

BRUE VALLEY 2013 BIG BAT SURVEY



Somerset
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Group

Acknowledgements

The Brue Valley Big Bat Survey was run by the Brue Valley Living Landscapes team of the Somerset Wildlife Trust (SWT) with the help and support of the Somerset Bat Group (SBG). The survey depended on the selfless dedication, enthusiasm and expertise of an army of volunteers devoting many hours to designing and walking transects, mapping and describing the routes, spending hours analysing the sound recordings and discussing the problems not to mention the hours in muddy terrain in the dark actually surveying. This team effort combining both the back-up and support of the Somerset Wildlife Trust with the Somerset Bat Group has enabled this under-surveyed area of Somerset to be assessed for its bat potential and it is hoped that the survey will continue to gather more information about this vital wildlife resource.

The transects were designed by Cath Shellswell Dave Cottle and the late Lou Pickersgill. The administration and organisation of the survey was the work of Mark Steer of Somerset Wildlife Trust and the analysis was carried out by the authors.

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Cover photograph: Lesser Horseshoe Bat hibernating in Shute Shelve in the Mendip Hills 2011 © Paul Kennedy

Report Authors: Edward Wells and Cath Shellswell of Somerset Bat Group

1. INTRODUCTION

The Somerset Big Bat Surveys were first conceived for the Mendip Hills Living Landscape Team of Somerset Wildlife Trust (SWT) and ran from 2007 and 2012. A second survey for the Blackdown Hills AONB Partnership has been run between 2011 and 2013 with plans to continue for a further three years providing funding for supporting the organisation of the survey can be secured. The popularity of these surveys does not seem to diminish with anything from 30 to over 70 people involved on the survey nights. The Big Bat Surveys have received national attention and acclaim following presentations at the National Bat Conference and the South West Regional Bat Conference.

It was always envisaged that each survey would be run for 6 years, subject to the necessary funding and man hours being available. The two years of joint Mendip Hills and Blackdown Hills surveys undertaken in 2011 and 2012 showed that it was possible to run two surveys in the same summer without loss of support and it was therefore decided by Somerset Bat Group (SBG) to seek a replacement for the Mendip survey at its conclusion in 2013. A number of areas were considered but it was SWT's Brue Valley Living Landscape that was chosen. The Brue Valley is very different from both the Mendips and the Blackdowns. Both are upland regions with pasture and woodland some of it at significantly high altitude. They are relatively un-intensively managed and divided by county boundaries. The moors and levels of the Brue Valley are a very wet pasture dominated area, at and even below sea level. Except for the conservation managed swathe of the Avalon Marshes there is little woodland and whilst the fields are stocked with cattle many of them are much lusher and less species rich than on the shallow limestone of the Mendips or the leached uplands of the Blackdown Hills. It was difficult to find transects with the variety of different habitats that had been selected for the first two surveys and, for obvious reasons, we were constrained by where the droves went and where rhynes bisect the landscape. Nonetheless the transects that were designed were as varied as the area allowed and provided a fascinating contrast. Whereas in the Blackdown Hills, Common Pipistrelles (*Pipistrellus pipistrellus*) were very much more recorded than any other species in the Brue Valley it was expected that the Soprano Pipistrelle (*P. pygmaeus*), a species believed to be more often associated with water, may take the lead.

As in the case of the two previous survey areas the main purpose of the survey was to obtain data by using a repeatable methodology and specifically to obtain flight records that could inform and improve our understanding of how bats use the landscape of the project area. 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 the Mendip surveys has been used successfully to support and direct agri-environment schemes enhancing conservation and providing a source of funding for land owners. Those who own and manage the land traversed 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 National Statistics, 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 for year to year and that in itself may give early warning of a less favourable condition of the land from a wildlife perspective.

The other 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. The huge popularity of all the Big Bat Surveys is an indication of how special people find the experience of using a bat detector and having a whole realm of invisible action revealed to them. 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

The 2013 Brue Big Bat Survey is a landscape survey to collect comparable data across an area of the Somerset Levels:

- (a) 17 predetermined routes (figure 1) were walked simultaneously comprising a series of 6 walking sections and 6 stationary points. Each team of volunteers listened to bats using heterodyne, time expansion or frequency division bat detectors and listed what they heard in each section.

- (b) At the same time one person in each group undertook a continuous recording on a wave recorder using a frequency division Batbox Duet Bat Detector. The recordings were assigned to separate tracks for each section and then analysed to count the number of bat passes in each section and, so far as possible, assign those passes to species.

2.1 Survey

Fifteen transects were surveyed in 2013. All were completed, however, not all of the recordings could be analysed. Each walk consisted of six stops of 5 minutes and six walked sections lasting an average of about 10 minutes. The stops were chosen strategically 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.

To create each route, a walk was drafted using OS Explorer Map 141 and 142. The transect was subsequently checked to measure the timings of the sections at a steady walking pace and define the different habitats at the stops. The volunteers were provided with maps of the transect they were undertaking, 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 Wildlife Trust.

Before starting the surveys, the volunteers met for a brief health and safety talk and then travelled to the beginning of each transect. Four to six individuals with a mixture of bat experience from beginner to very experienced were assigned to each group. One person in each group recorded the route continuously using a Batbox Duet and a wave recorder. The surveys started at 20:45 and finished at approximately 22:15. A chosen volunteer in each group travelled back to the Lifelong Learning Centre at the Avalon marshes Centre to hand-in the recordings and survey forms.

2.2 Sound Analysis

Each transect's recordings were analysed using BatSound software with BatScan software used to confirm some less obvious species identifications. The number of bat passes made by each species or group 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. 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. Changes in environmental conditions such as weather can be compensated by carrying out the surveys at the same time on the same night, and new batteries can be used.
- Observer error misidentifying bat passes and counting the number of bat passes – The standard procedure for counting bat passes was followed; however 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.
- Equipment failure – No calls were recorded on route 7 Westhay Moor due to a malfunction and it was not possible to equip route 13 Long Drove with a recording device. In both those cases we have relied on the written notes only. There were also cases of passes heard by the surveyors that were not recorded due to the need to replace batteries and in that situation we have relied on the written notes. There is a lower level of confidence in the identification of the species “missed” in this way but given the experience of the recorders concerned we considered it appropriate to accept their identification even though it could not be subjected to objective verification by sound analysis. 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.
- Faint recordings - occasionally the echolocation on the recording was 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”.

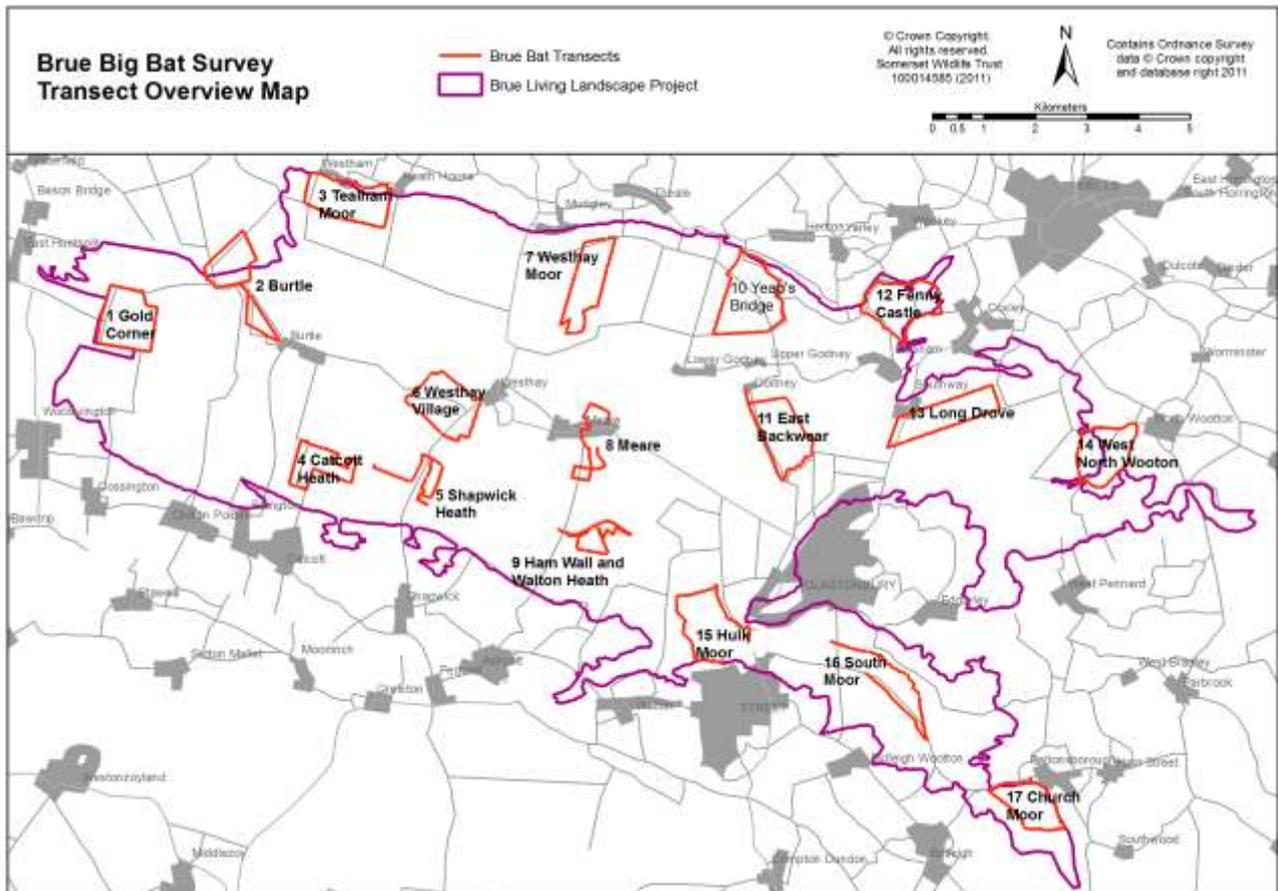


Figure 1: Map of the bat transects undertaken as part of the Brue Big Bat Survey

3. RESULTS AND SOUND ANALYSIS

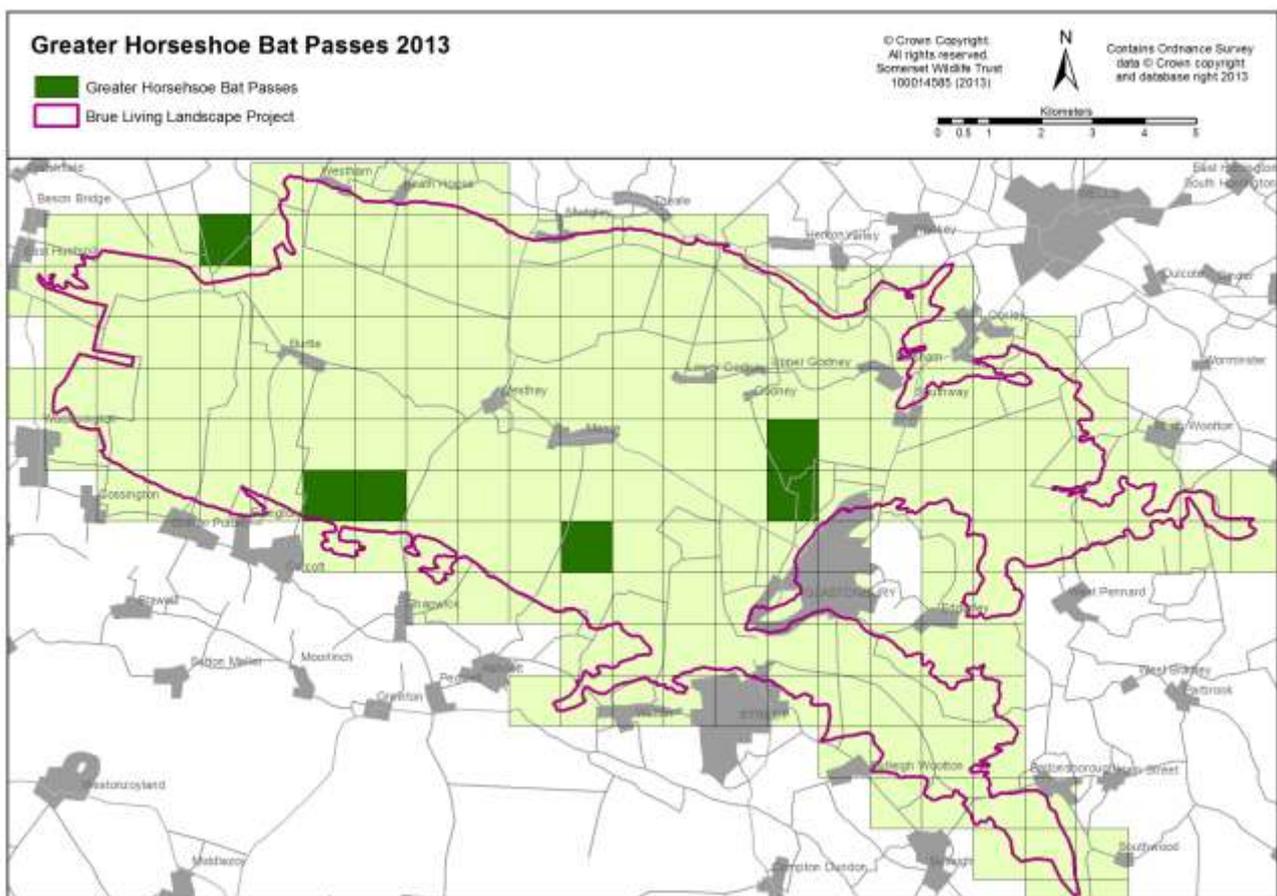
3.1 Overall summary

In total, seven species of bats were recorded and *Myotis* were grouped due to the similarity of call structure but there could have been another six species although it is unlikely that Bechstein's bat is present as this species has been found to prefer the more cluttered feeding environment of woodlands. The greatest number of bat passes were from Soprano Pipistrelle bats (echolocating at 55 kHz) comprising of just under half of all bat passes recorded. This is a likely result as this species has been found to be particularly associated with water bodies and channels. The Common Pipistrelle bat was not as frequently recorded comprising of just over quarter of the passes detected and *Myotis* sp were the third most commonly recorded group of bats. Daubenton's bat, sometimes referred to as the water bat due to its habit of gleaning insects just above the water surface, is likely to have been present in the area, although further surveys would need to be undertaken with a torch to identify the white flash of their underside which is often used to recognise this species as it passes over water. Both the Greater Horseshoe bat and Lesser Horseshoe bat were recorded and roosts are known in this area. Lesser horseshoe bat passes were detected only in the south and eastern routes whilst Greater Horseshoe bat passes were spread across the area. Of the larger bats, Serotine bat passes were spread across the Brue Valley area covered by the survey whilst Noctule bat passes were only found in the eastern end of the search area. One of the greatest surprises was recording some long-eared bat passes, which are probably Brown Long-eared bat being more common in Somerset than Grey Long-eared bats which have only been found further south towards Yeovil and just north of the Blackdown Hills AONB. As long-eared bats may not echolocate this does provide evidence that they are also using the Brue Valley as a place either to commute across and also as a feeding location.

Table 1 shows the number of bat passes and proportion of total calls for all the species recorded and the following maps show the presence of species recorded across the Brue levels. The results only show presence of bats identified from the recordings and can not 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.

Table 1: Number and proportion of bat passes recorded for each species / group.

Species /Species Group	2013 Bat Passes	2013 Total (%)
Greater horseshoe bat	5	0.2
Lesser horseshoe	9	0.3
Common 45 pipistrelle	782	26.8
Soprano 55 pipistrelle	1281	43.9
Pipistrelle sp	96	3.3
Serotine	62	2.1
Noctule	97	3.3
Myotis sp	509	17.4
Long-eared Bat	4	0.1
Unidentified bat species	75	2.6
TOTAL	2920	100



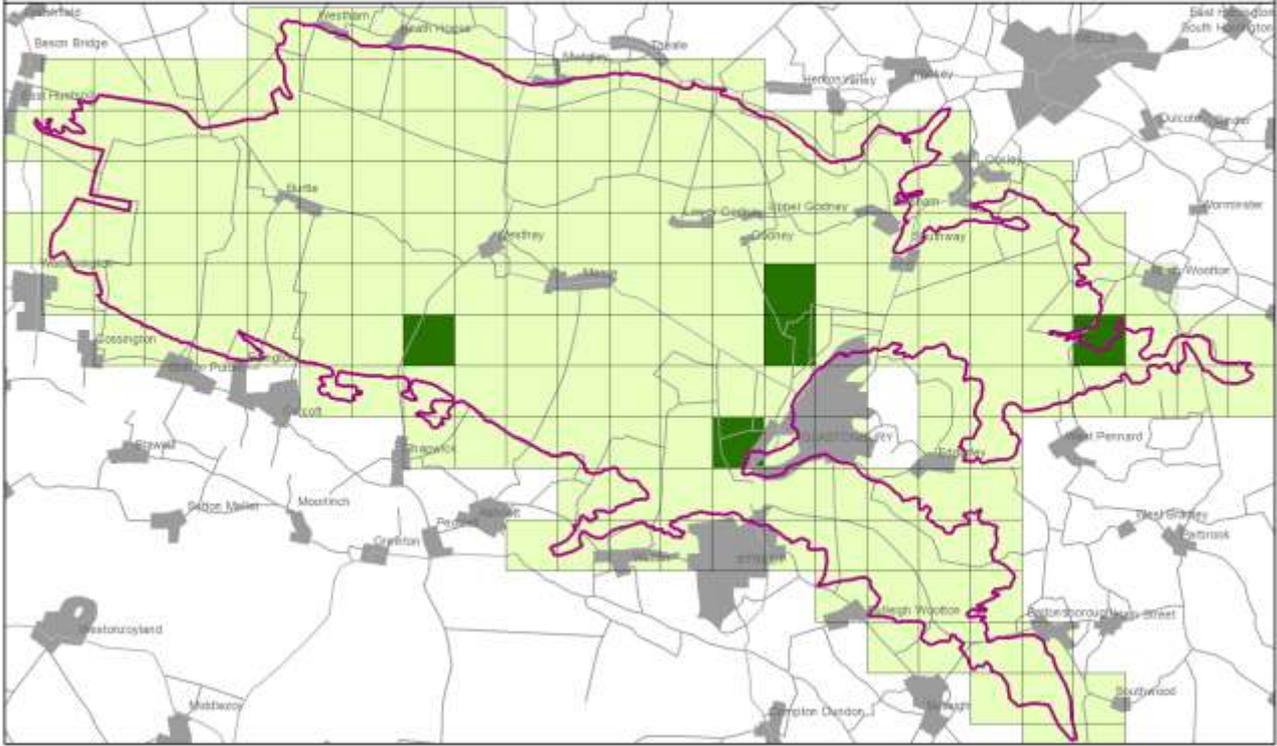
Lesser Horseshoe Bat Passes 2013

- Lesser Horseshoe Bat Passes
- Brue Living Landscape Project

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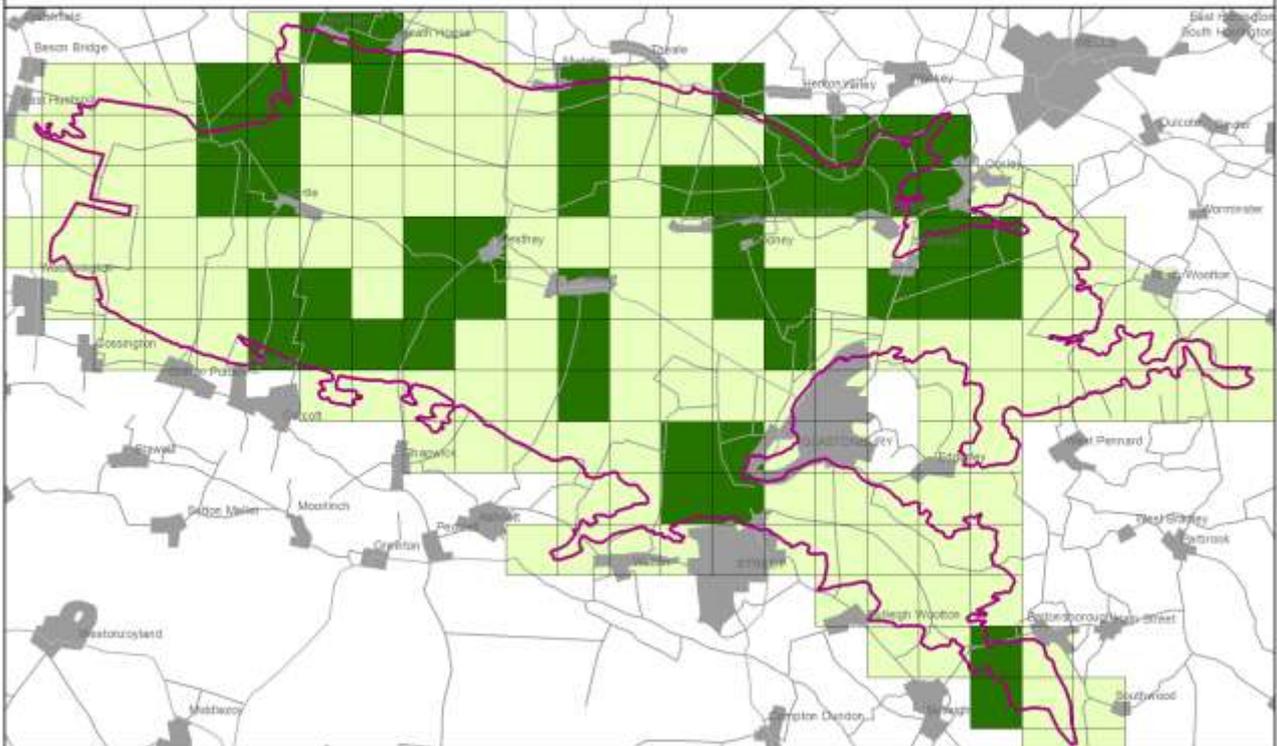
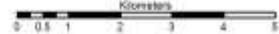
Common Pipistrelle Bat Passes 2013

- Common Pipistrelle Passes
- Brue Living Landscape Project

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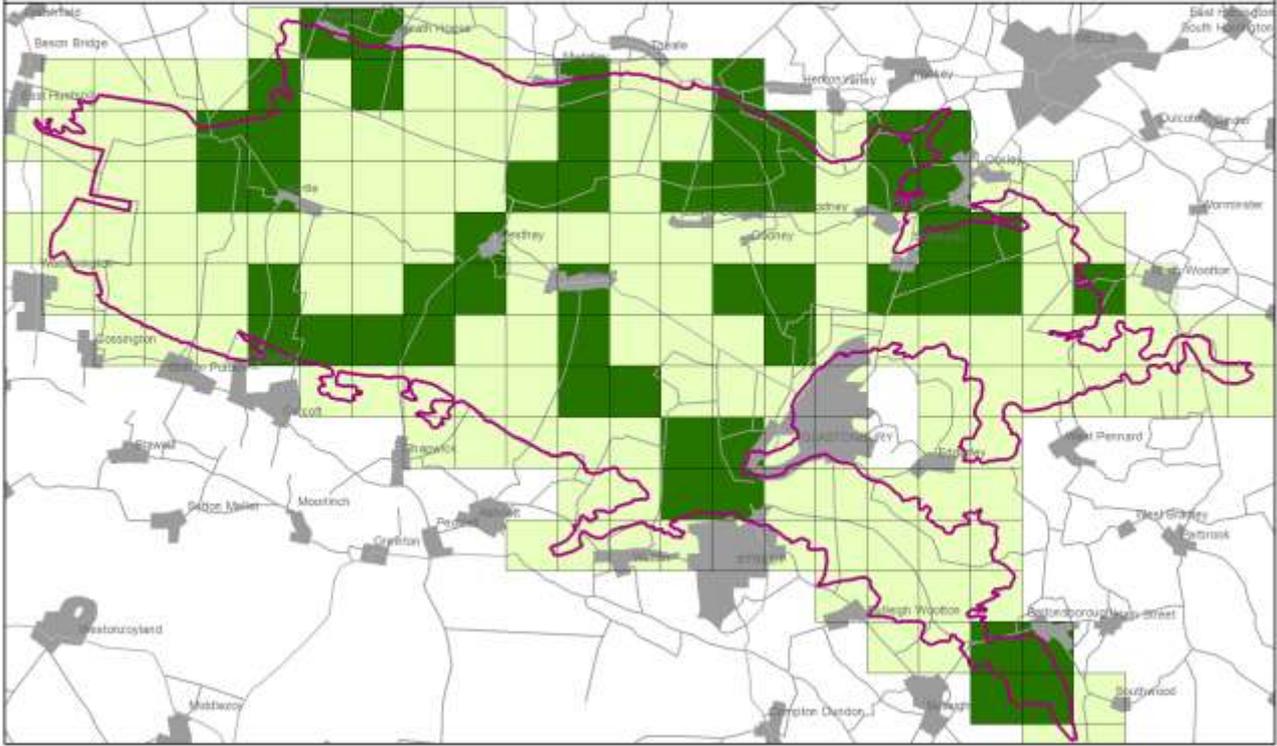
Soprano Pipistrelle Bat Passes 2013

-  Soprano Pipistrelle Passes
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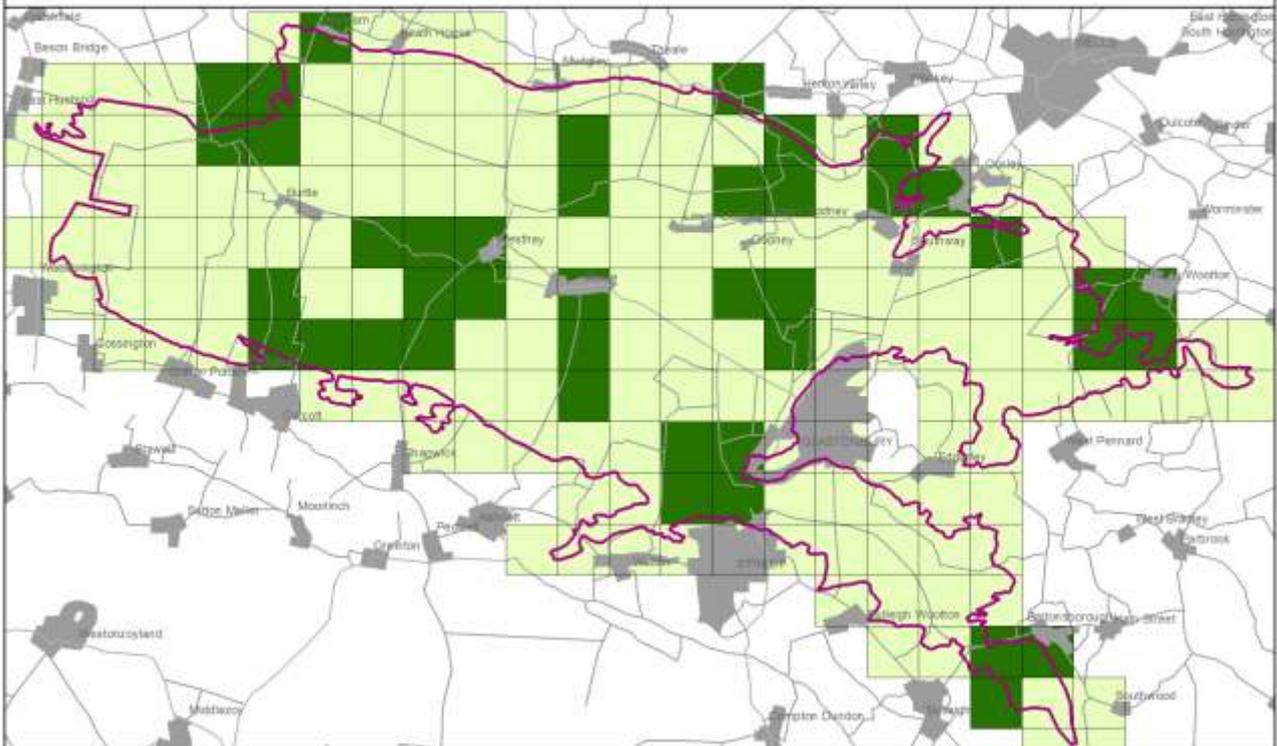
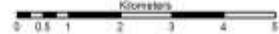
Myotis sp Bat Passes 2013

-  Myotis sp Passes
-  Brue Living Landscape Project

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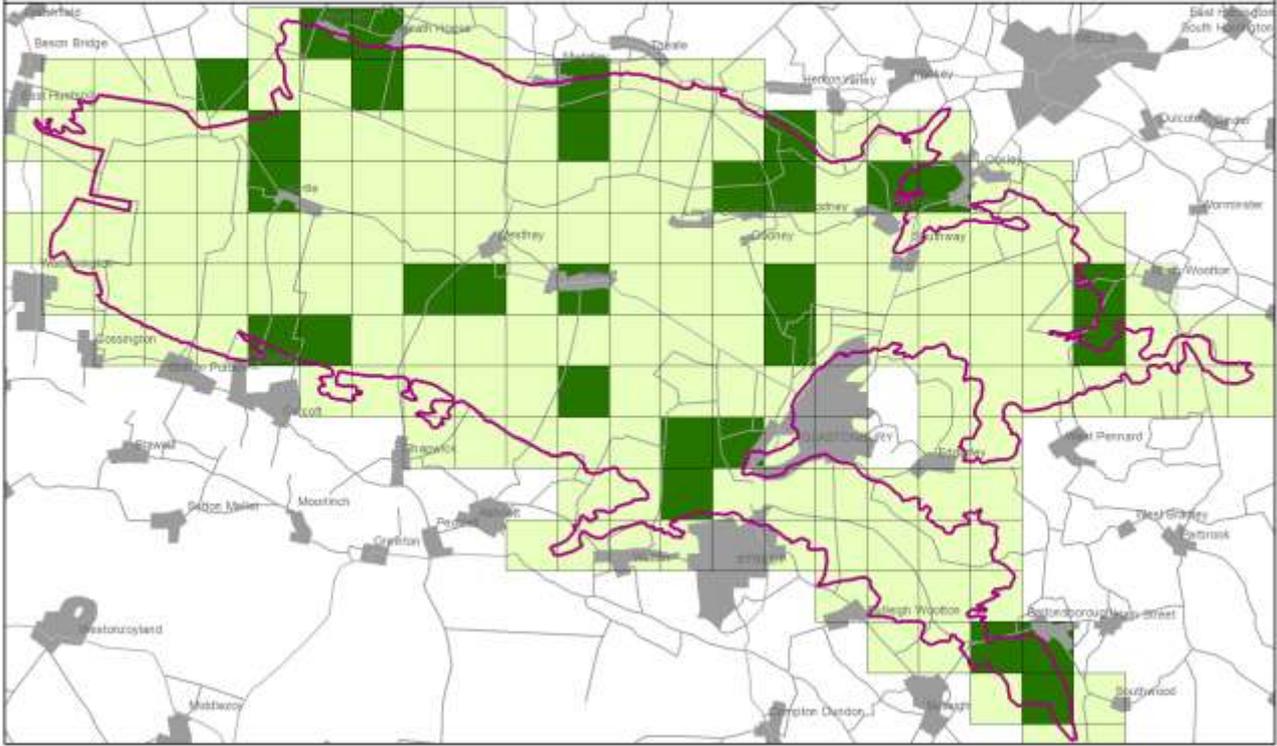
Serotine Bat Passes 2013

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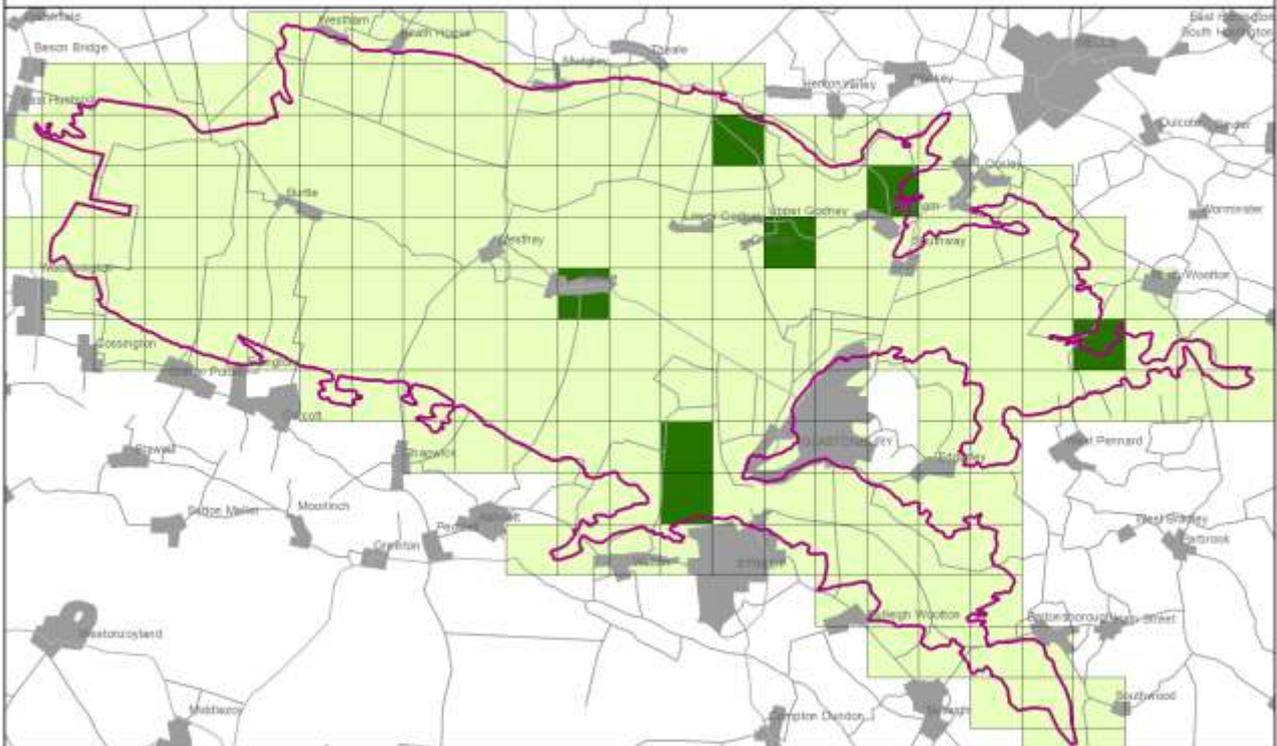
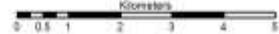
Noctule Bat Passes 2013

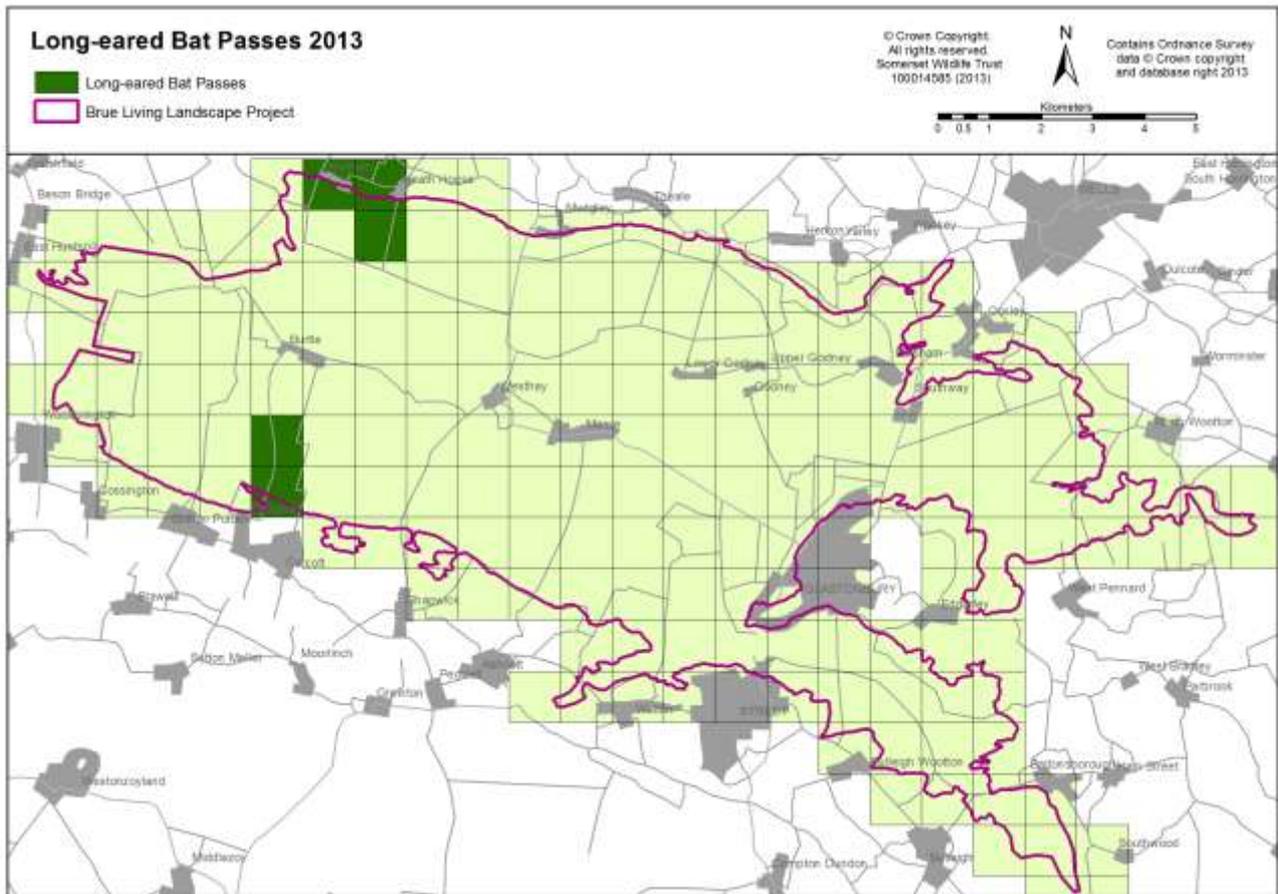
- Noctule Passes
- Brue Living Landscape Project

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3.2 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. It is, of course, impossible to draw any conclusions from one set of data and the following observations must be treated with caution and can at best merely highlight possible areas of comparison for following surveys.

3.2.1 Transect 1: Gold Corner

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												

3.2.1 Transect 2: Burtle

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							1						1
	Common Pipistrelle	10	1	10	1	16		8	9	2	1	13		70
	Soprano Pipistrelle	7	1	8	3	5		1	2	1		15	3	47
	Pipistrelle sp			1										2
	Myotis sp			1		1		1	1	5		1		9
	Serotine					10	2						1	13
	Noctule										1			1
	Unidentified bat passes		1					2	2					5

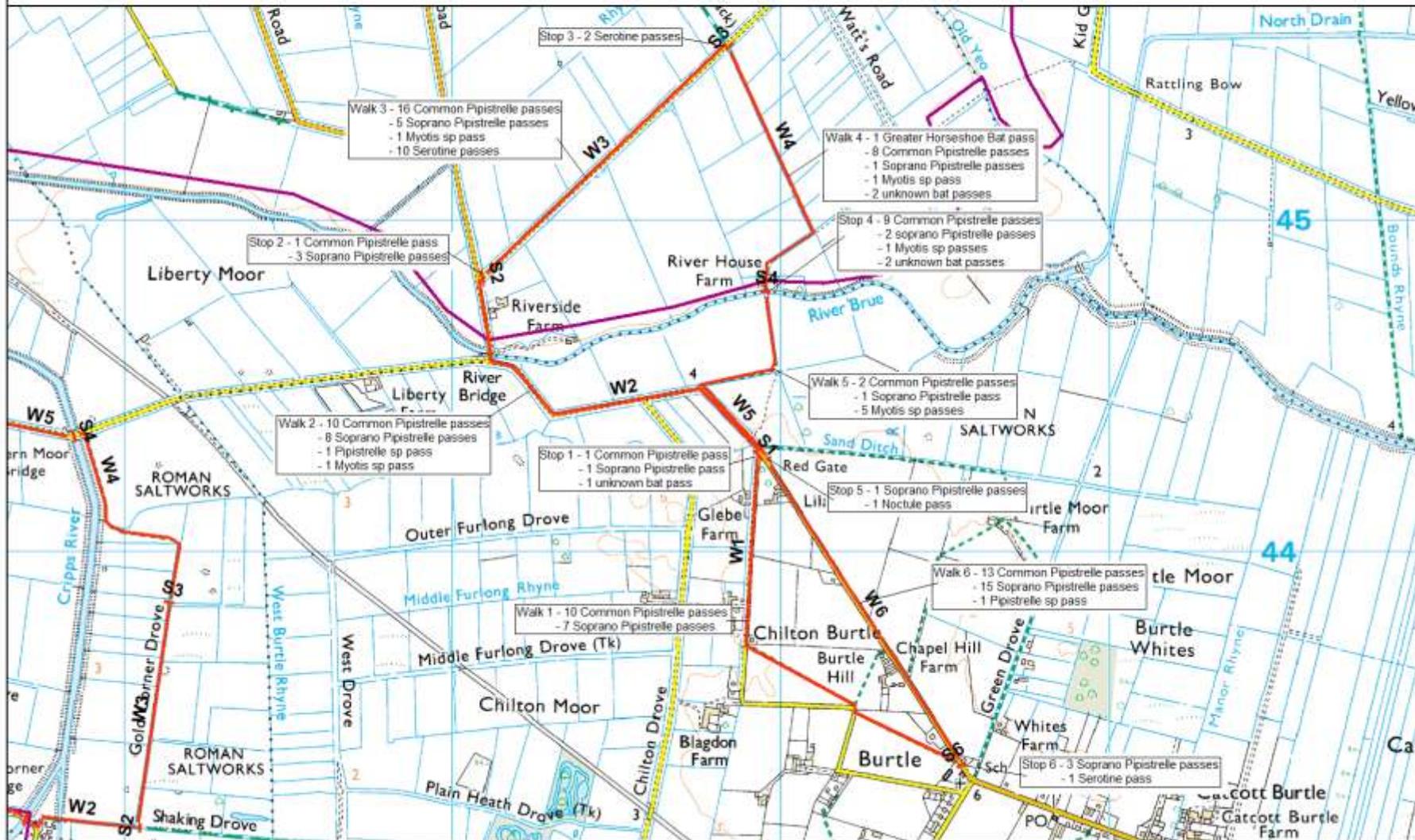
Unusually for this survey there were more Common Pipistrelle passes than Soprano Pipistrelle ones. Serotines were in evidence at Walk 3 suggesting that there were cattle somewhere nearby. Serotines often feed on *Aphodius* dung beetles which live on cow pats. The Greater Horseshoe Bat pass at Walk 4 is exciting as that point is approximately 4 km away from the known roost of this rare species near Shapwick Heath NNR. It will be interesting to see if this is repeated in future years.

Burtle

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3.2.1 Transect 3: Tealham Moor

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
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									

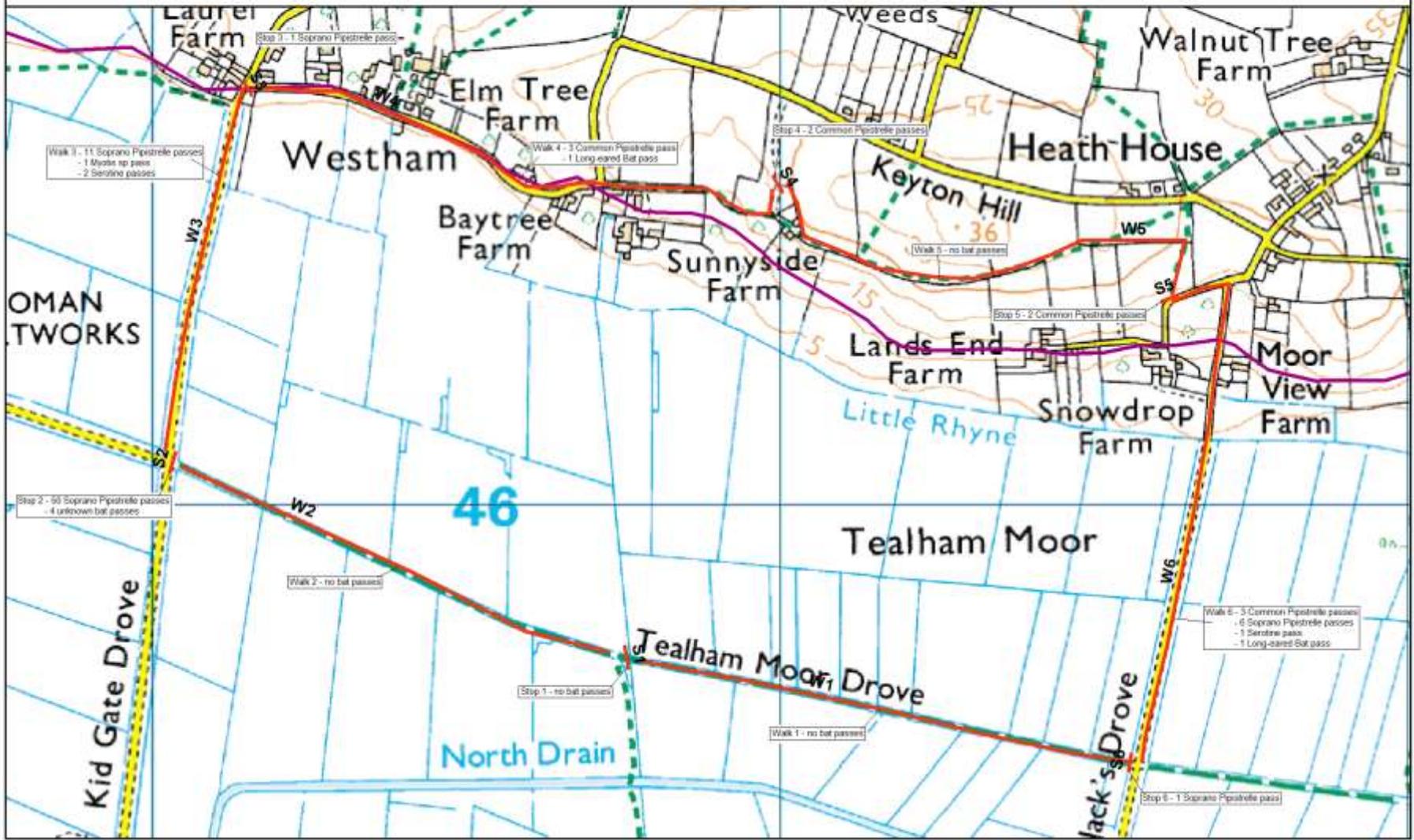
Tealham Moor appears to be Soprano Pipistrelle territory, with this species comprising 77.5% of all passes recorded. Most of those were at Stop 2 and Walk 3 suggesting that there may well be a substantial roost nearby. Soprano Pipistrelles are often found in larger numbers in their maternity roosts than any other British species.

Tealham Moor

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3.2.1 Transect 4: Cattcot Heath

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
2013	Greater Horseshoe					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

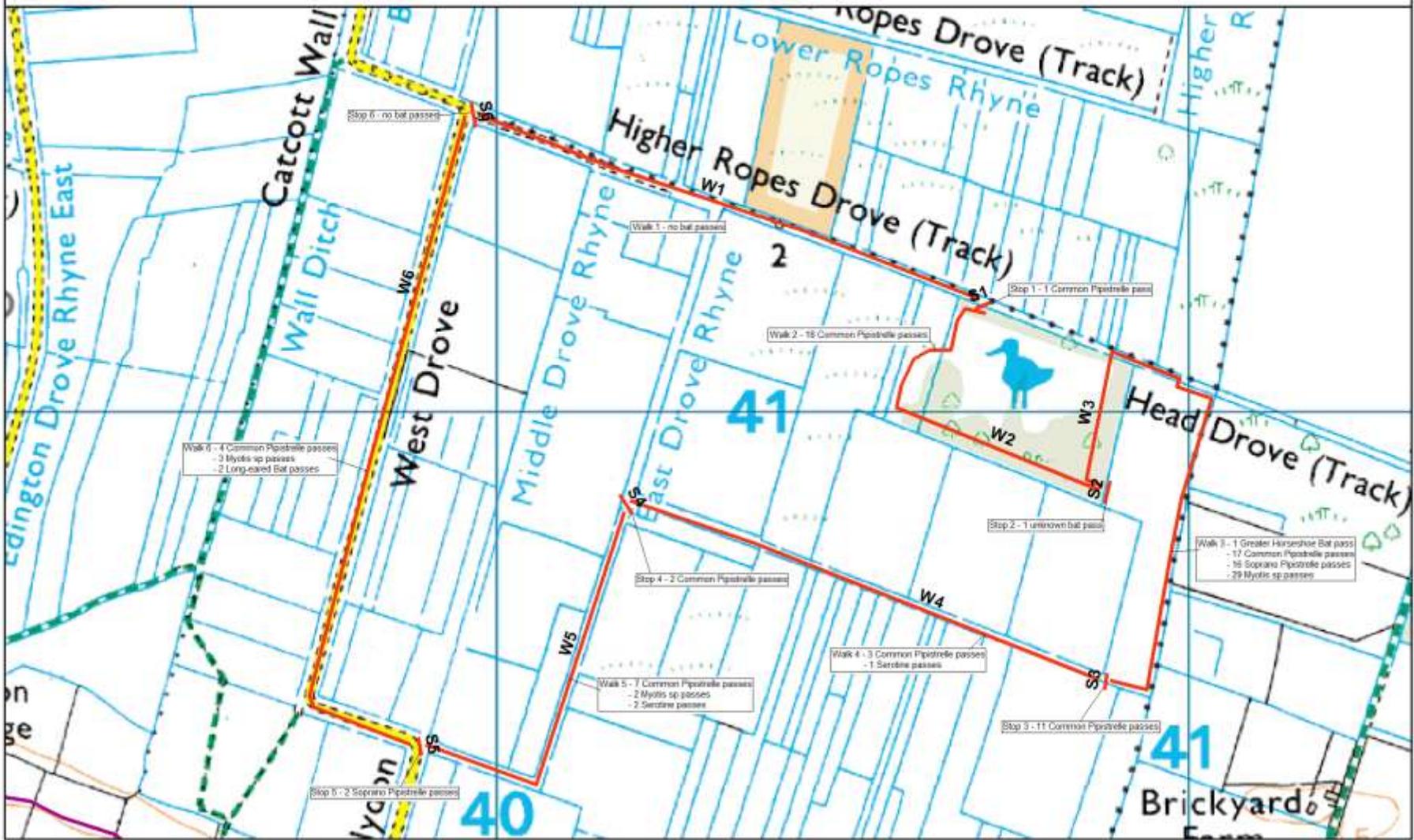
Both Pipistrelle species were found here and that bears out the experience of SBG in bat walks on the nature reserve. The figure for Myotis species passes is also encouraging. It is probable that many of these are Daubenton's Bats but over 20 Natterers Bats have been found by SBG in a bat box on the nature reserve. During this survey, no attempt has been made to differentiate between species in the genus Myotis to which both Daubentons and Natterers bats belong.

Catcott Heath

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3.2.1 Transect 5: Shapwick Heath

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											1		1
	Lesser Horseshoe			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

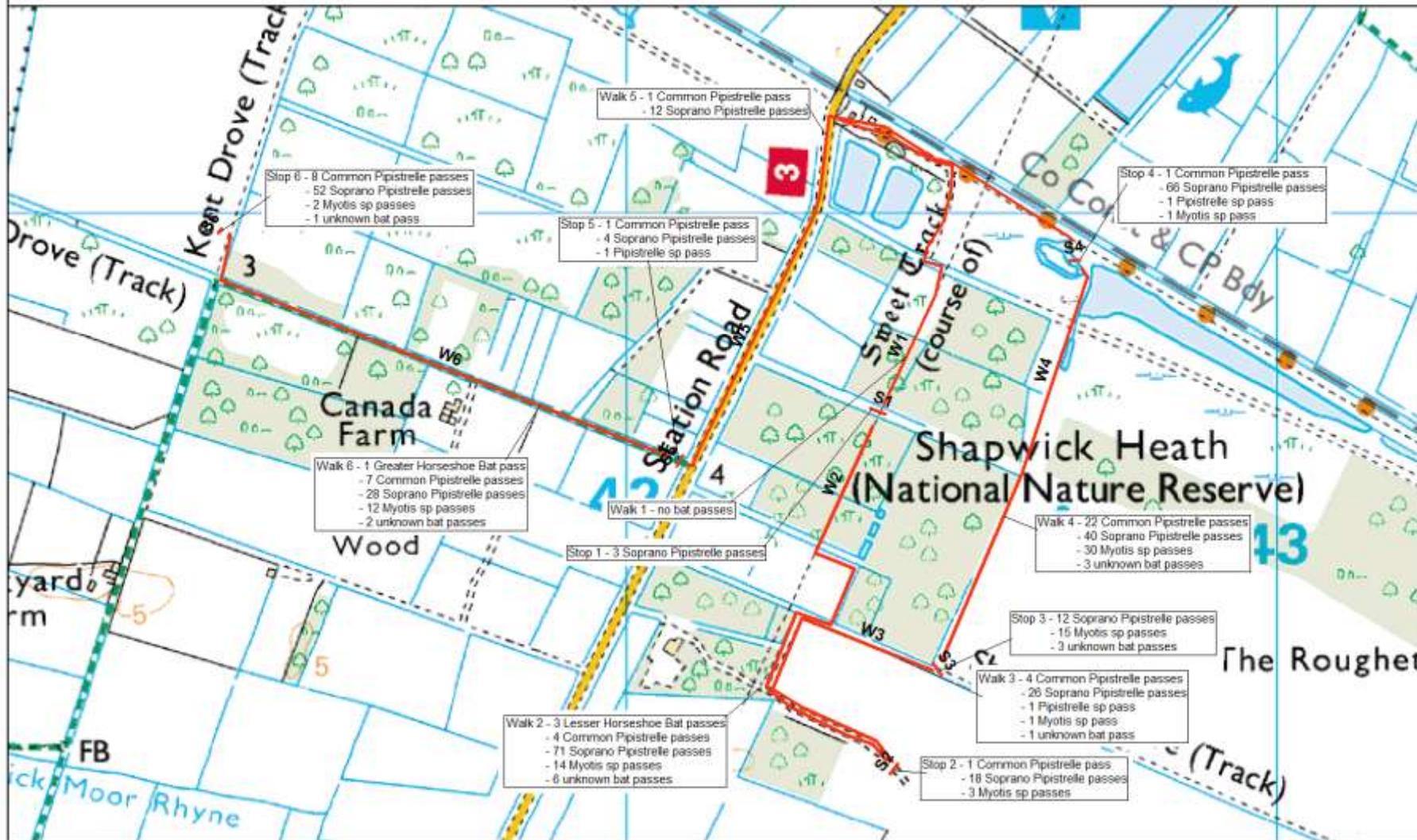
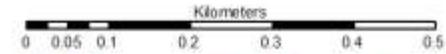
A very busy transect except for Walk 1 where nothing was recorded at all. This night suggest that though clearly a number of bats are feeding on the heath they may be coming some distance to do so. If the 2014 survey shows activity at that point but little or none at Stop 6 that would tend to confirm that the bats are taking a bit of time to get there. The Greater Horseshoe Bat at Walk 6 is very near to a known roost but the Lesser Horseshoe Bat passes at Walk 2 are more surprising as the nearest known roost is also close to Walk 6.

Shapwick Heath

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3.2.1 Transect 6: Westhay Village

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

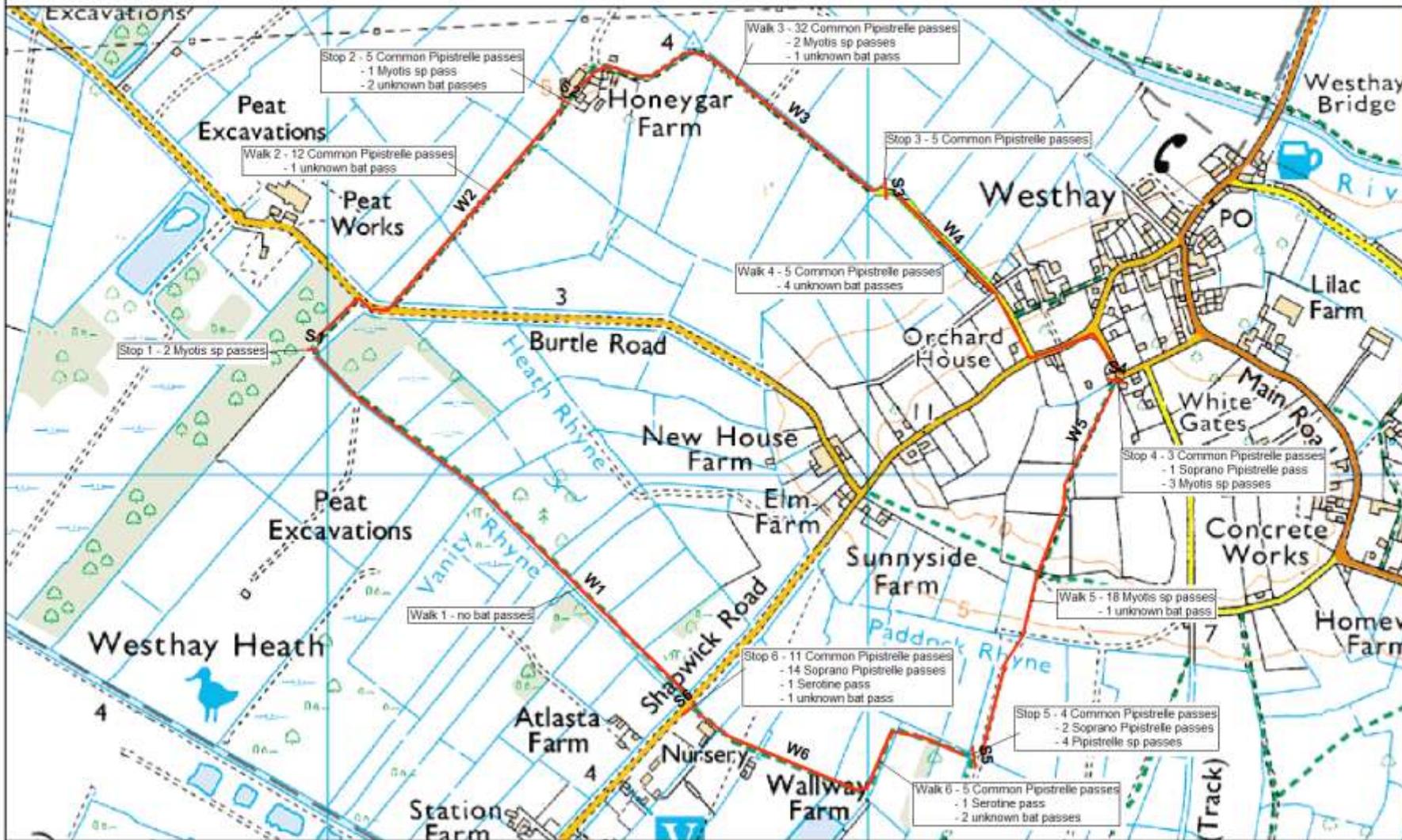
The absence of any bats at the start where the route is on typically low lying wet pastures may be a reflection of the lack of day roosting opportunities and suggests that the bats are coming from further away to feed. This may be confirmed if the pattern is reversed next time when the walk will start with Stop 6. The preponderance of Common Pipistrelle passes over those of the Soprano Pipistrelle may be a feature of a transect much of which does not have any significant large areas of open water. The Myotis passes at Walk 5 are interesting and if repeated in the next few surveys might suggest a roost nearby.

Westhay Village

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3.2.1 Transect 7: Westhay Moor

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
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

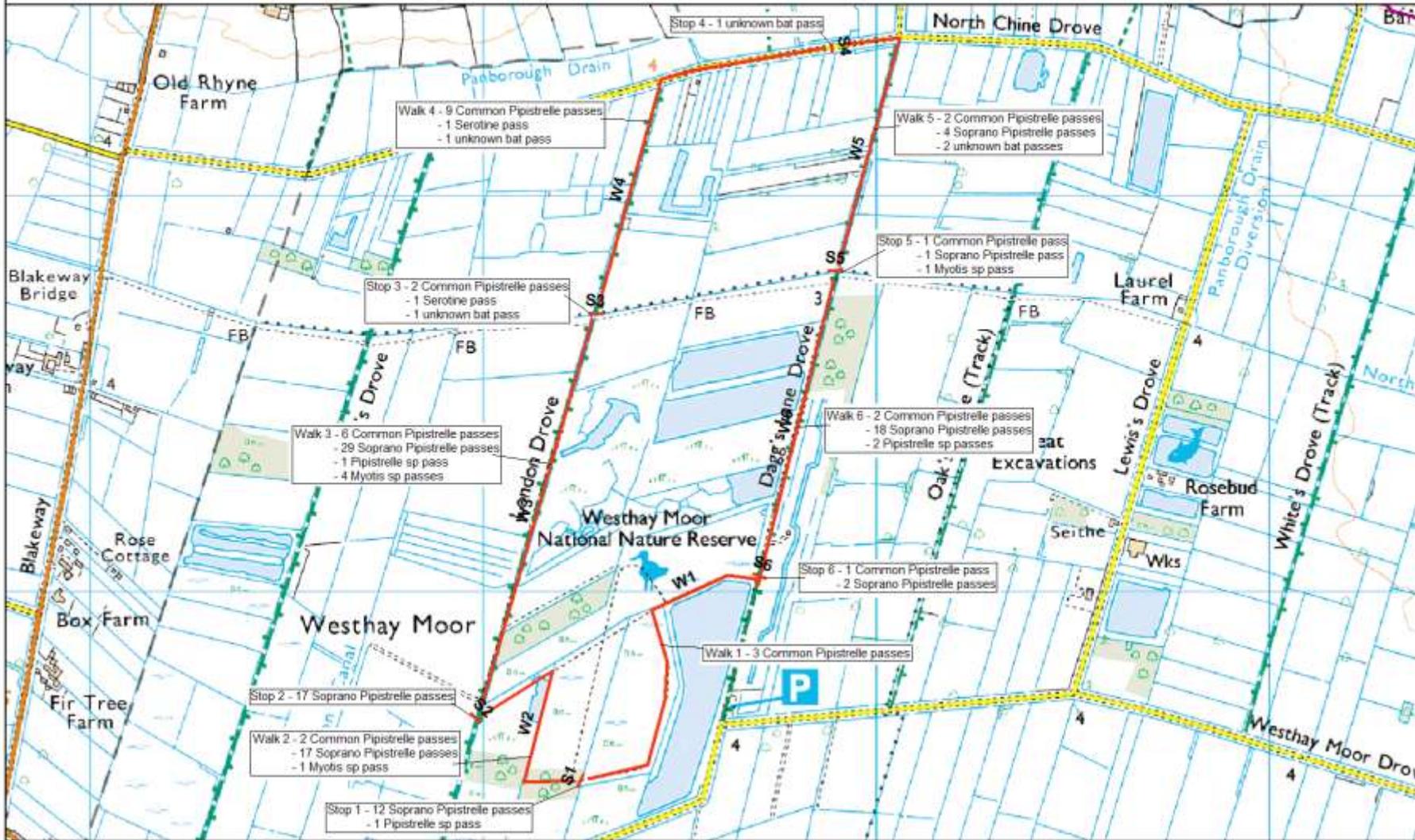
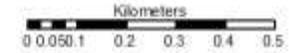
In contrast to Transect 6 this route does go close to some substantial lakes and Soprano Pipistrelle passes greatly outnumber those of all other species accounting for over 68% of the total. Noctules have often been recorded over the SWT reserve during the last 20 years but the big bats found this time were Serotines. It will be interesting to see if any Noctules turn up in future years. As with all the transects, what was heard in the couple of hours of the survey does not tell us anything about the bat activity in the rest of the night.

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3.2.1 Transect 8: Meare

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
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

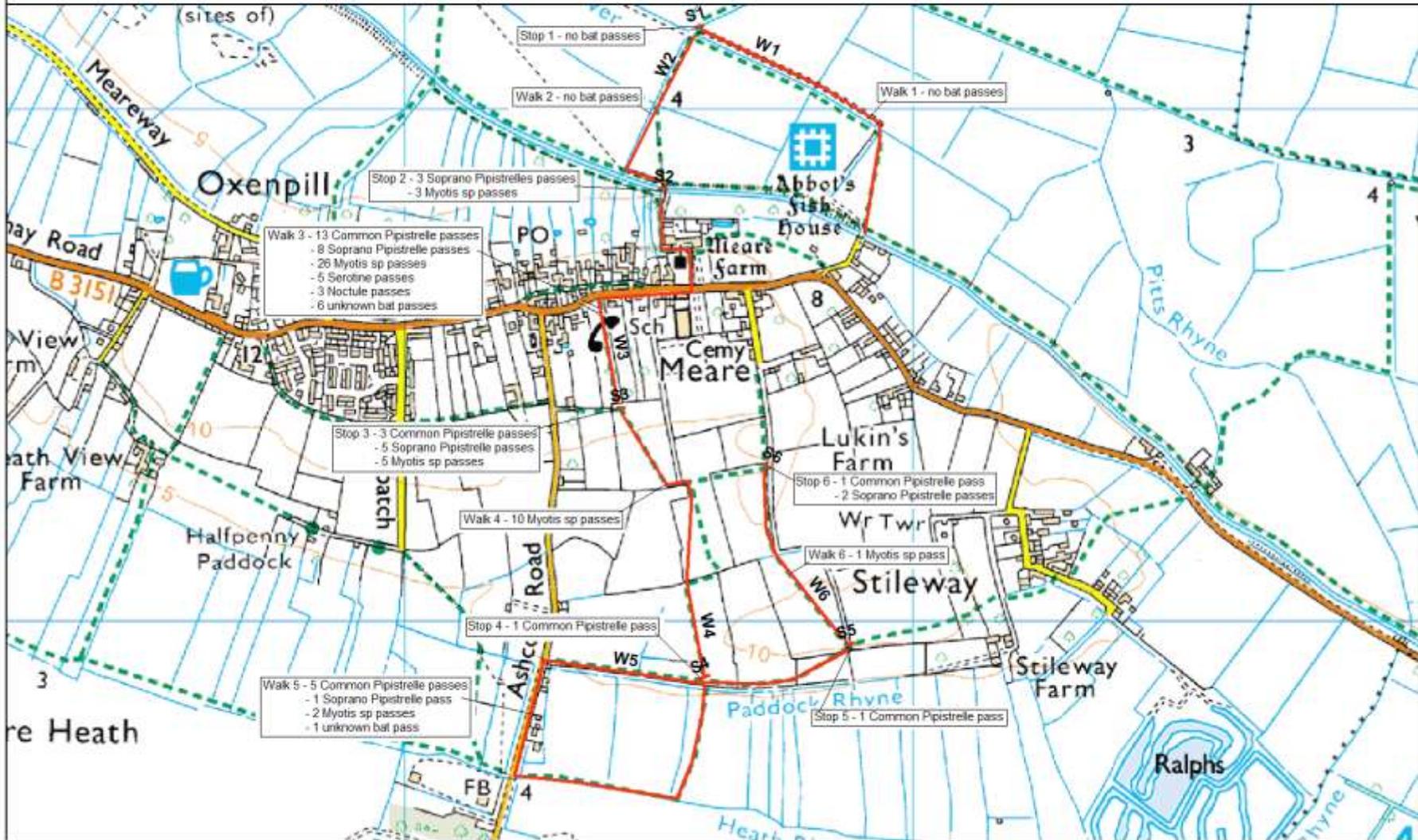
Remarkably few pipistrelles compared with most other transects and it is not easy to understand why. The Myotis count at Walk 3 is encouraging. That walk is on a slight South facing slope starting a bit above the level of the heath and in that is topographically similar to Walk 5 of Transect 6 which also recorded a Myotis hotspot. Is this coincidence or do these bats find a particular feeding opportunity in such a situation? If this sort of data is repeated it is a possibility worth considering.

Meare

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3.2.1 Transect 9: Ham Wall and Walton Heath

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
2013	Greater Horseshoe									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

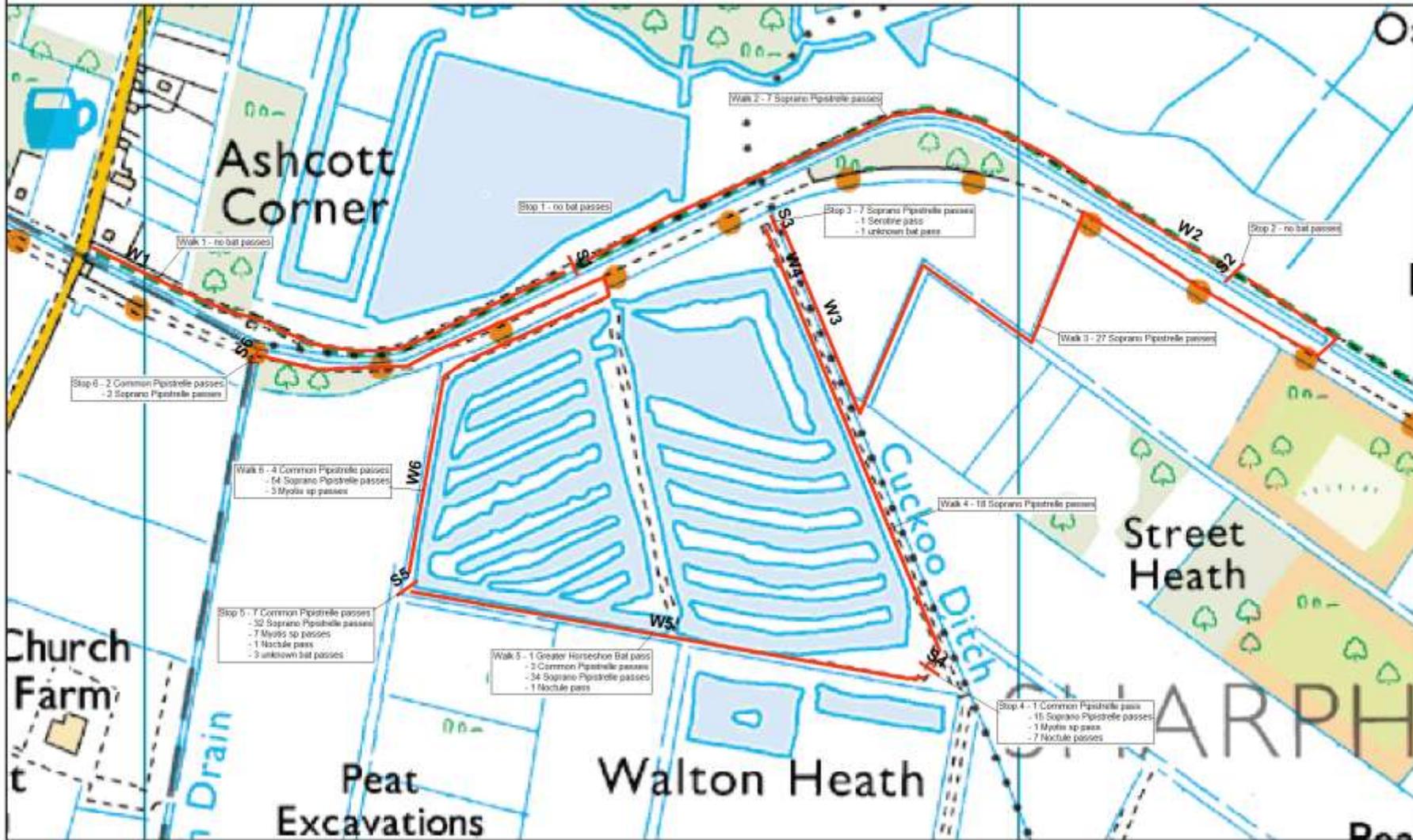
Management for Bitterns and other herons would appear to suit bats as well and RSPB have reason to be quite pleased. Soprano Pipistrelle passes account for 80% of all recorded passes and that species has been found in bat boxes on the reserve. One would have expected more Myotis passes in an area with plenty of open water where Daubentons Bats have been recorded in the past.

Ham Wall and Walton Heath

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3.2.1 Transect 10: Yeaps Bridge

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

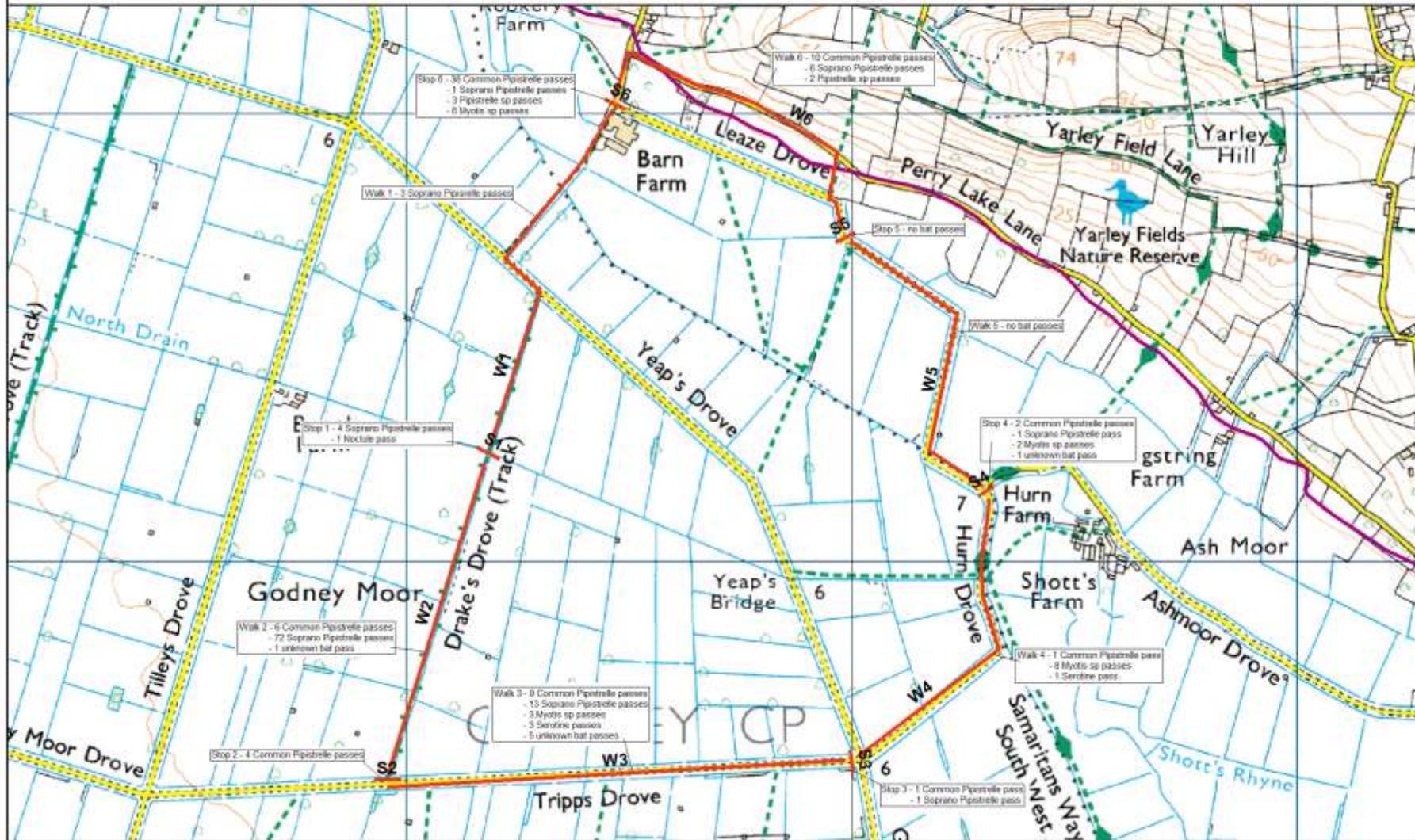
There was a large Pipistrelle roost in Godney in the 1980s and 1990. Although the records pre-date the separation of Common and Soprano species it is reasonable to assume that they were Soprano Pipistrelles because of the large numbers. This transect shows that the area is still good for this species and the result should encourage someone to check if there is still a roost at or near the historic one.

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3.2.1 Transect 11: East Backwear

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
2013	Greater Horseshoe									1				1
	Lesser Horseshoe							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

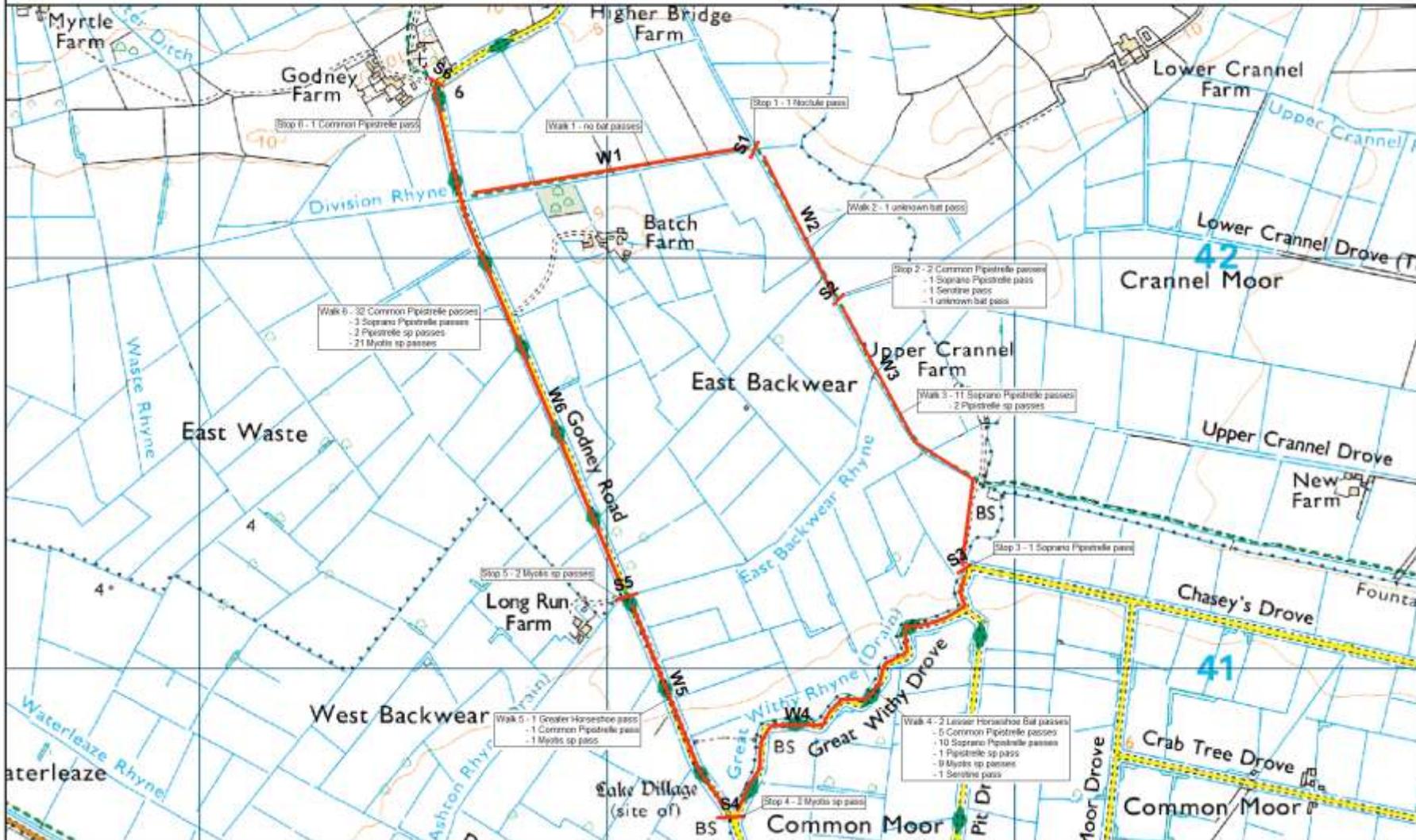
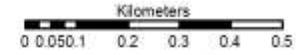
This transect has captured a good range of species with more Myotis passes than many others with more in the way of open water. It is encouraging that so many species are feeding quite close to the conurbation of Glastonbury. The two Horseshoe species are particularly interesting. The Greater Horseshoe in particular is a long way away from any known roost. They are big bats and capable of long distance flights but if this species turns up again in the next few years it might suggest a single male roosting quite nearby.

East Backwear

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3.2.1 Transect 12: Fenny Castle

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
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

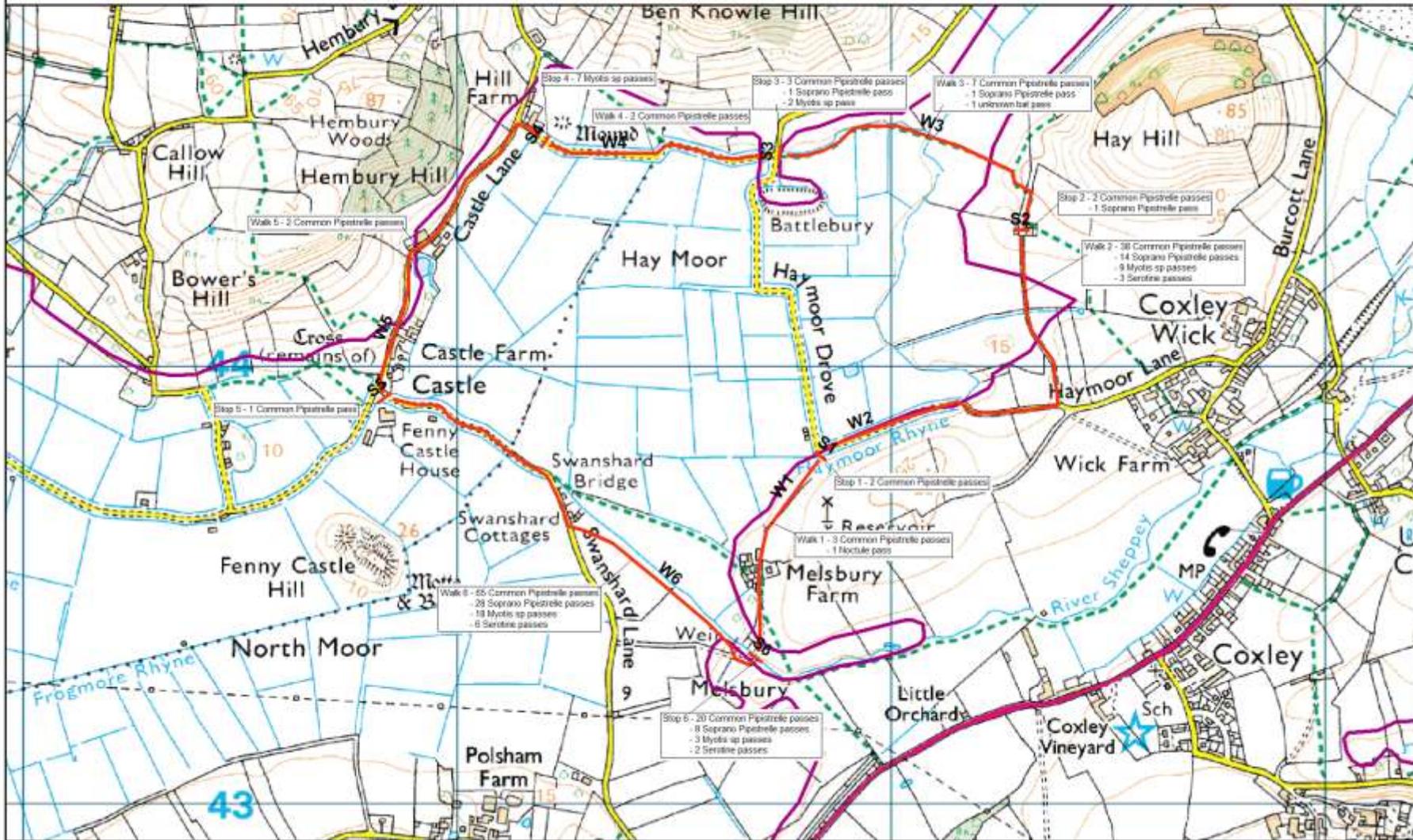
Again as soon as we survey at even the slightest altitude the Common Pipistrelle passes outnumber those of Soprano Pipistrelles. This is one of the driest transects in this survey and there are nearly three times as many Common Pipistrelle passes recorded as Soprano Pipistrelle ones. Walk 6 is the richest part and if it shows well next year we can assume that it is a preferred hunting ground. If not then it may be that bats arrive late at this transect and the earlier sections are not less favoured but only sampled too early.

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3.2.1 Transect 13: Long and Short Drove

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

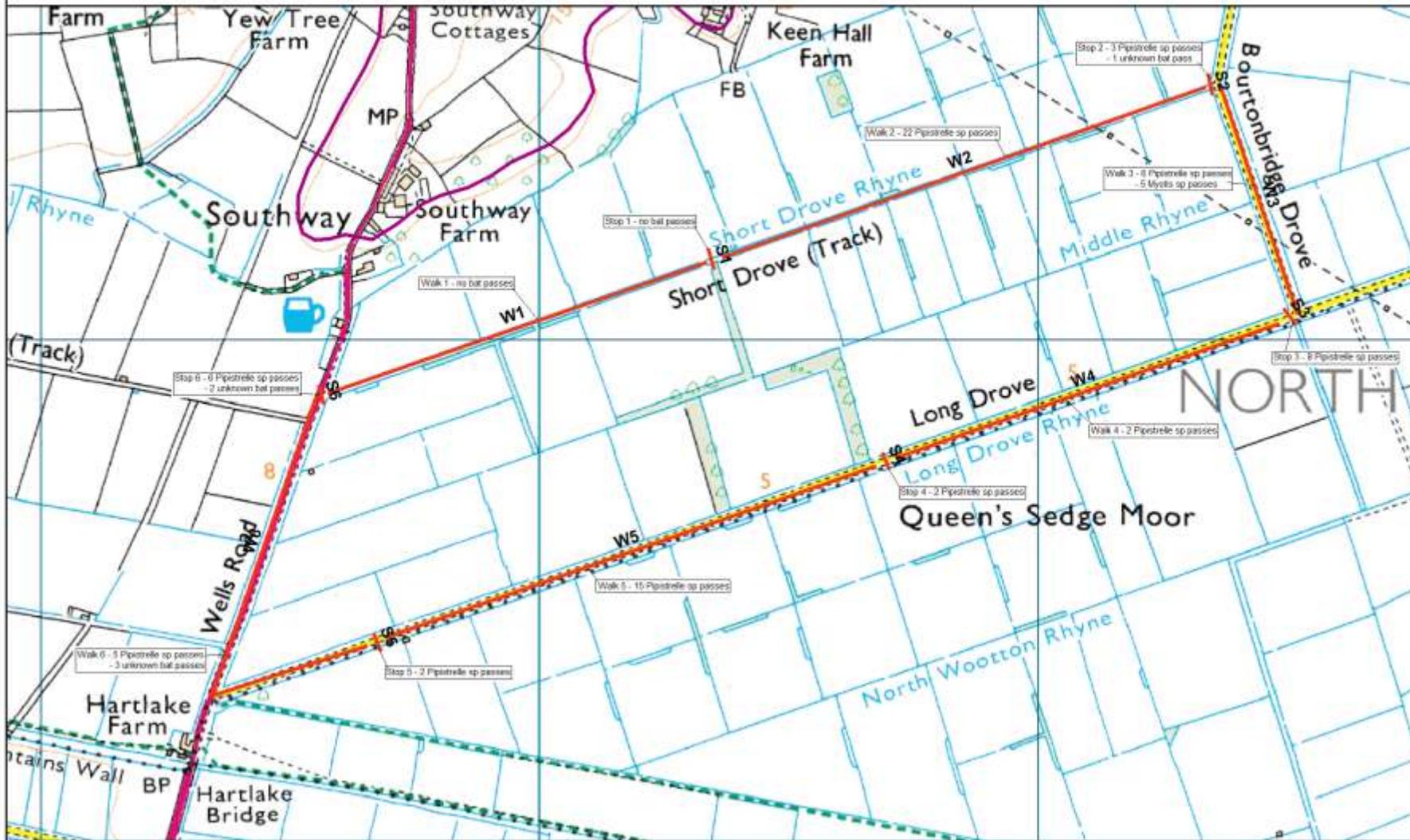
The lack of equipment to record has resulted in a table measuring bat activity generally but not the comparative activity of different species. Heterodyne detectors have a number of drawbacks. It is difficult to separate the pipistrelle species and not easy to tell Pipistrelles calls from Myotis calls. Any bat echolocating at a frequency other than that to which the detector is tuned will be missed and while different detectors in the survey group can be differently tuned to try and pick up Serotines and Noctules it is very unlikely that either Horseshoe species will be detected. Even so it was well worth walking the transect next year with a recording device as it should provide some interesting data.

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3.2.1 Transect 14: West North Wooton

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
2013	Lesser Horseshoe			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

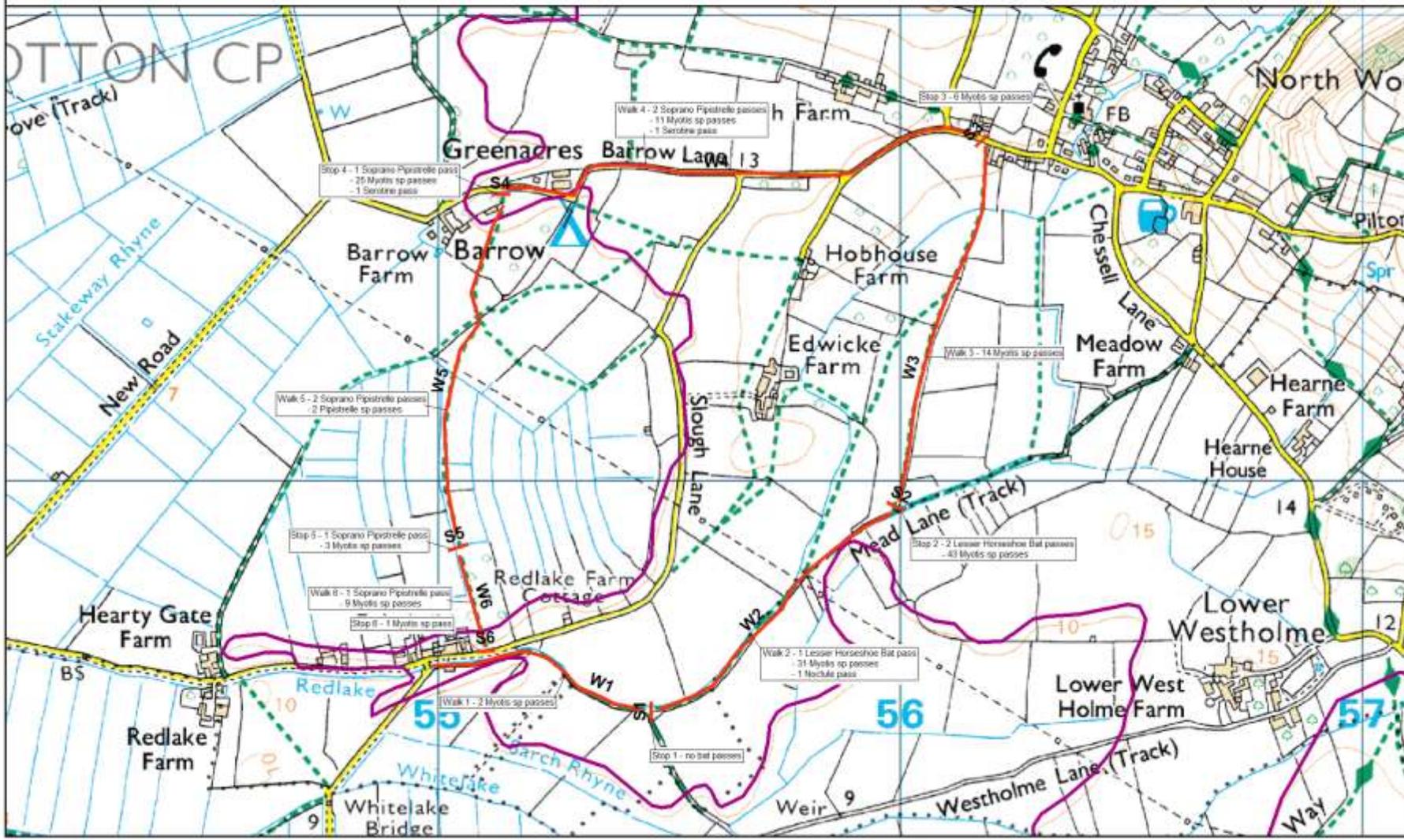
This table confounds expectation. The transect has not got as much open water as most and yet it is dominated by Myotis passes almost to the exclusion of the commoner pipistrelle species. There is woodland the other side of North Wooton village which might provide tree roosts for such species as Natterers or even Daubentons but the preponderance of Myotis activity is still a puzzle. Either there is a substantial roost near Mead Lane or the habitat is in some way particularly suitable which could be attributed to the tree-lined tunnel which has been created along this green lane. If there is food for Myotis bats then why are there not more pipistrelles?

West North Wooton

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3.2.1 Transect 15: Hulk Moor

Year	Bat Species	Transect Section												Total
		Walk 1	Stop 1	Walk 2	Stop 2	Walk 3	Stop 3	Walk 4	Stop 4	Walk 5	Stop 5	Walk 6	Stop 6	
2013	Lesser Horseshoe									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

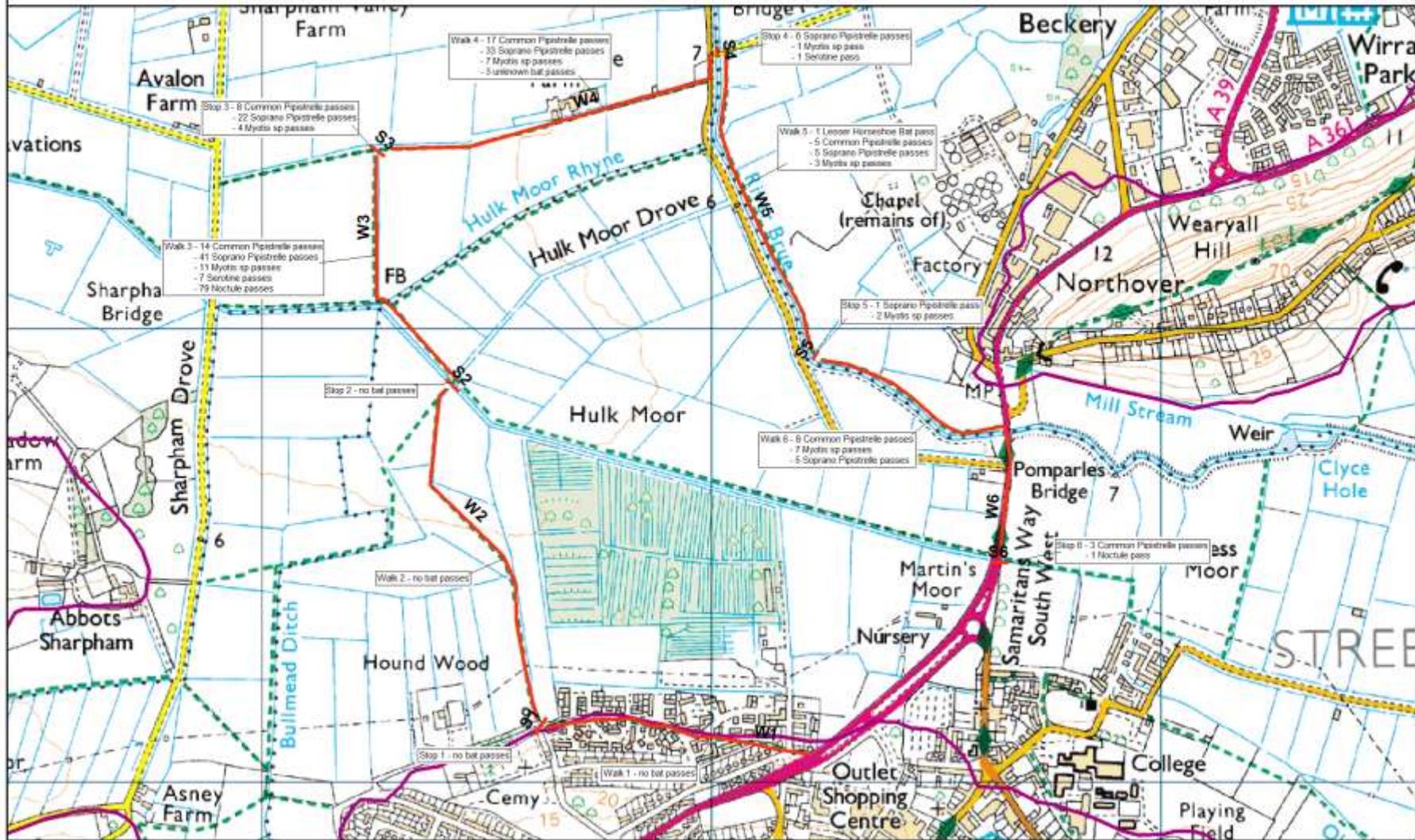
For much of our wildlife the close proximity of urban settlements is a discouragement but bats are well known to manage pretty well near and even in houses. This transect lies very close to both Street and Glastonbury but recorded over 200 “small bat” passes. More remarkable is the range of species involved. The Lesser Horseshoe pass is interesting. If it is one from Canada Farm it has come a long way so perhaps there are roosts to find nearby. 79 Noctule passes at Walk 3 is one of the outstanding results of the survey. Someone needs to look at old trees around there and if necessary go back at dawn to try and find where they are coming from.

Hulk Moor

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3.2.1 Transect 16: South Moor

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												

3.2.1 Transect 17: Church Moor

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

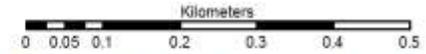
This transect is very busy with both of the Pipistrelle species. It is a bit apart from the main Avalon Marshes area and might benefit from the proximity of the East Polden ridge and its woodland. One might have hoped for some Noctules on the open pasture as the other 'big bat' Serotine was recorded along the route.

Church Moor

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4. Discussion

Although 'Big Bat Surveys' have been going on in Somerset for 7 years there is still a great deal to learn. The survey on the Mendip Hills ran from 2007 to 2012 and the Blackdown Hills Big Bat Survey from 2011 to 2013 completing 3 out of its intended 6 years. Both those surveys showed differences in their findings and in the people they engaged. The Brue Valley survey is the first Big Bat Survey to be carried out entirely within Somerset. The Mendip one drew in volunteers from Bristol and North Somerset and the Blackdown Hills survey was intentionally a "cross border" survey with helpers joining from deep into Devon. Even so the Brue Valley survey attracted over 60 people and was hailed as a most enjoyable evening by all those taking part.

The transects on the Mendip Hills were predominantly woodland and calcareous grassland much of it at quite high altitude and parts of many transects were very exposed. There are, of course, a number of known subterranean roosts in the Mendip Hills and we were anxious to find out how they related to feeding and commuting activity. There are no caves in the Brue Valley and much of the survey area is at or even below sea level. The transects devised for the Blackdown Hills survey were more varied in topography and land use than either of the other two surveys but were again quite high lying and quite windy. Although it did not always feel like it, both the Mendip Hills and the Blackdowns are relatively dry with little in way of open water particularly in the Mendips. The Brue Valley on the other hand includes some of the finest wetland sites in Europe. It was a challenge to devise routes that were not exclusively pastures and rhynes and inevitably the transects chosen were biased in favour of land managed for nature conservation and so even wetter than the rest. In an attempt to mix up the habitats sampled we went on to the ridge that runs through Wedmore and even close to the edge of Street but even so there were no routes that went higher than 40 metres above sea level.

Given the apparent uniformity of habitat across the routes selected it was surprising and encouraging to record as wide a range of species as on either of the other two surveys. Both Lesser Horseshoe Bats and Greater Horseshoe Bats are known to roost at the Western end of Shapwick Heath but the recordings made suggest that both species may be flying some distance to feed. That is a little surprising when the habitat immediately round the roost is perfect for them. Are the more far flung ones, for example a Greater Horseshoe Bat at East Backwear, lone males driven out of the prime feeding areas in favour of lactating females?

There are species which are traditionally regarded as wetland specialists, in particular Daubenton's Bats and Soprano Pipistrelles. Noctules are also often seen hunting over lakes. Certainly the Brue Valley turned up more Noctule passes than the other two surveys but 79 of those passes were at one site and if those are put aside the total is not as great as we might have expected. Noctules were often seen on Westhay Moor in the 1990s but none were recorded on that transect in this survey. There are limited roosting opportunities for them and these large bats may have to come some way to feed there. It is possible that they might arrive later into the night. The *Myotis* species are not differentiated in this survey but it seems likely that the majority of the 509 passes recorded as "*Myotis* sp" were from Daubenton's Bats particularly those recorded feeding over water as that species often does.

The most impressive difference with this wetland survey as against the more upland ones is the number of Soprano Pipistrelle passes. Generally both the two common Pipistrelle species are recorded almost everywhere in Somerset and both species were found on every big bat survey but in the Mendips and even more in the Blackdowns the dominant species was the Common Pipistrelle. In this survey Soprano Pipistrelles accounted for 43.9% of all passes and Common Pipistrelles only 26.8%. By comparison in the last Mendip survey Common Pipistrelle passes made up 51.2% of the total and Soprano Pipistrelle passes 19.5%. In the 2012 Blackdown Hills survey the percentages were Common Pipistrelle – 69.9% and Soprano Pipistrelle – 7.9%. Looking at where the two species were recorded in this survey it becomes clear that the Common Pipistrelle passes only out-number those of Soprano Pipistrelles on those transects or those parts of transects where the route is away from open water and at higher altitude.

The results so far as Pipistrelles are concerned start to confirm the received thinking which associates this species with large lakes but it is important not to read too much into one year's data. There was one year on the Mendip Hills survey when there were many more passes from the two Pipistrelle species than in the other 5 years and it is always possible that 2013 happened to be a very good Soprano Pipistrelle year. We can only find out by doing it all again.