



St Asaph Flood Risk Management Strategy

Bat Survey Report: Tree Roosts

August 2016





ST ASAPH FLOOD RISK MANAGEMENT STRATEGY Bat Survey Report: Tree Roosts

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1. INTRODUCTION

1.1 Project Brief and Background

Following severe flooding from the River Elwy during November 2012, Natural Resources Wales (NRW) is developing a Flood Risk Management Scheme (FRMS) to reduce flood risk in St Asaph, referred to as the St Asaph FRMS.

The St Asaph FRMS is being delivered as two separate packages with separate planning applications being made to cover each package of work (Package A and B).

The first package (Package A) of the St Asaph FRMS comprised a proposal to replace the Spring Gardens Bridge with a new bridge crossing which does not impede flow on the River Elwy. This planning application was submitted in June 2016. A bat survey report was produced in June 2016 with reference to Spring Garden Bridge (BV, 2016).

A second package (Package B) for planning permission for the St Asaph FRMS is anticipated to be sought in late summer 2016. This package includes all of the main elements of the St Asaph FRMS apart from Package A (i.e. Spring Gardens Bridge replacement) which will be undertaken in advance.

Package B consists of work to provide new, and improve, existing flood defences throughout St Asaph to protect it from flooding from the Afon Elwy.

The work will include a combination of new flood walls, raising and widening of existing embankments, construction of new flood walls on top of existing embankments and a section of new flood embankment. Work will extend along both sides of the River Elwy between Lower Denbigh Road south of New Inn, to Spring Gardens Caravan Park. Works will also include two sections of work downstream of St Asaph, namely a short section of embankment raising at Dol Afon footbridge and low level embankment along Station Road in Rhuddlan.

It is anticipated that, subject to obtaining all relevant consents, the construction of Package B would begin in late 2016 or early 2017.

A bat roost potential survey was conducted on all potentially impacted trees along the St Asaph FRMS in 2015 for both packages (GBV, 2015). With regards to the wider St Asaph FRMS (Package B) three trees were highlighted that had a high bat roost potential and twenty two moderate bat roost potential and the report concluded that '— bat activity surveys (dusk emergence / dawn re-entry) should be undertaken to determine the bat status of the remaining (Package B) trees. This would likely consist of three dusk/dawn surveys conducted on each tree with high potential (three trees). For trees with moderate potential (22 trees in total) this would likely consist of one dusk and one dawn survey conducted on each tree between May and August in accordance with current best practice.

This report specifically describes the bat roost surveys for Package B.



1.2 Scope

This report presents the findings of the bat activity (roost) surveys; comprising desk study and a dusk emergence and dawn re-entry surveys. The aim of the report is to:

- to confirm where possible the presence/absence of bat roosts with regards to trees due to be removed/lopped as part of Package B;
- to summarise the findings of previous desk study (GBV, 2014);
- to summarise findings of bat roost surveys in 2016;
- to make recommendations if a bat roost is recorded or if a bat roost cannot be proven to be absent during activity surveys; and
- to identify any further survey requirements.

The survey methodology is detailed in Section 2. The survey results are presented in Section 3 and on tree locations in Appendix A. Information on individual trees is located in Appendix B. Survey recording sheets are located in Appendix C. Discussion of the survey and any recommendations are discussed in Section 4.

1.3 Survey Locations

The 25 potential roost sites surveyed in 2016 are located throughout the Scheme and can be cross referenced with Appendix 1: Potential Roost Location Figure.

The potential roost sites are recorded in Appendix B: Bat Roost Potential Assessment Table.



2. METHODOLOGY

2.1 Desk Study

A desk study was undertaken for the St Asaph Scheme as part of the Preliminary Ecological Assessment (GBV, 2014) and data has been summarised as part of this report.

For the Preliminary Ecological Assessment data was sought to identify any nature conservation sites and/or any relevant protected or notable species records within 2km of the site.

The following sources of information were utilised:

- NRW Protected Sites Map (http://www.ccgc.gov.uk/interactive-maps/protected-sites-map.aspx)
- NBN Gateway (https://data.nbn.org.uk/)
- Ordnance Survey website (http://www.getamap.ordnancesurveyleisure.co.uk/)
- Wales Biodiversity Partnership (http://www.biodiversitywales.org.uk/)
- A data enquiry was also made to NRW for any records of bats.

For this report an updated search was made of the NRW Protected Sites Map for sites designated for bats within 10km and a review of the Bat Roost Potential Report (GBV, 2015) was also undertaken.

2.2 Bat Roost Surveys

Methodology for bat surveys undertaken as part of this study was undertaken in accordance with standard best practice survey guidelines 'Bat Surveys: Good Practice Guidelines (Hundt, 2016).

The methodology comprised dusk and dawn surveys. Dusk surveys started 15-30 minutes prior to sunset and extended for 90 minutes after sunset. Dawn surveys started 90 minutes prior to sunrise and extended up to sunrise. A survey visit in accordance with Hundt (2016) comprises all survey with a 24hr period; i.e. a dusk followed by a dawn the following morning is counted as one survey visit.

Trees surveyed with moderate bat roost potential comprised one consecutive dusk and dawn survey (1 survey visit). Where any indication of emergence/reentry was found in moderate potential trees then a further dusk and dawn were conducted. Surveys of high bat roost potential trees comprised 3 survey visits of a combination of dusk and dawn visits.

Each tree was surveyed by two surveyors on each survey; this ensured that where more than one feature or large feature there was complete visual coverage. Surveyors used hand-held heterodyne bat detectors (BatBox Duet). Recording devices (Zoom H1 or an automated static detector: Anabat Express) were also used at each feature to record any movements of bats from trees and any other incidental recordings of bat species activity. The primary objective of the roost surveys was to highlight any presence of bat roosts within tree structures and therefore bat activity was recorded only to supplement roost survey data.



Surveys were only undertaken in suitable weather conditions, avoiding periods of heavy rainfall and strong winds. In general, weather conditions throughout the survey period, and the summer in general, were dry and warm.

Table 2.1 below provides the survey dates at all of the potential roosts, including details of weather conditions.

Table 2.1: Environmental data and timing of bat roost surveys

Tuble 2.11 Environ			Weather Conditions			
Feature ID	Survey Date	Survey		precipitation, wind,		
	Survey Duce	No.		d cover)		
			Dusk	Dawn		
Tree 1 (high bat	13/05/16	1 of 3		No temperature		
	10, 00, 10	1 01 0		recorded, dry and		
roost potential)				clear (0%)		
	31/05/16	2 of 3	17°C, dry, still,	15°C, dry, still,		
			50%	70%		
	27/06/16	3 of 3	16°C, dry, light			
			breeze, 80%			
Tree 4	02/05/16	1	9°C, dry, still,	6°C, dry, still,		
1100 1			cloud cover	cloud cover data		
			data not	not provided		
			provided	•		
Tree 24/35 (in	13/06/16	1	13°C, dry, still,	8°C, dry, still,		
close proximity to			100%	100%		
T24 and surveyed						
at same time)						
	Not surveyed	Troo down	rodod to pogligih	le bat roost potential		
Tree 66	•	,	survey assessment	•		
T (0 /T F1	12/05/16	1 of 3	16°C, dry, light			
Tree 68/Tree 71	12/03/10	1 01 3	breeze, 30%	100%		
			010020, 3070	10070		
Tree 68	21/06/16	2 of 3	17-15°C, dry,			
1166.00			still, 100%			
	29/06/16	3 of 3		10°C, dry, still,		
				40%		
Tree 157	23/05/16	1	11°C, dry, still,	6°C, dry, still,		
1100 107			20%	cloud cover data		
				not provided		
Tree 602/607	20/06/16	1	16°C, dry, still,	14°C, dry, still, 0%		
			10%			
Tree: Poplar	17/05/16	1 of 2		7.5°C, dry, still,		
				0%		
	18/05/16	2 of 2	12°C, dry, still,			
			50%			
Tree 503	30/05/16	1	16°C, light	11°C, light breeze,		
			breeze, 50%	30%		
Tree 465/468	04/04/16	1	12°C, dry, still,	9°C, dry, still, 20%		
,			40%			



Feature ID	Survey Date	Survey No.	(temperature,)	r Conditions precipitation, wind, id cover)
Tree 349/350/351	14/06/16	1	12°C, dry, still, 100-60%	
Tree: Hawthorn1 and 2	19/05/16	1	13.5°C, periodic rain, light breeze, 100%	8°C, no rain, light breeze, 100%
Tree 254	02/06/16	1 of 2	11°C, light breeze, 0%	0%
	27/06/16	2 of 2	14°C, light breeze, 100%	11°C, light breeze, 70%
Tree 217 (high bat roost potential)	24/05/16	1 of 3	11°C, dry, light breeze, 80%	
	28/06/16	2 of 3		12°C, fine, still, 10%
	30/06/16	3 of 3	12°C, periodic rain, light breeze, 100%	11°C, dry, no wind, 100%
Tree 200/234 (surveyed at the same time as in close proximity)	09/06/2016	1	15°C, humid, no rain, light breeze, 100%	15°C dry and mild, 100%
Tree 190	26/05/16	1 of 3	12°C, dry, light breeze, 80%	7.5°C, dry, still 0%
	29/06/16	2 of 3	15°C, dry, light breeze, 50%	
	01/07/16	3 of 3		17°C, dry and still 30%
Tree 186 (high bat roost potential)	01/06/16	1 of 3	18°C, light breeze, no rain, 60%	13°C, dry, light breeze, 100%
	28/06/16	2 of 3	13°C, rained 30 mins before survey and during for 10- 15 minutes but fine for rest, no wind, 70%	
	30/06/16	3 of 3		13°C, dry, light breeze, 50%

The surveys were led by a number of ecologists; Russell Grey (class licence; WML-CL17), Kate Baggaley (NRW Licence number 60343:OTH:CSAB:2014 and NE Class licence registration number 2015-13308-CLS-CLS), Matt Rung MCIEEM and Martin Page MCIEEM.



2.3 Limitations

Timing

The optimal period for the undertaking of bat roost surveys is May to August and it is noted that bats use different roosts at different times throughout this period. Therefore in ideal survey conditions roost surveys would be spread out across this period. However, the survey effort was restricted to the period May-July to facilitate the planning submission (late Summer 2016). This is therefore within the optimal survey window and provides robust and adequate data in order to determine presence/absence.

Visibility

It is acknowledged that conducting roost surveys on trees is particularly difficult due to the presence of full foliage and often obscured views to some parts of any given tree. As many of the trees surveyed were located along the banks of the River Elwy surveyors were limited with their views during the surveys. However, every effort was made to ensure surveyors gained the best possible safe vantage point for each tree, with locations assessed prior to arrival for dusk surveys.

Methodology

Best practice guidance states that for moderate bat roost potential trees two surveys should be undertaken (high bat roost potential: three surveys should be undertaken) that are not conducted within the same 24 hour period. Although the requisite number of surveys were conducted in 2016 for moderate potential trees these consisted of surveys that were conducted in the same 24 hour period for the majority of trees and therefore are not considered to provide two surveys. For high roost potential trees three separate surveys were undertaken as the guidance recommends.

However, given that the most likely use of these trees is for transitory bats, and whenever potential roosting behaviours was seen on the first survey then additional surveys were carried out, this is considered proportional to inform the mitigation strategy (see Section 4.4).



3. RESULTS

3.1 Desk Study

There are no statutory or non-statutory sites that are designated for bats within 2km of the site. The following two statutory sites that are designated for bats are located within 10km of the site:

- Ffynnon Beuno and Cae Gwyn Caves Site of Special Scientific Interest (SSSI), 6km southeast, designated for winter roost of lesser horseshoe bat Rhinolophus hipposideros; also Natterer's bat Myotis nattereri & brown long-eared bat Plecotus auritus use caves.
- Coedydd ac Ogofau Elwy a Meirchion SSSI, 6km southwest, designated for Natterer's bat brown long-eared bat; Pipistrelle Pipistrellus pipistrellus; and lesser horseshoe bats.

NBN Records

Several bat species were recorded within the same 10km grid square as the survey area within the last 10 years. These were:

- Serotine:
- Daubenton's;
- Whiskered Myotis mystacinus / Brandt's Myotis brandtii;
- Natterer's:
- Noctule:
- Common pipistrelle;
- Soprano pipistrelle;
- Brown long-eared; and
- Lesser horseshoe.

NRW Records

NRW provided records for the following species within 1km of the scheme:

- Common pipistrelle;
- Myotis sp.;
- Brown long-eared bat; and
- Whiskered bat.

3.2 Roost Surveys

A significant amount of survey time and effort has been put in to roost surveys, generating a large volume of data comprising bat recordings in various formats and field observation sheets. Field observation sheets are supplied in Appendix 3. Sound recordings are available on request. For the purposes of this report, the findings are summarised on a tree by tree basis.



3.3 High Roost Potential Trees

Tree 1

The dusk surveys recorded activity from several bat species. Common pipistrelle and pipistrelle sp. was recorded foraging close to a residential property on several occasions located across the road from T1. Several passes from pipistrelle, noctule, myotis and unidentified bats were recorded during the surveys.

The dawn surveys recorded foraging common and soprano pipistrelle from the same residential property outlined in the above paragraph with several bat passes from Pipistrelle sp., Nyctalus sp. and an unknown bat.

A total of 4 bat species were recorded during surveys, which included common and soprano pipistrelle, Nyctalus sp, and Myotis sp. The earliest bat recording to sunset was 21:49 which was 19 minutes after sunset.

In summary, no roosting activity was recorded or observed associated with Tree 1 during the survey effort. Foraging activity was limited to the residential property situated across the road from T1 with bat passes observed in both directions crossing the road close to T1.

Tree 217

The dusk surveys recorded frequent foraging activity from pipistrelle sp. over the river with some foraging observed under the tree canopies and close to T217 but nothing was seen emerging. Daubenton's was recorded commuting downstream low to the river on two occasions.

The dawn surveys recorded constant activity from foraging soprano pipistrelle over the river with observations also from unknown bats commuting and foraging close to trees, including T217. Daubenton's and brown long eared bat were also observed foraging over the river during the survey.

A total of 5 bat species were recorded during the surveys; Daubenton's, soprano and common pipistrelle, brown long-eared bat and noctule. The earliest bat recording to sunset was 21:36 which was 8 minutes before sunset and was from a commuting pipistrelle.

In summary, no roosting activity was recorded or observed associated with Tree 217 during the survey effort. Activity (both foraging and commuting) was frequent being observed mainly along the river but also close to T217.

Tree 186

The dusk surveys recorded frequent foraging from soprano pipistrelle over the River Elwy. Noctule and brown long eared bat were observed foraging and commuting over the river with Myotis sp. also commuting. Occasional foraging was observed over the path, with bats coming off the river and circling between trees both above and below the canopy level.

The dawn surveys recorded constant foraging activity from soprano pipistrelle over the river with Motes sp. and noctule passes also noted.

A total of 4 bat species were recorded during surveys; soprano and common pipistrelle, Myotis sp and noctule. The earliest bat recording to sunset was 21:43 which was 14 minutes after sunset.



In summary, no roosting activity was recorded or observed associated with Tree 186 during the survey effort. Activity (both foraging and commuting) was frequent and with single and multiple bats foraging along the river and banks.

Moderate Roost Potential Trees

Tree 4

The dusk survey recorded common pipistrelle and pipistrelle (50hz) commuting to and from the river. One foraging observation was recorded of soprano pipistrelle along a ditch and then travelling back towards the river.

The dawn survey did not record any bat activity.

A total of 2 bat species were recorded during surveys; common and soprano pipistrelle. The earliest bat recording to sunset was 20:59 which was 16 minutes after sunset.

In summary, no roosting activity was recorded or observed associated with Tree 4 during the survey effort. Activity was generally low with commuting activity more common than foraging activity. As Tree 4 is set back from the river it is likely that commuting bats were heading to and from the river in order to forage.

Tree 24

The dusk and dawn surveys recorded constant foraging activity along the path and over the river. This was not located close to T24. Only 3 bat observations were recorded close to T24 and these were all of commuting bats.

In summary, no roosting activity was recorded or observed associated with Tree 24 during the survey effort. Activity was low close to T24 and limited to passes of single bats.

Tree 35

The dusk survey recorded both common and soprano pipistrelle and noctule foraging and commuting along the river. No roosting activity was observed at the bird box located on the tree.

The dawn survey recorded common and soprano pipistrelle and Daubenton's bat and brown long-eared bat along the river. No roosting activity was observed at the tree.

In summary, no roosting activity was recorded or observed associated with Tree 35 or the bird box that was fitted to it.

Tree 66

This tree was assessed prior to the planned dusk/dawn survey and was found to have fallen down. The tree was re-assessed for its potential to support roosting bats. Previous features, such as the woodpecker hole were no longer elevated on the main trunk and the tree was therefore downgraded from moderate to negligible bat roost potential. No further surveys were conducted on the tree.

Tree 68

The dusk survey recorded continuous activity close to the river and near the bridge. Pipistrelle sp., and noctule were both recorded foraging. One lesser



horseshoe bat was observed on two occasions foraging over the river. One bat was observed potentially emerging at 5m height from within the ivy cover at 21:18.

The dawn survey recorded frequent bat activity over the river corridor. One bat was observed to disappear at approximately a 10m height behind the tree and was a possible re-entry but this could not be confirmed.

Following the potential emergence and re-entry from this tree a further dusk and dawn survey was conducted to provide further information.

The second dusk survey recorded constant commuting and foraging activity from pipistrelle sp. over the river and close to T68 and nearby trees. Peak activity was between 21:50 and 22:15. No bats were observed emerging from the tree.

The second dawn survey recorded constant foraging activity over the River Elwy from pipistrelle sp. Daubenton's, Myotis sp., and brown-long eared bat passes were also heard with foraging Daubenton's also noted over the river.

A total of 5 bat species were recorded during surveys, which included soprano/common pipistrelle, Myotis sp, Daubenton's and brown long-eared bat. The earliest bat recording to sunset was 21:40 which was 5 minutes before sunset. This was noted to be flying low along the path and towards the river and was foraging.

In summary, potential roosting activity was recorded during the first dusk and dawn survey but this was not subsequently picked up on the follow up dusk and dawn survey.

Tree 71

Tree 71 was surveyed co-currently with the first dusk and dawn survey (13/05/16) at T68 as they are located within close proximity to one another. Therefore, activity data is the same as T68 with respect to these dates. However, no roosting activity was recorded at either the dusk or dawn survey in relation to T71

Tree 157

The dusk survey recorded pipistrelles commuting and foraging along the river bank, close to the footbridge and around surrounding tree canopies.

The dawn survey recorded a significantly lower volume of bat activity in general, with very occasional pipistrelle activity by the bridge and under the tree line.

Pipistrelle bats were the only bat encountered during both these surveys. The earliest bat recording to sunset was at 21:30 which was 33 minutes after sunset.

In summary, no roosting activity was recorded or observed associated with Tree 157 during the survey effort. Activity was low and limited to commuting and foraging along the river banks, bridge and trees.

Tree 602/607

The dusk and dawn surveys recorded constant foraging activity from pipistrelle bats over the river with some foraging and commuting observed around T602 and T607 but no evidence of emergence or re-entry.



Pipistrelle species were the only species recorded during surveys. The earliest bat recording to sunset was 21:39 which was 6 minutes before sunset.

In summary, no roosting activity was recorded or observed associated with Tree 602/607 during the survey effort. Activity was constant throughout the surveys and limited to pipistrelle sp. foraging along the river bank.

Tree: Poplar

The dusk survey recorded both common and soprano pipistrelles which were constantly foraging over the river and close to the Poplar and surrounding trees. Noctule was observed commuting on two occasions.

The dawn survey recorded a similar level of foraging activity to the dusk survey with foraging continuous over the river by common and soprano pipistrelle. 3-4 bats were seen circling above trees about 10m away from the Poplar but no reentry was observed.

A total of 3 bat species were recorded during surveys; common and soprano pipistrelle and noctule. The earliest bat recording to sunset was 21:09 which was two minutes before sunset.

In summary, no roosting activity was recorded or observed associated with the Poplar during the survey effort. Activity was constant and associated with the river and surrounding bankside trees which included the Poplar.

Tree 503

The dusk survey recorded both common and soprano pipistrelles commuting and foraging close to Tree 503 but no emergence was observed. Two noctule passes were observed close to the river and one Myotis sp. was observed foraging for 3 minutes over the River Elwy.

The dawn survey recorded a significantly lower volume of bat activity in general, with very occasional pipistrelle activity up until 30 minutes prior to sunrise. No reentry was observed.

In summary, no roosting activity was recorded or observed associated with Tree 503 during the survey effort.

Tree 465/468

The dusk survey recorded both common and soprano pipistrelles foraging regularly along the river with some commuting activity along the footpath all in close proximity to T465 but there were no observations of emergence. One commuting noctule was also heard but not seen.

The dawn survey recorded constant soprano pipistrelle foraging above the trees. A total of approximately 20 soprano pipistrelles were observed with feeding buzzes and swarming-type activity above a tree located approximately 20m north of T465 and then dispersing towards the nearby WwTW, which is located approximately 50m east of T465. The WwTW contains a number of single storey buildings that have the potential to hold bat roosts but do not fall within the survey boundary.



A total of 3 bat species were recorded during surveys; soprano and common pipistrelle and noctule. The earliest bat recording to sunset was 21:03 which was 17 minutes after sunset.

In summary, no roosting activity was recorded or observed associated with Tree 465 during the survey effort. Activity was restricted to foraging and commuting activity along the river and footpath close to T465 but not associated with it.

Tree 349/350/351

The dusk survey recorded both common and soprano pipistrelles commuting and foraging both along the river and footpath close to Trees 349/350/351 with some bats passing between trees during foraging. Foraging noctule was also observed over the river. Commuting Myotis sp and brown long eared bat were also recorded but not seen.

The dawn survey recorded constant foraging activity from common and soprano pipistrelle over the River Elwy and associated trees and footpath. This included bats foraging in between the surveyed trees. Myotis sp. and brown long-eared bats were observed commuting on two occasions during the survey.

A total of 5 bat species were recorded during surveys; common and soprano pipistrelle, Myotis sp, noctule and brown long eared bats. The earliest bat recording to sunset was 21:44 which was 2 minutes after sunset.

In summary, no roosting activity was recorded or observed associated with Trees 349/350/351 during the survey effort. Activity was high along the river with activity close to the surveyed trees.

Tree: Hawthorn 1 and 2

The dusk survey recorded both common and soprano pipistrelle, Pipistrelle sp. and Myotis sp. Myotis was recorded on one occasion and was a brief pass. Pipistrelle species were recorded both foraging and commuting over the River Elwy.

The dawn survey recorded soprano pipistrelle, Pipistrelle sp. and Myotis sp.. Foraging and commuting along the River Elwy and the footpath was recorded. It was noted that the lights from the cattle market adjacent to the trees were bright and could reduce the potential of the trees as a bat roost.

A total of 3 bat species were recorded during surveys; common, soprano pipistrelle and Myotis sp. The earliest bat recording to sunset was 21:37 which was 26 minutes after sunset.

In summary, no roosting activity was recorded or observed associated with Hawthorn 1 and 2 during the survey effort. Activity was low and limited to foraging and commuting either on the path or river away from Hawthorn 1 and 2.

Tree 254

The first dusk survey recorded continuous activity from 22:05 over the river and under trees. Pipistrelle sp, and Daubenton's were recorded foraging. One bat was observed potentially emerging at 22:00 which flew at 1m above the ground from the tree and over the river. No recording of this was made and therefore species could not be determined.

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The first dawn survey recorded frequent bat activity over the river between 04:00 and 04:20 with pipistrelle observed commuting and foraging. No re-entry activity was observed.

Following the potential emergence from this tree a further dusk and dawn survey was conducted on this tree to provide further information.

The second dusk survey recorded constant commuting and foraging activity from pipistrelle sp. over the river with noctule passes on three occasions. Daubenton's and potential Leisler's were recorded commuting over the river. No emergence activity was recorded.

The second dawn survey recorded frequent foraging activity close to the tree over the canopy by 2 soprano pipistrelles but these flew away down the river. Pipistrelle, Daubenton's and noctule were observed commuting along the river, with noctule also commuting perpendicular to the river over trees. No re-entry activity was recorded.

A total of 5 bat species were recorded during surveys; soprano/common pipistrelle, Daubenton's, noctule and Leisler's. The earliest bat recording to sunset was 21:56 which was 24 minutes after sunset.

In summary, roosting activity, in the form of emergence, was potentially recorded but not confirmed during the first dusk survey. There was no evidence of roosting activity during the follow up dusk and dawn survey.

Tree 200/234

The dusk surveys recorded Pipistrelle sp. frequently foraging and commuting and with social calls over the water. A spot light from the cattle market was observed to be bright close to both trees. One Daubenton's was recorded over the water foraging. No emergence activity was observed.

The dawn surveys noted frequent activity from Daubenton's and pipistrelle sp. with occasional social calls from pipistrelle. Activity was concentrated across the river and associated banks.

In summary, no roosting activity was recorded or observed associated with Tree 200/234 during the survey effort. Activity was low and limited to passes with infrequent foraging of single bats.

Tree 190

The first dusk survey recorded constant activity from common pipistrelle around the river and the canopy of T190. Noctule was also recorded commuting along the River Elwy. It was observed that there was lots of activity around the upper 5m of the canopy but no emergence was recorded.

The first dawn survey recorded a significantly lower volume of bat activity in general with only three observations by unidentified bats. At 4.20 emergence was potentially observed from T190 by 1-2 bats which then flew towards the river. The emergence was not confirmed and no bats were seen entering the tree.

Following the potential sighting of emergence by bats during the dawn survey a follow up dusk and dawn survey was undertaken to provide more information.



The second dusk survey recorded constant activity from between 1-7 soprano pipistrelles which foraged over the river and bank side tree canopies. One Daubenton's bat was seen foraging over the river.

The second dawn survey recorded bat activity from common and soprano pipistrelle, Myotis sp. and noctule which were all observed commuting along the river. Common and soprano pipistrelle were observed foraging over the river and banks close to T190.

In summary, emergence from 1-2 bats was observed associated with Tree 190 during the survey effort, however this was during a dawn survey when re-entry would normally be observed. No re-entry was subsequently observed. Activity was low and limited to passes with infrequent foraging of single bats.



4. DISCUSSION

4.1 Confirmed Roosts

There were no confirmed bat roosts recorded during the bat roost surveys.

4.2 Prospective Roosts

Three trees (T190, T68 and T254) were observed with a potential sighting of a bat emerging from a tree but this was not confirmed during the survey.

At T190 emergence was potentially observed during the dawn survey but no subsequent re-entry was observed. At this time of the morning (close to dawn) it would be expected that re-entry would be observed rather than emergence. If the emergence of a bat from this tree was legitimate then the re-entry should have been observed before the end of the survey. As this did not occur the presence of a roost cannot be confirmed. A follow up dusk and dawn survey of the tree was conducted which did not highlight any further emergence or re-entry activity.

At T68 potential emergence was observed during the first dusk survey and potential re-entry during a dawn survey. This was not confirmed during the survey and so a follow up dusk and dawn was conducted which did not highlight any emergence or re-entry activity. This tree contains a dense cover of ivy which is the major bat roosting feature of the tree. The surveys highlighted that this tree potentially has been and could be used in the future as a temporary summer bat roost.

At T254 potential emergence was observed from the tree during the first dusk survey. A subsequent dawn survey and follow up dusk and dawn survey did not record any further roosting activity.

4.3 No Roosting Activity

Roost surveys of the remaining 23 trees (which included the fallen tree, T66) indicated that no bat roosts were present within the trees along the Scheme that were highlighted as having moderate/high bat roost potential. It was observed that bat commuting and foraging activity was frequently constant along the River Elwy and its associated banks and the river is considered to be an important commuting and foraging route.

A number of limitations prevent the confirmation of absence of bat roosts from these trees, notably proximity to the River Elwy and dense ivy growth. As the majority of trees were located in close proximity to the River Elwy surveyors were not able to survey one side of trees which restricted visual observations from trees. In addition to this, many of the trees contained moderate to dense ivy growth which, although will not provide the potential for large roosts, can provide temporary summer roosts. In addition, surveying the entire ivy growth on trees can be problematic as there is not a single feature to focus on.



4.4 Recommendations

Of the trees originally identified as being potential bat trees, there are 14 that are planned to be lopped and 11 trees that are planned to be removed as part of the works in late 2016 (see Appendix B).

Survey results to date indicated that no bat roosts were present on surveyed trees along the scheme. However, owing to survey limitations there still remains a low risk that bats could use surveyed trees as roosts; although it is considered this is most likely to be only as summer transitory roosts as ivy is the main suitable roost feature recorded. Therefore, as a precautionary measure, the following mitigation is recommended for all medium and high risk bat trees:

- Where the tree has a potential roost feature and is to be felled, or that feature would be affected by tree work, then a 'climb and inspect' survey should be undertaken (where safe to do so) under the supervision of a licenced bat ecologist prior to works.
- When details of limb removal or pruning are confirmed and the ecologist confirms this is not likely to impact a potential roost feature then works can proceed without a climb and inspect survey.
- Trees with ivy covering should be cut back between October-December to allow the ivy to die back and then removed under the supervision of bat licensed ecologist. It is recommended that this is undertaken outside of breeding bird season which runs from March-July (inclusive) and outside of summer bat roost season (April-September). Once ivy is stripped and if there are no further roost features exposed (e.g. cracks and fissures) then felling or lopping can proceed without a further climb and inspect survey.

Measures to enhance the terrestrial habitats within the working footprint and the vicinity of the scheme should be considered as ecological compensation. These enhancements should be focused on improving the availability and abundance of prey items for bats.

Offset Measures: As trees are planned to be removed as part of the Scheme it is recommended that any loss or damage to features during the Scheme are offset e.g. bat boxes, new planting.



5. REFERENCES

Hundt, L. (2016). Bat Surveys for Professional Ecologists – Good Practice Guidelines, Bat Conservation Trust. $3^{\rm rd}$ Edition

Galliford Try, Black & Veatch (GBV) (2014). St Asaph Flood Risk Management Strategy. Preliminary Ecological Appraisal. Natural Resources Wales

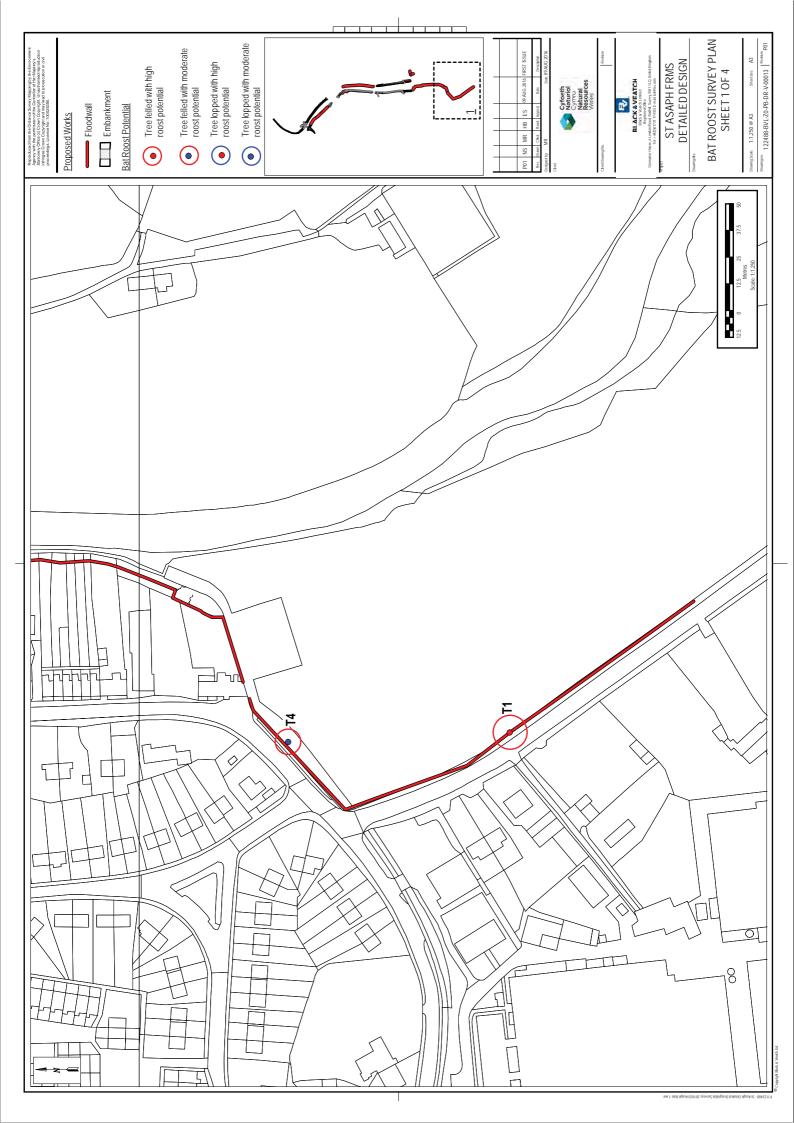
Galliford Try, Black & Veatch (GBV) (2015). St Asaph Flood Risk Management Strategy. Bat Roost Potential Report. Natural Resources Wales

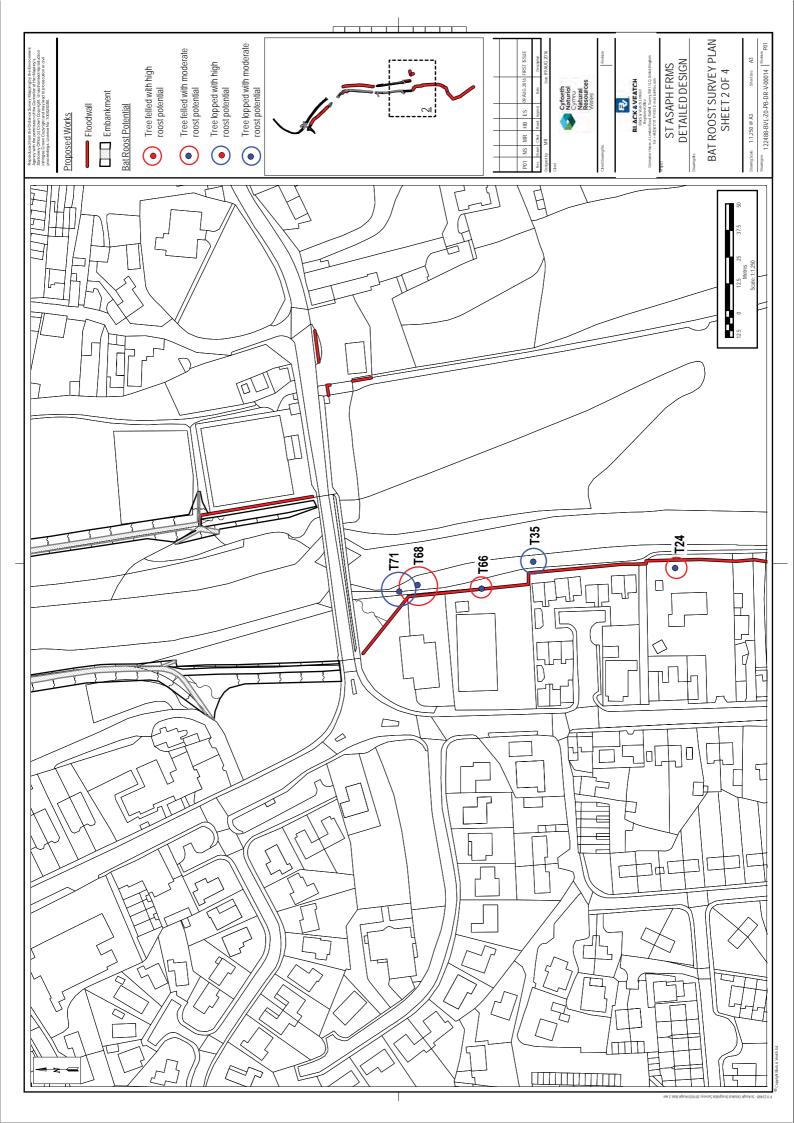


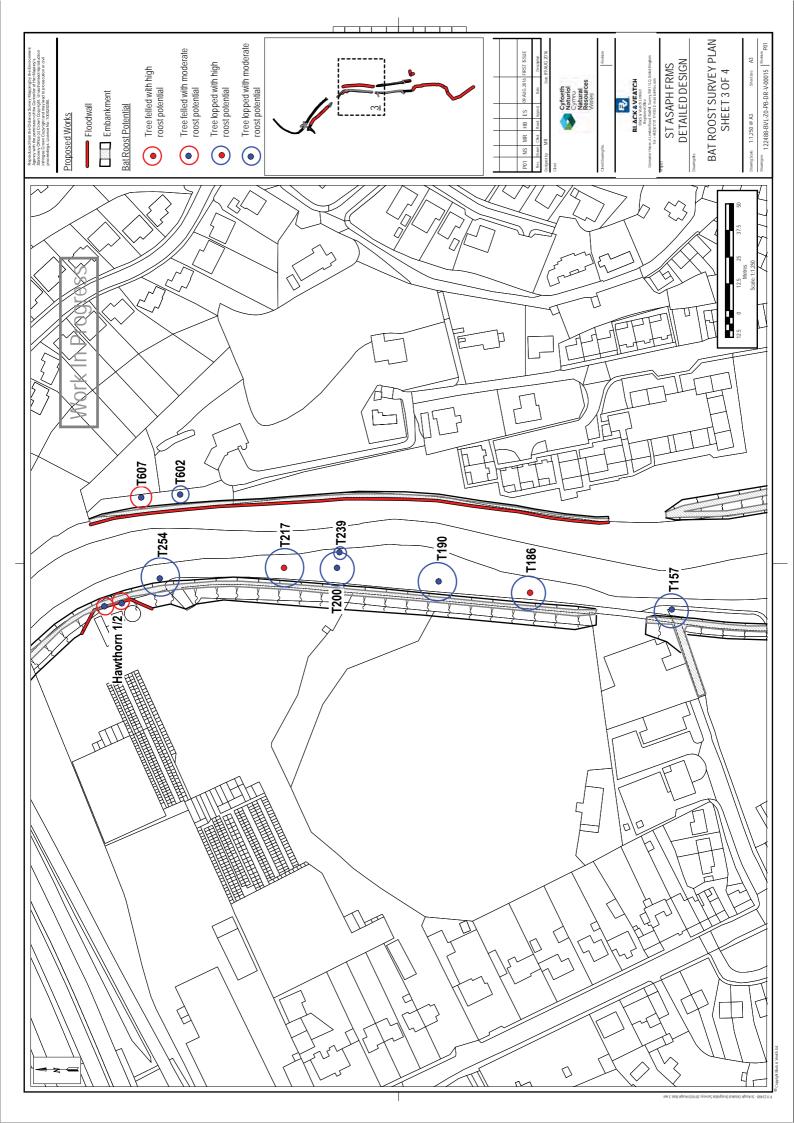
APPENDICES

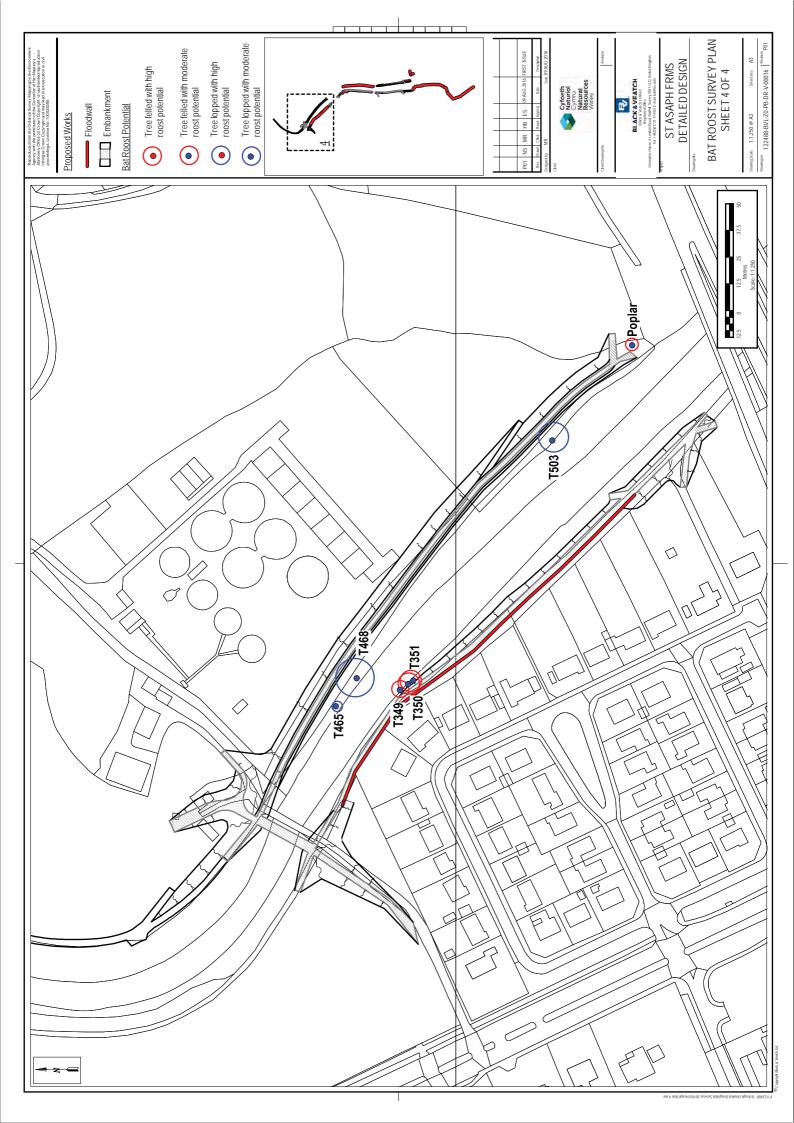


APPENDIX A: SURVEY LOCATION











APPENDIX B: TREE DESCRIPTIONS

			I			
	Proposed action (removed or lopped)	Removed	Removed	Removed	Lopped	Removed
	əldigilgəN					
	моД					
ntial	muibəM		×	×	×	×
Roost Potential	hgiH	×				
Roos	Confirmed					
	Bats/evidence present Describe	Three holes on north side 6m from ground; two fissures on main trunk 3m from ground. Downward leaning holes on south side	Hollow in main trunk (1m in length, 5-10cm in width)	Two shallow, north facing cavities present on main trunk 3-4m from ground	Ivy covered tree with two bird boxes attached to main trunk. Bird boxes are old and have gaps at the bottom and hold some roost potential	A dead alder tree growing to 6m with a north-facing woodpecker hole 5m from the ground. No staining scratching present but has potential to hold a roost
	Other				×	
	Callus rolls					
	ζν Ι	×	×		×	
ature	Branch cavity					×
of Fe	Trunk cavity	×	×	×		
Description of Feature	Loose bark					
Desc	1Hq8	X				
	Age (OM / M/ SM/ S)	M	M	M	M	МО
	Height (m)	12	12	8-9	12	8-12
	DBH (m)	1.5	1	0.3-0.5	-	0.4-0.8
	Tree	Ash	Ash	Lime	Ash	Alder
	Tree number / ref	п	4	24	35	99

					_		
	Proposed action (removed or lopped)	Lopped	Lopped	Lopped	Removed	Removed	Removed
	əldigilgəV						
	моД						
ential	muibəM	×	×	×	×	×	×
Roost Potential	АдіН						
Roo	Confirmed						
	Bats/evidence present Describe	Tree entirely covered with ivy but no other features of interest for bats observed	Tree entirely covered with ivy which obscured view of main trunk but no other features of interest for bats observed	Ivy densely covering much of lower and middle parts of trunk and some major limbs. No obvious cavities/fissures but potential does exist for a roost to be present	Ivy completely covers the main trunk and some major limbs	Split on major limb and south facing. Ivy densely covers main trunk	Ivy covered and dense in places. Main trunk grows straight and is in good condition
	Other						
	Callus rolls						
	Λ Λ Ι	×	×	×	×	×	×
ature	Вгапсһ сауіtу						
ı of Fe	Тгипк сауіtу						
Description of Feature	Loose bark						
Desc	HqS					X	
	Age (OM / M/ SM/ S)	M	M	X	M	M	M
	Height (m)	10	10	12	10	12	10-12
	DBH (m)	0.6-0.8	0.6-0.8	-	0.6-0.8	8.0	1
	Tree	Ash	Sycamore	Sycamore	Sycamore	Willow	Poplar
	Tree number/ ref	89	71	157	602	607	Poplar

inces
Cyfo Natur Natur Reso
O

	Proposed action (removed or lopped)	Lopped	Lopped	Lopped	Removed	Lopped	Removed	Lopped
	əldigilgəV							
	мод							
ential	muibəM	×	×	×	×	×	×	
Roost Potential	dgiH							×
Roo	Confirmed							
	Bats/evidence present Describe	Ivy clad throughout and dense so has the potential to hold a roost	Dense ivy growth throughout and gaps between bark and trunk (2-5cm)	Major split from trunk to major limb which is north facing and about 1m long	Ivy present with some potential to hold a small/individual roost. Tree appears in good condition	Trees are densely covered with ivy with 276 containing several fissures (partly exposed)	Ivy covered to hallway (dense) with some cracks and loose bark. Missing limbs present but cuts are clean with only shallow holes	Two south facing cavities 5m from the ground. Ivy dense throughout and some missing limbs
	Other							
	Callus rolls							
	ζΛΙ	×		×	×	×	×	×
ature	Вгапсһ саvіtу							
of Fe	Trunk cavity							X
Description of Feature	Loose bark		×				×	
Desc)ilq8					×		X
	Age (OM / M/ SM/ S)	M	Dead	M	\mathbb{W}	M	M	M
	Height (m)	∞	10	10	10	∞	14	15
	DBH (m)	1	1	1	0.3-0.5	0.3-0.5	1	180
	Tree species	Ash	Crack willow	Crack willow	Alder	Hawthorn	Ash	Black poplar
	Tree number/ ref	503	468	465	349/350/351	Hawthorn 1 and 2	254	217



	Proposed action (removed or lopped)	Lopped	Lopped	Lopped	Lopped
	əldigilgəN				
	Гом				
ntial	muibəM	×	×	×	
Roost Potential	dgiH				×
Roos	Confirmed				
	Bats/evidence present Describe	Small north facing holes present but couldn't see how deep these were from the ground. Ivy densely covering	Ivy covering is dense and covers the main trunk	Ivy covering is dense and covers the main trunk	Tree hole is south facing and 10cm in diameter. Fissure present along main trunk that is not exposed
	Other				
	Silos rolls				
	ζΔΙ	×	×	×	×
ature	Вгапсһ саvіtу				×
of Fe	Trunk cavity	×			
Description of Feature	Loose bark				
Desci	Split	×			×
	Age (OM / M/ SM/ S)	MO	M	M	M
	Height (m)	19	12	12	12
	(m) HBQ	9.0	1	0.8	-
	Tree species	Alder	Ash	Ash	Ash
	Tree number / ref	234	200	190	186



APPENDIX C: BAT ROOST (DUSK/DAWN) SURVEY SHEETS



			. AR	
Date	26/5/16		7190	73
Location	ST. ASTERU _ T1	90.	RO	-
Surveyor	RG.			
Weather conditions	solo clad dy , lu	It breeze.		
Sunrise / sunset time	21.25			
Temp start	12°C	Temp en	1 10°C - de	arthur (a end
Survey start	21.15	Survey fi	nish 22.55	a try a end

RIVER.

Time of activity	Species noted	Location	Type of activity
21.20	45 gp Plais	and have enged	Les carges nicrond of T190.
33	Nostite, Plus	pats in the concept	now Cocket steller ~ 500 from diguel.
39	3 bt seen	" chang wote	
22.02		WIRRED PRET in tree	breaking @ In dove abakent hegt.
17	2x Normes	, dog fild edge,	dorution, the timed + fle book upsteam.
	No	bab seen to en	ege - but lots of activity around
STAC	PM-SURVEY 03,35	- dear stry, winty	7.5°C. Upo sm of conopg.
	SE C 04.55	L. lan whit are	A toron too live.
	No bats se	in to only tee	

T190 26/5/16 Heather

earner	
Date	
Location	
Surveyor	
Weather	
conditions	
Sunrise / sunset	
time	
Temp start	Temp end
Survey start	Survey finish

Time of activity	Species noted	Location	Type of activity
activity			- Grant u
21.33	Grandle Diagram	O Pat Owler	
	Frequency s	O Bat flying r	tound but didnt come in tree. Came from
11.36	4 (C) A C	1 -10 0 1-1	went off to north (downstream).
>	4 60 - A Pe	whats arcling a	bove but didn't go in tree. Flew off
2 1 1; 8/	As at	re river (north),	flying above canopy.
21.48	As above		
51.27	FS3. Pipisi	relle, Flew past	tree towards north, past tree.
			,
		dillus	
4.10	low leve	flying stro	an direction (along embarker
			south flew to tree, flew around
4.12	low level 1	lying bat from	South Flew to tree, flew around
	abit, fle	in back to sou	$\mathcal{T}_{\mathcal{T}}}}}}}}}}$
4.20	F55. 10	v level. Think e	neged from tree ~ 5m up trusk,
	flew towa	rds river. (2 bo	45)
> Con	mort more	er duck or dom	n. (pun:31/5/14
_			
-			
			8

Date	18 5 16		
Location	Poplar (duck)		
Surveyor MC+RK			
Weather conditions	Clear (4/8cc), no ram, no wind		
Sunrise / sunset time	21.11		
Temp start	12-0	Temp end	11.5
Survey start	20.50	Survey finish	23.11

Time of	Species noted	Location	Time of outlides
activity	Species noteu	Location	Type of activity
21.09	pir		Frenchom over to the right of popular
			+ buck (forage for 2 mins). H+5
21.12	nin		Comm x 2 pips. from river Nt-wards
21-15-	S. per	10m S A Poplar	over Lead and circly around Roplar
21.28			foragem. Just 1 bat.
21.29	Sirw	11	4 forago close to replan
21.30 -			4 /11/34)
21.40	S. pup XS		continua forage.
2640.			V V V
2200	J. Myxlor2	U	continuous forage, les activity the below
22.04	noc	Comm	HNS
22.01			
-22.15	S-rup	fray	continuos like earlier (x 2 or 3)
22.17		com	un3
22-16-			
22.30	2- July	foras	Same as earler
22.31			
23-11	pip + S. Pup	Continuen for	around Poplar
No	but see	- leaven o	enterns her
		N =	
		17	
		<u></u>	

Date	17/5/16	^	
Location	Popolar (me	de Ber) Dawn	
Surveyor	matrx		
Weather conditions	7.5° (clear 0/8, no rain, 0-1 0, nd		
Sunrise / sunset time	5.10		
Temp start	7.5	Temp end	7.5
Survey start	3.40	Survey finish	5.10.

	Time of	Species noted	Location	Type of activity
	activity	0 1050	infield to ear	7201
	3.45	Prp (SSist)		forey - 2-3 of the - Cophing
		6 w could be 95		
	4.017		1 (forage: H+S
	4-10	2.1	0 6110	Ls '
	4-11-		from held in une	leimss + prot us. foras - Mass
	4.20		1 44	
		E. pup	3 HAVI CONSTANT FORE	I'm actually from hold to under pass
1	4.30	6 6 0116	-0.44 (M+5, 2-3 individuals Nothing no tree
-	4.31	C7048314	Shill brown but	sometimes civiliz near tree:
	4.32-	gitenes 1	son have disting	and.
	4.35			
	6.36	pyp		E-m p myerbas?
	quo		forago &1.1.	bove Leads New Alem & unterpass
	4.42	buto		and widepass. 20m from us.
	Mo 8	and after	4-42	
		-		
l				

Date	2/6/16		
Location	ST ASAPH T254	Ash tee in	to half hught + vacks + loose bor
Surveyor	RG		10000
Weather conditions	Dry, Huph NW, clear sky.		
Sunrise / sunset time	21.32 / 04.52		
Temp start	1100	Temp end	10°C
Survey start	21.17	Survey finish	23.02

Time of activity	Species noted	Location	Type of activity
21.38	Kinglisher hie	101	
56	Ryan kas phi	hot but,	
22.00	Muray 102	Suana + Perasis au	
05	dantitasit	both go sp., Low	of artists thats in our valor + under on
45	No actuals a	poth fip sp. 11 LOTS re al both auts —	Contat pps, dand + oth to? @ fart of enterter
44.4534.994456.400	3		
		1	
	Parm -		
de	or, mistry st	1	
03,22	COAT		
04.00	by bat a	1 - 4	
02	OCC "	" exabret	aling towards been us nother
12	up, fly	n (251) story	3
16	open untur	in noi tent und tree	
	Nothing Den +	o etr bei	

		TG8 (B) A	
Date	12/5/16.	Mex	
Location	TER - St. Asada	Dave in	cover. No other features visible.
Surveyor	RG		
Weather conditions	High cloud-30%. das, light	ONL	Y buto SEEN are noted below.
Sunrise / sunset time	21.00	ANY 2	her buts RECORDED were not son.
Temp start	16%	Temp end	14°C.
Survey start	20.45	Survey finish	22,30

Date Location		14/	5/16.	mex 1	1	
Surveyor		768 - St. Asaph Dave in cover. No other features visible				
Weather				14	200011	
condition		High o	claud-30%. dus, li	ez.	UNLY buto	SEEN are noted belo
Sunrise / time	sunset	21.0	0	AN	y other bato	RECORDED were not see
Temp sta		16	i°C	Temp end	11	è
Survey st	art	20.4	+5	Survey fir	nish 22.30	
					40.73	
Time of	Species n	oted	Location	Type of activi	ity los in	<i>i</i> -1 0
activity					1000	ate.
21.18			Ix but evones	- Don lei	alt + flew	uptream.
21.21	Po:	×1	lodging we we	A I	Back !	
22	ZX If	5	LUB,	proper of me	+ are My	head.
25	mulis	re bay	Goodger inc	edited upto		8
28	Noctul		fatagra high	1 / // //	idge -	
35	1 x b		flying when o		ato my lu	ad.
30	1 //	武, 击	Jan Coll Con	T Wes	Hen back -	- avery left.
40/41	1 13/		The state of the s			
22.30	1 pan) 4c a	· Pay or once	- ays	My Wad	
	1 00,					
		()				
40 00	KWK	SURV	4			
03.55	STA		1 0			
04/17	begut	7	the are wer an	olar	11 / 01	
7	Ixbat	disap	and (On behild	tree - come from	the left -	possible re-edy
C.1-	1. 0	<u>-</u>	1111	O sidge 1	114-1:	Ju D
Seul	and a	المالية الأمالة	invalidady upit	and the	Met to be un	partit karaging area
14-7	D way	Wieles	admit of by	ge = trong/6	Jun Wyos car	two te chanel.
0517	SURRISE		my both	IC CHURCH MARE	the artifice t	asagraig.
V) (/	20010()	—				
						1,000

7/16/16 Flan Swel = 9.16 pm Smise = 4.44 AM

	should ke?13
Date	01616 banter
Location	1200 (wares #?) + T234 # Top of banh TRIS
Surveyor	Heilmen
Weather conditions	Armid, warm but day (vained earlier), overcast.
Sunrise / sunset time	Surset 9-20?ph
Temp start	Tempend 1600 (in
Survey start	9.20 pm & 2.25 Survey finish 3.55 5 w am

Time of	Species noted	Location	Type of activity
activity			
21-45	50 th	Not see	volial burt of panog hal? (que wer ?)
21.50	b	u_	n
1		stal	dsporting rain slightly 9.45 - 955
21.57	Ĺ.	h.	of short but at philatin comotors (force)
20. 58	~	μ.	n et 1 aer men.
21.59	· ·	A L	10
72.01	14	1 (cpd) ~	in the ocariant societ wills
N.	k	, 1, 1, 5	и 45
2203	^	- Roll	" 46-deaerreente sola (DR
06		n called	shat, pan H) - n
		More)	48
		W.W.)	AG feeling as pier
22.11		3	more to egyen panes, foraging as wer
WE WAR	social		\$1003 parser of Grazing bat, no ward -0
23.05	end		invitriple partes for 5-10 mins.
,			'
3.25	Start dan	smey-dustin	by has bentowny genry + Mistry
h	50HZ	NOW	frequent parting but noise bettend bout
		and hope feel	It 1) No issued - too down touring
		No Carly Metro	
		1.	repet paron, Sen ditau aran,
		(occamend)	respect passing, some distact away,
		1 SOCIAL	from stal with 4.28
		1 60.	It 12 ofward recoveryd figured activolo (4.25)
		Jam as	
		N. a.d.	Cantrait activity, been y, above iver
			+ near bank (apare Runeli's le
			Ce. 28 = last but heard.
			4.45 en.
		. \	1

No entry a emergence noted during clush of dawn. "

2/6/16		
ST. ASAPH T254	Ash tee, up to	- half hught + wacks + loose bard
RG		
D. A. L. MILL. b.		
My, Char sing.		
2132 / 04.52		
7		
11°C	Temp end	10°C
21.17	Survey finish	23.02
	RG Dry, Huph NW, clear sky. 21.32 / 04.52	RG Dry, Lymph NW, clear sky. 21.32 / Olf. 52 Temp end

Time of activity	Species noted	Location	Type of activity
5) 56	Kinglisher Air	a lott, aut wer,	
22.00	libat, ly	ya (o) M apare grad	
04	dantetan 1 1	Chang + forasis are	Met chancel
45	No actualy		contat pips, dand + other 2 @ fort of embeding
	12 may 1		
	lan -		
ىل	or, misty, s	till	
03.22	START.	1-1	
07	DCC		H, I A I
12	x gi, fls	in (22m) stay	but is a twanty tree very up the an
16	when writing	in noi tak ushri	
	Nothing sen	to etr her.	

Date	2300 Mara			
Location	7157 @ Poar o	Albren	0.1	5 1
Surveyor	Harrien (+ Kak)	and the same of		
Weather	11 SWA	+		
conditions	minula barel			
Sunrise / sunset	950			
time	80.18			
Temp start	1100	Temp end		
Survey start	8.25	Survey finish		

Time of activity	Species noted	Location	Type of activity
71.42	8010-		FRANT Lu .
			on and t
			#
			2016
			4
			An Wish
			10 cm
		The same and the s	CAADO)
7	OAn	Name and American	1
	10,4-11	V	1
		White .	5.65 1116
			repailer occavional points
			sere an ment
			(district / griet)
			DN Q 5 50 mm

	1.14. 10.00	21.1		
Date	30/5/16 (Dans 1)	318		
Location	50 3	50 3		
Surveyor	Melak			
Weather conditions	3/8 cc, fre + 1, M breeze			
Sunrise / sunset time	TR.44.53			
Temp start	1(Temp end [/		
Survey start	3.20	Survey finish 4.55		

Time of activity	Species noted	Location	Type of activity
very	quer.		
3.41	Sirm	river	formsy.
45		1 1	
76	11	. !	11 × 3
4.05	Pm	STEEL HINS	pals.
08	5.84	Ports + 7503	forage high orne T503
(1	11.	ener	
4.20	rw	O 1001	pros.
	e-enh	Osever	1000011
100	C-Viorg	4 stevens	CM (av)
			Y
		74	

Date	30/05/16	
Location	7503	
Surveyor	malex	
Weather conditions	Fire, 4/1 cland	wh 1.80 breeze
Sunrise //sunset	21.27	
Temp start	16	Temp end
Survey start	21.10	Survey finish 22.55

Time of activity	Species noted	Location	Type of activity
21.36	84	Nat presour	river brut 5-+ N
21.41	C-Pro	phis over river	pas s
21.49		To around TSO3	forage for 2 mins
21.55	5.74	T503 over+ river	3 x bots pray for 10-15 mins
25.02	S. Py + C. Py	11 (1	carpures brown.
55-15	myo	SINT HUS	pass
22.20	2. but (c.bh	753	Shil Conhunos dores
22.76	NOC	SMM MNS	U-5 sported
25.32	17	11	i agam
28.40	th	703	form achin.
22.43	mso	River	toran for 3 mins
٥٥٥	emersene	hored.	
	-		



Date	29/6/16		
Location	T190		
Surveyor	melwn		
Weather conditions	Fore, 418,	no wand	
Sunrise / sunset time	21:42		
Temp start	15°C	Temp end	13°
Survey start	21.12	Survey finish	23.10 - Too dark to see and
			coming con tree fives

Time of **Species noted** Location Type of activity activity 21-34 over ruer Contruos L 11 over hees 6-7 Foraging over water

pour to fours on Seen a roose foul as no sung

Date	13/6/16				
Location	St Asaph T24+	35			
Surveyor	KB.				
Weather					
conditions					
Sunrise / sunset	- 17 11 - 17 11 - 1 - 1 - 1 - 1 - 1 - 1				
time	21:18 4.43				
Temp start	16.5.	Temp end		1	
Survey start	9.05 22.45	Survey finish	22·US	4.35	

Time of activity	Species noted	Location	Type of activity
(0.00	Istcall.	Along floate	
		,	
4.10	No call just vieval	Along Nath	D-
735-	papsp. but no no roos) brel on	general achur achurs a mz achurs once amo	to noted on rwer Little + Sperifically an Ne bird box on 12e Lidawn Survey.



Date	1/6/13		
Location	7186		
Surveyor	MULVH		
Weather conditions	18' -		
Sunrise / sunset time	v.lught breeze 1-5m	n, 5/8 cc 21-30	2429
Temp start	180 0	Temp end	
Survey start	21.10	Survey finish	

Time of activity	Species noted	Location	Type of activity
21.43	noc	HN S	commune
21.44	BLE X 1	S+M over clay	forms y
21.46	MOCH BLE	foray	the stor noc, Blt const form
21.51	(m)	comm + foras	MNS. SIM contrat from on R.Elws
21.53	myohs	comm.	
21.55	5-Pup	Glas	fores (5-6 but) speas my vary. (
21-59	S.py+no	Elms	continuon forage.
22-06	C-140 !	post by wa	comm sout.
28.10	C. Pup	6lm	form control now do.
Loh		istorhe so c.	eye + 5 Pyp defront to determine.
22.26	Pup	Glm	3MM cont Arrang but only 1-2
22.40	pup	н	11
22.5	Pup	"	* (
			A C
4 80C	- 5,50. 8	art 3.50 end	6.00. Wester fre wh no wind.
			A 6
3.50	S-PWX		Contrat forage over river
3.26	ເກັ	Elw3+bank	(1)
3-38	8-py 2/	3 u	· · · · · · · · · · · · · · · · · · ·
3.55	5. pup 2/3	د د	4.1
4.13	S.bnba1	"	[4
4.21	achuly Ge	esed.	
4.35	Shul mo	actures .	
4.42	11	n n	

Al BLE could be four pup calls as or is only a four furmer.

Date	28/6/16
Location	T18'6
Surveyor	MRINT
Weather conditions	free, rained 30 mins Lefre jurves. 6/8 cloud no mil
Sunrise / sunset time	21.45
Temp start	Temp end 13°
Survey start	21.15 Survey finish 23.15

Time of activity	Species noted	Location	Type of activity
21.50	Pup (55?)	over water	foragy - for 10 mins - 1 individual
22.66	11	((11 possibly 2 of New now
22.10	VI	1 (
22.11	nochile	NAZ	commund.
22-18	pip	over w de	5 M continuous for my y from start
22-28	41	11	11 continuon
22-31		HNS	Pass commune.
22 40	py (con)	over water	conne
22-50	6		forago (owhomes to 23. \$5 (and)
ner	hy seen	you hole in	hee.
23.07	my o?	Fain Can Hrs	(omn
		11	

M

Date	30/5/16			
Location	T186			
Surveyor	mnwy			
Weather conditions	Ine, 4/8, no wed			100
Sunrise / sunset time	445		,	
Temp start	02:41 5	Temp end	13°	
Survey start	1300 +	Survey finish	04.50	

Time of	Species noted	Location	Type of activity
activity	•		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
0.5.21	py	over water	formy (7 mm):5-10 m M ground
03:02	3 pup) (continues forage 1. Just 1 bot (10 mis)
03:12	1 4	1.1.	(1
03:25	5-pm/50=	55) 11	l C
03:31	11	1 11	11 same toran no previor + sometimes on , ath
1	45	1)	1)
03-45	(t	L.C	foram get less frequent. Faint from top deback
03:51	1,	11	forms every minune leard. but ohm regular
04-050	-58 11	1 (in for
et 03:28	nochre	HAS	Commute
10.40	mobile	()	11
04.05	5 ry	over water	continues forage (8 mins) I bar
04.02	my0 3	405	faint call - 35152.
14.17	S-RW	nor when I ba	
55:40	n	11	ShM (onthings (2 by)
04:31	11	14	11
04:37	an ach	with ceased	
04.80	END	- no com	hom till . No roof
_			
			1 12 12 12 12 12 12 12 12 12 12 12 12 12

\$ (with is shoth ingward faces

Date	02 1	144	2016			Lan	ted on str	eour
Location	T4 (adjacer	of alascoe	1 Stream), St	Asach	- Colde	el free. Sh	mail
Surveyor	Helme	en B	auch (2nd to Rex.	el aven		of hole in	
Weather								
conditions	Drya	nd cl	eer (P)	1 TAM)				
Sunrise / sunset			-					
time	Suiser	0.45	Survis	1 5 35				ĺ
Temp start				Temp end				
Survey start	20.30	-+	04.00	Survey finish	27,15	+	05.35	

Time of activity	Species noted	Location	Type of activity
	Z46Hz	No Sighting (NS)	Short bust head a detector, net recented
21.12	и	NS	Recarding #2
21.19	и		Sun fra he designation Recording #3
21. 32	50 Hz	Seen Almadous Cla	Score Shapen Randale Alle
· · · · · · · · · · · · · · · · · · ·		from L-R tensen's Elm	skow Stream Reading # 4
21.43	50 Hz	NS	#6
21.46	u	NS	# 7 (Paint + short)
21-48	h	NS	# 8 (chart + quet)
21.49	и	dimsed against et lis	+ zom ha he NO recenting
		teward, alascoed,	out which.
21.58	u	NS	#9 (strong same)
22.15	END!		
0.400	NONE -	No battheard as	een
to 05.	30	(Blight using tree	
			,
Note-	Russel c	Uso recorded al	I night using static recently
			t will Swades sound till

Date	15/6/16		
Location	349/350/351		
Surveyor	mainalan		
Weather conditions	8/8 - fine, no	wind.	ic = 5/8 & 7 end
Sunrise / sunset time	4.47		
Temp start	1700	Temp end	1700
Survey start	2-45	Survey finish	4.45

Time of	Species noted	Location	Type of activity
activity			
2-45	C. PCp	Mu)	foraging Just - for 15-17 mins
2.59	pup	HNI	(omn)
3.67	C- P4	HN3	forming for 12 mins
3.22	C. pip	JAIN)	forago (just 1 for 20 mins infrequent)
3.23	5- pup	MMI	com
3-30	blue	MNS	comm
3.32	? mys/But	HNS	fam can yossuly of 301/2
3.35	pup	NHS	Myan can .
3.31	C-P4	NNS	Commy New Juras intregitor 10 mins
3.41	unld	MMS	(omn (Neck)
3.50	n. 14".	MNS	Commy Non fires, intreg; for 10 mins (oma (Neck) 30-31 for a stand (Neck)
4.01	Pyr	MMS	(or mull
4.67	mgo?	NNS	both comm + fourt
4.08	li or Bit	10	l (
4.09	ry	MNS	distal Jorass for I min
4./2	L. Pip	mrs	brief comm
4.21	S. Fly	MNS	Comm
4.18	BCE.	SNN	com our houses from N. Elwy
445	500		
		E	20



Date	14616				
Location	349/350/351				
Surveyor	me jun / HM				
Weather conditions	clear at start. 8/8 cloud; 130, no and				
Sunrise / sunset time	21.20 21.42				
Temp start	13° C Temp end 13° C				
Survey start	21.15	Survey finish	23.45		

Time of	Species noted	Location	Type of activity
activity			
21.44	5 NV intern	Why R. elwy	(small,
21.50	py	and SHE BHNS	· (imm -
21.52	pup (55)	alms footpal	Comm
21.53	drizzle	Stopped or: 22-09	
2159	BOR + UDC	Learn not jeh -	SM drive but 118M
22.01	noL	· toras HNS	forms
22.04	py	over par	forage (3-4 mins)
C.S. 0.1	myo	ever bol	con-
22.11	no c	to, Hu?	(onn
72.12	ry	over 12 this	foras (+3)
12.15	ply	over e-t	com
22.16	C. FW	HNS	further & comment
52.19	BLE	HNS	Murrer & Commune
22.21		MHZ	foras
21.929		for 10-15 mins	,
22.34		over River C	foracy &2 (for 15-20 mins)
23.01	drizzle pm	v. 1.64 (Smins)	,
23.12	myo	HMS	form for 10 min
23.21	Pup (55)	over River	firm for 10 min
-			,
			A
		13200-23	
			·
1		70	

Date	4/4/16				
Location	St Asapl - T4	5 - Split is around form + exposed			
Surveyor	MR + RK Smith Shered gaps at				
Weather conditions	3/8 CC (1245 no rain, 0-5mx).				
Sunrise / sunset time	20.46				
Temp start	12°	Temp end			
Survey start	20.26	Survey finish			

Time of activity	Species noted	Location	Type of activity	Record
L1.03	PY	a fooder	comm W-E	5.52.32-
21-07	C. pup	l I	E-W	
21-15	Sirving	n + riverx2	feely (ar leaf) Smi	7:21:31- 30
21.30	> mp	11	Lach contrat (10 min	130- 25-18
2185	not	3 y our par	noc comm HNG	25:18-25-03
22.10	8- Pup	3 M our par	seeding (45 mins)	25 - 03 - 24.25
,	-		,	2:24:25 -24:02
3-42	Sprip	seedy 5+4	Hars over river	(for 12 ming)
4.00-	4.30 Syry		12	
4-12		S. PIN ONEN BUR	over put	
435	223-py	feeting	over part.	1
4.41	5-py 8.8	feets	comber above fees	2:24:02-2:03:4
5.02	Spy	24 shusely by		Likely root in wwf
		1.00		behind in building.
-04	Srw	last 2 per for	as of flyg un wh	The (4 buildings)
		1		/

Date	3/5//6			
Location	St Arapl T356-Alder			
Surveyor	RK+MR			
Weather conditions	Good. 9° C, 1/8 CC, 10mg wand			
Sunrise / sunset time	20.45			
Temp start	20-30 10° Temp end 23.0° 9°C			a, c
Survey start		Survey finish		

Time of	Species noted	Location	Type of activity	
activity				
21.11	py	comm river	Comm	
51-13	5. pup	over river	comm	
21.14_	ry	feed over rive	contre _ All	
25			MN	
21.29	Dany	co over vive	com	
21.37.	- pry, Sym	over non	Contrar	
52.05	,	+ moder broky	feed	
21.06	my o	come on ba	K MNS	
82.07	-	over river	contrat.	
23-04	44,0			
	- A-	3.35 7 , 0/	8, which is 0-5 mpl.	
	book	3.77. 1 , 01	8, while o-smil.	+
3-4-	s. pup	over water	comm MNS + brett	1
-18	Pure	4.6	W	
1.31	pro	11	14.28:	
4-5.2	piy	n	MNS Budger ove	7
5.09	c-pip	our water	S+M com Spring Bril	×E
				7
				\exists
				\exists
				-
				-
				-
				4
				_

GALS.

Date	20/6/16			
Location	84. Asash. 7602 27607			
Surveyor	KS WH.			
Weather	Dry, calm, 60% cloud court.			
conditions		/		
Sunrise / sunset	21.45 22-20	- wind increas	eg	
time	04.46 - Dry, still.		1	
Temp start	16.5°C./14°C Temp end 16°C./.16°C			
Survey start	21.05/03.06	Survey finish	D2-50/04-45.	

Time of	Species noted	Location	Type of activity
activity			
WAV 15	1st caul WH		
21.41	1st coul(Kg)	-Fant (on viver)	
21 41	61 635(1-5)	Tarrett on vivo	
	austrat Plus	SUC PARSE C	
	feeding Ev	ELS PASSES 22 LA GATOR 21.	5.5
		V [
			á .
1.11/16			
WAV 16			
02.00	Couls const	auth	
03.43	Cous const	70626	
		ased @ ~ 04.30	Lelow conory
	, ict iver y	30 31 (holow consul
			1100
			41
			R O
			(// a(M)))
			16/11/22
		*	
			The A
L	<u> </u>	· ·	

fee over

Date	21/6/16	
Location	St Asaph T68	- Behind co-op area, close to bridge
Surveyor	K8 WH.	Ash-Ivy Coxered
Weather		
conditions		
Sunrise / sunset	21.45	
time	04.46	
Temp start	17°C.	Temp end
Survey start	21.00.	Survey finish 22. 45.

Time of activity	Species noted	Location	Type of activity
21-40	Piō .p.	Along fleath	- Flynd low alaxa Dath. - Hier back, or towned onto
			Constant fly bys - peak activity between 21:50 - 22:15



TI XMR

Date	27/6/16	
Location	TI	
Surveyor	HRIMR	
Weather conditions	7/8, no and, fire.	Wind picked up to Smpl. toward
Sunrise / sunset time	21.43	
Temp start	16°	Temp end
Survey start	21-13	Survey finish 23-43

Time of activity	Species noted	Location	Type of activity
22-05	PW	Forage ormale has	rol (1) - for 2 mins
2726	prop	HN)	compleas
22.27	c-624	See nost	A real. comm le hus
22.28	Cielon	HMS	forace (ordsall same bat as about
22-34	C. Ph	HNS	fortige (think on the other side of road to hop)
22-40	(- 10 - 1	S+M (aimmule)	Comn pass A real. comm pass Forage (probably same bat as whore) forage (think on the other side of road to bee) ghot a cross road past the bee howards on
2245	Phe	1 1/2)	Comm
22.48	myolpus	Nns	foraging-pert pup but cowld have myo too forage on track text to horse (5 mins) Common forage for 6 mins (der at (3) (1) Common hen frage for 3 mins Bret further close to house?
22-50	pup,	(1)	forage on hack that be how (5 mins)
22.53	PW	CC-4NS	come forage ont of for 6 mins (der at (3) (1)
23.14	pw	(1)	Comm+ New Longe for 3 mins
23.19	BM	MNS	Bret flutter close to Louse?
	•		

Date - Lover Dembigl Location Surveyor 4/8 cloud. Weather ONUS + Andsor Exp conditions Sunrise / sunset time Temp end **Temp start** 23.30 21.05 **Survey start** Survey finish

activity 21.49 (Bat) mas in airly will. Pass. (outline in become it diomera. 21.51 (Bat). 22.08 (Up S+M (E) I sec Comm outh road. 22.11 per Mass (I) forming pp but failing 22.14 noc? Mass (I) forming 2 sec in hormal 22.15 (May Mass (I) broke Commenty 22.16 per S+M (E) broke Commenty 22.17 per S+M (E) broke Commenty 22.18 per Mass (I) forming (I) per S+M (I) 22.19 per S+M (I) commenty 22.20 11 Mass (I) 11 22.21 noc Mass (I) poss. forming (I) forming 22.22 noc Mass (I) forming (I) forming 22.23 noc Mass (I) forming (I) forming 22.24 per Mass (I) forming (I) forming 23.14 per Mass (I) pass 23.14 per Mass (I) pass 23.14 noc (I) Mass (I) pass 23.14 noc (I) Mass (I) pass 23.14 noc (I) Mass (I) pass	Time of	Species noted	Location	Type of activity
21.49 Bah 21.51 Bah 21.51 Bah 22.08 Bup S+M (D) Leec Comm out road. 22.11 pay Mrs (1) foras, pap but faint 22.14 noc? Mrs (1) foras, pap but faint 22.15 Lulau Mrs 27.16 pap S+M (E) brok comment 27.16 pap S+M (E) brok comment 27.17 Lulau Mrs 27.18 pap S+M (E) brok comment 21.21 pap S+M (E) comment 21.21 pap S+M (E) comment 21.21 pap S+M (E) pass foras, (f fece.) 21.21 pap Mrs (E) foras, (f fece.) 21.31 pap Mrs (E) pass 21.41 pap Mrs (E) pass 21.41 pap Mrs (E) pass 21.41 pap Mrs (E) pass	1	Species noted	Location	Type of activity
21-51 Bat 1. 22.04 Bat 1. 22.08 Pup S+M (D) lsec comm own road. 22.11 pap 1000? Hars (1) form 2 sec in Morand 22.14 noc? Hars (1) form 2 sec in Morand 22.15 Lullau 1005 weird and be from passing car. Cleuk 22.16 pap S+M (D) book comment 22.20 11 1005 S+M (D) comment 22.20 11 1005 S+M (D) comment 22.21 noc 1005 form 22.22 noc 1005 form 22.23 noc 1005 form 22.24 comment 22.24 noc 1005 forming (5 feer) 22.39 noc 1005 forming (5 feer) 22.39 noc 1005 forming (5 feer) 22.31 pat 1005 pass (2 sees) 23.14 pap 1000 pass		Bar	(1) MAS IN ROOM	ald. Pass. Couldn't id become A distance.
27.04 (Ser Mrs (186c). 27.08 (up S+M (C) 186c (comm own road). 21.11 pry Mrs (D) forage pry but faint 22.14 noc? Mrs (D) forage pry but faint 27.15 LMGM Mrs (D) forage pry but faint 27.16 pry S+M (Z) bnot comment 27.20 11 Mrs (D) forage pry but faint 21.21 pry S+M (Z) bnot comment 21.21 pry S+M (Z) comm 21.21 noc Mrs (D) poss-forage et-S secret 21.22 noc Mrs (D) forage. (S feer.) 22.39 hoc Mrs (D) forage. (S feer.) 21.41 par Mrs (D) pass 21.41 par Mrs (D) pass 23.14 pry Mrs (D) pass	-			
22.08 (up S+M (i) lec Comm own road. 22.11 pry Mrs (i) foreign pry but faint 22.14 noc? Mrs (i) fami 2 sec in Morand 22.15 LM/GH Mrs (ii) fami 2 sec in Morand 22.16 pry S+M (ii) brok commell 22.20 11 Mrs (ii) brok commell 22.20 11 Mrs (ii) comm 22.20 11 Mrs (ii) comm 22.21 noc Mrs (ii) poss. foreign 4-5 second. 22.22 noc Mrs (ii) foreign. (5 feco.) 22.39 noc Mrs (ii) foreign. (5 feco.) 22.39 noc Mrs (ii) foreign. (5 feco.) 22.39 noc Mrs (ii) foreign. (5 feco.) 22.31 pat Mrs (iii) pass 23.14 pry Mrs) pass				and can (1860)
22.14 por mrs (1) formy pry but faint 22.14 noc? Mrs (1) formy pry but faint 22.15 LMGM Mrs 27.16 pry S+M (2) brok comment 22.20 11 Mrs (3) Comm 21.21 poc Mrs (4-5 seconds 21.21 poc Mrs (6) poss-formy 4-5 seconds 21.22 noc Mrs (6) poss-formy (5 feconds 21.24 Copy Mrs (6) forming (5 feconds 22.23 noc Mrs (6) forming (5 feconds 22.33 noc Mrs (7 forming (5 feconds) 22.33 noc Mrs (7 feconds) 22.34 par Mrs (1) pass 23.14 pry Mrs pass	_	1.		
22.14 roc? HMS (1) fam 2 see in Morand 27.15 LMGH MNS weird com could be hom passing con. Cleck 27.16 prop S+M (2) brook comment 22.20 11 MNS (3) 11 21.21 poc MNS (5) poss. foras 4-5 secons 22.21 poc MNS (6) poss. foras 4-5 secons 22.22 noc MNS (6) forasing (5 fecs.) 22.39 hoc MNS pass (2 sees) 22.39 hoc MNS pass (2 sees) 22.41 par MNS pass 23.14 prop MNS pass				
27.15 LM/64 MNS weird com could be how passing car. Clerk 27.16 prop S+M (2) brief commity 22.20 11 MNS (3) 11 21.21 proc MNS (5 poss. foras 4-5 secons 22.22 noc MNS (5 poss. foras 4-5 secons 22.24 c.prop MNS (2) commity 22.24 noc MNS (3) forasing. (5 fees.) 22.39 noc MNS (3 forasing. (5 fees.) 22.39 noc MNS pass (2 sees) 22.41 par MNS pass 23.14 prop MNS pass				from 2 See in Mand
77.18 prop S+M (2) brok comments 22.20 11 NNS (3) 11 71.21 Proc S+M (3) Comm 22.21 noc NNS (1) poss-forage 4-5 seconds 22.24 C. prop MNS (2) comments 22.23 noc MNS (2) foraging (5 feecs) 22.39 noc MNS pass (2 sees) 22.41 par MNS 11 22.51 rgo? MNS pass 23.14 prop NNS pass		,		
22.20 11 21.21 Pyrc2 S+M (3) Comm 12.21 Poc Mrs (6) Poss. foras 4-5 secre. 22.22 Poc Mrs (7) forasing. (5 fecs.) 22.39 Poc Mrs (7) forasing. (5 fecs.) 22.39 Poc Mrs (7) poss (7) 22.39 Poc Mrs (7) Poss (7) 22.51 Poc Mrs (7) Poss (7)			S+11 (2)	
21.21 Pyrc2 S+M (3) Comm 22.21 noc Mrs (0 poss. forage 4-5 secon. 22.24 noc Mrs (1 foraging. (5 fecs.) 22.39 noc Mrs (2 sees) 22.41 par Mrs (1) 22.51 ryo? Mrs pass 23.14 pyr Mrs pass				
22.27 noc MNS () poss. forage 4-5 seconds 22.27 noc MNS () commune. 22.39 noc MNS () foraging. (5 fees.) 22.39 noc MNS pass (2 sees) 22.41 par MNS pass 23.14 pm MNS pass	I.			
22.27 noc Mrs (5 feer.) 22.39 noc Mrs (5 feer.) 22.39 hoc Mrs pass (2 sees) 22.41 pat Mrs pass 23.44 pro Mrs pass				
22.27 noc Mrs (5 feer.) 22.39 hoc Mns pass (2 sees) 22.41 pat Mbs 11 22.51 ngo? MNS pass 23.14 py MNS pass		1	-	()
22.39 hoc MN3 pass (2 sees) 22.41 pat MD3 11 22.51 rgo? MD3 pass 23.14 py MN3 pass	22.27	_		
22.51 mgo? MNJ pass 23.14 py MNJ pass	22-39	hoc	MN3	
22.51 mg. ? UND pass 23.14 pm NND pass	72.41	par	Mby	
23.14 py 11N) pars	22.51	ryo?	CAN	pass
	23.17		MNS	
		•		

Date	116106			
Location	TI			
Surveyor	mark			
Weather conditions	True, no who	d 6/8 cc		
Sunrise / sunset time	4-52			
Temp start	1200	Temp end	1400	
Survey start	2.50	Survey finish	4.52	

Time of	Species noted	Location	Type of activity
activity 2 - 5 l	01.0	(I) MN1	Longe
3.19	(- BL02	(1) HNS	fora of 5 min
3.17	C. pup	17.00	how S
3.19	pup	H+5	My across road come + forage
3-21	prop	MNS	foras I minul
3.26	S.pw!	HNS	four commerce
3.27) Bre ! Hh?	fourt could be myo BLE?)
3.29	C. bab	HNS	forago pup on over sint A road (I'm
3.35	C.pup	4+30	toragon over ledge by TI (10 mins)
3.45	5.pu	MNS	foreign
3.48	PY	Mas	forag (3) behind mr
3.57	moclage	H~S	fait (1) possibly. commune.
3.55	BCE?	400	both commute.
4.00	pup 45184	Mrs.	four . poss forege for 30 secs. forege my. Unand All for 5 mins. (3) area.
4.15	Pro	nrs	Commune
4.16	pup	Mrs 3	bret frage (5 secs)
4.32	Bar	HW2	bref. (omm.
			<u> </u>
	-		

Date	28/6/16		
Location	T217		
Surveyor	MRIAR		
Weather conditions	Fire, 218cc, no ran		
Sunrise / sunset time	04:49		
Temp start	N°C	Temp end	12°
Survey start	02-50	Survey finish	4.55

Time of	Species noted	Location	Type of activity
activity	Species noted	Location	Type of activity
02.50	S. PUP	over water (1)	constant forag of single bat (15 minute)
3.10	S. UPW MOC	((()	foras wor poss noc
3.17	Spip	11	8m pragu + seen (1 individual) (8 mi)
3.30	PUP	A\$ (2)	comm MNS (but behind MR)
3-32	5-74	Ll	forage same as before, Continuos, 10 mis
3.47	S-ypip+c.pu	r? 11	forasin : But 2-3 individues coursed - + 10 mins
3-55	S-rw	11	foraging. Just 1, advidual - continuos. + lom
4.05	rup	11	forasy (at least 3 bas longer with.
4.10	pup	4+5	foraging over water XZ. cowhomas for : to mins
4.20	rips	11+>	Ar lear 3 foragy: For 4 mins
4-25-4		Muchy.	
4-31-	4.40 - no a		165
4-41-	4-51 - no a	my - End.	
		,	

& Dense 1vg 1 carry 5.10cm diameter - 6m high - Too exposed?

Date	Ent) une		HW 7 I
Location	T217 ++0		0 4
Surveyor	RG borstand		Of and Ilan
Weather conditions	Overait + raing. 15 ich.		1 1650
Sunrise / sunset time	21.45		
Temp start	13°C	Temp end	12°C,
Survey start	21.30	Survey finish	23.15

Time of activity	Species noted	Location	Type of activity
21.36	x RO POUD	are new, heading UPA	74
37	X I dontea	are bak tout	tree the downers are niv
38	x 2 ins. Va	h danted Paragli	with some tree causes.
42	X / Wan	dantian >!	
44	X , flotting a	and year carges + lubs	of the tree not son to envire.
1) st	gred rung, b	it trees shal large	leads of voito in the mid = feely like ran a
22-00	X / bats, Muin	11.77.1	mir edge pert to me - registed largery the le
09-	and worm	in to ato as the	is busine duin + less treezy: weres.
15	Daymtars, Var	are wer bling do	in steam !?
391	x reer as a		the tree courses
55	BUR	/	43
•			
000			
03.25	START	DAVN.	Elia Dry calor awant,
38	x l let, Playi	prototree on N as	luge 0309 ~ Sigh, 11°C.
40,		they have be some	
46.	X / Parage	of the last of the second	Jak Male
LIX	VII 113	don helpou	N-St. fort
49	V1 ()	11.	
51,1	Parain Na	p too Rield sode.	
53,	41 Phraging	inder tee, Rild 1	
404	X SEN,	field sale.	
11-	X I	1 1	
45	ENP.		

	1		
Date	29/6/16		
Location	T68		
Surveyor	majur		
Weather conditions	Fire, 3/8, no we	nd	
Sunrise / sunset time	04:50		
Temp start	10°C	Temp end	
Survey start	02:55	Survey finish	

Time of	Species noted	Location	Type of activity	1
activity	,		**	
2-59	py	over water	continuos for 5 mins	
3-12	YM	11 11	Comm	
3-14				
3.28	PW	over water	comm + buch formy	
3.20	mao	111)	comm , secre	X.
3.31	sove nur!	NHS	Single brazy (40-43 Phronger 1 Thick) &.	
3-37	my0 ? py(4	o) HN)	Comm & forage	
3.40	pup(40)	Nh?	brush brase + repeated for 10 mins formers. could be common pur distrorted sound by	
3-41	pro (40)	NN)	foras. could be common pry distorted sound by	brees
3-47	DAWS /mi		Pass	
403	e-pup	m)	pass	
4.19	OLt?	the?	Lion nurer brief	
423	Dans/mb.		Comm	
429	C. ry	Hor	comm	
Holly		A .		
Smy	end. Not	by see from	her.	
]
				7
				7
				1
				7
				1
				1
				1
				1
				1
				1
	1 and 4 A		<u></u>	_

o wy correct of Arfrench to Ange (Aran better to Clin)
o was is moderated covern. Temp summer room onthe
o Quite Armen to fee (n + as 1vg + branens obscure)

Date Location	19/5/16 Hawchom 1.		
Surveyor	MR+RK	+ ((104 covered)	
Weather	MICTRA		
conditions			
Sunrise / sunset			7.1
time	1		
Temp start	8		
Survey start	3.1/	Temp end 9-5	
	7.11	Survey finish	

Time of activity	Species noted	Location	Type of activity
3.11-	·01	0	and the same of th
3.20	pup	tonay no +	1 or 2 foreseen
		over rue	1 or 2 forages
3.53	8-pip	Comm	MNS
4.00 t.03	S.py	11	
2.03			et .
4.07	BLEPMAO		Lights from cattle maker turned on which
4.08	STAN		
1-21	Mys	MNS park	Comm once up + down
1.02	J. prop		comm parts
1.28	41	on pah (6/1-)	fordy up a form.
.41		11	11
	Pup	Jame 42~ 5	Com
11	A-		
	end.		
-			
FVA			
-			
ALT:			
1			



Date	23/24 May 16.						
Location	St Asao	u bu foothri	dae TI5	7			
Surveyor	KOLD KO	St Asaph by footbridge T157 Kate Boggally					
Weather	DUSK - D	ry, clear, NO wi	rd ~11°C				
conditions	Dawn - 1	DOWN - Dry, clear, no wind who c					
Sunrise / sunset	Surset -						
time	Surise -						
Temp start	Temp end						
Survey start	20.35	03.30	Survey finish	B 22.00	04.30.		

Time of activity	Species noted	Location	Type of activity
21.30	Pip Sp	from floridge	Faint Dass- bu
4.35	11 11	11	faint pass-by
1.40	unknown	te (/	faint pass-by
1.42	Pip SP	Around summunding	- El Odin huzzes - constant activity
		tree canopies	-feeding buzzes - constant activity for in 15 mins
3.31	Pio sp	MCrown	V. Faint call
3-40	ti tr	under tree line	Faint call - poss feeding buzz. (River noise obsaming calls!) V. Faint call
3.45			(River noise obsercing calls!)
	PID SP	By bridge Under thee line	V. Faint Cay
3.46	<i>u u</i>	Under thee line	Pass by.
-			
	W		X - Position

Surveyors
- Flight

Adman

Date	25/6/16-	- (AM)				
Location	T186	0-1	Post of	arbakment upste	pan of Tree.	
Surveyor	RG					
Weather conditions	40% cloud,	breezy,	10-150	ph		
Sunrise / sunset time	04.45°					
Temp start	13°C			Temp end	13°C	
Survey start	03,20			Survey finish	04.457	

Time of	Species noted	Location	Type of activity
activity			
es set	meles Pordain	Qton a bank @ su	ver stat.
13/3/4	PAN 11 Plan	us udo love low	
39	get the mes	1 1 1 1	we lives votrous, we buy one, brages us they go
54	LT >	3	the figure of the first the go
S6	Pro actions	is yet lawy.	1 hays
59	et ent 2x	laro Lawry our	
		pps willing und	the upon tree causey.
04.04	North fly	upshean over	
-	for sall was	in volvaion	
	still at least	(p) avenue u	for camp
13	+1 flying	heit, dantian,	but last langer out mer back
13	vote le bas	in yest cargo.	
22	+ 1 duet fly	La Company	40 y hayle
24	+2 n	. 4	(, , ,
25	+ 1 duct	dantier arong	hud
27	at boot x3	bats in upor county	
29	actual versed	danstran - va	in till seen over in + high tree coughs of 2
30	x 1 bot of	the cirlin vearby	but dawner
34	12 come	rate, willy do	wer caron, the are but not its the
38-40	XI Rods	in our now ha	and the lew vost are abstract the
		3	+ over cichit grand, towards reciclitati
	No both see	to entre tee	Tooking on the
	But lots a	with in words	a + aur un
	The last of	7	

Date	24/06/201	.6
Location	T186, St Asa	
Surveyor	Russel Great	a) + Herbe Rom
Weather	That I	
conditions	1 Dm & de	ear, Showt mind
Sunrise / sunset		
time		
Temp start		Temp end
Survey start	03:29	Survey finish

Time of activity	Species noted	Location	Type of activity
3 20	50	Rivar	touthe and we introduced
		WYYUV	14 1 2 142
			Heling Admil over inver chand HI + 2 (HZ = 4 mms as forged to form off) Carriers from 3 202 3 33 Men parse
1			Cannua non 3 Cet 5.5% Inh parse
			338 & actually (fearth green was
			13-40 bridging stats)
			3.65 wind pickings, tooks still king heard
			#404,12 represented recoving of
			3.36 & actually (few trans week (3.40 brids any stats) 3.65 mind pickings, buts still being heard #40 4,12 representative recovering of each tool bod citims heary (wire-
			1 alt hear @ 4 35 pm intil 4.40 - Bat sien lyng han were range proserves could grow No butter actually eniod siney = 4.750
			4.40 - Bat sien lyng han wee
			Town prosent could grand
			No butter actions
			enid siney = 4. \$50

71 56+68 66=cbal=leller Jen 55

Date	12/5/2016		
Location 171	PRON veer of	Ce-cp 8t Ah	
Surveyor	Herbren		
Weather conditions	Dinjwan, de	Pake pietr	
Sunrise / sunset time	9.15		taneway.
Temp start	grow	Temp end	
Survey start	9 gu	Survey finish	

Time of	Species noted	Location	Type of activity
activity			
	49 th		Bat New pastyres + vastt val
21.784			for Renal
			Zhat Teyku.
			Bathan pastifier + vand + vand + vand - vand
			Carlo Area of
	4		Moetales + 7-3 bats.
	2. 2. 10	. 0	Nicetyles :
	on howa	/)	1 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
	0, 10.		#1+2 0 Soits
	fleeto	ń	43 6 704
		7	H 4 0 50114
	e buc	ne de	45 0 72 Hz
		1 - 20	H 4 @ 50 11 4 H 5 Q 22 Hay H 6 Ze 50 scordly
	of near	Wel	" Cravy
			9.32 Slemy dan
	977 XI	noul	940 (en visuel
		RO ich	Well policy of the
	101	Du t	Rfill pochog in cele lection Q 70 + 50 HI
			Chi again 1 7/1 /alla att
			Convend panes. + vente
	. /	11 1 1	a converse funes. There or a
voa	cuely ne	Whir	9.44 ments 50 Hz.
0	11110	16 Dy sile	License continue la victo ca ta
VVO	~ Migho	10 Wy SIVE	some 6-10 Mill recovery 46
		***************************************	Schree Co MII Velentry 76
	North		occanional the part deug part and went sive of the morty newby
	North + Pip		accommand the part deling part an
			her sive of thee, marty newson
			Some from what t behad free
			> ome fun inhalt to they free

21.44 | bat, tand the for left but the third of pron 188 ", fants of part of back beath the .

STARTED BAINNO C - 21.45 Light rain.

21.55 | bat, fan fall how pries , parned doe by to The .

still fing, fartimen, for fraging clock of Lock.

21.53 | bat, fan fall is beathwist ree...?

20.5 Lots of autis, both Nove and Thee...

14 2 bats seen challs one and it with the chapt. of Sure, St. Asoph souther ecens, 15th, wetgrand, still. Thee 234 on miss edge. Dead abler.

Street Cot. The 234 Down Enney For Street Cos. 25, Sunster Cos. 25, Sunster Cot. 45

64.03. Bother etree + lost, -possible entry?

04.19.

Generally loss of actuals about the both to obs snaming behaviour.

04.33 Noithe (Dis upter-, high bone conquy.

Date	13/5/2016	
Location	171 PROW	near of asert do busdone
Surveyor	HS	
Weather conditions	Dry + clean	
Sunrise / sunset time	5.15 Am	
Temp start		Temp end
Survey start	3.45	Survey finish

Time of activity	Species noted	Location	Type of activity
8.50	30#z		Nac le a
5.50	1016	11	Well have t
		1-7	tar Dollan & Welloway
			HOCKUTHAN 7 Fat Colom & inventoward healen : # 08 = Catherine la terma
			# 08 = Cahman be to my
	ļ		(?
			Less Henry Carponal.
			Und head Chinad.
			Conf. Let
			and the second s
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<u></u>			G C
			7 f' vos trao par
	1		
100			
			£ , t, q
			1
		<u> </u>	5.15 end or smay (smise)

19/5/16

DUSK Hawlin 1+2

MR + RK

13.5.4 Cream. Ons he Gran but moderate winds. 8/8 elsend

21-11 8 months 20:41. From 1:23.11

Dush there 20:41.

Time	Spelies	Locara	Type 1. achurch
1.10	Statut d	1122 ing	
-9	Shorped -	Jane Kilo	
1.11	2 Lo bland -	Suns Comu for	
21.37	brid	MMS comm	2 & Schwy
11 36	m50?	MMS comm	hie o / fem !
1.57	5. pro	nos	for 2-3 stands
21.58		comm H+8	over part.
		Forage Mass	
(13)	C-bib	Larange 1.	
-			and the second s
-		7 7 7	
-			The second secon
		12.00	
			4
		1	10 10 10 10 10 10 10 10 10 10 10 10 10 1
-			
		U	
			0 1
-			
			A
		14.	
		- N	

Date	2/5/16		51	REET LIGHT ADT TO TREE.	
Location	T4	ROAPSIDE	ILLUMINATES CAN'TY /CARCK AN		
Surveyor	R. GREY TRUNK.				
Weather conditions	CLEAR, DRY			FIELD-FACING GARS, PARTVALLY	
Sunrise / sunset time	20.43/5.34 IHUMINATED.				
Temp start	9°C / 6	°C	Temp end	6°C /6°C	
Survey start	20.28		Survey finish	22.15	
	04.00			05 34	

Time of Species noted Location Type of activity activity 20.59 45 rip. Not seen (NS) FLY BY 21.11 21 21.31 N5 21 43 21. 45 17 ANADLE FEW N.S MERGED.