

# Bonesgate Stream

## Bird, Mammals (including bats) and General Invertebrate Surveys

A Report for Kingston upon Thames Council for information  
towards the Green Arc Project

August 2006

## Summary of findings

	Badger	Bat roosts	Water Voles	Kingfisher nest sites	Other interest
Section 1 Bonesgate Open Space.	Present	Small common pipistrelle roost in nearby property off Thrigby Road.	High potential	Breeding	Amphibians Marsh woundwort Bullfinches <i>Crysolina oricalsia</i>
Section 2 Moor Lane to Drake Road Open Space.	NA	Common pipistrelle roost in property on Moor lane. Daubenton's bat.	Medium potential	Breeding	Song thrush Large Volucella species
Section 3 Field 5847 to Cox Lane.	Low potential	Common pipistrelle roost in a property at Gately Avenue.	High potential	Low potential	<b>Breeding</b> birds at F5847 include at least four species of high conservation concern: lesser spotted woodpecker, bullfinch, house sparrow and song thrush.
Section 4 Cox Lane to Colne Court, Watersedge Estate (Tolworth Court Farm)	Low potential	Roost present in a property near the Basket Ball Court. Daubenton's bat near the confluence.	Medium potential	Low potential but breeding nearby along the Hogsmill	Hedgehog 4 species of bush cricket including Roesel's Lesser Marsh grasshopper Box Bug

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## 1.0 Introduction

Two arms of the Bonesgate Stream flow from the southwest of the borough into the River Hogmill near the A240. One arm rises in Horton Country Park in nearby Epsom and Ewell, whilst a second near Chessington Wood. They both join at Green Lane TQ 180 628. This survey of birds, mammals (including bats) and general invertebrates reports on the stretch from Filby Road, Chessington (as it flows from Castle Hill) to the confluence with the Hogsmill at Watersedge. For the purpose of this report this stretch of the Bonesgate Stream has been divided into four sections. Each section reflects the changing character of the stream due to the influence of offsite land.

1. South western stretch: Bonesgate Open Space (TQ190637)
2. Moor Lane to *Drake Road Open Space* (TQ194641)
3. Drake Road, Field 5847 to Cox Lane (TQ196644)
4. North eastern stretch: Cox Lane to Colne Court, Watersedge Estate (TQ200648)

### Section 1 South western stretch: Bonesgate Open Space



Both banks are entirely within Kingston upon Thames and are characterised as oak woodland with mature hazel and blackthorn scrub which overshadow the watercourse. The eastern side is known as Bonesgate Open Space, Local Nature Reserve. The grass is mown very short except near Filby Road, where several mound forming grasses (*Deschampsia cespitosa*) and a stand of meadowsweet, are found. On the south west bank near Moor Lane are old allotments which have remained uncultivated since the 1980's and are known as Moor Lane Conservation Area. The mature oaks (standing and fallen) make this an interesting area. On the opposite bank are two stands of marsh woundwort (Fig. 1).

### Section 2 Moor Lane to Drake Road Open Space.

Bonesgate Open Space continues beyond Moor lane on the western side of the stream. For the purposes of this report it has been called Drake Road Open Space. It is characterized as poor diversity improved grassland although there are some interesting plants such as agrimony and hard heads. A tall belt of hornbeams and poplars along the meadow just before Field 5847 creates an interesting microclimate. The Stream forms the boundary with Surrey and the eastern boundary is in the district of Epsom and Ewell. There are small patches of woodland along this side and harts tongue fern features along the bank.

### Section 3 Drake Road (Field 5847) to Cox Lane

The western boundary of the stream coincides with Field 5847. Breaks in the vegetation at waterholes provide views across honeysuckle covered hawthorn scrub and the occasional patch of marsh woundwort. The mid-point on this stretch is Gately Avenue, often used as a marker in the report. On the last hundred and fifty metres of the eastern bank, is a large bund causing a pinch point on the path.

Fig. 2: Section 4 the north eastern stretch: Cox Lane to Watersedge



The western boundary of the stream coincides with Tolworth Court Farm Local Nature Reserve. Several large willows overhang the stream where it ends at its confluence with the River Hogsmill.

## 2.0 Bird Surveys

### Method

The survey was based on the methodology of the British Trust for Ornithology (BTO) Breeding Bird Survey. On each visit a slow walk was made along riparian paths and all birds seen or heard were recorded. Three visits of approximately 4 hours each visit were made on:

- 25.6.06
- 30.6.06,
- 16.7.-17.7.06.

### Results

Of the 35 species recorded during the survey at least thirty were found to be breeding along the river corridor. The most comprehensive bird surveys of these areas in recent years were: Tolworth Court Farm which found thirty six breeding bird species (Lower Mole Project, 1995); a survey for Kingston Council of Castle Hill Wood found twenty five species of breeding bird. Three species recorded at Castle Hill were not recorded along the Bonesgate River corridor during the current survey (little owl, nuthatch and goldcrest, Fure, 1997).

Some bird species recorded using Section 1, were largely present due to the proximity of Castle Hill Woodland, particularly sightings of jackdaws. Grey heron, grey wagtail and kingfisher along the northern section were usually associated with the Hogmill. Kestrels and some warblers were associated with Tolworth Court Farm.

The greatest abundance, diversity and number of breeding birds of conservation concern (four breeding, five in total) were found associated with Field 5847 which must contain the most diverse breeding bird assemblage in the borough. Records from Surbiton and District Birdwatching Society (SDBWS) show that many of the borough's scarce and declining birds have been recorded here. These include meadow pipit (Mold, 1995); reed bunting (Chaffe, 1995); stonechat (Mold, 1997); lesser spotted woodpecker (Quinn, 1997) and water rail (Mold, 1997). Yellowhammers are occasionally seen in the winter along with a variety of finches.

Table 1: List of bird species recorded at Sections 1 - 4

Species Section1 Bonesgate Open Space (Filby Road to Moor Lane)	Status	Species Section 2 Moor Lane to Drake Road (Drake Road Open Space)	Status
Sparrowhawk	1	Sparrowhawk	1
Heron	R		
Wood Pigeon	7	Wood Pigeon	5
Collared Dove	2	Collared Dove	2
Swift	S	Swift	S
Kingfisher	1	Kingfisher	1
Green woodpecker	1		
Great Spotted woodpecker	1	Great spotted woodpecker	1
		Grey wagtail*	1
Robin	1	Robin	2
Wren	4	Wren	7
Dunnock*	4	Dunnock*	3
Song thrush**	2	Song thrush**	1
Blackbird	4	Blackbird	4
Blackcap	2	Blackcap	2
Blue Tit	2	Blue Tit	2
Great Tit	2	Great Tit	3
Jay	R	Jay	1
Magpie <i>Pica pica</i>	1	Magpie <i>Pica pica</i>	RB
Carrion Crow <i>Corvus corone</i>	RB	Carrion Crow <i>Corvus corone</i>	RB
Jackdaw	R		
Starling**	R	Starling**	R
House Sparrow**	R	House Sparrow**	R
Chaffinch	RB		
Greenfinch	3	Greenfinch	RB
Bullfinch**	R		
Goldfinch	3	Goldfinch	RB
Number of species breeding on-site	<b>19</b>	Number of species breeding on-site	19
Total species	<b>26</b>	Total species	22

<b>Species</b> <b>Section 3 Drake Road to Cox Lane</b> <b>(Field 5847)</b>	<b>Status</b>	<b>Species</b> <b>Section 4 Cox Lane to Watersedge.</b> <b>(Tolworth Court Farm)</b>	<b>Status</b>
Heron		Heron	R
Common Moorhen	2	Common Moorhen	1
		Kestrel*	RB
Sparrowhawk	RB	Sparrowhawk	RB
Wood Pigeon	RB	Wood Pigeon	RB
Collared dove	1	Collared dove	1
		Kingfisher	R
		Green woodpecker	1
Lesser spotted woodpecker**	1	Great Spotted Woodpecker	1
		Jay	R
Robin	1	Grey Wagtail*	R
Wren	RB	Wren	3
Song thrush**	2		
Blackbird	RB	Blackbird	RB
Dunnock*	1	Dunnock*	2
Blackcap	1	Blackcap	1
Blue Tit	RB	Blue Tit	RB
Great Tit	RB	Great Tit	RB
Willow warbler*	SB	Long tailed tit	R
Magpie	RB	Magpie	RB
Carrion Crow	RB	Carrion Crow	RB
Starling**	R	Starling**	R
House Sparrow**	RB	House Sparrow**	R
Lesser whitethroat	1		
Whitethroat	1		
Chiff Chaff	1	Chiff Chaff	1
Greenfinch	RB	Greenfinch	R
Goldfinch	1	Goldfinch	RB
Bullfinch**	1	Bullfinch**	R
Goldfinch	RB	Goldfinch	RB
Number of species breeding on-site	24	Number of species breeding on-site	18
Total Species	25	Total species	27

**Key**      \*\*      = Red listed species of high conservation concern.  
              \*      = Amber listed species of medium conservation concern.

RB      = Resident and breeding or number of pairs  
 R      = Resident - non-breeding or breeding status uncertain  
 S      = Summer visitor



Figs. 3 and 4 Blackbird and wren nests found in tree roots by the water.

The watercourse was very important for birds for nest-sites, feeding, bathing and socialising: Blackbirds and wrens nested within knarled, exposed roots of waterside trees (Figs. 3 and 4). Blackbirds were seen and heard cracking snail shells against tree trunks in the woodland. Song thrushes were seen cracking snails along the path in front of the poplars in Section 2.

Great tits reused mammal holes in the freeboard as nest sites by filling them with moss. Many young tits, robins and blackbirds were found learning to find their first prey along the stream. Young tits tumbled through the brambles growing over the stream trying to catch insects. Juvenile blackbirds foraged along these wetter areas, the only place for a novice to find invertebrates in the hot summer temperatures. Collared doves, woodpigeon, blackbirds, goldfinches and greenfinches were frequently observed bathing in the shallows where the water covered half of the stream bed.

### Kingfisher

Kingfishers were encountered approximately thirty times during the survey. There were two territories along the Bonesgate and one along the Hogsmill. The Hogsmill bird used the Bonesgate stream from time to time although it had a favourite hunting perch above a newly created deep pool just north of the confluence. Old kingfisher nests were found in steep clay banks. Their contents were slightly different to those found along the Thames, which usually consist of bleached fishbones. Instead they contained many blackened fishtails, the only remnant of its stickleback prey species. A dying three-spined stickleback, which may have had a narrow escape from a kingfisher, was found

by the stepping stones by F5847, just above a favoured kingfisher feeding area by the poplars. Kingfishers were often seen over flying woodland on the west side of the Bonesgate Open Space and Field 5847 as the watercourse was too overgrown for navigation. This doesn't appear to have affected their conservation.

#### Grey wagtail

Nest site opportunities are very limited for this species and they were found nesting in sub-optimal areas, making them vulnerable to predation. Near Moor Lane Bridge the safety rails were covered in hops and grey wagtails were found breeding at the base of this climbing plant. In a 2004 study they were found nesting under the bridge but bridgeworks may have made this nest pocket unsuitable for use, or an earlier brood may have been predated.

#### Lesser spotted woodpecker

This is a secretive bird and a fluffy juvenile was a *mystery species* until the parent appeared. Woodpeckers are found throughout the corridor although green woodpeckers are largely associated with Tolworth Court Farm and juveniles were seen on 17.7.06 in a willow tree along Section 4. Great spotted woodpeckers were breeding in Section 2.

#### Predation

Pinch points and dog incursions into the watercourse appear to increase bird mortality. A blackbird nest at a concrete revetment had been predated by a mammal. The young had had the wings chewed off and the heads and beaks were left. The ledge was very narrow and it is possible that either mink or rat were responsible. Moorhen chicks floating in the water (by Field 5847) were found near a dog watering hole and similar observations were made near the Moor Lane section. At least two sparrow hawk feeding perches were found.

## 3.0 Mammal Surveys

### Method

- Walkover survey's
- Longworth trapping
- Sherman Traps
- Water shrew Tubes
- Hazel Nut searches
- Footprints

### Results

#### Large mammals: Badgers and foxes



Several large mammal holes were noted during the study. This freshly dug one (Fig.5) was close to the bridge at Filby Road. Whilst it smelt of fox it was always broader than tall. There was a characteristic furrow into the tunnel (Bang & Dahlstrøm, 2001). The spoil was thrown some distance away rather than fanning out from the hole.

This picture was taken on the 9.7.06. By the 24.7.06 it was slightly altered in size and the spoil heap was larger. Investigation revealed badger several hairs. A run to a back way off the path was noted. On 6.8.06 a latrine and hawthorn scratching post were found together with a well worn path over the bridge portal.

Evidence of fox persecution was found along this section. Foxes were seen appearing from Castle Hill Wood during bat emergence surveys. During the mammal trapping, foxes soon learnt how to shake the casters out of the Sherman traps and some ended up in the water.

Medium sized mammals: Hedgehogs, squirrels and mink.



A hedgehog (Fig.6) was encountered in Section 4 during a bat survey. Previous records for this species include a hedgehog road casualty in Cox Lane (author's data, 2002).

Squirrels breed along the corridor in great numbers, but particularly along the first section at Bonesgate Open Space. This year saw a large crop of hazel nuts which were quickly eaten by squirrels. Mink may have been responsible for some bird predation. There has been an increase in anecdotal recordings of this species over the summer especially along the Thames. A hole thought suitable for a mink sized animal was found at trap point ten along Section 1 near an ivy covered tree overhanging the water.

Small mammals



Fig. 7 Hazel nut cluster.



Fig. 8 Print with claw (marked by arrow).

Water voles

No latrines or droppings characteristic with water vole activity were found during the study, but there was also an absence of rat faeces, despite several sightings, including a dead rat with a predated abdominal cavity (Section1). The undercut of the bank is so deep that most of the mammal activity (and hence the defecation) takes place under the hidden undercut. All the mammal holes along the stream near Gately Avenue appear to exit into the water. There is a recessed area for horses to drink from Field 5847 where there are huge warrens of mammal holes near grassy areas, regularly observed for

feeding signs, although none were found. The small amount of grass available for mammal foraging was so shriveled by the hot weather that any grazing of roots and shoots would not have been easy to observe. During a 2004 study mammal runs were found upstream of the Moor Lane Culvert. Rotten toe boarding had fallen into the watercourse leaving animal burrows visible. In order to establish whether these belong to water voles the toe boarding should be removed from the sections with the most activity. It is highly likely that this will reveal water vole burrows.

The manner in which the above hazel nuts were chewed (Fig.7) was observed at one location, where there were many bank side holes and mammal runs. Small mammal footprints were found throughout the length of the stream. Whilst it is difficult to tell water vole and rat footprints apart, the latter are slightly bigger. The scissor handle (Fig.8) is 2.5 m in diameter and all footprints found, fitted inside the handle, well within the water vole range.

#### Method

Longworth traps, Sherman traps and Shrew tubes.

A total of twenty Longworth traps, ten Sherman traps and twenty shrew tubes (Fig. 10) were set at suitable locations along both sides of the stream banks. At each location, traps were placed in varied positions to ensure that they could be easily located during changing stream conditions yet concealed from passers by. This is a very urban site with many dog walkers and concealment was more important than accuracy of trap line spacing. Traps were baited with sunflower seeds, casters (for shrews) and dry hay. The Longworth trapping period was from the afternoon of 6.7.06 until the afternoon of 9.7.06, seventy-two hours, with twice-daily trap rounds. The shrew tubes were monitored over a three week period. The trapping, handling and marking of animals was conducted according to the guidelines in Gurnell and Flowerdew (1990) and covered by an English Nature license for the taking of shrews. Captured animals were sexed and their age was estimated then each was individually marked by fur clipping before release at the capture point.



Fig.9 wood mouse recaptured for the third time Fig. 10 Himalayan Balsam useful to hold shrew tubes

## Results

No mammal faeces were found in the shrew tubes.

Only eleven members of one species, wood mouse (Fig. 9), were captured during the study with the number of recaptures increasing exponentially with each trap round.

During a similar study on Tolworth Court Farm (Fure, 2002) a total of 21 individuals of four species were caught: 10 wood mice; 7 field voles, one pygmy shrew and three common shrew in a much shorter (57 hour) trapping study. The Sherman and shrew traps failed to attract target species. A variety of slugs and frogs were captured.

Wood mice are highly mobile and adaptable, exploiting a wide range of habitat types (Flowerdew 1991, Macdonald and Barrett 1993) and are typical species of urban open spaces. The absence of field voles (grassland specialists) and common shrew, both relatively common species can be explained by the dense canopy of overhanging trees and shrubs prevented the development of an under storey. Much of the bank, particularly in Section 1 consisted of bare earth. In order to encourage small mammals it is recommended that some of the overhang be removed/thinned and the Himalayan balsam be removed in June to allow native vegetation to recolonise the banks. Although it is recognized that dog incursions into the watercourse will increase with the removal of the latter.

## 4.0 Bat surveys

### Method

The transect methodology was based on Bat Conservation Trust national Daubenton's and Serotine/Noctule/ Pipistrelle transect methodology with five, five and two minutes stops during each transect respectively. Each transect consisted of a set route with twelve, twelve and twenty survey points respectively, points were selected to be well spaced yet representative of the habitats. Transects were started at 20 minutes after sunset on two occasions and ten minutes after sunset on the second occasion when it was hoped to record noctule bat, a tree dwelling species, briefly recorded along the Hogsmill in 2004 (Bailey).

At each point bat calls were recorded using a recordable Bat Box 4 Frequency Division and Bat Box 3 equipment. Replayed sound was recorded onto a minidisk and compact flash card using minidisk recorders and an MP3 player. The recordings were later analysed using Batsound software with species determination following Russ (1999). The numbers of bat passes were counted to give a quantifiable measure of bat activity. On the last transect (all four sections), GPS was used to plot recorded bats onto a map. Due to current Ordinance Survey restrictions this map is not reproduced here but the grid references are made available for this purpose (Table 8).

Observation times in relation to sunset are important when interpreting bat activity. Bats on emerging from roost sites will often fly first in darker areas close to their roost, such as under woodland canopy, before dispersing along flyways to their foraging sites when light conditions have become suitable. The emergence surveys targeted strategic points along the river corridor in order to detect new or known roosts. Both transect and emergence surveys covered the period just after dusk when bats would be expected to be leaving roost sites and continued for 1.5 hours during the peak of bat activity. Surveys were carried out in favourable weather conditions, to ensure activity was at its optimal.

The three transects were carried out on:

- 27.6.06 Section 1 and 2. The confluence – Drake Road (Field 5847)
- 3.7.06 Section 3 and 4. Drake Road - Filby Road
- 14.8.06 All four sections

Three emergence surveys were carried out on the evenings of:

- 30.6.06 the Pipe Bridge along Bonesgate O.S.
- 7.7.06 The junction of the Hogsmill River with the Bonesgate Stream
- 15.8.06. Filby Road Bridge

## Results

At least four possibly five bat roosts were found in close association with the Bonesgate Stream (refer to Table 2). Of these, two roosts were known from previous work (Field 5847, 2003; Moor Lane Culvert Strengthening, 2004) and a third from existing biological records. A total of three species of bat were detected, common and soprano pipistrelles and Daubenton's bat. Common pipistrelles comprised the majority of bat passes. The number of soprano passes increased with proximity to Castle Hill Wood and appeared later in the evening. During the first transect along Section 4 each bat appeared to have it's own 'beat' along the river corridor and the number of passes shown in the table usually pertained to one or two feeding bats (Table 3). The pattern was repeated throughout this section. Very few soprano pipistrelles were recorded and then only later in the evening. An emergence survey was carried out in this section by the confluence of the two rivers from Tolworth Court Farm. Bats did not reach this area until thirty two minutes after sunset, perhaps having traveled from the roost behind the Basketball Court. At thirty eight minutes after sunset a bat stream was seen to head northwest along the Hogsmill River from the direction of Colne Court. As the light levels dimmed (after 22.00) the first soprano pipistrelles were detected feeding in large circles over Tolworth Court Farm.

Table 4 demonstrates the level of pipistrelle activity in Sections 2-1 (Drake Road Open Space - Filby Road). Bat passes along Section1 (Bonesgate Open Space) were few. Two emergence surveys carried out at this section show that there is a small roost of common pipistrelles in a property located to west of the stream. During the first emergence survey at the rear of properties along Thrigby road (on the western bank of the stream), there were several passes at two large oak trees being watched by two surveyors at twenty minutes after sunset. Most bat passes at this location were of bats echolocating at 50 kHz and were not assigned to species although one bat pass was of a soprano pipistrelle.

Table 5 describes the third transect although the data is treated in a different way and the recorded and timed bat passes were plotted using GPS. This shows a possible Daubenton's bat plotted forty six minutes after sunset, feeding by the line of poplar trees along Drake Road Open Space, (just before Field 5847). After surveyors had finished recording, another Daubenton's bat passed, 1.5 hours after sunset, at the confluence of the Hogsmill and Bonesgate streams.

## Conclusion

Four perhaps five common pipistrelle bat roosts were indicated during the survey associated with properties near the Bonesgate stream. There is a 1993 record of a pipistrelle roost of unknown species along Rollesby Road. Soprano pipistrelles were the less common of the two species detected arriving onsite later in the evening. The river corridor is important for feeding bats between Sections 4-2 (Tolworth Court Farm to Moor Lane. Section 4 contains two roosts. One of these is almost certainly a maternity roost as bats in the June survey did not appear to travel far, foraging along their own beat, which is often the case with heavily pregnant bats or bats returning to feed young. The presence of two roosts in Section 4 could be due to the close proximity of the Hogsmill River.

There were very few bats associated with Section 1 and Bonesgate Open Space. Despite roosts located offsite they do not appear to feed within this section. It was interesting to note that early bats traveling south west (over Filby Road) did so where the overhang of two large ash trees on either side of the road almost touched. These bats were perhaps from a roost west of Thrigby Road. The possibility of early bats at Filby Road having traveled from the roost at Moor lane was considered. Bats emerging from Moor Lane tended to travel north, preferring the dark cover of the woodland behind properties along Derek Close in the early evening. These bats would benefit from a strengthening of the treeline along that section of the Bonesgate.

The opening out of the river at Bonesgate O.S. would benefit bats although this must be balanced against the pressures this will put on birds when people and their pets have greater access to the river from both sides of the bank.

No tree roosts were detected along these four sections of the Bonesgate stream although there are trees exhibiting high potential for bat use. Earlier soprano pipistrelles

were detected when close to Castle Hill Wood, indicating a possible tree roost in the wood. These are the species of pipistrelle most likely to be found in trees. A survey of the nearby Hogsmill (Bailey, 2004) found that only 21% of bats surveyed were 55 kHz pipistrelle. During this study the figure was probably slightly less despite south-west London being a stronghold for this species (author's data).

The trees are important for the insect biomass and they serve to create the dark conditions necessary for bats. For an urban situation this is a surprisingly dark river corridor and it was disappointing not to find more species, particularly *Myotis* bats which favour these conditions. It is likely that bats use the river corridor throughout the night at low density, depending on the time of year. This is consistent with previous work carried (Bailey, 2004) when a brief pass of a Daubenton's bat was detected. The presence of a Daubenton's bat, forty six minutes after sunset, highlights the potential for a tree roost of this species within the Bonesgate corridor.

The large number of social calls recorded during Transect 3 at the river confluence has two interpretations: That the bridge is a mating roost; or that bats were flying along the western side of the hedge on the Tolworth Court Farm out of range of the bat detector. Social calls are low frequency sound which travels further than echolocation. From the results of the second emergence survey, it is likely that the latter is the case, and that the social calls were from the late arriving soprano pipistrelles feeding over the meadow.

Table. 2 Bat roosts in close proximity to the Bonesgate stream

1. Section1: Small common pipistrelle roost in nearby property (off Thrigby Road) A known roost (1993) in Roseberry Road.	Sunset + 15 14.8.06 Transect 3 Sunset + 21 15.8.06 Emergence 3 Sunset + 20 30.6.06 Emergence 1
2. Section 2: Roost present in property along Moor lane.	sunset +12 minutes October 18th 2004 sunset +17 3.7.06 Transect 2
3. Section 4: Present in a property at Gately Avenue.	sunset + 13minutes 19 <sup>th</sup> July 2000
4. Section 4: Common pipistrelle roost present in a property near the basket ball court.	sunset + 29 27.6.06 Transect 1 sunset + 32 7.7.06 Emergence 2

Table 3 – Selected Bat Activity Transect 1. 27.6.06

Sunset 21.21 p.m. Cloud cover 6/8. Temperature 15 degrees centigrade.

Time	Details: From the Confluence of the two rivers to Field 5847 5 minute intervals
21.49 ss+29	Common pipistrelle
21.51	Pipistrelles feeding around large oak tree near basketball court. Floodlights not in operation. Period property at the rear of this area with a good variety of roof pitches. Some bats are using the tree line along the river others are feeding over Tolworth Court Farm. <b>50</b> bat passes.
21.58	En route to station 5 there are a further <b>33</b> bat passes all of which belong to common pipistrelle.
22.00 (ss+39mins)	Pipistrelles continue to feed near honeysuckle
22.03	First soprano pipstrelle records <b>42</b> passes
22.08	Constant feeding activity of common pipistrelle <b>23</b> bat passes but probably only 2 bats
22.14	55 kHz pipistrelle pass near Gately Avenue
	Quiet near playground
22.30	5 bat passes near F5847
Other species	Willow warbler still singing at F5847 Peacock calling at Gately Avenue

Table 4 – Selected bat activity Transect 2. 3.7.06

Sunset.21.20pm. Cloud cover 2/8. Temperature 24degrees centigrade.

Time	Details: Poplar trees at F5847 towards Filby Road 5minute intervals
21.37 ss+17	Path up to properties near Moor lane First bat common pipistrelle <b>30</b> passes
21.45	Lots of passes including one 55kHz pipistrelle in the woodland behind the properties on Moor Lane
21.50	Lots of common pipistrelle passes en route to Bonesgate Pub car park. Passes over fairly open ground and in lit conditions. Pipistrelles noted feeding over the watercourse before it passes through the culvert on the 3 <sup>rd</sup> transect.
22.11	Bonesgate open space , no bats until now and a brief pass of a common pipistrelle
22.20	Pipistrelle near pipe bridge
22.30	Constant feeding activity on the Filby Road bridge near Castle Hill Wood
Other species	Foxes, song thrush, swifts

Table 5 – Selected bat activity 14.8.06. Transect 3

Place	Actual time	Time after sunset in minutes	Species
Filby Road start			
TQ1907637482	20.46	ss+0.57s	45kHz
TQ1930063982	21.11	ss+25	10 passes of a 55kHz
TQ1929963982	21.12	ss+26	2 passes 55kHz
TQ1950064249	21.30	ss+46	pip species
TQ1950064249	21.30	ss+46.5	myotis bat
TQ1954464252	21.31	ss+47	45kHz with social calls
TQ1965864365	21.40	ss+54	5 bat passes from 2 pipistrelle species
TQ2001364672	21.52	ss+66	45kHz
TQ2004464711	21.55	ss+69	45kHz
TQ2009264779	21.57	ss+71	social calls of a bat species
TQ2015764876	22.59	ss+73	social calls of a bat species
TQ2020664886	22.00	ss+75	social calls of a bat species
TQ2022464930	22.02	ss+77	social calls of a bat species

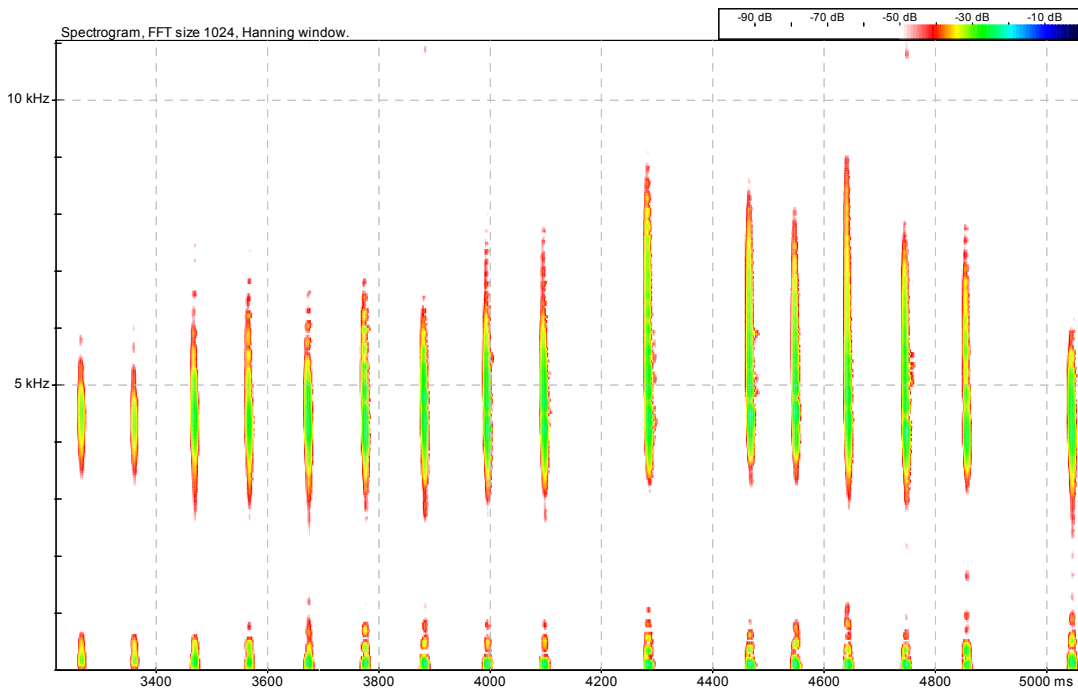


Fig.11 Sonogram of Daubenton's bat by the poplar trees, Drake Road Open Space.

## 5.0 General Invertebrates



Fig.12 Beating trays



Fig.13 *Oedemera nobilis*

### Methods

- Casual observation
- Sweep netting
- Tray beating (Fig.12)
- Ultrasound detector (Orthoptera)

Notes were made of the invertebrates found *en route* throughout the three months that this study was undertaken to account for fluctuating insect populations. Detailed tables with scientific names are appended. Some lesser well known voucher specimens will be named over the winter.

### Section 1

Due to the short mowing regime and the closed tree canopy over Bonesgate Stream systematic invertebrate surveys were not thought worthwhile. General observations are reported here. One of the most widespread and beautiful beetles recorded (especially on bind weed at Bonesgate Open Space) was the thick legged flower beetle *Oedemera nobilis* (Fig. 13). Of the most unusual beetle species was *Chrysolina oricalsia* recorded on Hogweed. This is a local species associated with the Hogsmill River Corridor. (I. Menzies *pers comm.*). It is found on Epsom Common and Ham Lands (2005).

Large numbers of speckled wood were recorded on many occasions in a gathering, close to the portal of the culvert as it goes under Filby Road. There are only two species of woodland butterfly that use the interior of the woodland (under the canopy), the

speckled wood being one. The day flying Vapourer moth was seen along the grassy area under the pylon, where perhaps the wingless females had laid their eggs along with several grass moths.

Another speciality of this section was *Volucella zonaria*, a large hornet-mimic hoverfly and one of Britain's largest flies. It is a local species, the larvae of which scavenge in the nests of social wasps. Although nationally scarce, this fly is fairly widespread and common in the London area, on which its British distribution appears to be centred (Morris, 1998). It was recently recorded at Crane Park Nature Reserve.

The non-native ladybird the Asian/Harlequin ladybird *Harmonia axyridis* was found emerging from a pupa near the gate to Moor Lane. It was introduced into America to control aphids and has now found its way here. In the absence of aphids it will predate other species including native ladybird species. Many were found in 2004 on the Embankment and it is now widely distributed in London. It was recorded at the Hogsmill on Villiers Road on 15.8.06.

Large numbers of pond skaters were noted in the stream. Walking through the water creates a wash which sent them into the undercut which is where they probably spend times of summer spate.

## Section 2

A dead stag beetle was found in the woodland behind Derek Close. Although common and widespread in south-east London, this species is thought to be declining nationally. It breeds in dead heartwood of broad-leaved trees, especially partly subterranean wood such as old stumps, large logs lying on the soil and old roots. In London it is essentially a garden species.

Most of the yellow meadow ant mounds *Lasius flavus* were found in this section by stand of the poplars. They play a big part in modifying habitat and are a potential food source for the green woodpecker. Their presence allows plants and warmth - loving insects to colonise.

Ringlet butterflies were seen in large numbers over the grassland at Drake Road Open Space in addition to a small number of gatekeepers and occasional red admirals. Casual observations were particularly interesting along the line of poplar trees from the Surrey bank. Predatory insects such as southern hawker dragonflies and the large and distinctive black hoverfly *Volucella pellucens* were seen hawking small insects along this treeline. Twenty speckled wood butterflies were counted here on one occasion.

Beating trays collected a great deal of material from Drake Road O.S. (5.8.06). This included many nymphs of the 14mm long, impressive bug *Coreus marginatus*, on dock. Hosts of this species include sorrel, great water dock, curled dock, rhubarb, persicaria and knotgrass. Because of this large range, the bugs may be found in hedgerows, the margins of cultivated fields, wastelands and the edges of woods. It is found in England and Wales up to the southern midlands, the known distribution is patchy; the bug is much more abundant in the south of its range. It has recorded on water dock Ham Lands (2005).

Also found were a cuckoo wasp, oak bush crickets, froghoppers, tortrix moths, many species of ladybird and bugs (selected tables are appended).

### Section 3

No systematic surveys were carried out at this location as no permission had been sought from the landowner to enter Field 5847. The Surrey bank had been mowed short and tall forbs such as dock had been treated with glyphosate. It was felt that efforts should be concentrated on those areas free from chemical use.

There is a small playground where two new benches have recently been situated and around this open area several butterflies were noted in early July, including comma and red admiral. Of the many dragonflies seen feeding along the hedgerows (along F5847) was the common darter. A large hornet was seen along regenerating elm during July. Banded demoiselles were twice seen from the Cox Lane Bridge. They are often sited as an indicator of good water quality.

#### Section 4

Typical grassland species at the Tolworth Court Farm side of the stream were the Orthoptera. When walking through long grass grasshoppers will jump up but bush crickets tend to dissolve deeper into the grass. Ultrasound detectors immediately located Roesel's bush cricket *Metrioptera roeselii* which enjoys tall herbage in a warm environment. They have a strong ovipositor which can saw into grass and bramble stems. Males trill like bicycle wheels. In 15 years there has been a dramatic north and south spread through the Thames region to Oxfordshire. Ham Lands, Morden Hall Park, Wimbledon Common and Richmond Park are amongst the best local sites to see/hear Roesel's bush cricket.

Also recorded were the long-winged cone-head, oak bush cricket, speckled bush cricket, lesser marsh grasshopper and meadow grasshopper. The lesser marsh grasshopper can be distinguished from the meadow grasshopper by the lack of black femura and is a species recorded along the Hogsmill River at Berrylands (I. Menzies, pers comm).

Tolworth Court Farm is exceptional for butterflies and is one of a few places in the borough where Brown Argus can be seen. 14 species of butterfly are regularly associated with TCF. Of these 11 have been recorded in great abundance: gatekeeper 100+; and common blue 24 (Quinn 1997). 11 species were recorded in Fure, 2003 with good numbers of ringlet. 2006 was an exceptional year for butterflies and during the survey there were great clouds of ringlets.

Sweep netting and tray beating discovered a large range of ladybirds and flea beetles weevils and bugs. The most notable finding was the Box bug nymph. This bug was originally thought to be recorded only at Box Hill although it has been found at other localities including Ham Lands (2005). The attractive Hawthorn Bug was found along with the larger Forest Bug and the Green Shield Bug.

## 6.0 Reptiles and Amphibians



Fig.14 Frog outside a Sherman Trap

Many common frogs were seen along Section 1. They were regularly found in the Sherman traps (Fig.14). During mammal trapping along Section 3 at Drake Road Open Space, a possible common lizard was seen moving off the path, in the early morning. Previous records show a heron was seen taking a slow worm on Tolworth Court Farm. (Mammal trapping, 2002).

## 7.0 Conclusions

Field 5847 and Tolworth Court Farm are amongst the most important open spaces for wildlife in the Borough. Some surprising features of wildlife interest emerged during the surveys. These included the line of poplars and hornbeam shading the stream along Section 2. This was the area where a Daubenton's bat was recorded on the final transect, kingfishers were consistently heard calling at this location and predatory insects, not found at any other stretches were recorded here. A song thrushes anvil was found along the path in front of the poplars and several song thrushes were seen at this location. The hogweeds and other umbels, the daisy family (including ragworts and thistles) are important nectar plants, and the value of ivy is high later in the year. It is unfortunate that glyphosate is used along this bank.

The hazels along Section 1 are unique in the borough but are reduced in their magnificence due to the closed overhead canopy which prevents colonization by many species, as lack of light prevents general productivity. Many birds nest within the

exposed complex of hazel roots along the watercourse, which offer nesting niches not found elsewhere.

During the bat surveys it was noted that dog owners opened their rear garden gates at night sending their dogs to range free onto the nature reserve. Measures should be put in place to deter dog owners from allowing their dogs to roam unsupervised at night to defecate upon the open space. This constitutes anti social behaviour and is not appropriate to management of an area protected for wildlife.

There was a large amount of dog mess throughout but especially at the pinch point of the paths along the bund in Section three. There was extensive fly-tipping throughout but especially along Thrigby Road and Derek Close. There were signs that animal holes in woodland close to properties had been blocked. Some of these near Filby Road may have belonged to badgers.

Airgunners have been using tins of coca cola for target practice along Drake Road Open Space. Several white (high power) shotgun cartridges were found along Section 3 in greater number than can be explained from being washed along by the stream (from offsite farmland). Several dead woodpigeons were found arranged in a line during a survey in 2002. Rot holes in trees had been filled with kindling and set fire to (particularly in Section 1).

Large sections of the Bonesgate River are overgrown and some management is overdue. Opening up the watercourse should be balanced against the damage caused by the increased accessibility of dogs and their owners (which inhabit both sides of the banks in Section 1).

- Impenetrable areas need to be retained: brambles should be left to grow around the base of old trees as both a health and safety measure and for fire prevention.
- Varying mowing regimes should be implemented and grass should be left to grow where close to trees and scrub.
- Chemicals should not be used along the watercourse; their use is ineffective killing only the grass surrounding the docks.

## 8.0 References

- Bang, P. & Dahlstrøm, P., 2001. *Animal Tracks and Signs*. Oxford Univ. Press
- Bailey, S. 2005 *Bats of Watersedge, West Ewell* Surrey Urban Biodiversity Partnership
- Fure, A., 1997-2006 *Authors Data*
- Fure, A., 1997 *Birds of Castle Hill Wood* Part of a breeding bird survey on seven Local Nature reserves for RBK
- Fure, A., Cheesman, E., 2003 *Field 5847*
- Fure, A., 2004 *Moor Lane Culvert Strengthening* a report for Symmonds Group
- Fure, A., 2002 *Mammal Trapping on Tolworth Court Farm* a study for RBK
- Flowerdew, J.R. 1991. Wood mouse. In Corbet G.B and S. Harris, Eds.1991. *The Handbook of British Mammals*. Ed.3. Blackwell, Oxford: pp. 221–228.
- Gurnell, J. and Flowerdew J.R. 1990 Live trapping small mammals: a practical guide, Ed.2.Mammal Society, London.
- Macdonald, D. and Barret, P.1993 *Mammals of Britain and Europe*. London: Harper Collins
- Morris, R.K.A. 1998. *Hoverflies of Surrey*. Pirbright: Surrey Wildlife Trust.
- Pender, J., 1995 *Breeding bird survey of TCF Lower Mole Project*
- Bird Reports (1995-2005) Surbiton & District Birdwatching Society

## 9.0 Appendix 1

Selected species recorded during the surveys.

Taxon	English Name	Gridref	Date
Insects			
Curculionidae	Weevils	TQ200648	Aug-06
Leptophyes punctatissima	Speckled Bush Cricket	TQ200648	Aug-06
Pararge aegeria	Speckled Wood	TQ190637	30-Jul-06
Bombus terrestris	Buff-tailed Bumble Bee	TQ190637	25-Jun-06
Polyommatus icarus mariscolore	Common Blue	TQ200648	Aug-06
Polygonia c-album	Comma	TQ200648	Aug-06
Chrysolina oricalcia		TQ190637	25-Jun-06
Pentatoma rufipes		TQ194641	Aug-06
Palomena prasina		TQ196644	Aug-06
Coreus marginatus		TQ200648	Aug-06
Gonocerus acuteangulatus	Box bug	TQ200648	Aug-06
Chalcoides plutus		TQ200648	Aug-06
Chalcoides aurata		TQ200648	Aug-06
Rhyzobius litura		TQ200648	Aug-06
Oedemera nobilis		TQ190637	25-Jun-06
Lasius flavus		TQ194641	Jul-06
Calopteryx splendens	Banded Demoiselle	TQ196644	Jul-06
Adalia decempunctata	10-spot Ladybird	TQ200648	Aug-06
Tytthaspis sedecimpunctata	16-spot Ladybird	TQ200648	Aug-06
Adalia bipunctata	2-spot Ladybird	TQ200648	Aug-06
Subcoccinella vigintiquatuorpunctata	24-spot Ladybird	TQ200648	Aug-06
Calvia quattuordecimguttata	Cream-spot Ladybird	TQ200648	Aug-06
Lucanus cervus	Stag Beetle	TQ194641	Jul-06
Lymantriidae	tussock moths	TQ200648	Aug-06
Orgyia antiqua	Vapourer	TQ190637	30-Jul-06
Curculionidae	Weevils	TQ200648	Aug-06
Pyronia tithonus	Gatekeeper / Hedge Brown	TQ200648	Aug-06
Pieris brassicae	Large White	TQ200648	Aug-06
Pieris napi britannica	Green-veined White	TQ190637	30-Jul-06
Chorthippus albomarginatus	Lesser Marsh Grasshopper	TQ200648	Aug-06
Ochlodes venata	Large Skipper	TQ194641	25-Jun-06
Conocephalus discolor	Long-winged Conehead	TQ200648	Aug-06
Metrioptera roeselii	Roesel's Bush Cricket	TQ200648	Aug-06
Peribatodes rhomboidaria	Willow Beauty	TQ190637	30-Jul-06
Maniola jurtina	Meadow Brown	TQ190637	25-Jun-06
Chorthippus parallelus	Meadow Grasshopper	TQ200648	Aug-06
Meconema thalassinum	Oak Bush Cricket	TQ200648	Aug-06
Halyzia sedecimguttata	Orange Ladybird	TQ200648	Aug-06
Vanessa atalanta	Red Admiral	TQ194641	25-Jun-06
Aphantopus hyperantus	Ringlet	TQ200648	Jul-06
Volucella pellucens			
Volucella zonaria			

<i>Harmonia axyridis</i>	Harlequin ladybird		
<b>Mammals</b>			
<i>Apodemus sylvaticus</i>	Wood Mouse	TQ190637	Jul-06
<i>Rattus norvegicus</i>	Brown Rat	TQ190637	30-Jul-06
<i>Sciurus carolinensis</i>	Grey Squirrel	TQ200648	25-Jun-06
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	TQ200648	Jul-06
<i>Myotis daubentonii</i>	Daubenton's Bat	TQ194641	Aug-06
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	TQ190637	Jul-06
<i>Erinaceus europaeus</i>	Western Hedgehog	TQ200648	27-Jun-06
<i>Vulpes vulpes</i>	Red Fox	TQ190637	25-Jun-06
<b>Birds</b>			
<i>Ardea cinerea</i>	Heron	TQ196644	27-Jun-06
<i>Pica pica</i>	Black-billed Magpie	TQ196644	25-Jun-06
<i>Sylvia atricapilla</i>	Blackcap	TQ190637	25-Jun-06
<i>Parus caeruleus</i>	Blue Tit	TQ194641	25-Jun-06
<i>Corvus corone corone</i>	Carrion Crow	TQ190637	25-Jun-06
<i>Fringilla coelebs</i>	Chaffinch	TQ196644	Jul-06
<i>Turdus merula</i>	Common Blackbird	TQ194641	25-Jun-06
<i>Pyrrhula pyrrhula</i>	Common Bullfinch	TQ196644	Jul-06
<i>Phylloscopus collybita</i>	Common Chiffchaff	TQ196644	25-Jun-06
<i>Falco tinnunculus</i>	Common Kestrel	TQ200648	15-Aug-06
<i>Alcedo atthis</i>	Common Kingfisher	TQ200648	27-Jun-06
<i>Gallinula chloropus</i>	Common Moorhen	TQ194641	Jul-06
<i>Sturnus vulgaris</i>	Common Starling	TQ194641	25-Jun-06
<i>Apus apus</i>	Common Swift	TQ196644	Jul-06
<i>Sylvia communis</i>	Common Whitethroat	TQ196644	Jul-06
<i>Columba palumbus</i>	Common Wood Pigeon	TQ196644	25-Jun-06
<i>Streptopelia decaocto</i>	Eurasian Collared Dove	TQ194641	25-Jun-06
<i>Corvus monedula</i>	Eurasian Jackdaw	TQ190637	Jul-06
<i>Garrulus glandarius</i>	Eurasian Jay	TQ190637	25-Jun-06
<i>Accipiter nisus</i>	Eurasian Sparrowhawk	TQ190637	25-Jun-06
<i>Carduelis carduelis</i>	European Goldfinch	TQ190637	25-Jun-06
<i>Carduelis chloris</i>	European Greenfinch	TQ194641	25-Jun-06
<i>Erithacus rubecula</i>	European Robin	TQ194641	25-Jun-06
<i>Dendrocopos major</i>	Great Spotted Woodpecker	TQ190637	25-Jun-06
<i>Parus major</i>	Great Tit	TQ200648	25-Jun-06
<i>Picus viridis</i>	Green Woodpecker	TQ196644	25-Jun-06
<i>Motacilla cinerea</i>	Grey Wagtail	TQ200648	25-Jun-06
<i>Prunella modularis</i>	Hedge Accentor	TQ190637	25-Jun-06
<i>Passer domesticus</i>	House Sparrow	TQ190637	25-Jun-06
<i>Dendrocopos minor</i>	Lesser Spotted Woodpecker	TQ196644	Jul-06
<i>Sylvia curruca</i>	Lesser Whitethroat	TQ190637	25-Jun-06
<i>Aegithalos caudatus</i>	Long-tailed Tit	TQ196644	Jul-06
<i>Turdus philomelos</i>	Song Thrush	TQ190637	25-Jun-06
<i>Phylloscopus trochilus</i>	Willow Warbler	TQ196644	Jun-06
<i>Troglodytes troglodytes</i>	Winter Wren	TQ190637	25-Jun-06
<b>Amphibians &amp; Reptiles</b>			

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Rana temporaria	Common Frog	TQ190637	Jul-06
Lacerta vivipara	Viviparous Lizard	TQ194641	Jul-06
<b>Selected Plant species</b>			
Veronica beccabunga	Brooklime	TQ190637	25-Jun-06
Humulus lupulus	Hop	TQ194641	25-Jun-06
Dryopteridaceae	Buckler-fern family	TQ190637	25-Jun-06
Mercurialis perennis	Dog's Mercury	TQ190637	24-Jul-06
Acer campestre	Field Maple	TQ190637	25-Jun-06
Stellaria holostea	Greater Stitchwort	TQ190637	25-Jun-06
	Lords-and-ladies / Cuckoo Pint /		
Arum maculatum	Wild Arum	TQ190637	25-Jun-06
Stachys palustris	Marsh Woundwort	TQ190637	25-Jun-06