purchased into the county.

To reduce and ultimately eradicate TB in Hampshire, some wildlife control measures will be needed in the north-west portion of the county which might be badger culling or vaccination on a sustained and large scale. However, there were no Badger Edge Vaccination Scheme (BEVS) funded badger vaccination projects active in Hampshire in 2018 although there was one small area in the county licensed to carry out badger vaccination in 2018.

² ibTB interactive mapping tool - <https://www.ibtb.co.uk/>

APPENDICES

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

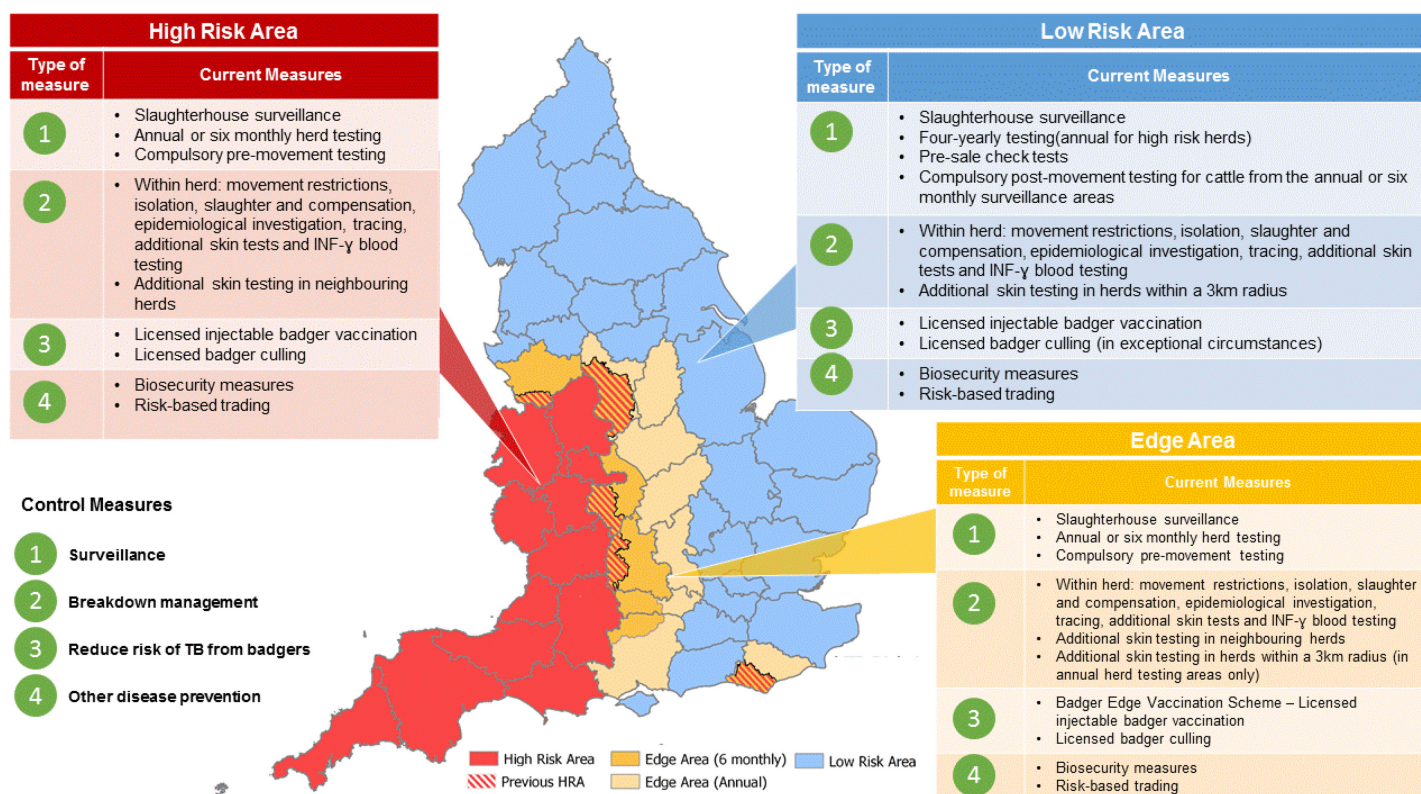


Figure A1: Bovine TB risk and surveillance areas of England effective since January 2018, as set out in the Government's Strategy for Achieving Officially Tuberculosis-Free Status for England³.

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 TB 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

³ <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)⁴

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

⁴ ibTB interactive mapping tool - <https://www.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	462	121	102	51	18	24	780	86.6680	35

Finishing units registered in Hampshire:

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

Common land in the county: There are 3,000 cattle which graze on the New Forest annually either all year round or for the summer grazing season. There are no barriers to prevent cattle movement over the whole 200 square miles of the 'perambulation' which makes separation of cattle groups difficult and therefore local knowledge is vital in analysing risk and formulating breakdown control strategies. The New Forest authorities have devised a specific TB control plan which includes measures to try to prevent infection being introduced to the common grazing areas from purchased cattle.

Cattle/herd purpose:

	Beef		Dairy		Dual purpose		Unknown		Total
	Number	%	Number	%	Number	%	Number	%	Number
Cattle	39791	58.9	24151	35.7	3658	5.4	1	0.0	67601
Holdings	687		248		264		1		

Appendix 3: Summary of the Hampshire 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	934	910	880
Total number of herd tests carried out in the period	938	873	954
Total number of OTF cattle herds TB tested during the period for any reason	778	764	751
Total number of OTF cattle herds at the end of the report period (i.e. herds not under any type of TB02 restrictions)	903	880	841
Total number of cattle herds that were not under restrictions due to an ongoing TB breakdown at the end of the report period.	915	891	858
Total number of new TB breakdowns detected in cattle herds during the report period	45	36	42
OTF status suspended (OTFS)	28	25	29
OTF status withdrawn (OTFW)	17	11	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?	10	7	6
New OTFW breakdowns triggered by skin test reactors or 2xIRs at routine herd tests	8	7	0
New OTFW breakdowns triggered by skin test reactors or 2xIRs at other TB test types (forward and back-tracings, contiguous, check tests, etc.)	8	5	2
New OTFW breakdowns first detected through routine slaughterhouse TB surveillance	1	0	0
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	N/A	N/A	1
OTFW	N/A	N/A	0
Number of OTFW herds still open at the end of the period (including any ongoing OTFW breakdowns that began in a previous quarter)	9	7	8
New confirmed (positive <i>M. bovis</i> culture) incidents in non-bovine species detected during the report period (indicate host species involved)	0	0	0

Animal-level statistics (cattle)	2016	2017	2018
Total number of cattle tested in the period (animal tests)	111988	97288	111536
Reactors detected:			
tuberculin skin test	165	99	177
additional IFN-gamma blood test reactors (skin-test negative or IR animals)	139	43	151
Reactors per breakdown	6.8	3.9	7.8
Reactors per 1000 animal tests	2.7	1.5	2.9
Additional animals identified for slaughter for TB control reasons (DCs, including any first-time IRs)	13	3	18
Private slaughters	6	2	3
SLH cases (tuberculous carcasses) reported by FSA	3	3	3
SLH cases confirmed by culture of <i>M. bovis</i>	3	1	0

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)	16	0	5	3	36.8%
Local contiguous infection - lateral spread from neighbouring holdings	5	0	1	0	5.9%
Exposure to infected wildlife	37	1	0	0	50%
Exposure to other farmed species	0	0	0	0	0%
Residual infection from a previous TB breakdown	9	1	5	0	20.8%
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 TB Control Programme in Hampshire

Summary of TB control measures specific to Hampshire:

5.1 Edge Area Testing Policy

- From January 2018 herds located in the north west 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.
- Discretionary removal of inconclusive reactors (IRs) as direct contacts (DCs) took place on a number of occasions in an effort to prevent spread within a herd and to shorten the breakdown.

5.2 Unusual TB breakdowns

- A persistent OTFS herd which commenced its breakdown in 2016 was resolved using the non-specific reactor protocol in January 2018. Unfortunately it returned to OTFS breakdown status at the 6M test.

5.3 Other Testing Measures

- Only one OTFS breakdown was detected as a result of radial testing. This suggests that, on the whole, 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.
- The number of overdue testing cases was minimal because of the efforts of APHA and Hampshire Trading Standards. Overdue testing therefore poses minimal risk to the county.
- Audits of Official Veterinarians by APHA took place resulting in recommendations for re-training for some.
- Regional meetings with farmers and their representatives have taken place led by TB Advisory Service (TBAS)⁵ but Hampshire does not currently have a local TB Eradication Group (TBEG).
- There has been liaison with local authorities in relation to their regular checks for overdue testing and illegal cattle movements which may have occurred whilst a herd is under movement restrictions.

APHA is an Executive Agency of the Department for Environment, Food and Rural Affairs and also works on behalf of the Scottish Government, Welsh Government and Food Standards Agency to safeguard animal and plant health for the benefit of people, the environment and the economy.

⁵ TB advisory service - <http://www.tbas.org.uk/>