

MAMMALS OF KINGSTON UPON THAMES 1998-2017

Abstract

The Royal Borough of Kingston upon Thames (RBK) is a small borough of which approximately 13% is open land. Despite policies at all levels to favour 'sustainable development' and 'green infrastructure', as well as numerous local initiatives, development pressure continues to diminish the boroughs' open spaces and wildlife habitats. Due to the proximity of good quality habitats in neighbouring boroughs, as well as strong boundary features, a surprising thirty-two species of mammal were recorded in the borough between 1998 - 2018. The all too familiar pressures and initiatives to counter them are considered in the first part of this paper and is followed by a Directory of the Mammals of Kingston, a presentation of the records to date.

RBK and its Habitats

Open Spaces in the borough

RBK has a small amount of open land, estimates vary between 13%-17%. Land designated as Public Open Space accounts for 7.5% (276.68 ha) and Sites of Nature Conservation Importance or SNCI land 10% (377.35 ha) [last updates to SNCIs received in 2010) (GIGL, 2013]. In considering the presence/absence of fauna, no borough can be seen in isolation and has to be considered in the context of, at least, the surrounding boroughs and their open land: fifty-five per cent of the adjacent Borough of Richmond upon Thames (LBRuT) is open land.

Boundary features (especially rivers) and large areas of 'publicly owned land' used as grazing pasture or leased to golf courses, ensure that RBK retains an important wildlife interest. The RBK borough boundary is twentyseven miles long and borders two Special Areas of Conservation (SACs) - Richmond Park National Nature Reserve (NNR) and Special Site of Scientific Interest (SSSI) (45 ha in RBK) and Wimbledon Common SSSI (4.9 ha in RBK). The River Thames Site of Metropolitan Importance (SMI) forms the boundary with LBRuT for several kilometres. Smaller rivers, most notably the Beverley Brook, Hogsmill River and the Bonesgate Stream, form boundaries with LBRuT, Merton and Surrey as well as important railway corridors, which separate Sutton and RBK to the east.

There are fifty-one SNCIs in RBK; nine Local Nature Reserves (LNR's) and fifty-two SNCI's. Of the latter, twenty-nine are in council ownership, with twenty-one being actively managed for wildlife. The remaining twenty-three sites are not in the Council ownership being privately owned. Most of the larger nature reserves are 'riparian ribbons' with the exception of Tolworth Court Farm the borough's largest nature reserve (98 ha) and are described in the London Ecology Unit Handbook No. 18 (Swales *et al* 1992).

Some of those under active management, are fragments of semi-natural vegetation or the remains of old farmland, their importance for biodiversity being their longevity and presence of species rare to the borough, e.g. the pyramidal orchids found on a fragment of old meadow in Chessington and the swathes of purple loosestrife *Lythrum salicaria* and meadowsweet *Filipendula ulmaria* found on the ancient Malden Meadow near the Hogsmill River. Other sites are important examples of relict habitats, such as the traditional field systems and ancient species-rich hedgerows of Tolworth Court Farm Fields LNR.

Factors affecting open space

Development has been a long-term pressure in RBK affecting many types of open land and diminishing our green spaces, resulting in the homogenisation of previously naturalised sites. Examples include:

- Farmland. This has seen enormous changes over the last few years. One important area abutting a Surrey National Nature Reserve (NNR) has been illegally used as a landfill site. Although this resulted in belated enforcement action, the local hydrology has been changed (Environment and Neighbourhood Overview Panel, 2005).
- Greenbelt. In the greenbelt at Chessington World of Adventures (CWoA), a second hotel was recently given planning permission. Denotification of small parcels of Metropolitan Open Land (MOL) in the Council's Core Strategy 2012, clearly gives an indication that it is acceptable to build on MOL (LIDL's H.Q. 2016);
- River catchments. Already damaged by fibre optic cabling (e.g. the Bonesgate Stream) catchments are further diminished by the sale of floodplain land, e.g. Rookwood Avenue, Beverley Brook (2013) or blighted by overshadowing developments (Kingston Heights on the River Thames in 2013).
- Rivers. The Hogsmill, Beverley Brook and River Thames are affected by light pollution from encroaching development or sports pitches. Light pollution causes fragmentation and loss of habitat, as well as interrupting ecological processes.
- There are more than embryonic signs that with the advent of Crossrail, a spur namely 'Crossrail 2', may increase the pressure for a new suburb in Chessington.

Policies and Failures

Land use policies are clearly stated within the RBK Core Strategy 2012, which reflect the changes in the National Planning Policy Framework with a presumption for sustainable development. According to Policy DM 5 on Green Belt, Metropolitan Open Land (MOL) and Open Space Needs, it is stated that the Council will:

- Only allow development on sites adjacent to the Green Belt, MOL or other open space designation that does not have a detrimental impact on its visual amenities;
- Does not result in the partial loss of public open space, outdoor recreation facilities or allotments; and
- Ensure that development proposals do not harm open spaces which form part of an area of value for wildlife.

According to Policy DM6 on Biodiversity the Council will:

- Ensure new developments protect and promote biodiversity as part of sustainable design, through the inclusion of new or improved semi-natural habitats;
- Require an ecological assessment;
- Ensure that new development does not result in a net loss of biodiversity and, where appropriate; and
- Include new or improved habitats and provision for natural and semi-natural public green space.

In its 'Review of Biodiversity in Kingston Town', (Kingston Council, 2006) paragraph 26 states that, '*The guiding principle of the Kingston Biodiversity Action Plan is to allow no further net loss of biodiversity and achieve positive gain*'. But have the decision makers ever seen this as this is belied by council actions? Land use planning officers recommended the development of housing on a thirteen-hectare site, designated as MOL and a Grade 1 Site of Nature Conservation Importance (SNCI). This decision was made, not only in contradiction to the Council's own recently adopted Core Strategy, which included a site specification stating that housing was unsuitable for this site. The development was also supported by the GLA, resulting in an expensive Public Inquiry (November, 2013).

The Green Spaces Strategy 2008-18 identifies twenty-one sites where the priority is '*enhancement of the habitats found on site*'. However, only a small sum of money has been allocated for the management of all the Council's SNCIs. Since the Green Spaces Strategy was written in 2008, species composition has suffered particularly at an orchid site in Chessington, indicating that such a tiny isolated fragment, so close to gardens where

hybridisation has occurred, was ill conceived at the planning stage and management has been insufficient.

The borough has been named as felling far more street trees than it replants with over 460 trees felled 2010-13 and only 112 planted during the same period. (J. Jones *pers. comm.* April, 14). Two kilometres of hedgerow was removed from Lower Marsh Lane and a large area of scrub removed along an ancient boundary at Pear Tree Close, Chessington (Author's data 2013-14 respectively).

Bats

Bats are particularly vulnerable to redevelopment or lighting schemes due to a lack of surveys requested by the Local Planning Authority, despite Policy DM6 and the fact that the borough is familiar with the process as it holds its own European Protected Species licence for a small bat colony (in respect of the redevelopment of a school Focus, 2012).

Some small habitat patches can be strategically important and these need to be highlighted in the Green Spaces Strategy. For example, a harp-trapping and radio-tagging project at Wimbledon Common funded by the London Bat Group LBG, tracked a natterer's bat *Myotis*



nattereri from a tree in Richmond Park (Whitby, 2013). After leaving its roost it flew towards the A3 road bridge over Beverley Brook onto Wimbledon Common. *Myotis* bats were also observed flying through the grille at the Beverley Brook into Richmond Park (Fig 1). At this location the Brook falls within RBK and what is done here, regarding management of lighting for example, will affect a number of bat species crossing the A3.

Fig. 1 Beverley Brook: looking under the bridge towards the rag grille at Richmond Park from the sports fields at Wimbledon Common, RBK.

Badgers

Badger persecution does occur, effected by different sectors of the community: on farmland and at LNR's and especially when near to private gardens.

Despite legal protection, residents living near the A3 have tried to fill in badger setts with garden waste without realising that they would have to fill in at least eight chambers. This particular sett has been active every year since interference was first noted in 2007 and includes this year (Author's data, 2014). Police investigating a similar incident to the north of the borough decided that the CPS might consider that using stuffed sacks of windfall apples to block a chamber to be an act of misplaced kindness.

As setts in some urban areas have become smaller, characterised by a single chamber, (bolthole or outlier sett) holes are often not recognised as pertaining to badger, with the consequence that long-established setts have been lost as a result of works, such as cabling operations (Bonesgate Stream, Chessington, 2013). Three sites have been lost as a result of housing development at Kingston Hill and two at Chessington.

In 2013, the Kingston Environment Centre convened the Kingston Biodiversity Network and a separate steering group is embarking on updating the KBAP plans, which were developed for both Standing Water and Hedgerows before disappearing into the long grass. Kingston Cemetery has produced a Lichens Plan (undated), which is available on the councils' website, to support the sensitive management of stonework and masonry. It has long been recognised that land-use policies are ultimately key to protecting habitat and, along with Planning Policy Officers, a good practice guide for 'Biodiversity within the Planning Process' was produced in 2006 as an integral part of the Kingston Biodiversity Action Plan (KBAP) although this took many years to appear and is not widely available. In the current review of the boroughs' Green Spaces Strategy, the KBN identified several Priority Habitats, which were hopefully included in a revised strategy (September, 2014). These are:

- Standing water
- Running water
- Woodland
- Meadows (Acid, neutral and chalk); and
- Hedgerows.

The contradiction between land use policy and implementation continues to be evident. Despite policy statements on biodiversity, which should include restrictions on light pollution near wildlife sites there are plans to increase lighting especially in the town's Ancient Market Place and perhaps along the Thames (SMI). The following statement pertained to only 2% of respondents (although the contract which includes façade lighting of buildings in the town centre amounts to £2,000,000) 'Lighting suggestions have been well received, especially the subtle highlighting of historic facades and features', Stage 2 Ancient Market Place Consultation (2011).

It is clear from these examples alone that the council has fallen short in its obligation to conserve biodiversity in its planning function. It rarely asks for surveys in respect of planning applications and despite stated aspirations, there has not been a mechanism to deliver biodiversity benefits or planning gain on the ground. The budget for greenspaces is inadequate. Biodiversity appears so low down the council's priorities it does not even feature in the Borough Vision (Destination Kingston, 2014-2018).

The Rear-guard: Partnerships and Local Groups

There has been no shortage of initiatives by bodies attempting to counter the failure of land use policies to protect the borough's natural resources. RBK now has a strong Kingston Biodiversity Network (KBN) convened in 2013 by the Kingston Environment Centre. A separate steering group embarked on refreshing and updating the embryonic KBAP, 2004. The steering group picked up the threads from the original KBAP group, which recognised that although the key to conserving RBK's biodiversity was the protection of wildlife habitat, ultimately achieved through land-use policies, land management had in fact been neglected.

The borough does benefit from the existence of the Kingston University BAP (KUBAP, 2012), which covers the land owned and managed by the University. A part of the KUBAP is a commitment to provide environmental education, student volunteers to engage in conservation activities as well as an annual Bio-blitz and campus wildlife and bat walks. There is a healthy cross-fertilisation of information and skills through to other groups who operate within the borough.

At the same time as the establishment of the KBN, a number of exciting projects, led by local Trusts, were beginning to make a noticeable difference to our open spaces. These organisations employ a small staff who organise volunteers. As well as being cost effective, this provides an excellent way of sharing skills and networking. Several volunteers have

subsequently progressed to paid work in the conservation field. These groups are welcome and active members of the KBN and have contributed momentum and clarity to the role and priorities of the KBAP.

Amongst these, the Lower Mole Countryside Trust has been supporting countryside management in the borough for many years. Their tradition of coppicing in our green belt is currently funded by English Heritage and Higher Level Stewardship.

The Environment Trust, a conservation organisation with 30 years' experience of improving local green spaces for people and wildlife across the London area, has been working in the borough since July, 2012. The Trust has engaged volunteers in coppicing, tree planting, pond clearance, creating a bat hibernaculum from a Pill Box, as well as controlling invasive species along the river and at Local Nature Reserves.



River Catchment Partnerships, formed in response to the European Water Framework Directive and led by the South East Rivers Trust, are working with volunteers from Kingston University and KBN to restore the riverbank along a 100m length of the Hogsmill River near the centre of Kingston (February-April, 2014). Fig.2. Volunteers staking wood from pollarded

trees in the first stage of installing deflectors in the Hogsmill River'.

Participants have been monitoring eels *Anguilla anguilla*, under the guidance of a local wildlife educator as part of his role at the Zoological Society of London (2012-14). A specially installed eel pass on a weir in the Hogsmill assists the fish in their journey upstream. Some weirs have been removed to enable safe eel passage and a type of plastic 'tile' has been installed at the Clattern Bridge, which was previously identified as an impenetrable entry point to the channel. Capturing data on the numbers of eels found is an important part of a Citizen Science conservation project.

Land managers at the Hogsmill Sewage Works (HSW) and Chessington World of Adventures (CWoA) have shown a desire to work with local groups and share information gathered from surveys on their land. The Hogsmill Valley Sewage Works Nature Reserve, where a newly restored lagoon created from the former sludge ponds, was opened to the public by the Mayor in February 2014. As part of these remediation and mitigation works, islands, deflectors and backwaters were created along the Hogsmill River (as it leaves Elmbridge Meadows

downstream to Kingston Cemetery). It is hoped that these works will improve the habitat to encourage water vole, which is thought to be present, albeit at low levels of population density.

At CWoA, some of the organisations that are represented within the KBN have had site access to undertake surveys. Dormouse *Muscardinus avellanarius* tubes were erected last year and continue to be monitored by Surrey Wildlife Trust. Both the Surrey Bat Group (SBG) and LBG have given advice as to the bat species present at the site. We have also undertaken harp-trapping of bats under a licence designed to discover the true status of Nathusius' pipistrelle bat across the country.

Both the SBG and LBG undertake bat roost visits and bat care in the borough depending on member availability. The Bat Conservation Trust (BCT) operates a helpline system for London, under contract from Natural England. Calls are taken from the public and allocated according to urgency, to advise householders when problems arise with bats entering their homes. We provide advice as to the best time of year to undertake repairs or re-roofing, sometimes provide bat detectors (in the case of baby bats entering the dwelling space) or undertake an emergence survey to ascertain species and numbers. There is also a system of training volunteers for the future.

Sources of data for the Directory

The Directory has been compiled using data from a number of sources. These include the surveys for the London Ecology Unit Handbook No. 18 (Swales, Yarnham and Britton, 1992) and the GLA Borough Habitat Survey (Dobson, 1992), which incorporated records of the mammal species encountered. Other sources include surveys carried out relating to improvements along the Hogsmill River and Bonesgate Stream for the Green Arc Partnership, Environment Agency and RBK and from Longworth Trapping projects (Author's data).

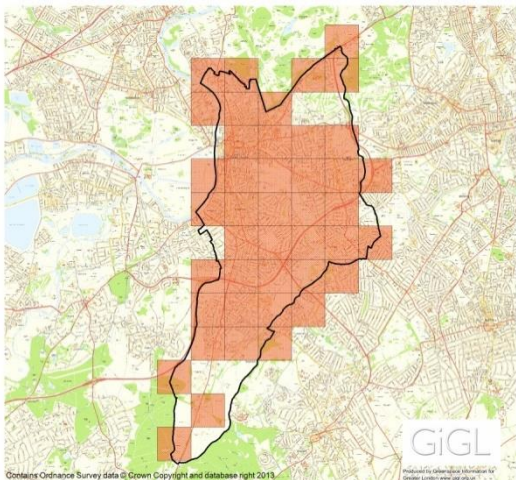
Bat surveys have elicited information on other species, particularly badgers, hedgehog, mink and shrews. Regular monitoring is carried out by myself on behalf of the LBG or the BCT National Bat Monitoring Programme. In particular, the Daubenton's Waterway Survey (DWS) has been undertaken along Canbury Gardens since 1990. This produces time series data on the activity of one bat species, at a particular location in the borough. Additional bat surveys include the annual London Bat Group Batty Boat Trip, which was undertaken every year in June since 2006. This has now been replaced by Harp Trapping under licence.

Bat monitoring was carried out for this article on approximately 50% of the sites mentioned, in order to ascertain whether species such as Natterer's bat were still present at the Fishponds, Surbiton as well as to monitor the use of the Beverley Brook as it crosses from Wimbledon

Common to Richmond Park. Useful information has also been gleaned from the local Surrey Comet, with records for harbour seal, deer and even details of European Protected Species.

Data sources are tabulated at Appendix 1. Mapmate was the vehicle used to transfer records to Greenspace Information for Greater London (GIGL) [Author's data, 1998]. Aforementioned bat roost visits (and bat casualties) are a source of data. Natural England requires an eight figure grid reference of any site, when such a visit is undertaken on its behalf and the information is relayed quarterly to GIGL and the London Bat Group Recorder.

Fig 3: Left shows the extent of data coverage for the borough (GIGL, 2013). Chessington and the greenbelt, occupy the southern cone area;



the greenbelt, occupy the southern cone area;

The River Thames is located at the western boundary;

The Beverley Brook, Wimbledon Common is located at the north eastern quadrant as it flows northward into Richmond Park.

The Hogsmill forms a central spine through the borough extending onto the Hogsmill Valley

Sewage Works, Kingston Cemetery and associated sports fields.

Directory of mammal species in Kingston

There are around 64 species of wild mammal breeding in Britain in thirteen Orders. Thirty-three of these species, of which ten species are bats, have been recorded in the borough since 1998. The Directory includes species for which there are no records in the Borough, but which have been recorded within 100m of the borough boundary. It follows the nomenclature used by the People's Trust for Endangered Species.

SHREWS, MOLES AND HEDGEHOGS

There are six species in these three Orders in Britain, of which at least four are present in the borough. These include hedgehog, which is the largest and pygmy shrew, which is the smallest. The hedgehog is a priority species of the UK Biodiversity Action Plan and appears in Section 41 of the Species of Principal Importance of the NERC Act, 2006. All shrews are partially protected by the Wildlife and Countryside Act, 1981 (WCA) which makes it illegal to trap them without the appropriate licence.

Hedgehog *Erinaceus europaeus* Status: native, common locally and nationally

The hedgehog is an uncommon species in RBK. Ironically, one of the indicators of the declining national trend of this species is the lack of animals now found dead on the roads. Hedgehogs persist in areas where habitat corridors are strong and land-use remains relatively unchanged. This includes Kingston Cemetery, where family groups of hedgehogs have been seen along the boundary fence. Hedgehogs have bred on at least two occasions in my garden, which is located near the cemetery. The young, however, are prone to attacks from cats and can drown in waterbodies. Once a female was seen carrying a pup in its mouth, trying to hide it into an ivy thicket (2005); a juvenile was found dead in the pond (despite gently sloping sides October, 2013). Individuals have been seen along the river corridors near the River Thames at Dysart Avenue and Lower Ham Road (2001-02): at the Bonesgate Stream and Hogsmill River and at Tolworth Court Farm. As is the case with many animal species found in RBK, sightings increase on the southern side of the borough boundary with Surrey, although there have been a number of sightings around the northern boundary with Richmond Park at Barnfield Allotments, Kings Road and Park Road (2001-2). At Southborough, on the western boundary, there are a number of large gardens, leading to a collection of records from these districts.

Mole *Talpa europaea* Status: native, common and widespread locally and nationally

There are records for the south and west of the borough in greenbelt, particularly along the Bonesgate Stream at Castle Hill LNR, Winey Hill, Barwell Court, Byhurst, Park and Rushett Farms. The Kingston stretch of the Beverley Brook, where it forms the boundary with Wimbledon Common before going under the A3 into Richmond Park, is an important crossing for several animal species, which may include mole.

Common shrew *Sorex araneus* Status: native, common and widespread locally and nationally.

Found among the larger gardens on Kingston Hill and Berrylands. Although very common, most records (dead and alive) refer to Tolworth Court Farm, where three were caught during a trapping study (2002) and another was found dead on a path. Records are more frequent than those for pygmy shrew, as they are often left dead and uneaten by cats. One seen swimming along the Bonesgate Stream could easily be distinguished from the frenetic diving motion of a water shrew, as it was swimming with its head held out of the water in a linear direction. (March 2014).

Pygmy shrew *S. minutus* Status: native, common and widespread locally and nationally.

One was caught at Tolworth Court Farm (2002). These animals will readily use mammal/bird boxes, unlike common shrew. Despite having pygmy shrews live for up to three years in the same box, I have only once found more than one animal inside.

Water shrew *Neomys fodiens* Status: native, unknown locally, 'locally' common nationally.

There are anecdotal records from the Hogsmill River in Surrey but not within RBK. A water shrew survey, using baited shrew tubes, was undertaken along the Tolworth Brook (1999) All tubes were washed away during each rainfall event and no data was obtained. Common shrews will take to water and swim and may be a source of confusion.

RODENTIA

There are fifteen species of rodent in Britain, eight of which are native, the others having been introduced and naturalised (e.g. house mouse) or introduced themselves as stowaways (such as the brown rat). Nine species have been recorded in the borough with the presence of a tenth species (dormouse) being a real possibility, due to the proximity of several north Surrey records. Water vole and dormouse are given some protection, under the WCA, 1981 and both are priority species under the NERC, 2006

Grey squirrel *Sciurus carolinensis* Status: non-native, common and widespread locally and nationally.

This species is frequently encountered in parks and gardens and may enter property. They have greatly increased in the last ten years. On one day more than twenty were counted at Kingston Cemetery (December, 2013) although eight were once considered a number worthy of a record (author's data, 1998). I record this species where abundance may be an issue for tree dwelling species of bat. Consequently large areas of Surbiton are considered as having elevated numbers, examples being the Richard Jefferies Bird Sanctuary, Surbiton Cemetery and Addison Gardens Allotments. Squirrel features in the Invasive species section of the Kingston University Biodiversity Action Plan.

Bank vole *Myodes glareolus* Status: native, common locally and nationally

Records exist from a Longworth Trapping Survey undertaken in woodland at Kingston Hill, (Kingston University, 2012) as well as skulls obtained from owl pellets, although the latter are problematic as it is not known where the owls were hunting. Bank vole have not featured in any of the Longworth Trapping studies along the Hogsmill River, Bonesgate Stream or at Tolworth Court Farm, due, in part, to the short duration of the studies.

Short tailed or field vole *Microtus agrestis* Status: native, common locally and nationally

The best sites for this species are Tolworth Court Farm, Hogsmill Sewage Works, and the river corridors. During a trapping study at Tolworth, seven new individuals were caught. A vole was found dead in Kingston Cemetery (2007) which may have been taken from the Hogsmill Sewage Works and dropped by a kestrel. This species can often be seen under discarded boards or carpet.

Wood or long tailed field mouse *Apodemus sylvaticus* Status: native, common and widespread, locally and nationally.

Many gardens, especially if bird feeders are present, will be visited by wood mice. This species is the most frequently occurring species in Longworth Trapping studies especially those of short duration, which it tends to favour. This would appear to corroborate with the literature that both bank voles and field voles seem to enter traps less readily than woodmice (Gurnell and Gipps 1989; Redpath *et al*, 1994).



(Fig. 4 left) a wood mouse that was caught three times (according to its clip mark) during a seventy-two-hour trapping study along the Bonesgate Stream in 2006.

A similar study at Tolworth Court Farm (2002) found a total of twenty-one individuals of four rodent species, including ten wood mice in a much shorter (fifty seven hour) trapping study. This species featured in a Longworth Trapping weekend at Kingston University, 2012.

Yellow-necked mouse *A. flavicollis* Status: native, 'locally' common nationally and unknown locally

There are no recent records for this species, although there is mention of their presence during the 1990s at Sixty Acre Wood, which runs along the southern borough boundary (LEU, 1992) and in Richmond Park, which is in close proximity to the northern boundary of RBK (author's data, 2001).

House mouse *Mus domesticus* Status: non-native common and widespread nationally and locally

Although there are no records in the databases consulted, this is a commensal species often undetected except by cat owners. All mice trapped in my house and garden have been wood mice.

Hazel or common dormouse *Muscardinus avellanarius* Status: native, rare and vulnerable to extinction nationally, no borough records

The common dormouse is one of Britain's most endangered mammals and is rarely seen. No records exist from within the borough, although there are records from sites abutting the Chessington boundary at Horton Country Park, Ashted Common NNR and Epsom Common SSSI. These records are from the last three years, when dormice have been found by accident during winter coppicing, which has led to more formal monitoring programmes. Records from cat owners of captured dormice are often not taken into consideration (Wells Estate, Epsom, 2010-11).

There has been a dormouse box scheme over the Greater London boundary in Surrey at Horton Country Park since 2005, where two nests were found. An end of year record (P. Howarth, 2017) has led to renewed interest in the box scheme. This site is contiguous with Castle Hill LNR, Chessington. No evidence of the species was found when these areas were previously surveyed, although lack of access to the best habitats may have affected the final results. (C. Herbert, 2008). There is currently a monitoring programme at CWoA, although there are no current records (J.Jones *pers. comm.*, 2014). With increased national monitoring, numbers are accumulating (see Fig.5).

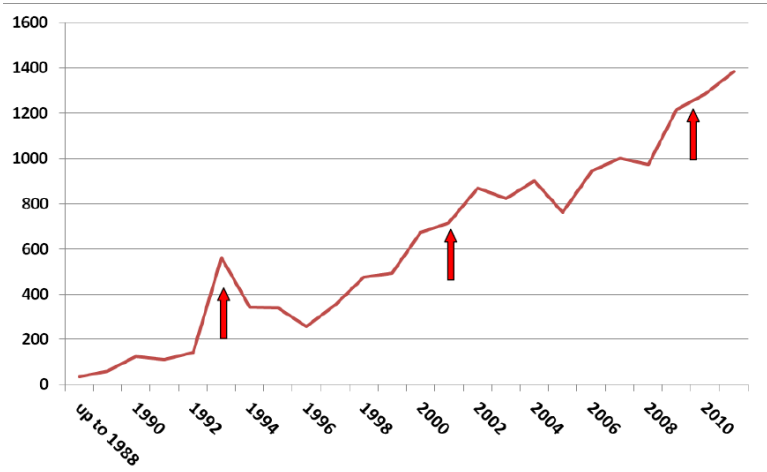


Fig.5 This shows the increase in dormouse records submitted each year on a national basis. Red arrows indicate 'Nut hunt' years. (Courtesy of P. Chanin, and PTES/N.E. 2014).

Water vole *Arvicola amphibius*. Status: native and 'locally' common nationally, still thought to have a presence in the borough

Water voles are a "Priority Species" of the UK BAP and water vole "places of shelter" are afforded protection under Schedule 5 of the 1981 Wildlife and Countryside Act. The species has suffered dramatic declines in recent decades.

In Surrey, the remaining water vole colonies are mainly confined to the upper reaches of river catchments, being absent from the main rivers due, primarily, to the presence of predatory mink (Crowther and Groome, 2006). The nearest known colony is situated within Horton Country Park (Newman, 2000) although evidence from holes, droppings and cut stems are recorded annually along the Hogsmill River and Bonesgate Stream (see below). The only documented sighting of an animal in recent years has been along the River Thames, seen whilst counting bats emerging from a roost (Author's data, 2001).

Bonesgate Stream

No latrines or droppings characteristic with water vole activity were found during commissioned studies along the Bonesgate Stream at Tolworth (2004, 2006) however, there was also an absence of rat faeces, despite several sightings. The undercut of the bank is so deep that most of the mammal activity and, hence the defecation, takes place in the hidden area.

The most likely area for water vole persistence along the Bonesgate Stream is where the river meanders through farmland near the footpath between Green and Chalky Lanes, Chessington. Here exist bankside holes, droppings and a range of nibbled plants, especially Lesser Celandine *Ficaria verna* and Celery-leaved buttercup *Ranunculus scleratus* as well as a range of grasses.

Hogsmill River

Historically, water voles along the Hogsmill River have been well documented from Old Malden to the HSW. At Old Malden Road, so called anecdotal evidence suggests that there is a small population of water voles, although whether this will cope with recent development/drainage works remains to be seen (SWT, 1999, C. Strachan, 2001, Fure, 2009). The presence of water voles at the HSW appears to have fluctuated over various surveys. Evidence of water vole around the HSW was originally identified in 2005 within a specific, locally limited area of the channel (GBM). However surveys undertaken by Entec in 2006 did not locate any evidence of the species. Details of the surveys including timing and conditions are not known.

Along the Hogsmill River, as it runs between Kingston Cemetery and HSW, burrows were present on the water line, with exits into the water approximately every 300m along the southern bank (Williams, Fure 2006-2012). These reappeared opposite Kingston Cemetery when the Environment Agency undertook re-profiling during 2012, but have since disappeared after an extended period of spate during the first quarter of this year.

A full survey of the Hogsmill River channel was undertaken in October 2010. Limited evidence in the form of potential tunnel entrances was identified in broadly the same areas as the original surveys, however, no feeding remains or latrines could be identified, which is sometimes the case when animals exist at low density. No holes were found recently along the water line except opposite a newly created on-line pond by the HSW (Fure, 2014).

Brown rat *Rattus norvegicus* Status: non-native common and widespread locally and nationally

First reaching England in 1728, this species has competed very successfully with the black rat *Rattus rattus*, a more arboreal species (the latter now extinct in the borough). The brown rat is common and widespread, found in sewers and in gardens, especially around bird tables, it is frequently encountered along the Beverley Brook, Hogsmill River and Bonesgate Stream as well as any shrub beds in the town centre, which are close to fast food outlets. At Elmbridge Meadows, where Tolworth Brook leaves the Hogsmill River to run through Raeburn Avenue open space, a brown rat was counted at one minute intervals at a point along the brook (2004). Dead animals may indicate poisoning from pest controllers operating in the district. One was found along the Hogsmill River during a recent litter picking exercise, decomposing in a plastic bag (April, 2014). The council no longer runs a pest control service and open or broken sewer inspection chambers may lead to a high visibility of this species.

RABBITS AND HARES

There are three species of mammals in this Order in Britain, two of which are recorded in the borough.

Rabbit *Oryctolagus cuniculus* Status: non-native common and widespread nationally and 'locally common' locally

Most records pertain to greenbelt farmland but this species is also recorded in central Kingston at the HSW (GBM, 2011). There are numerous animals present at the eastern boundary of Manor Park Recreation Ground burrowing along the railway lines. These can be seen feeding in the park at dusk. There are also records for unusual areas such as a Chessington Industrial Estate (GIGL, 2003). This species was seen during a survey 2017 along the Kingston side of the Beverley Brook near sports fields in the area of spoil tipped known as the Acropolis.

Brown hare *Lepus europaeus* Status: native common nationally although uncommon locally

Brown hare are a UK Priority Species with an intention to increase the range of this animal. It is given no legal protection as it is considered a game species and (other than Muntjac deer, it is the only one with no closed season). A record reported by me to the Surrey Wildlife Trust (2001) at Byhurst Farm was later thought to pertain to a massive warren of escaped lop-eared rabbits. There are anecdotal records of this species from time to time from local landowners.

CARNIVORES

There are nine species of carnivore in Britain eight of which are native. American mink is an escaped introduction. At least five are recorded in the borough, although no stoat records could be found, ferret has been included. The nine species are comprised of three families:

- Canids (foxes);
- Mustelids (badgers, weasels, stoat, mink, otter etc.; and the
- Felids (wildcats).

Fox *Vulpes vulpes* Status: Native, common and widespread nationally and locally

Foxes are protected from hunting with dogs under the Hunting Act, 2004 and all are protected under the (Cruelty to) Mammals Act, 1996. This is a widespread urban species and found throughout the borough. They may use vacant or occupied badger setts or live under buildings, especially sheds. They can be seen sleeping on shed roofs on a sunny day, especially when travelling along the Kingston Loop railway, which facilitates views of rear gardens.

Weasel *Mustela nivalis* Status: Native, common and widespread nationally and locally

Although most of the sightings of this species are just outside the borough boundary at Horton CP there are records from Castle Hill LNR. Predated bird remains and the characteristic twisted droppings of this species are sometimes found under bridges during surveys (Bonesgate Stream, 2006).

Badgers *Meles meles* Status: native, common and widespread nationally and locally.

Badgers are still protected from persecution and have their own legislation, The Badgers Act 1992.

Badger activity is found at locations throughout the borough and most sites cannot be disclosed here. Badgers suffer mainly from development pressure resulting in shrinking foraging areas and access to water. Most of my Chessington sightings have been during bat surveys when young badgers are *en route* to some well-established feeding station provisioned by local residents.

Badgers are located along many points of all of the borough boundaries:

- At the westernmost point of the borough, close to the Grapsome (the source of the Tolworth Brook);
- To the north along the Richmond boundary as well as areas of Kingston Hill;
- Along the eastern boundary, wherever there is back land and strong corridors linking private gardens (sometimes under sheds);
- To the south at ancient features usually on farmland (green lanes and old railway embankments); and
- A clan is located in central Kingston at the HSW, with active paths and latrines recorded in the Western Scrub and Eastern Mound areas. From this source I have had late night encounters along Bonner Hill Road.

Otter *Lutra lutra* Status: native and localised nationally, unknown locally.

Otters are a priority species under the UK BAP and are classified as 'Near Threatened' on the IUCN red list. They are fully protected on Schedule 5 & 6 of the WCA, 1981, as well as European Protection under the Habitats Directive and the Convention of International Trade in Endangered Species (CITES).

Although there are no verified sightings of this species along the River Thames (recent anecdotal records usually pertain to harbour seals or mink) there have been sightings at the margins along the 'out of borough' tributaries. For this reason, sightings are dependent on survey effort and an Otter Bridge Blitz resurvey of the National Otter Survey 2009-10 took place this year along the river Mole and Wey (5.4.14).

American mink *Neovison vison* Status non-native, common and widespread nationally and locally

This species is known to be breeding in the borough, possibly at more than one location. It is regularly seen swimming around Raven's Ait, usually at dusk (C. Matcham, 2001, author's data, 2012-13). This species is known to reside at Thames Ditton Marina and can also be seen during quieter periods under the bridge along Queen's Wharf by Charter Quay. During 2017, there were daytime sightings along the Hogsmill river at Middle Mill, Elmbridge Meadows and the near the A3. This increase in sightings may correspond to increased conservation work (path construction, RMI monitoring) along the river.

Ferret *Mustela putorius f. furo* Status: non-native locally common nationally and present in Kingston. National population estimate 2,500 (Harris *et al*, 1995).

This is the domesticated form of the European Polecat. Being so closely related to polecats, ferrets easily hybridize with them, and this has occasionally resulted in feral colonies of polecat-ferret hybrids that have caused damage to native fauna. Frequent adverts on lamp posts, attest to a lost pet ferret and they are sometimes seen at night running around front gardens close to the Hogsmill River. There was an advert on a lamp post pertaining to an escapee at the end of 2017.

PINNIPED

There are two species of pinniped in Britain both of which, the grey and the harbour seal, has been recorded in the borough. Harbour seals are least threatened under the IUCN red list. They are protected under the Conservation of Seals Act, 1970 and the European Habitats Directive. Sixteen SACS have been designated for them. Occasionally they will travel up the Thames, remaining near to the pool of London. It is unusual for them to find their way above Teddington Lock, but when they do they have been mistakenly recorded as an otter species.

Harbour seal *Phoca vitulina* Status: native, 'locally' common nationally and rare locally. Recent declines of 50% since 2000.



A Juvenile was seen on 30.12.11 at Lower Ham Road, at the northern entrance of Canbury Gardens. A spectator said that it was rare to see a seal so far up river because of the obstacle of Teddington Lock, and the last time he recalled it happening was 12 years previously, when an adult seal had

been spotted in close proximity to a marker buoy (Fig. 6 Surrey Comet, 29.12.11)

Grey seal *Halichoerus grypus* Status: native, 'locally' common nationally and rare locally.

Recent increases in the Thames Estuary

During mid-December, 2014, a grey seal was seen in The Thames below Teddington Lock and as far upriver as East Molesey Lock. Sightings continued until mid-January, 2015 and it was regularly seen taking fish from around Teddington Lock. These sightings can be seen on the Zoological Society website here: [http://sites.zsl.org/inthethames/#Public sightings](http://sites.zsl.org/inthethames/#Public%20sightings)

ARTIODACTYLA

There are seven species of even-toed ungulates in Britain. This mainly pertains to deer but also includes wild boar. Three species are recorded in the borough.

Reeves' or Chinese Muntjac *Muntiacus reevesi* Status: non-native, common and widespread nationally and locally

Records exist from sites from Chessington and also the along Pipe Track, New Malden. The Pipe Track is the Thames Water ring main and is situated at the rear of gardens, where its leaky nature created interesting habitat until recent habitat changes.

Roe deer *Capreolus capreolus* Status: native, common and widespread locally and nationally.

Roe deer are commonly seen almost everywhere in Chessington, but especially at Castle Hill LNR and the Bonegate Stream, where many safe crossing points have been made by grading the banks. Deer slots are found regularly at Tolworth Court Farm and even in central Kingston including the HSW, where droppings and loafing areas have been recorded. The remains of a skinned deer found in Chessington may be evidence of poaching (Guardian May 2010).

CHIROPTERA

There are eighteen species of bat in Britain, of which ten are recorded in the borough. Several are UK Priority Species and all are protected under European Law.

Noctule *Nyctalus noctula* Status: native, uncommon nationally and locally

There are records from ten localities with a maternity colony on the west side of the River Thames, just over the borough boundary in LBRuT. The status of noctule bats in London has changed in recent years (Briggs et al, 2007), mainly due to loss of suitable stands of trees. At Seething Wells, eleven noctules have been recorded at any one time (EDP, 2012) [Briggs *pers comm*, 2012) compared with only one or two bats flying at any time at the London Wetland Centre Barnes. Noctule bats are often recorded as singles during the London Bat Group annual 'Batty Boat Trip'. There are records Kingston Riverside at Canbury Gardens, with one seen flying in daylight during March (2005) at this site. Overhead passes have been recorded at Kingston University Kingston Hill Campus, and The Woods, Surbiton. Four were caught during harp-trapping project at Sixty-Acre wood in Chessington, 2016.

Leisler's Bat *Nyctalis leisleri* Status: native, rare nationally but local in the borough

This (mostly) tree dwelling species used to be recorded in good numbers along the Thames during the annual London Bat Group Batty Boat Trip from 2006-2013. More recently, encounters are reduced to brief passes, although there are still prolonged feeding episodes at Seething Wells. The main stronghold for this species is the neighbouring borough of Merton and encounters are made wherever the borough boundary meets suitable habitat in Merton, especially between June-August. The former Worcester Park Sewage Works, to the east of the borough boundary with Sutton (now known as Mayflower Park) is a favoured feeding site as well as Joseph Hood Memorial Playing Fields to the north in Merton. Brief overhead registrations are made throughout the borough and there are records along the Hogsmill Valley, including Kingston Cemetery and Knights Park, next to the University Campus.

Common Pipistrelle *Pipistrellus pipistrellus* Status: native, common and widespread nationally and locally

Small colonies are present throughout the borough, especially around the boundaries of good habitat, such as Richmond Park. Common pipistrelle colonies are often small in number (the largest colony in the borough is around 100+ bats). A survey of the Bonesgate Stream (2006) estimated that four to five pipistrelle colonies were located in close proximity to the river, judging by their flight direction and time of arrival at the sites surveyed. Seething Wells is the only known hibernation site for this animal in the borough. European Protected Species licence applications in the borough for *Pipistrellus* species are on the increase as more surveys have been commissioned due to greater awareness although illegal roost destruction is still prevalent.

Soprano pipistrelle *P. pygmaeus* Status: native, common and widespread nationally and locally

Colonies of this species are far easier to detect due to a propensity to roost in much larger numbers than the common pipistrelle. There exists a colony, which has regular roost sites around the Surbiton area, never far from the River Thames. The soprano pipistrelle often locates itself in flat roofs, which retain the sun's warmth throughout the day and can number more than two hundred and fifty individuals. A well-established colony in central Kingston of one hundred and seventy-six bats uses wooden soffits. This species will also roost in trees and has used sites at Fishponds, Lower Marsh Lane, Surbiton and Jubilee Wood. Smaller colonies, such as at Kingston Hill (60 bats) are most likely to be satellites of larger colonies.

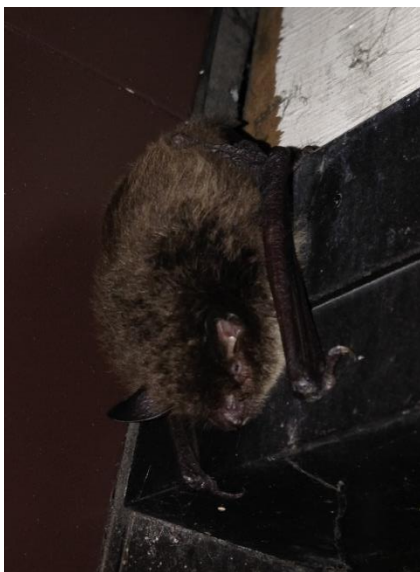
During the summer months, good numbers can be found feeding on insects generated along the Hogsmill River, Beverley Brook, Bonesgate Stream and Tolworth Brook. Tree roosts are also known at Tolworth Court Farm. The only known winter roost site for this species is Seething Wells, where bats are frequently seen exiting usually during February.

Nathusius' pipistrelle *P. nathusii* Status: considered to be a migratory species, rare nationally, local to the borough riverside.

This species is known along the Thames Riverside and has been recorded regularly flying over Seething Wells filter beds and the riverside, particularly at Canbury Gardens, during the BCT Daubenton's Waterways Survey. Encounters are no longer of the as frequent as during the mid-2000s, possibly due to a roost site relocating from Barge Walk, where it was originally thought to be. Annually, mating roosts are still located under the railway bridge in the town centre. During a harp trapping project a male Nathusius' pipistrelle was caught at a Thames Water site 2017.

Serotine *Eptesicus serotinus* Status: native, nationally considered a 'local' species rarely recorded in the borough.

This species was recorded at twelve localities in the borough, most of which are associated with the River Thames or the HSW. Since 2004, these encounters have diminished in frequency. Serotines are more likely to be recorded across the county boundary in north Surrey. There are no known roosts of this species in the borough



Daubenton's Bat *Myotis daubentonii*. Status: native, nationally uncommon (TMJ,2011) Declining in London (Briggs *et al*, 2007).

Regularly recorded at four wetland sites in the borough. A maternity roost of thirty animals (2001-12), located at the barge tunnel in Seething Wells, was lost when the Filter Beds, used as a foraging area, were drained. Since then only three animals have been recorded using the tunnel, which has lost its protective hatch. This site is still used as a hibernaculum during the winter months, particularly during January. This juvenile (Fig. 7 October, 2013) was found above the doorway of the department store in New Malden high street. The nearest watercourse is the Beverley Brook as it traverses the New Malden golf course.

The Hogsmill River and Seething Wells are important feeding sites for this species. If a static bat detector is left under the bridges of any of the small rivers in the borough, it is possible to detect at least one Daubenton's bat pass over the course of an evening (depending on the time of year) indicating that these are important commuting routes. Light pollution is an issue for this species and has been written about elsewhere (Fure, 2012).

Two females were caught during a harp-trapping project at the East and West lagoons at Hogsmill Sewage Works, 2017.

Whiskered/Brandt's/Alcathoe Bat *Myotis spp*). Status: native, nationally considered rare, uncommon, and unknown respectively). Locally: unknown, rare and unknown.

A Brandt's bat was identified from recordings made along the river of the Seething Wells Filter Beds by a static bat detector positioned on a wall during surveys (EDP, 2012). A roost of this species was located in neighbouring LBRuT within 1 km (2006) and verified during further surveys (2008). A Brandt's bat was caught during a harp trapping project at Jubilee Wood 2016.

A Whiskered bat (identified by dentition) was controlled using a harp trap at Barwell Court Lake during August, 2017. The only local record is from Kempton Park, making it a first record for the borough.

Natterer's Bat *M. nattereri* Status: uncommon nationally, rare in the borough

This species is recorded at four localities in RBK with only one known roost situated in a tree at the Fishponds Surbiton (2003 - 2005). Dawn and evening emergence surveys were undertaken with members of the LBG and staff from Surrey University where recordings were taken and the presence of this species was confirmed. More recently, Natterer's bats were not detected at the park with subsequent and noticeable change in the habitat, particularly the loss of standing dead wood, 2013. Other locations within the borough include the Hogsmill River, where Natterer's bats were recorded feeding at a temperature of six degrees centigrade, considered to be a very cold air temperature for insect activity (Knights Park 2003-04, Guildhall 2004-06). Natterer's bat were recorded at Surbiton Sewage Works where this species was thought to use the crowns of poplar pollards for roosting (2004). Often recorded during the London Bat Group Batty Boat Trip on the west bank at Barge Walk. (LBRuT). The only known maternity colony along the river (in LBRuT) was lost to development about the same time as the species disappeared from Canbury Gardens (DWS, 2004).

Brown Long-eared Bat *Plecotus auritus* Status: considered common in wooded areas but uncommon in the borough).

Whilst this species is common in the wooded areas of north Surrey, it is only recorded at a handful of sites in the borough. It can be a difficult bat to detect in the field and is more likely to be found when directly observed at a roost or as a casualty. A bat was removed from the Vampire Ride at CWoA (February, 2013) the day before the ride opened for the school half term. It was returned to be released the following week. A brown long-eared bat was caught during harp-trapping projects at Sixty Acre wood, 2016 and Barwell Court Lake August, 2017.

Droppings of this species, were found at a converted Pill Box in woodland at Chessington. Brown long-eared bats have strongholds at five sites abutting the borough boundary including Ditton Fields, Home and Richmond Park and Wimbledon Common. It is likely that singles or even small colonies exist in trees or the larger properties at Kingston Hill and Castle Hill LNR. Maternity colonies are known to have been lost in the district during recent developments (at Teddington (LBRuT and Epsom, Surrey to the north and south of the borough, respectively and this may have an effect on the distribution and abundance of the local population).

Barbastelle *Barbastella barbastellus* (rare nationally)

There is one unverified record of this species for the borough.

APPENDIX 1

Species	Survey	From 1998
Data Coverage Map	GIGL records	See map below
Crowther., K and Groome G.	Hogsmill Management Plan	2006
Fure	Longworth trapping records Tolworth Court Farm 2002	2002
Fure	Longworth trapping records Bonesgate Stream	2006
Fure	Longworth trapping records Hogsmill OS	2008
GMB	Water Vole, Hogsmill near Sewage Works	2011
Fure, A, Hillary Saw	NBMP Bat surveys	2000-20013
Fure, A	General bat surveysHogsmill/Bonesgate/Tolworth Brook/ Thames/ Fishponds (June, 2013)	2000-13
Surrey Comet	Seal at Kingston riverside Boxing day http://alisonfure.blogspot.co.uk/p/local-wildlife-sightings.html	2012
London Bat Group	Batty Boat surveys	2006-13
Jones, J Surrey Wildlife Trust/PTES	Dormouse survey Chessington Zoo	2013
Kingston University Biodiversity Group	Mammal Trapping Project	2012
Swan., A	Dormouse survey	No date
Williams, D., Fure, A Surrey Wildlife Trust	Water Vole, Hogsmill	2005
ARM/LMG;	Muntjac survey	
Charlotte Aybes LNHS	Hare Survey	
Fure, A., K., Boudreau	Hogsmill Sewage Works	May 2013

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Thank you to Annie Chipchase for commenting on the drafts. For further reading about the Mammals of Britain, two books were found especially useful as the order of the systematic list has recently been revised and Latin names have changed. These were Britain's Mammals PTES, which does not mention feral ferret, which was found in A Review of British Mammals Harris *et al*, 1995. In addition Distribution of Hazel Dormouse in Greater London C. Herbert LN, 2008 and P. Morris London's Mammals LN, 88, 2009 are also useful.