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Sveti Nikola Wind Farm

2010 Bat Surveys Report

July 2011

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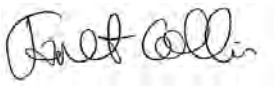
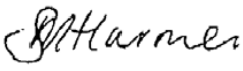
General Notes

Project No:	80154
Title:	Sveti Nikola Wind Farm 2010 Bat Surveys Report
Contracting Authority:	AES Wind Operations Europe
Issue Date:	July 2011
Issuing Office:	Tonbridge

Authorised by:	 Jan Collins	**Author**	**Date:**	01.03.2011
Authorised by:	 Sarah Harmer	**Technical QA**	**Date:**	01.03.2011

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1 EXECUTIVE SUMMARY

1. This report provides details of bat surveys undertaken in 2010 at the Sveti Nikola Wind Farm in Kavarna, Bulgaria, on behalf of AES Wind Operations Europe. The report provides a comparison of the results of the 2009 (pre-operation but post-construction) surveys with the 2010 (during operation) surveys. It also provides recommendations for future survey work at the site.

2. Sveti Nikola Wind Farm consists of 52 Vestas V90 wind turbines, constructed over several months during 2009. The area is dominated by agriculture, with arable fields separated by bushy shelterbelts. Operation of the wind farm commenced in spring 2010.

3. Studies from the USA and Europe have found that dead bats can appear in large numbers beneath wind turbines either as a result of collision with the turbine blades or barotrauma, a fatal condition resulting from rapid pressure changes around the turbine. Casualties most often include migrating species, although high-flying resident species are also known to be involved.

4. Commitments were made as part of the original Environmental Impact Assessment (EIA) process and in the subsequent Environmental Management and Monitoring Plan (EMMP) (RSK Group, 2008) to carry out bat activity surveys and bat mortality monitoring to establish if the predicted level of impact was correct. It was predicted that diversity and abundance of bats within the territory would be low and therefore any negative impacts would be '*within the limits of the admissible*'.

5. The surveys carried out in 2009 included ground level car transect surveys both on-site and off-site (as a control) carried out monthly between July and October; bat detector surveys at height carried out during parts of August, September and October; late afternoon observations for foraging migrants during part of September; and night-time thermal infrared camera and acoustic migration surveys carried out during part of September.

6. The surveys carried out in 2010 included ground level car transect surveys both on-site and off-site monthly between April and October; bat detector surveys at height from April to October; and bat carcass searches (with searcher efficiency and carcass removal trials) carried out from July to October.

7. In 2009 and 2010 a diverse range of bat species was recorded at ground level during the car surveys at the Saint Nikola Wind Farm site. These included, most commonly, *Eptesicus serotinus; Hypsugo savii; Miniopterus schreibersii* and *Pipistrellus nathusii.* Species recorded less often were *Myotis* species; *Nyctalus noctula; Pipistrellus*

pipistrellus; P. pygmaeus; Rhinolophus ferrumequinum; possibly *Nyctalus leisleri;* possibly *Vespertilio murinus* and possibly *Tadarida teniotis*.

8. In both years, no bat species were recorded during the off-site transects that were not also recorded on site (similar diversity) and vice versa. Similarly, bats were no less abundant at parts of the Saint Nikola site than on the transect carried out in more diverse habitats towards the coast (similar abundance).

9. Average numbers of bat passes were higher on site in the summer (during the breeding season) and lower in the autumn (during the migration season) in both years. Average numbers peaked to the north of the site in the autumn and peaks can be seen at the coast in both the summer and the autumn.

10. The patterns in bat activity are fairly similar year to year, although the summer peak in the on-site transects appeared later in 2010 (August) compared to 2009 (July) and the autumn peak in the off-site transects appears earlier in 2010 (September) compared to 2009 (October). It is not known why this pattern occurs although it could relate to ambient temperature, which was higher (compared to 2009) in August and September 2010 than in July and October respectively.

11. In general, higher numbers of *Eptesicus serotinus* and lower numbers of *Hypsugo savii* and *Miniopterus schreibersii* were recorded in 2010 compared to 2009. There was no obvious pattern in the changes observed between 2009 and 2010 for *Pipistrellus nathusii*.

12. There were numerous technical difficulties with the detectors placed at height and any recordings made included high noise levels from the turbine nacelles. There was no effective data collection during 2010 (during operation) as a result, although several species at risk from wind turbines had been recorded pre-operation during 2009.

13. A single dead *Nyctalus noctula* was found underneath one of the turbines. No other carcasses were observed during the bat carcass searches, during the trials or during bird carcass searches also carried out at the site. This suggests extremely low levels of mortality here.

14. The car transect surveys and bat carcass searches have commenced in 2011. For this reason, it is proposed that they continue for the remainder of the year to October 2011 but that they cease if no obvious patterns in bat activity emerge and no further bat carcasses are located, regardless of the three year commitment to monitor mortality in the EMMP.

15. This scenario would suggest that the impacts of the Sveti Nikola wind farm on bats in this region are, as expected, low (or insignificant) despite the higher diversity and abundance of bats on site than expected in the original EIA.

2 INTRODUCTION

2.1 General

This report presents the results of bat surveys undertaken in 2010 in connection with the Sveti Nikola Wind Farm (Kavarna, Bulgaria) on behalf of AES Wind Operations Europe. The report provides a comparison of the results of the 2009 (pre-operation but post-construction) surveys with the 2010 (during operation) surveys. It also provides recommendations for future survey work at the site.

Sveti Nikola Wind Farm consists of 52 Vestas V90 wind turbines, constructed during 2009. They have a capacity of 3 MW each, with an overall height to blade tip not exceeding 150 metres (m). Testing of the turbines commenced in mid-December 2009 and operation commenced in spring 2010.

AES Wind Operations Europe made commitments to carry out surveys to monitor the impacts of the wind farm on bats in relation to gaining funding for the project. These commitments are outlined in the original Environmental Impact Assessment (EIA) report and the Environmental Management and Monitoring Plan (EMMP) (RSK Group, 2008). Surveys carried out in 2009 included ground level bat detector car surveys; at height bat detector surveys; and thermal infrared camera / acoustic monitoring surveys. Surveys carried out in 2010 included ground level bat detector car surveys; at height bat detector surveys; and ground level bat carcass searches. The 2010 surveys are the subject of this report.

The site location is shown in *Figure 1* and *Figure 2* shows an aerial photograph. All figures are provided in *Section 7*.

2.2 Ecological Context

The Sveti Nikola Wind Farm is located within a continuous area of agricultural land supporting arable crops. Between the large fields are shelter belts and dirt roads, which provide habitat connections for animal species. The countryside immediately surrounding the site is similarly agricultural, but also includes various villages. Several kilometres to the south are species-rich steppe grassland and rocky coastal cliffs with caves, cracks and crevices.

2.3 Background Information About Bats and Wind Turbines

Recent evidence from Europe and the USA, suggests that wind turbines can present a risk to bats and bat populations. Impacts can include pre-, during and post-

construction disturbance; loss of roosts; loss of foraging and commuting habitat; fragmentation effects; and risk of direct collision with turbine blades.

Much of the evidence suggests that high-flying, migrating bats are most at risk from direct collision with turbine blades (or barotrauma caused by rapid changes in air pressure around the turbines); many casualties have been found beneath turbines during the late summer and early autumn migration period in Europe and the USA (Betts, 2006; Alcade and Saenz, 2004; Brinkmann, 2004; Johnson *et al.,* 2003 & 2004). There is other evidence from Sweden to suggest that resident species that hunt in open air space may be affected (Ahlen, 2003).

Various different hypotheses have been put forward to explain why bats die at wind turbines, including the effects of air turbulence; failure of individual bats to recognise the rotating blades using echolocation; and attraction of bats to increased numbers of invertebrates around wind turbines (Rodrigues et al., 2008).

2.4 Background Information about EIA and Commitments Made

EIA reports were submitted in 2006 for the Sveti Nikola Wind Farm. These reports provide details of bat survey work carried out during autumn (October) of 2004 using Pettersson D240x bat detectors, sound recording equipment and analysing bat echolocation calls following fieldwork using specialist software: BatSound 3.10.

Seven species of bats were recorded in the territory of the municipality of Kavarna and the region above the coastal cliff rich in rock niches, cracks and caves (between Yaylata and Taukliman). These species are *Rhinolophus hipposideros, Rhinolophus ferrumequinum, Eptesicus serotinus, Pipistrellus pipistrellus, P. pygmaeus*, *P. nathusii* and unidentified individuals of the *Myotis* species group.

Three caves within the region of Rusalka, on the coast, were visited and a maternity colony of *Rhinolophus hipposideros* observed.

Of interest, a large group of *Pipistrellus nathusii* bats were observed feeding around isolated trees in the species-rich steppe habitats, assumed to be migrants due to their absence on previous nights.

In the EIA report, comments relating to the bats actually at the site of the proposed wind farm are as follows:

- *Rhinolophus hipposideros*: *'probably when the weather is quiet these bats fly over the site'*; and,
- *Myotis* species: *'single bats were observed from the smaller type of this species; they flew actively by single isolated trees on the territory of the site'*;

The observation was made that the number and diversity of bats observed at the coast was likely to be much higher than at the territory of the proposed wind farm and that any negative impacts would thus be '*within the limits of the admissible*'. It was also observed that, due to the well-developed echolocation systems of bats, they were likely to locate and avoid the wind turbine blades.

Table 1 provides information taken from the EMMP (RSK Group, 2008); it is the commitments register from the original EIA report.

Table 1. Parts of the commitments register from the EIA report relating to bats

Measures	**Implementation period / stage**	**Reason for measure**	**Responsibility**
Avoid removal of trees and treebelts when constructing the wind farm. Where removal is required trees will be replanted to compensate for the loss of vegetation	Construction	Prevent net loss of vegetation and impacts upon bat species	Contractor
Works will be restricted to daylight hours to avoid use of artificial lighting that may be a nuisance to the animals, many of which are active during night time including bat species.	Construction	Minimize the disturbance to animal species.	Contractor
Pre-construction surveys will be undertaken for mammals and reptiles in order to ensure the construction works do not disturb species. Particular attention will be paid to bat species	Construction	Prevent any collisions during bird migration.	AGE/ Contractor
Post construction surveys of bats will be undertaken in order to assess the potential impacts of the Project on these species. Mortality monitoring for bats will be annual for the first three years of operation. Where no significant effect is seen, monitoring will cease. Where effects are seen then measures will be developed and agreed with the funders and relevant authorities prior to implementation. Such measures to be considered include: planting suitable habitat (where acceptable to landowners) to divert bat activities away from the turbines, possible bat relocation and erection of bat boxes away from the turbine cluster, and use of possible deterrents (scarers to dissuade bats from passing close to turbines).	Operation	To monitor the impacts upon bat activity	AGE

The EMMP (RSK Group, 2008) makes the following general commitments in the text:

'Similar data in terms of mortality of bats will also be recorded as part of (bird) *carcass monitoring.'*

'*AES Geo Energy will commission a bat monitoring programme to assess whether the predicted impact level on bats is correct. This will include monitoring surveys of bat activity in adjacent woodland/shelterbelts within the site (close to turbines) and comparison with similar habitat outside the site. The results of such a study will help inform both the monitoring responsibilities of the project site and also provide a valuable data set for future impact assessments for wind turbines in similar habitats.*'

'Complete an independent bat survey and implement as necessary. Based on the survey, develop bat mitigation measures where necessary.'

In the case of the Sveti Nikola Wind Farm the concern relates mainly to post-construction disturbance, risk of collision with turbine blades (or barotrauma from rapid changes in air pressure around the turbine blades) and any associated higher altitude fragmentation effects. Bat monitoring did not commence at this site until construction was nearly complete and therefore pre- and during construction disturbance cannot easily be assessed. No roosts, foraging or commuting habitat were lost because the shelterbelts were retained. This means that habitat fragmentation is unlikely at a lower altitude.

2.5 Summary of 2009 Survey Data

Surveys carried out in 2009 included ground level bat detector car surveys both on-site and off-site (as a control) carried out monthly between July and October; bat detector surveys at height carried out during parts of August, September and October; late afternoon observations for foraging migrants during part of September; and night-time thermal infrared camera and acoustic migration surveys carried out during part of September.

A diverse range of bat species was recorded at ground level during the car surveys at the Sveti Nikola Wind Farm site in 2009. These included, most commonly *Eptesicus serotinus; Hypsugo savii; Miniopterus schreibersii* and *Pipistrellus nathusii.* Species recorded less often were *Myotis* species; *Nyctalus noctula; Pipistrellus pipistrellus; P. pygmaeus; Rhinolophus ferrumequinum;* possibly *Nyctalus leisleri;* and possibly *Vespertilio murinus*. No bat species were recorded during the off-site transects that were not also recorded on site (similar diversity). Similarly, bats were no less abundant at parts of the Sveti Nikola site than during the transect carried out in more diverse habitats towards the coast (similar abundance).

Several bat species were also recorded by the detectors placed at height, including most commonly *Nyctalus noctula* and *Pipistrellus nathusii.* Species recorded less often were *Eptesicus serotinus; Hypsugo savii; Miniopterus schreibersii; Myotis* species; *Pipistrellus pipistrellus; Tadarida teniotis;* possibly *Nyctalus leisleri;* possibly *Pipistrellus pygmaeus;* and possibly *Vespertilio murinus.* Numbers of the

most commonly recorded species peaked simultaneously on several of the detectors on certain nights. Larger numbers were recorded when average wind speed was less than 7 m per second.

No large numbers of bats (which may be foraging migrants) were seen in the late afternoon during the September surveys.

150 animals were seen flying southwards along the coastline on 25.09.2009 between 00.20 and 01.00 using the thermal infrared camera. No acoustic data was collected by the surveyors at ground level on the coast, but there was a peak in numbers of *Pipistrellus nathusii* recorded by the detectors at height on the wind farm at around this time. It is possible that the animals observed on the coast formed part of a widespread group of these bats migrating through. Other evidence was collected during the surveys to suggest that this species may migrate through this region. It may be that *Nyctalus noctula* also migrates through, although less evidence is available to suggest this is the case.

Many of the species found at the Sveti Nikola Wind Farm have been found to be casualties within other European wind farm sites. Migrating and high-flying species, both of which occur at this site, are known to be particularly at risk. *Pipistrellus nathusii* and *Nyctalus noctula* are known to be particularly vulnerable to wind farm development, although impacts at a population level are difficult to establish. All species identified are protected to a varying level by international and national legislation.

2.6 Objectives of the Surveys and Report

The aims of the 2010 surveys were:

- to identify if levels of bat activity across the site had changed during operation of the wind turbines (which commenced in spring 2010) in comparison to before operation (but during construction, as surveys had not commenced before this time);
- to identify if any bats were flying within the rotor swept zone (detected by the bat detectors in the turbines); and
- to identify if any bats were subject to either collision or barotrauma (resulting in carcasses found beneath the turbines).

The overall aim was to satisfy the commitments outlined in *Section 2.3*.

The report outlines the methodology used to carry out the surveys and the results obtained. It outlines ongoing monitoring work proposed for 2011.

3 METHODS

3.1 Car Transect Bat Surveys

The aim of carrying out car transect surveys is to compare bat diversity and levels of bat activity across the site during operation with the same parameters pre-operation (the 2009 surveys were carried out during the construction period). The rationale behind choosing this method is provided in the 2009 report (RSK Carter Ecological, 2010).

Car transect surveys were carried out at Sveti Nikola Wind Farm monthly between April and October 2010 by Ivaylo Raykov, who was trained during 2009 by Jan Collins of RSK Carter Ecological Limited. Four different car transect routes (two on-site and two off-site) were driven on four nights during each month; dates, transect numbers and times are given in *Table 2,* below. The wind turbines were operational during the surveys.

The methodology, including the sound analysisof bat passes[1] recorded during the car transect surveys, was exactly the same as that used in 2009 and carried out by the same personnel, as described in the 2009 report (RSK Carter Ecological, 2010).

Surveys were only carried out in good conditions for bats to fly, *i.e.* when temperatures were above 8°C and there was no strong wind or rain. The temperature, wind speed (Beaufort) and cloud cover (Octas) were recorded at the start and end of each survey onto specially designed survey forms. Conditions recorded during the surveys are given in *Table 2,* below. Descriptions of the Beaufort and Octas scales are provided in *Appendix 1*.

[1] A bat pass is recorded during a survey when a bat flying past the observer is recorded on a bat detector. A bat pass can be defined as a continuous series of echolocation pulses emitted by one bat. No distinction is made of echolocation that indicates that a bat may be commuting or foraging.

Table 2. Dates, transect numbers, times and weather conditions for car transect surveys carried out in and around the Sveti Nikola wind farm during 2010

Date	13.04.10	18.04.10	21.04.10	23.04.10	11.05.10	12.05.10	15.05.10	18.05.10	19.06.10	20.06.10	26.06.10	27.06.10	15.07.10	16.07.10
Transect number	1	2	3	4	1	2	3	4	1	4	3	2	1	2
Length of transect (km)	36.4	27.1	32.6	7.6	36.5	27	32.6	7.8	36.4	7.9	32.7	25.7	36.5	25.6
Sunset time	19:44	19:50	19:54	19:56	20:16	20:18	20:21	20:25	20:49	20:49	20:51	20:51	20:46	20:45
Survey start time	20:40	20:30	20:30	20:35	20:55	20:55	21:00	21:00	21:30	21:30	21:35	21:55	21:30	21:20
Survey end time	22:30	21:49	22:09	22:10	22:44	22:15	22:36	22:36	23:19	23:07	23:12	23:10	23:18	22:36
Length of transect (minutes)	110	79	99	95	110	80	96	96	109	97	97	75	108	76
Temperature at start (°C)	8.6	8.8	10.9	10	17.2	16.8	17	13.5	20.2	20.2	19.3	17.8	23.2	21.9
Temperature at end (°C)	7	8	9.4	9	13.6	17	15	13	21.5	20.7	18.9	17.1	21.8	22
Wind conditions at start (Beaufort)	2	2	3	1	2	2	3	3	1	2	2	1	2	1
Wind conditions at end (Beaufort)	2	2	2	2	2	2	3	2	2	2	2	1	2	1
Cloud cover at start (Octas)	1	1	2	1	0	0	3	3	1	1	2	1	1	0
Cloud cover at end (Octas)	1	1	0	1	0	0	0	0	4	1	2	1	0	0
Rain at start (dry / drizzle / rain)	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Rain at end (dry / drizzle / rain)	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dru	Dry	Dry

Table 2 (contd.). Dates, transect numbers, times and weather conditions for car transect surveys carried out in and around the Sveti Nikola wind farm during 2010

Date	17.07.10	18.07.10	15.08.10	17.08.10	18.08.10	19.08.10	13.09.10	14.09.10	15.09.10	16.09.10	13.10.10	16.10.10	17.10.10	19.10.10
Transect number	3	4	1	2	3	4	1	2	3	4	3	4	1	2
Length of transect (km)	32.7	7.9	36.5	25.6	32.7	7.9	36.5	25.5	32.7	7.9	32.7	7.9	36.5	25.6
Sunset time	20:45	20:43	20:12	20:10	20:12	20:10	19:23	19:21	19:20	19:18	18:29	18:24	18:23	18:19
Survey start time	21:20	21:15	20:45	20:45	20:46	20:40	19:55	19:55	19:55	19:55	19:05	19:00	19:00	19:00
Survey end time	22:57	22:50	22:35	22:00	22:21	22:17	21:41	21:09	21:31	21:31	20:41	20:35	20:47	20:15
Length of transect (minutes)	97	95	110	75	95	97	106	74	96	96	96	95	107	75
Temperature at start (°C)	22.6	22.1	26.2	26.3	26	25.5	19.5	20.3	19.8	19.7	12.5	13.1	16.5	14.9
Temperature at end (°C)	22.6	21.8	26	25.7	23	23.5	12.2	17.9	17.9	18.7	12.1	13.5	15.4	17.3
Wind conditions at start (Beaufort)	1	1	2	1	1	0	2/3	1	0	0	2	2	1	1
Wind conditions at end (Beaufort)	1	2	2	1	1	0	2	1	1	0	2	2	2	1
Cloud cover at start (Octas)	0	0	0	2	1	1	3	1	0	0	2	3	3	1
Cloud cover at end (Octas)	0	0	0	1	1	0	3	1	0	0	2	3	3	1
Rain at start (dry / drizzle / rain)	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Rain at end (dry / drizzle / rain)	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry

3.2 Bat Surveys At Height

The aim of carrying out bat activity surveys at height is to identify the bat species present at greater heights above ground level (diversity) and gain an impression of the number of individuals at greater heights (relative abundance). The ultimate aim was to compare bat activity data during operation of the turbines with that collected prior to operation commencing (the 2009 surveys were carried out post-construction but pre-operation, the 2010 surveys were carried out during operation). The rationale behind choosing this method is provided in the 2009 report (RSK Carter Ecological, 2010).

Anabat SD1 bat detectors were deployed into the nacelles of five wind turbines in order to record bat activity at height at Sveti Nikola Wind Farm constantly between April and October 2010. AES Wind Operations Europe were responsible for setting up and deploying these detectors.

The methodology, including the sound analysis, was exactly the same as that used in 2009, as described in the 2009 report (RSK Carter Ecological, 2010). However, the wind turbines were operational during the surveys.

3.3 Searcher Efficiency Trials

A searcher efficiency trial was carried out prior to commencing bat carcass searches beneath the turbines, with the aim of calculating how many bat carcasses would simply not be detected by our searchers at all.

The first searcher efficiency trial was carried out in June 2010 and a second trial was carried out in October 2010.

The trials involved placing out dead mice, dark in colour to imitate bats, randomly beneath five turbines with similar habitats to those where the actual carcass searches would be carried out. The mice were not distributed evenly across the five turbines and the surveyor was not given any information about how the mice were distributed at each turbine or where they were placed.

The surveyor due to carry out the carcass searches then searched for these carcasses on the same day that they were deployed to see how many were found, giving a percentage efficiency rate. This rate can then be used to calculate an adjusted mortality rate (number of bats actually colliding with the turbines) from the observed mortality rate (number of carcasses actually found).

3.4 Carcass Removal Trials

A carcass removal trial was carried out prior to commencing bat carcass searches beneath the turbines, with the aim of calculating how many bat carcasses would be removed by scavengers before our searchers could find them.

The first carcass removal trial commenced in June 2010 and a second trial was carried out in October 2010.

The trials involved placing out dead mice, dark in colour to imitate bats, randomly beneath five turbines with similar habitats to those where the actual carcass searches would be carried out. The mice were not distributed evenly across the five turbines.

On subsequent days the plots were checked again to see if the carcasses had been removed by scavengers until all carcasses had finally been removed. This gives a rate of removal, which can then be used to calculate an adjusted mortality rate (number of bats actually colliding with the turbines) from the observed mortality rate (number of carcasses actually found).

3.5 Bat Carcass Search Repetition Rate

The searcher efficiency and carcass removal trial results from June 2010 (described above) were used to inform the search interval for bat carcass searches for the remainder of the year.

'Smallwood (2007) presents an equation which can be used to adjust observed ('raw' turbine search) estimates of collision mortality rates to account for searcher efficiency, carcass removal and inter-interval search timings. The estimator of adjusted mortality rate, M_a, is as follows:

$$M_a = c / (t \times p / I) (e^{I/t} - 1 / e^{I/t} - 1 + p)$$

where c is average number of carcasses observed per year (i.e. observed or raw mortality rate), t is the mean number of days for carcass removal, p is observer efficiency rate, and I is the search interval in days' (Duffy and Whitfield, 2009).

The equation above was used to establish the effect of differing search intervals on the proportion of carcasses found at the site.

3.6 Bat Carcass Searches

The aim of searching for carcasses beneath the turbines is to find bats that have been killed by the operational turbines.

Every five days (as determined by the searcher efficiency and carcass removal trials – see above) a surveyor searched a plot 100 m x 100 m around the base of the five turbines where the bat detectors were erected (WTG 8, 26, 37, 43 and 46). Plots were surveyed by commencing in one corner and walking transects 2 m apart north up the plot then south down the plot searching systematically for bat carcasses until the whole area had been covered. In order to cover the area systematically the surveyors walked between markers placed at the ends of the plots and also used GPS units.

The searches were carried out during the morning, with a single turbine searched every day. The surveys commenced on 06.08.10 and ended on 06.11.10. Ivaylo Raykov was trained to carry out these surveys during June 2010 by Jan Collins of RSK Carter Ecological Limited and completed the checks from 06.08.10 to 30.08.10. Stefan Mitev was subsequently trained by Ivaylo Raykov and continued the checks until the end of October.

4 RESULTS

4.1 Car Transect Bat Surveys

Appendices 2-8 provide the results of the sound analysis from the car transect surveys. The tables and graphs below provide summary information.

Table 3. Species/groups and number of passes recorded on car transect 1 between April and October 2010 at Sveti Nikola Wind Farm.

Species	April	May	June	July	August	September	October	TOTAL
Eptesicus serotinus			55	62	90	23	7	237
Hypsugo savii		1	122	6	6		3	138
Miniopterus schreibersii	2	17	5	1	4		1	30
Nyctalus noctula					3		6	9
Pipistrellus nathusii		18	36	20	26	60	19	179
Pipistrellus pipistrellus		1		2		4		7
Pipistrellus pygmaeus		1						1
Hypsugo savii or		3	9	6				
Pipistrellus nathusii					13		8	39
Miniopterus schreibersii or			1					
Pipistrellus pipistrellus								1
Nyctalus leisleri or								
Nyctalus noctula							2	2
Nyctalus leisleri, Nyctalus noctula or *Vespertilio murinus*							3	3
Pipistrellus pipistrellus or Pipistrellus nathusii				1		1		2
Myotis species		1			2			3
Myotis myotis or Myotis blythii				3				3
Undetermined			18	7	3		2	30
TOTAL BAT PASSES	2	42	246	108	147	88	51	684
AVERAGE NUMBER OF BAT PASSES PER KILOMETRE	0.05	1.15	6.76	2.96	4.03	2.41	1.40	
AVERAGE NUMBER OF BAT PASSES PER MINUTE	0.02	0.38	2.26	1.00	1.34	0.83	0.48	

Graph 1. Number of passes per species recorded on car transect 1 between April and October 2010 at Sveti Nikola Wind Farm.

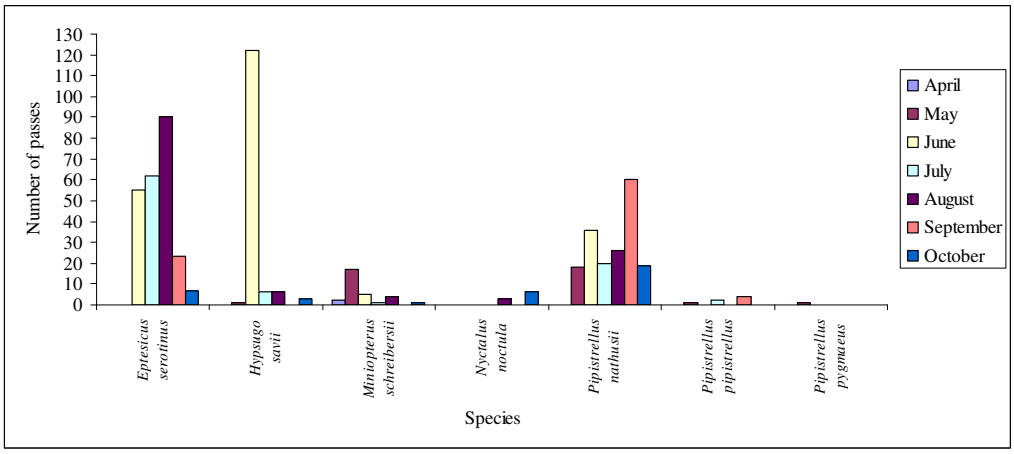


Table 3 and *Graph 1* illustrate that at least eight bat species were recorded during April to October on *Transect 1*, which covers the western half of the site (wind farm). These species include *Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii, Nyctalus noctula, Pipistrellus nathusii, Pipistrellus pipistrellus, Pipistrellus pygmaeus* and at least one of the *Myotis* species.

Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii and *Pipistrellus nathusii* were recorded the most frequently, the rest were recorded only infrequently.

The largest numbers of passes for *Eptesicus serotinus* and *Miniopterus schreibersii* were recorded in May. The largest numbers of passes for *Hypsugo savii* were recorded in June. In the case of *Pipistrellus nathusii*, however, more passes were recorded in September than in any other month.

Table 4. Species/groups and number of passes recorded on car transect 2 between April and October 2010 at Sveti Nikola Wind Farm.

Species	April	May	June	July	August	September	October	TOTAL
Eptesicus serotinus			1	3	16	9		29
Hypsugo savii			24	1	6			31
Miniopterus schreibersii		1	5	5	4		2	17
Nyctalus noctula						1		1
Pipistrellus nathusii	1	15	2	5	15	9	15	62
Pipistrellus pipistrellus						1		1
Pipistrellus pygmaeus			1					1
Rhinolophus ferrumequinum			1				2	3
Hypsugo savii or *Pipistrellus nathusii*		2		1	9		1	13
Pipistrellus pipistrellus or Pipistrellus nathusii						2		2
Myotis species								0
Myotis myotis or Myotis blythii				3	9	1		13
Undetermined			5					5
TOTAL BAT PASSES	1	18	39	18	59	23	20	178
AVERAGE NUMBER OF BAT PASSES PER KILOMETRE	0.04	0.67	1.52	0.70	2.30	0.90	0.78	
AVERAGE NUMBER OF BAT PASSES PER MINUTE	0.01	0.23	0.52	0.24	0.79	0.31	0.27	

Graph 2. Number of passes per species recorded on car transect 2 between April and October 2010 at Sveti Nikola Wind Farm.

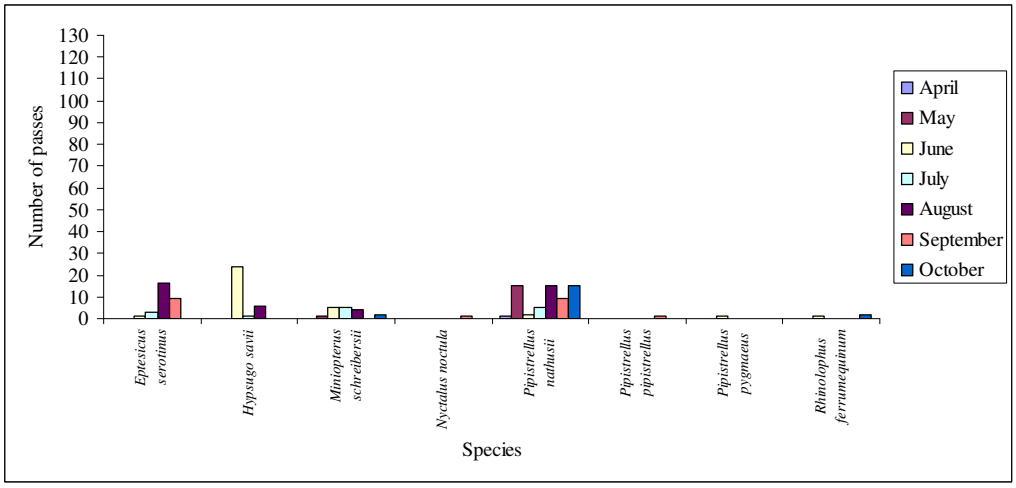


Table 4 and *Graph 2* illustrate that at least nine bat species were recorded during April to October on *Transect 2*, which covers the eastern half of the site. These species include *Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii, Nyctalus noctula, Pipistrellus nathusii, Pipistrellus pipistrellus, Pipistrellus pygmaeus, Rhinolophus ferrumequinum* and at least one of the *Myotis* species.

Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii and *Pipistrellus nathusii* were recorded the most frequently, the rest were recorded only infrequently.

The largest numbers of passes for *Hypsugo savii* and *Miniopterus schreibersii* were recorded in June. The largest numbers of passes for *Eptesicus serotinus* were recorded in August. Similar numbers of *Pipistrellus nathusii* passes were recorded in the months of May, August and September, with less in the other months of the year.

Table 5. Species/groups and number of passes recorded on car transect 3 between April and October 2010 at Sveti Nikola Wind Farm.

Species	April	May	June	July	August	September	October	TOTAL
Eptesicus serotinus			3	6	16	16	7	48
Hypsugo savii			17			3	3	23
Miniopterus schreibersii	7	9	9	6	1	1	1	34
Nyctalus noctula						8	6	14
Pipistrellus nathusii	12	8	11	3	7	75	19	135
Pipistrellus pipistrellus				3		5		8
Pipistrellus pygmaeus	1					1		2
Rhinolophus ferrumequinum								0
Eptesicus serotinus or *Nyctalus noctula*	1	1						2
Hypsugo savii or *Pipistrellus nathusii*				1		2	8	11
Miniopterus schreibersii or *Pipistrellus pygmaeus*	1							1
Pipistrellus pipistrellus or *Pipistrellus nathusii*				4	2	5		11
Myotis species					3	1		4
Myotis myotis or *Myotis blythii*					1	2		3
Nyctalus leisleri or *Nyctalus noctula*						1	2	3
Nyctalus leisleri, Nyctalus noctula or *Vespertilio murinus*						2	3	5
Nyctalus noctula or *Tadarida teniotis*					1			1
Undetermined			2			2	2	6
TOTAL BAT PASSES	22	18	42	23	31	124	51	311
AVERAGE NUMBER OF BAT PASSES PER KILOMETRE	0.67	0.55	1.28	0.70	0.95	3.79	1.56	
AVERAGE NUMBER OF BAT PASSES PER MINUTE	0.22	0.19	0.43	0.24	0.33	1.29	0.53	

Graph 3. Number of passes per species recorded on car transect 3 between April and October 2010 at Sveti Nikola Wind Farm.

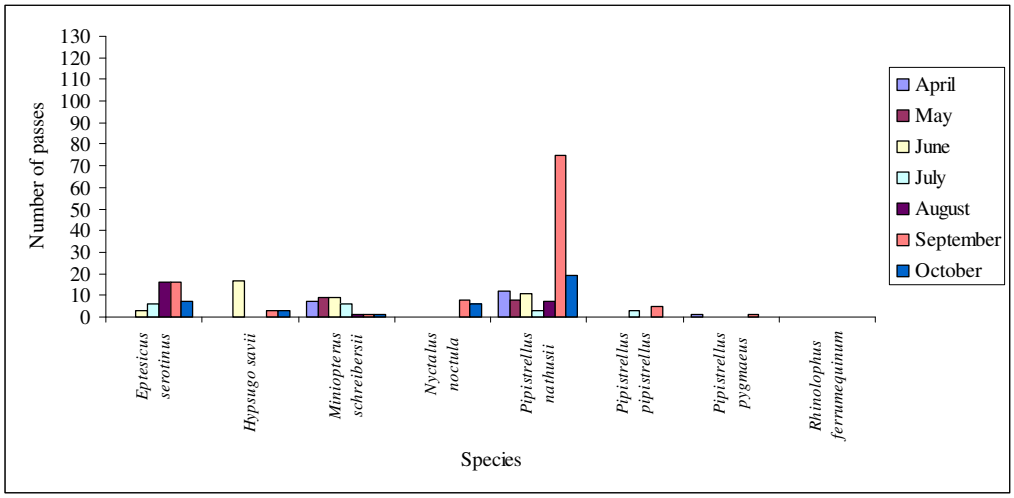


Table 5 and *Graph 3* illustrate that at least nine bat species were recorded during April to October on *Transect 3*, which is on undeveloped land to the north of the site. These species include *Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii, Nyctalus noctula, Pipistrellus nathusii, Pipistrellus pipistrellus, Pipistrellus pygmaeus, Rhinolophus ferrumequinum* and at least one of the *Myotis* species.

Pipistrellus nathusii was recorded the most frequently and the greatest number of passes was recorded in September, the remaining species were recorded relatively infrequently.

Table 6. Species/groups and number of passes recorded on car transect 4 between April and October 2010 at Sveti Nikola Wind Farm.

Species	April	May	June	July	August	September	October	TOTAL
Eptesicus serotinus			11	74	1	20		106
Hypsugo savii			24	7	7	6	3	47
Miniopterus schreibersii	9	5	14	16	1	5	2	52
Nyctalus noctula						5		5
Pipistrellus nathusii	17	8	14	12	6	43	46	146
Pipistrellus pipistrellus						3	1	4
Pipistrellus pygmaeus	1	2						3
Rhinolophus ferrumequinum								0
Eptesicus serotinus or *Nyctalus noctula*					5			5
Hypsugo savii or *Pipistrellus nathusii*			16	14		9		39
Miniopterus schreibersii or *Pipistrellus pygmaeus*					1			1
Pipistrellus pipistrellus or Pipistrellus nathusii		1				2		3
Myotis species	1	12	5	5	7			30
Nyctalus leisleri or *Nyctalus noctula*								0
Nyctalus leisleri, Nyctalus noctula or *Vespertilio murinus*						10		10

Undetermined			4	4	1			9
TOTAL BAT PASSES	28	28	88	132	29	103	52	460
AVERAGE NUMBER OF BAT PASSES PER MINUTE	0.29	0.29	0.91	1.39	0.30	1.07	0.55	

Graph 4. Number of passes per species recorded on car transect 4 between April and October 2010 at Sveti Nikola Wind Farm.

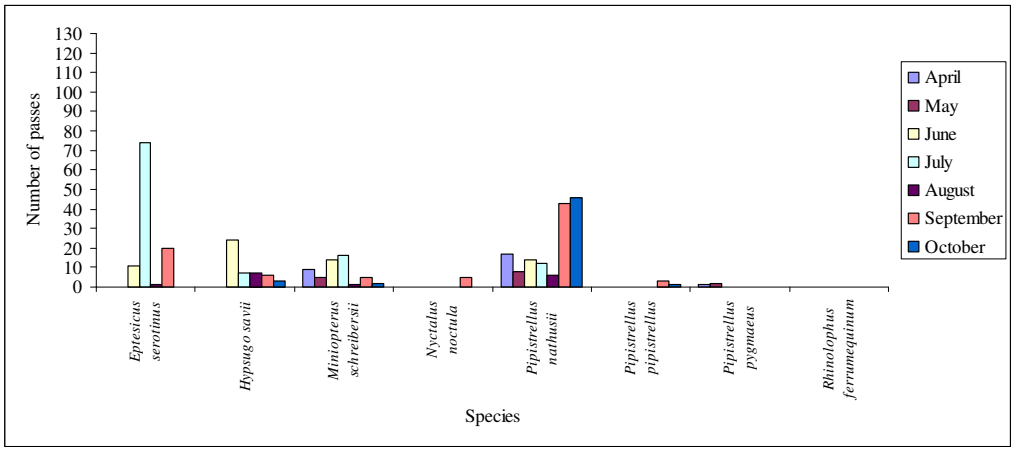


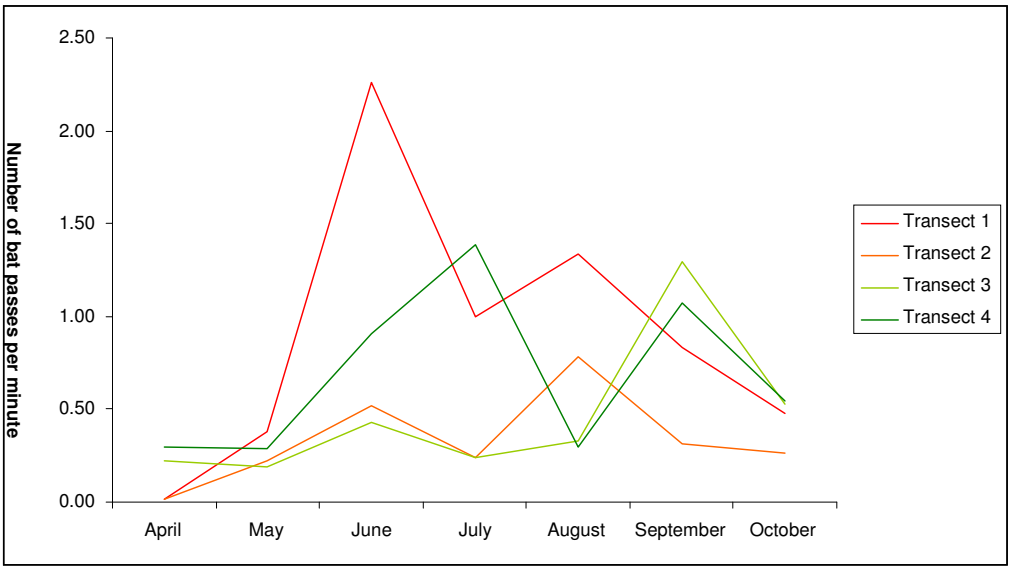
Table 6 and *Graph 4* illustrate that at least nine bat species were recorded during April to October on *Transect 4*, which is on undeveloped land to the south of the site. These species include *Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii, Nyctalus noctula, Pipistrellus nathusii, Pipistrellus pipistrellus, Pipistrellus pygmaeus, Rhinolophus ferrumequinum* and at least one of the *Myotis* species.

Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii and *Pipistrellus nathusii* were recorded the most frequently, the rest were recorded only infrequently.

The largest numbers of passes for *Eptesicus serotinus* and *Miniopterus schreibersii* were recorded in July. The largest numbers of passes for *Hypsugo savii* were recorded in June. Numbers of *Pipistrellus nathusii* passes peaked in September and October, with less in the other months of the year.

In the tables above, the number of bats per kilometre (for *Transects 1*, *2* and *3* only, because *Transect 4* included static point stops) and per minute of survey time were included in the tables as a relative measure of bat abundance. It is not appropriate to compare total numbers of bat passes because each transect was a different length. The graph below provides a comparison of relative abundance of bats on each transect by plotting the number of bat passes per minute.

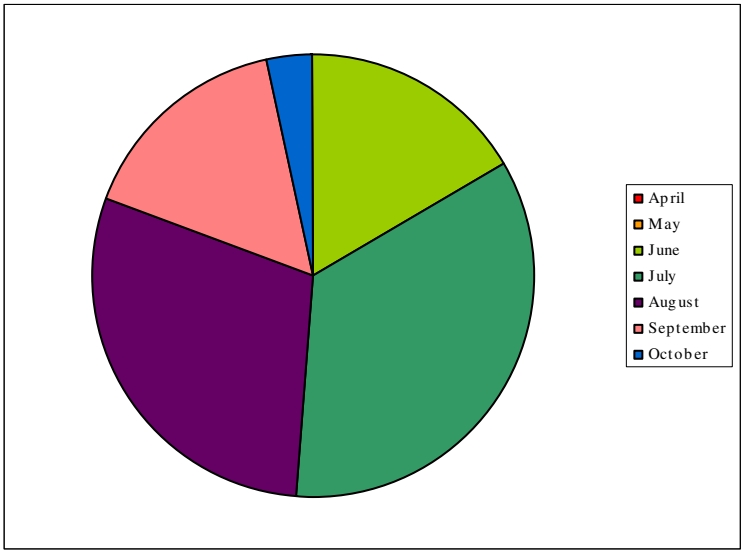
Graph 5. Number of bat passes per minute recorded on car transects driven between April and October 2010 at and to the north and south of Sveti Nikola Wind Farm.



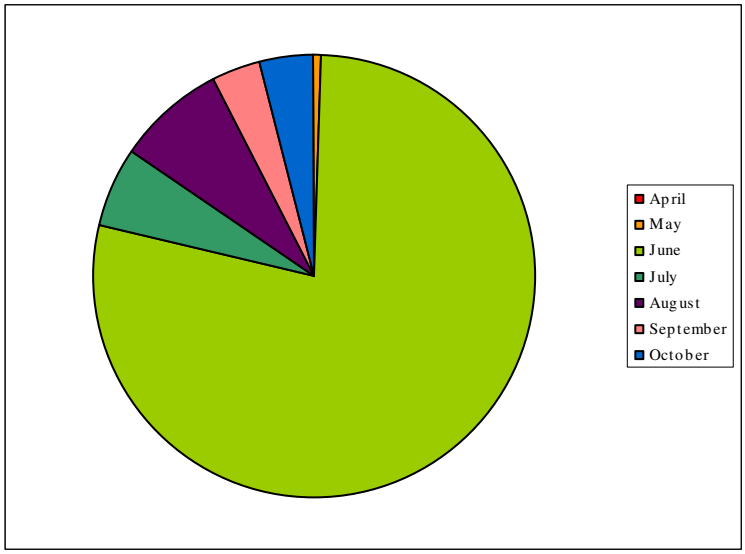
On the whole, the abundance of bats was not greater in the more diverse habitats at the coast than on the wind farm territory.

The four most commonly recorded species (*Eptesicus serotinus, Hypsugo savii, Miniopterus schreibersii and Pipistrellus nathusii*) are represented below according to the proportion of total recorded calls per month.

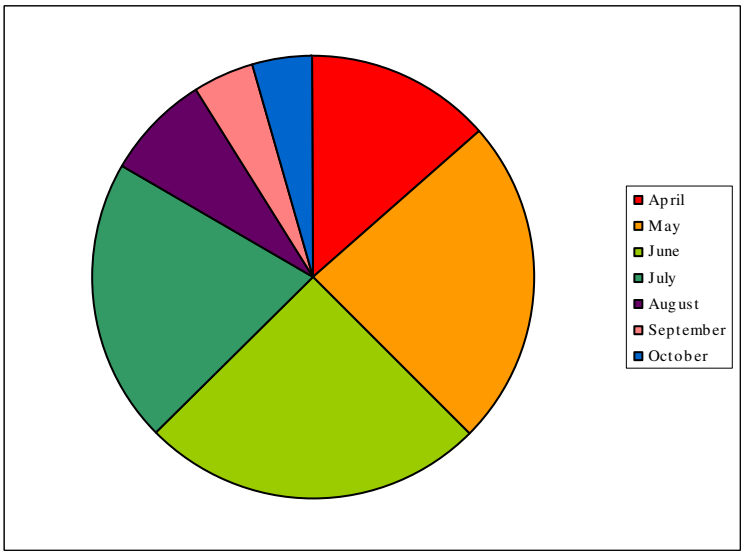
Graph 6. Distribution of passes of Eptesicus serotinus *recorded from April to October 2010 at and to the north and south of Sveti Nikola Wind Farm (sum of 420 passes).*



Graph 7. Distribution of passes of Hypsugo savii *recorded from April to October 2010 at and to the north and south of Sveti Nikola Wind Farm (sum of 239 passes).*

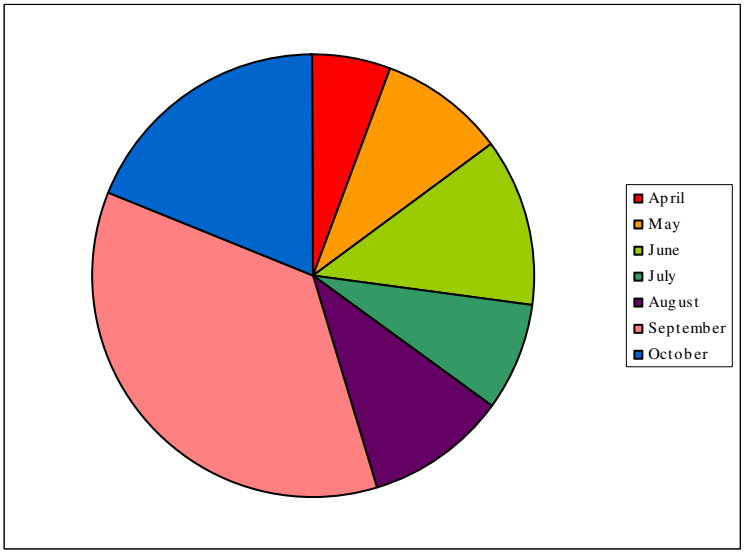


Graph 8. Distribution of passes of Miniopterus schreibersii *recorded from April to October 2010 at and to the north and south of Sveti Nikola Wind Farm (sum of 133 passes).*



For the three species above, the largest proportion of calls was recorded in June and July. This may indicate that these bats are breeding in the region.

Graph 9. Distribution of passes of Pipistrellus nathusii *recorded from April to October 2010 at and to the north and south of Sveti Nikola Wind Farm (sum of 522 passes).*



The largest proportion of passes of *Pipistrellus nathusii* was recorded in September. This may indicate that these bats are migrating through the region.

4.2 *Bat Surveys At Height*

Despite the detectors operating effectively within the turbine nacelles post-construction and pre-operation in 2009, they failed to operate effectively during operation in 2010. The detectors frequently failed to operate properly, produced huge amounts of noise files that could not be analysed and, on one occasion, the microphone had fallen out of the nacelle.

A sample of the files was analysed (because there were too many noise files[2] to effectively analyse the whole data set) producing the results presented in *Table 7* below.

Table 7. Data retrieved from Anabats in wind turbine nacelles.

Turbine	Date	Time	Species
T37	09.04.2010	00.51	*Pipistrellus nathusii*
		00.52	*Pipistrellus nathusii*
	15.04.2010	02.07	*Pipistrellus nathusii*
	17.04.2010	01.52	*Hypsugo savii or Pipistrellus nathusii*
	02.05.2010	??	*Hypsugo savii or Pipistrellus nathusii*
T43	01.10.2010	19.55	*Pipistrellus nathusii*

[2] Anabat detectors record the noise that triggers them. This is normally a bat echolocating as it passes within range of the microphone. However if background or ambient noise is the loudest sound triggering the bat detector then this is recorded. The detectors can to a greater extent distinguish between background noise and bat echolocation and stores the two in separate files. Occassionally within the noise files a bat may have passed at the same time and that will also be recorded within the noise file. At this site the turbine noise was the dominant sound constantly triggering the detectors.

Turbine	Date	Time	Species
		23.50	*Pipistrellus nathusii*
		00.15	*Pipistrellus nathusii*
		00.33	*Pipistrellus nathusii*
	15.10.2010	21.46	*Pipistrellus nathusii*
		21.46	*Pipistrellus nathusii*
		21.46	*Pipistrellus nathusii*

The data confirms that bats can be recorded at height from within operational wind turbines although the method obviously requires significant refinement.

4.3 Searcher Efficiency Trials

Tables providing more information about the searcher efficiency trials are provided in *Appendices 9-10.*

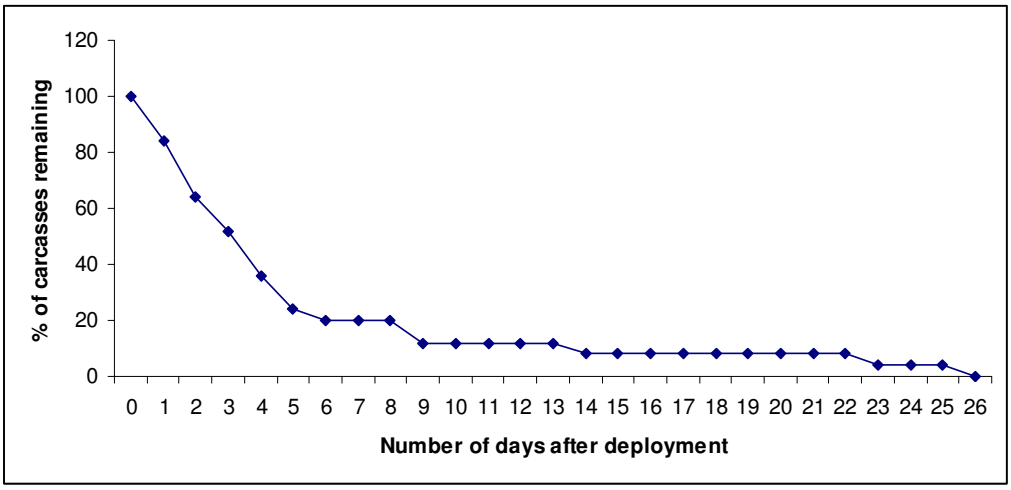
During the first searcher efficiency trial in June 2010 the searcher, Ivaylo Raykov, found 15 of the 25 mice deployed and therefore his searcher efficiency rate was 60%. This figure was used to calculate the most appropriate search interval for the bat carcass searches.

During the second searcher efficiency trial in October 2010 the searcher, Stefan Mitev, found 29 of the 44 mice deployed and therefore his searcher efficiency rate was 66%.

*4.4 Carcass **Removal Trials***

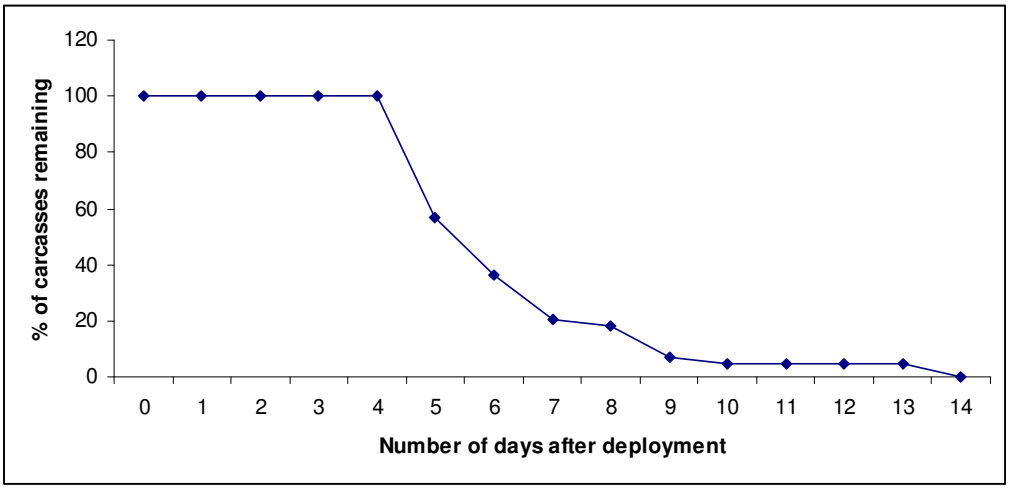
Tables providing more information about the carcass removal trials are provided in *Appendices 11-12*. *Graphs 10* and *11*, below, summarise the results.

Graph 10. Results of carcass removal trial in June 2010.



The mean number of days for carcass removal in June was 5.64 days. This figure was used to calculate the most appropriate search interval for the bat carcass searches.

Graph 11. Results of carcass removal trial in October 2010.



The mean number of days for carcass removal in October was 6.57 days.

4.5 Bat Carcass Search Repetition Rate

Using the equation provided in *Section 3.5*; the searcher efficiency (p = 0.6) and carcass removal (t = 5.64) rates from June 2010; and a theoretical observed mortality rate (or unadjusted mortality rate, Mu) of 25 carcasses per year, it is possible to

calculate what percentage of carcasses would be found given different bat carcass search intervals. *Table 8* illustrates this.

Table 8. Calculation of the effect of using different bat carcass search intervals

Search interval (d)	Adjusted mortality (Ma)	% of carcasses found
1	30.24	83
2	35.60	70
3	41.10	61
4	46.73	53
5	52.48	48
6	58.35	43
7	64.33	39
8	70.43	35
9	76.64	33
10	82.95	30
11	89.35	28
12	95.85	26
13	102.43	24
14	109.09	23
15	115.82	22
16	122.62	20
17	129.48	19
18	136.40	18
19	143.37	17
20	150.39	17
21	157.45	16
22	164.54	15
23	171.67	15
24	178.84	14
25	186.03	13

A search interval of 5 days was used as a compromise between the results gained and the effort exerted to gain those results. With this search interval, theoretically 48% of carcasses would be found.

4.6 Bat Carcass Searches

A single bat was found during the carcass searches. This was a *Nyctalus noctula* (Noctule) found on 17.08.10 beneath wind turbine T46.

5 DISCUSSION

5.1 Comparison Between 2009 and 2010 Car Transect Bat Survey Data

The same diverse range of species was recorded on the transects in 2010 as compared to 2009, including the following:

- *Eptesicus serotinus;*
- *Hypsugo savii;*
- *Miniopterus schreibersii;*
- *Myotis* species;
- *Nyctalus noctula;*
- *Pipistrellus nathusii;*
- *P. pipistrellus;*
- *P. pygmaeus;*
- *Rhinolophus ferrumequinum;*
- possibly *Nyctalus leisleri;*
- possibly *Vespertilio murinus; and*
- possibly *Tadarida teniotis*.

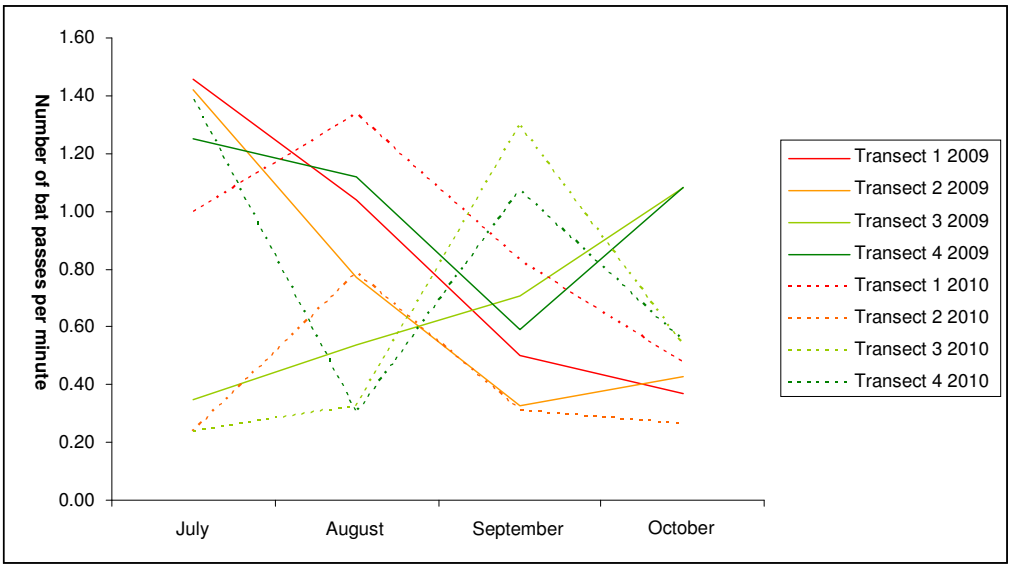
Similar to 2009, the species recorded most frequently in 2010 were:

- *Eptesicus serotinus;*
- *Hypsugo savii;*
- *Miniopterus schreibersii;* and
- *Pipistrellus nathusii.*

Again, no more or less species (a measure of diversity) were recorded during the off-site car transects on agricultural land to the north (*Transect 3*) and on agricultural land, steppe grassland, wetland, scrub, trees, caves, cliffs and coastline to the south (*Transect 4*) when compared to the on-site car transects. This confirms that species recorded at the site are still typical of those in the surrounding area.

Graph 12 provides a comparison between the numbers of bat passes recorded per minute (a measure of abundance) in each month, on each transect and in the two years of survey.

Graph 12. Results of car transect surveys in 2009 and 2010 regarding the rate of bat passes at the four transects.



On *Transect 1* in 2009, the rates of bat passes were at their highest in July, reducing through August, September and October. Pass rate peaked later in 2010, with a higher rate in August than in July and a similar decline (the lines are almost parallel) in September and October.

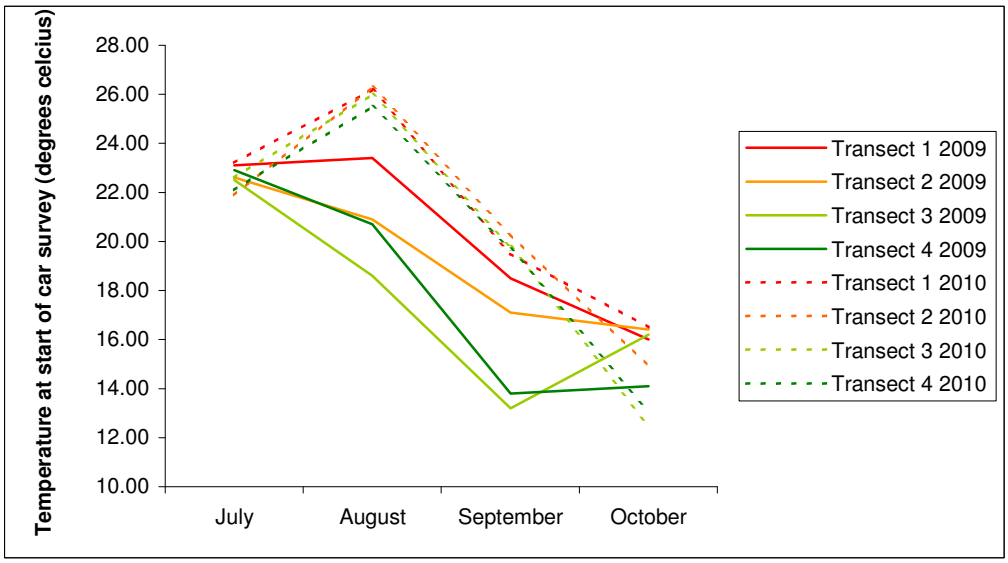
On *Transect 2* in 2009 a similar pattern was observed to that on *Transect 1*, with a peak in July followed by a decline through the remaining months (although a slight increase can be observed in October compared to September). Again, as with *Transect 1*, passes peaked later in 2010, with a higher rate in August than in July followed by a decline throughout the remaining months.

Transect 3 in 2009 showed an increase to a peak in September, followed by a decline in October. On the same transect in 2010, passes gradually rose to a peak in October.

On *Transect 4* in 2009, the rate of passes dropped from a peak in July to a dip in September and a subsequent rise in October. The pattern is similar in 2010, starting with a peak in July followed by a dip, except that the dip is in August and is followed by a peak in September and another dip in October.

In general, the rates of bat passes are higher on site (*Transects 1* and *2*) in the summer (during the breeding season) and lower in the autumn (during the migration season) in both years. Average pass rates peak to the north (*Transect 3*) in the autumn and peaks can be seen at the coast (*Transect 4*) in both the summer and the autumn. The patterns in activity are fairly similar year to year, although the summer peak in the on-site transects appears later in 2010 (August) compared to 2009 (July) and the autumn peak in the off-site transects appears earlier in 2010 (September) compared to 2009 (October). It is possible that this is related to ambient temperature. *Graph 13*, below, shows temperatures recorded at the start of each car survey.

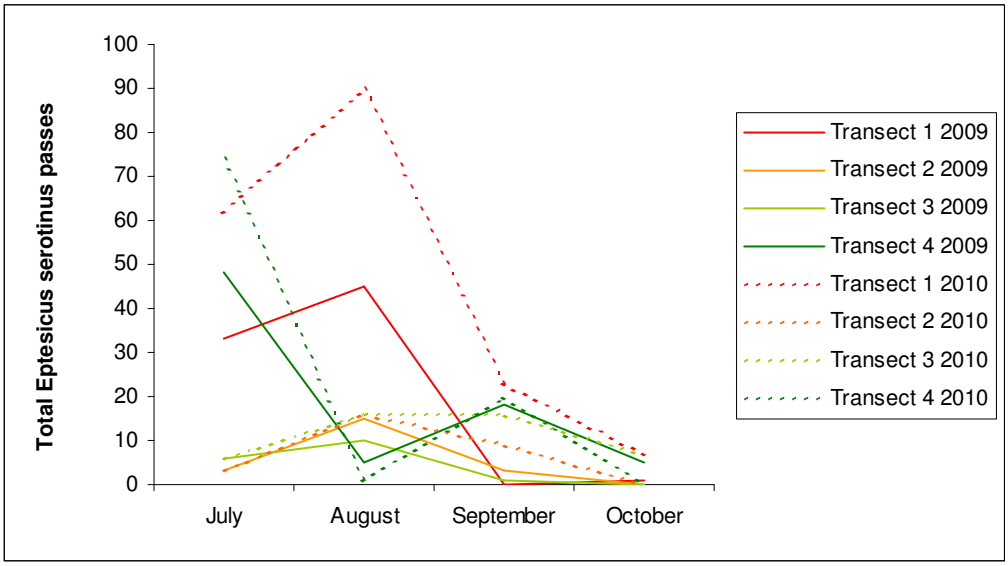
Graph 13. Temperatures recorded at the start of the car transect surveys in 2009 and 2010



Temperatures in July were fairly similar in 2009 and 2010 but higher in August and September 2010 than in the same months in 2009. This may have partly contributed to the differences in peak bat activity between the two years.

Graphs 14-17, below, enable a comparison of patterns of activity between 2009 and 2010, for the four most commonly recorded species.

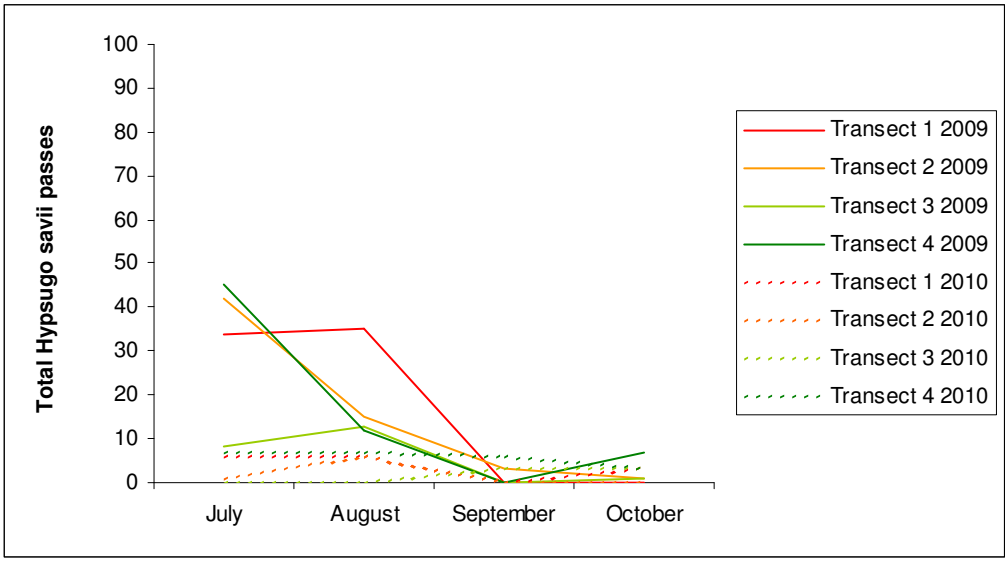
Graph 14. Total Eptesicus serotinus passes recorded on car transect surveys in 2009 and 2010



Similar activity patterns can be observed month to month in terms of numbers of *Eptesicus serotinus* passes on each of the transects between the two years (the solid lines and equivalent dashed lines are almost parallel: Graph 14). The most striking

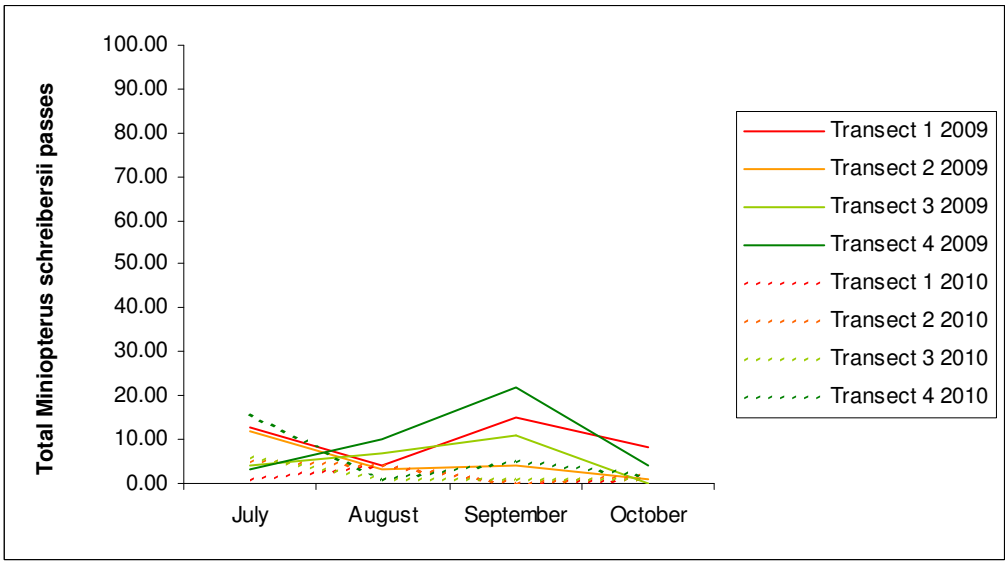
difference between the two years is in the number of passes of this species recorded on *Transect 1*; far more were recorded in 2010 than had been recorded in 2009. It is possible that this species has been attracted onto the wind farm in greater numbers due to the wind turbines, although this change could equally be attributed to other factors such as weather conditions or local roost relocations.

Graph 15. Total Hypsugo savii passes recorded on car transect surveys in 2009 and 2010



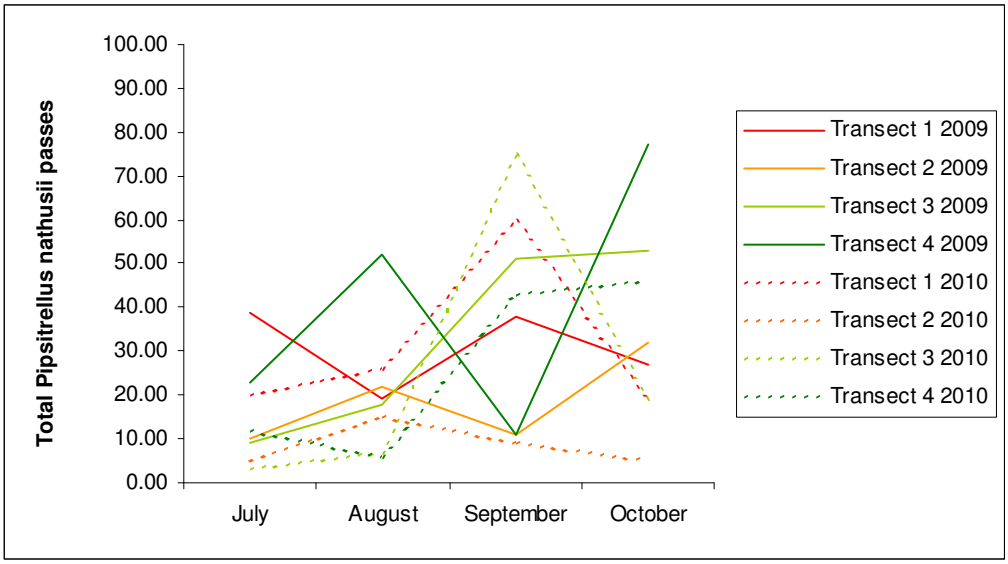
More passes of *Hypsugo savii* were recorded in July and August in 2009 than in 2010; then numbers were fairly similar in September and October (Graph 15). Again, this may be attributed to the wind farm deterring bats or it could be due to different weather conditions or local roost relocations.

Graph 16. Total Miniopterus schreibersii passes recorded on car transect surveys in 2009 and 2010



More passes of *Miniopterus schreibersii* were recorded in September and October in 2009 than in 2010, but passes were fairly similar between years in July and August (Graph 16). Again, this may be attributed to the wind farm deterring bats or it could be due to different weather conditions or local roost relocations.

Graph 17. Total Pipistrellus nathusii passes recorded on car transect surveys in 2009 and 2010



The pattern across transects and years is far more complicated for *Pipistrellus nathusii* (Graph 17). Higher passes were recorded on all transects in July 2009 compared to July 2010. In August 2009, numbers on *Transects 1, 3,* and *4* were lower in 2009 compared to 2010 (numbers on *Transect 2* were actually higher in 2009 compared to 2010). In September, passes in 2009 were lower for *Transects 2, 3* and *4* but higher for *Transect 1* compared to 2010. Finally, in October, all transects showed higher passes in 2009 than in 2010. This pattern is very difficult to rationalise. What is clear, however, is that the autumn peak is earlier in 2010 (September) than it was in 2009 (October). As this is likely to relate to migrating bats, it may be due to conditions experienced in the bats' country of origin rather than in Bulgaria.

5.2 *Bat Surveys At Height*

Without a full set of data from the at height surveys it is not possible to draw any conclusions regarding changes in bat behaviour around the moving wind turbines. Solutions should be explored to improve data collection in this respect.

5.3 *Bat Carcass Searches*

With only a single carcass found it is not appropriate to use equations to calculate the actual mortality for the wind farm. The sample size is too low.

Searches have been carried out throughout the bat active year at five wind turbines, with trials carried out on a further five. Surveyors have also been carrying out bird carcass searches on other plots; no bat carcasses have been found during these surveys.

Hence, these results suggest an extremely low level of mortality of bats at the site.

5.4 Recommendations for Further Bat Monitoring Surveys at Sveti Nikola Wind Farm

The car transect surveys apparently show some clear changes from year to year, with increases in bat activity seen in some species and decreases seen in others. There is, however, no clear overall pattern and therefore it is not possible to rationalise these changes given the data available.

No pre-construction data are available; no data are available from April to June 2009 (during construction) and there are little or no 'at height' data for 2009 and 2010 against which to compare the 'ground level' car transect data. At the time of writing, the car transect surveys have been carried out between April and July 2011 and these will continue for the remainder of the 2011 season (because July to October are the months for which pre-operation data is available) but then cease. The data collected in 2009, 2010 and 2011 can then be compared to see if any clearer patterns emerge.

Regardless, the car transect data should be assessed alongside the other data collected at the site, which suggest that bat mortality is extremely low. Therefore, whether bats are more attracted to the site with wind turbines or not, this does not appear to have caused marked number of fatalities due to collision or barotraumas.

It would be ideal to continue the bat surveys at height, with the Anabat microphones suspended below the turbine nacelles to eliminate or reduce the amount of noise recorded from the nacelle. If a practical solution cannot be reached to the satisfaction of the client then these surveys will also have to cease.

At the time of writing, the bat carcass searches have continued into 2011 according to the same methodologies. These surveys will cover the spring, summer and autumn period. However, as the search team and the conditions on site have not changed (and considering the extremely low level of bat mortality observed) they will not be accompanied by the searcher efficiency and carcass removal trials. Trial data from 2010 will be used if necessary.

Surveyors carrying out the trials and bird carcass searches on alternative plots should also be vigilant and report any bat carcasses found.

If no further bat carcasses (or only small numbers in total) are found in 2011 then these surveys should also cease. The surveys carried out suggest that bat mortality at the Sveti Nikola Wind Farm is insignificant and that the impact of the wind farm on bats is as predicted: insignificant.

6 CONCLUSION

This report provides details of bat surveys undertaken during 2009 and 2010 at the Sveti Nikola Wind Farm in Kavarna, Bulgaria, on behalf of AES Geo Energy. The surveys were carried out to monitor bat populations at ground level and at height pre- and post operation. The ultimate aim of these surveys (and future surveys) is to meet the commitments made in the EIA report and EMMP (RSK Group, 2008) to carry out bat activity surveys and bat mortality monitoring to establish if the predicted low level of impact was correct.

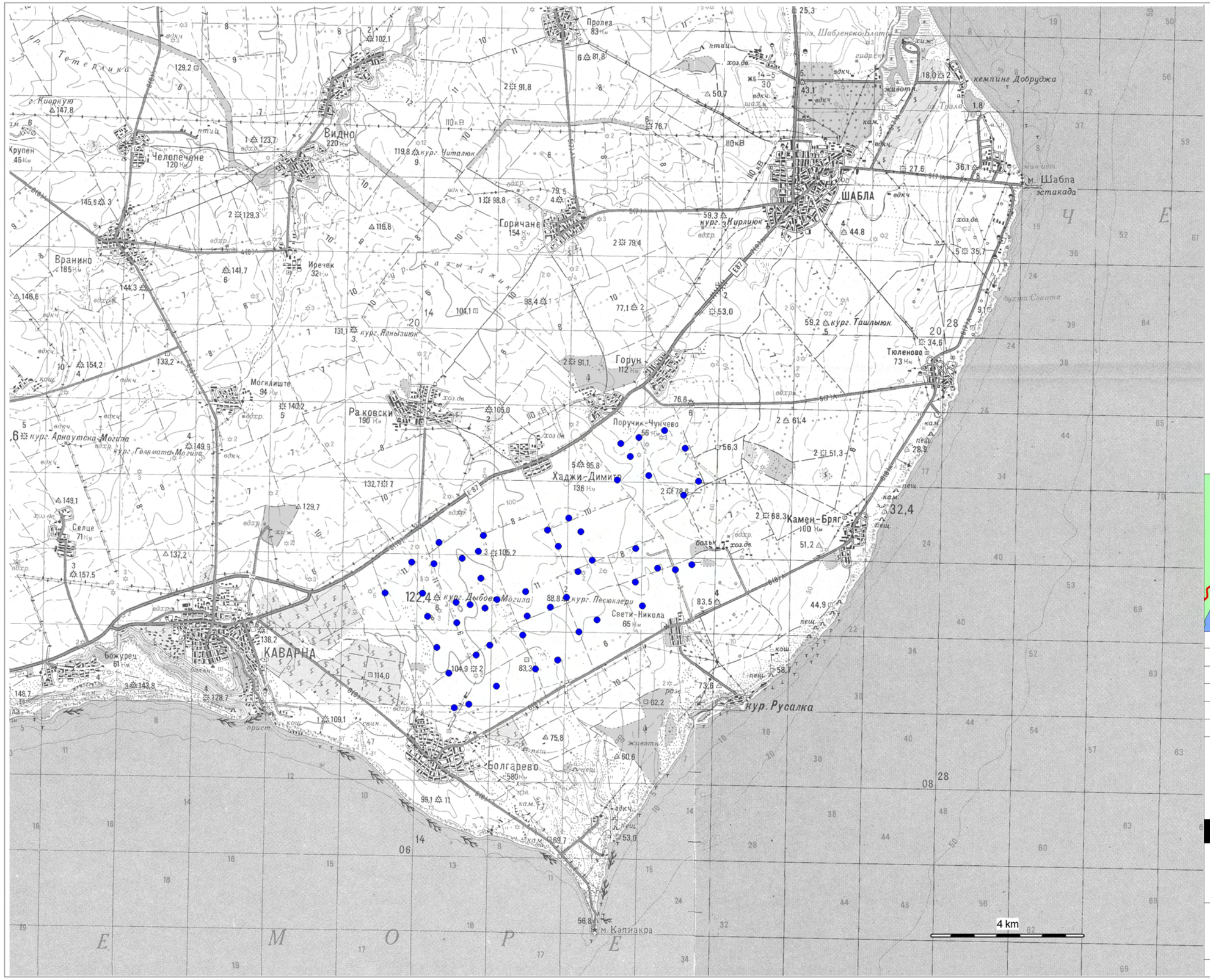
In 2009, ground level car transect surveys were carried out both on-site and off-site (as a control) monthly between July and October. These surveys were repeated in 2010 between April and October. Bat detector surveys were carried out at height pre-operation during parts of August, September and October 2009 but practical difficulties associated with noise produced by the nacelles inhibited effective data collection in 2010. Late afternoon observations for foraging migrants and night-time thermal infrared camera / acoustic migration surveys were carried out during part of September 2009. Carcass searches (including searcher efficiency and carcass removal trials) were carried out between August and November 2010.

The results of the ground level car transect surveys have not shown any clear patterns of change from pre-operation (2009) to during operation (2010). It is understood that these surveys have now been carried out between April and July 2011. They should therefore continue to the end of October 2011 (because July to October are the months for which pre-operation data is available) but then, unless any clearer patterns emerge, they should cease.

The results of the 2009 'at height' surveys showed the presence of bat species that could be at risk of collision (or barotraumas) with wind turbine blades *(Pipistrellus pipistrellus* and *Nyctalus noctula);* peaks in activity of these species were observed during the migration season; and some possible observations of migrating bats were seen using the thermal infrared camera. However, 'at height' data collected in 2010 is unusable due to noise levels experienced within the turbine nacelles. Practical solutions to this should now be discussed in order to continue with this survey technique if possible.

Only a single *Nyctalus noctula* bat was found dead beneath one of the five turbines searched at the site. No other casualties were found despite continued presence on other turbine plots for trials and bird carcass searches. This suggests an extremely low level of mortality at the site. If the 2011 bat carcass searches show the same results then the surveys should cease and the conclusion can be drawn that the actual impacts of the wind farm on bats are, indeed, insignificant.

7 FIGURES AND PLATES



Rev	Date	Description	Drn	Chk	App
00	09.02.10	Overview Map	RG	OM	JC

N
W E
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Kavarna

AES Geo Energy

Figure 1

Site location plan

SCALE: 1:100,000 @ A3

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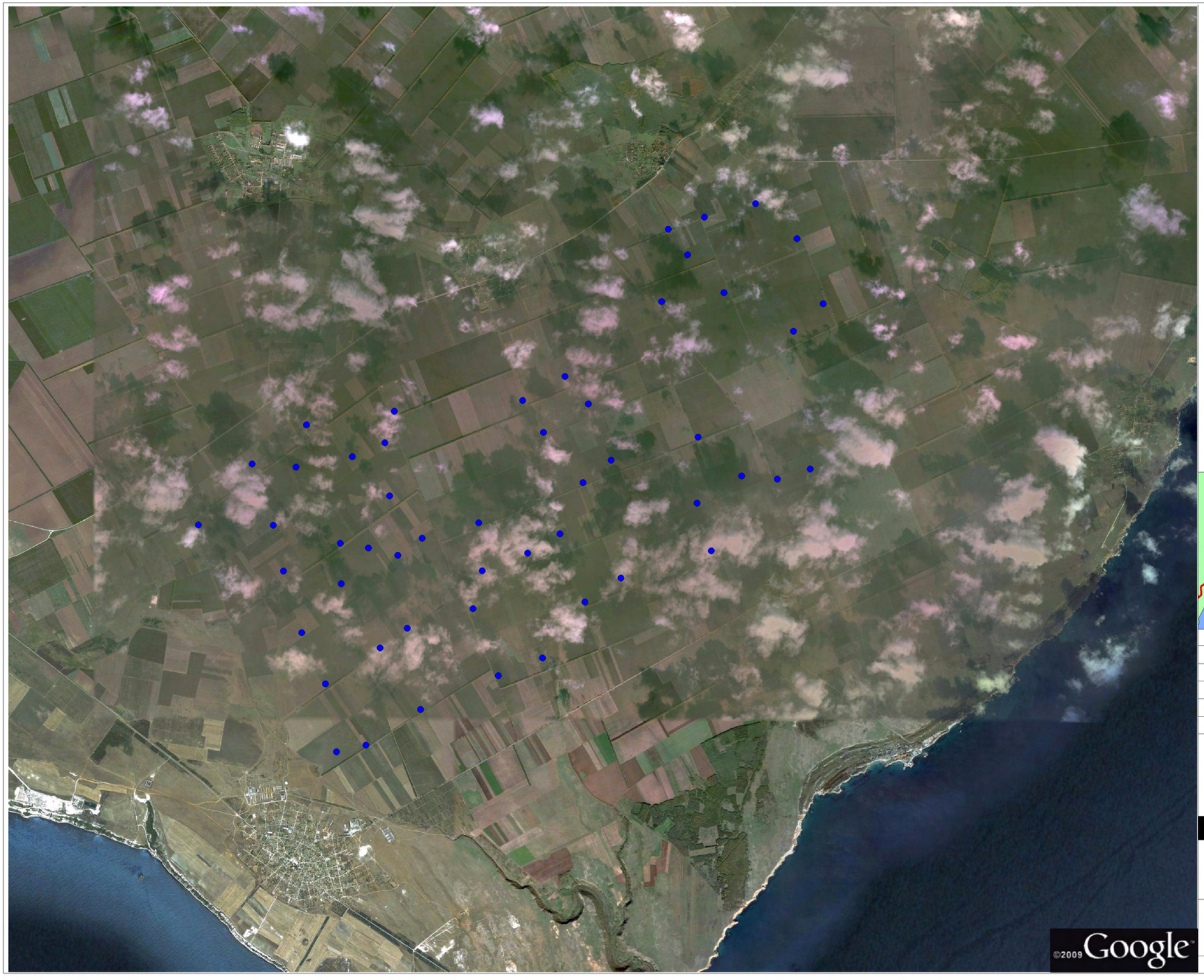

Wind turbine

00	09.02.10	Overview Map	RG	OM	JC
Rev	Date	Description	Drn	Chk	App

N
W E
S

Kavarna

AES Geo Energy

Figure 2

Aerial Photograph of Site

SCALE: 1:50,000 @ A3

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Transect 1
Transect 2
Transect 3
Transect 4
Wind Turbine

Rev	Date	Description	Drn	Chk	App
00	09.02.10	BS	RG	OM	JC

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Kavarna

AES Geo Energy

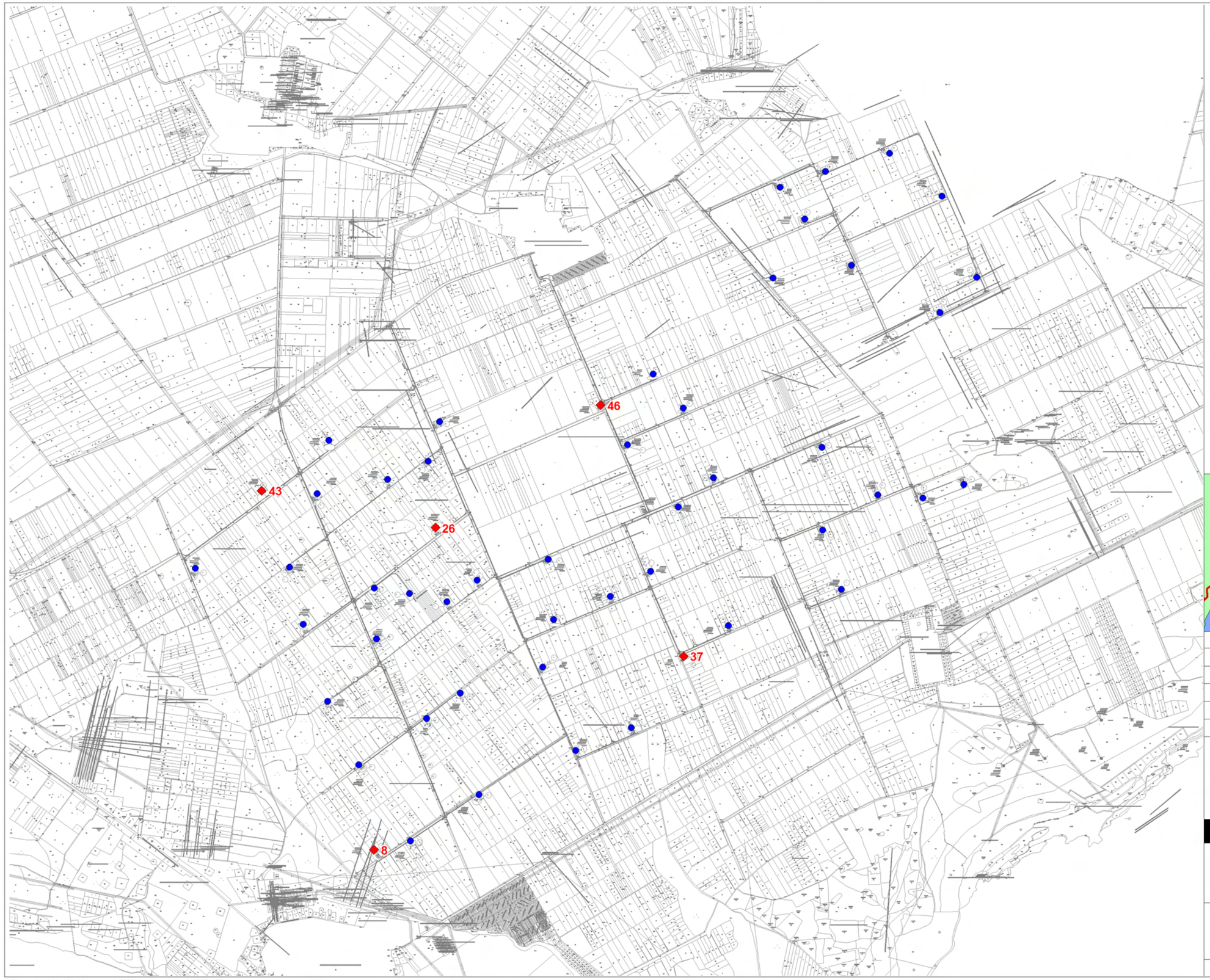
Figure 3

The four car transect routes

SCALE: 1:60,000 @ A3

Basemap provided by Client

FILE NAME: T:\All GIS RSK\801154 - Kavarna\Figure\Final \Wksps\Bat\



Wind turbine

Turbines with Anabat bat detectors

Rev	Date	Description	Drn	Chk	App
00	09.02.10	BS	RG	OM	JC

N
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Kavarna

AES Geo Energy

Figure 4

Turbines where Anabat bat detectors were erected

SCALE: 1:40,000 @ A3

FILE NAME: T:\All GIS RSK\60154 - Kavarna\Figure\Final Wksps\Batt

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APPENDIX 1. DESCRIPTIONS OF BEAUFORT AND OCTAS SCALES USED FOR WEATHER RECORDING

Beaufort scale:

No.	Description	Effects on land
0	Calm	Smoke rises vertically.
1	Light air	Smoke drifts in the wind.
2	Light breeze	Leaves rustle. Wind felt on face.
3	Gentle breeze	Small twigs in constant motion. Light flags extended.
4	Moderate wind	Dust, leaves and loose paper raised. Small branches move.
5	Fresh wind	Small trees sway.
6	Strong wind	Large branches move. Whistling in phone wires.
7	Very strong wind	Whole trees in motion.
8	Gale	Twigs break off trees. Difficult to walk.
9	Severe gale	Chimney pots and slates removed.
10	Storm	Trees uprooted. Structural damage.
11	Severe storm	Widespread damage. Very rarely experienced on land.
12	Hurricane force	Widespread damage. Very rarely experienced on land.

Octas scale:

No.	Description
0	No cloud cover
1	12.5% cloud cover
2	25% cloud cover
3	37.5% cloud cover
8	100% cloud cover

APPENDIX 2. CAR TRANSECT SURVEY RESULTS APRIL 2010

Transect 1: 13.04.2010

Chunk (0-5 minutes is chunk 1, 5-10 minutes is chunk 2 and so on)	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	507000	1	3	0	51.5	73.7	48.2	318	Miniopterus schreibersi
	507600	1	2	0	51.0	59.2	49.1	516	Miniopterus schreibersi

Transect 2: 18.04.10

Chunk (0-5 minutes is chunk 1, 5-10 minutes is chunk 2 and so on)	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	82264	1	2	0	37.5	38.1	35.6	10.1	Pipistrellus nathusii

Transect 3: 21.04.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	42482	1	1	0	51.0	56.3	48.5	9.2	Miniopterus schreibersi
	47411	1	1	0	39.4	40.3	37.3	9.5	Pipistrellus nathusii
	154051	1	1	0	51.9	58.0	49.1	10.6	Miniopterus schreibersi
	154403	1	1	0	51.0	55.0	49.1	6.7	Miniopterus schreibersi
	159330	1	1	0	51.5	56.6	49.5	7.7	Miniopterus schreibersi
	214939	1	3	0	42.3	69.2	37.5	5.5	Pipistrellus nathusii
	218108	1	2	0	39.9	41.2	38.2	7.5	Pipistrellus nathusii
	218457	1	3	0	39.9	43.5	37.5	7.9	Pipistrellus nathusii
	218810	1	2	0	39.9	46.7	37/8	7.5	Pipistrellus nathusii
	219161	1	2	0	40.4	45.5	38.8	6.1	Pipistrellus nathusii
	219516	1	2	0	40.8	43.7	39.7	3.9	Pipistrellus nathusii
	221626	1	2	0	40.4	42.9	38,7	6.2	Pipistrellus nathusii
	221979	1	3	0	40.4	52.1	38.1	7.8	Pipistrellus nathusii
	222331	1	2	0	39.9	44.9	37.8	7.6	Pipistrellus nathusii
	231839	1	1	0	39.4	41.7	36.6	7.0	Pipistrellus nathusii
	239929	1	2	0	50.0	59.1	47.4	9.5	Miniopterus schreibersi
	264213	1	4	0	52.5	72.8	49.1	5.3	Miniopterus schreibersi
	264525	1	2	0	51.5	55.1	50.0	9.1	Miniopterus schreibersi
	274770	1	2	0	38.4	42.4	35.5	6.7	Pipistrellus nathusii
	411327	1	1	0	24.4	27.3	22.4	11.9	Nyctalus noctula or Eptesicus serotinus
	578855	1	4	0	56.3	74.5	49.1	9.0	Pipistrellus pygmaeus
	579208	1	4	0	53.4	68.5	48.9	8.7	Pipistrellus pygmaeus or Miniopterus schreibersi

Transect 4: 23.04.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	11539	1	3	0	51.0	67.4	46.5	6.8	Miniopterus schreibersi
	31954	1	4	0	52.9	71.4	50.0	4.2	Miniopterus schreibersi
	35119	1	3	0	53.9	72.0	50.5	4.4	Miniopterus schreibersi
	35824	1	1	0	55.8	63.1	52.1	2.8	Pipistrellus pygmaeus
	36177	1	4	0	50.5	53.9	48.8	4.6	Miniopterus schreibersi
	39342	1	2	0	51.5	53.9	49.5	8.4	Miniopterus schreibersi
	39694	1	2	0	51.0	67.8	47.0	8.3	Miniopterus schreibersi
	90729	1	2	0	51.5	57.5	49.2	7.3	Miniopterus schreibersi
	91079	1	2	0	52.5	59.4	48.8	7.6	Miniopterus schreibersi
	274446	1	1	0	39.4	40.5	38.4	6.8	Pipistrellus nathusii
	299083	1	3	0	55.3	85.5	36.9	3.1	Myotis sp.
	329703	1	1	0	39.4	39.7	36.9	4.6	Pipistrellus nathusii
	330056	1	2	0	37.0	40.6	34.9	12.9	Pipisterllus nathusii
	330408	1	2	0	37.5	40.0	36.4	7.7	Pipistrellus nathusii
	331815	1	2	0	37.5	38.7	35.9	6.2	Pipistrellus nathusii
	333233	1	2	0	37.5	41.2	36.3	7.1	Pipistrellus nathusii
	334279	1	2	0	38.4	40.6	37.5	9.2	Pipistrellus nathusii
	351525	1	2	0	38.0	42.0	36.3	7.7	Pipitrellus nathusii
	351878	1	1	0	38.9	40.3	35.9	7.7	Pipistrellus nathusii
	352582	1	1	0	38.0	39.7	35.6	7.7	Pipistrellus nathusii
	354340	1	2	0	38.9	42.3	36.3	4.3	Pipistrellus nathusii
	360675	1	2	0	38.9	42.2	36.7	6.9	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	361380	1	3	0	41.8	49.7	39.9	3.4	Pipistrellus nathusii
	387775	1	1	0	51.9	57.1	49.1	8.8	Miniopterus schreibersi
	419099	1	1	0	38.0	41.4	36.6	4.8	Pipistrellus nathusii
	419459	1	2	0	39.4	46.4	36.7	6.7	Pipistrellus nathusii
	419802	1	1	0	37.0	39.4	34.3	7.1	Pipistrellus nathusii
	447609	1	2	0	38.0	63.4	36.3	5.8	Pipistrellus nathusii

APPENDIX 3. CAR TRANSECT SURVEY RESULTS MAY 2010

Transect 1: 11.05.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	4087	1	3	0	35.5	40.5	33.4	11.2	Hypsugo savii or Pipistrellus nathusii
	5339	1	3	0	37.5	64.5	33.2	8.8	Pipistrellus nathusii
	5690	1	2	0	35.1	42.6	32.3	11.0	Hypsugo savii or Pipistrellus nathusii
	6394	1	2	0	34.6	38.5	32.2	9.2	Hypsugo savii or Pipistrellus nathusii
	7801	1	2	0	40.4	44.0	38.5	5.5	Pipistrellus nathusii
	7799	1	3	0	39.9	44.4	38.2	5.3	Pipistrellus nathusii
	11670	1	3	0	40.4	42.4	37.8	4.6	Pipistrellus nathusii
	18009	1	4	0	35.5	44.6	33.7	7.1	Pipistrellus nathusii
	21879	1	3	0	34.6	45.8	31.6	8.8	Hypsugo savii
	23290	1	4	0	41.3	70.4	39.1	7.1	Pipistrellus nathusii
	25402	1	2	0	36.0	45.0	34.3	8.7	Pipistrellus nathusii
	25752	1	3	0	36.0	44.4	32.8	10.4	Pipistrellus nathusii
	41590	1	2	0	36.0	45.2	34.0	10.1	Pipistrellus nathusii
	42647	1	3	0	36.5	39.4	34.1	7.5	Pipistrellus nathusii
	184836	1	3	0	52.9	59.7	50.5	8.6	Miniopterus schreibersi
	235515	1	2	0	51.5	55.6	48.9	11.4	Miniopterus schreibersi
	264023	1	1	0	54.9	57.5	52.0	3.4	Pipistrellus pygmaeus
	272281	1	3	0	42.3	43.8	40.2	2.7	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	290419	1	2	0	51.5	55.6	50.0	6.5	Miniopterus schreibersi
	290771	1	2	0	51.5	56.3	49.5	8.3	Miniopterus schreibersi
	291123	1	3	0	50.5	57.7	47.3	10.8	Miniopterus schreibersi
	291473	1	3	0	51.5	63.7	48.3	9.5	Miniopterus schreibersi
	291827	1	1	0	51.0	54.4	49.5	7.1	Miniopterus schreibersi
	292179	1	3	0	51.9	70.5	48.3	8.8	Miniopterus schreibersi
	292883	1	3	0	49.5	59.8	47.7	10.0	Miniopterus schreibersi
	313297	1	2	0	51.9	57.5	49.7	6.1	Miniopterus schreibersi
	344620	1	1	0	39.9	41.5	37.5	9.4	Pipistrellus nathusii
	382924	1	1	0	52.5	57.2	50.0	3.7	Miniopterus schreibersi
	387206	1	4	0	52.5	64.9	48.5	10.5	Miniopterus schreibersi
	388262	1	1	0	51.0	60.1	49.2	7.4	Miniopterus schreibersi
	388615	1	3	0	52.5	57.8	50.3	4.2	Miniopterus schreibersi
	388966	1	3	0	51.9	64.9	47.4	9.3	Miniopterus schreibersi
	401989	1	3	0	38.0	67.2	34.6	10.2	Pipistrellus nathusii
	452629	1	1	0	40.4	43.4	39.0	5.1	Pipistrellus nathusii
	455485	1	1	0	38.4	40.3	37.5	8.5	Pipistrellus nathusii
	455838	1	1	0	38.0	40.2	36.1	7.0	Pipistrellus nathusii
	507573	1	2	0	41.3	51.1	39.4	6.8	Pipistrellus nathusii
	520244	1	1	0	51.0	60.9	47.9	9.5	Miniopterus schreibersi
	552623	1	2	0	43.8	55.6	39.7	3.4	Myotis sp.
	581000	1	1	0	39.4	45.8	35.1	6.9	Pipistrellus nathusii
	647000	1	1	0	50.5	60.2	48.6	7.1	Miniopterus schreibersi

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	648000	1	1	0	47.6	55.3	43.8	7.5	Pipistrellus pipistrellus

Transect 2:12.05.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	2195	1	2	0	35.1	48.6	32.5	13.1	Hypsugo savii or Pipistrellus nathusii
	12051	1	2	0	36.0	43.5	33.2	7.1	Hypsugo savii or Pipistrellus nathusii
	12402	1	3	0	37.5	67.4	33.7	10.1	Pipistrellus nathusii
	12756	1	3	0	37.5	45.0	34.0	9.3	Pipistrellus nathusii
	13108	1	2	0	36.5	39.4	33.4	10.1	Pipistrellus nathusii
	13461	1	2	0	35.5	39.3	33.7	9.3	Pipistrellus nathusii
	66604	1	3	0	39.4	47.0	37.5	7.6	Pipistrellus nathusii
	66954	3	9	0	41.3	47.9	39.3	6.5	Pipistrellus nathusii
					38.0	43.7	35.8	6.6	Pipistrellus nathusii
					37.5	39.3	34.9	6.2	Pipistrellus nathusii
	67307	2	9	0	40.8	47.1	38.1	6.6	Pipistrellus nathusii
					37.0	39.1	34.3	9.1	Pipistrellus nathusii
	67661	2	6	0	39.4	48.8	36.9	6.9	Pipistrellus nathusii
					36.5	50.0	34.6	9.3	Pipistrellus nathusii
	90536	1	3	0	40.4	59.4	36.7	8.2	Pipistrellus nathusii
	95816	1	3	0	37.5	42.6	34.7	9.7	Pipistrellus nathusii
	275662	1	2	0	39.9	48.8	37.6	6.1	Pipistrellus nathusii
	390748	1	1	0	51.5	53.0	49.2	5.9	Miniopterus schreibersi

Transect 3: 15.05.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	87059	1	2	0	39.4	40.8	37.5	8.8	Pipistrellus nathusii
	158504	1	2	0	50.5	56.8	48.3	7.7	Miniopterus schreibersi
	168714	1	2	0	51.0	53.2	48.2	6.4	Miniopterus schreibersi
	169065	1	2	0	50.0	52.4	47.4	7.5	Miniopterus schreibersi
	194405	1	2	0	50.5	56.0	48.3	9.7	Miniopterus schreibersi
	205315	1	3	0	50.5	64.2	48.5	10.3	Miniopterus schreibersi
	206370	1	3	0	51.9	56.3	49.5	6.9	Miniopterus schreibersi
	206725	1	1	0	49.5	49.7	47.1	3.9	Miniopterus schreibersi
	216580	1	3	0	50.5	60.0	46.7	11.0	Miniopterus schreibersi
	253179	1	1	0	24.0	28.1	19.9	3.7	Eptesicus serotinus or Nyctalus noctula
	368973	1	1	0	51.9	56.8	50.0	6.1	Miniopterus schreibersi
	472800	1	2	0	36.5	38.8	34.1	7.3	Pipistrellus nathusii
	473151	1	2	0	36.5	42.7	34.4	8.0	Pipistrellus nathusii
	525593	1	2	0	39.4	40.5	37.0	6.3	Pipistrellus nathusii
	525945	1	2	0	39.9	40.9	38.1	9.3	Pipistrellus nathusii
	530873	1	2	0	39.4	43.7	37.2	9.0	Pipistrellus nathusii
	531224	1	3	0	40.4	43.4	38.5	6.5	Pipistrellus nathusii
	531576	1	3	0	42.8	45.8	40.3	5.4	Pipistrellus nathusii

Transect 4: 18.05.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	31861	1	1	0	55.8	61.5	52.3	3.5	Pipistrellus pygmaeus
	40663	1	2	0	51.5	58.1	48.3	6.0	Miniopterus schreibersi
	75152	1	2	0	55.8	58.7	50.9	3.6	Pipistrellus pygmaeus
	91691	1	1	0	51.0	53.6	48.8	8.3	Miniopterus schreibersi
	92393	1	2	0	51.9	60.3	48.2	4.8	Miniopterus schreibersi
	107534	1	1	0	51.0	52.7	48.8	8.6	Miniopterus schreibersi
	111401	1	2	0	51.5	54.4	49.1	7.9	Miniopterus schreibersi
	154691	1	6	0	48.1	69.6	32.5	3.2	Myotis sp.
	155040	1	5	0	52.9	58.0	41.1	2.2	Myotis sp.
	155754	1	4	0	46.2	50.0	30.7	2.5	Myotis sp.
	220859	1	1	0	38.0	41.4	35.2	7.3	Pipistrellus nathusii
	221213	1	1	0	37.0	43.4	34.9	6.8	Pipistrellus nathusii
	224732	1	2	0	50.0	62.1	36.1	2.3	Myotis sp.
	231770	1	3	0	47.1	51.8	36.6	2.3	Myotis sp.
	263979	1	3	0	53.9	68.9	39.0	3.0	Myotis sp.
	318352	1	2	0	42.8	56.8	35.1	2.8	Myotis sp.
	338411	1	2	0	41.3	43.4	39.3	5.6	Pipistrellus nathusii
	342988	1	2	0	40.4	41.2	37.9	10.9	Pipistrellus nathusii
	347560	1	2	0	43.3	44.1	39.6	5.9	Pipistrellus pipistrellus or Pipistrellus nathusii
	350731	1	1	0	42.3	45.5	40.9	3.4	Pipistrellus nathusii
	354251	1	2	0	39.9	40.9	38.4	16.2	Pipistrellus nathusii
	357420	1	2	0	39.9	42.3	38.1	7.0	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	361992	1	1	0	40.4	41.1	38.7	7.7	Pipistrellus nathusii
	441182	1	3	0	46.2	55.7	38.5	3.3	Myotis sp.
	512980	1	4	0	47.8	60.8	37.5	3.2	Myotis sp.
	513000	1	4	0	47.6	55.6	38.4	3.5	Myotis sp.
	523000	1	1	0	44.2	50.6	38.5	2.9	Myotis sp.
	525000	1	2	0	53.4	62.5	42.5	3.0	Myotis sp.

APPENDIX 4. CAR TRANSECT SURVEY RESULTS JUNE 2010

Transect 1: 19.06.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	2739	1	4	0	42.8	60.1	40.3	4.3	Pipistrellus nathusii
	53773	1	2	0	39.4	44.6	36.3	8.2	Pipistrellus nathusii
	54125	1	1	0	37.0	39.9	34.3	6.9	Pipistrellus nathusii
	55182	1	1	0	34.5	35.5	32.5	11.8	Hypsugo savii
	60813	1	3	0	35.1	45.3	32.8	13.1	Hypsugo savii or Pipistrellus nathusii
	61164	1	2	0	35.1	45.6	32.8	11.2	Hypsugo savii or Pipistrellus nathusii
	61516	1	2	0	34.1	36.3	31.7	14.3	Hypsugo savii
	61868	1	2	0	33.6	35.1	32.0	13.7	Hypsugo savii
	62221	1	1	0	33.1	33.7	31.1	13.6	Hypsugo savii
	62571	1	2	0	34.6	38.8	31.9	15.8	Hypsugo savii
	63629	1	1	0	35.1	35.5	32.5	11.5	Hypsugo savii
	63979	1	2	0	33.1	33.8	31.6	14.9	Hypsugo savii
	64331	1	1	0	33.1	35.5	31.6	12.0	Hypsugo savii
	65036	1	1	0	35.1	35.5	32.5	12.4	Hypsugo savii
	70669	1	1	0	26.4	34.0	23.7	9.9	Eptesicus serotinus
	71018	1	10	0					undetermined, probably E. serotinus
	71371	1	3	0	25.9	35.6	23.7	8.4	Eptesicus serotinus
	77000	1	1	0	27.8	30.8	25.4	5.3	Eptesicus serotinus
	77354	1	1	0	27.3	29.5	24.5	4.6	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	77708	1	1	0	26.8	27.7	24.3	4.2	Eptesicus serotinus
	85451	1	1	0	26.4	28.7	23.7	7.2	Eptesicus serotinus
	86154	1	2	0	35.1	37.6	32.8	10.7	Hypsugo savii or Pipistrellus nathusii
	88618	1	2	0	35.1	38.2	32.3	10.2	Hypsugo savii or Pipistrellus nathusii
	88967	2	4	0	29.7	39.3	26.4	5.8	Eptesicus serotinus
					34.6	35.9	31.6	12.5	Hypsugo savii
	89320	1	2	0	34.1	36.4	32.3	10.1	Hypsugo savii
	89671	1	1	0	34.1	35.4	32.3	10.7	Hypsugo savii
	90024	1	1	0	35.1	35.9	33.4	10.6	Hypsugo savii
	93544	1	2	0	35.1	37.6	32.9	11.4	Hypsugo savii
	96008	1	2	0	34.6	36.1	32.8	10.1	Hypsugo savii
	96360	1	1	0	36.0	37.5	32.9	7.0	Hypsugo savii
	96711	1	2	0	34.6	38.4	32.5	9.7	Hypsugo savii
	99879	1	2	0	36.5	37.6	34.1	13.3	Hypsugo savii
	100231	1	2	0	35.5	37.3	32.9	15.5	Hypsugo savii
	100584	1	2	0	34.1	35.2	32.3	15.3	Hypsugo savii
	110439	1	3	0	35.1	37.2	33.8	7.5	Hypsugo savii
	121701	1	2	0	36.5	37.8	34.3	10.6	Hypsugo savii or Pipistrellus nathusii
	126276	1	1	0	32.7	33.8	31.6	14.6	Hypsugo savii
	126628	1	1	0	33.1	34.3	31.9	13.5	Hypsugo savii
	138594	1	2	0	39.4	40.3	37.9	10.0	Pipistrellus nathusii
	141058	1	2	0	36.0	38.5	34.0	11.5	Hypsugo savii or Pipistrellus nathusii
	141411	1	2	0	35.5	40.3	32.8	10.2	Hypsugo savii
	141762	2	4	0	39.9	41.2	37.8	7.5	Pipistrellus nathusii
					35.5	36.4	33.2	8.8	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	142113	1	2	0	39.4	41.2	37.9	6.8	Pipistrellus nathusii
	142465	1	1	0	42.8	45.9	41.4	4.8	Pipistrellus nathusii
	150208	1	3	0	50.5	54.8	48.5	8.3	Miniopterus schreibersi
	153337	1	1	0	35.1	37.3	33.4	9.9	Hypsugo savii
	153798	1	2	0	35.5	39.3	32.2	9.7	Hypsugo savii
	154079	1	2	0	35.5	42.4	32.8	8.9	Hypsugo savii
	154432	1	3	0	34.1	41.1	31.7	11.1	Hypsugo savii
	154784	1	3	0	35.1	40.2	33.4	7.0	Hypsugo savii
	164990	1	2	0	38.0	42.4	35.6	8.7	Pipistrellus nathusii
	165342	2	2	0	36.0	37.3	34.6	8.2	Hypsugo savii or Pipistrellus nathusii
					34.1	34.7	32.8	10.9	Hypsugo savii
	165695	1	8	0					undetermined
	166047	1	3	0	35.5	40.6	33.2	8.3	Hypsugo savii
	167101	1	1	0	33.1	34.4	31.7	13.7	Hypsugo savii
	168860	1	2	0	34.6	39.6	31.9	13.1	Hypsugo savii
	173084	1	3	0	34.1	48.5	31.1	10.7	Hypsugo savii
	176957	1	2	0	35.5	38.2	33.5	7.7	Hypsugo savii
	177308	1	2	0	34.1	39.0	31.9	10.9	Hypsugo savii
	178717	1	1	0	35.1	36.4	33.5	8.9	Hypsugo savii
	182237	1	2	0	35.5	39.0	33.7	15.3	Hypsugo savii or Pipistrellus nathusii
	182588	1	2	0	37.0	42.9	35.1	9.9	Pipistrellus nathusii
	182942	1	3	0	34.1	36.9	31.9	17.0	Hypsugo savii
	183294	1	5	0					undetermined
	183645	1	2	0	34.5	35.5	31.9	8.8	Hypsugo savii
	183996	1	2	0	34.6	37.2	32.3	9.5	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	184348	1	2	0	33.5	35.1	31.9	13.8	Hypsugo savii
	184701	1	2	0	32.7	34.4	30.7	8.9	Hypsugo savii
	185757	1	2	0	33.6	35.9	31.7	8.2	Hypsugo savii
	186107	1	2	0	34.1	35.1	32.2	9.3	Hypsugo savii
	191387	1	1	0	38.4	41.2	35.2	11.0	Pipistrellus nathusii
	191740	1	2	0	38.9	41.7	36.3	9.9	Pipistrellus nathusii
	192090	1	2	0	38.4	39.7	35.5	11.8	Pipistrellus nathusii
	193499	1	1	0	35.1	36.3	32.6	9.2	Hypsugo savii
	195259	1	2	0	34.5	35.5	32.6	12.5	Hypsugo savii
	199130	1	1	0	35.1	35.6	32.8	12.5	Hypsugp savii
	199482	1	2	0	34.1	35.2	32.3	12.7	Hypsugo savii
	199832	1	1	0	35.5	39.6	33.8	7.5	Hypsugo savii
	212504	1	1	0	35.5	38.4	33.4	8.6	Hypsugo savii
	217430	1	2	0	35.1	36.7	32.3	7.6	Hypsugo savii
	218140	1	1	0	33.6	35.9	31.7	16.5	Hypsugo savii
	222007	1	2	0	35.5	37.3	33.7	12.3	Hypsugo savii
	222715	1	2	0	35.5	38.7	34.1	7.5	Hypsugo savii
	223062	1	2	0	33.1	34.1	31.3	14.1	Hypsugo savii
	224118	1	1	0	35.1	36.6	34.3	11.8	Hypsugo savii
	238548	1	1	0	35.1	35.9	34.1	11.8	Hypsugo savii
	238900	1	1	0	35.1	37.5	31.9	10.8	Hypsugo savii
	256848	1	2	0	29.3	31.4	25.1	6.1	Eptesicus serotinus
	257202	1	3	0	27.3	36.7	24.5	9/4	Eptesicus serotinus
	257904	1	1	0	27.3	38.1	25.7	6.3	Eptesicus serotinus
	258259	1	2	0	27.8	43.4	25.7	8.1	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	258609	1	2	0	26.8	43.4	24.5	9.6	Eptesicus serotinus
	258963	1	1	0	26.4	29.6	23.9	6.3	Eptesicus serotinus
	264240	1	3	0	28.3	59.2	27.3	7.3	Eptesicus serotinus
	264593	1	2	0	26.8	31.3	24.5	5.4	Eptesicus serotinus
	271983	1	1	0	28.8	30.8	26.3	4.4	Eptesicus serotinus
	272336	1	1	0	24.9	39.9	22.2	13.6	Eptesicus serotinus
	277966	1	1	0	35.5	36.9	33.4	10.7	Hypsugo savii
	278320	1	2	0	34.6	41.8	32.3	10.4	Hypsugo savii
	278673	1	2	0	34.5	46.1	31.8	9.2	Hypsugo savii
	279022	1	2	0	33.6	37.5	31.6	7.9	Hypsugo savii
	284652	1	1	0	35.1	35.9	33.2	9.8	Hypsugo savii
	285006	1	1	0	35.1	36.4	33.2	12.1	Hypsugo savii
	285357	1	1	0	35.1	36.4	32.8	11.8	Hypsugo savii
	285711	1	1	0	35.1	36.4	32.6	13.5	Hypsugo savii
	286061	1	2	0	35.1	37.5	32.6	11.9	Hypsugo savii
	287119	1	3	0	38.9	48.5	37.3	7.8	Pipistrellus nathusii
	288174	1	2	0	35.1	35.4	33.1	13.1	Hypsugo savii
	291341	1	2	0	32.1	34.1	29.6	14.9	Hypsugo savii
	291694	1	1	0	35.5	37.9	33.7	10.7	Hypsugo savii
	294756	1	2	0	33.1	35.5	31.7	15.2	Hypsugo savii
	303307	1	2	0	34.1	35.1	32.5	10.2	Hypsugo savii
	305421	1	2	0	35.1	37.0	32.8	12.6	Hypsugo savii
	305770	1	3	0	35.5	37.3	32.8	10.9	Hypsugo savii
	307530	1	2	0	34.5	35.2	32.6	14.5	Hypsugo savii
	307884	1	1	0	33.6	33.8	31.7	10.7	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	312809	1	2	0	34.6	35.1	32.6	14.2	Hypsugo savii
	319145	1	2	0	32.7	34.3	30.2	11.9	Hypsugo savii
	319500	1	2	0	35.1	36.9	33.4	11.2	Hypsugo savii
	320554	1	1	0	35.1	37.2	33.2	11.2	Hypsugo savii
	321615	1	2	0	34.6	35.9	33.5	11.7	Hypsugo savii
	325125	2	3	0	37.5	37.8	35.5	12.2	Pipistrellus nathusii
					27.3	36.6	24.5	12.8	Eptesicus serotinus
	325480	2	7	0					undetermined
									undetermined
	325831	1	3	0	26.8	40.5	25.1	8.8	Eptesicus serotinus
	326185	1	1	0	27.3	36.8	24.2	9.0	Eptesicus serotinus
	326537	1	1	0	25.9	39.0	24.2	12.7	Eptesicus serotinus
	326888	2	3	0	38.4	39.4	35.9	13.6	Pipistrellus nathusii
					26.8	40.6	24.2	13.4	Eptesicus serotinus
	327242	1	1	0	27.3	40.0	25.4	9.9	Eptesicus serotinus
	327593	1	2	0	27.3	42.6	23.1	14.1	Eptesicus serotinus
	327945	2	3	0	35.5	36.4	34.4	13.8	Hypsugo savii
					26.8	40.2	39.4	14.9	Eptesicus serotinus
	328297	1	1	0	27.3	43.4	22.5	16.2	Eptesicus serotinus
	328648	2	3	0	25.4	38.5	21.6	13.0	Eptesicus serotinus
					50.0	54.7	48.3	8.2	Miniopterus schreibersi
	329001	1	3	0	36.0	41.5	32.8	11.1	Hypsugo savii
	329352	1	1	0	34.6	38.5	33.7	9.7	Hypsugo savii
	330057	1	3	0	35.5	40.2	34.1	9.4	Hypsugo savii
	330409	1	3	0	34.6	36.7	31.7	18.8	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	330760	1	2	0	49.5	56.6	47.4	8.5	Miniopterus schreibersi
	333575	1	2	1	35.5	36.7	34.0	12.8	Hypsugo savii
	333928	1	0	1					indetermined
	334631	2	2	0	30.2	34.3	28.4	5.4	Eptesicus serotinus
					38.9	41.5	37.0	9.2	Pipistrellus nathusii
	334984	2	3	0	28.8	45.3	26.4	8.5	Eptesicus serotinus
					38.4	40.5	36.6	10.1	Pipistrellus nathusii
	335335	2	5	0	39.9	61.3	37.2	6.6	Pipistrellus nathusii
					28.8	55.4	37.3	8.6	Eptesicus serotinus
	335686	2	4	0	38.4	48.5	36.1	10.3	Pipistrellus nathusii
					30.7	45.3	28.0	8.0	Eptesicus serotinus
	336039	2	4	0	31.2	47.9	29.3	5.5	Eptesicus serotinus
					38.4	44.0	36.6	11.1	Pipistrellus nathusii
	336391	2	3	0	38.4	39.4	37.2	6.9	Pipistrellus nathusii
					36.0	59.2	28.9	6.7	Pipistrellus nathusii
	336741	2	1	0	49.5	59.1	47.9	9.7	Miniopterus schreibersi
					28.3	46.4	24.2	9.4	Eptesicus serotinus
	337095	1	2	0					undeterrmined
	337447	2	3	0	28.8	30.1	27.3	4.5	Eptesicus serotinus
					29.7	31.0	24.6	9.9	Eptesicus serotinus
	337798	1	2	0	30.7	37.8	28.7	6.8	Eptesicus serotinus
	338885	1	1	0	31.7	48.5	28.1	3.9	Eptesicus serotinus
	339206	1	1	0	30.2	47.0	26.3	8.0	Eptesicus serotinus
	339560	1	1	0	32.7	43.5	28.4	7.4	undetermined
	341670	1	1	0	34.1	41.2	31.0	4.4	undetermined

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	351524	1	5	0					undetermined
	352228	1	1	0	36.5	44.3	32.9	4.0	undetermined
	353283	1	2	0	36.0	37.8	34.4	10.4	Hypsugo savii or Pipistrellus nathusii
	353635	1	1	0	34.1	34.7	32.0	11.4	Hypsugo savii
	353988	1	1	0	34.1	36.3	32.0	12.0	Hypsugo savii
	387775	1	2	0	48.1	54.7	46.4	9.8	Miniopterus schreibersi or P. pipistrellus
	401503	1	2	0	34.1	34.8	32.3	12.3	Hypsugo savii
	401854	1	1	0	34.1	35.5	30.7	11.1	Hypsugo savii
	410653	1	1	0	37.0	39.4	35.5	6.9	Pipistrellus nathusii
	411004	1	2	0	37.5	44.1	35.8	7.2	Pipistrellus nathusii
	411357	1	1	0	35.5	38.2	34.3	10.2	Hypsugo savii
	422971	1	1	0	35.5	37.3	34.3	12.0	Hypsugo savii
	432473	1	1	0	35.5	36.9	34.3	10.3	Hypsugo savii
	432826	1	2	0	33.6	34.9	31.7	13.9	Hypsugo savii
	433529	1	1	0	33.1	35.9	31.1	13.0	Hypsugo savii
	447256	1	2	0	33.6	35.2	31.7	13.5	Hypsugo savii
	447610	1	2	0	33.6	37.9	32.3	8.8	Hypsugo savii
	476820	1	2	0	36.0	38.3	33.5	11.3	Hypsugo savii
	477000	1	2	0	35.1	37.8	34.2	10.2	Hypsugo savii
	483000	1	2	0	34.1	36.8	32.4	12.6	Hypsugo savii
	512000	1	2	0	35.5	37.6	33.8	10.6	Hypsugo savii
	520800	1	1	0	27.3	36.8	24.6	6.8	Eptesicus serotinus
	527650	1	1	0	33.6	35.2	31.8	5.6	Hypsugo savii
	529230	1	1	0	34.1	37.2	31.4	3.8	Hypsugo savii
	535220	1	1	0	28.3	35.6	25.8	4.0	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	538596	1	1	0	25.9	29.8	23.4	4.2	Eptesicus serotinus
	537002	1	1	0	27.3	42.6	25.6	5.0	Eptesicus serotinus
	537395	1	1	0	27.8	40.2	25.6	5.2	Eptesicus serotinus
	541986	1	3	0	53.9	55.8	49.6	4.8	Miniopterus schreibersi
	557080	1	2	0	37.5	52.6	32.8	8.6	Pipistrellus nathusii
	557398	1	1	0	36.5	46.2	32.8	8.0	Pipistrellus nathusii
	557786	1	1	0	35.5	40.2	33.6	8.8	Pipistrellus nathusii
	581000	1	3	0	35.5	38.6	32.4	7.8	Pipistrellus nathusii
	581390	1	4	0	36.5	41.2	33.4	7.6	Pipistrellus nathusii
	586976	1	2	0	38.0	40.6	36.2	8.6	Pipistrellus nathusii
	598220	1	2	0	30.7	35.8	26.4	6.8	Eptesicus serotinus
	598961	1	1	0	38.4	40.6	35.6	9.8	Pipistrellus nathusii
	604926	1	1	0	28.8	32.6	25.6	8.6	Eptesicus serotinus
	611950	1	2	0	34.1	36.8	32.2	12.6	Hypsugo savii
	612720	1	1	0	32.7	35.8	31.2	13.0	Hypsugo savii
	614526	1	1	0	30.2				undetermined
	615988	1	2	0					undetermined
	615964	1	1	0	28.3	38.6	25.4		Eptesicus serotinus
	616862	1	2	0	30.7	35.6	28.6	5.4	Eptesicus serotinus
	617280	2	3	0	35.1	36.6	32.6	10.5	Hypsugo savii
					32.1				undetermined
	617596	2	3	0	34.6	36.8	32.4	10.6	Hypsugo savii
					30.2	42.8	27.6	8.0	Eptesicus serotinus
	617985	2	2	0	29.3	35.4	27.6	5.7	Eptesicus serotinus
					35.1	38.5	32.4	10.5	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	618350	1	1	0	27.8	32.6	25.6	8.4	Eptesicus serotinus
	618750	1	3	0					undetermined
	619020	1	1	0					undetermined
	619740	1	1	0	27.8	38.6	24.8	8.2	Eptesicus serotinus
	620150	2	4	0	30.2	25.4	35.8	7.8	Eptesicus serotinus
					29.7	32.6	25.6	6.4	Eptesicus serotinus
	621186	1	1	0	36.0	38.8	32.4	8.8	Hypsugo savii
	621480	2	3	0	34.5	37.6	32.6		Hypsugo savii
					36.0				undetermined
	622985	1	1	0	35.5	38.8	31.4	9.5	Hypsugo savii
	622592	2	6	0	35.5	36.5	33.4	10.0	Hypsugo savii
					39.9	46.4	37.2	10.2	Pipistrellus nathusii
	622980	1	2	0	39.9	45.8	36.6	6.8	Pipistrellus nathusii
	648986	1	1	0	34.6	38.5	32.6	6.2	Hypsugo savii
	649260	1	2	0	34.6	39.4	32.6	7.0	Hypsugo savii
	649670	1	2	0	38.0	46.4	36.2	5.6	Pipistrellus nathusii
	650320	2	3	0	35.5	38.5	31.6	10.0	Hypsugo savoo
					40.4	45.8	38.5	8.7	Pipistrellus nathusii
	650700	2	7		34.1	36.9	31.7	9.8	Hypsugo savoo
									undetermined
	651085	2	6	0	35.1	38.6	32.4	10.6	Hypsugo savoo
					39.4	45.6	37.4	8.6	Pipistrellus nathusii
	651400	1	3	0	35.1	38.2	32.2	9.0	Hypsugo savii
	651726	1	3	0	35.1	38.6	32.2	9.5	Hypsugo savii
	652498	1	2	0	34.5	39.5	31.8	8.9	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	655986	1	2	0	28.3	36.6	25.5	5.9	Eptesicus serotinus
	656385	1	1	0	26.4	35.8	24.4	6.0	Eptesicus serotinus

Transect 2: 20.06.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
4	25556	1	2	0	42.3			2.8	Myotis sp.
5	16332	1	4	0	44.7			3.1	Myotis sp.
	22315	1	1	0	34.1			14.0	Hypsugo savii
6	25749	1	1	0	53.9			3.8	Miniopterus schreibersi
	26101	1	4	0	51.0			7.3	Miniopterus schreibersi
7	10530	1	1	0	34.1			14.1	Hypsugo savii
	10881	1	1	0	34.6			10.6	Hypsugo savii
8	4111	1	2	0	36.0			6.6	Hypsugo savii
	12558	1	1	0	35.5			12.3	Hypsugo savii
	12909	1	2	0	35.5			11.9	Hypsugo savii
	13612	1	1	0	34.6			13.7	Hypsugo savii
	13966	1	2	0	35.1			15.3	Hypsugo savii
	14670	2	3	0	39.4			9.1	Pipistrellus nathusii
					34.1			11.1	Hypsugo savii
	15021	2	4	0	41.3			9.4	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
					36.5			4.6	Hypsugo savii
	15372	1	3	0	37.0			11.6	Pipistrellus nathusii
	15725	1	2	0	35.5			11.2	Hypsugo savii
	16077	1	1	0	35.5			9.2	Hypsugo savii
	16428	1	3	0	37.0			6.7	Pipistrellus nathusii
	17134	1	2	0	35.1			12.7	Hypsugo savii
	19246	1	2	0	35.1			13.5	Hypsugo savii
	19597	1	1	0	35.5			13.3	Hypsugo savii
	19947	1	1	0	34.6			14.2	Hypsugo savii
	25933	1	1	0	34.6			12.6	Hypsugo savii
	29804	1	1	0	36.5			12.9	undetermined
9	153	1	2	0	36.0			10.1	undetermined
	1914	1	2	0	36.0			11.8	undetermined
	2267	1	2	0	36.0			13.4	undetermined
	5434	1	1	0	36.5			12.9	Pipistrellus nathusii or Hypsugo savii
	5786	1	1	0	34.1			11.1	Hypsugo savii
	6139	1	2	0	34.1			14.6	Hypsugo savii
	7545	1	1	0	35.5			9.9	Hypsugo savii
	7897	1	1	0	36.5			7.1	Pipistrellus nathusii or Hypsugo savii
	8249	1	2	0	37.0			8.4	Pipistrellus nathusii
	9304	1	2	0	37.5			8.9	Pipistrellus nathusii
	9658	1	1	0	37.0			12.1	Pipistrellus nathusii
	10712	1	1	0	37.0			11.8	Pipistrellus nathusii
	11066	1	2	0	35.5			8.7	Pipistrellus nathusii or Hypsugo savii
	12471	1	2	0	37.0			7.8	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	12285	2	3	0	36.0			10.2	Pipistrellus nathusii or Hypsugo savii
					37.5			12.0	Pipistrellus nathusii
	13175	2	3	0	35.5			12.0	Pipistrellus nathusii or Hypsugo savii
					35.5			9.6	Pipistrellus nathusii or Hypsugo savii
	13529	2	2	0	35.5			12.6	Pipistrellus nathusii or Hypsugo savii
					35.5			15.2	Pipistrellus nathusii or Hypsugo savii
	17752	1	2	0	37.5			13.4	Pipistrellus nathusii
	18101	2	5	0	37.5			7.7	Pipistrellus nathusii
					36.0			10.1	Pipistrellus nathusii or Hypsugo savii
	18808	1	1	0	36.5			11.0	Pipistrellus nathusii or Hypsugo savii
	19863	1	1	0	37.0			13.1	Pipistrellus nathusii
	20216	1	2	0	35.5			13.7	Pipistrellus nathusii or Hypsugo savii
	20567	1	2	0	34.6			14.4	Hypsugo savii
	20920	1	1	0	35.1			8.1	Hypsugo savii
	29367	1	1	0	51.5			7.2	Miniopterus schreibersi
10	1125	1	1	0	31.2			7.2	Eptesicus serotinus
	1830	1	1	0	29.3			6.6	Eptesicus serotinus
	8163	1	2	0	50.5			8.7	Miniopterus schreibersi
	10277	1	1	0	30.7			7.3	Eptesicus serotinus
	11686	1	1	0	24.4			3.9	Eptesicus serotinus
	12034	1	2	0	26.4			4.2	Eptesicus serotinus
	13444	1	5	0	41.8			2.9	Myotis sp.
	19426	1	2	0	51.0			8.0	Miniopterus schreibersi
	23650	1	1	0	27.3			12.1	Eptesicus serotinus
	25410	1	1	0	52.5			6.0	Miniopterus schreibersi

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
11	3153	1	1	0	49.1			4.9	Miniopterus schreibersi
	3505	1	2	0	49.1			5.6	Miniopterus schreibersi
	14062	1	1	0	35.5			11.8	Hypsugo savii
	18285	1	1	0	51.0			9.8	Miniopterus schreibersi
12	4474	2	4	0	41.3			4.4	Myotis sp.
					50.0			8.4	Miniopterus schreibersi
	24890	1	1	0	26.8			9.2	Eptesicus serotinus
	25240	1	1	0	26.4			14.7	Eptesicus serotinus
13	12134	1	1	0	37.0			5.6	Pipistrellus nathusii
	12839	1	1	0	26.4			9.1	Eptesicus serotinus
	13539	1	2	0	26.4			12.4	Eptesicus serotinus
	16355	1	1	0	29.3			7.1	Eptesicus serotinus
15	8795	1	1	0	36.5			9.6	Pipistrellus nathusii or Hypsugo savii
	9148	1	1	0	36.0			11.8	Pipistrellus nathusii or Hypsugo savii
	9499	1	2	0	33.1			11.3	Hypsugo savii
	14074	1	2	0	50.5			10.0	Miniopterus schreibersi
	15833	1	1	0	51.0			9.1	Miniopterus schreibersi
	17242	1	2	0	44.7			4.2	Myotis sp.
	23578	1	2	0	51.0			9.0	Miniopterus schreibersi
	25339	1	1	0	51.5			5.4	Miniopterus schreibersi
16	24195	1	1	0	35.5			7.6	Pipistrellus nathusii or Hypsugo savii
	24549	1	2	0	35.5			13.1	Pipistrellus nathusii or Hypsugo savii
	24900	1	2	0	36.0			10.4	Pipistrellus nathusii or Hypsugo savii

Transect 3: 26.06.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	22268	1	1	0	33.6			8.4	Hypsugo savii
2	7313	1	1	0	33.1			18.2	Hypsugo savii
	21038	1	1	0	35.5			10.8	Hypsugo savii
4	7138	1	1	0	49.5			6.8	Miniopterus schreibersi
5	7405	1	2	0	51.9			5.7	Miniopterus schreibersi
	7756	1	4	0	51.0			6.4	Miniopterus schreibersi
	11979	1	2	0	35.5			11.9	Hypsugo savii
	12333	1	1	0	35.1			12.9	Hypsugo savii
	28874	1	2	0	51.0			7.0	Miniopterus schreibersi
6	13653	1	2	0	35.1			9.2	Hypsugo savii
	22452	1	3	0	51.0			10.8	Miniopterus schreibersi
	23154	1	1	0	53.4			9.2	Miniopterus schreibersi
8	8905	1	1	0	36.5			7.8	undetermined
	13479	1	1	0	36.0			12.4	undetermined
	17704	1	5	0	42.8			4.3	Pipistrellus nathusi
	28965	1	2	0	51.5			5.7	Miniopterus schreibersi
12	9612	1	2	0	27.3			8.4	Eptesicus serotinus
	9964	1	1	0	25.9			10.1	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	16650	1	2	0	38.9			9.6	Pipistrellus nathusi
	17002	1	2	0	34.5			9.1	Hypsugo savii
	17355	1	2	0	35.1			14.5	Hypsugo savii
	17706	1	2	0	35.1			14.1	Hypsugo savii
	18059	1	2	0	35.1			13.9	Hypsugo savii
	18410	1	2	0	34.6			13.4	Hypsugo savii
	18763	1	2	0	35.5			9.6	Hypsugo savii
	19115	1	3	0	35.5			9.1	Hypsugo savii
	20523	1	1	0	24.2			11.9	Eptesicus serotinus
	21930	1	2	0	51.0			9.6	Miniopterus schreibersi
13	1782	1	2	0	41.3			8.0	Pipistrellus nathusi
	2135	1	2	0	39.4			7.3	Pipistrellus nathusi
	3189	1	3	0	50.5			6.5	Miniopterus schreibersi
	8117	1	2	0	41.3			3.8	Pipistrellus nathusi
16	18062	1	2	0	34.1			12.9	Hypsugo savii
	18416	1	2	0	34.1			13.5	Hypsugo savii
	18769	1	2	0	35.1			8.9	Hypsugo savii
	19119	1	2	0	34.1			13.3	Hypsugo savii
17	5306	1	4	0	42.8			5.6	Pipistrellus nathusi
	6362	1	3	0	40.8			4.7	Pipistrellus nathusi
	25720	1	2	0	39.9			7.6	Pipistrellus nathusi
	26072	1	2	0	39.9			9.4	Pipistrellus nathusi
	26425	1	2	0	39.4			7.4	Pipistrellus nathusi
18	4163	1	2	0	42.8			5.0	Pipistrellus nathusi

Transect 4: 27.06.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
3	16802	1	1	0	34.1			6.0	Hypsugo savii
	17153	1	2	0	35.1			9.8	Hypsugo savii
	17507	1	2	0	32.7			12.7	Hypsugo savii
	17858	1	1	0	33.1			15.0	Hypsugo savii
	18211	1	1	0	32.1			11.0	Hypsugo savii
	21729	1	1	0	35.5			13.7	Hypsugo savii
4	528	1	1	0	34.6			9.8	Hypsugo savii
	881	1	1	0	36.7			8.5	Hypsugo savii
	1232	1	2	0	35.1			10.4	Hypsugo savii
	1583	1	2	0	34.6			11.7	Hypsugo savii
	1936	1	21	0					undetermined
	2286	1	2	0	35.5			11.7	Hypsugo savii
	2639	1	2	0	34.6			13.0	Hypsugo savii
	2991	1	2	0	35.1			13.2	Hypsugo savii
	3344	1	2	0	35.1			16.0	Hypsugo savii
	4398	1	4	0					undetermined
5	20152	1	1	0	34.1			11.7	Hypsugo savii
6	15845	1	1	0	32.1			5.6	undetermined
	16196	1	1	0	33.1			4.1	undetermined
	16548	1	2	0	49.1			11.2	Miniopterus schreibersi
	20068	1	3	0	51.5			10.3	Miniopterus schreibersi
	21828	1	1	0	51.5			3.6	Miniopterus schreibersi
	25699	1	2	0	35.1			13.0	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	26050	1	2	0	33.6			12.5	Hypsugo savii
7	5553	1	1	0	25.9			6.8	Eptesicus serotinus
	6257	1	1	0	35.1			8.9	Hypsugo savii
	8721	1	1	0	35.1			12.3	Hypsugo savii
	21390	1	1	0	51.0			7.3	Miniopterus schreibersi
	21744	1	2	0	56.3			10.0	Pipistrellus pygmaeus
9	13478	1	3	0	35.1			11.2	Hypsugo savii
	13833	1	2	0	35.1			10.1	Hypsugo savii
	14182	1	1	0	34.1			8.1	Hypsugo savii
	14887	1	1	0	34.1			8.2	Hypsugo savii
10	4596	1	4	0	35.1			3.3	undetermined
	10226	1	3	0	77.6			39.7	Rhinolophus ferrumequinum
11	4157	1	3	0	40.4			8.8	Pipistrellus nathusii
	28795	1	2	0	49.1			7.5	Miniopterus schreibersi
13	19476	1	2	0	40.4			5.1	Pipistrellus nathusii
14	16222	1	1	0	35.1			7.0	Hypsugo savii

APPENDIX 5. CAR TRANSECT SURVEY RESULTS JULY 2010

Transect 1:15.07.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	2569	1	2	0	35.1			11.4	Hypsugo savii
	11014	2	7	0	27.3			10.6	Eptesicus serotinus
					42.3			4.5	Pipistrellus nathusii
	11367	2	5	0	42.3			3.7	Pipistrellus nathusii
					26.8			10.5	Eptesicus serotinus
	11719	1	2	0	26.4			11.1	Eptesicus serotinus
	12072	2	5	0	42.8			4.1	Pipistrellus nathusii
					26.4			12.7	Eptesicus serotinus
	12423	2	3	0	25.4			11.3	Eptesicus serotinus
					43.8			3.4	Pipistrellus nathusii
	12775	1	2	0	25.4			11.2	Eptesicus serotinus
	13126	1	4	0	45.2			3.6	Pipistrellus pipistrellus
	13479	1	4	0	42.8			4.2	Pipistrellus pipistrellus or Pipistrellus nathusii
	19111	1	2	0	44.2			2.7	Pipistrellus pipistrellus
	21926	1	3	0	37.5			8.4	Pipistrellus nathusii
	22280	1	3	0	36.0			10.5	Pipistrellus nathusii or Hypsugo savii
	22631	1	2	0	35.5			12.3	Pipistrellus nathusii or Hypsugo savii
	22983	2	4	0	35.5			6.1	Pipistrellus nathusii or Hypsugo savii
					35.1			7.9	Pipistrellus nathusii or Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	23334	1	3	0	36.0			7.8	Pipistrellus nathusii or Hypsugo savii
	23697	1	5	0					undetermined
	24039	1	2	0	36.0			6.1	Pipistrellus nathusii or Hypsugo savii
1	8817	1	2	0	34.6			9.7	Hypsugo savii
	9117	1	2	0	33.1			11.6	Hypsugo savii
	29231	1	3	0	40.4			7.3	Pipistrellus nathusii
	29583	1	5	0					undetermined
2	0	2	5	0	40.8			6.7	Pipistrellus nathusii
					35.1			10.4	Hypsugo savii
	4157	1	3	0	41.3			8.4	Pipistrellus nathusii
	5213	1	3	0	38.0			10.3	Pipistrellus nathusii
	6268	1							undetermined
	7676	2	8	0	28.3			5.5	Eptesicus serotinus
					30.2			6.4	Eptesicus serotinus
	8029	2	7	0	29.7			5.8	Eptesicus serotinus
					31.2			4.1	Eptesicus serotinus
	17530	1	4	0	37.0			10.2	Pipistrellus nathusii
	19290	1	2	0	34.1			12.5	Hypsugo savii
	19643	2	5	0	37.5			8.2	Pipistrellus nathusii
					29.5			5.8	Eptesicus serotinus
	19996	2	4	0	31.2			6.0	Eptesicus serotinus
					37.0			7.7	Pipistrellus nathusii
	20698	1	1	0	34.1			5.0	Hypsugo savii
	21050	2	6	0	40.8			7.9	Pipistrellus nathusii
					31.2			6.8	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	21404	2	4	0	38.4			8.4	Pipistrellus nathusii
					31.2			7.1	Eptesicus serotinus
	21754	1	2	0	36.5			7.1	Pipistrellus nathusii
	22107	2	2	0	30.2			3.0	Eptesicus serotinus
					37.5			6.2	Pipistrellus nathusii
	22459	2	6	0	31.7			5.2	Eptesicus serotinus
					43.6			4.6	Pipistrellus nathusii
	22809	2	5	0	30.2			6.0	Eptesicus serotinus
					42.3			2.6	Pipistrellus nathusii
	23162	1	2	0	32.7			6.2	Eptesicus serotinus
	23865	1	1	0	32.1			6.6	Eptesicus serotinus
	24219	1	3	0	30.7			5.6	Eptesicus serotinus
	24571	1	2	0	32.1			5.4	Eptesicus serotinus
	24922	1	4	0					undetermined
	25274	1	2	0	29.7			7.6	Eptesicus serotinus
	25626	3	7	0	29.3			9.5	Eptesicus serotinus
					33.1			7.5	Eptesicus serotinus
					27.8			9.1	Eptesicus serotinus
	25977	2	6	0	29.7			6.3	Eptesicus serotinus
					29.3			8.2	Eptesicus serotinus
	26332	2	6	0	28.3			9.7	Eptesicus serotinus
					29.3			7.8	Eptesicus serotinus
	26682	2	5	0	29.3			8.6	Eptesicus serotinus
					27.8			8.3	Eptesicus serotinus
	27033	2	6	0	27.8			7.8	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
					30.7			7.6	Eptesicus serotinus
	27386	2	4	0	27.3			4.3	Eptesicus serotinus
					27.8			6.7	Eptesicus serotinus
	27739	1	4	0	27.3			7.0	Eptesicus serotinus
	28091	1	2	0	28.3			3.7	Eptesicus serotinus
	28443	1	3	0	28.8			4.6	Eptesicus serotinus
	28793	1	1	0	28.3			3.7	Eptesicus serotinus
	29146	1	1	0	28.3			3.4	Eptesicus serotinus
3	18501	1	3	0	30.7			7.3	Eptesicus serotinus
7	13582	1	2	0	39.4			7.7	Pipistrellus nathusii
	13932	1	1	0	38.4			7.6	Pipistrellus nathusii
8	27574	1	1	0	34.6			3.5	undetermined
	27926	1	2	0	30.2			4.0	undetermined
9	8481	1	1	0	26.4			7.5	Eptesicus serotinus
	8833	1	2	0	27.3			6.9	Eptesicus serotinus
	22560	1	2	0	30.7			4.4	Eptesicus serotinus
11	5845	1	3	0	30.2			4.1	Eptesicus serotinus
	6902	1	2	0	29.3			8.9	Eptesicus serotinus
	7253	1	2	0	28.3			8.8	Eptesicus serotinus
	7605	1	2	0	27.3			10.4	Eptesicus serotinus
	7959	1	1	0	26.4			11.8	Eptesicus serotinus
	8308	1	1	0	26.8			6.9	Eptesicus serotinus
	8661	1	3	0	27.3			8.8	Eptesicus serotinus
	12532	1	1	0	27.8			10.3	Eptesicus serotinus
	12884	1	1	0	26.4			10.6	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	13237	2	5	0	26.4			14.0	Eptesicus serotinus
					27.3			9.3	Eptesicus serotinus
15	4093	1	1	0	50.5			12.4	Miniopterus schreibersi
18	14394	1	2	0	27.8			9.7	Eptesicus serotinus
	14745	2	3	0	28.3			9.3	Eptesicus serotinus
					25.4			13.8	Eptesicus serotinus
	15099	1	2	0	26.8			5.8	Eptesicus serotinus
	15448	1	1	0	27.8			7.5	Eptesicus serotinus
19	1287	1	2	0	30.2			8.3	Eptesicus serotinus
	1638	1	1	0	27.3			9.6	Eptesicus serotinus
21	6041	1	4	0	36.0			5.9	Myotis myotis/bluthi
	6395	1	2	0	37.0			3.5	Myotis myotis/bluthi
	6746	1	2	0	36.0			4.7	Myotis myotis/bluthi

Transect 2: 16.07.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
2	8188	1	1	0	40.8			2.8	Pipistrellus nathusii
6	23335	1	4	0	52.9			11.6	Miniopterus schreibersi
	25445	1	2	0	29.3			8.8	Eptesicus serotinus
7	6005	1	3	0	39.9			7.1	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	6357	1	2	0	40.8			9.7	Pipistrellus nathusii
	7413	1	2	0	37.5			10.5	Pipistrellus nathusii
	7765	1	1	0	37.0			12.3	Pipistrellus nathusii
	11635	2	8	0	51.0			5.1	Miniopterus schreibersi
					53.9			6.3	Miniopterus schreibersi
	14452	1	2	0	51.9			4.5	Miniopterus schreibersi
	17269	1	3	0	52.5			4.8	Miniopterus schreibersi
8	24926	1	1	0	24.4			13.5	Eptesicus serotinus
	25277	1	1	0	24.4			14.9	Eptesicus serotinus
12	11918	1	1	0	35.5			9.8	Hypsugo savii or Pipistrellus nathusii
	26347	1	1	0	34.1			9.3	Hypsugo savii
13	571	1	2	0	32.1			6.2	Myotis myotis/blythii
	921	1	2	0	31.2			10.1	Myotis myotis/blythii
	1273	1	2	0	31.2			6.3	Myotis myotis/blythii

Transect 3: 17.07.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
2	1721	1	2	0	43.3			3.7	Pipistrellus pipistrellus or Pipistrellus nathusii
	2073	1	2	0	44.2			3.4	Pipistrellus pipistrellus
	4185	1	4	0	42.8			3.9	Pipistrellus pipistrellus or Pipistrellus nathusii
	4537	1	2	0	42.8			3.5	Pipistrellus pipistrellus or Pipistrellus nathusii
	5240	1	3	0	47.6			2.9	Pipistrellus pipistrellus
	5594	1	5	0	42.8			4.4	Pipistrellus pipistrellus or Pipistrellus nathusii
	5944	1	4	0	44.7			3.1	Pipistrellus pipistrellus
	10167	1	3	0	35.5			4.7	Hypsugo savii or Pipistrellus nathusii
8	8228	1	4	0	38.9			6.7	Pipistrellus nathusii
	13508	1	3	0	39.4			8.5	Pipistrellus nathusii
	13861	1	3	0	39.4			7.4	Pipistrellus nathusii
9	21514	1	2	0	26.8			3.2	Eptesicus serotinus
10	16849	1	1	0	51.5			8.5	Miniopterus schreibersi
	18610	1	1	0	51.5			6.3	Miniopterus schreibersi
	18962	1	2	0	51.9			9.1	Miniopterus schreibersi
	19313	1	2	0	51.9			9.6	Miniopterus schreibersi
11	3035	1	2	0	51.0			9.8	Miniopterus schreibersi
15	5850	1	1	0	51.9			7.2	Miniopterus schreibersi
17	12358	1	2	0	32.1			5.5	Eptesicus serotinus
	17288	1	2	0	28.8			8.3	Eptesicus serotinus
	17637	1	2	0	31.2			6.6	Eptesicus serotinus
	17989	1	2	0	30.2			8.4	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	18342	1	2	0	29.3			10.4	Eptesicus serotinus

Transect 4: 18.07.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
1	29045	1	1	1	36.5			11.4	Pipistrellus nathusii or Hypsugo savii
	29397	1	3	0	35.1			11.2	Pipistrellus nathusii or Hypsugo savii
3	1418	1	1	0	35.1			9.6	Pipistrellus nathusii or Hypsugo savii
6	8898	1	1	0	54.4			2.9	undetermined
	17346	1	2	0	51.9			8.4	Miniopterus schreibersi
7	10924	1	2	0	38.4			5.8	Pipistrellus nathusii
8	6260	1	1	0	36.0			8.1	Pipistrellus nathusii or Hypsugo savii
	10131	1	1	0	51.0			9.3	Miniopterus schreibersi
9	17081	1	2	0	38.4			9.3	Pipistrellus nathusii
	17432	1	5	0	38.4			8.1	Pipistrellus nathusii
	19196	1	1	0	35.1			10.2	Pipistrellus nathusii or Hypsugo savii
	19548	1	2	0	35.5			8.4	Pipistrellus nathusii or Hypsugo savii
	23417	1	2	0	30.2			7.3	Eptesicus serotinus
	24123	1	1	0	28.8			8.2	Eptesicus serotinus
	24474	1	1	0	29.3			9.0	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	24827	2	1	4	28.3			11.3	Eptesicus serotinus
	25176	2	1	1	27.8			10.5	Eptesicus serotinus
	25529	1	2	0	28.8			8.9	Eptesicus serotinus
	25882	1	2	0	29.7			11.8	Eptesicus serotinus
	26233	1	2	0	26.8			9.8	Eptesicus serotinus
	26586	1	2	0	28.3			3.8	Eptesicus serotinus
	27640	1	1	0	27.8			8.6	Eptesicus serotinus
	27993	1	2	0	27.8			8.9	Eptesicus serotinus
	28345	2	4	0	28.3			7.3	Eptesicus serotinus
					28.3			8.2	Eptesicus serotinus
	28697	1	1	0	27.3			5.8	Eptesicus serotinus
	29051	1	1	0	28.8			9.2	Eptesicus serotinus
	29401	2	1	3	27.8			11.7	Eptesicus serotinus
	29755	1	1	0	26.8			6.7	Eptesicus serotinus
10	1508	1	1	0	27.8			8.4	Eptesicus serotinus
	1862	1	2	0	27.8			11.2	Eptesicus serotinus
	2213	1	2	0	26.8			7.7	Eptesicus serotinus
	3620	1	1	0	28.3			9.9	Eptesicus serotinus
	3974	1	2	0	28.3			11.9	Eptesicus serotinus
	4328	1	1	0	27.8			11.0	Eptesicus serotinus
	4677	1	1	0	27.3			10.0	Eptesicus serotinus
	5028	1	2	0	28.8			8.4	Eptesicus serotinus
	5381	1	2	0	28.8			10.2	Eptesicus serotinus
	5733	1	1	0	29.3			7.3	Eptesicus serotinus
	6436	1	1	0	34.1			10.2	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	7843	1	3	0	34.6			8.2	Hypsugo savii
	8196	1	1	0	34.1			13.0	Hypsugo savii
	9604	1	2	0	28.3			5.8	Eptesicus serotinus
	9955	1	2	0	28.3			10.5	Eptesicus serotinus
	10309	1	1	0	27.8			12.1	Eptesicus serotinus
	10660	1	2	0	27.8			7.0	Eptesicus serotinus
	12067	1	2	0	28.3			7.6	Eptesicus serotinus
	12421	2	5	0	27.8			8.8	Eptesicus serotinus
					28.8			7.5	Eptesicus serotinus
	13471	1	1	0	25.4			6.0	Eptesicus serotinus
	13827	1	2	0	25.4			6.1	Eptesicus serotinus
	14885	1	1	0	38.9			7.0	Pipistrellus nathusii
	18051	1	1	0	50.5			10.2	Miniopterus schreibersi
	20514	1	1	0	36.5			4.4	undetermined
	21923	1	2	0	33.6			7.7	undetermined
	23330	1	2	0	28.3			7.0	Eptesicus serotinus
	24043	1	1	0	34.1			14.0	Hypsugo savii
	24738	1	1	0	33.6			11.9	Hypsugo savii
	25090	1	2	0	33.6			10.9	Hypsugo savii
	27552	1	3	0	30.7			6.6	Eptesicus serotinus
	28611	1	1	0	31.2			5.3	undetermined
11	1070	1	1	0	27.8			8.3	Eptesicus serotinus
	1422	1	2	0	28.8			7.4	Eptesicus serotinus
	1773	1	3	0	28.8			8.1	Eptesicus serotinus
	2127	1	2	0	30.2			6.6	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	2477	3	8	0	28.8			7.3	Eptesicus serotinus
					27.8			9.1	Eptesicus serotinus
					30.7			9.3	Eptesicus serotinus
	2830	1	4	0					Eptesicus serotinus
	3181	1	3	0	27.3			11.2	Eptesicus serotinus
	3884	2	2	0	36.5			10.4	Pipistrellus nathusii or Hypsugo savii
					26.8			10.0	Eptesicus serotinus
	4237	1	3	0	27.3			8.3	Eptesicus serotinus
	4942	2	3	0	25.4			13.6	Eptesicus serotinus
					51.0			8.2	Miniopterus schreibersi
	5293	1	3	0	27.3			11.5	Eptesicus serotinus
	5645	1	4	0	24.9			10.9	Eptesicus serotinus
	8109	1	1	0	34.1			11.0	Hypsugo savii
	9868	1	2	0	51.5			9.1	Miniopterus schreibersi
	10923	1	3	0	31.2			5.4	Eptesicus serotinus
	11277	2	3	0	27.8			8.1	Eptesicus serotinus
					51.0			9.3	Miniopterus schreibersi
	16203	1	3	0	29.3			7.3	Eptesicus serotinus
	16555	1	2	0	28.3			7.4	Eptesicus serotinus
	19722	1	1	0	38.4			8.7	Pipistrellus nathusii
	22891	1	2	0	52.5			6.2	Miniopterus schreibersi
	23244	1	1	0	51.0			9.1	Miniopterus schreibersi
	26760	1	2	0	51.5			8.3	Miniopterus schreibersi
	29577	1	1	0	51.5			9.4	Miniopterus schreibersi
12	3796	1	2	0	50.5			8.1	Miniopterus schreibersi

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	4149	1	4	0	51.0			8.1	Miniopterus schreibersi
	4501	2	3	0	50.0			8.1	Miniopterus schreibersi
					27.8			6.9	Eptesicus serotinus
	6260	2	4	0	36.0			9.8	Pipistrellus nathusii or Hypsugo savii
					30.2			5.4	Eptesicus serotinus
	7670	1	3	0	36.0			9.3	Pipistrellus nathusii or Hypsugo savii
	8021	1	3	0	36.5			9.4	Pipistrellus nathusii or Hypsugo savii
	13300	1	1	0	37.5			5.3	Pipistrellus nathusii
	13653	1	1	0	36.0			8.2	Pipistrellus nathusii or Hypsugo savii
	18580	1	1	0	36.0			8.4	Pipistrellus nathusii or Hypsugo savii
	19636	1	1	0	38.4			4.5	Pipistrellus nathusii
	19988	1	1	0	37.5			5.5	Pipistrellus nathusii
	20339	1	1	0	38.4			5.2	Pipistrellus nathusii
	24916	1	1	0	28.8			6.8	Eptesicus serotinus
	25266	1	1	0	31.7			6.5	Eptesicus serotinus
	25617	2	4	0	30.2			10.8	Eptesicus serotinus
					27.8			9.5	Eptesicus serotinus
	25971	1	1	0	30.7			10.9	Eptesicus serotinus
	26323	1	3	0	28.3			10.6	Eptesicus serotinus
	27027	1	1	0	28.3			10.2	Eptesicus serotinus
	28434	1	1	0	50.0			9.6	Miniopterus schreibersi
13	895	1	1	0	27.8			7.4	Eptesicus serotinus
	3007	1	1	0	35.5			7.9	Pipistrellus nathusii or Hypsugo savii
	3359	1	1	0	35.5			10.0	Pipistrellus nathusii or Hypsugo savii
	16733	1	5	0	37.5			7.4	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	20251	1	2	0	50.5			7.0	Miniopterus schreibersi
	20605	1	5	0	51.5			5.2	Miniopterus schreibersi
	26236	1	3	0	42.8			3.1	Pipistrellus nathusii
14	15237	1	1	0	24.9			12.1	Eptesicus serotinus
	22978	1	1	0	37.0			6.7	Pipistrellus nathusii
	24388	1	3	0	27.3			6.1	Eptesicus serotinus
	24739	1	2	0	26.8			6.9	Eptesicus serotinus
15	1072	1	1	0	27.8			14.3	Eptesicus serotinus
	1774	1	1	0	27.3			11.6	Eptesicus serotinus
	2480	1	2	0	29.3			5.8	Eptesicus serotinus
	2830	1	1	0	27.8			9.9	Eptesicus serotinus
	3535	1	3	0	27.3			12.3	Eptesicus serotinus
	14797	1	3	0	56.3			4.3	Myotis sp.
	15499	1	3	0	49.5			2.9	Myotis sp.
16	6262	1	3	0	40.8			3.3	Myotis sp.
	6614	1	2	0	40.8			6.4	Myotis sp.
	6966	1	3	0	39.4			5.3	Myotis sp.

APPENDIX 6. CAR TRANSECT SURVEY RESULTS AUGUST 2010

Transect 1: 15.08.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	5829	1	2	0	27.3			5.8	Eptesicus serotinus
	22021	1	2	0	35.5			7.5	Hypsugo savii or Pipistrellus nathusii
	22724	1	2	0	35.5			9.5	Hypsugo savii or Pipistrellus nathusii
	23426	1	2	0	35.1			9.1	Hypsugo savii or Pipistrellus nathusii
	23781	1	3	0	35.1			11.4	Hypsugo savii or Pipistrellus nathusii
	24132	1	2	0	34.6			13.9	Hypsugo savii or Pipistrellus nathusii
	24484	1	2	0	34.6			7.2	Hypsugo savii or Pipistrellus nathusii
	24836	1	3	0	35.1			9.8	Hypsugo savii or Pipistrellus nathusii
	25188	1	1	0	34.6			14.5	Hypsugo savii or Pipistrellus nathusii
	25539	1	2	0	35.5			12.2	Hypsugo savii or Pipistrellus nathusii
	25892	1	2	0	35.1			11.4	Hypsugo savii or Pipistrellus nathusii
	26244	1	3	0	33.1			14.6	Hypsugo savii
	26595	1	1	0	35.5			11.1	Hypsugo savii or Pipistrellus nathusii
	26950	1	2	0	35.1			9.4	Hypsugo savii or Pipistrellus nathusii
1	9615	1	3	0	30.0			6.4	Eptesicus serotinus
2	2841	1	3	0	28.8			8.1	Eptesicus serotinus
	3193	1	1	0	26.4			13.4	Eptesicus serotinus
	6712	1	2	0	34.1			10.4	Hypsugo savii
	9527	1	1	0	27.3			7.5	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	9881	1	1	0	26.8			7.6	Eptesicus serotinus
	10231	1	2	0	26.4			11.4	Eptesicus serotinus
	10584	1	3	0	25.4			16.5	Eptesicus serotinus
	10936	1	3	0	25.4			11.5	Eptesicus serotinus
	11289	1	3	0	26.8			14.8	Eptesicus serotinus
	16920	1	2	0	39.4			8.9	Pipistrellus nathusii
	25718	1	2	0	36.5			8.4	Pipistrellus nathusii
	26070	1	2	0	35.5			10.8	Hypsugo savii or Pipistrellus nathusii
3	6625	1	1	0	34.1			11.5	Hypsugo savii
	21759	1	3	0	38.9			12.5	Pipistrellus nathusii
4	14986	1	1	0	51.5			6.1	Miniopterus schreibersi
5	17362	1	1	0	41.3			6.2	Pipistrellus nathusii
	17716	1	1	0	27.3			5.9	Eptesicus serotinus
	18068	1	1	0	27.3			4.1	Eptesicus serotinus
	18418	1	1	0	26.8			11.3	Eptesicus serotinus
	19123	1	1	0	27.3			6.7	Eptesicus serotinus
6	31	1	2	0	51.5			6.3	Miniopterus schreibersi
	11292	1	2	0	27.3			6.7	Eptesicus serotinus
	11997	1	3	0	27.8			10.1	Eptesicus serotinus
	12350	1	1	0	26.8			16.1	Eptesicus serotinus
	12702	1	2	0	51.0			8.7	Miniopterus schreibersi
	14810	1	1	0	50.5			8.6	Miniopterus schreibersi
	17627	1	1	0	39.9			9.7	Pipistrellus nathusii
	26726	1	1	0	38.4			3.6	Myotis sp.
7	13318	1	1	0	30.7			7.6	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	13668	1	2	0	25.4			12.0	Eptesicus serotinus
	14021	1	1	0	25.9			5.5	Eptesicus serotinus
	14374	1	1	0	27.8			6.0	Eptesicus serotinus
	14728	2	4	0	28.3			9.9	Eptesicus serotinus
					26.7			13.6	Eptesicus serotinus
	15077	1	1	0	25.9			8.4	Eptesicus serotinus
8	25196	1	3	0	35.1			5.1	undetermined
	25549	1	2	0	35.1			3.8	undetermined
9	20535	1	1	0	39.9			9.4	Pipistrellus nathusii
10	10240	1	2	0	39.9			12.8	Pipistrellus nathusii
12	10419	1	1	0	19.6			17.5	Nyctalus noctula
	29793	1	1	0	24.0			10.1	Eptesicus serotinus
13	1182	1	1	0	42.8			4.3	Pipistrellus nathusii
	1535	1	1	0	39.4			5.8	Pipistrellus nathusii
14	4966	1	1	0	26.8			11.5	Eptesicus serotinus
	5671	1	3	0	27.8			6.4	Eptesicus serotinus
	6023	1	2	0	28.8			12.5	Eptesicus serotinus
	6375	1	1	0	27.3			11.1	Eptesicus serotinus
	7077	1	1	0	27.3			10.6	Eptesicus serotinus
	7431	1	2	0	25.9			10.6	Eptesicus serotinus
	16228	1	2	0	38.0			6.7	Pipistrellus nathusii
	17636	1	1	0	27.3			9.9	Eptesicus serotinus
15	19311	1	1	0	35.1			11.1	Hypsugo savii
	27052	1	1	0	15.7			11.9	Nyctalus noctula or Tadarida teniotis
16	8312	1	1	0	34.6			12.8	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	9369	1	1	0	40.8			6.7	Pipistrellus nathusii
17	9281	1	2	0	40.4			10.3	Pipistrellus nathusii
	9634	1	1	0	39.4			10.5	Pipistrellus nathusii
	9986	1	2	0	39.9			11.3	Pipistrellus nathusii
	10338	1	1	0	39.4			11.2	Pipistrellus nathusii
	10691	1	2	0	39.9			12.8	Pipistrellus nathusii
	11042	1	1	0	39.4			10.1	Pipistrellus nathusii
18	25032	1	3	0	39.4			3.9	Pipistrellus nathusii
	26440	1	2	0	27.3			7.9	Eptesicus serotinus
	26793	1	2	0	26.4			11.4	Eptesicus serotinus
	27144	1	2	0	27.3			11.9	Eptesicus serotinus
	27495	1	2	0	27.3			12.9	Eptesicus serotinus
	27848	1	1	0	21.0			17.1	Nyctalus noctula
	29257	1	1	0	26.8			11.6	Eptesicus serotinus
19	0	2	4	0	27.3			11.3	Eptesicus serotinus
					28.8			10.2	Eptesicus serotinus
	309	1	2	0	27.3			15.0	Eptesicus serotinus
	661	2	2	0	34.1			14.7	Hypsugo savii
					26.8			12.1	Eptesicus serotinus
	1014	1	1	0	26.8			14.6	Eptesicus serotinus
	1366	1	1	0	25.4			15.9	Eptesicus serotinus
	2070	1	2	0	26.8			13.9	Eptesicus serotinus
	2420	1	2	0	25.4			12.4	Eptesicus serotinus
	9108	2	2	0	29.3			10.1	Eptesicus serotinus
					28.3			9.0	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	9460	2	3	0	26.8			8.6	Eptesicus serotinus
					28.3			10.3	Eptesicus serotinus
	9812	2	3	0	26.8			12.0	Eptesicus serotinus
					25.9			10.2	Eptesicus serotinus
	10515	1	2	0	28.3			9.4	Eptesicus serotinus
	10868	2	3	0	24.9			12.2	Eptesicus serotinus
					28.3			12.1	Eptesicus serotinus
	11221	1	1	0	26.4			5.6	Eptesicus serotinus
	11572	1	3	0	30.2			8.6	Eptesicus serotinus
20	223	1	1	0	43.3			3.5	Myotis sp.
	10781	1	1	0	39.4			7.9	Pipistrellus nathusii
	11134	1	1	0	39.4			7.8	Pipistrellus nathusii
	11486	1	1	0	39.9			9.4	Pipistrellus nathusii
	12188	2	2	0	38.9			9.4	Pipistrellus nathusii
					26.8			6.5	Eptesicus serotinus
	12540	1	2	0	27.3			10.2	Eptesicus serotinus
	12893	1	1	0	39.4			9.2	Pipistrellus nathusii
	13595	1	1	0	38.4			9.9	Pipistrellus nathusii
	14299	1	1	0	38.9			9.2	Pipistrellus nathusii
	14651	1	2	0	26.8			9.5	Eptesicus serotinus
	15003	1	1	0	27.3			10.1	Eptesicus serotinus
	15357	1	1	0	25.0			11.6	Eptesicus serotinus
	15709	2	2	0	38.4			7.8	Pipistrellus nathusii
					26.8			11.2	Eptesicus serotinus
	16058	1	1	0	27.3			5.6	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	16412	1	2	0	27.3			6.8	Eptesicus serotinus
	16763	1	1	0	27.3			8.9	Eptesicus serotinus
	17116	1	1	0	27.8			8.9	Eptesicus serotinus
	17467	1	1	0	27.8			8.4	Eptesicus serotinus
	17819	1	1	0	26.4			11.9	Eptesicus serotinus
	18171	1	2	0	27.3			7.5	Eptesicus serotinus
	18526	1	1	0	27.8			3.8	Eptesicus serotinus
	18875	1	2	0	28.3			8.6	Eptesicus serotinus
	19227	1	2	0	27.8			9.4	Eptesicus serotinus
	19580	1	2	0	28.3			11.6	Eptesicus serotinus
	19931	1	1	0	25.9			12.0	Eptesicus serotinus
	20283	1	1	0	25.9			12.3	Eptesicus serotinus
	20635	1	1	0	26.4			11.9	Eptesicus serotinus
	20987	1	2	0	27.3			8.7	Eptesicus serotinus
	21339	1	1	0	26.4			9.2	Eptesicus serotinus
	21691	1	1	0	26.8			11.8	Eptesicus serotinus
	22046	1	1	0	26.8			11.6	Eptesicus serotinus
	22395	1	2	0	29.7			5.2	Eptesicus serotinus
	24507	1	1	0	25.4			10.4	Eptesicus serotinus
	24858	1	1	0	25.4			11.5	Eptesicus serotinus
	25210	1	3	0	25.9			16.4	Eptesicus serotinus
	25563	1	1	0	26.4			12.7	Eptesicus serotinus
	25914	1	2	0	26.8			12.8	Eptesicus serotinus
	26268	1	1	0	25.9			16.6	Eptesicus serotinus
	26617	1	1	0	25.0			15.5	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	26971	1	1	0	24.4			13.7	Eptesicus serotinus
	27321	1	1	0	23.5			12.5	undetermined
	27674	1	1	0	25.4			11.6	Eptesicus serotinus

Transect 2: 17.08.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
1	7010	1	3	0	35.5			10.9	Hypsugo savii or Pipistrellus nathusii
	10177	1	2	0	35.1			11.1	Hypsugo savii or Pipistrellus nathusii
	10528	1	3	0	34.5			9.1	Hypsugo savii
	10880	1	1	0	34.6			11.5	Hypsugo savii
2	6567	1	1	0	34.5			10.7	Hypsugo savii
	6919	1	1	0	34.5			12.1	Hypsugo savii
	29795	1	1	0	35.5			11.2	Hypsugo savii or Pipistrellus nathusii
3	0	1	2	0	38.4			5.5	Pipistrellus nathusii
	143	1	1	0	33.6			9.2	Hypsugo savii
	847	1	2	0	38.4			6.7	Pipistrellus nathusii
	1197	1	1	0	40.4			6.3	Pipistrellus nathusii
	5772	1	1	0	50.0			7.9	Miniopterus schreibersi
	13517	1	1	0	51.9			5.6	Miniopterus schreibersi
	29706	1	1	0	51.9			4.2	Miniopterus schreibersi

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
4	51	1	2	0	50.0			7.9	Miniopterus schreibersi
	7443	1	1	0	26.8			6.9	Eptesicus serotinus
	8500	1	2	0	32.7			18.5	Hypsugo savii
	21521	1	2	0	27.3			7.5	Eptesicus serotinus
	21873	1	2	0	24.9			13.8	Eptesicus serotinus
	22225	1	1	0	26.4			10.8	Eptesicus serotinus
	22576	1	2	0	26.4			12.7	Eptesicus serotinus
	22930	1	2	0	27.8			5.7	Eptesicus serotinus
	23282	1	2	0	26.4			7.9	Eptesicus serotinus
	23633	1	2	0	26.4			10.5	Eptesicus serotinus
	23985	1	2	0	25.9			11.5	Eptesicus serotinus
	24337	1	1	0	24.4			12.5	Eptesicus serotinus
	25393	1	1	0	25.9			10.9	Eptesicus serotinus
	25744	1	1	0	27.8			8.9	Eptesicus serotinus
	26098	1	1	0	26.8			10.2	Eptesicus serotinus
5	11292	1	3	0	31.7			6.4	Myotis myotis/blythi
	12281	1	3	0	33.1			10.0	Myotis myotis/blythi
	12633	1	3	0	32.7			9.5	Myotis myotis/blythi
	12984	1	2	0	33.1			6.8	Myotis myotis/blythi
6	17119	1	1	0	35.5			12.5	Hypsugo savii or Pipistrellus nathusii
	17472	1	3	0	35.5			12.7	Hypsugo savii or Pipistrellus nathusii
	20637	1	2	0	31.7			5.2	Myotis myotis/blythi
	21344	1	2	0	35.1			13.2	Hypsugo savii or Pipistrellus nathusii
	29437	1	2	0	35.5			12.7	Hypsugo savii or Pipistrellus nathusii
7	4709	1	2	0	37.0			7.6	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	5061	2	5	0	35.1			9.2	Hypsugo savii or Pipistrellus nathusii
					35.5			7.6	Hypsugo savii or Pipistrellus nathusii
	28292	1	4	0	39.9			4.1	Pipistrellus nathusii
8	15178	1	1	0	39.9			5.5	Pipistrellus nathusii
9	11216	1	2	0	37.5			10.8	Pipistrellus nathusii
	11571	1	2	0	38.0			11.1	Pipistrellus nathusii
	11923	1	2	0	38.4			10.9	Pipistrellus nathusii
	12272	1	2	0	38.9			9.5	Pipistrellus nathusii
	12978	1	3	0	34.6			5.1	Myotis myotis/blythi
	24945	1	3	0	39.9			11.9	Pipistrellus nathusii
10	11831	1	1	0	32.7			4.9	Myotis myotis/blythi
	12186	1	1	0	31.2			5.3	Myotis myotis/blythi
11	17021	1	1	0	37.5			9.9	Pipistrellus nathusii
	29340	1	2	0	33.6			6.2	Myotis myotis/blythi
12		no bats							
13		no bats							
14	9010	1	2	0	26.4			15.0	Eptesicus serotinus
	9361	1	2	0	26.8			8.5	Eptesicus serotinus
	10064	1	2	0	26.4			12.5	Eptesicus serotinus
	25551	1	1	0	41.3			5.5	Pipistrellus nathusii
	25904	1	2	0	39.9			6.3	Pipistrellus nathusii
	26255	1	3	0	41.3			4.3	Pipistrellus nathusii

Transect 3: 18.08.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	5340	1	5	0	43.3			7.1	Pipistrellus nathusii or Pipistrellus pipistrellus
5	24627	1	2	0	27.3			15.0	Eptesicus serotinus
	24978	1	3	0	27.8			11.4	Eptesicus serotinus
	25331	1	2	0	26.8			13.6	Eptesicus serotinus
6	16446	1	2	0	27.3			7.6	Eptesicus serotinus
8	12053	1	1	0	42.3			6.3	Pipistrellus nathusii
	16627	1	2	0	39.9			9.7	Pipistrellus nathusii
	16981	1	2	0	39.4			7.4	Pipistrellus nathusii
	21556	1	2	0	30.2			7.5	Eptesicus serotinus
	26835	1	2	0	36.0			4.9	Myotis sp.
9	8096	1	3	0	51.9			9.6	Miniopterus schreibersi
	15839	1	2	0	36.0			6.4	Myotis sp.
	16191	1	3	0	37.5			4.6	Myotis sp.
11	29396	1	1	0	26.8			13.1	Eptesicus serotinus
	29747	1	1	0	25.4			13.2	Eptesicus serotinus
14	17526	1	2	0	26.4			11.5	Eptesicus serotinus
	17879	1	2	0	25.9			12.4	Eptesicus serotinus
	18933	1	1	0	16.2			13.2	Nyctalus noctula or Tadarida teniotis
15	21665	1	3	0	42.3			6.0	Pipistrellus nathusii
16	1517	1	2	0	26.8			12.5	Eptesicus serotinus
	1871	1	3	0	24.4			13.1	Eptesicus serotinus
	9612	1	3	0	28.8			8.3	Eptesicus serotinus
	9965	3	7	0	43.3			4.9	Pipistrellus nathusii or Pipistrellus pipistrellus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
					25.4			13.2	Eptesicus serotinus
					28.8			10.1	Eptesicus serotinus
17	9176	1	1	0	39.4			8.2	Pipistrellus nathusii
	9526	1	1	0	39.4			8.1	Pipistrellus nathusii
	9880	1	2	0	39.4			8.2	Pipistrellus nathusii
18	3459	1	2	0	29.7			7.5	Eptesicus serotinus
	9793	1	2	0	28.8			7.0	Eptesicus serotinus

Transect 4: 19.08.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	10699	1	4	0	34.6			14.0	Hypsugo savii
	11052	1	2	0	35.1			13.1	Hypsugo savii
1	3577	1	3	0	36.0			11.8	Hypsugo savii or Pipistrellus nathusii
	3928	1	4	0	37.0			5.9	Pipistrellus nathusii
	6040	1	2	0	34.6			12.3	Hypsugo savii
	6393	1	2	0	34.1			11.8	Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	10614	1	4	0	40.8			5.2	Pipistrellus nathusii
	10969	1	1	0	39.9			7.9	Pipistrellus nathusii
	12728	1	2	0	35.1			11.8	Hypsugo savii
	20823	1	2	0	34.6			11.6	Hypsugo savii
2	18275	1	1	0	37.0			10.3	Pipistrellus nathusii
	18627	1	2	0	37.5			14.4	Pipistrellus nathusii
	18978	1	3	0	36.0			10.0	Pipistrellus nathusii
3	4816	1	2	0	54.4			7.0	Pipistrellus pygmaeus or Miniopteruis schreibersi
4	1213	1	26	0					undetermined
	8957	1	1	0	31.7			3.9	Myotis myotis/blythi
	9308	1	2	0	36.5			10.0	Hypsugo savii or Pipistrellus nathusii
	9660	1	1	0	34.6			11.5	Hypsugo savii
	11419	1	5	0	50.5			4.6	Myotis sp.
	22682	1	5	0	46.6			4.0	Myotis sp.
	24442	1	4	0	49.5			4.1	Myotis sp.
	27609	1	7	0	48.6			3.6	Myotis sp.
	29016	1	9	0	53.9			2.8	Myotis sp.
	29369	1	5	0	47.1			3.3	Myotis sp.
5	1833	1	8	0	51.0			4.3	Myotis sp.
6	20051	1	3	0	27.8			6.2	Eptesicus serotinus
8	14251	1	3	0	51.0			6.6	Miniopterus schreibersi
	19177	1	1	0	35.5			10.4	Hypsugo savii or Pipistrellus nathusii
	19530	1	1	0	35.5			11.2	Hypsugo savii or Pipistrellus nathusii
	19881	1	1	0	35.1			8.9	Hypsugo savii or Pipistrellus nathusii

APPENDIX 7. CAR TRANSECT SURVEY RESULTS SEPTEMBER 2010

Transect 1: 13.09.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	23074	1	3	0	41.2			4.0	Pipistrellus nathusii
	23426	1	1	0	42.6			4.1	Pipistrellus nathusii
	24833	1	2	0	26.7			7.2	Eptesicus serotinus
	25538	2	6	0	27.6			8.7	Eptesicus serotinus
					27.6			4.7	Eptesicus serotinus
	25890	1	3	0	28.6			9.1	Eptesicus serotinus
	26243	2	4	0	26.2			10.9	Eptesicus serotinus
					38.8			4.8	Pipistrellus nathusii
1	6802	1	2	0	40.7			5.7	Pipistrellus nathusii
	7153	1	3	0	39.7			8.5	Pipistrellus nathusii
	11730	2	6	0	39.3			2.7	Pipistrellus nathusii
					41.2			3.3	Pipistrellus nathusii
	12079	2	6	0	39.3			4.4	Pipistrellus nathusii
					27.1			9.2	Eptesicus serotinus
	13136	1	2	0	26.7			8.8	Eptesicus serotinus
	25808	1	1	0	38.3			5.8	Pipistrellus nathusii
	29327	1	2	0	27.1			10.2	Eptesicus serotinus
	29676	2	8	0	42.2			7.9	Pipistrellus nathusii
					40.2			6.6	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
2	29	1	3	0	39.7			9.2	Pipistrellus nathusii
	6011	1	3	0	38.3			8.7	Pipistrellus nathusii
	21148	1	3	0	39.7			8.3	Pipistrellus nathusii
	21498	1	1	0	38.3			11.3	Pipistrellus nathusii
	23259	1	2	0	44.1			3.4	Pipistrellus pipistrellus
	23611	2	6	0	44.6			4.0	Pipistrellus pipistrellus
					46.0			3.3	Pipistrellus pipistrellus
	23962	2	6	0	44.1			4.9	Pipistrellus pipistrellus
					42.6			5.7	Pipistrellus nathusii
	25018	1	3	0	39.3			6.7	Pipistrellus nathusii
	25370	1	3	0	38.8			6.3	Pipistrellus nathusii
3	14337	1	1	0	38.9			7.7	Pipistrellus nathusii
	15079	1	3	0	41.3			10.5	Pipistrellus nathusii
	18952	1	2	0	42.3			8.2	Pipistrellus nathusii
	19303	2	4	0	40.8			8.1	Pipistrellus nathusii
					38.4			8.5	Pipistrellus nathusii
	25285	1	3	0	41.3			5.5	Pipistrellus nathusii
4	10421	1	3	0	42.8			4.6	Pipistrellus nathusii
5	4353	1	1	0	39.9			7.8	Pipistrellus nathusii
	12446	1	3	0	41.8			5.6	Pipistrellus nathusii
	12801	1	2	0	39.4			5.3	Pipistrellus nathusii
	19135	1	2	0	41.3			7.6	Pipistrellus nathusii
6	8491	1	2	0	41.8			4.7	Pipistrellus nathusii
	28905	1	2	0	40.4			4.9	Pipistrellus nathusii
	29257	1	2	0	39.4			6.8	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
7	1369	1	2	0	39.4			8.8	Pipistrellus nathusii
	1718	1	1	0	39.4			6.5	Pipistrellus nathusii
	3831	1	1	0	39.4			9.0	Pipistrellus nathusii
	5240	1	2	0	39.4			9.7	Pipistrellus nathusii
	6647	1	2	0	38.0			6.2	Pipistrellus nathusii
	7000	1	2	0	39.9			7.2	Pipistrellus nathusii
8	7621	1	1	0	38.0			7.5	Pipistrellus nathusii
	25568	1	2	0	25.4			11.7	Eptesicus serotinus
	25922	1	3	0	42.3			6.2	Pipistrellus nathusii
	26274	1	1	0	38.4			6.8	Pipistrellus nathusii
9	3313	1	2	0	39.9			5.2	Pipistrellus nathusii
	3664	1	1	0	39.4			5.8	Pipistrellus nathusii
	15631	1	2	0	38.9			7.5	Pipistrellus nathusii
	15982	1	2	0	39.4			10.8	Pipistrellus nathusii
	16334	1	2	0	38.4			7.1	Pipistrellus nathusii
10	28568	3	10	0	38.9			8.7	Pipistrellus nathusii
					27.8			6.0	Eptesicus serotinus
					39.4			5.3	Pipistrellus nathusii
	28922	1	1	0	26.4			10.4	Eptesicus serotinus
12	13969	1	3	0	40.8			3.8	Pipistrellus nathusii
13	3679	1	1	0	25.4			9.1	Eptesicus serotinus
	13182	2	5	0	38.4			8.2	Pipistrellus nathusii
					40.4			6.6	Pipistrellus nathusii
	13532	2	8	0	39.9			6.4	Pipistrellus nathusii
					39.4			5.3	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	13886	2	4	0	39.9			8.5	Pipistrellus nathusii
					37.5			5.5	Pipistrellus nathusii
	23387	2	3	0	26.8			13.3	Eptesicus serotinus
					39.9			6.0	Pipistrellus nathusii
14	7466	1	1	0	38.9			10.4	Pipistrellus nathusii
	24007	1	1	0	40.8			7.1	Pipistrellus nathusii
15	24981	1	2	0	29.3			6.9	Eptesicus serotinus
	25330	1	2	0	27.3			8.5	Eptesicus serotinus
	25682	1	3	0	27.8			5.9	Eptesicus serotinus
	26035	1	1	0	28.8			4.6	Eptesicus serotinus
16	29119	1	2	0	27.3			6.8	Eptesicus serotinus
	29471	1	2	0	26.4			8.3	Eptesicus serotinus
17	8971	1	3	0	43.3			3.0	Pipistrellus pipistrellus or Pipistrellus nathusii
	9325	1	2	0	39.47			7.6	Pipistrellus nathusii
	19531	1	1	0	37.5			7.5	Pipistrellus nathusii
	27626	1	0	4					
19	7749	1	1	0	25.9			4.9	Eptesicus serotinus
	8100	1	2	0	25.9			5.1	Eptesicus serotinus
	8454	1	3	0	29.7			4.6	Eptesicus serotinus
	8804	1	2	0	24.9			10.2	Eptesicus serotinus

Transect 2: 14.09.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
2	5571	1	1	0	24.7			14.1	Eptesicus serotinus
	5924	1	3	0	27.6			10.8	Eptesicus serotinus
	6276	1	2	0	26.2			12.3	Eptesicus serotinus
	6627	1	2	0	26.2			11.5	Eptesicus serotinus
	6980	1	2	0	24.7			9.6	Eptesicus serotinus
3	0	1	1	0	24.0			10.6	Eptesicus serotinus
5	9193	1	1	0	48.1			11.0	Pipistrellus pipistrellus
	24677	1	2	0	39.4			8.2	Pipistrellus nathusii
	27139	1	1	0	39.4			7.8	Pipistrellus nathusii
6	20017	1	1	0	36.5			12.6	Pipistrellus nathusii
	29520	1	1	0	43.3			5.1	Pipistrellus pipistrellus or Pipistrellus nathusii
	29872	1	1	0	43.3			2.8	Pipistrellus pipistrellus or Pipistrellus nathusii
7	222	2	6	0	26.8			8.9	Eptesicus serotinus
					40.8			5.9	Pipistrellus nathusii
	575	2	6	0	30.2			5.3	Eptesicus serotinus
					40.8			4.6	Pipistrellus nathusii
	929	1	1	0	27.8			7.3	Eptesicus serotinus
	9022	1	3	0	38.0			6.4	Pipistrellus nathusii
	26271	1	1	0	39.4			9.9	Pipistrellus nathusii
9	12022	1	2	0	32.1			3.8	Myotis myotis/blythi
11	28748	1	2	0	39.9			8.9	Pipistrellus nathusii
12	6488	1	1	0	21.2			15.8	Nyctalus noctula
13	23652	1	1	0	38.4			10.2	Pipistrellus nathusii

Transect 3: 15.09.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	1643	1	3	0	42.6			4.2	Pipistrellus nathusii
	1995	1	4	0	42.6			6.5	Pipistrellus nathusii
	3755	1	1	0	43.6			3.5	Pipistrellus nathusii or Pipistrellus pipistrellus
1	5075	1	2	0	21.8			14.5	Nyctalus noctula
	5426	1	1	0	17.4			20.6	Nyctalus noctula
	5778	1	3	0	23.3			10.8	Nyctalus noctula or Nyctalus leisleri
	6132	1	1	0	19.4			15.0	Nyctalus noctula
	6483	1	1	0	19.4			12.9	Nyctalus noctula
	10354	1	3	0	43.1			4.6	Pipistrellus pipistrellus or Pipistrellus nathusii
	10706	2	6	0	42.2			5.8	Pipistrellus nathusii
					44.1			3.7	Pipistrellus pipistrellus
	11060	1	4	0	40.2			5.8	Pipistrellus nathusii
	11762	1	2	0	43.6			3.3	Pipistrellus pipistrellus or Pipistrellus nathusii
	13170	1	3	0	44.1			3.1	Pipistrellus pipistrellus
	13521	1	4	0	41.2			5.1	Pipistrellus nathusii
	13875	1	3	0	39.3			8.4	Pipistrellus nathusii
	14226	1	3	0	40.2			6.3	Pipistrellus nathusii
	17745	1	4	0	41.7			3.7	Pipistrellus nathusii
	18449	1	3	0	41.7			4.1	Pipistrellus nathusii
	18801	1	3	0	40.7			7.3	Pipistrellus nathusii
	19453	1	4	0	40.7			6.4	Pipistrellus nathusii
	20209	2	7	0	40.2			6.4	Pipistrellus nathusii
					40.7			3.0	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	20560	1	3	0	42.2			6.2	Pipistrellus nathusii
	20914	1	4	0	40.2			6.3	Pipistrellus nathusii
	21268	1	2	0	41.2			5.6	Pipistrellus nathusii
2	766	1	3	0	39.7			7.4	Pipistrellus nathusii
	7101	1	5	0	43.6			5.0	Pipistrellus pipistrellus or Pipistrellus nathusii
	7452	1	4	0	41.2			4.9	Pipistrellus nathusii
	8861	1	3	0	42.2			6.5	Pipistrellus nathusii
	9211	1	4	0	41.2			7.1	Pipistrellus nathusii
	9564	1	3	0	41.2			7.1	Pipistrellus nathusii
	9915	1	3	0	39.7			6.7	Pipistrellus nathusii
	17307	1	1	0	20.8			16.3	Nyctalus noctula
	18715	1	1	0	18.9			17.1	Nyctalus noctula
	19068	1	2	0	18.4			16.0	Nyctalus noctula
4	13966	1	1	0	18.6			15.6	Nyctalus noctula
5	13176	1	2	0	39.4			9.2	Pipistrellus nathusii
6	6050	1	2	0	40.4			9.7	Pipistrellus nathusii
	20833	1	2	0	38.0			9.9	Pipistrellus nathusii
7	9836	1	2	0	33.6			10.8	Hypsugo savii
	10186	1	2	0	38.9			4.5	Pipistrellus nathusii
	10539	1	1	0	37.5			7.9	Pipistrellus nathusii
	13354	1	1	0	26.4			6.9	Eptesicus serotinus
	22154	1	2	0	39.4			7.6	Pipistrellus nathusii
8	5172	1	2	0	37.0			9.2	Pipistrellus nathusii
	7284	1	2	0	38.0			9.7	Pipistrellus nathusii
	11510	1	3	0	39.4			8.2	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	11859	2	5	0	38.9			12.4	Pipistrellus nathusii
					33.6			11.2	Hypsugo savii
	12212	2	5	0	38.9			8.8	Pipistrellus nathusii
					33.1			11.1	Hypsugo savii
	19956	1	3	0	27.8			9.8	Eptesicus serotinus
	20305	1	2	0	25.9			14.7	Eptesicus serotinus
	20657	2	5	0	41.3			6.7	Pipistrellus nathusii
					26.4			10.4	Eptesicus serotinus
	21011	2	3	0	40.8			7.8	Pipistrellus nathusii
					39.9			5.4	Pipistrellus nathusii
	21714	1	3	0	40.4			6.8	Pipistrellus nathusii
	22419	1	1	0	40.4			5.9	Pipistrellus nathusii
	22770	1	2	0	40.8			3.3	Pipistrellus nathusii
	23123	1	3	0	39.9			8.0	Pipistrellus nathusii
	23476	1	2	0	38.9			8.2	Pipistrellus nathusii
	24178	1	2	0	39.9			5.3	Pipistrellus nathusii
	24882	1	3	0	40.4			8.4	Pipistrellus nathusii
	25234	2	4	0	39.9			8.6	Pipistrellus nathusii
					39.9			4.1	Pipistrellus nathusii
	25585	1	2	0	40.4			7.7	Pipistrellus nathusii
	25938	2	4	0	45.2			3.4	Pipistrellus pipistrellus
					41.8			5.1	Pipistrellus nathusii
	26290	1	2	0	41.3			6.1	Pipistrellus nathusii
	26643	1	2	0	42.3			5.7	Pipistrellus nathusii
	27345	1	2	0	39.9			5.8	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
9	1919	1	3	0	44.2			3.8	Pipistrellus pipistrellus
	2271	1	2	0	39.9			3.9	Pipistrellus nathusii
	2623	1	2	0	39.4			4.5	Pipistrellus nathusii
	4029	1	4	0	43.8			3.9	Pipistrellus pipistrellus or Pipistrellus nathusii
	6493	1	3	0	44.2			4.6	Pipistrellus pipistrellus
	6846	1	2	0	41.3			7.4	Pipistrellus nathusii
	15998	1	2	0	40.8			3.6	Pipistrellus nathusii
	16348	1	1	0	40.4			5.3	Pipistrellus nathusii
10	12743	1	2	0	39.9			8.0	Pipistrellus nathusii
	13094	1	1	0	39.4			9.9	Pipistrellus nathusii
	26820	1	2	0	54.9			5.4	Pipistrellus pygmaeus
11	12654	1	1	0	39.4			4.4	Pipistrellus nathusii
12	6234	1	2	0	38.9			10.8	Pipistrellus nathusii
	13272	1	2	0	52.5			6.4	Miniopterus schreibersi
	18904	1	6	0					undtermined
13	6851	1	1	0	40.4			4.4	Pipistrellus nathusii
	20929	1	4	0	39.9			7.7	Pipistrellus nathusii
14	11339	1	2	0	38.9			10.4	Pipistrellus nathusii
	15914	1	1	0	22.0			18.9	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	16266	1	12	0					undtermined
	16620	1	1	0	21.5			14.7	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
15	22868	1	2	0	36.0			8.1	Pipistrellus nathusii or Hypsugo savii
	23218	1	2	0	35.1			11.5	Pipistrellus nathusii or Hypsugo savii
	23572	1	2	0	38.0			9.4	Pipistrellus nathusii
	23922	1	2	0	37.5			12.5	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	24627	1	1	0	38.0			11.3	Pipistrellus nathusii
16	25245	1	1	0	24.9			8.5	Eptesicus serotinus
17	9320	1	3	0	42.8			3.1	Pipistrellus nathusii
	17767	1	1	0	39.9			7.8	Pipistrellus nathusii
	23397	1	2	0	38.0			7.4	Pipistrellus nathusii
18	2194	1	2	0	39.4			5.4	Pipistrellus nathusii
	12754	1	3	0	34.1			5.0	Myotis sp.
	16976	1	1	0	26.4			5.9	Eptesicus serotinus
	18032	1	2	0	25.9			11.3	Eptesicus serotinus
	18363	1	1	0	26.4			10.3	Eptesicus serotinus
	18735	1	2	0	26.8			11.2	Eptesicus serotinus
	19087	1	1	0	28.3			11.1	Eptesicus serotinus
	19439	1	1	0	27.3			8.8	Eptesicus serotinus
	20145	1	1	0	28.8			8.8	Eptesicus serotinus
	20494	1	3	0	27.3			11.0	Eptesicus serotinus
	21199	1	1	0	26.4			13.6	Eptesicus serotinus
	21903	1	2	0	28.3			10.2	Eptesicus serotinus
	22255	1	1	0	27.8			6.7	Eptesicus serotinus
	28236	1	2	0	39.4			5.4	Pipistrellus nathusii
19	348	1	1	0	38.4			4.9	Pipistrellus nathusii
	4572	1	2	0	38.4			6.9	Pipistrellus nathusii
	5625	1	2	0	41.3			6.8	Pipistrellus nathusii
	5980	1	1	0	39.9			8.0	Pipistrellus nathusii
	6329	1	1	0	39.4			8.6	Pipistrellus nathusii

Transect 4: 16.09.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	9195	1	2	0	39.3			6.9	Pipistrellus nathusii
	18346	1	2	0	40.7			7.1	Pipistrellus nathusii
	24682	1	5	0	53.3			6.5	Miniopterus schreibersi
	27497	1	3	0	49.9			10.4	Miniopterus schreibersi
1	12278	1	3	0	50.4			10.2	Miniopterus schreibersi
	20374	1	3	0	44.1			2.4	Pipistrellus pipistrellus
	20726	1	4	0	42.2			3.9	Pipistrellus nathusii
	26709	1	6	0	43.1			4.8	Pipistrellus pipistrellus or Pipistrellus nathusii
	29172	1	7	0	42.6			3.6	Pipistrellus nathusii
	29524	1	3	0	41.7			3.8	Pipistrellus nathusii
2	2337	1	5	0	42.6			4.5	Pipistrellus nathusii
	4450	1	6	0	42.2			5.0	Pipistrellus nathusii
	5155	1	6	0	45.6			3.9	Pipistrellus pipistrellus
	7267	1	4	0	42.2			3.8	Pipistrellus nathusii
	7617	1	3	0	40.7			4.6	Pipistrellus nathusii
	9026	1	3	0	42.2			3.8	Pipistrellus nathusii
	9376	1	4	0	41.2			3.9	Pipistrellus nathusii
	9729	1	2	0	41.2			7.7	Pipistrellus nathusii
	10080	1	4	0	39.3			12.1	Pipistrellus nathusii
	10433	1	3	0	41.7			4.7	Pipistrellus nathusii
	14656	1	3	0	42.6			4.5	Pipistrellus nathusii
	15360	1	5	0	43.1			4.4	Pipistrellus nathusii
	15712	1	4	0	42.6			5.0	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	29085	1	2	0	32.0			5.0	Myotis myotis/b;ythi
3		no bats							
4	4631	1	3	0	32.7			7.2	Myotis myotis/b;ythi
5	10177	1	2	0	40.8			7.5	Pipistrellus nathusii
	10530	1	3	0	40.4			7.6	Pipistrellus nathusii
6	27689	1	4	0	40.8			4.1	Pipistrellus nathusii
7		no bats							
8	7459	1	1	0	20.6			19.8	Nyctalus noctula
9	13006	1	1	0	36.5			9.9	Pipistrellus nathusii
	13354	1	1	0	38.0			6.7	Pipistrellus nathusii
	27433	1	1	0	51.5			8.4	Miniopterus schreibersi
10	17144	1	3	0	23.0			8.4	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	17493	1	1	0	23.0			14.7	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	17845	1	2	0	23.0			20.0	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
11	26559	1	2	0	35.1			11.4	Pipistrellus nathusii or Hypsugo savii
	26910	1	1	0	34.1			14.6	Hypsugo savii
	27623	1	1	0	34.1			10.4	Hypsugo savii
	27614	1	2	0	34.5			9.6	Hypsugo savii
	28320	1	1	0	34.6			7.9	Hypsugo savii
	28671	1	1	0	34.5			9.2	Hypsugo savii
12	7119	1	1	0	35.5			9.3	Pipistrellus nathusii or Hypsugo savii
	7466	1	2	0	35.1			11.1	Pipistrellus nathusii or Hypsugo savii
	8172	1	1	0	38.4			7.8	Pipistrellus nathusii
	8524	1	1	0	35.5			9.6	Pipistrellus nathusii or Hypsugo savii
	10636	1	2	0	35.1			9.0	Pipistrellus nathusii or Hypsugo savii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	10989	1	1	0	35.5			9.6	Pipistrellus nathusii or Hypsugo savii
	12041	1	1	0	39.9			6.9	Pipistrellus nathusii
	12395	2	4	0	40.8			6.0	Pipistrellus nathusii
					39.9			6.2	Pipistrellus nathusii
	13803	1	1	0	24.9			5.7	Eptesicus serotinus
	14154	1	2	2	27.3			6.7	Eptesicus serotinus
	15211	1	2	0	26.4			6.8	Eptesicus serotinus
	15564	1	1	0	26.4			11.3	Eptesicus serotinus
	15913	1	1	0	24.4			7.7	Eptesicus serotinus
	16619	1	2	0	36.0			12.4	Pipistrellus nathusii
	16971	1	3	0	36.0			12.2	Pipistrellus nathusii
	20492	2	4	0	23.5			16.6	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
					38.9			8.6	Pipistrellus nathusii
	21195	1	1	0	24.4			16.6	Eptesicus serotinus
	21548	2	2	0	24.0			15.6	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
					35.1			8.6	Pipistrellus nathusii or Hypsugo savii
	21898	2	3	0	34.6			10.2	Pipistrellus nathusii or Hypsugo savii
					23.5			14.8	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	22251	1	1	0	24.0			12.4	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
13	4568	1	1	0	40.4			7.3	Pipistrellus nathusii
	7032	2	3	0	42.3			4.7	Pipistrellus nathusii or Hypsugo savii
					24.9			8.4	Eptesicus serotinus
	7385	2	4	0	25.9			8.9	Eptesicus serotinus
					41.3			7.3	Pipistrellus nathusii
	7737	1	1	0	25.4			13.8	Eptesicus serotinus

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	8086	1	1	0	27.3			9.0	Eptesicus serotinus
	8440	1	1	0	25.4			10.5	Eptesicus serotinus
	10200	2	3	0	26.4			8.0	Eptesicus serotinus
					42.8			2.7	Pipistrellus nathusii
	26741	1	1	0	26.8			8.7	Eptesicus serotinus
	28852	1	1	0	27.3			16.4	Eptesicus serotinus
	29203	1	1	0	25.4			14.3	Eptesicus serotinus
	29557	1	1	0	23.0			11.7	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
14	257	1	1	0	20.1			20.1	Nyctalus noctula
	17152	1	1	0	21.0			15.8	Nyctalus noctula
	19616	1	2	0	31.7			8.6	Hypsugo savii
	19968	2	4	0	38.4			9.4	Pipistrellus nathusii
					25.4			11.7	Eptesicus serotinus
	20321	2	5	0	38.4			9.0	Pipistrellus nathusii
					24.0			12.9	Eptesicus serotinus
	20673	1	2	0	24.0			15.4	Eptesicus serotinus
	27710	1	1	0	39.4			8.5	Pipistrellus nathusii
15	2636	1	1	0	25.4			13.9	Eptesicus serotinus
	2989	1	1	0	24.4			15.2	Eptesicus serotinus
	9325	1	1	0	23.5			12.7	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
16	12405	1	2	0	42.3			3.4	Pipistrellus nathusii
	12757	1	2	0	38.0			8.2	Pipistrellus nathusii
	130109	1	3	0	41.3			3.3	Pipistrellus nathusii
	13461	1	2	0	38.4			4.9	Pipistrellus nathusii
	18387	1	2	0	38.4			7.1	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	18742	2	5	0	44.2			6.2	Pipistrellus pipistrellus
					38.9			8.2	Pipistrellus nathusii
	19093	1	3	0	40.4			4.5	Pipistrellus nathusii
17	14080	1	2	0	50.5			9.6	Miniopterus schreibersi
	17249	1	1	0	23.5			8.7	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	17600	1	1	0	20.1			17.1	Nyctalus noctula
	25343	1	1	0	20.1			13.9	Nyctalus noctula
18	10825	1	1	0	43.3			3.4	Pipistrellus nathusii or Pipistrellus pipistrellus
	11178	1	3	0	41.8			3.6	Pipistrellus nathusii

APPENDIX 8. CAR TRANSECT SURVEY RESULTS OCTOBER 2010

Transect 1: 13.10.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	1723	1	4	0	39.4			6.5	Pipistrellus nathusii
	7707	1	4	0	41.3			4.1	Pipistrellus nathusii
	8060	1	4	0	37.0			3.3	Pipistrellus nathusii
	8412	1	2	0	42.8			3.0	Pipistrellus nathusii
	9466	1	4	0	44.2			4.5	Pipistrellus pipistrellus
	16154	1	4	0	43.3			3.2	Pipistrellus pipistrellus or Pipistrellus nathusii
	20379	1	3	0	41.3			4.1	Pipistrellus nathusii
	21783	1	4	0	39.9			6.1	Pipistrellus nathusii
	22136	1	2	0	40.4			4.7	Pipistrellus nathusii
	22488	1	4	0	40.8			3.7	Pipistrellus nathusii
	24247	1	3	0	40.8			3.8	Pipistrellus nathusii
	24952	1	4	0	41.8			3.3	Pipistrellus nathusii
	25656	1	3	0	40.8			6.6	Pipistrellus nathusii
	26010	1	2	0	40.8			5.7	Pipistrellus nathusii
	26360	1	3	0	39.9			6.5	Pipistrellus nathusii
	26713	1	2	0	40.4			4.7	Pipistrellus nathusii
1	6566	1	2	0	39.4			7.4	Pipistrellus nathusii
	10437	1	3	0	38.9			5.7	Pipistrellus nathusii
	17476	1	2	0	40.4			3.1	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	17829	1	2	0	43.3			4.4	Pipistrellus pipistrellus or Pipistrellus nathusii
4	2790	1	2	0	41.8			3.1	Pipistrellus nathusii
	3141	1	2	0	39.9			5.5	Pipistrellus nathusii
	3495	1	3	0	39.4			5.6	Pipistrellus nathusii
	4199	1	2	0	42.8			2.7	Pipistrellus nathusii
	4549	1	2	0	39.9			7.4	Pipistrellus nathusii
	4901	1	1	0	39.4			5.7	Pipistrellus nathusii
	7716	1	1	0	42.3			3.9	Pipistrellus nathusii
	8775	1	2	0	39.9			4.5	Pipistrellus nathusii
	9125	1	3	0	39.9			6.0	Pipistrellus nathusii
	9478	1	2	0	40.4			5.9	Pipistrellus nathusii
	9830	1	3	0	41.3			8.2	Pipistrellus nathusii
7	3591	1	2	0	39.9			7.1	Pipistrellus nathusii
	10279	1	3	0	42.3			4.9	Pipistrellus nathusii
8	3504	1	3	0	50.0			8.1	Miniopteris schreibersi
	25677	1	2	0	40.4			4.5	Pipistrellus nathusii
	27790	1	2	0	41.3			4.7	Pipistrellus nathusii
9	16794	1	2	0	29.3			8.7	Eptesicus serotinus
10	17059	1	2	0	38.0			5.8	Pipistrellus nathusii
11	13454	1	4	0	43.3			5.9	Pipistrellus pipistrellus or Pipistrellus nathusii
	13811	1	1	0	42.3			4.5	Pipistrellus nathusii
16	28868	1	1	0	20.6			16.7	Nyctalus noctula
17	0	1	1	0	18.2			25.9	Nyctalus noctula
	18575	1	1	0	38.4			5.2	Pipistrellus nathusii

Transect 2: 16.10.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	10757	1	1	0	51.0			10.9	Miniopterus schribersi
	14630	1	3	0	39.4			7.1	Pipistrellus nathusii
	14982	1	2	0	39.4			7.1	Pipistrellus nathusii
	15334	1	2	0	39.4			6.4	Pipistrellus nathusii
	17094	1	1	0	34.6			12.1	Hypsugo savii
	17447	1	1	0	34.6			14.1	Hypsugo savii
	17797	1	1	0	34.1			13.5	Hypsugo savii
	18502	1	3	0	39.9			4.6	Pipistrellus nathusii
	18855	1	2	0	51.0			8.4	Miniopterus schribersi
	19558	2	6	0	41.8			7.2	Pipistrellus nathusii
					41.3			4.4	Pipistrellus nathusii
	19909	1	2	0	39.4			6.4	Pipistrellus nathusii
	20262	2	5	0	39.9			4.9	Pipistrellus nathusii
					40.4			4.8	Pipistrellus nathusii
	22021	1	3	0	41.8			5.1	Pipistrellus nathusii
	22375	1	3	0	39.9			7.1	Pipistrellus nathusii
	26243	1	3	0	41.3			4.8	Pipistrellus nathusii
	26596	1	3	0	47.1			5.8	Pipistrellus pipistrellus
	28709	1	3	0	41.3			5.4	Pipistrellus nathusii
	29060	1	1	0	40.4			5.3	Pipistrellus nathusii
1	2927	1	2	0	39.9			8.1	Pipistrellus nathusii
	3277	1	3	0	38.9			9.1	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	3631	1	2	0	39.4			9.9	Pipistrellus nathusii
	6093	1	3	0	39.4			6.4	Pipistrellus nathusii
	6446	1	2	0	40.4			7.7	Pipistrellus nathusii
	6797	1	2	0	38.4			9.9	Pipistrellus nathusii
	7151	1	2	0	41.3			6.0	Pipistrellus nathusii
	7502	1	1	0	38.9			9.0	Pipistrellus nathusii
	8206	1	3	0	42.8			4.6	Pipistrellus nathusii
	8558	1	2	0	42.3			5.7	Pipistrellus nathusii
	8910	1	2	0	42.8			6.6	Pipistrellus nathusii
	9261	1	1	0	39.4			6.8	Pipistrellus nathusii
	9964	1	3	0	41.8			6.5	Pipistrellus nathusii
5	15944	1	1	0	38.9			9.2	Pipistrellus nathusii
	16297	1	1	0	38.9			8.9	Pipistrellus nathusii
6	29229	1	1	0	41.3			7.6	Pipistrellus nathusii
9	19812	1	1	0	38.4			9.3	Pipistrellus nathusii
	23331	1	1	0	39.4			9.7	Pipistrellus nathusii
	23685	1	1	0	37.5			7.0	Pipistrellus nathusii
12	6170	1	1	0	40.8			10.9	Pipistrellus nathusii
	6875	1	1	0	40.8			8.0	Pipistrellus nathusii
	20954	1	1	0	38.4			9.1	Pipistrellus nathusii
	24121	1	1	0	40.8			10.1	Pipistrellus nathusii
	24474	1	2	0	40.4			10.7	Pipistrellus nathusii
13	5376	1	3	0	39.9			10.4	Pipistrellus nathusii
	5731	1	4	0	39.9			8.8	Pipistrellus nathusii
	6081	1	2	0	39.9			7.0	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	12066	1	1	0	39.9			7.8	Pipistrellus nathusii
	13824	1	3	0	40.8			7.5	Pipistrellus nathusii
14	11272	1	1	0	39.9			7.8	Pipistrellus nathusii
18	5286	1	1	0	40.4			7.3	Pipistrellus nathusii
	5636	1	1	0	39.9			9.1	Pipistrellus nathusii

Transect 3: 17.10.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
0	1043	1	1	0	35.5			10.2	Hypsugo savii or Pipistrellus nathusii
	1394	1	2	0	35.5			12.7	Hypsugo savii or Pipistrellus nathusii
	1747	1	1	0	35.1			12.7	Hypsugo savii or Pipistrellus nathusii
	2097	1	2	0	35.1			10.0	Hypsugo savii or Pipistrellus nathusii
	2449	1	4	0	35.1			10.0	Hypsugo savii or Pipistrellus nathusii
	2802	1	1	0	35.5			11.1	Hypsugo savii or Pipistrellus nathusii
	3154	1	2	0	35.1			8.2	Hypsugo savii or Pipistrellus nathusii
	4210	1	2	0	35.1			10.6	Hypsugo savii or Pipistrellus nathusii
	4562	1	2	0	34.6			12.3	Hypsugo savii
	22862	1	1	0	20.6			13.4	Nyctalus noctula
	23214	1	1	0	20.6			14.5	Nyctalus noctula
	23568	1	1	0	25.4			11.9	undetermined

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	23918	2	4	0	27.3			9.0	Eptesicus serotinus
					23.5			15.5	undetermined
	24270	2	4	0	23.0			14.2	Nyctalus noctula or Nyctalus leisleri
					26.8			10.4	Eptesicus serotinus
	24623	1	1	0	24.9			11.1	Eptesicus serotinus
	24974	1	4	0	23.5			9.6	Nyctalus noctula or Nyctalus leisleri
	25327	2	5	0	40.8			4.7	Pipistrellus nathusii
					22.0			17.3	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	25678	2	3	0	39.4			7.7	Pipistrellus nathusii
					21.5			15.8	Nyctalus noctula
	26031	1	1	0	24.0			18.4	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	26385	1	1	0	23.5			14.8	Nyctalus noctula or Nyctalus leisleri or Vespertilio murinus
	26733	1	1	0	21.0			13.6	Nyctalus noctula
	27087	1	1	0	21.0			14.3	Nyctalus noctula
1	11863	1	1	0	26.4			6.6	Eptesicus serotinus
	12217	1	2	0	39.9			6.6	Pipistrellus nathusii
	12569	1	1	0	40.4			5.5	Pipistrellus nathusii
2	2627	1	1	0	36.0			3.8	Pipistrellus nathusii
	14593	1	2	0	40.8			2.9	Pipistrellus nathusii
	14946	1	2	0	40.8			5.1	Pipistrellus nathusii
3	28231	1	2	0	38.0			7.2	Pipistrellus nathusii
5	957	1	1	0	25.9			9.9	Eptesicus serotinus
6	7554	1	3	0	51.5			11.4	Miniopterus schreibersi
	7907	1	1	0	38.0			6.9	Pipistrellus nathusii
	8260	1	1	0	37.5			7.4	Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	8611	1	2	0	38.4			7.9	Pipistrellus nathusii
	8962	1	1	0	38.0			7.3	Pipistrellus nathusii
	9317	1	2	0	37.5			7.2	Pipistrellus nathusii
7	8522	1	3	0	39.9			3.5	Pipistrellus nathusii
9	5883	1	3	0	38.4			9.8	Pipistrellus nathusii
10	17763	1	1	0	38.4			10.4	Pipistrellus nathusii
	18114	1	1	0	37.5			11.9	Pipistrellus nathusii
11	782	1	1	0	25.4			14.4	Eptesicus serotinus
	1135	1	1	0	24.0			12.3	Eptesicus serotinus
	27883	1	1	0	38.9			5.2	Pipistrellus nathusii
	28235	1	1	0	39.4			6.4	Pipistrellus nathusii
17	11871	1	1	0	34.1			9.6	Hypsugo savii
	12574	1	1	0	34.1			14.3	Hypsugo savii
19	17679	1	1	0	19.6			19.0	Nyctalus noctula

Transect 4: 19.10.10

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
1	29178	1	3	0	40.8			4.2	Pipistrellus nathusii
2	4458	1	1	0	39.9			4.3	Pipistrellus nathusii
	28037	1	1	0	35.5			5.8	Hypsugo savii or Pipistrellus nathusii

Chunk	Time (from the start of the snapshot) ms	No. of bats	No. of echolocation calls	No. of social call sequences	Peak frequency (KHz)	Max. frequency (KHz)	Min. frequency (KHz)	Duration (ms)	Suggested species
	28742	1	3	0	76.1			39.2	Rhinolophus ferrumequinum
3	502	1	1	0	79.0			11.1	Rhinolophus ferrumequinum
5	14760	1	3	0	38.9			9.2	Pipistrellus nathusii
	27079	1	1	0	49.5			8.6	Miniopterus schreibersi
6	21361	1	3	0	39.9			3.7	Pipistrellus nathusii
	25587	1	2	0	40.4			4.6	Pipistrellus nathusii
	25938	1	3	0	41.8			6.3	Pipistrellus nathusii
	29104	1	1	0	39.4			5.4	Pipistrellus nathusii
	29458	1	3	0	37.0			7.2	Pipistrellus nathusii
	29810	1	1	0	36.5			7.9	Pipistrellus nathusii
7	158	1	1	0	38.4			4.6	Pipistrellus nathusii
	1215	1	2	0	37.5			8.5	Pipistrellus nathusii
	1567	1	2	0	37.0			7.9	Pipistrellus nathusii
	1921	1	1	0	37.5			8.7	Pipistrellus nathusii
8	13800	1	3	0	51.5			5.4	Miniopterus schreibersi
11	14249	1	4	0	41.8			5.4	Pipistrellus nathusii
	14600	1	2	0	39.4			9.1	Pipistrellus nathusii

APPENDIX 9. RESULTS OF SEARCHER EFFICIENCY TRIAL JUNE 2010

Searcher:	**Ivaylo Raykov**		
Date carcass placed	**Turbine No.**	**Carcass No.**	**Found? (Y/N)**
17.06.2010	29	1	Y
17.06.2010	29	2	Y
17.06.2010	29	3	Y
17.06.2010	29	4	Y
17.06.2010	29	5	N
17.06.2010	29	6	Y
17.06.2010	9	7	Y
17.06.2010	9	8	N
17.06.2010	9	9	N
19.06.2010	18	10	Y
19.06.2010	18	11	N
19.06.2010	18	12	Y
19.06.2010	18	13	Y
19.06.2010	18	14	Y
19.06.2010	18	15	Y
19.06.2010	18	16	Y
19.06.2010	19	17	N
19.06.2010	19	18	N
19.06.2010	19	19	N
19.06.2010	19	20	N
19.06.2010	19	21	Y
20.06.2010	17	22	Y
20.06.2010	17	23	N
20.06.2010	17	24	N
20.06.2010	17	25	Y

APPENDIX 10. RESULTS OF SEARCHER EFFICIENCY TRIAL OCTOBER 2010

Searcher:	**Stefan Mitev**		
Date carcass placed	**Turbine No.**	**Carcass No.**	**Found? (Y/N)**
21.10.2010	29	1	Y
21.10.2010	29	2	Y
21.10.2010	29	3	Y
21.10.2010	29	4	Y
21.10.2010	29	5	Y
21.10.2010	29	6	Y
21.10.2010	29	7	Y
21.10.2010	29	8	Y
22.10.2010	26	9	N
22.10.2010	26	10	Y
22.10.2010	26	11	Y
22.10.2010	26	12	Y
22.10.2010	26	13	Y
22.10.2010	26	14	N
22.10.2010	26	15	Y
22.10.2010	8	16	N
22.10.2010	8	17	N
22.10.2010	8	18	N
22.10.2010	8	19	Y
22.10.2010	8	20	N
22.10.2010	8	21	Y
22.10.2010	8	22	Y
22.10.2010	8	23	Y
22.10.2010	8	24	N
22.10.2010	8	25	N
23.10.2010	46	26	N
23.10.2010	46	27	N
23.10.2010	46	28	N
23.10.2010	46	29	Y
23.10.2010	46	30	N
23.10.2010	46	31	Y
23.10.2010	46	32	Y
23.10.2010	46	33	Y
23.10.2010	46	34	N
23.10.2010	46	35	Y
23.10.2010	46	36	Y
23.10.2010	37	37	Y
23.10.2010	37	38	N
23.10.2010	37	39	Y
23.10.2010	37	40	N
23.10.2010	37	41	Y
23.10.2010	37	42	Y
23.10.2010	37	43	Y
23.10.2010	37	44	Y

APPENDIX 11. RESULTS OF CARCASS REMOVAL TRIAL JUNE 2010

Turbine no.	Carcass no.	Date carcass left out	Day after positioning																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
29	1	17.06.2010	Y	Y	Y	N																						
29	2	17.06.2010	N																									
29	3	17.06.2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N												
29	4	17.06.2010	Y	Y	Y	Y	Y	N																				
29	5	17.06.2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
29	6	17.06.2010	Y	N																								
9	7	17.06.2010	N																									
9	8	17.06.2010	Y	N																								
9	9	17.06.2010	Y	Y	Y	N																						
18	10	19.06.2010	Y	Y	Y	Y	Y	Y	Y	Y	N																	
18	11	19.06.2010	Y	Y	Y	N																						
18	12	19.06.2010	Y	Y	Y	Y	Y	Y	Y	Y	N																	
18	13	19.06.2010	Y	N																								
18	14	19.06.2010	Y	N																								
18	15	19.06.2010	Y	Y	Y	Y	N																					
18	16	19.06.2010	Y	N																								
19	17	19.06.2010	N																									
19	18	19.06.2010	Y	Y	Y	Y	N																					

Turbine no.	Carcass no.	Date carcass left out	Day after positioning																								
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
19	19	19.06.2010	Y	Y	Y	N																						
19	20	19.06.2010	N																									
19	21	19.06.2010	Y	Y	Y	Y	N																					
17	22	20.06.2010	Y	Y	N																							
17	23	20.06.2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N			
17	24	20.06.2010	Y	Y	N																							
17	25	20.06.2010	Y	Y	N																							

Status (Y = present, N = missing)

APPENDIX 12. RESULTS OF CARCASS REMOVAL TRIAL OCTOBER 2010

Turbine no.	Carcass no.	Date carcass left out	Day after positioning													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
29	1	21/10/2010	Y	Y	Y	Y	Y	Y	N							
29	2	21/10/2010	Y	Y	Y	Y	Y	Y	N							
29	3	21/10/2010	Y	Y	Y	Y	Y	Y	N							
29	4	21/10/2010	Y	Y	Y	Y	Y	Y	N							
29	5	21/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	N					
29	6	21/10/2010	Y	Y	Y	Y	Y	Y	N							
29	7	21/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	N				
29	8	21/10/2010	Y	Y	Y	Y	Y	Y	N							
26	9	22/10/2010	Y	Y	Y	Y	Y	N								
26	10	22/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
26	11	22/10/2010	Y	Y	Y	Y	Y	N								
26	12	22/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
26	13	22/10/2010	Y	Y	Y	Y	Y	Y	N							
26	14	22/10/2010	Y	Y	Y	Y	Y	N								
26	15	22/10/2010	Y	Y	Y	Y	Y	Y	Y	N						
8	16	22/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	N					
8	17	22/10/2010	Y	Y	Y	Y	Y	N								
8	18	22/10/2010	Y	Y	Y	Y	Y	N								
8	19	22/10/2010	Y	Y	Y	Y	Y	N								
8	20	22/10/2010	Y	Y	Y	Y	Y	N								
8	21	22/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	N					
8	22	22/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	N					
8	23	22/10/2010	Y	Y	Y	Y	Y	Y	Y	Y	N					

Turbine no.	Carcass no.	Date carcass left out	Day after positioning													
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
8	24	22/10/2010	Y	Y	Y	Y	Y	N								
8	25	22/10/2010	Y	Y	Y	Y	Y	N								
46	26	23/10/2010	Y	Y	Y	Y	N									
46	27	23/10/2010	Y	Y	Y	Y	N									
46	28	23/10/2010	Y	Y	Y	Y	N									
46	29	23/10/2010	Y	Y	Y	Y	N									
46	30	23/10/2010	Y	Y	Y	Y	N									
46	31	23/10/2010	Y	Y	Y	Y	N									
46	32	23/10/2010	Y	Y	Y	Y	N									
46	33	23/10/2010	Y	Y	Y	Y	N									
46	34	23/10/2010	Y	Y	Y	Y	N									
46	35	23/10/2010	Y	Y	Y	Y	N									
46	36	23/10/2010	Y	Y	Y	Y	N									
37	37	23/10/2010	Y	Y	Y	Y	N									
37	38	23/10/2010	Y	Y	Y	Y	N									
37	39	23/10/2010	Y	Y	Y	Y	N									
37	40	23/10/2010	Y	Y	Y	Y	N									
37	41	23/10/2010	Y	Y	Y	Y	N									
37	42	23/10/2010	Y	Y	Y	Y	N									
37	43	23/10/2010	Y	Y	Y	Y	N									
37	44	23/10/2010	Y	Y	Y	Y	N									

Status (Y = present, N = missing)