BRUE VALLEY BIG BAT SURVEY 2015

Somerset Bat Group

Sedgemoor IN SOMERSET

NATURAL ENGLAND

Bat Conservation Trust

CONTENTS

SUMMARY

The Somerset Big Bat Surveys were developed as part of the Mendip Hills Living Landscapes project in 2007. The first Brue Valley Big Bat Survey took place in 2013 – this is the third year of the project. Funding has kindly been provided by Natural England, the Bat Conservation Trust and Sedgemoor District Council.

The survey assessed bat activity over specified transect routes with predefined stops and walk sections. Seventeen routes were defined in 2013 but only a selection of these have been surveyed each year (fifteen transects in 2013, nine transects in 2014, eleven transects in 2015); the reasons for this are partly to ensure a minimum of three surveyors per team and partly to increase coverage of the survey area. The routes were walked in 'normal' and 'reverse' directions in alternate years. Thus, in 2013 and 2015, the transect began at walk 1 and finished at point 6; in 2014 the transect began at point 6 and finished at walk 1 This makes little difference to the middle hours of the survey but the earliest and latest sections vary year on year.

Bat activity was recorded as the number of bat passes. For nine transects walked each year there is three years of data available with two years of 'normal' direction transect data and one of 'reverse' direction transect data. There are two years of data available for one transect, and six transects have only been surveyed once. 2015 saw the greatest number of bat passes in total for the two 'normal' direction transects but was lower than the 'reverse' direction transect. Further survey data will be necessary to determine whether this is random fluctuation or a definite change.

2015 saw the greatest number of bat passes for all the transects that were walked during this survey. As transects included in the survey differed between years, comparing each year's total dataset is likely to be less relevant than comparing data from those transects surveyed for each of the three years. This is due to the high degree of unknown variation that will be present between transects, thus meaning that data from different transects will not be directly comparable with one another. However, these differences will become less significant over a larger dataset.

Salient points with regard to passes by individual species or groups of bats are as follows:

- Eleven species of bats and seven genera of bats were recorded.
- The greatest number of bat passes were, as in both previous years, from soprano pipistrelle. The common pipistrelle bat was recorded at less than half the number of passes compared with soprano pipistrelle.
- Nathusius' pipistrelle was found at another few locations, and has now been recorded at Ham Wall & Wooton Heath, Yeaps Bridge, Catcott Heath and Shapwick Heath, all sites which have been recorded for all three years.
- The percentage of passes ascribed to the group of *Myotis* species has been fairly consistent for the three years when comparing transects that have been recorded for all three years although with a slight drop in numbers. There were a significant number of *Myotis* species recorded in 2013 along transects that have not been re-visited. Therefore, although the overall total might appear concerning, in reality this variation is caused by different transects being surveyed each year and where the same transects have been surveyed the variation is lower and could be ascribed to changes in weather patterns.
- Lesser horseshoe bat passes were the lowest at 3 passes and 0.1% of the total passes. Greater horseshoe bat passes represented the highest number over the three years of the survey when looking at total survey data, but most of these records were from transects that have only been surveyed once or twice – looking only at transects that had been surveyed for three years, 2015 actually saw the lowest number of greater horseshoe bats with only one recorded.
- The number of serotine bat passes was much greater in 2015. There was a general increase in passes, but higher than expected numbers of passes were recorded at Catcott Heath, West North Wooton and Church Moor (all surveyed in all three years).
- The number of noctule bat passes was still below the large number recorded in 2013 but not greatly so when it is borne in mind that over 80% of the 2013 records came from one point in Transect 15, Hulk Moor, which has not been surveyed since.
- Leisler's bats were recorded at low levels at West North Wooton (surveyed for all three years) but 13 were recorded at Gold Corner (2015 is the first year this transect has been surveyed). This species has only recently been confirmed to be present in Somerset as several injured Leisler's bats were found grounded in Taunton. Its appearance in widely separated parts of the valley is very encouraging.
- In 2015 barbastelle bat passes have been recorded at Shapwick Heath, Ham Wall & Walton Heath, Yeaps Bridge and Church Moor, all transects that have been surveyed for three years but they were not re-recorded at Catcott Heath which has also been surveyed for three years.
- Long-eared bat passes have remained quite consistent over the three years, both as a total figure and with regard to transects that have been surveyed for all three years. This genus is notoriously hard to

record as it may not use echolocation to catch its prey and there is likely to be far higher activity than the survey suggests.

In 2015 35 participants volunteered their time for the survey. Although lower than other Big Bat Surveys in the Mendip Hills and Blackdown Hills, the enthusiasm for surveying the Brue Valley is high and the results of the surveys are showing some unexpected distribution patterns, and are adding greatly to our knowledge of rare bats throughout the county.

ACKNOWLEDGEMENTS

Somerset Bat Group (SBG) ran the third Brue Valley Big Bat Survey which was kindly funded by Natural England, the Bat Conservation Trust and Sedgemoor District Council.

The survey depended on the enthusiasm and expertise of local volunteers devoting their time to walking transects, mapping and describing the results and spending hours analysing the sound recordings. This has given an opportunity to build on the findings of the previous surveys and provide more data of a kind that could not be recorded in any other way.

Seventeen transects were designed prior to the initial survey in 2013 by Cath Shellswell, Dave Cottle and the late Lou Pickersgill. A selection of these seventeen have been surveyed each year that the project has run, therefore some transects have been surveyed each year, others only once or twice.

The administration and organisation of the survey was largely by Cathy Horsley of the Somerset Environmental Records Centre, whom also undertook the essential task of manning HQ on the night. The sound analysis was carried out by the Edward Wells and Cath Shellswell and the maps and tables in this report by Laura Quinlan and Cath Shellswell. Ann Fells of the Somerset Environmental Records Centre undertook further analysis of the data and helped with the evaluation of bat activity.

Special thanks to:

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All the land holders that allowed the survey to take place around their holdings.

Cover photograph: Nathusius' pipistrelle and common pipistrelle © Paul Kennedy

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1. INTRODUCTION

The Somerset Big Bat Surveys were first conceived for the Mendip Hills Living Landscape and ran from 2007 and 2012. A second survey for the Blackdown Hills has been run between 2011 and 2015. The Brue Valley Big Bat Survey is a landscape survey to collect comparable data across an area of the Somerset Levels with a methodology derived from the Somerset Big Bat Surveys.

The first Brue Valley Big Bat Survey was undertaken in 2013, and has been repeated twice more in 2014 and 2015. The surveys have received national attention and acclaim following presentations at various conferences including Bat Conservation Trust SW Regional Conference and the National Bat Conference. On average, the Brue Valley Big Bat Survey is well attended with approximately 30 participants each year.

Funding has been kindly provided by Natural England, the Bat Conservation Trust and Sedgemoor District Council.

The Brue Valley was chosen as the focus as it considerably differs from both the Mendip Hills and the Blackdown Hills. Those are regions of un-intensively managed pasture and woodland with relatively little standing water. The moors and levels of the Brue Valley are low-lying very wet pasture, at and even below sea level. Except for the conservation managed swathe of the Avalon Marshes there is little woodland. The fields are stocked with cattle and much of the grassland has been agriculturally improved and is much lusher and less species rich than on the shallow limestone of the Mendips or the leached uplands of the Blackdown Hills. In 2014 it became clear that whereas in the Blackdown Hills common pipistrelles (*Pipistrellus pipistrellus*) were very much more recorded than any other species, the dominant species in the Brue Valley was the soprano pipistrelle (*P. pygmaeus*), a bat believed to be more often associated with open water. It was anticipated that the 2015 surveys might add more credence to that finding. In addition, there have been recordings of Nathusius' pipistrelle (*P. nathusii*), a particularly rare bat in the UK, and the wet open areas have been identified as prime foraging areas for this species. It is unknown whether the Brue Valley plays a part in this resource and whether Nathusius' pipistrelles are regular visitors.

As in previous surveys the main purpose was to obtain data by using a repeatable method and specifically to obtain flight records that could inform and improve our understanding of how bats use the landscape. Most flight records are by their nature anecdotal and often hard to verify or interpret. By recording the bat passes both on a form and on a recording device it was possible to collect evidence of activity that was capable of being analysed objectively. Some roosts on or near transects are known and it may be possible to relate some of the activity to those populations but there are a great many more bats whose day roosts are not known at all and the data collected in this survey may help us to know where we should be looking.

There are 17 species of bat known to breed in Britain and 16 of them are known to be breeding in Somerset. Some of the data from other surveys has been used successfully to support and direct agri-environment schemes enhancing conservation and providing a source of funding for landowners. In the new agri-environment scheme, Countryside Stewardship, launched in January 2015, horseshoe bats (*Rhinolophus* spp.) are target species for management options and increase the likelihood of land managers with these bats to enter the scheme if they are willing to carry out management options beneficial for these species. This would have a knock-on effect for other bat species associated with wet landscapes such as Daubenton's bat (*Myotis daubentonii*) and soprano pipistrelle. Therefore those who own and manage the land included in the survey transects can learn and profit from the findings of such surveys.

Bats are highly mobile, opportunistic feeders and the presence of bats is in itself an indication of the insect abundance and diversity of an area. The National Bat Monitoring Programme is now regarded as part of National Statistics along with data gathered on farmland birds, and although the Big Bat Surveys are not combined with this data, it does emphasise the importance of bats regarding their place in the ecosystem and as an ecosystem service. By repeating such surveys it may be possible to identify changes from year to year, and that in itself may give early warning of a less favourable condition of the land from a wildlife perspective.

Another reason for such a survey is to give non-expert local people a chance to help do something positive but very different for their local wildlife and to give them an experience of the wild world which is not usually available to them. The huge popularity of the Big Bat Surveys and of the bat walks that SBG has run for some years with Natural England at Shapwick Heath are an indication of how special the experience is for people. There is a magic in glimpsing the world of the creatures of the night and even hardened bat workers can still feel a thrill at hearing a species they did not expect.

2. METHOD

2.1 Survey

Prior to commencement of the first Brue Valley Big Bat Survey in 2013, seventeen predetermined routes were mapped and planned for surveying (Figure 1). These transect routes were designed to be walked simultaneously and comprised of a series of six walking sections and six stationary points.

The transects are designed to take between 1.5 and 2 hours to complete and to use public rights of way. For safety reasons they normally avoid busy roads. As far as possible each transect traverses a variety of habitats including water, woodland and pasture. Many are wholly or in part across land in conservation management.

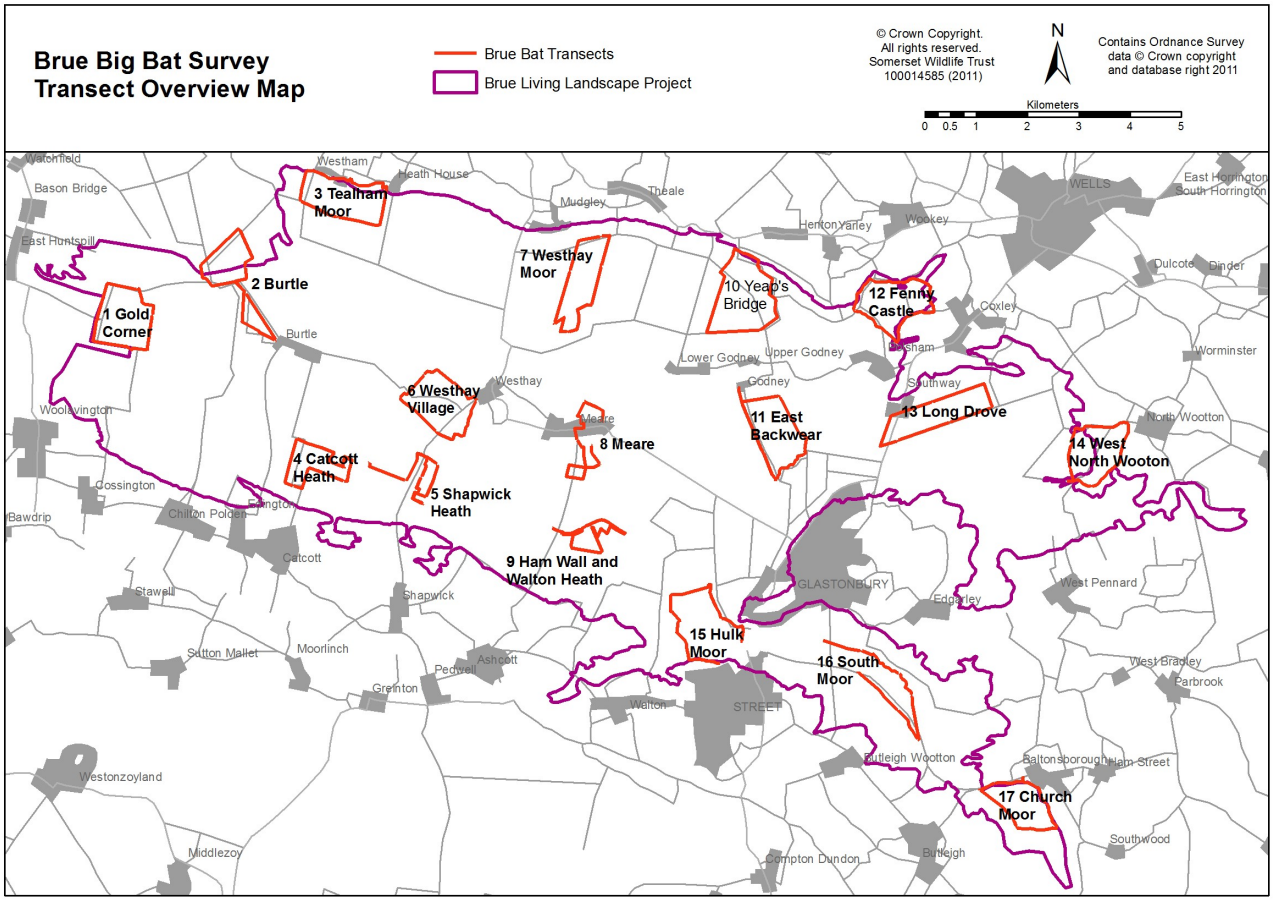


Figure 1: Map of the bat transects undertaken as part of the Brue Valley Big Bat Survey

The transects are designed to be walked in a reverse direction in alternate years in order to decrease data inconsistencies caused by different species of bat being active at different times of night, i.e., if a species is active only at a particular point along a transect at a particular time, it will be missed if the survey team at a different location along the transect at that time. Therefore in 2013 and 2015 transects were walked in the 'normal' direction, in 2014 they were walked in the 'reverse' direction.

The survey took place on 14th August 2015. Eleven of the seventeen transects were surveyed in their entirety by teams of a minimum of three volunteers. Each transect consisted of six stops of five minutes and six walk sections lasting an average of about ten minutes. The stops were located where there were potentially significant landscape features and the walks were mainly along established footpaths for the comfort and safety of the volunteers. All landowners along each transect were asked for permission to access their land.

Before starting the surveys, the volunteers met for a brief health and safety talk and then travelled to the beginning of their transect. Four to six individuals with a mixture of bat experience from beginner to very experienced were assigned to each group.

The volunteers were provided with maps of the transect which they were surveying, a risk assessment and asked to walk the route in daylight for safety prior to the survey. Further information that was provided to volunteers is available from the Somerset Environmental Records Centre.

The surveys started at 21:00 and finished at approximately 22:30. The teams listened to bats using heterodyne, time expansion or frequency division bat detectors and listed what they heard in each section.

One person in each group recorded the route continuously using a wave recorder and a frequency division Batbox Duet Bat Detector. The recordings were assigned to separate tracks for each section and analysed to count the number of bat passes in each section and, so far as possible, assign those passes to species.

One member from each group took the recordings and survey forms back to the Lifelong Learning Centre at the Avalon Marshes Centre.

2.2 Sound Analysis

Each transect's recordings were analysed using BatSound software.

The number of bat passes made by each species or genus was counted to provide a measure of bat activity along each walk section and stop section.

A bat pass is a continuous stream of echolocation calls indicating a bat flying past. A sequence of calls interrupted by a feeding buzz (a rapid accelerating set of calls indicating the capture or attempted capture of prey) was treated as two passes. The number of bat passes is therefore best understood as an index of bat activity rather than the absolute number of bats in the area. Except for the bats of the genus *Myotis*, each species has a spectrogram which is usually distinctive.

2.3 Limitations of the Survey

There are several factors that may affect the results and comparison between the routes:

- Differences in the range of individual bat detectors. Individual detectors of the same type can vary in range depending on factors such as local environmental conditions and battery strength. The latter can be partially compensated for by using new batteries at the start of each survey, although makes and models of batteries still vary.
- Changes in some factors, such as daylight length and different levels of activity at different times in the breeding season, can be partially compensated for by carrying out the surveys at the same time on the same night each year.
- However, less predictable variables – such as temperature, wind speed and direction, and levels of precipitation before, during and after the survey, all of which will affect invertebrate activity and thus bat activity – are less easy to compensate for and thus may affect the results.
- Human error in misidentifying bat passes and counting the number of bat passes. Although the standard procedure for counting bat passes was followed, there is scope for error if more than one bat of the same species / genus is passing the bat detector at one time. There is also the potential to misidentify species, particularly if the call is faint.
- Human error in relation to use of or failure of equipment, or misinterpretation of maps or instructions. This was largely removed by ensuring that each team had at least one very experienced team member.
- Inconsistencies caused by using different equipment on different transects: There is a greater danger of inaccuracies in identifying species from bat passes from heterodyne recordings, and individual bat passes are more difficult to distinguish if more than one bat is flying past the bat detector at the same time, resulting in counting errors. There is also a greater risk that bat species echolocating at different frequencies may be missed, for example, heterodyne detectors are unlikely to pick-up both a noctule bat pass and a lesser horseshoe bat pass at the same time as the difference in frequency is too large if the detector is tuned to either the lower or higher end of the spectrum.
- Differences in range of bat echolocation calls. Certain bat species may echolocate particularly quietly, for example Barbastelle bat, or may not echolocate at all and use passive hearing, for example long-eared bats. Other species have a particularly high echolocation frequency which may not travel as far as lower frequencies, for example horseshoe bats. This affects the capacity of the detector to pick-up and record bat passes unless the bat is close, and as a consequence some species may be recorded less frequently than other species and there will be errors in estimating the proportions of different species present.

- Misidentification of faint recordings. Occasionally the echolocation recording may be too faint to identify the bat species. Faint recordings also make it difficult to extract a peak frequency for the echolocation calls of pipistrelle species. Where the genus of bat was uncertain the recording is marked in the report as "bat species" and where there is sufficient confidence to assign a recording to the genus *Pipistrellus* but not to a species the recording is marked as "pipistrelle species".
- Species missed due to the differences in activity of different species at different times of night. Reversing the transects year on year is an attempt to reduce this potential impact on the results but is unlikely to completely remove the possible effect of this.

3. RESULTS AND SOUND ANALYSIS

3.1 Overall summary

Over the three years of the survey to date, different transects have been surveyed in different years which affects what conclusions can be gleaned from analysis of the data. Analysis of the total results (in particular, numbers of each species recorded) will not give an accurate indication of changes over time, as it is not a comparison of like with like.

Nine transects have been surveyed in all three years, therefore comparison of numbers of species and numbers per species looking at just these nine transects will give a more representative indication of changes over time. One transect has been surveyed twice and six transects once.

It must be borne in mind that there have been no statistical analyses carried out on the survey results therefore these analyses are solely related to overall impressions.

The total numbers of species for all transects surveyed, regardless of whether they've been surveyed once, twice or three times, can still give a good picture of activity of different species of bat over the Brue Valley as a whole, but not an accurate indication of changes over time.

As in 2014, eleven species of bats and seven genera of bats were recorded, three more species than in 2013. The calls of the echolocation of the two long-eared species (*Plecotus* sp.) are indistinguishable and the similarity in the call structure of the six *Myotis* species meant that those calls were not differentiated. It is therefore possible that up to 17 species were present but about 13 is more likely

Table 1: Total passes over all transects and proportion of bat passes recorded for each species/group.

Species / Species Group	2013 Bat Passes	2013 total (%)	2014 Bat Passes	2014 total (%)	2015 bat passes	2015 total (%)
Greater horseshoe	4	0.1	3	0.1	5	0.2
Lesser horseshoe	10	0.3	14	0.5	3	0.1
Common pipistrelle	783	26.9	861	30.9	811	26.9
Soprano pipistrelle	1280	43.8	1386	49.8	1618	53.6
Nathusius' pipistrelle	0	0	8	0.3	10	0.3
Pipistrelle sp	95	3.3	21	0.7	15	0.4
Serotine	62	2.1	74	2.6	123	4.0
Noctule	97	3.3	3	0.1	5	0.2
Leisler's	0	0	3	0.1	14	0.4
Myotis sp	510	17.5	380	13.7	333	11.4
Long-eared bat sp	4	0.1	7	0.3	5	0.2
Barbastelle	0	0	1	<0.1	12	0.4
Unidentified bat species	75	2.6	24	0.9	60	1.9
TOTAL	**2916**	**100**	**2782**	**100**	**3014**	**100**

The greatest number of bat passes over all transects was recorded in 2015 – 98 passes more than 2013 and 232 more than recorded in 2014 (Table 1), the increase predominantly attributable to soprano pipistrelles. Comparing the total numbers of bats recorded in transects walked the 'normal' direction (2013 and 2015), the numbers are under 100 different, whereas the numbers of bats recorded in the year that the transects were walked in the 'reverse' direction, the total numbers were much lower. However, as mentioned above,

changes in numbers over time for the total passes over all transects should not be given too much credence in regard to indicating a decline or increase in numbers as it is not a comparison of like with like.

Table 2: Passes for transects with three years' data and proportion of bat passes recorded for each species/group.

Species / Species Group	2013 bat passes	2013 total (%)	2014 bat passes	2014 total (%)	2015 bat passes	2015 total (%)
Greater horseshoe	3	0.2	3	0.1	1	<0.1
Lesser horseshoe	6	0.3	14	0.5	3	0.1
Common pipistrelle	389	20.6	861	30.9	634	24.7
Soprano pipistrelle	1025	54.3	1386	49.8	1412	55.1
Nathusius pipistrelle	0	0	8	0.3	10	0.4
Pipistrelle sp	14	0.74	21	0.7	4	0.2
Serotine	26	1.4	74	2.6	103	4
Noctule	14	0.74	3	0.1	5	0.2
Leisler's	0	0	3	0.1	1	<0.1
Myotis sp	360	19.1	380	13.6	322	12.6
Long-eared bat sp	4	0.2	7	0.3	5	0.2
Barbastelle	0	0	1	<0.1	9	0.4
Unidentified bat species	46	2.4	24	0.9	54	2.1
TOTAL	**1887**	**100**	**2785**	**100**	**2563**	**100**

However, when comparing data from the nine transects with three years' of data thereby allowing a comparison of change over time, the greatest number was from the second year of the survey, 2014, when the transects were walked in the 'reverse' direction (Table 2). Comparing data from the two years when the transects were walked in the 'normal' direction the numbers have increased by 35%, with over 90% of the change attributable to common and soprano pipistrelles.

3.2 Pipistrelle species

The greatest number of bat passes through all three years of the surveys, regardless of how data is analysed, is by sopranro bats, comprising 50% or more of the total numbers of passes. The Brue Valley is indeed a stronghold for this species which is often associated with wetland landscapes.

The common pipistrelle, the commonest species throughout Western Europe, was only recorded at half the number of passes compared with soprano pipistrelle, contributing 27% of the overall passes.

Nathusius' pipistrelle was recorded at Yeaps Bridge in 2014, Ham Wall in 2014 and 2015, Shapwick Heath and Catcott Heath in 2015. This is a migratory species and it is possible that these were bats in transit, but Nathusius' pipistrelle is believed to breed in North Somerset and had been recorded a number of times throughout summer within the past five years near Axbridge. Their presence in the Brue Valley is significant and would merit further investigation by continuing the surveys for a further year. The gradual increase in activity of this species may be of significance and further years' survey data may show whether this is an on-going trend.

3.3 *Myotis* species

The percentage of passes ascribed to the group of *Myotis* species was 15% lower than in 2014 and 10% lower than in 2013 comparing the nine transects surveyed in all three years (Table 3). This level of change may well be within typical annual variation parameters, only further years of survey data will enable any conclusion to be made as to whether this is part of a gradual decline or not.

The overall numbers for all transects surveyed does show a drop in numbers of *Myotis* species passes between 2013 and 2015 (Table 1) but this is likely to be related to the variation in the transect routes seeming as the difference in numbers is much less when comparable data is used.

It is probable that the majority of *Myotis* recordings were of Daubenton's bat, another species closely associated with water, but Natterer's bat (*M. nattererii*) is regularly found in bat boxes at Catcott Heath and a whiskered bat (*M. mystacinus*) has been caught at Shapwick Heath using a harp trap.

Table 3: Number of *Myotis* sp. passes recorded per year in transects surveyed for three years.

Site surveyed	**2013 Bat Passes**	**2014 Bat Passes**	**2015 Bat Passes**
Tealham Moor	1	9	1
Catcott Heath	34	73	13
Shapwick Heath	78	50	29
Westhay Moor	6	91	24
Meare	47	18	15
Ham Wall and Walton Heath	16	31	31
Yeaps Bridge	19	20	23
West North Wooton	145	39	148
Church Moor	14	49	38
TOTAL	**360**	**380**	**322**

3.4 Horseshoe bats

Both greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*R. hipposideros*) were recorded and roosts are known in this area.

The number of greater horseshoe bat passes was slightly down in the nine transects in 2015 (Table 2), but numbers have been very low in all three years therefore it is not possible to draw any conclusions from this at this stage.

Lesser horseshoe bat numbers were comparable with the other year in which the transects were walked in the 'normal' direction (2013) although noticeably lower than in 2014 when the transects were walked in the 'reverse' direction.

This could be an indication that the bats are at different locations at the time when the survey is passing through on the 'normal' years compared to 'reverse' years but further years' data – at a minimum, one further year walked in the 'reverse' direction – would be required to confirm this.

The numbers of both species of horseshoe bats is low, as typical throughout the Brue Valley. The changes in numbers are therefore also low and could well be within typical annual variation parameters although there are a number of variables that may affect numbers:

- The changes in numbers could be weather related. Horseshoe bats can emerge significantly later than many other species of bat, therefore if the weather deteriorated as a survey progressed, the results may show their activity as more significantly affected than other species of bat.
- The variation could also be a product of the bats changing their activity to suit changes in livestock paddocking throughout the valley, as greater horseshoe bats in particular feed on invertebrates associated with cattle dung.
- It may also be a product of the frequencies that these bats echolocate at. Both have very high frequency calls, ~80kHz for greater horseshoe bat and ~110kHz for lesser horseshoe bat, and high sounds travel shorter distances. Thus, there is a possibility that bats flying the other side of a hedge, to remain out of any wind, and catch insects might not be recorded.

3.5 Serotines

The number of passes of serotine bat (*Eptesicus serotinus*) has increased year on year, both the total number of passes over all transects surveyed and when comparing only transects recorded in all three years. There was a general increase in passes, but higher than expected numbers of passes were recorded at Catcott Heath, West North Wooton and Church Moor. However, at Yeap's Bridge, the number of serotine passes was considerably greater in 2014, the reverse year of walking the transect, compared with 2013 and

2015. This suggests that the bats are not present at the locations at the time when the survey is passing through on the 'normal' years.

3.6 Noctules

The number of passes of noctule bat (*Nyctalus noctula*) was still very low compared with 97 in 2013. However, 79 of those 97 in 2013 passes were recorded at one point in Transect 15, a transect that was not surveyed in 2014 or 2015. Otherwise, numbers have dropped a little but further years' data will be required to determine whether this is a significant decline or not.

There are fewer signs of noctules than one might reasonably expect and that is of concern, not least because it is a species whose day roosts are notoriously hard to locate

3.7 Leisler's bats

Leisler's bats (*Nyctalus leisleri*) were recorded at Gold Corner, West North Wooton, Meare, Hulk Moor and Tealham Moor in 2015; only three of these transects have been recorded in all three years.

This species has only recently been confirmed to be present in Somerset as several injured Leisler's bats were found grounded in Taunton, and its appearance in widely separated parts of the valley, albeit in very low numbers, is very encouraging.

However, it should be noted that there has been a reluctance to attribute calls to a species which had not been definitively proved to be present in Somerset.

3.7 Barbastelle

Numbers of barbastelle bat (*Barbastella barbastellus*) passes increased in 2015 although, interestingly, none at Catcott Heath which is the only transect where they had been recorded before. They made up 0.4% of the total passes in 2015, a considerable rise from nothing in 2013 and just one pass in 2014.

Nine passes were recorded in 2015 along the regularly surveyed transects, with one pass at Shapwich Heath, one pass at Ham Wall and Wooton Heath, three passes at Yeaps bridge and four passes at Church Moor. It is not known why the presence of this species has increased, but it could be attributed to better identification of Barbastelle passes.

The increased recording of Barbastelles is also of considerable interest. In spite of a great deal of study of this species over the last decade it is still a bat about which we have a great deal still to learn.

3.8 Long-eared bats

The number of long-eared bat passes has remained fairly consistent through the three years of the surveys, with the genus mostly recorded in the same transects year on year although with two new transects in 2015. This genus is notoriously hard to record as it may not use echolocation to catch its prey and there is likely to be far higher activity than the survey suggests.

4. ACTIVITY MAPS PER SPECIES OVER THE SURVEY AREA

The following maps show the presence of species recorded across the survey area. The results only show presence of bats identified from the recordings and cannot indicate the absence of a particular species as the survey does not cover the entirety of each square kilometre and, consequently, there is the possibility that species may have been missed.

Figure 2: Map of greater horseshoe bat cumulative totals (2013 to 2015).

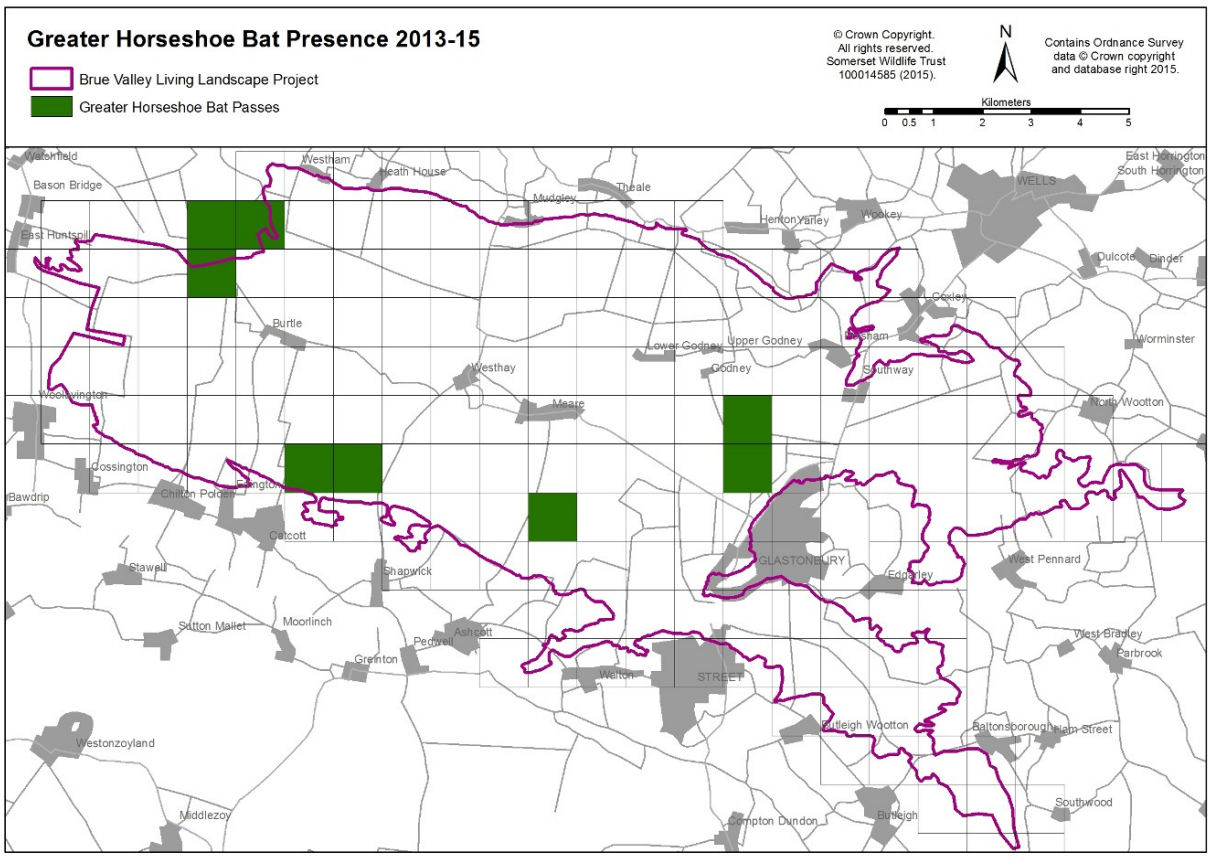


Figure 3: Map of lesser horseshoe bat cumulative totals (2013 to 2015).

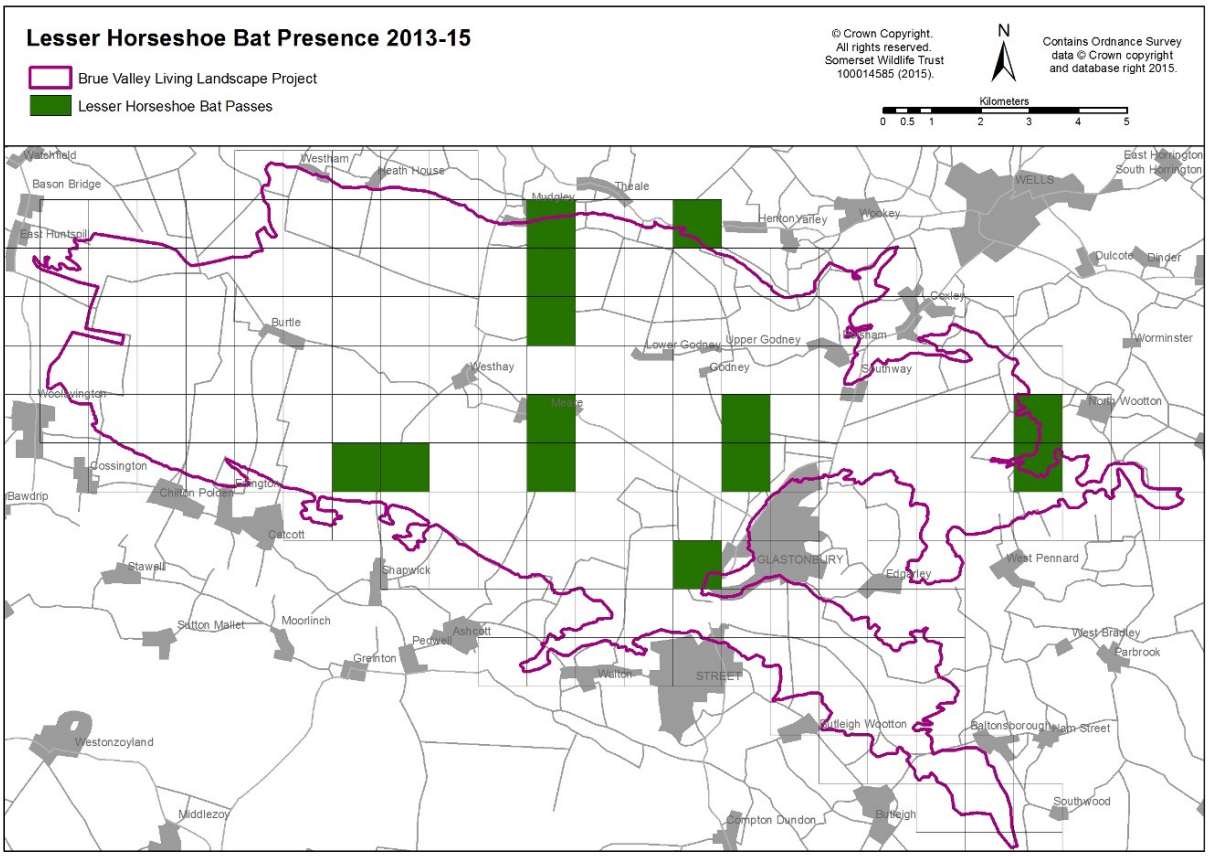


Figure 4: Map of common pipistrelle cumulative totals (2013 to 2015).

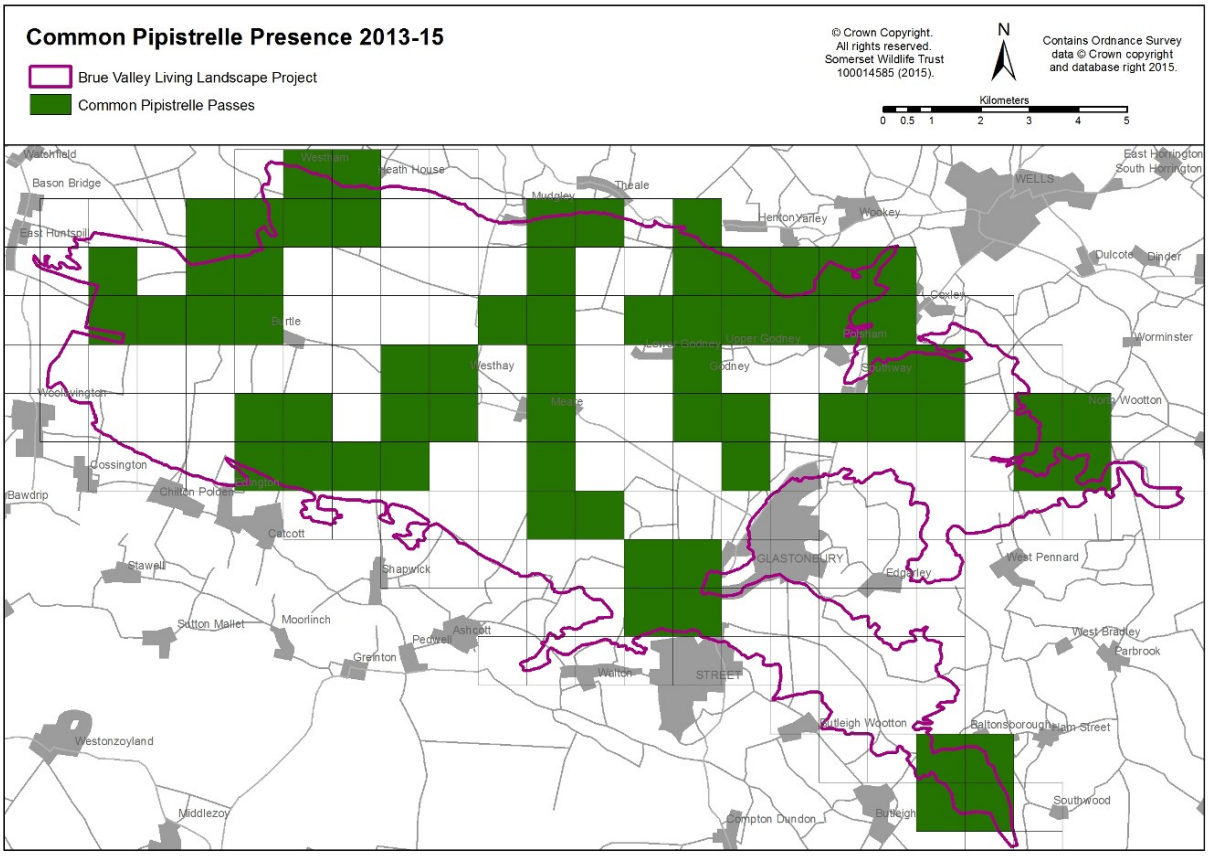


Figure 5: Map of soprano pipistrelle cumulative totals (2013 to 2015).

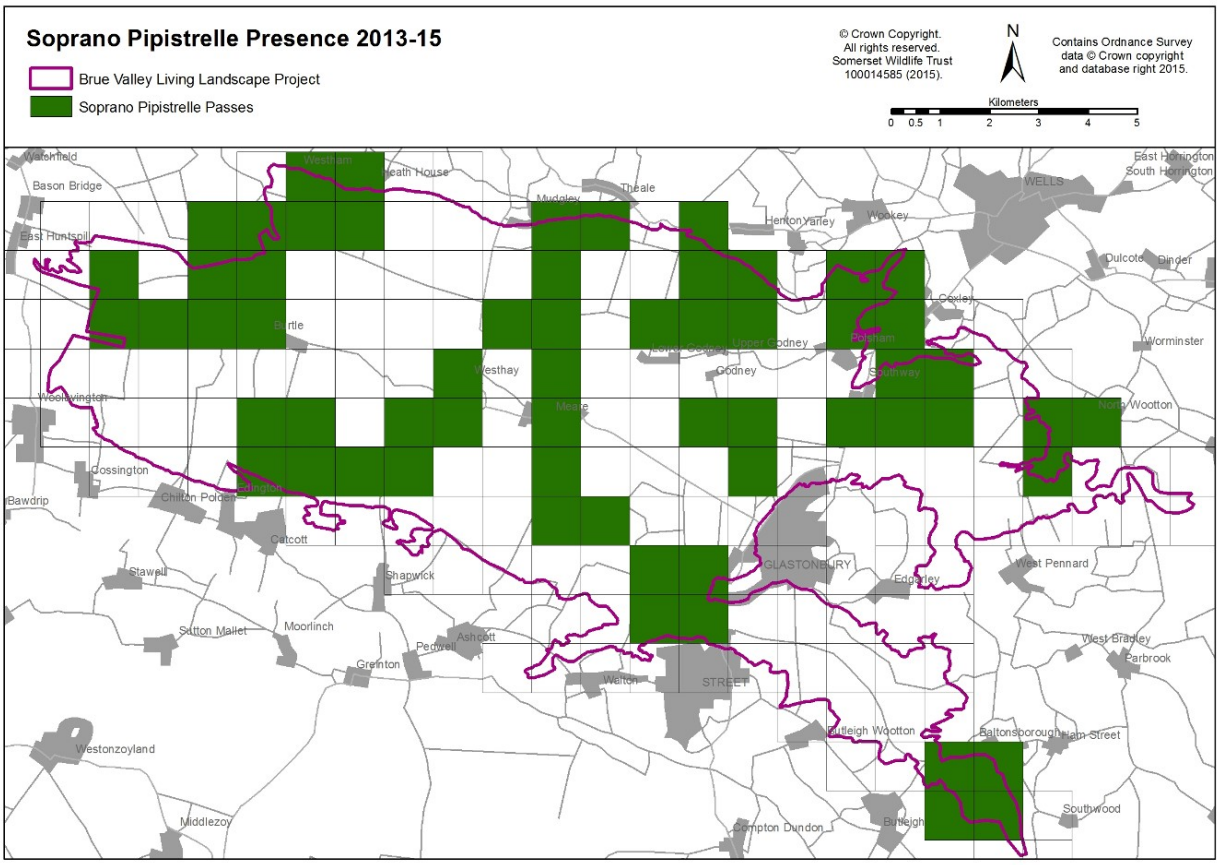


Figure 6: Map of Nathusius' pipistrelle cumulative totals (2013 to 2015).

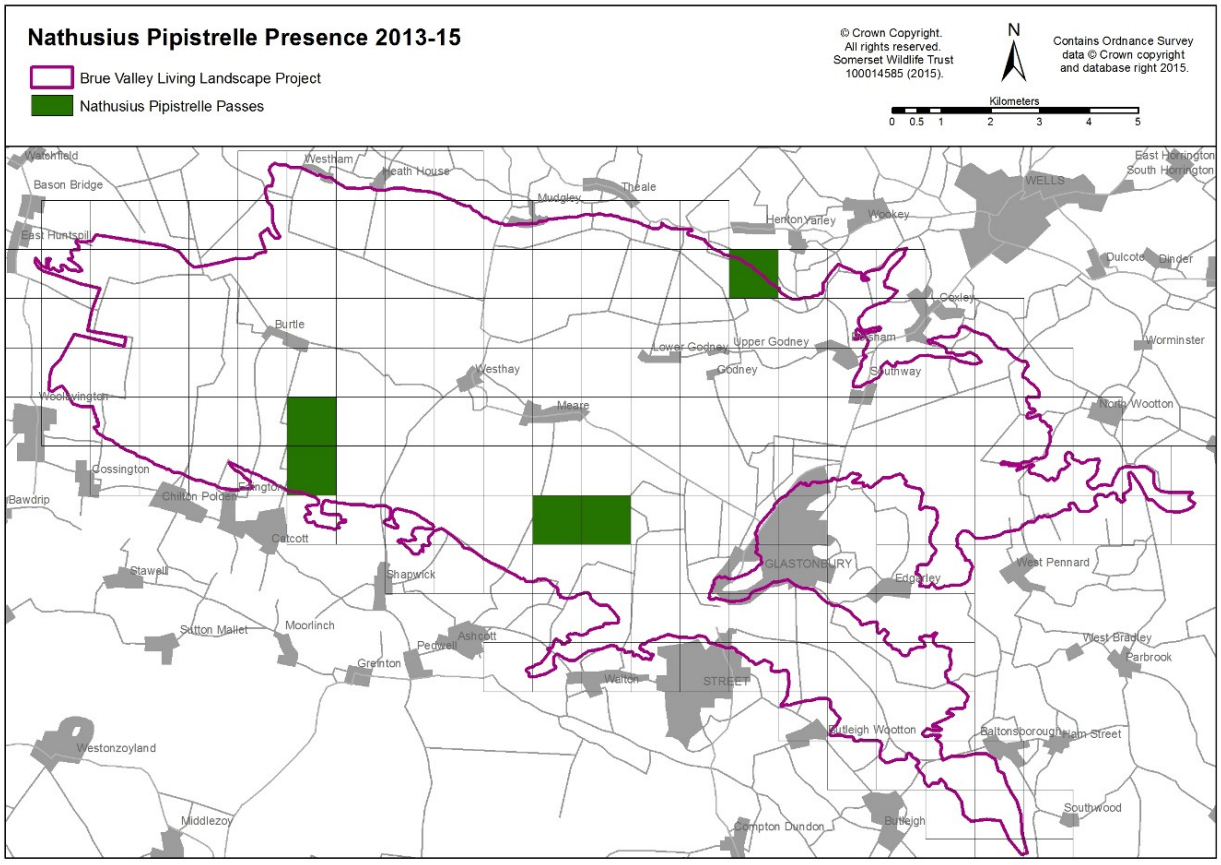


Figure 7: Map of serotine cumulative totals (2013 to 2015).

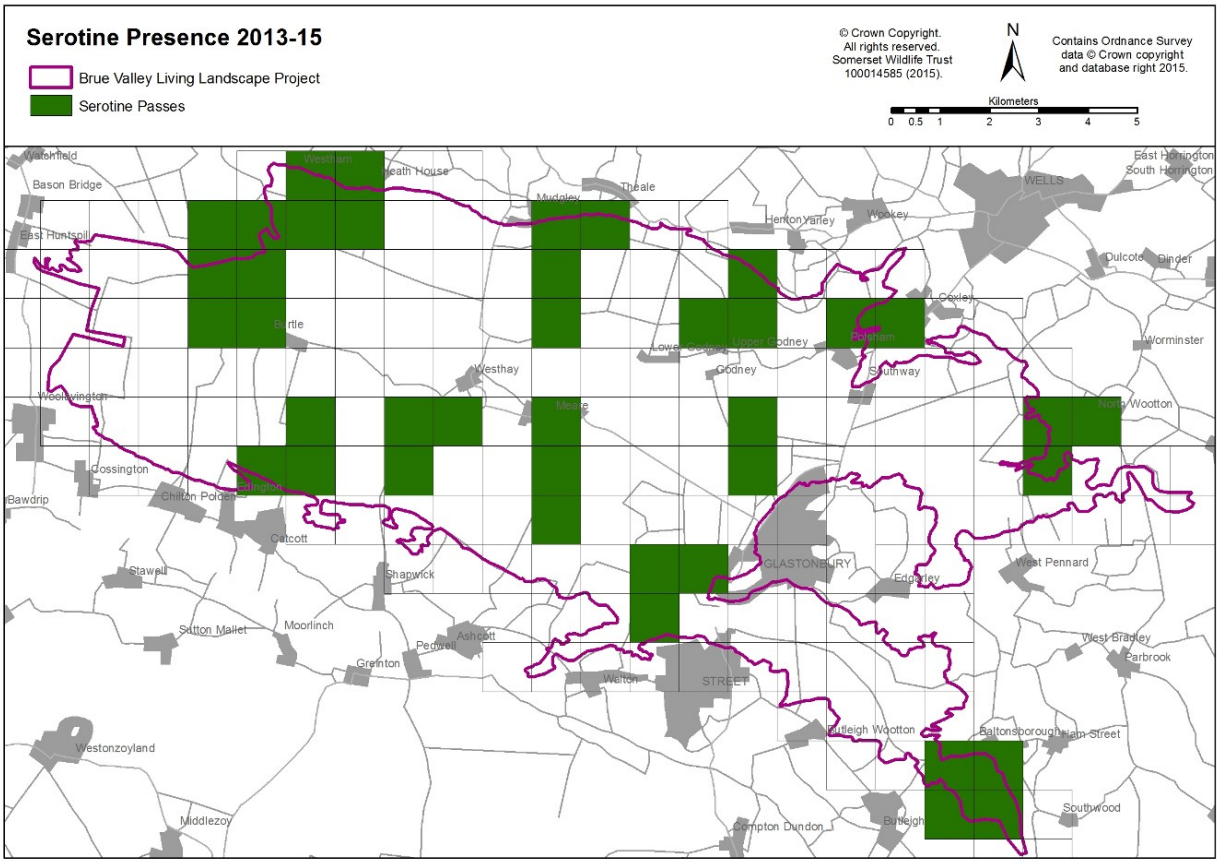


Figure 8: Map of noctule cumulative totals (2013 to 2015).

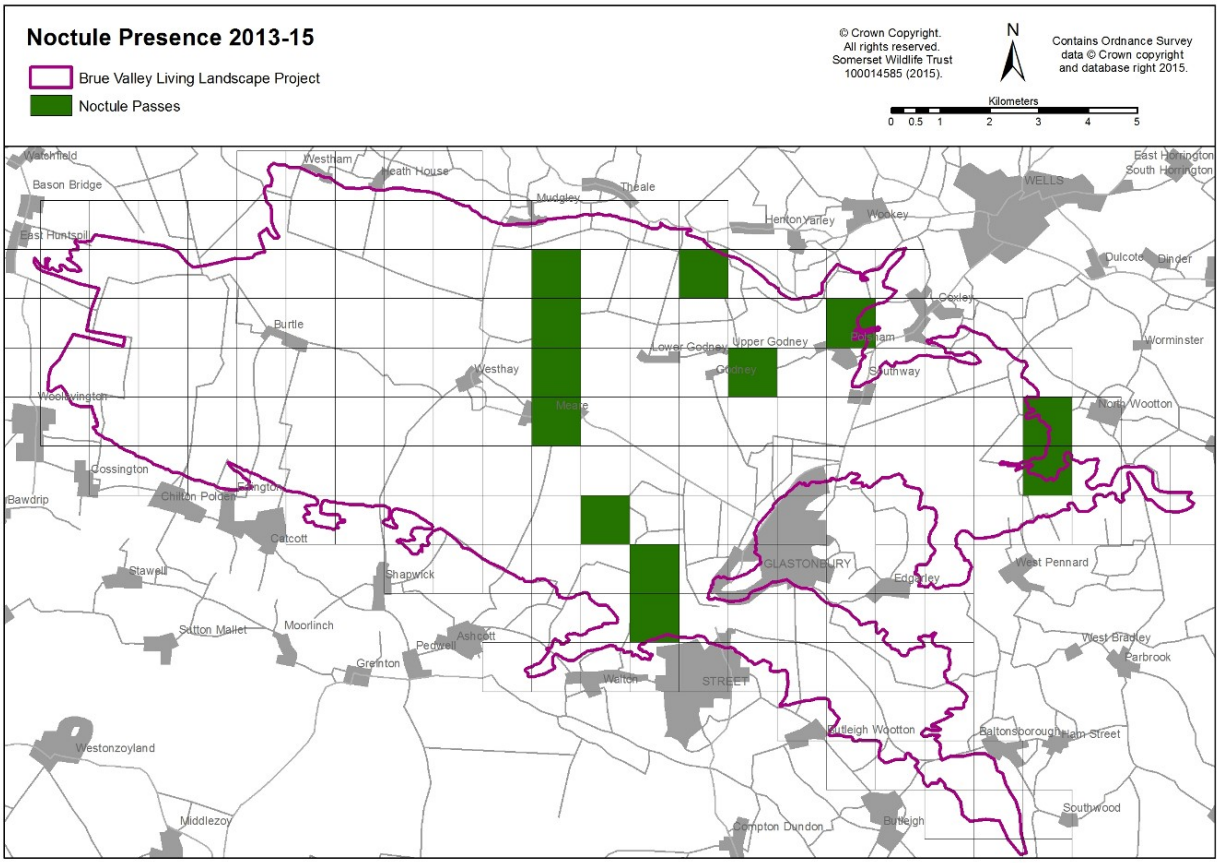


Figure 9: Map of Leisler's cumulative totals (2013 to 2015).

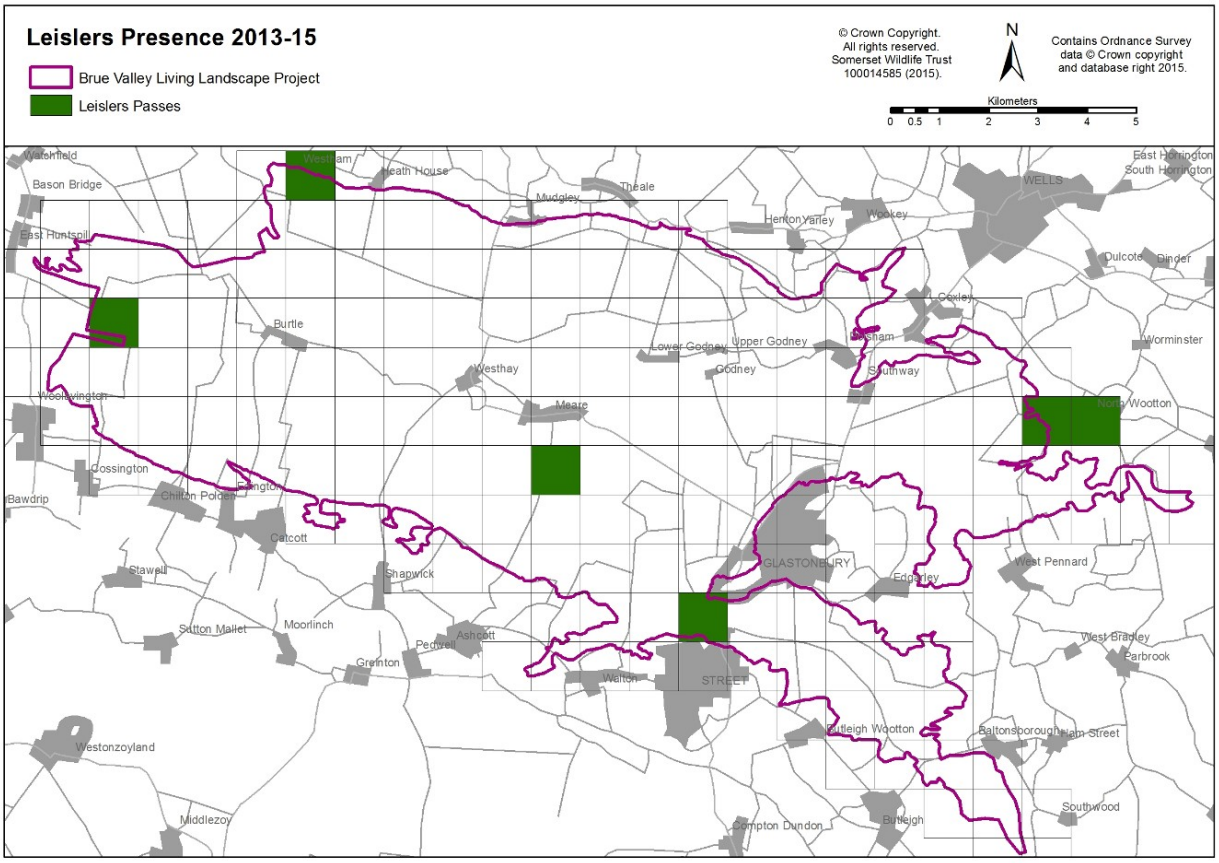


Figure 10: Map of *Myotis* sp. cumulative totals (2013 to 2015).

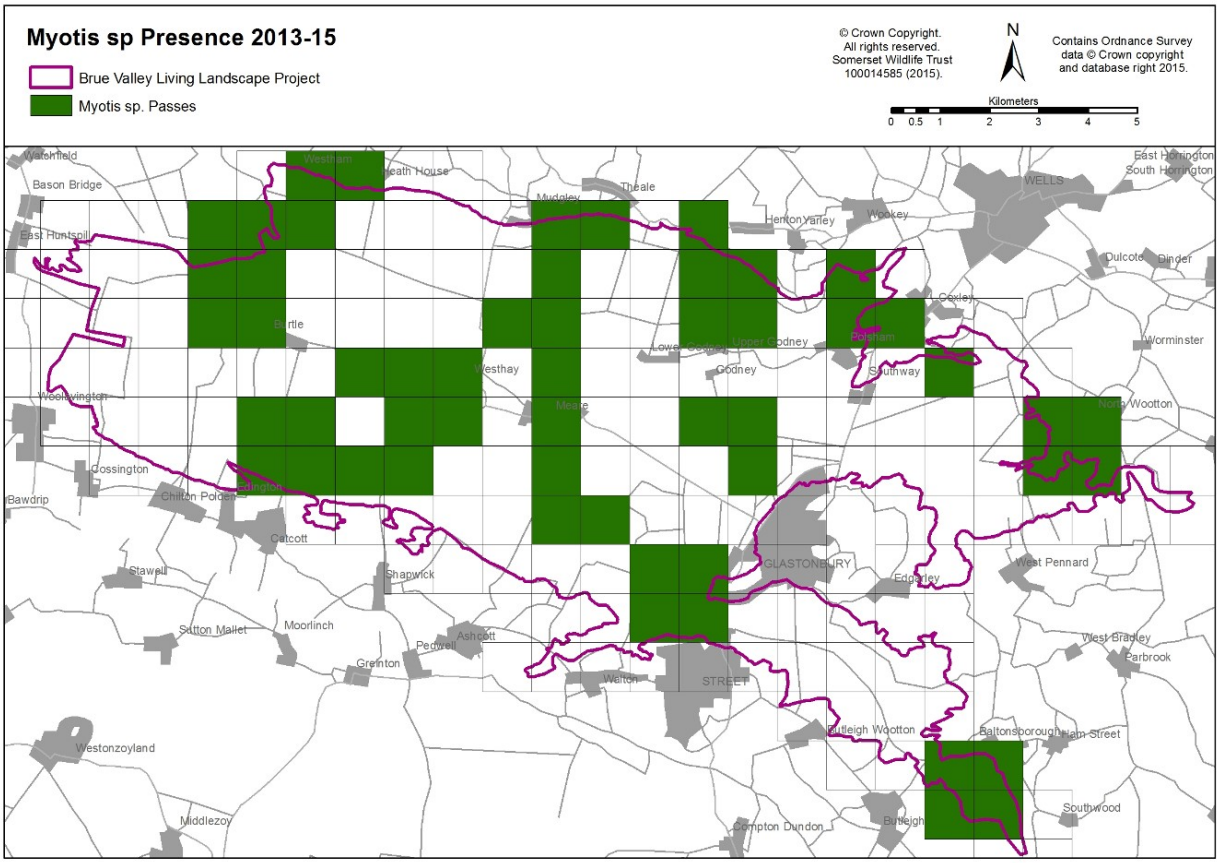


Figure 11: Map of long-eared bat species cumulative totals (2013 to 2015).

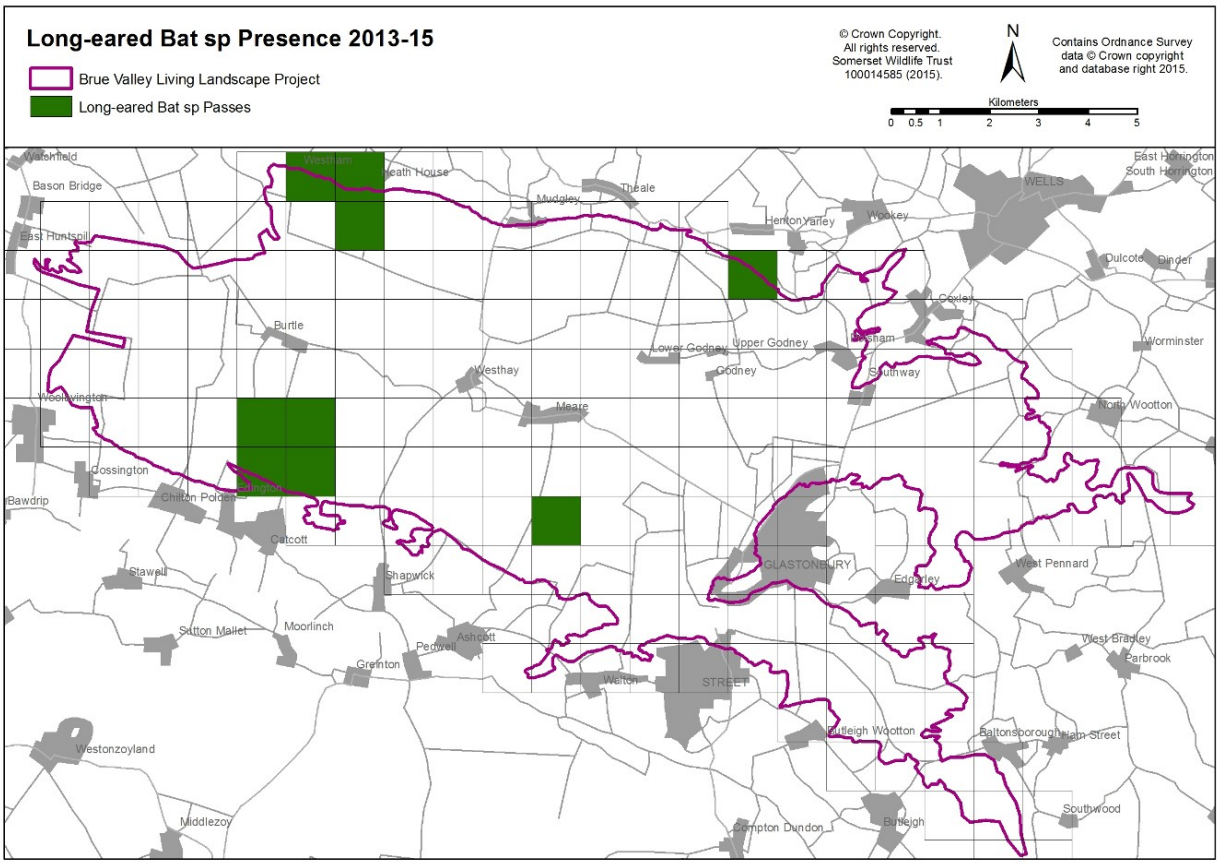
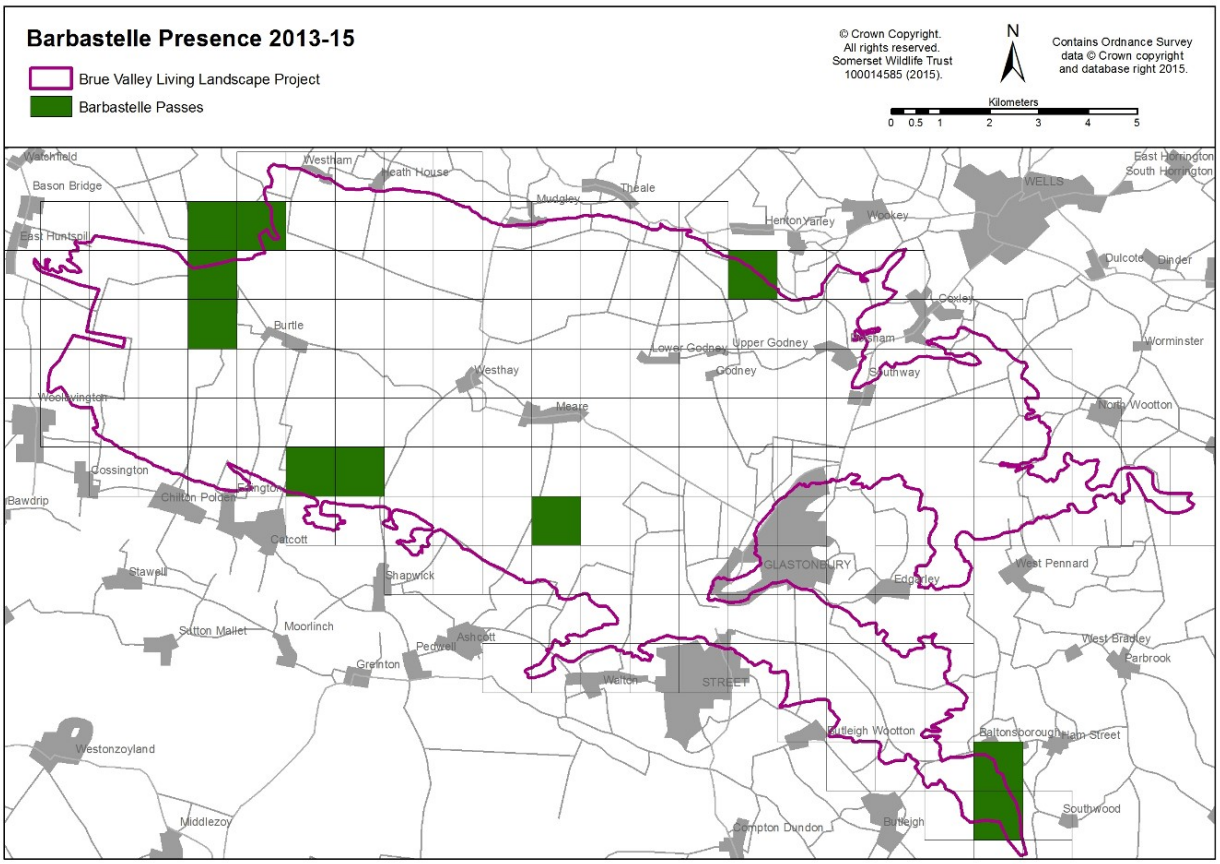


Figure 12: Map of barbastelle cumulative totals (2013 to 2015).



5. BAT PASSES RECORDED ALONG EACH TRANSECT ROUTE

The recordings from each transect were analysed separately and divided into the walk and stop sections shown in the following tables and maps.

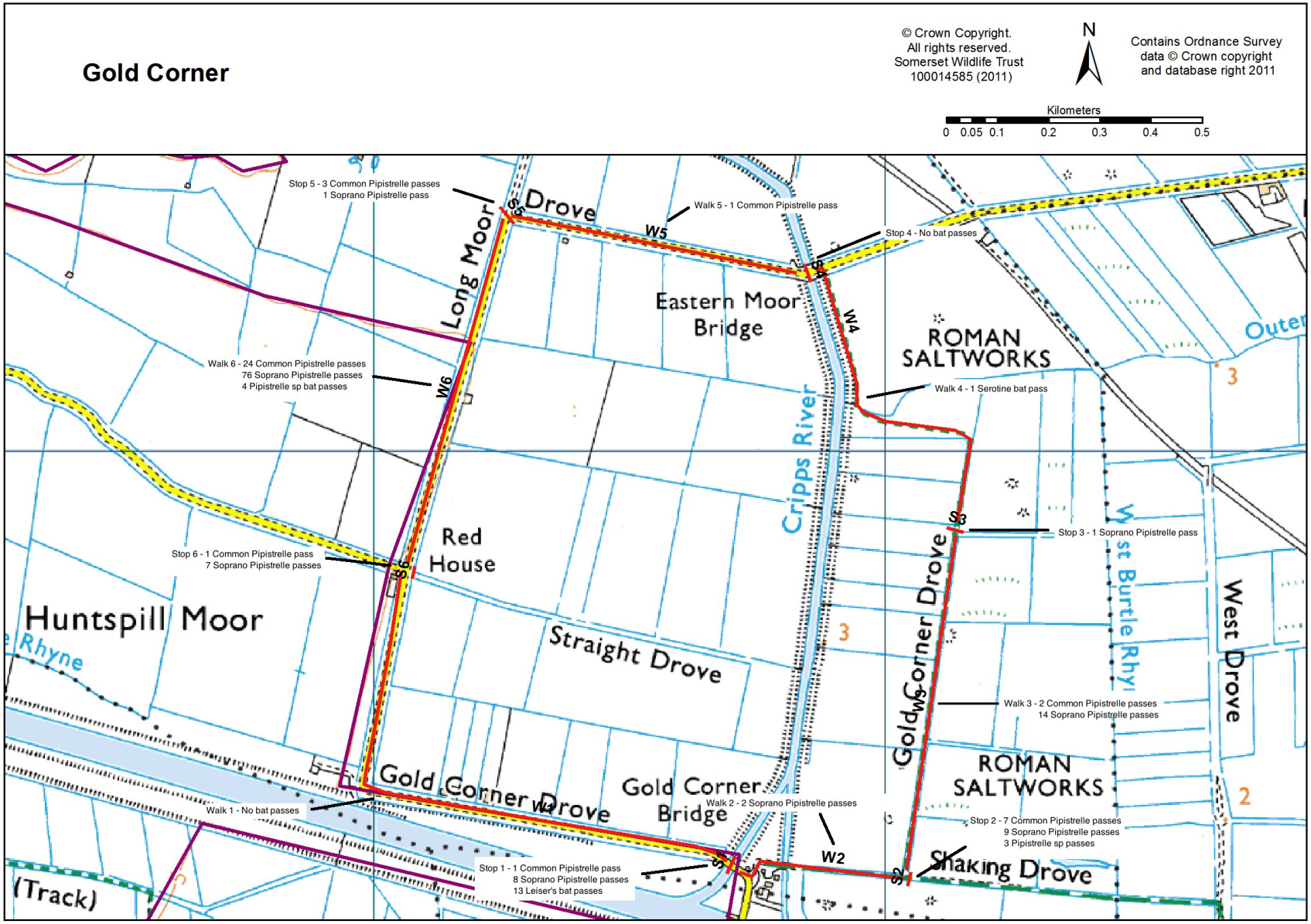
5.1 Transect 1: Gold Corner

Table 4: Bat passes recorded along Transect 1 Gold Corner, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013		This route was not surveyed in 2013												
2014		This route was not surveyed in 2014												
2015	Common 45 pipistrelle		1		7	2				1	3	24	1	39
	Soprano 55 pipistrelle		8	2	9	14	1				1	76	7	118
	Pipistrelle sp				3							4		7
	Serotine							1						1
	Leisler's		13											13

2015 was the first time that this transect had been included. The most impressive result was 13 passes from one or more Leisler's bat at Stop 1. Whilst certainly under-recorded in the past, it is only recently that this species has been confirmed as a resident Somerset species and it is still not common. Although soprano pipistrelles are common it is still interesting to observe 76 passes on Walk 6. Most transects tend to show activity at its peak in the central sections of the walk but this one is surprisingly quiet in the middle of the walk with only 3 bat passes in total between Stop 3 and Walk 5 inclusive. It seems unlikely that this is because of a lack of feeding opportunities as Walk 4 runs alongside the Cripps River but it may reflect a lack of riparian trees or some other landscape deficiency. More data are needed.

Figure 13: Location of bat passes recorded along Transect 1 Gold Corner.



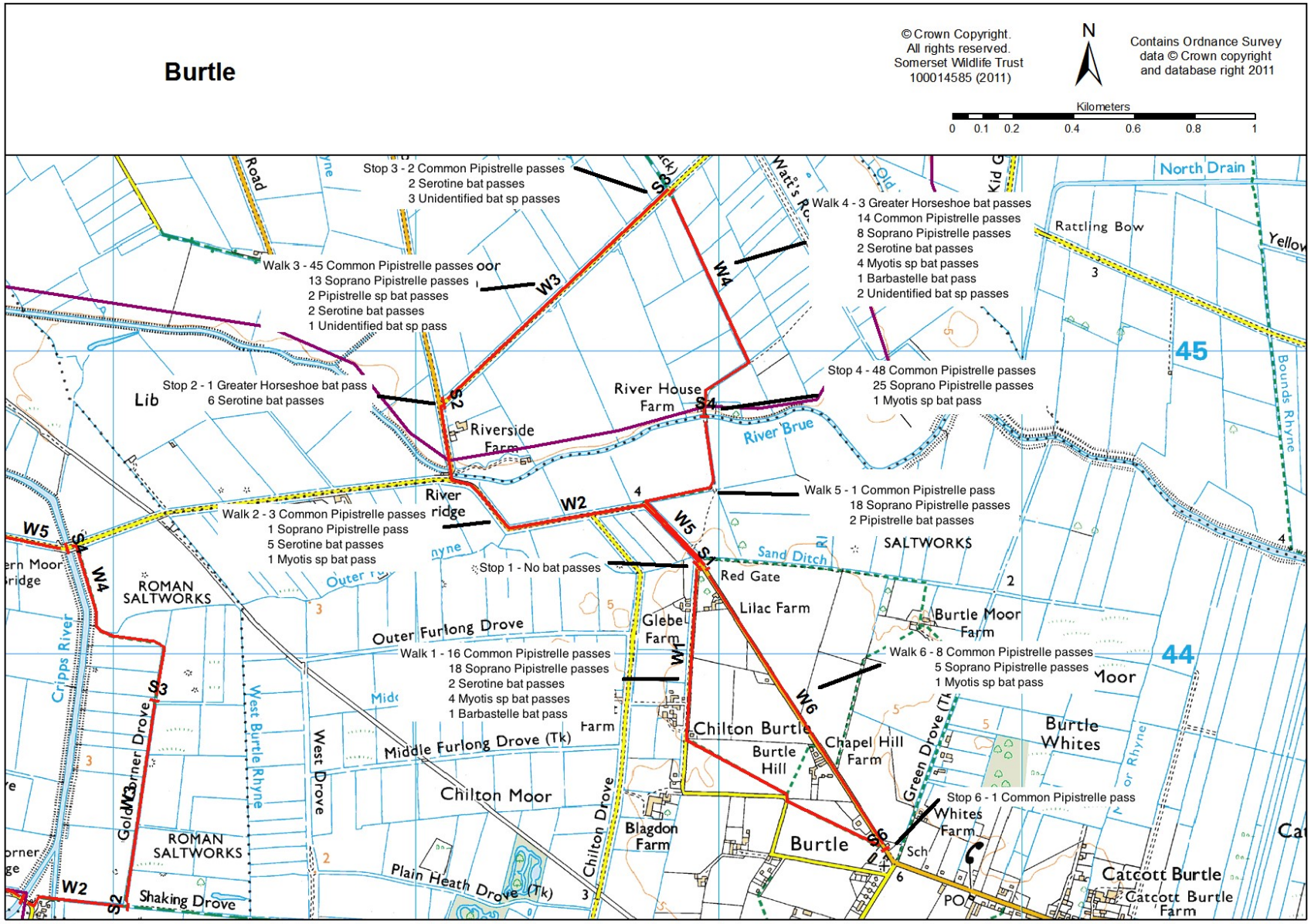
5.2 Transect 2: Burtle

Table 5: Bat passes recorded along Transect 2 Burtle, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Lesser horseshoe bat							1						1
	Common pipistrelle	10	1	10	1	16		8	9	2	1	13		71
	Soprano Pipistrelle	7	1	8	3	5		1	2	1		15	3	46
	Pipistrelle sp			1										1
	Myotis sp			1		1		1	1	5		1		10
	Serotine					10	2						1	13
	Noctule										1			1
	Unidentified bat passes		1					2	2					5
2014		This route was not surveyed in 2014												
2015	Greater horseshoe bat				1			3						4
	Common pipistrelle	16		3		45	2	14	48	1		8	1	138
	Soprano pipistrelle	18		1		13		8	25	18		5		88
	Pipistrelle sp					2				2				4
	Serotine	2		5	6	2	2	2						19
	Myotis sp	4		1				4	1			1		11
	Barbastelle	1						1						2
	Unidentified bat species					1	3	2						6

As in 2013, there were more common pipistrelle passes recorded than soprano pipistrelle which is not the normal pattern for transects in the Brue Valley. There were no lesser horseshoe bat passes in 2015, but there were 4 passes of greater horseshoe bats. Two years of data is too few to reach any conclusion but there are many well-documented cases of the larger horseshoe species bullying the smaller one for roosts and even for feeding territory. The number of serotine passes was up and they were spread over six sections rather than the three recorded before. The 2 barbastelle passes are interesting as this does not appear obvious barbastelle habitat. Barbastelle bats usually roost in mature woodland, for instance in split branches, and hunt in woodland and over heathland. They have been known to commute over 10 miles in a night. Furthermore the fact that they were recorded at the very start of the walk might suggest that the roost is not far away. It would be interesting to survey the band of woodland along the ridge to the south.

Figure 14: Location of bat passes recorded along Transect 2 Burtle.



5.3 Transect 3: Tealham Moor

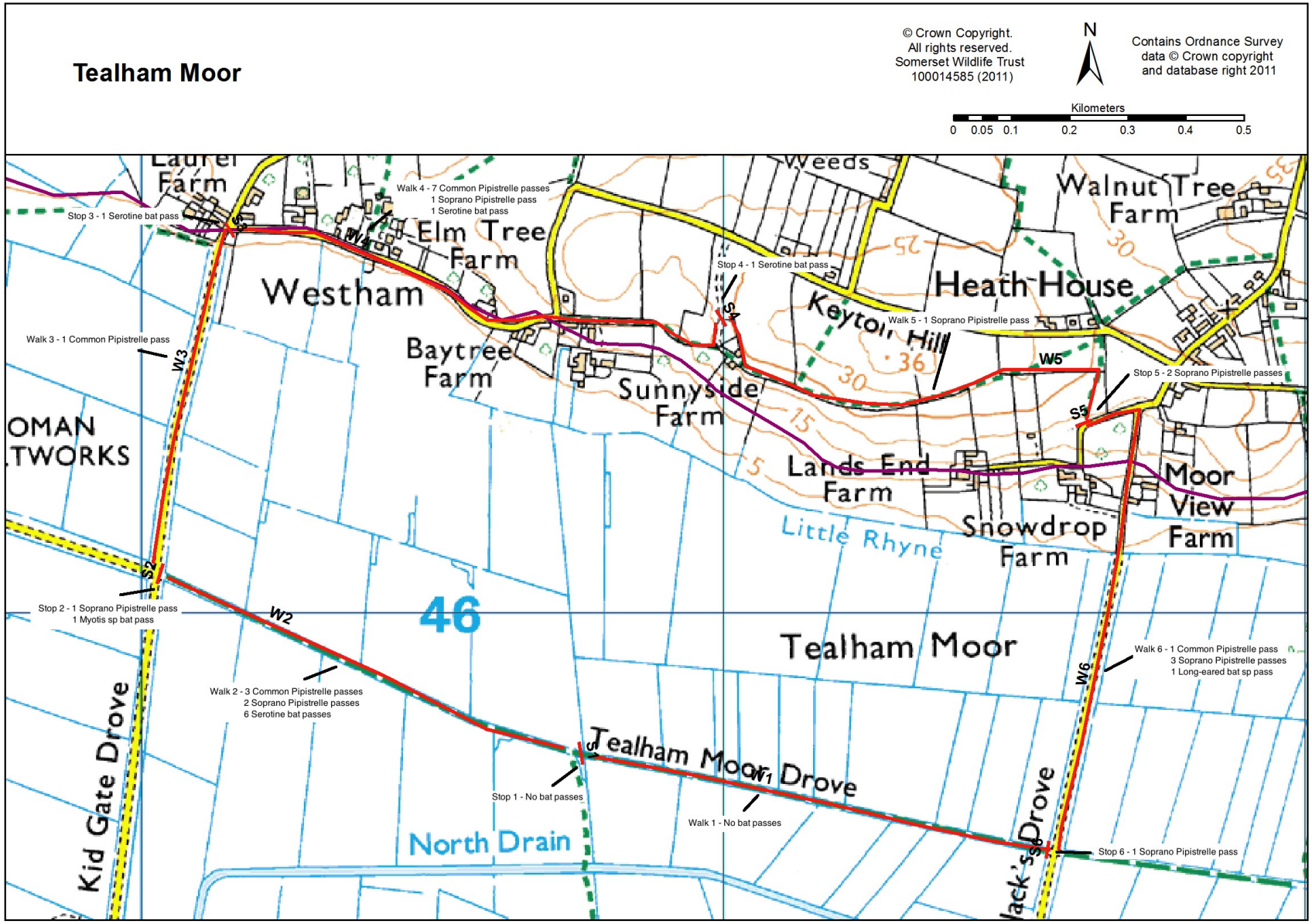
Table 6: Bat passes recorded along Transect 3 Tealham Moor, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Common pipistrelle							3	2		2	3		10
	Soprano pipistrelle				50	11	1					6	1	69
	Myotis sp					1								1
	Serotine					2						1		3
	Long-eared bat							1				1		2
	Unidentified bat passes				4									4
2014*	Common pipistrelle	2	1	1		4	10	9		1	1			29
	Soprano pipistrelle	3	10	1		3	11	4			1	21		54
	Myotis sp			2	2	1		1	1	2				9
	Serotine							2		2				4
	Leisler's								1					1
	Unidentified bat passes				1									1
2015	Common pipistrelle			3		1		7				1		12
	Soprano pipistrelle			2	1			1		1	2	3	1	11
	Serotine			6			1	1	1					9
	Myotis sp				1									1
	Long-eared bat sp											1		1

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

We now have three years' data for this transect. 2015 showed a much lower level of activity than either of the precious two years with only 34 passes in total compared with 89 in 2013 and 98 in 2014. The difference is mostly in passes from soprano pipistrelles and that is not a pattern that has emerged elsewhere in the survey. It is essential to have more data to see if this is a genuine change or a surveying anomaly. Without that it is unwise to speculate as to why 2015 was so quiet, but any number of factors could be at play including how dry the land was at the time of the survey, grazing regimes at a field by field level or the weather before or during the survey.

Figure 15: Location of bat passes recorded along Transect 3 Tealham Moor.



5.4 Transect 4: Catcott Heath

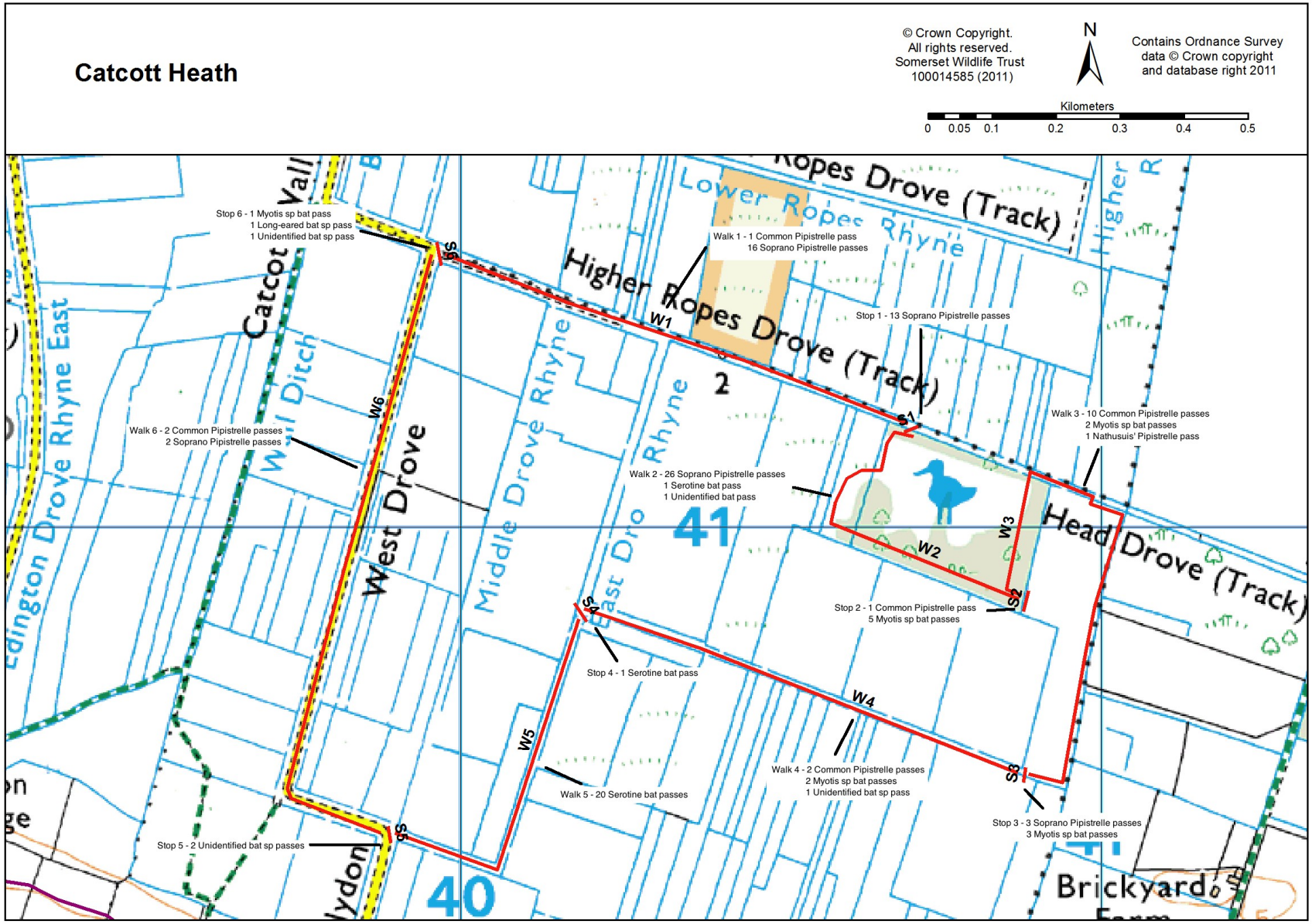
Table 7: Bat passes recorded along Transect 4 Catcott Heath, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Greater horseshoe bat					1								1
	Common pipistrelle					17	11	3	2	7		4		44
	Soprano pipistrelle		1	18		16					2			37
	Myotis sp					29				2		3		34
	Serotine							1		2				3
	Long-eared bat											2		2
	Unidentified bat passes				1									1
2014*	Common pipistrelle	5	1	5	10	8	2	4	9	4				48
	Soprano pipistrelle	7	3	10	4	9		8	4	8		1		54
	Myotis sp	1	2	10	45	3		5	3	4				73
	Serotine			9				1		2				12
	Barbastelle						1							1
	Long-eared bat				1	6								7
	Unidentified bat passes				1	1								2
2015	Common pipistrelle	1			1	10		2				2		16
	Soprano pipistrelle	16	13	26			3					2		60
	Serotine			1					1	20				22
	Myotis sp				5	2	3	2					1	13
	Long-eared bat sp												1	1
	Nathusius' pipistrelle					1								1
	Unidentified bat species			1				1			2		1	5

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

The third year for this transect showed a decrease in common pipistrelle passes, which may or may not be a real change. There was a more marked decline in passes from *Myotis* bats which is surprising as the area is known to have a population of Natterer's bats and regularly has records of Daubenton's bats. Natterer's bats in particular are fairly quiet echolocators and might not be picked up on the recordings if they are flying further away from the path. The difference in data could also be related to 'normal' direction transects versus 'reverse' direction transects as in 2014, the 'reverse' year, the majority of records were towards the start of the survey. When more data is gathered it will be possible to confirm if the trend is, or is not, continuing. The record of Nathusius' pipistrelle here is very welcome, particularly with the work that has been carried out to open up areas of permanent open water here – the habitat is clearly suitable for this comparatively rare species.

Figure 16: Location of bat passes recorded along Transect 4 Catcott Heath.



5.5 Transect 5: Shapwick Heath

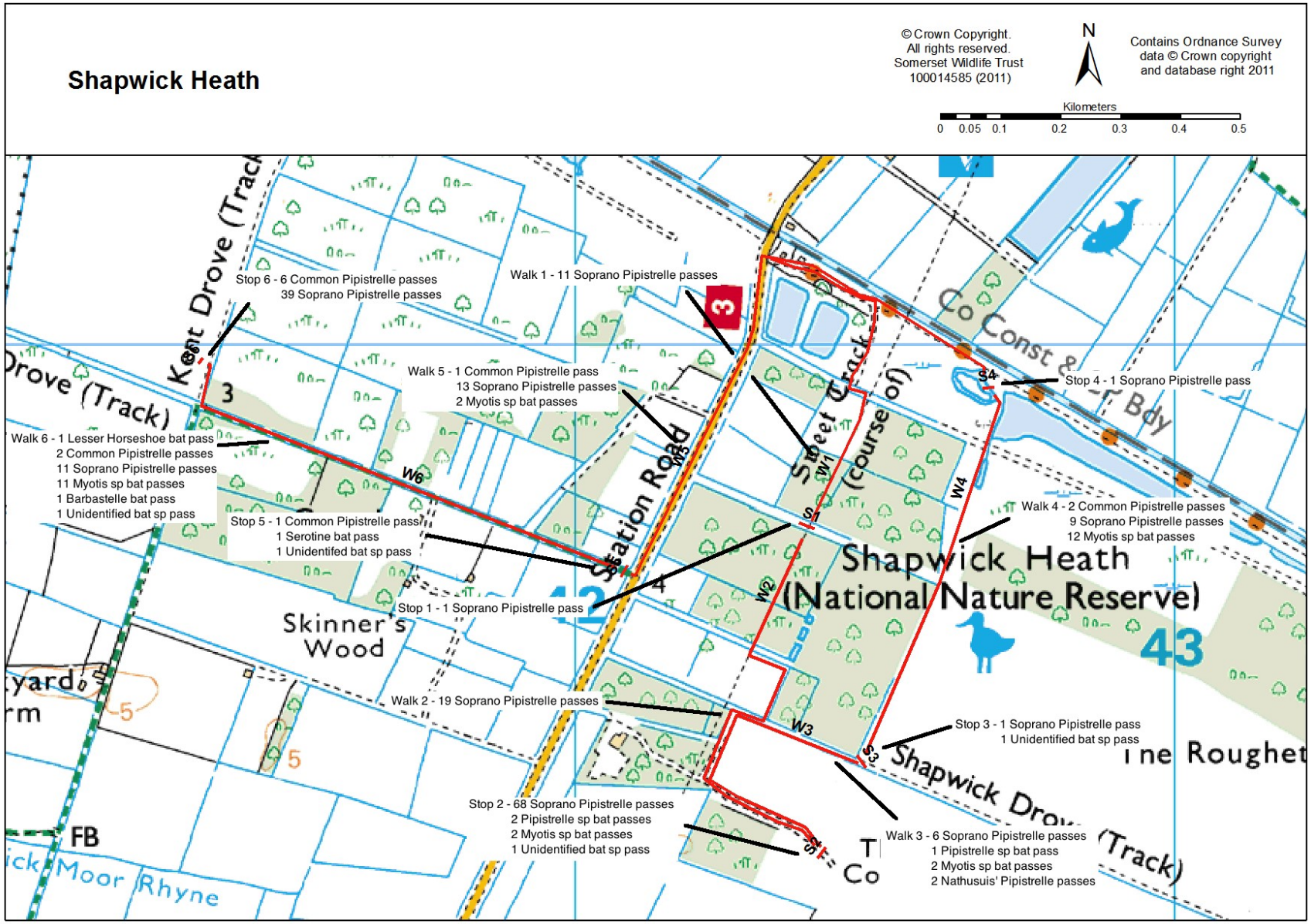
Table 8: Bat passes recorded along Transect 5 Shapwick Heath, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Greater horseshoe bat											1		1
	Lesser horseshoe bat			3										3
	Common pipistrelle			4	1	4		22	1	1	1	7	8	49
	Soprano pipistrelle		3	71	18	26	12	40	66	12	4	28	52	332
	Pipistrelle sp					1			1		1			3
	Myotis sp			14	3	1	15	30	1			12	2	78
	Unidentified bat passes			6		1	3	3				2	1	16
2014*	Greater horseshoe bat		3											3
	Lesser horseshoe bat	1				1						1		3
	Common pipistrelle	5		2		2		4	3					16
	Soprano pipistrelle		2	13	37	12	13	4	3	11		14		109
	Myotis sp	7	7	8	3	3	2	17		3				50
	Serotine							1		1				2
	Unidentified bat passes	1		2	2									5
2015	Lesser horseshoe bat											1		1
	Common ppistrelle							2		1	1	2	6	12
	Soprano pipistrelle	11	1	19	68	6	1	9	1	13		11	39	179
	Pipistrelle sp				2	1								3
	Serotine										1			1
	Myotis sp				2	2		12		2		11		29
	Barbastelle											1		1
	Nathusius' pipistrelle					2								2
	Unidentified bat species				1		1				1	1		4

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

In all three years of the survey this transect has had abundant activity of soprano pipistrelles. There appears to be a decline in *Myotis* passes here but numbers of passes are still quite good. There were no greater horseshoe bat passes this time and only a single lesser horseshoe bat pass where one would expect more activity as the transect is close to a known roost. This is another transect which has recorded a barbastelle, but it does include some mature broad-leaved woodland which is typical barbastelle habitat. This is another place which looks right for Nathusius' pipistrelle and 2 passes confirm that it may be using the open water of this NNR.

Figure 17: Location of bat passes recorded along Transect 5 Shapwick Heath.



5.6 Transect 6: Westhay Village

Table 9: Bat passes recorded along Transect 6 Westhay Village, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Common pipistrelle			12	5	32	5	5	3		4	5	11	82
	Soprano pipistrelle								1		2		14	17
	Pipistrelle sp										4			4
	Myotis sp		2		1	2			3	18				26
	Serotine											1	1	2
	Unidentified bat passes			1	2	1		4		1		2	1	12
2014		This route was not surveyed in 2014												
2015		This route was not surveyed in 2015												

Sadly it has not proved possible to repeat this transect since the initial survey in 2013. It is hoped that it may feature in the survey in 2016.

5.7 Transect 7: Westhay Moor

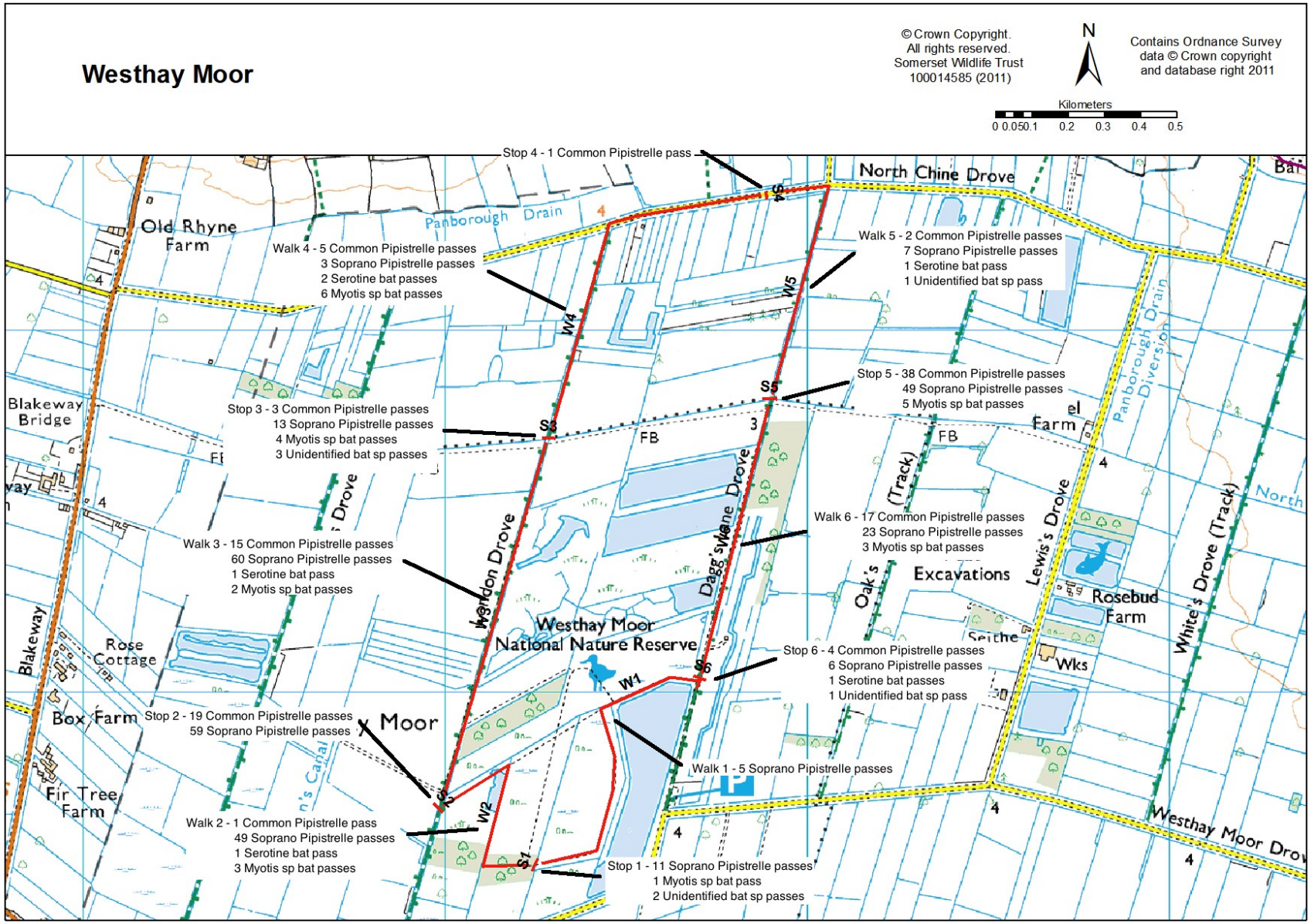
Table 10: Bat passes recorded along Transect 7 Westhay Moor, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Common pipistrelle	3		2		6	2	9		2	1	3	1	29
	Soprano pipistrelle		12	17	17	29				4	1	18	2	100
	Pipistrelle sp		1			1						2		4
	Myotis sp			1		4					1			6
	Serotine						1	1						2
	Unidentified bat passes						1	1	1	2				5
2014*	Lesser horseshoe bat		2				1	2			1			6
	Common pipistrelle	4	27	64	24	82	1	3	2	6	4	3		220
	Soprano pipistrelle	46	114	132	38	89	3	5		3	13	43		486
	Pipistrelle sp			3		3	1		1					8
	Myotis sp	18	4	12	3	21	1	18	1	9	2	2		91
	Serotine			1				4		1				6
	Noctule					1								1
2015	Common ppistrelle			1	19	15	3	5	1	2	38	17	4	105
	Soprano pipistrelle	5	11	49	59	60	13	3		7	49	23	6	285
	Serotine			1		1		2		1			1	6
	Myotis sp		1	3		2	4	6			5	3		24
	Unidentified bat species		2				3			1			1	7

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

The third year of survey on this transect did not show a repeat of the massive numbers of passes for common and soprano pipistrelles that were a feature of 2014, but passes were still well up on 2013 when the transect was last walked in this direction. Another 'reverse' year is needed to see if the pattern is repeated. If so then one can speculate that the bats may be arriving at the best feeding areas at Walk 1 to Walk 3 comparatively late in the evening. That might suggest that they are coming some distance from their roost. Historically there has been a large roost of soprano pipistrelles at Godney some 4km away. This remains a very active transect, particularly for soprano pipistrelles. No noctules were recorded – in the past Westhay Moor NNR has been a recognised feeding area for this species.

Figure 18: Location of bat passes recorded along Transect 7 Westhay Moor.



5.8 Transect 8: Meare

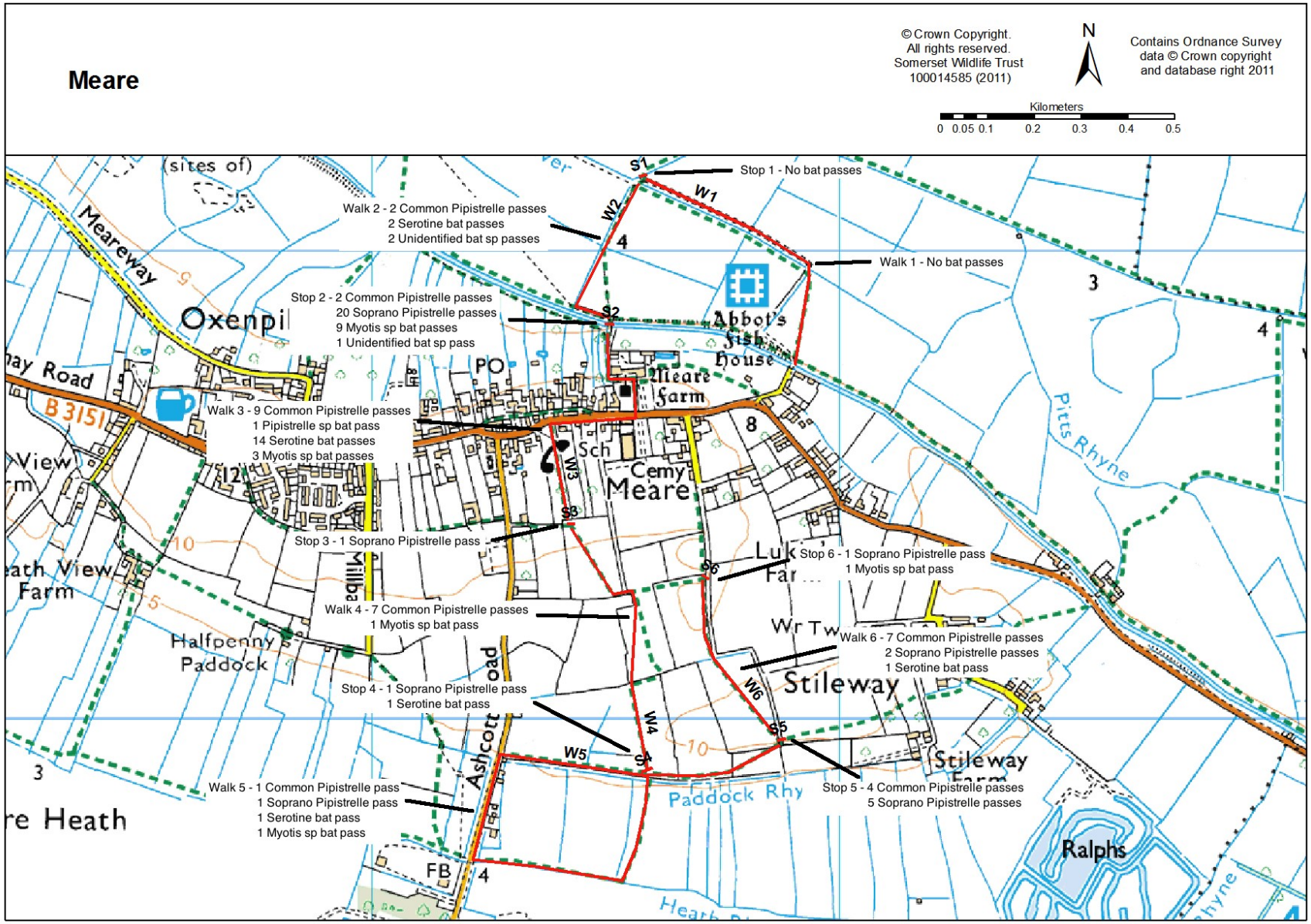
Table 11: Bat passes recorded along Transect 8 Meare, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Common pipistrelle					13	3		1	5	1		1	24
	Soprano pipistrelle				3	8	5			1			2	19
	Myotis sp				3	26	5	10		2		1		47
	Serotine					5								5
	Noctule					3								3
	Unidentified bat passes					6				1				7
2014*	Lesser horseshoe bat						2			2				4
	Common pipistrelle	12	3	18	10	5				21				69
	Soprano pipistrelle	6	8	6	5	3	2	2		52	4		4	92
	Pipistrelle sp		1											1
	Myotis sp	1				1			2	13	1			18
	Serotine				5	7		1		3				16
	Noctule	1												1
	Leisler's									1				1
	Unidentified bat passes									3				3
2015	Common pipistrelle			2	2	9		7		1	4	7		32
	Soprano pipistrelle				20		1		1	1	5	2	1	31
	Pipistrelle sp					1								1
	Serotine			2		14			1	1		1		19
	Myotis sp				9	3		1		1			1	15
	Unidentified bat species			2	1									3

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

This is another transect where we now have three years' data. *Myotis* passes were down in 2015 from the number recorded in 2013 but the figure is comparable with 2014. This appears to be a good site for serotines. The surge of both common and soprano pipistrelle activity at Walk 1 to Walk 3 in 2014 might be another case of the bats arriving late to a good feeding area and in the 'normal' years the surveyors might have had to set off too early for the bats to have got there. Another year with the transects walked in the 'reverse' direction might tell us if that is a pattern or not.

Figure 19: Location of bat passes recorded along Transect 8 Meare.



5.9 Transect 9: Ham Wall and Walton Heath

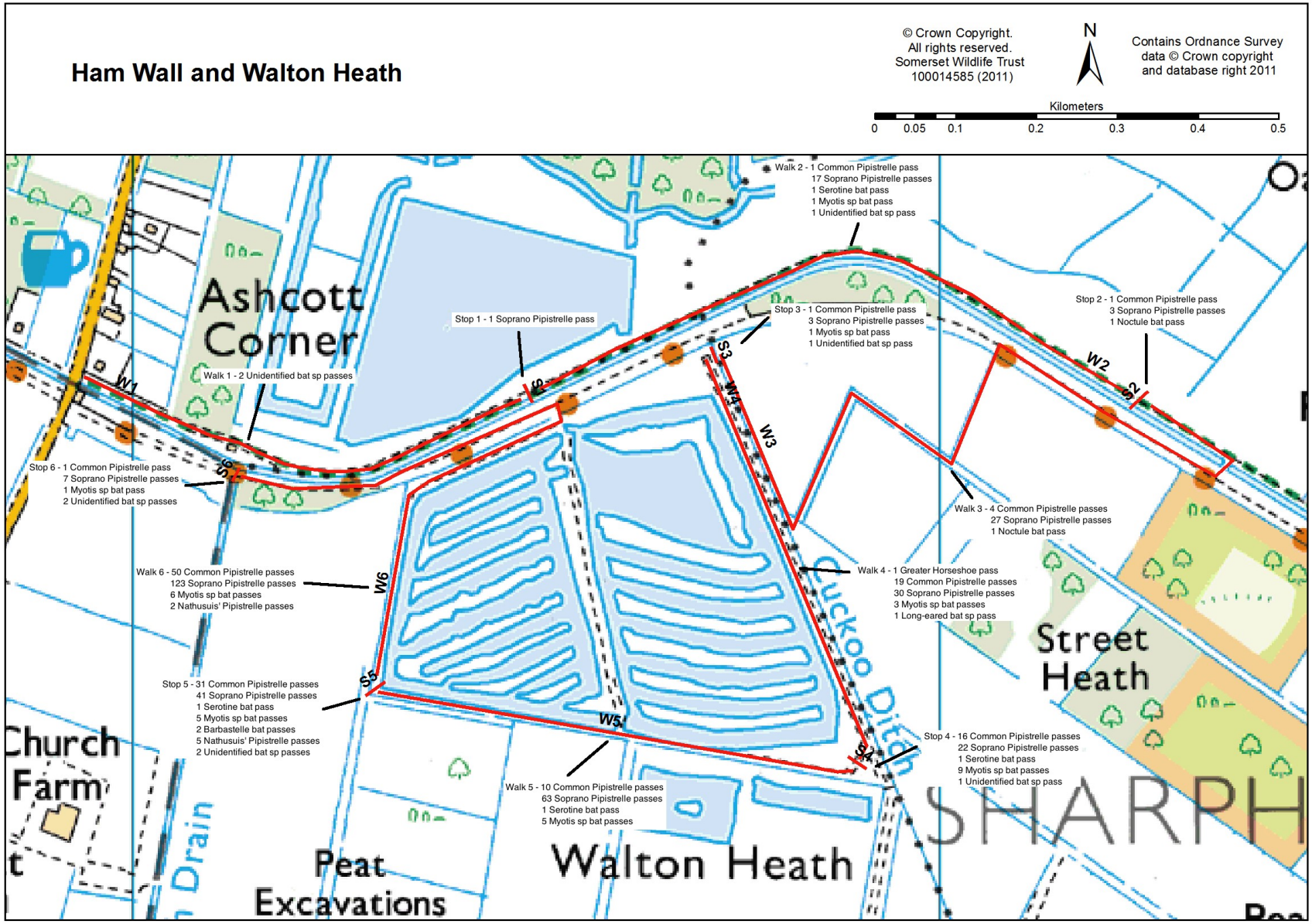
Table 12: Bat passes recorded along Transect 9 Ham Wall and Walton Heath, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Greater horseshoe bat									1				1
	Common pipistrelle								1	3	7	4	2	17
	Soprano pipistrelle			7		27	7	18	15	34	32	54	2	196
	Myotis sp								1	5	7	3		16
	Serotine						1							1
	Noctule								7	1	1			9
	Unidentified bat passes						1				3			4
2014*	Common pipistrelle	5	7	11	4	11	10	7		1				56
	Soprano pipistrelle	21	7	40	6	59	8	22	4	51	11	48	2	279
	Nathusius' pipistrelle		1		1	4								6
	Myotis sp	1	1	13	2	2	2	4		1	3	2		31
	Unidentified bat passes						1				2			3
2015	Greater horseshoe bat							1						1
	Common pipistrelle			1	1	4	1	19	16	10	31	50	1	134
	Soprano pipistrelle		1	17	3	27	3	30	22	63	41	123	7	337
	Nathusius' Pipistrelle										5	2		7
	Serotine			1					1	1	1			4
	Noctule				1	1								2
	Myotis sp			1			1	3	9	5	5	6	1	31
	Long-eared bat sp							1						1
	Barbastelle										2			2
	Unidentified bat species	2		1			1		1		2		2	9

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

This area is nationally famous after an enormous amount of work by the RSPB to create habitat for bitterns and other bird species of reedbed. As often happens what is good for a target species is good for all sorts of other wildlife. There is a huge amount of bat activity here, particularly of soprano pipistrelles but also, and possibly increasingly, by common pipistrelles. The count of *Myotis* passes is consistent, unlike some other transects. Much rarer species also show up here: greater horseshoe bat, barbastelle and Nathusius' pipistrelle. The last of these is currently being studied in the area of North Somerset and Ham Wall was identified as a place with the right habitat. Nathusius' pipistrelles being recorded in two out of the three years of the Brue Valley Big Bat Survey here agrees with this assessment.

Figure 20: Location of bat passes recorded along Transect 9 Ham Wall and Walton Heath.



5.10 Transect 10: Yeaps Bridge

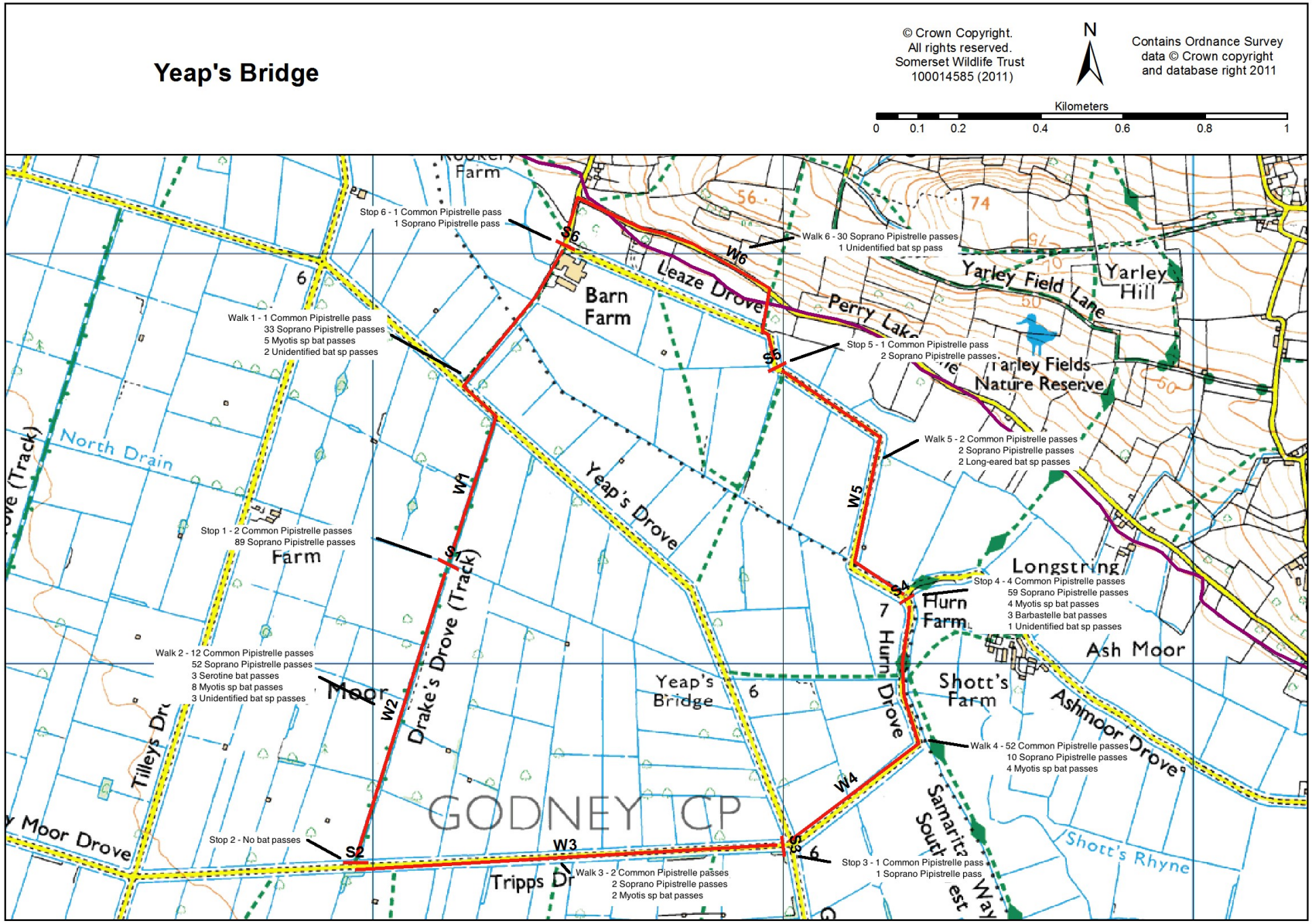
Table 13: Bat passes recorded along Transect 10 Yeaps Bridge, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Common pipistrelle			6	4	9	1	1	2			10	36	69
	Soprano pipistrelle	3	4	72		13	1		1			6	1	101
	Pipistrelle sp											2	3	5
	Myotis sp					3		8	2				6	19
	Serotine					3		1						4
	Noctule		1											1
	Unidentified bat passes			1		5			1					7
2014*	Lesser horseshoe Bat											1		1
	Common pipistrelle	17	1	31	1	6		32	32	14	1	1		136
	Soprano pipistrelle	10	4	20		8		17	73	3	29	9		173
	Nathusius' pipistrelle									2				2
	Pipistrelle sp	1								5				6
	Myotis sp	1	1			5		7	5		1			20
	Serotine									29				29
	Unidentified bat passes			1		2		3		2		1		9
2015	Common pipistrelle	1	2	12		2	1	52	4	2	1		1	78
	Soprano pipistrelle	33	89	52		2	1	10	59	2	2	30	1	281
	Serotine			3										3
	Myotis sp	5		8		2		4	4					23
	Long-eared bat sp									2				2
	Barbastelle								3					3
	Unidentified bat species	2		3					1			1		7

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

The third year of survey for this transect has provided a very large number of soprano pipistrelle passes and consistent numbers for common pipistrelles and *Myotis* bats. The Nathusius' pipistrelle of the previous year was not recorded in 2015, but a barbastelle pass was for the first for this species here. Again one can speculate about where it day roosts. There were 3 serotine passes which mirrors the 4 passes in 2013 but in 2014 there were 29. This may reflect where the cattle were in the different years as this species is usually associated with grazing livestock and often feeds on dung beetles.

Figure 21: Location of bat passes recorded along Transect 10 Yeaps Bridge.



5.11 Transect 11: East Backwear

Table 14: Bat passes recorded along Transect 11 East Backwear, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Greater horseshoe bat									1				1
	Lesser horseshoe bat							2						2
	Common pipistrelle				2			5		1		32	1	41
	Soprano pipistrelle				1	11	1	10				3		26
	Pipistrelle sp					2		1				2		5
	Myotis sp							9	2	1	2	21		35
	Serotine				1			1						2
	Noctule		1											1
	Unidentified bat passes			1	1									2
2014		This route was not surveyed in 2014												
2015		This route was not surveyed in 2015												

Sadly it has not proved possible to repeat this transect since the initial survey in 2013. It is hoped that it may feature in the survey in 2016.

5.12 Transect 12: Fenny Castle

Table 15: Bat passes recorded along Transect 12 Fenny Castle, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Common pipistrelle	3	2	38	2	7	3	2		2	1	65	20	145
	Soprano pipistrelle			14	1	1	1					28	8	53
	Myotis sp			9			2		7			18	3	39
	Serotine			3								6	2	11
	Noctule	1												1
	Unidentified bat passes					1								1
2014		This route was not surveyed in 2014												
2015		This route was not surveyed in 2015												

Sadly it has not proved possible to repeat this transect since the initial survey in 2013. It is hoped that it may feature in the survey in 2016.

5.13 Transect 13: Long and Short Drove

Table 16: Bat passes recorded along Transect 13 Long and Short Drove, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Pipistrelle sp			22	3	6	8	2	2	15	2	5	6	71
	Myotis sp					5								5
	Unidentified bat passes				1							3	2	6
2014		This route was not surveyed in 2014												
2015		This route was not surveyed in 2015												

Sadly it has not proved possible to repeat this transect since the initial survey in 2013. It is hoped that it may feature in the survey in 2016.

5.14 Transect 14: West North Wooton

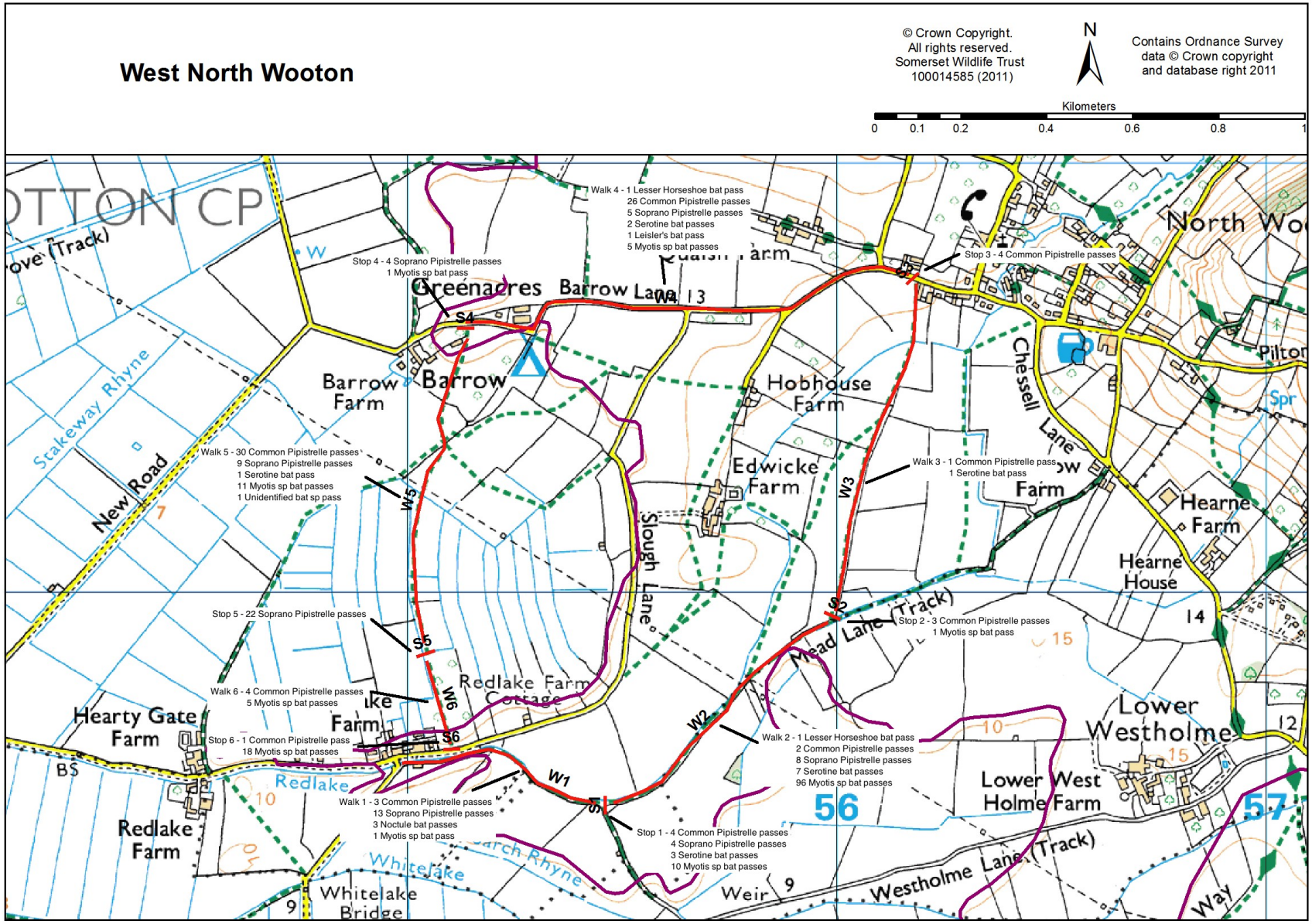
Table 17: Bat passes recorded along Transect 14 West North Wooton, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Lesser horseshoe bat			1	2									3
	Soprano pipistrelle							2	1	2	1	1		7
	Pipistrelle sp									2				2
	Myotis sp	2		31	43	14	6	11	25		3	9	1	145
	Serotine							1	1					2
	Noctule			1										1
2014*	Common pipistrelle					6	3	4	2	1		3		19
	Soprano pipistrelle			2		1		2		4		3		12
	Pipistrelle sp								6					6
	Myotis sp			18	7	2		9	2	1				39
	Serotine						1		1					2
	Noctule									1				1
	Leisler's					1								1
2015	Lesser horseshoe bat			1				1						2
	Common pipistrelle	3	4	2	3	1	4	26		30		4	1	78
	Soprano pipistrelle	13	4	8				5	4	9	22			65
	Serotine		3	7		1		2		1				14
	Noctule	3												3
	Leisler's							1						1
	Myotis sp	1	10	96	1			5	1	11		5	18	148
	Unidentified bat species									1				1

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

As in 2013 the most remarkable feature of this transect was the very large number of *Myotis* passes at 148 (145 in 2013). Why then were there only 39 in 2014? It does not appear to be a case of timing, the low year being a 'reverse' year, because the passes are spread throughout the transect. If it was a case of not getting there in time or too late, the passes would surely be at the beginning or end of the walk. It could be related to differences in weather. In the previous two years there seem to have been unusually few pipistrelle species, but in 2015 the 78 common pipistrelles passes and 65 soprano pipistrelle passes are much more what one would expect. What has changed? It does not appear that these species have increased at the expense of the similar sized *Myotis* bats. The Leisler's bats are a useful discovery adding more to our knowledge about their flight activity around the Brue Valley.

Figure 22: Location of bat passes recorded along Transect 14 West North Wooton.



4.15 Transect 15: Hulk Moor

Table 18: Bat passes recorded along Transect 15 Hulk Moor, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Lesser hrseshoe bat									1				1
	Common pipistrelle					14	8	17		5		8	3	55
	Soprano pipistrelle					41	22	33	6	5	1	5		113
	Myotis sp					11	4	7	1	3	2	7		35
	Serotine					7			1					8
	Noctule					79							1	80
	Unidentified bat passes							3						3
2014		This route was not surveyed in 2014												
2015		This route was not surveyed in 2015												

Sadly it has not proved possible to repeat these transects since the initial survey in 2013. It is hoped that they may be repeated in 2016.

5.16 Transect 16: South Moor

Table 19: Bat passes recorded along Transect 16 South Moor, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013		This route was not surveyed in 2013												
2014		This route was not surveyed in 2014												
2015		This route was not surveyed in 2015												

This transect has been set up since the start of the surveys in 2013 but has not yet been included.

5.17 Transect 17: Church Moor

Table 20: Bat passes recorded along Transect 17 Church Moor, 2013 to 2015.

Year	Bat species	Transect section												
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	Total
2013	Common pipistrelle					3	37	29	57	11	3	5	2	147
	Soprano pipistrelle			7	43	24	38	14	35	1	1	1		164
	Myotis sp						6	1			4	3		14
	Serotine			2						1	3			6
	Unidentified bat passes					1				1				2
2014*	Common pipistrelle		4	15	40	64	20	78	2		24	21		268
	Soprano pipistrelle	22	41	4		10	12	29		1	5	2	1	127
	Myotis sp		3	1		1	1	7		1	30	5		49
	Serotine	1		2										3
	Unidentified bat passes											1		1
2015	Common pipistrelle	3	2	2	3	38	16	15	59	15	6	6	2	167
	Soprano pipistrelle	46	44	10		23	3	1	33	2		1		163
	Serotine					15	1	3		2	1	1	2	25
	Myotis sp		21	7				1	2		5	1	1	38
	Barbastelle			4										4
	Unidentified bat species	1	1	1		2			8				5	18

* The 2014 survey was completed in reverse starting at Stop 6 and finishing at Walk 1.

Fairly consistent over the three years although 268 common pipistrelle passes in 2014 was very much higher than in the other two years. The count of serotine passes was up to 25 in 2015 from 6 and 3 in 2013 and 2014 respectively. As noted above, that may well reflect the presence of grazing cattle and the consequent availability of insect-rich fresh cowpats. Another transect with a barbastelle for the first time, but the location close to Baltonsborough and orchards, gardens with scrub and trees may provide some additional habitat for this species and possibly roosts.

Figure 23: Location of bat passes recorded along Transect 17 Church Moor.