Nyctalus (N.F.), Berlin 8 (2003), Heft 6, S. 588 - 595

Barbastelle (*Barbastella barbastellus*) within the Tamar Valley

Die Mopsfledermaus (*Barbastella barbastellus*) im Tamartal

Barbastelle (*Barbastella barbastellus*) dans la vallée de Tamar

By John J. Kaczanow, Devon

Summary

In Britain the Barbastelle is rarely encountered, only a single maternity roost is known to date. In the study area records are mainly based on single specimens, apart from two sites that are continuously producing small numbers of hibernating and occasional summer sightings.

Feeding and roost sites cannot be protected until more data is amassed, in spite of the habitat and human population around the known sites any threat to their short term survival however must be avoided.

Future research in the Tamar Valley will be aided by mist netting, ringing programs, increased number of bat boxes along with extended hours in the field.

Zusammenfassung

In Britannien trifft man sehr selten auf die Mopsfledermaus, und bis heute ist nur ein Wochenstubenquartier bekannt. Im Untersuchungsgebiet wurden meist Einzelexemplare nachgewiesen. Es gibt nur zwei Orte, an denen regelmäßig eine kleine Anzahl überwinternder Tiere und gelegentlich Sommerquartiere nachgewiesen werden konnten.

Ohne ausreichende Datensammlungen können Jagdhabitate und Quartiere nicht unter Schutz gestellt werden, dennoch sollte, trotz der in der Umgebung lebenden Menschen, jede Gefährdung ihres kurzen Lebens vermieden werden.

In Zukunft werden die Forschungen im Tamartal durch Netzfänge, Beringungsprogramme, eine steigende Anzahl von Fledermauskästen sowie zahlreiche Außentermine ausgedehnt werden.

Résumé

En Grande-Bretagne, la Barbastelle se rencontre rarement et une seule colonie de reproduction est connue jusqu'à présent. Dans la zone d'étude, les observations concernent principalement des individus isolés, à part deux sites qui produisent régulièrement un petit nombre d'observations hivernales et d'occasionnelles rencontres en été.

Les terrains de chasse et les gîtes ne peuvent pas être protégés tant que plus d'informations soient rassemblées. Cependant, à cause de l'habitat et de la population humaine autour des sites connus, toutes les menaces à court terme doivent être évitées.

Des recherches futures dans la vallée de Tamar seront soutenues par des captures au filet, des programmes de baguement, une augmentation du nombre de nichoirs à chauves-souris tout en passant davantage d'heures sur le terrain.

1. Introduction

1.a Project Area. The River Tamar & its Tributaries

The River Tamar flowing North to South divides the counties of Devon & Cornwall. It is 60 miles long. The final 19 miles are tidal, with the main tributaries joining the river within these reaches. They are the Rivers Tavy, Lyner and Tiddy. Smaller but equally important are the Rivers Inny, Lyd, Ottery and Carey that flow in way above the weir at Gunnislake.

The initial stretches of the Tamar originating North of the Tamar Lakes flow through gentle pastures until it gains momentum at the halfway point. High sided wooded valleys are a prominent feature for most of the middle reaches. The final estuarial stretches spread out before entering the sea at Plymouth. Its catchment area extends many miles each side, running from the west bordering Bodmin Moor and from the East deep into The Dartmoor National Park. A conservative estimate of more than fifteen hundred square miles.

The tributaries are important for their individual diversities, ranging from fast clean flowing to meandering brackish waters. Variable deciduous ancient wooded valleys are many as traditional farmland, mostly void of excessive fertilizers and harmful chemicals.

Culm grassland and bog areas also abound.

Conifer forests are evident but generally are of varying ages and mingle with deciduous woodland, thus producing forest unrivalled in the Southwest for quality, not size.

At the river's lower expanses, high sided southern slopes produce crops weeks ahead of other areas. Consequently enabling species to benefit on early food, breeding condition, etc.

Our industrial past has left many valuable hibernation /roosting sites as mines, adits & lime kilns, etc. Sadly some have been lost along with their occupants, others have been grilled, others I have still to find.

Probably, the area chosen will vary more in habitats than most areas of its size. Producing unlimited variation in species, from ten *Bats* to *High brown* and *Heath Fritillaries*. Breeding *Peregrine Falcons* and *Hobbies*. Sightings of *Honey Buzzards, Ospreys* and *Red kites*.

Otters & Dormice are also abundant (pers. rec.). The tally is almost hard to grasp.

The human population here is sparse with few large towns. Hundreds of hamlets and villages along with miles of country lanes and small fields produce outstanding bat habitats.

The River Tamar is considered of exceptional value and is an AONB (Area of Outstanding Natural Beauty). I am convinced that the project will continue to yield many surprises.

1.b Aims and Benefits

Detailed assessment of *Barbastella barbastellus* within the Tamar Valley & its Tributaries.
By;

1. Monitoring all known hibernation sites.
2. Target known areas & selected buildings to find possible maternity colonies. By visual means and using bat detectors, recording and analysing such by computer.
3. The erection and trial of new designs of bat boxes and monitoring such through all seasons. Proceed with the expansion of existing schemes as planned.
4. Continue liaison with landowners, foresters & council landscape officers in formulating policies regarding woodland management within the project area.

Extensive field work to continue through all seasons.

Benefits of the project will enhance knowledge of the Barbastelle and Chiroptera of the region, thus aiding future conservation measures.

Some involvement of bat groups and local environmental bodies will strengthen relations, facilitating future research.

Records of other species encountered can strengthen our knowledge, so aiding their conservation.

Contact with the public should enlighten them to the benefits of all the species

1.c Descriptive Text

GENUS: Barbastella Gray 1821
Two species, one in Europe
Barbastelle
Barbastella barbastellus (Schreber 1774)
The Barbastelle bat within Britain is a very elusive creature with only a few beings recorded each year. No recent nursery colonies were recorded in the UK until one turned up in North Norfolk August 1996.

Black fur, pug nose and distinctive triangular ears make the Barbastelle instantly recognisable. A high percentage have a small skin flap (lobe) about halfway up on the outer edge of each ear. One specimen observed had minute lobes. Small orange mites have been observed on the ears of the Barbastelle. Ears 12 - 18 mm joined at the base on top of the forehead. 5 - 6 traverse folds. A medium size bat, forearm 36 - 44 mm. Head and body 45-58 mm. Wingspan 260 - 290 mm. Weight 6 - 13.5 g. Tail (36) 38 - 52.
Dental arrangement $\frac{2123}{3123}$ = 34 teeth. Condylobasial length 12 - 14.7 mm.

Records of feeding suggest that it favours water and close to foliage. Steep sided heavily wooded valleys are also revered. Norfolk Bat Group say (pers com.) that Norfolk specimens are found frequenting old Parkland. With the wide distribution area of the species its favourable haunts are going to be variable. As with all of our *Chiroptera* it has to find its insect prey.

Its dependency on tree roosts will also dictate habitats. Thus, providing the key factor Woods. For this region most specimens recorded are

single individuals that have fallen prey to cats and sickly ones found mainly in the open.

Authentic records for Devon begin in 1805 and 1808 two specimens killed/collected by COL MONTAGUE. Cornwall's records start in 1850 with a specimen from Maenporth Bay, Falmouth. Own records began autumn 1992.

2. Survey work 1996 - Winter 1997

2. a Areas covered and Summary of Habitat Types

Each location or site because of the diversification of the region requires a different approach to bat survey work.

Woodlands initially are searched during daylight hours, with most 'return home' journeys being close to dusk or after dark. Therefore, some bat detector surveying is possible then. Likely tree roosts are either plotted for future reference or inspected when found (circumstance dictates). Woodland searches are most productive while the canopy is bare. Although we could argue that waiting for emerging bats and plotting their flight paths etc. might be more productive later in the year? The seasons are notoriously short.

Hedgerows, stumps, roots and individual trees are targeted and is time consuming. Old woodpecker holes, healed cracks, rotten wood with hard outer crust and rings of suckers from the base line are all places of interest.

Within most woodlands along the Tamar and Tavy valleys are sizable rocky buttresses. Bats use these for hibernating and night time feeding places. In one instance we discovered Greater Horseshoes *(Rhinolophus ferrumequinum)*, I believe were taking advantage of the cooler conditions during a hot summer period.

Mines are prevalent in the project area, some are easy others not so approachable. I do not regard these sites to be important to our Vesper bats. Hypotheses that might challenge scrutiny from „people in the know", they are without question places that are continually producing records of *Rhinolophus*.

Adits remain the easiest of places to survey and probably the safest underground sites. These also manifest good records of *Rhinolophus*.

Man-made tunnels, either through rock or as a garden feature made of stone, may predominately be very important as hibernacula and summer roost. I think second only to certain buildings & trees.

Natural caves are sparse and produce few Vesper records.

Old buildings (to include ice houses) are useful places and where I expect to find Bb. I have recorded vesper species in old chimneys and missing mortar cracks.

Habitable abodes and associated buildings are continuously being surveyed and these places have to date produced the highest numbers of bats and their roost (and problems).

Watercourses are very productive, the majority have safe access, some however are very difficult to survey and extreme care is needed. Most provide sufficient clearance for good bat detector surveillance. Day time familiarisation is essential to find possible roosts and no go areas. For foraging bats it is crucial in the area covered. The climate around some tracts is responsible for high concentrations of insects, encouraging large numbers of bats that I have recorded along the River Tamar. Especially the slow deep meandering middle reaches. The tidal stretches and some reservoirs have yet to be assessed.

River banks, another important habitat for roost, feeding and travel. A prime target also for bat box sites.

One such bank at Double Waters (R. TAVY), reach only by flood water. An otter holt was found which contained Lesser Horseshoe droppings two feet from the ground.

River bridges, if conditions exist, could be prime sites. Few in the survey area.

Quarries abandoned or working can be of use to bats, cliff faces and old buildings are areas to be searched. With a few underground sites.

2.b Devon & Cornwall records plotted to show seasonal occurrence of *Barbastella barbastellus*

52 of 58 records from 1805 - 1997 showed monthly data which is plotted below to show

the seasonal occurrence of this species in the two counties. The winter months are still the prime times in the region.

With an increase of the project recording during the breeding season, our regional figures will change more with a recorder bias to the summer if recoveries remain static in the winter. Norfolk Bat Group (the Hot Spot) have stated that their records show an equal amount.

3. Barbastelle Records

3.a Barbastelle Hibernacular Site A

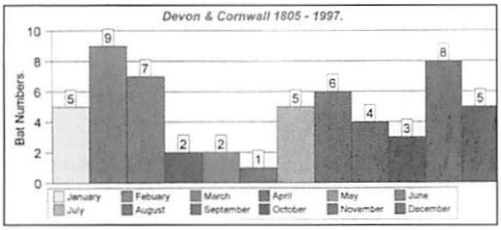

Fig. 1. Monthly occurrence of *B. barbastellus* in the Devon and Cornwall 1805-1997

Abb. 1. Monatliches Vorkommen von *B. barbastellus* im Devon und Cornwall 1805-1997

Graph. 1. Répartition mensuelle des observations de *Barbastella barbastellus* dans le Devon et les Cornouailles de 1805-1997

Devon Wildlife Trust Nature Reserve

Main Tunnel

A tunnel leading from the Arboretum to the top of the kilns, beneath the main ramp rising from the lake. The tunnel lined with quarried stone runs east to west, the west end being blocked by spoil. Size about 6' wide, 8' high with cathedral dome and 50' long. Limestone scale covers the interior in most places washed through over the years.

Many crevasses are available for roosting bats. Some have squeezed well into the cracks. Others have remained quite open.

Bats have been found covered in water droplets and icicles have formed within. A different micro climate to Site B. I hope to secure a weather station within the tunnel in the future.

Bats recorded here are: *Plecotus auritus*, *Myotis brandtii*, *Myotis daubentonii*, *Myotis nattereri*, *Rhinoloplus hipposideros*, *Rhinoloplus ferrumequinum*.

Barbastella barbastellus encountered 11/11/92, 31/3/93, 23/3/94 and November 94 and 4/1/97.

Barbastelle Hibernacular Site B Tunnel

This tunnel system is the most desirable area surveyed to date. It is joined to the rear of the Shell House (A small stone built „Folly" lined with mineral samples and sea shells, six sided with two windows and a door.) by a single section that then joins another length opened at each end to form a „T" complex. This tunnel separates the garden and lawn from the woodland, with the top of the „T" being the walkways through. Each section is approx. 15 ft long, 4 ft wide and 7 ft high with a cathedral dome interior. The interiors are lined with flat stones. The loss of some mud binding has created many nooks and crannies.

To date the site has remained dry and has a steady flow of air, depending on weather conditions.

I have recorded six individual Barbastelles from this site.

Bat species recorded are *Plecotus auritus*, *Myotis brandtii/mystacinus*, *Myotis nattereri*, *Myotis daubentonii*, *Rhinoloplus hipposideros*, *Pipistrellus pipistrellus* and *Barbastella barbastellus*.

3.b Records of encounterers with the *Barbastelle* and Pie Chart of Lobe Occurrence

Hibernacular Site A.

11/11/92. 17.45 hrs. *Barbastella barbastellus* in the tunnel on side wall, active with ruffled appearance. Another bat in flight which exited, the *Barbastella barbastellus* then took flight. Had it just mated?

31/3/93. Dusk. Misty not cold, lots of midges around. *Barbastella barbastellus* in flight at the front of the kilns. At times it came within feet of our heads, very clear identifiable record. It stayed around for about 15 mins.

I recorded it on a Mini QMC batdetector from 22 kHz - 122 kHz.

23/3/94. Single *Barbastella barbastellus*. Five *Myotis daubetonii/nattereri*, all torpid.

Nov.94. Single *Barbastella barbastellus* photographed by torch light. (No visible ear lobe). **4/1/97.** Single *Barbastella barbastellus* and *Myotis daubentonii*. 3 *Myotis nattereri*. All torpid. A very cold spell, icicles forming within tunnel.

Hibernacular Site B. Shell House Tunnel

17/2/93. 17.15 hrs. Dry and cloudy. Tunnel temperature 11.1°C.

Two *Plecotus auritus*, two *Myotis nattereri*, a single *Myotis brandtii/mystacinus* and most pleasing a single *Barbastella barbastellus*.

7/12/94 17.00 hrs. Cold & clear.

Three *Barbastella barbastellus* (with ear lobes). Five *Plecotus auritus*. All torpid. Single *Myotis nattereri*, two *Pipistrellus pipistrellus*, these three were awake.

24/12/94 11.00 hrs. Hoar frost, sunny at times. Five *Plecotus auritus*. Two *Barbastella barbastellus* and two *Pipistrellus pipistrellus*, all torpid. Tunnel temperature 0.8° C.

5/1/95 17.03 hrs. First-quarter moon, broken sky. A single shower at 17.30 then sky cleared.

A single *Barbastella barbastellus* on the tunnel face that was active on my arrival.

Another *B. b.* and two *Pipistrellus pipistrellus* plus four *Plecotus auritus* all torpid. Tunnel temperature 4.9 ° C.

4/2/95 17.37 hrs. Tunnel temperature 8.5° C. Weather conditions dry with broken sky.

Seven *Plecotus auritus*, two *Myotis nattereri*, single *Pipistrellus pipistrellus* and two *Barbastella barbastellus*, found all torpid.

One of the Barbastelle had 5-6 orange mites on the outer edge of the right ear, the other had very small ear lobes of which I had not seen before. This makes an individual count of five specimens for this site.

I plotted the chart from eight records of species identified as different, other Barbastelles were seen but could not be individually identified, therefore have not been plotted.

A scientific explanation of the presence or absence of the lobe is not forthcoming. The general consensus is that it has no effect on the species and with or without they remain *Barbastella barbastellus*.

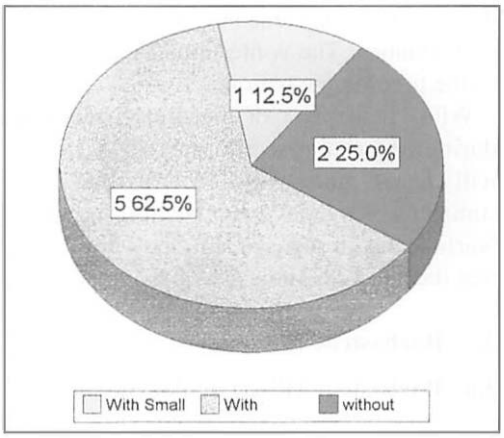

Fig. 2. Barbastelle ear lobe occurrence. Data from 8 specimens

Abb. 2. Auftreten von Ohrläppchen bei Mopsfledermäusen. Daten von 8 Exemplaren

Graph. 2. Barbastelles présentant un lobe auriculaire. Données de 8 individus

28/2/95 16.15 hrs. Found single *Myotis nattereri*, *Barbastella barbastellus* and *Plecotus auritus*, all torpid. Tunnel temperature 7.7° C. The weather for the past few days has been quite mild.

5/3/95. 16.00 hrs. Single *Barbastella barbastellus*. Two *Pipistrellus pipistrellus*. Three *Myotis nattereri* with one *Myotis nattereri* or *daubentonii* and two *Plecotus auritus*, all torpid.

27/9/95 16.10 hrs. Tunnel temperature 12.4°C. Sunny with some cumulus and strong wind. Tunnel drafty. Single *Barbastella barbastellus* and *Myotis nattererii*, both awake. Single *Pipistrellus pipstrellus*, torpid. First bats of the autumn.

17/11/95 11.03 hrs. Tunnel temperature 4.8° C. Clear sky, bright sun. Frosty and calm. The first frost for this valley.

Two *Myotis nattereri*, single *Barbastella barbastellus* and *Plecotus auritus*, seven *Pipistrellus pipistrellus*, all torpid.

11.55 hrs. Tunnel temperature 6.4°C warming up as the sun reached the South Easterly opening.

2/12/95 16.30 hrs. Tunnel temperature 10.9° C. Light going with misty drizzle. Ambient temperature (19.12 hrs.) 11.3° C.

Five *Pipistrellus pipistrellus*. Four *Plecotus auritus*, all torpid. Single *Myotis nattereri*, awake.

Three *Barbastella barbastellus*, two torpid, one awake, this one had no ear lobes. One torpid specimen is a very large creature with heavy bent forearms, looks ancient. This one I have not seen before which brings the individual total for this site to six.

30/1/96 12.45 hrs. Tunnel temperature 3.8° C. Overcast and calm. Two *Barbastella barbastellus*, two *Pipistrellus pipistrellus* and five *Plecotus auritus* found. One *Barbastella barbastellus* in the stem of the „T".

22/2/96 16.20 hrs. Overcast slight breezes. Cold but warmer than previous days. One *Barbastella barbastellus* in the stem of the „T". Four *Pipistrellus pipistrellus* and seven *Plecotus auritus* found.

5/5/96 19.16 hrs. Single *Barbastella barbastellus*, *Plecotus auritus*, *Pipistrellus pipistrellus* and *Myotis nattereri*, all torpid. A succession of a few cold evenings.

25/5/96 21.10 hrs. Single *Barbastella barbastellus*, torpid, *Plecotus auritus* and *Myotis nattereri*, awake.

20/6/96 20.50 hrs. Warm evening, preceded by a couple of cooler days and rainy nights. Single *Myotis nattereri* and *Barbastella barbastellus* (with ear lobes) in tunnel, both awake. Netted Barbastelle, very lively healthy plump female. Released her in the Shell House for recordings.

19/10/96 10.55 hrs. Muggy day, some showers, calm. Two *Plecotus auritus*, torpid. Single *Barbastella barbastellus*, no visible ear lobes, reacted to torch light.

28/10/96 10.15 hrs. Cool, wet, windy. 2 *Barbastella barbastellus*, 3 *Myotis nattereri*, Single *Pipistrellus pipistrellus* and *Plecotus auritus* seen.

6/11/96 14.10 hrs. Overcast, cool and windy, with a promise of rain. Single *Barbastella barbastellus*, 2 *Plecotus auritus*, all torpid. 2 *Myotis nattereri*, one torpid, the other reacted to torch light.

25/11/96 15.45 hrs. Clear sky, calm 8 - 9° C. Single *Barbastella barbastellus* – awake at crevice entrance. Five *Pipistrellus pipstrellus*, 3 torpid, 1 awaking, 1 active. Two *Plecotus auritus*, torpid and single *Myotis nattereri* awake. 16.20 hrs. *Barbastella barbastellus* took flight, recorded at 45 kHz.

29/11/96 11.00 hrs. 10 - 11° C. Cool slight breeze. Single *Barbastella barbastellus*, three *Pipistrellus pipistrellus*, three *Plecotus auritus*, all torpid.

2/1/97 Single *Barbastella barbastellus*, 3 *Plecotus auritus*, 4 *Myotis nattereri*, 3 *Pipistrellus pipistrellus*, all torpid.

Main House (*Pipistrellus pipistrellus* 55 kHz roost) (Site B)

5/8/96 05.18 hrs. Slight chill, calm. *Barbastella barbastellus* in flight at a southern end of Main House. It came in low, flew around me and disappeared. Pipistrelle bats swarming at main roost entrance.

8/11/96 15.30 hrs. Main pip roosts. Carcasses recovered, no bats seen. West end small collection of droppings at end wall and in cobwebs at a ridge beam, not pips.

Note: I compared the collection of droppings above with a reference collection of *Barbastella barbastellus* held by JOHN PAGE of Cornwall Bat Group. They were identical.

River Tamar (Below site B)

14/7/96 21.30 hrs. Warm, slight cloud cover. Several *Nyctalus noctula* over the river valley, *Pipistrellus pipistrellus* and *Myotis daubentonii* by the score over the water.

Possibly 3-4 Barbastelles hawking along foliage overhanging the river on the Cornish side below Swiss Cottage.

Court Yard (*Rhinolophus hipposideros* roosts) (Site B)

25/7/96 21.50 hrs. Warm, clear sky. All *Rhinolophus hipposideros*, emerged.
22.20 hrs. *Barbastella barbastellus* in flight in the courtyard, where it came from, not known.
22.50 hrs. A small colony of *Myotis mystacinus* in the ridge above L / H / S roost.

Salmon Hatchery (Site B)

21/7/96 22.10 hrs. Clear sky, slight breezes. *Barbastella barbastellus* above main water body, for five minutes only.

12/9/96 20.50 hrs. *Barbastella barbastellus* around holding tanks.

Dates when a Barbastelle was apparent	Bat numbers				
	M. bran./mys.	*P. aur./aus.*	*M. nat.*	*P. pipistr.*	*B. barbast.*
17.02.93	1	2	2		1
07.12.94		5	1	2	3
24.12.94		5		2	2
05.01.95		4		2	2
04.02.95		7	2	1	2
28.02.95		1	1		1
05.03.95		2	4	2	1
27.09.95			1	1	1
17.11.95		1	2	7	1
02.12.95		4	1	5	3
30.01.96		5		2	2
22.02.96		7		4	1
05.05.96		1	1	1	1
25.05.96		1	1		1
20.06.96			1		1
19.10.96		2			1
28.10.96		1	3	1	2
06.11.96		2	2		1
25.11.96		2	1	5	1
29.11.96		3		3	1
02.01.97		3	4	3	1

Table 1. Species hibernating with *Barbastella barbastellus*

Tab. 1. Mit *Barbastella barbastellus* überwinternde Arten

Tableau 1. Espèces hivernant avec *Barbastella barbastellus*

4. Conclusion

The Barbastelle is still a very elusive species, to-date no new records to my knowledge have arisen for Cornwall since the summer of 1996 and 16th January 94 for Devon, excluding my records enclosed. I have been fortunate in two days this year to have recorded the species in A and B sites.

Site A produced its first record for more than two years on 4th January 97. The two hibernation sites have now yielded eight individual bats. The presence or absence of an ear lobe has helped me to calculate this figure. *See Pie Chart.*

I have had restricted observations of the bats, at times to the hibernacula, emergence and some field i.e. flighting and feeding behaviours. A female caught exiting from the tunnel (20th June 96 at site B) accentuates my belief that we should not abandon some winter sites during the summer months.

Observation of 3-4 together above the river one night was most pleasing. Unfortunately I proved no knowledge of the sex of the bats. It could be possible that they were a collection of males, as SCHOBER & GRIMMBERGER mentions small summer groups. SCHOBER also considers the Barbastelle females (from small colonies) to be feeding within 500 mtrs of the roost.

Future training in mist netting will be invaluable with emphasis on sexing the bats caught to decide that I am observing the right sex and species. Which with backtracking etc. should eventually lead to a summer roost. With the amount of renovations being done at the prime site B it is imperative that any roosts there are identified soonest.

Future bat detector survey work should be enhanced with the purchase of the „Tranquillity" Detector / Recorder. BARATAUD quotes this type of detector to be more accurate in the ability to correctly identify most species, compared

with the normal heterodyne type.

An infrared night-scope has been used to good effect especially along the rivers and buildings.

A change of tactics proved valuable during the summer months when we made visits to Site B at dawn instead of dusk. I hope to continue this trend as the bats are more noticeable when swarming i.e. the characteristic social interaction outside the roost.

Bats were seen going into places that were never observed exiting from at dusk. We saw a Barbastelle at the main house and at the Court Yard during these visits.

The computerised wildlife recording programme „Recorder" was purchased with English Nature funding and although I have not fully mastered Plot 5 the mapping programs, the main body is very useful.

We will expand bat box projects and start new ones this year as I believe that their potential is undervalued by some. Tentative lobbying in some corners may already prove productive.
To have spent so much time on the ground and only enhanced my records minimally are an indication of how demanding and important the project is, it has not discouraged me from my goals.

Acknowledgements

I have been fortunate to have some financial backing from the Bat Conservation Trust, Bat Groups Support Fund and English Nature for this project, along with moral support from my wife CHRISTINE and practical aid from friends, STEVE POCOCK and NICK BENTHAM-GREENE (for keeping me safe at night).

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