

THE GLOUCESTERSHIRE NATURALIST

No.7

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THE GLOUCESTERSHIRE NATURALIST

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Editor : Robin M. Sellers

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SONIA HOLLAND - AN APPRECIATION

With the passing of Sonia Holland on 21 January 1993 at the Sue Ryder home in Leckhampton, conservation and natural history in Gloucestershire lost one of its most distinguished, dedicated and energetic supporters and a source of unrivalled knowledge on the county's flora and fauna. She was also recognised as one of the country's top botanists and introduced as such when invited to speak at a conference at the national botanical centre at Kew.

Sonia was brought up in Aberdovey in Wales and first came to live in Gloucestershire in 1947. She quickly became involved with the county's natural history and, in 1948 was a founder member of the Cheltenham & District Naturalists' Society (which was later to become the North Gloucestershire Naturalists' Society and is now the Gloucestershire Naturalists' Society).

She held several posts within the Society, becoming its Vice-Chairman in 1961. Perhaps her greatest and most enduring service to the Society began in 1962 when she became joint editor, with the late R.J.M.Skarratt, of its then monthly *Journal*, taking over from him in mid-1965 and continuing with this demanding post until June 1980. Under her stewardship the *GNS Journal* was a model of regularity and accuracy. She also served the Society as the first Chairman of its Scientific & Publications Sub-committee.

She was pre-eminently a botanist with an immense store of knowledge of all flowering plants. Early particular interests were the county's orchid and umbellifer population and later she became an expert on sedges and grasses.

She achieved national recognition in the field: she served a term as a Council member of the Botanical Society of the British Isles beginning in 1970 and was this Society's Recorder for Gloucestershire.

Probably her greatest botanical achievement was the undertaking, with her friends Mary Caddick, Sue Dudley-Smith and Kathleen Ludbrook, of a Supplement to the 1948 *Flora of Gloucestershire*. This was published in 1986 and is a fine tribute to Sonia, the editorial team and the many people who contributed records.

Sonia was one of the most knowledgeable people in Gloucestershire on birds and verified the sighting of many rare species. As a member of the British Trust for Ornithology she participated in many waterfowl counts at places such as Slimbridge and the Cotswold Water Park. Together with Denis Mardle, the then County Bird Recorder, she wrote *Bird Watching in the Cotswold Water Park*.

In the late 1970s Sonia became interested in dragonflies, becoming the driving force behind the Gloucestershire Naturalists' Society recording scheme which began in 1978. The result was that in January 1991 she published an atlas with

notes entitled *Distribution of Dragonflies in Gloucestershire*. Shortly before her death Richard Gabb and David Kitching published a booklet called *The Dragonflies and Damselflies of Cheshire* which was dedicated to Sonia Holland "whose initial comments led to the development of the Cheshire Tetrads Breeding Survey and whose subsequent interest provided us with continuing encouragement".

Sonia was also a founder member of the Gloucestershire Trust for Nature Conservation (now called the Gloucestershire Wildlife Trust), and one of those who cemented its links with the Naturalists. She rapidly became involved in Trust management both at the reserve level and centrally. From 1962 until her death she was Secretary of the Trust's first managed reserve at Badgeworth which protects a rare buttercup found only at this site and known as Adder's Tongue Spearwort (*Ranunculus ophioglossifolius*). This was combined with membership of the management committee of the Brassey Nature Reserve from 1964 (with its Chairmanship from 1968), involvement with the Lark Wood Nature Reserve, interest in virtually every site in the county, lifelong membership of the Trust's Scientific (now Conservation) Committee from 1963, and membership of the Council from 1969 to 1976.

Sonia was invited to take part in many radio and television programmes on both local and national stations and became known as "The Buttercup Lady" through a documentary on the Badgeworth Buttercup Reserve.

It would be virtually impossible to determine the amount of information which Sonia made available to wildlife conservation. She recorded on innumerable Sites of Special Scientific Interest (SSSIs) in the county and took part in many surveys both on behalf of the Gloucestershire Wildlife Trust and the Farming and Wildlife Advisory Group (FWAG) including one of Prince Charles' Estate at Highgrove. The results of her 20 year "labour of love" into the distribution of the Black Poplar resulted in the publication of her survey *The Black Poplar in Gloucestershire* by FWAG in July 1992.

Sonia's dedication to conservation was perhaps epitomised by her personal purchase of the magnificent Katford daffodil bank near Dymock in order to preserve this splendid natural resource when it became apparent that the established conservation bodies were not prepared to act to stop the deterioration of the site.

Sonia acquired countless friends both in Gloucestershire and throughout the country through her interests in natural history and she was always ready to share her knowledge and experience. Many naturalists in the county have attributed their continuing interest to their initial contacts with her. She was as happy to escort a novice on a first field trip as she was to join a group of botanical experts from Kew. Inevitably if a visiting naturalist from abroad enquired about sites in Gloucestershire they were referred to Sonia and she entertained naturalists from as far afield as the USA and Russia.

Her enthusiasm for her interests remained with her to the end through an

increasingly severe illness which she bore with great bravery and quiet matter of factness. Her husband, T.W. (Bill) Holland pre-deceased her by over 20 years; she is survived by her son, Clive.

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This is not intended to be a complete list of Sonia's publications, but serves to emphasise the scope of her contribution to Gloucestershire natural history. In addition to the above Sonia published a regular series of "Botanical Notes and Records" (initially with R.J.M.Skerratt, then with Cdr R.Dudley-Smith, Miss D.E. de Vesian, Mrs D.S.Dudley-Smith and latterly with Miss H.M.Caddick), "Mammal Notes" and, more recently, "Odonata Notes" as well as a large number of short articles on a wide range of natural history subjects in the *Gloucestershire Naturalists' Society Journal*.

ADDER'S-TONGUE FERN *OPHIOGLOSSUM VULGATUM* L. IN GLOUCESTERSHIRE

Sonia C. Holland

The Adder's-tongue Fern is a curious looking little grassland fern only 4-6 inches in height. It has one oval bright green leathery leaf-like frond with no mid-rib and an erect slender plantain-like frond growing out of its sheathing base bearing two rows of yellow spores along its upper half. The plants appear in late April or early May and contrary to the method of most ferns the leaf-like frond unrolls from the sides. The fern grows in colonies and may be abundant over large areas of a field but can easily go undetected in the spring sward. The species is short-lived and after the spores ripen the plants soon die down. It is difficult to spot them in late summer but I hold one record for mid-September from woodland on Poor's Allotment.

In Gloucestershire the fern's habitat ranges from unimproved damp meadows, old ridge and furrow meadows, and elevated dry limestone grassland in the Cotswolds, to grassy woodland tracks and rides (as in Cirencester Park), and rough grassland in open scrub and on the gravel of the Cotswold Water Park.

The *Flora of Gloucestershire* (Riddelsdell, Hedley and Price 1948) describes the Adder's-tongue Fern as common throughout the county except in parts of District 7B so that few localities are listed. Today its status apparently remains much the same although the number of sites may have decreased with so many changes in the countryside. The accompanying distribution dot map shows how widespread it is covering 35 of the county's 10 km squares. The Gloucestershire Naturalists' Society holds details and 6-figure grid references for some eighty individual sites and each year a few more are added. The absence of a site in SO60, Lydney area, reflects the absence of observers rather than a lack of suitable habitat.

ACKNOWLEDGEMENT: My thanks to all those who have submitted records.

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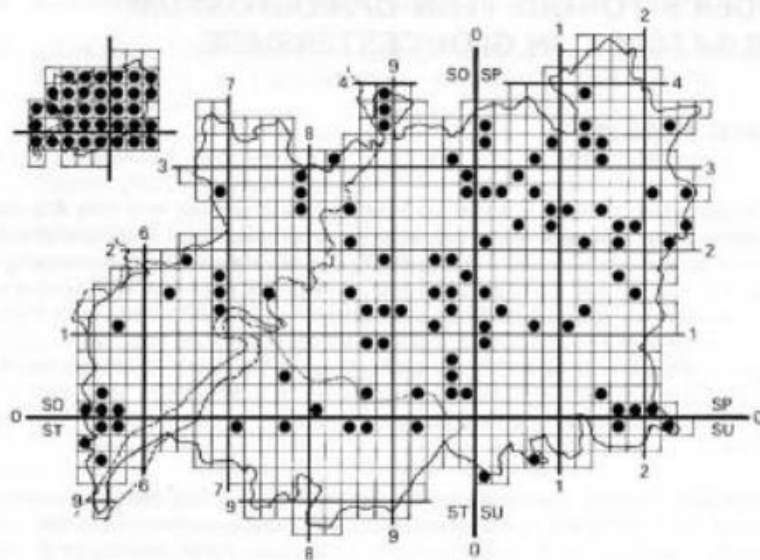


FIGURE 1. Tetrad distribution of Adder's-tongue Fern in Gloucestershire

THE ROMAN SNAIL *HELIX POMATIA* L. IN GLOUCESTERSHIRE AND ITS CONSERVATION

Keith N.A.Alexander

The Roman Snail has been present in the Cotswolds for many centuries, but is not native here, only naturalised. The first evidence of the species in the British Isles dates from the period of the Roman Occupation early last millennium (Pollard 1975). Whether it was brought in directly by the established Roman population or came over with traders from Gaul or elsewhere on the Continent remains to be ascertained, but it is interesting to speculate why it was named "Roman" Snail rather than another species which first appeared in this country about the same time, our "Garden" Snail *Helix aspersa*. Both were brought over as food items and so could have been collectively called "Roman" snails! Indeed, from some of the sites reported to me as having "Roman" snails, it would appear that such collective naming still occurs in Gloucestershire. The true origin of our common names for these species is, however, not recorded.

Pollard (1974) mentions that there have been more recent introductions to England "as a curiosity for the estates of country gentlemen". Whether these involve Gloucestershire is not clear, but snails have certainly been moved around within the county. I have been told of one garden where snails were introduced recently (from a Gloucestershire population) and where they still survive.

Albeit a naturalised alien in Britain, the Roman Snail is of considerable interest to naturalists. Not only is it instantly recognisable to many general naturalists, with no specialist knowledge of molluscs, but it is virtually confined to "wild" habitats, unlike the "Garden" Snail which mostly only thrives in areas severely affected by people, such as gardens, industrial sites and other disturbed habitats. It is also of particular conservation interest not only as a long-established resident species but also because the native populations of much of Europe are in decline, primarily due to over-exploitation for food (Wells *et al* 1983).

HABITAT REQUIREMENTS

The Roman Snail is most frequently found in rough unimproved limestone grasslands - grasslands which have not been seriously altered in their composition through the application of agricultural chemicals. The actual situation of colonies varies considerably, from open rough pastures to "edge" grasslands such as woodland rides and boundaries, hedgerows and roadside banks, and old railway embankments. It is also widespread in open-canopied semi-natural woodlands on the limestone - that is, those which are dominated by tree species native to the Cotswolds. Restriction to limestone districts is a feature of the British populations;

it is not the case on the Continent, although even there it is most abundant on limestone soils.

The key features of the known sites are tall dense vegetation and areas of sparsely vegetated ground. The tall vegetation provides cover from predators, essential to such a large animal; however open ground is also needed for egg-laying - the snails burrow down into friable soils to bury the egg mass, and the eggs are incubated by the warmth of the sun which penetrates the soil in open areas to a considerably greater degree than under dense vegetation. This requirement for radically different habitat features in a small area is characteristic of many animals, and often the reason for the failure of conservation measures based on botanical concepts.

LIFE HISTORY

The snails are mainly active from May to August, hibernating over the winter months in holes excavated beneath dead vegetation such as grass and leaf litter. The earliest and latest documented dates for activity in the Cotswolds are April 30th and September 1st, while the peak in observations covers May and June. Activity is closely related to humidity; full-grown snails are often to be seen in greatest numbers on muggy summer days, but the juveniles are predominantly nocturnal - their thinner shells afford less protection from predators. They feed on a wide variety of plants but are said to prefer knapweed foliage (Pollard 1975).

Other than people, the main predators of full-grown snails are foxes, badgers and rats - a good way of discovering whether or not Roman Snails occur in a particular locality is to look in the vicinity of the local badger sett for empty shells. The occasional snail is reported to be attacked by glow worms and the larger carabid beetles, although a full-grown Roman Snail must be a formidable prey item for these beetles - an active snail froths vigorously when attacked. The snails are particularly vulnerable to predation when hibernating, mating and egg-laying. But predation - other than by man - has a negligible effect on a particular population's viability. The main, non-human, mortality falls on the eggs and juveniles, largely as a result of desiccation.

Like all pulmonate land snails, Romans are hermaphrodite, and fertilise each other during mating. Mating usually takes place early in the summer, and only in very humid weather. Egg-laying can occur throughout the main activity period but is most frequently observed in the Cotswolds during early June. The eggs are laid in batches of around 40 in a hole excavated about 6 cm deep in the soil. Egg-laying can take as long as 48 hours, during which time the snail is very vulnerable. The open ground sites selected can be the result of erosion of vegetation by vehicles along tracks, and hence a single vehicle crossing a site at egg-laying time can cause serious mortality. However, a well-used track will have compacted soil and so will not be so suitable.

The young snails may take between 2 and 5 years to reach maturity. Adults tend to be very long-lived; 5 to 6 years is common, while up to 10 years is possible.

Reproductive success is low however and many British populations have been found to contain a very low proportion of young snails. This low recruitment rate is the cause for declines through over-exploitation - the collection of large numbers of adults for food from a single site can severely deplete the population and readily lead to extinction. On top of this, individual snails do not travel any great distance, spending their entire lives within an area of about 30 m diameter. Extension of range is therefore a very slow process and the natural establishment of new sites is virtually impossible in the modern Cotswolds - suitable sites are all too often fragmented and isolated.

One interesting observation made during the present survey demonstrated that the snails can actually successfully cross water bodies. A full-grown snail was found part way up a reed stem in the middle of the disused canal near Sapperton. Presumably this animal had accidentally fallen into the water and had floated until it was able to grasp some vegetation - unfortunately, in this case, it had hauled itself out in the middle of the canal!

A more detailed account of the biology of Roman Snails may be found in Pollard (1975) and Wells *et al* (1983).

THE GLOUCESTERSHIRE SURVEY

Like so many other species, the Cotswold history of the Roman Snail is clearly one of fragmentation of populations and local extinction. Fears of local extinctions in Britain were expressed early this century (Taylor 1909) and a decline at Cooper's Hill was reported even earlier - "owing . . . to the Gypsies, who have long been aware of its gastronomic qualities" (Simpson 1875). The survey reported in this paper was organised through the Gloucestershire Naturalists' Society (GNS) and Gloucestershire Trust for Nature Conservation (GTNC), and was designed to establish a base-line documentation of the known sites which would enable analysis of population trends in the future. The survey was initiated in 1984 and, after an initial good response, continued at a low level. The old records for the county have also been examined to see if there is any evidence of a decline.

While old natural history and conchology books and journals list known localities, the only detailed national distribution maps known to me are those published by Pollard (1974) and the Conchological Society of Great Britain and Ireland (Kerney 1976). This shows the species to have been present in 8 of the county's 10 km squares during the period 1950-1976, while it had also been present within one other square previously. David Long, the GNS Mollusc Recorder, was able to supply me with all of the Gloucestershire records known to him.

With this information as a comparative base, I initiated a county-wide survey in 1984 by asking members of the GNS and the GTNC to send in details of all their encounters with the snail. The request was picked up by a number of newspapers and so received a wider circulation. There was a good response in the first year, but - despite reminders - tailed off in subsequent years. Records have however

continued to accumulate.

It is clear that the Gloucestershire Cotswolds has had a widespread population of Roman Snails. But - with reports of widespread declines internationally (Wells *et al* 1983) - was this still true and, if so, would it continue to be so? These were the questions which led me to the detailed examination of the county's Roman Snail population. Live snails are now known from 46 tetrads for the period 1980-1992, while there are older records from a further seven; these are all mapped in Figure 1. One site reported to still have live snails after a recent introduction (see Introduction) has not been included on the map. The tetrads largely coincide with the same 10 km squares mapped by the Conchological Society for 1950-76, but with a few minor changes: (i) the square then reported with an old record only has now been found to still contain populations, (ii) one other square now has only pre-1980 records, and (iii) one new square has been added. A 10 km square distribution map is however too coarse to use for analysis of change at the local level, and the following comments are based on interpretation of the tetrad map.

The Roman Snail colonies have a peculiar clustered distribution, enclosed by an imaginary circle defined by Cheltenham, Stroud, Cirencester and Northleach. There are remarkably few sites further north-east or south-west along the Cotswold

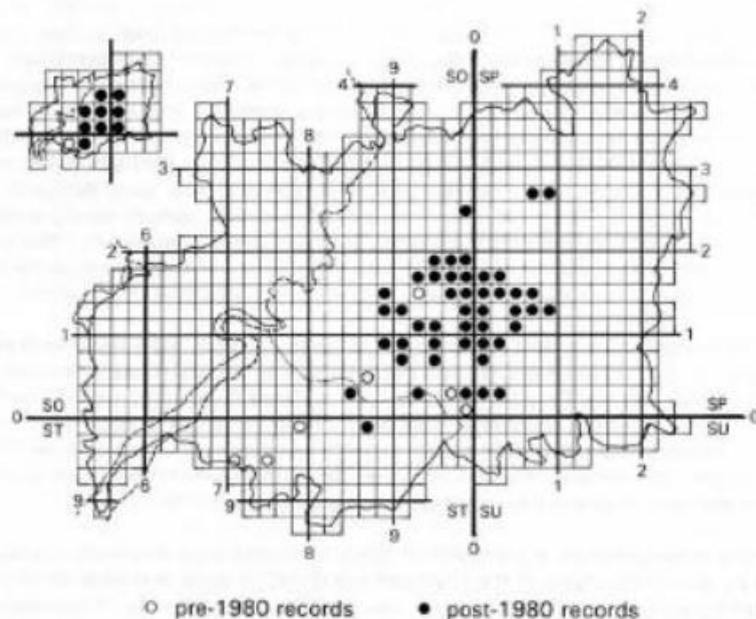


FIGURE 1. Tetrad distribution of the Roman Snail in Gloucestershire

scarp, and none further east into the dip-slope country. The sites follow the well-drained slopes of the limestone scarp and the river valley sides. Pollard (1975) pointed out the effect of the prevailing westerly winds in Gloucestershire which result in the snails being most frequently found where the aspect is easterly or otherwise sheltered.

The outlying colonies around Wotton-under-Edge all appear to have been lost. Snails were reported in this area as recently as 1972 (Uley), 1971 (Westridge Woods) and 1958 (North Nibley). The North Nibley colony was believed to have become extinct by 1972 (M.P.Kerney, pers.comm.). No reports were received from these areas in the course of the present survey and searches by the present author in and around these named localities all proved fruitless. The cause (or causes) of these extinctions is not known.

The county clearly still supports a large number of sites with Roman Snails and is still one of the best counties in Britain for the species - there are only two other main centres for the species, on the Chalk of the North Downs and Hertfordshire.

MONITORING

The sites are now all individually documented and should form a good basis for repeat surveys in the future. Details of the localities have been lodged with the GNS Mollusc Recorder and the GTNC. As the first Roman Snail survey in the county, this will form a base-line for the assessment of any future change in status. It is important to bear in mind that absence of a record from a particular tetrad does not imply absence of Roman Snails. Only the positive records currently held can be used for long term monitoring of the species' performance. Any future repeat surveys should concentrate on re-visiting those sites and seeing how the populations have fared in the intervening years. It would be invaluable if those recorders who contributed to the present survey were to continue to keep detailed records of their sites, ready for a future re-appraisal. We cannot know how the Roman Snail is reacting to changes in our countryside if we do not have full and accurate records of localities and numbers.

Counts of live snails should be made as often as possible and the highest number for each year recorded. Any juvenile shells should be recorded separately. Warm sunny afternoons after recent rain should be selected for counts. This is when the adults are most active in daylight and will give a better idea of the total population size.

CONSERVATION

The essence of Roman Snail conservation is to ensure that there are no major changes in vegetation structure at the known sites, and to seek to extend the available habitat and preferably link it to other suitable places. Agricultural chemicals should be avoided as these are potentially toxic, and chemical-free buffer zones should be established to minimise the effects of spray drift. Habitat variety

should be maintained - patches of scrub, lying dead wood and rocks, etc., in pastures provide essential cover and should be retained. Light grazing is important at many sites and should be maintained if at all possible, as the transition to dense scrub will result in losses.

The modern practice of tree-planting the steeper slopes on farmland is a serious threat to the Roman Snail (and other wildlife). Although the early stages of the plantations provide good habitat for the Romans, this is increasingly lost as the trees develop, and the snails will become extinct as the canopy closes over - unless there is an extensive ride system to provide the necessary open grassland habitat. Many grassy banks are, however, abandoned altogether by the land managers and the end result is the same, although the development of scrub and, ultimately, secondary woodland is a slower process and gives greater opportunity for habitat recovery.

The re-establishment of lost populations or the re-location of populations threatened by development is quite feasible - that is how the Roman Snail became established in the first place.

ACKNOWLEDGEMENTS: The results presented here would not have been possible without the generous support of all the GNS and GTNC members who sent me details of their sightings. I would also like to thank David Long for access to the GNS Mollusca records and for commenting on an earlier draft of this paper, Michael Kerney for access to the Conchological Society records and to the collections held at the British Museum (Natural History).

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FIRST CONFIRMED BREEDING OF THE COMMON SANDPIPER IN GLOUCESTERSHIRE

G.Moyser

The Common Sandpiper *Actitis hypoleucos* is a double passage migrant on the River Severn at Berkeley, where detailed observations have been made almost every working day since 1976 (cf. Moyser & Sellers 1985). Small numbers (1-4) are seen most springs and annually up to 15 birds are recorded between the end of June and early October, with a peak in mid-July. The earliest spring arrival on record is 17 April. Birds are very rare in the second half of May.

It was very unusual therefore that the first bird noted in 1993 was on 25 May. The exact location had been slightly neglected, and, although viewed regularly from a distance, a bird the size of a Common Sandpiper could have gone unnoticed. The bird was seen again on 28 May and probably on 9 June. The latter sighting resulted in the frequency of observations being increased sharply at that location. On 15 June, 2 birds thought to be returning migrants were seen at the mouth of Berkeley Pill, some ½ mile to the north. That in itself was unusual as the earliest autumn sighting prior to this was 29 June, although it must be stated that observations at the Pill are not normally carried out until mid-July, when the peak numbers may be found.

On 22 June, back at the original location, a pair were reported showing "breeding behaviour". On the 23 June the pair were seen posturing and were very agitated, giving contact calls as well as the usual flight calls, and were perched in prominent positions as though defending a territory. With very careful observation a small downy sandpiper chick was seen amongst the rocks. It was about half adult size. The chick was seen well the next day, but only the adults in "guard" position subsequently. The last contact call was heard on 9 July. By 14 July passage birds were building up and the breeding pair presumably dispersed among them.

Historically Mellersh (1902) mentions about five instances of supposed nesting but with no direct proof. Swaine (1982) refers to breeding suspected near Rendcomb and elsewhere, but concludes that there is no fully satisfactory record. The Berkeley record thus appears to be the first confirmed breeding in the county.

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TWITE IN GLOUCESTERSHIRE

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The Twite *Carduelis flavirostris* is a small streaky brown finch chiefly distinguished by its yellow bill (non-breeding season), pink rump (males only) and distinctive "twa-it" flight call. It is usually found in open country and in the British Isles breeds mainly in the Northern and Western Isles, north and west Scotland, the west coast of Ireland and the Peak District in England (Sharrock 1976). The latter population moves to winter mainly in East Anglia and the Low Countries (Davies 1988). Most Scottish birds appear to remain in Scotland, although a few may move into Ireland or possibly England. Within Scotland there is, however, some redistribution of birds with movement off high ground mainly to the east coast of Scotland. Twite are occasionally recorded in Gloucestershire and these notes summarise their recent status in the county based primarily on 22 record cards collected by the Gloucestershire Naturalists' Society over the past 25 years

RESULTS

TIMING OF OCCURRENCE

Twite have been recorded in Gloucestershire in only six winters in the past 25 years (1963/64 to 1988/89 inclusive). These were 1966/67, 67/68, 71/72, 80/81, 83/84 and 86/87. Records have been made in all months from August to April inclusive, except September, with little obvious pattern (Table 1; the large number of March records is due to a well watched flock in the Frampton area in March 1984). The earliest record is 19 August (next earliest 1 October) and the latest 8 April.

FLOCK SIZES

About a third of birds seen were singletons and most of the remainder were in groups of 2, 3 or 4 (Table 2). Only four larger flocks have been recorded, three of 9 birds and one of ca.25 birds.

TABLE 1. Timing of Occurrence of Twite in Gloucestershire 1963-89

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
No. flocks	1	0	2	2	1	1	1	12	2
No. bird days	1	0	2	26	1	1	1	56	4

TABLE 2. Flock Sizes of Twite Wintering in Gloucestershire 1963-89

Flock size	1	2	3	4	9	25
No. flocks	7	3	5	3	3	1

TABLE 3. Distribution of Sightings of the Twite in Gloucestershire 1963-89

Location	Tetrad No.	No. sightings (flocks)
Frampton Shore/New Grounds	SO70H/I/N	20
Beachley Point	ST59K	1
Cotswold Water Park West ^a	SU09T	1

^a Flight record

DISTRIBUTION

The bulk of records are from Frampton Shore and the New Grounds, an area of saltmarsh and rough pasture. Other records come from Beachley Point and the Cotswold Water Park (Table 3).

DISCUSSION

It is apparent from the information presented here that the Twite is at best a scarce winter visitor to Gloucestershire. Even though this rather undistinguished bird is easily overlooked it is doubtful whether the winter numbers ever exceed a few tens of birds. Most records have been from the banks of the R. Severn near Frampton-on-Severn in habitat typical of that used by birds wintering in East Anglia (Davies 1988). The Gloucestershire birds probably originate from the Peak District population but there is as yet no proof of this.

There are no Gloucestershire records of the Twite in the 1950s or early 1960s (see CDNS/NGNS Ornithological Reports for 1955/57/59/61/63) but it should be noted that before 1963 only records north of a line drawn from Tetbury to the northern end of the New Grounds were considered. No information concerning the earlier years of this century is available. For the 19th century Mellersh (1902) describes the Twite as "less frequent than formerly" and as occurring "chiefly [on the] higher Cot[s]wolds" whilst Witchell & Strugnell (1892) report it as occurring "occasionally at Leigh" and as "common . . . often seen on the hillsides while its favourite thistle seeds last . . ." if these comments are to be believed there has been a considerable change in the species' winter status over the past century.

ACKNOWLEDGEMENT : I am indebted to the Gloucestershire Naturalists' Society

for permitting access to their records.

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THE MARINE MAMMALS OF GLOUCESTERSHIRE

Mervyn Greening

Although Gloucestershire does not have a proper coastline, the tidal reaches of the River Severn do occasionally play host to marine mammals (and other marine animals) and consequently Gloucestershire has a more varied vertebrate fauna than might be expected (cf. Heaven 1992). This article presents a review of records of such mammals in Gloucestershire. The recording area is taken as that part of the Severn estuary which is within Gloucestershire, extending down the estuary to a line drawn between the mouth of the River Wye across the estuary to Aust. Visits by seals and cetaceans to these waters are rare events, however, and for many proves fatal. Identification is not easy and it is quite possible that some misidentifications have occurred especially of live animals. Strandings, many of which have been photographed, provide much better chances of correct identification.

A previous summary of records covering the whole of the Bristol Channel up to 1935 was published by Matthews in 1941. This review includes these earlier sightings together with recent material obtained via the Gloucestershire Naturalists' Society, from David Dartnell of Gloucester Museum, various newspapers and other sources mentioned below. A complete listing of the available records is shown in Appendix 1.

SUMMARY OF RECORDS

SEALS

Common Seal Phoca vitulina

Grey Seal Halichoerus grypus

There is considerable anecdotal evidence for seals visiting the Severn estuary. Fishermen recount several occasions when seals have been seen and Waters (1947) makes a number of references to seals. Definite records with dates, however, are not so frequent, and records with detail of identification features are rare.

There has been considerable debate over the identification of the seals seen in the Severn. Matthews concluded that prior to 1934 all sightings were of Grey Seals, and was able to confirm this using skull characteristics of two remaining specimens. There is the probability that seals observed were just assumed to be "Common Seals". In 1934 Matthews confirmed the establishment of a colony of breeding Common Seals in the Bristol Channel, assumed to have arisen from the spread of Common Seals down the west coast of Britain from Scotland. This colony is outside Gloucestershire, but the 1935 record from Lydney possibly

indicates that breeding has occurred in the county, as it concerned a very recently born pup. The continued existence of this colony is uncertain, but Common Seals are now seen regularly in the Severn.

It is not certain whether the increased number of sightings since 1965 is due to increased numbers of seals, or increased numbers of wildlife recorders. Virtually all of the records since 1965 have been made by birdwatchers. All were reported as Common Seals, but only one record has supporting detail of facial characteristics: the 1965 Epney record. Another is absolutely certain: the Tewkesbury record of 1985 of which photographs exist.

The occurrence of a seal in Tewkesbury attracted much media attention. Attempts were made to capture the animal for return to the sea, but all proved futile. The seal fed adequately whilst in Stanchards Pit (the weir pool of the Avon weir) much to the annoyance of local fishermen, who witnessed a master fish catcher! As with other recent records of marine mammals, this seal achieved press stardom, and had its picture in two of the local newspapers.

An interesting feature of the seal records is that the majority are live sightings, and the dead animals have all been the result of human interference (trapped in salmon weir pool or clubbed!). This contrasts with the cetacean records where most are of dead animals. That seals survive their visit to the upper estuary is no doubt due to their ability to survive on land. The low tide conditions of the estuary, which prove fatal to the totally aquatic cetaceans, are not so harmful to the seals, whose smaller size allows them to survive.

Although on the west coast of England and Wales the Grey Seal is the most commonly occurring seal, their different breeding habitat from that of the Common Seal, makes estuaries like the Severn unappealing to the Grey.

The *Handbook of British Mammals* refers to Common Seals making long journeys up rivers into fresh water, so the Tewkesbury animal is not unique. However, the river conditions that allowed the animal to bypass two sets of locks on its way upriver are not so usual. Despite the requirements of high tides and much fresh water in the river, the lock keeper at Upper Lode (Tewkesbury) remembers two occasions when seals have been in the vicinity. Unfortunately their presence is not recorded in the daily log, so exact dates and details are not available.

The only recent sighting of a Grey Seal, at Beachley in 1986, was fortunately described fully, allowing precise identification. The rocky promontory at Beachley, being the only rocky coastline in the county, is probably the most hospitable area for a Grey Seal.

It is surely no coincidence that the vast majority of seal sightings are made during or following a period of high tides. Of the sixteen sightings for which precise dates are available, 50% were made during August, September and October; all months with favourable tides, but also months when birdwatchers are scanning the estuary

for autumn migrants.

Walrus *Odobenus rosmarus*

The finding and subsequent shooting of a Walrus in the estuary during 1839 was a most unusual event, the more so because so few have been recorded from elsewhere on the English coastline. The Walrus is an animal of the polar seas, and one can only assume that this young specimen, found at Purton, was accidentally out of its normal area, or too inquisitive for its own good.

CETACEA

Baleen whale species recorded from Gloucestershire:

Fin Whale *Balaenoptera physalus*

Minke Whale *Balaenoptera acutorostrata*

Sei Whale *Balaenoptera borealis*

Since Matthews 1941 paper only two cetacean strandings have been recorded, both of the same species *Balaenoptera acutorostrata*, the Minke Whale or Lesser Rorqual. The stranding at Awre in 1943 is barely recorded and no photographs have been discovered. Waters (1947) in his book *Severn Tide* mentions this stranding and its subsequent hauling ashore and disposal, the only details given are that it was approximately 20 ft long and weighed approximately 2 tons.

The stranding at Sedbury cliffs in 1972, however, attracted a large number of visitors, and was well documented by David Dartnell of Gloucester Museum, and reported with photographs in the South Wales Argus newspaper. Presumably the same animal had been seen on a couple of occasions prior to its stranding, once from the Severn Bridge, and once from Lydney docks. However no details of dates *etc.* exist of these live sightings. Again we can only assume that the animal was stranded by the ebbing tide (a very high tide at the time), as examination of the carcass gave no indication of the cause of death, the assumption being that it overheated or suffocated. This beast was 16 ft 9 in long, and was a young animal, possibly off course.

Minke Whales occur closer inshore more often than most other large whales, and are known to migrate down the western side of Britain, so their occasional occurrence in the estuary should not come as a surprise.

It is likely that a Sei Whale *Balaenoptera borealis* visited the Gloucestershire part of the estuary in 1925. No precise details of the sightings in the county can be found. However the South Wales Argus newspaper reported that in February 1925 a Rorqual Whale was stranded at Portskewitt (a few miles below the mouth of the Wye). In the article accompanying pictures of the stranding, it is asserted that the whale was seen as far upstream as Lydney, and its return down the estuary observed. The animal unfortunately taking the wrong channel in the shoots region of the estuary, leading to its demise at Charlston lighthouse as the tide fell. This whale was also reported in *A History of the Gloucester Harbour Trustees* by

W.A.Stone in which there is an indication that the stranding was "aided/caused" by the lighthouse keeper.

Toothed whale species recorded from Gloucestershire:

Bottle-nosed Whale *Hyperoodon ampullatus*

Killer Whale *Orcinus orca*

Porpoise *Phocoena phocoena*

Bottle-nosed Dolphin *Tursiops truncatus*

Common Dolphin *Delphinus delphus*

Since the article by Matthews there have been nine records of toothed whales in Gloucestershire. All have been dolphins or porpoises.

Bottle-nosed Whale

An early record of Bottle-nosed Dolphins from Gloucestershire (Berkeley) is cited by Matthews as the first record for Britain. Of the later records photographs exist of the 1971 occurrence, an event which created much public interest, and stories about it ran for several days in local papers.

The 1971 dolphin was one of a school that made its way up river. Unusually for small whales, it would appear that four of the five successfully made their way back to the sea. The fifth remained in a deeper stretch of the river at Framilode, where many people observed its antics. Attempts were made to catch it, which were eventually successful. It was destined for an existence in a dolphinarium, but humanely destroyed because of a skin disease.

In September 1986 a dolphin became trapped in a deep pool of the river, this time at Longney, and again needed rescuing. This time the rescue and subsequent release at Barry were successful. This animal was reported, with photographs, in the Gloucester Citizen newspaper as a "Common Bottle-nosed Dolphin", and in other records as a Bottle-nosed Dolphin. However, in light of the fact that its rescuer, Terry Nutkins, estimated its age at 5 years, and its size and beak dimensions in photographs are not those of a Bottle-nosed Dolphin, it would appear that this animal was a Common Dolphin, which is further supported by the skin markings in the photographs.

Common Dolphin

In June 1940 a school of Common Dolphins made their way up river as far as Minsterworth. Waters in his book quotes that a conservative estimate was of 47 animals, none of which made it back to the sea. Gloucester Museum records show that at least five were stranded by human intervention, and two skulls are kept in the museum collection. A photograph exists of one of the animals.

Porpoise

The five porpoise records since Matthew's paper have failed to attract the publicity that their larger cousins achieved. None have been reported in newspapers. Four of the records are of dead animals and the fifth record is probably the same animal

that was later found dead at Arlingham Passage. The 1994 animal was still alive when found, but had a serious abdominal injury, so was humanely destroyed.

Waters makes reference to Porpoises being seen at Upper Lode, Tewkesbury, having followed a shoal of Twaite Shad *Alosa fallax*. He also cites cases of lave net fishermen having captured Porpoises at Purton, and goes on to say that Tidenham sent six Porpoises each year to Bath Abbey in the Middle Ages as the flesh was so highly valued.

CONCLUSIONS

The most obvious conclusion from this survey is that the Severn estuary is not a place to watch for marine mammals. The records are very sparse, and insufficient to come to any satisfactory statistical conclusions about the sightings. There is a direct relationship, as might be expected, between spring tides and sightings. The majority of records come at times of large tides in the estuary. However, as Table 1 shows, there is no direct relationship between the times of the highest spring tides and sightings. One might have expected the records to be concentrated around those months when the highest tides occur, but this is not the case.

Dolphins would appear to be summer visitors to the estuary, the only record outside of this period is a sighting of a fin in late February (this record was shortly followed by the finding of an injured Porpoise which had to be put down).

Porpoises have a wider spread of records, from early spring through to autumn, and in the case of records from fishermen, are associated with strong runs of fish up the estuary. It is tempting to suggest that Porpoise sightings are related to the occurrence of large fish shoals, but records are not available to confirm this.

Minke Whales migrate down the western side of Britain, and occur closer in shore

TABLE 1. Timing of occurrence of marine mammals in the Severn estuary

	J	F	M	A	M	J	J	A	S	O	N	D
Seals		3	1	1	1	3	2	3	1	4		
Whales	1	1					1					1
Dolphins		1				2		2	2			
Porpoises			3		1	1	1	1		1		
All dated records	1	5	4	1	2	6	5	6	3	7		
High tides ^a	5	6	11	8	2			2	7	9	8	7

^a Number of high tides big enough to create a noticeable bore (based on tides in 1984).

than other large whales, so their occurrence is not entirely surprising. Also the records refer to young animals, which could easily be off course or just inquisitive.

In the absence of supporting evidence as to the correct identity of all the seal sightings, it is again impossible to come to any definite conclusions about the seal records, despite them being the most numerous. Even the absence of records during the winter months is not necessarily relevant, as this is a time when few people are observing the river, so it is quite possible that sightings have been missed.

Footnote: Undoubtedly, despite the researches that have been made, this is an incomplete record of the marine mammals of Gloucestershire. If nothing else I am sure that there will have been more seal sightings than have got into the written record. In the case of the cetaceans, this has been little more than a catalogue of disaster, both by natural or human means. However the 1971 and 1985 dolphins are indicative of the way our attitudes to these animals have changed over the years. One can only hope that future visitors to the estuary will receive similar considerations. It is worth noting that there is now a marine mammal rescue unit operative in the area which can be contacted through the RSPCA emergency telephone numbers. I would be extremely grateful to anyone who can supplement this record of the marine mammals of Gloucestershire, by contacting me through the Gloucestershire Naturalists' Society. A number of organisations now exist to promote the conservation of marine mammals, and all require data concerning both live sightings and strandings. The Severn estuary is greatly under recorded, and to a large extent unwatched. Hopefully this review will go some way to encouraging people to report their sightings from the river.

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APPENDIX 1. Summary of marine mammal records from the Severn estuary

DATE	SPECIES *	LOCATION	MAP REF	SOURCE ^{b,c}
1620	Whale sp. (D)	Berkeley	SO6600	LHM
1639	Seal (Grey) (D)	Berkeley	SO6600	LHM
1787	Dolphin (Bottle-nosed) (D)	Berkeley	SO6600	LHM,DD
3 Nov 1819	Whale sp. (D)	Frampton	SO7306	GC ^d
1837	Seal (Grey) (D)	Berkeley	SO6600	LHM
9 Jul 1839	Walrus (K)	Purton	SO6904	LHM
Oct 1840	Bottle-nosed Whale (D)	Aust	ST5689	LHM
1855	Whale sp. (D)	Glos. county		LHM,WS
Aug 1863	Killer Whale (L,K)	Sharpness	SO6603	LHM,WS,DD
1863	Porpoise (L)	Sharpness	SO6603	LHM,WS
1875	Bottle-nosed Whale (D)	Lydney	SO6400	SFRBA
1880-	Whale sp. (D)	Glos. county		LHM,WS,DD
15 Jan 1885	Fin Whale (D)	Littleton	ST5891	LHM,DD (P)
1902	Seal (Grey) (D)	Oldbury	ST5992	LHM
31 Jul 1922	Porpoise (D)	Chepstow	ST5393	DD
Feb 1925	Sei Whale (L)	Lydney	SO6400	SWA,HGHT (P)
1 May 1935	Seal (Common) (K)	upstream of Lydney	SO6502	LHM (br)
Jun 1940	Dolphin (Common) (K)	Minsterworth	SO7716	DD (P)
4 Jul 1942	Seal sp. (L)	Load Pool	SO7308	SFRBA
13 Jul 1943	Minke Whale (D)	Awre	SO7208	DD,SFRBA
1943	Seal sp. (L)	Purton	SO6904	SFRBA
Aug 1943	Porpoise (L)	Lydney	SO6400	SFRBA
26 Jul 1944	Seal sp. (L)	Lydney	SO6400	SFRBA
Jun 1946	Porpoises (L)	Gatcombe	SO6805	SFRBA
Jun 1946	Seal sp. (L)	Awre	SO7208	SFRBA
May 1958	Porpoises (L)	sev. places		SFRBA
1960	Porpoises (L)	sev. places		SFRBA
1 Feb 1965	Seal (Common) (L)	Epney	SO7611	NGNS ^e
Jun 1967	Dolphin sp. (L)	Well House Bay	SO6603	SFRBA
27 Jun 1969	Seal (Common) (L)	Arlingham	SO7009	NGNS ^f
Jun 1969	Seal (Common)	R.Wye	ST5490	NGNS ^f
1971	Porpoise (L)	Glos. county		SFRBA
27 Sep 1971	Dolphin (Bottle-nosed) (L)	Framilode	SO7510	DD,GC (P)
20 Oct 1972	Porpoise (L)	Lydney Sands	SO6400	DD
22 Oct 1972	Minke Whale (D)	Sedbury Cliffs	ST5592	DD,GNSMR, SWA (P)
Oct 1976	Seal (Common) (L)	Arlingham	SO7009	GNS ^g
Apr 1977	Seal (Common) (L)	Slimbridge	SO7105	GNS ^g

APPENDIX 1 cont.

DATE	SPECIES *	LOCATION	MAP REF	SOURCE **
20 Aug 1977	Seal (Common) (L)	Frampton	SO7306	GNS *
29 Aug 1977	Seal (Common) (L)	Awre	SO7208	GNS *
15 Feb 1978	Seal (Common) (L)	Awre	SO7208	GNSMR
Oct 1979	Seal (Common) (L)	Newnham	SO6911	GNSMR
Oct 1979	Seal (Common) (L)	opposite Sharpness	SO6603	GNSMR
24 Feb 1985	Seal (Common) (L)	Hock Cliff	SO7209	GNSMR
23 Aug 1985	Seal (Common) (L)	Tewkesbury	SO8933	EA (P)
2 Aug 1986	Dolphin (Bottle-nosed) (L)	Purton	SO6904	GNSMR
13 Sep 1986	Dolphin (Common) (L)	Longney	SO7611	DD, GC (P)
14 Sep 1986	Seal (Grey) (L)	Beachley	ST5590	GNSMR
10 Mar 1993	Seal (Common) (L)	Lydney	SO6400	GNSMR
12 Mar 1993	Porpoise (L)	Longney	SO7611	GNSMR, BBCRG
21 Mar 1993	Porpoise (D)	Arlingham Passage	SO7009	GNSMR
28 Feb 1994	Dolphin sp. (L)	Epney	SO7611	GNSMR, GC
1 Mar 1994	Porpoise (D)	Lower Framilode	SO7410	GNSMR (P)

- a L, Live sighting or rescue; D, Dead animal or stranding; K, Killed by human interference.
- b LHM, L.Harrison Matthews (1941); DD, David Dartnell of Gloucester Museum, WS, Witchell & Strugnell (1892); SFRBA, Severn Fisheries River Board Annual Reports; SWA, South Wales Argus newspaper; HGHT, *History of Gloucester Harbour Trust* by Stone; NGNS, North Gloucestershire Naturalists' Society published records; GC, Gloucester Citizen newspaper; GNS, Gloucestershire Naturalists' Society published records; GNSMR, Gloucestershire Naturalists' Society unpublished records; EA, Evesham Admag newspaper; BBCRG BBC Radio Gloucestershire; br, breeding record; P, photograph available.
- c Photographs of sea mammals in Gloucestershire have been published as follows: Fin Whale in 1885, see J.Hudson, 1987, *Thames to Berkeley in Old Photographs*, (Alan Sutton, Gloucester), p.148; Sei Whale in 1925, see *South Wales Argus*, 27 October 1972; Bottle-nosed Dolphin in 1971, see *Gloucester Citizen*, 28, 29 and 30 September 1971; Minke Whale in 1972, see *South Wales Argus*, 25, 27 and 30 August 1972; Common Seal in August 1985, see *Evesham Admag*, 23 August 1985 and *Evesham Journal*, 29 August 1985; Bottle-nosed Dolphin in September 1986, see *Gloucester Citizen*, 12 and 13 September 1986.
- d *Gloucester Citizen*, 16 July 1979.
- e *NGNS Journal*, 1965, 16, 206.
- f *NGNS Journal*, 1969, 20, 88.
- g *GNS Journal*, 1977, 28, 411.



BATS IN GLOUCESTERSHIRE

A.Nicholls and R.A.Wells

Although our fourteen resident bat species constitute a significant percentage of our British mammal list, they have only recently been widely studied. Their nocturnal habits, elusive nature and difficulty of identification makes them a real challenge to naturalists.

Bat populations have declined dramatically over the last few decades prompting the establishment of a network of County Bat Groups during the 1970s and 1980s, usually associated (as in the case of the Gloucestershire Bat Group) with local Wildlife Trusts. The Wildlife and Countryside Act of 1981 protects all bats and their roosts but English Nature (previously Nature Conservancy Council) could not fulfil its obligations without the voluntary assistance of local bat groups.

Since its growth in 1986 from a small handful of enthusiasts into a large well organised group, the Gloucestershire Bat Group has collected a large number of bat records. Members have put countless hours of effort into bat conservation, research, public relations and education work. Careful recording and collation of data have resulted in the creation of a large database of information.

Several factors make Gloucestershire an interesting county in which to conserve and study bats:

- (1) Our southerly latitude and westerly situation endow us with thirteen of the fourteen British species.
- (2) The topography of the county with low hills, wooded valleys and the Severn Vale is conducive to the generation of plenty of bat food (insects).
- (3) Our countryside and farming methods are still relatively "traditional". For example, we have not lost as many hedgerows as some other counties.
- (4) The Forest of Dean and (to a lesser extent) the Cotswolds provide a large choice of underground hibernation sites for bats in winter. These include disused stone quarries and iron mines *etc.*
- (5) We have a large number of large old residential properties set in mature grounds with associated outbuildings, cellars *etc.* favoured by some bat species.

All British bats are small (less than 40 g) and insectivorous, sometimes eating thousands of small prey items during a summer night. When at rest or hibernating,

bats go into torpor - they allow their body temperature to drop to ambient temperature with reduction of heartbeat to a very low value. A large single baby (up to 40% of the mother's body weight) is born in June or July. The young bat feeds on milk and can generally fly at around four weeks old. As it becomes proficient at hunting insects using its echo-location it is weaned. Some time after the young are flying the nursery colony disperses. The bats then feed to put on weight for winter hibernation which commences when temperatures fall, often in November. The bats hibernate until spring, waking periodically to check all is well. Mating takes place either in autumn or at the end of the winter. Sperm is stored within the mated female until she ovulates in the spring.

The data preceding each map is derived from Stebbings (1988), Greenaway & Hutson (1990), Richardson (1985) and Gloucestershire Bat Group records.

The distribution maps are derived from Gloucestershire Bat Group records which include reports on roosts found or revisited, and reports of individual bats found grounded. Sightings of bats on the wing have not been included as positive identification is rarely possible. The number of bats recorded per roost varies over a considerable range, with many showing only a few bats per roost. The maps therefore show the distribution of roosts and grounded bats rather than numbers of bats.

The majority of maps cover the period 1983-1993 only, and show the more recent status of the various species in the county. In one case, Leisler's bat, there have been no records in the period, and the map for this species shows the few records on file from earlier years.

The Gloucestershire Bat Group may be contacted either via the Gloucestershire Wildlife Trust or on Gloucester 712406.



Mouse-eared Bat

GREATER HORSESHOE BAT *Rhinolophus ferrumequinum*

Size: Forearm length 51-61 mm; Wingspan 350-400 mm; Body mass 14-34 g.

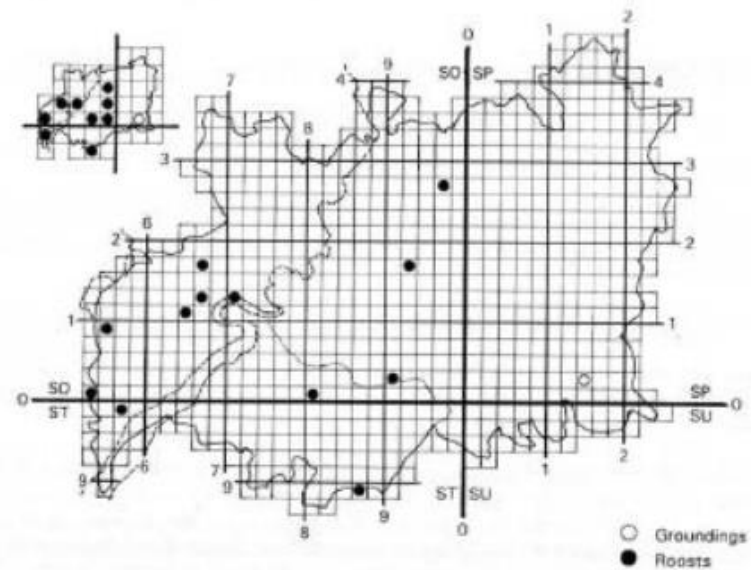
Distribution: Occurs throughout the entire Palearctic from Britain to Japan.

Habitat: Mostly cave dwelling but has adapted to larger buildings for nurseries especially in northern Europe. Associated with mixture of pasture, scrub and woodland.

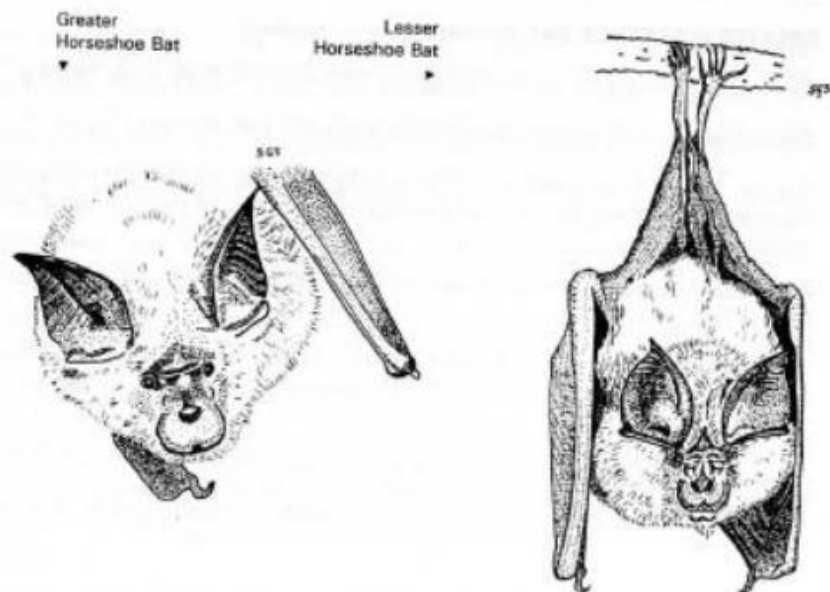
Food: Moths (especially Noctuids), beetles (cockchafer, dor and scavenger), caddis, Diptera (e.g. cranefly).

Status: Populations now greatly reduced in most areas of Europe. Now regarded as endangered. Very rare in Britain, occurs in south-west England and south Wales.

Gloucestershire records: The map shows a concentration of roosts in the south-west, with the majority to the west of the R. Severn. The scatter of roosts to the north and east of Stroud are of very few bats in each, and indicate the extreme edge of the distribution of this species in the county.



MAP 1. Records of Greater Horseshoe Bat in Gloucestershire 1983-1993



LESSER HORSESHOE BAT *Rhinolophus hipposideros*

Size: Forearm length 35-42.5 mm; Wingspan 200-250 mm; Body mass 4-9 g.

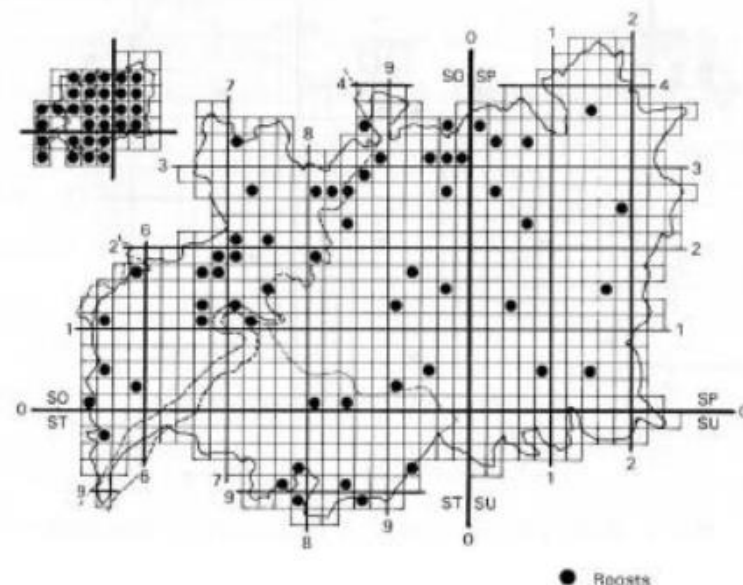
Distribution: From Ireland to Kashmir and Poland to North Africa.

Habitat: Nurseries found predominantly in warm caves in southern areas of Europe but roofs of buildings mostly used in the north. Hibernates in caves, mines and cellars usually close to the nursery.

Food: Small moths, Diptera (e.g. crane-fly), small beetles, lacewings.

Status: Locally extinct in some northern areas of Europe with populations generally in decline. Regarded as endangered in many regions. Rare in Britain, found in Wales and south-west England.

Gloucestershire records: The roosts of this species extend further east than for the Greater Horseshoe, but the density can be seen to be falling off towards the north and east. Recent survey work by the Gloucestershire Bat Group has shown Gloucestershire to be the stronghold of this species in England and Wales with the possibility of an expansion of range under way in the east of the county. The roosts with the largest colonies are to the west of the R. Severn.



MAP 2. Records of Lesser Horseshoe Bat in Gloucestershire 1983-1993

WHISKERED BAT *Myotis mystacinus*

Size: Forearm length 30-37 mm; Wingspan 200-240 mm; Body mass 4-8 g.

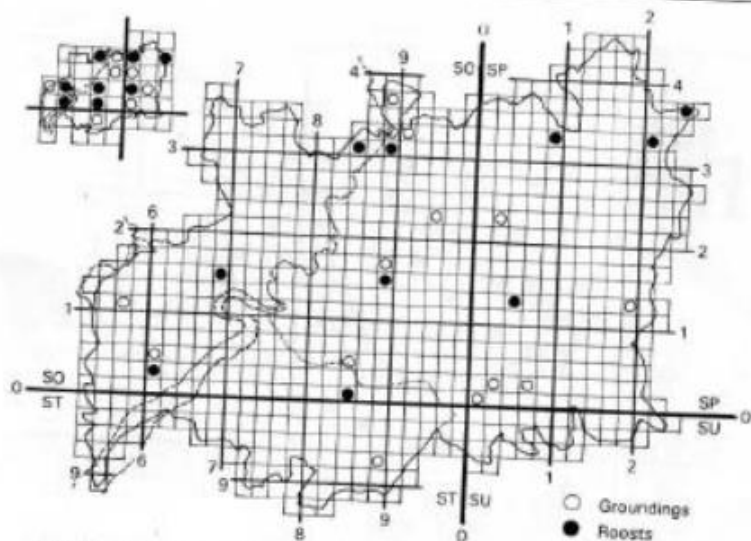
Distribution: Found throughout Palearctic from Ireland to Japan.

Habitat: In summer, nursery colonies mostly found in buildings, but occur in trees and exceptionally in tunnels. Hibernates in caves, mines and cellars. Feeds around woodland and around riparian habitats.

Food: Mayfly, small moths, Diptera (e.g. crane-fly)

Status: In Europe, some populations are in decline. Appears to have suffered from remedial timber treatment. Widespread in England and Wales.

Gloucestershire records: The number of roosts on record is not great. The plot suggests a widespread but very low density distribution. However, the number of sick, injured, or exhausted bats reported of this species suggests a population of, perhaps, 20% of that of the Pipistrelle.



MAP 3. Records of Whiskered Bat in Gloucestershire 1983-1993

BRANDT'S BAT *Myotis brandtii*

Size: Forearm length 31-39 mm; Wingspan 200-255 mm; Body mass 4-10 g.

Distribution: First recognised in 1971, it appears to be restricted to central and northern Europe.

Habitat: Summer roosts mostly in buildings but also occur in trees. Hibernates in caves and mines. Generally found around woodlands in agricultural and other rural areas.

Food: Mayfly, small moths, Diptera (e.g. crane-fly).

Status: Little known about the status of this widespread species across Europe but chemical timber treatments are known to have killed some colonies. Widespread in England and Wales. More frequently encountered in the west and north (but there is the possibility of confusion with the similar Whiskered Bat).

Gloucestershire records: There is only one instance of this species on record: one bat was identified hibernating in a mine in the Forest of Dean. No map is given for this species, since it would identify the position of a hibernating site rather than indicate the distribution over the county. The bat itself is almost indistinguishable from Whiskered Bat without detailed examination and a sketch is not included.

NATTERER'S BAT *Myotis nattereri*

Size: Forearm length 36-43 mm; Wingspan 240-300 mm; Body mass 6-12 g.

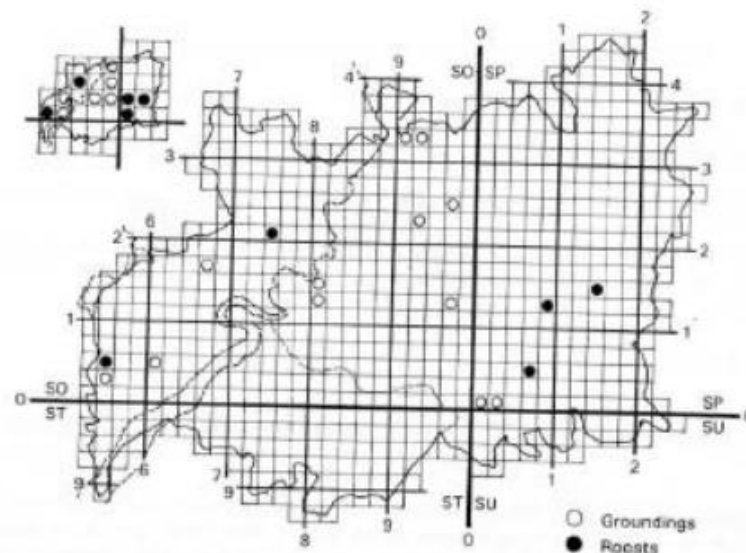
Distribution: Throughout most of Europe, North Africa and east to Japan.

Habitat: In summer, roosts mostly in buildings and hollow trees but nurseries also found in caves and mines. Latter are major hibernation sites. Feeds along forest edges, often close to water.

Food: Diptera, moths, caddis, spiders.

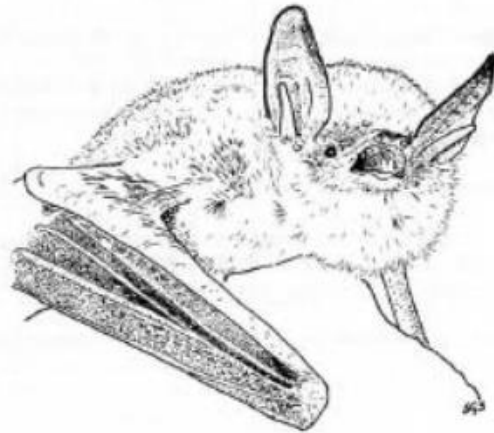
Status: In Europe some large declines are reported, especially from colonies subjected to remedial timber treatment. Fairly common throughout southern Britain but apparently less so in the north.

Gloucestershire records: Apart from single hibernating bats in caves or mines, the first summer roost for this species on record dates from 1989. Few roosts are known, but the scatter of groundings shown on the map suggests that the distribution is fairly widespread. It is possible that some sightings of bats over water are due to this species rather than the Daubenton's Bats they are usually assumed to be.



MAP 4. Records of Natterer's Bat in Gloucestershire 1983-1993

Natterer's Bat

**BECHSTEIN'S BAT** *Myotis bechsteinii*

Size: Forearm length 38-47 mm; Wingspan 250-300 mm; Body mass 7-13 g.

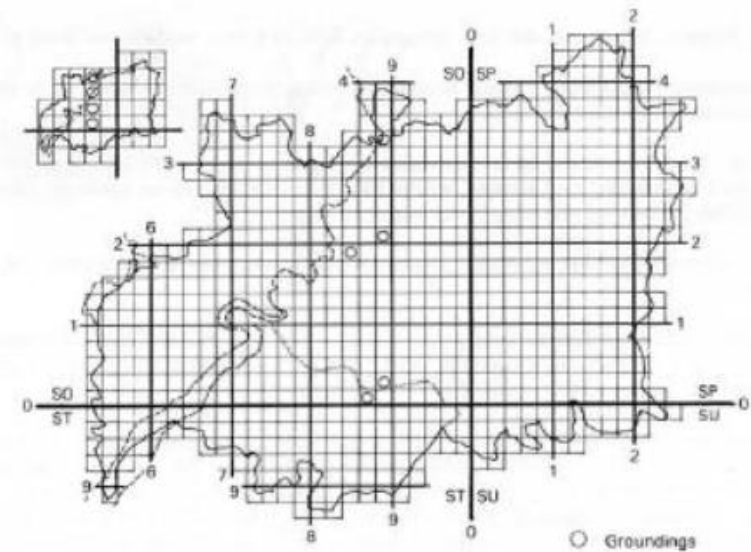
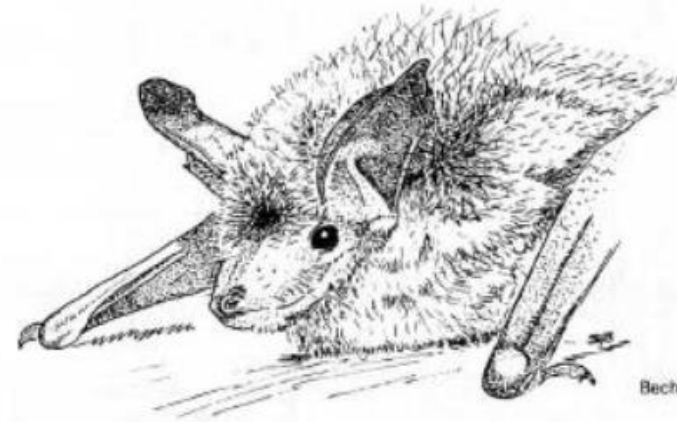
Distribution: Much of Europe from Spain and France, to the Ukraine and Caucasus.

Habitat: Nursery colonies occur in trees, but also roosts in buildings. Uses caves in winter. Requires extensive woodland and parkland where it feeds amongst vegetation.

Food: Moths.

Status: Very rare everywhere in Europe. Possibly declining due to loss of forest and climatic change. Rare in central southern England. Absent elsewhere in Britain.

Gloucestershire records: The map shows the few groundings on record for this very rare species. There are no known roost sites. The map cannot be said to represent the distribution of Bechstein's within the county, but the latest contacts suggest the exciting possibility of a colony to the east of Stroud.

**MAP 5.** Records of Bechstein's Bat in Gloucestershire 1983-1993

Bechstein's Bat

DAUBENTON'S BAT *Myotis daubentonii*

Size: Forearm length 33 -34 mm; Wingspan 230-275 mm; Body mass 6-12 g.

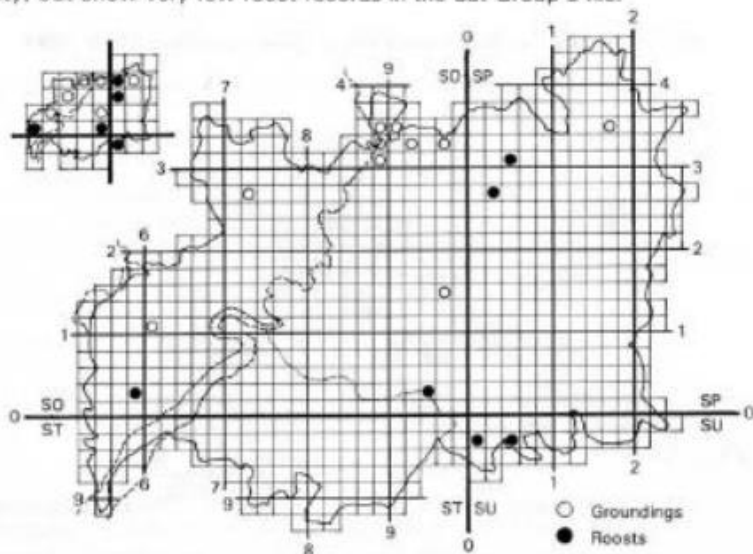
Distribution: Throughout Europe (except extreme north) east to Japan. Absent from southern Palearctic.

Habitat: Nurseries occur in a wide variety of places from trees and cool damp tunnels to warm dry roof spaces, where bats may mix with other species. Feeds mostly in riparian habitat often over water.

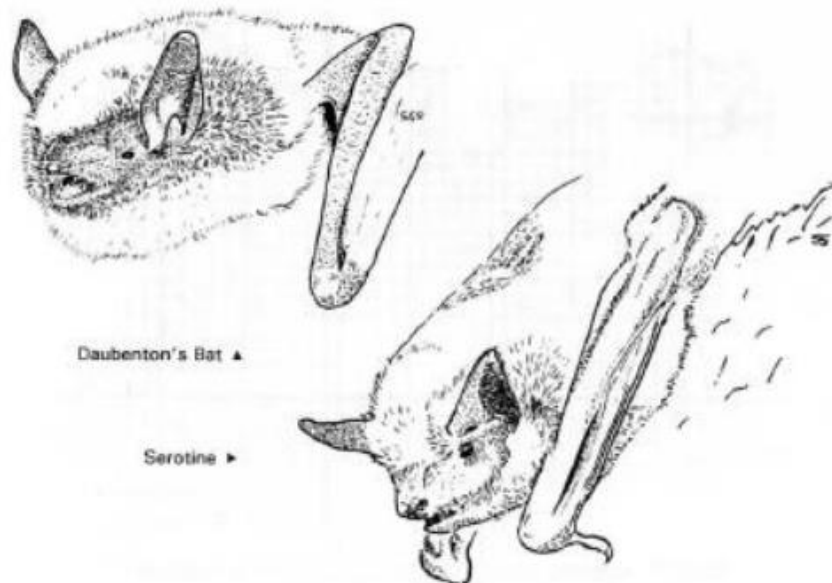
Food: Caddis, Diptera (especially chironomids), moths, beetles, mayflies, water boatmen.

Status: Some local populations in central and northern Europe have increased substantially, while others have declined. Major threat is loss of roosts in walls. Common throughout Britain.

Gloucestershire records: For many of the species seen in the county the records are so few that no clear indication of distribution can be obtained; the plots may well show merely where, by chance, roosts have been found of what is, perhaps, a quite uniformly distributed species. This is most probably the case for the Daubenton's Bat which can be seen over many of the ponds, lakes and rivers in the county, but show very few roost records in the Bat Group's file.



MAP 6. Records of Daubenton's Bat in Gloucestershire 1983-1993

**SEROTINE** *Eptesicus serotinus*

Size: Forearm length 48-56 mm; Wingspan 330-380 mm; Body mass 15-35 g.

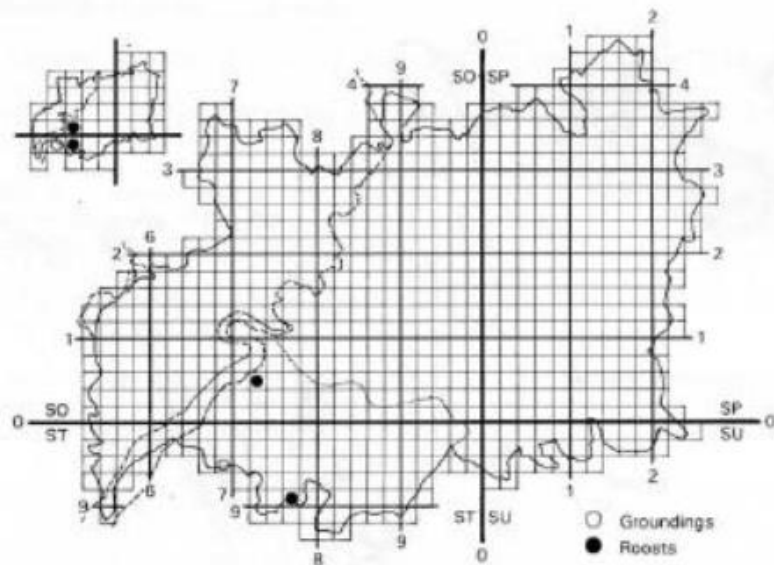
Distribution: From western Europe and north Africa (excluding northern areas) east to Korea.

Habitat: Nurseries mostly in buildings but occasionally found in hollow trees. Hibernates in same roosts as summer. Also in crevices in caves in east and north. Feeds in sheltered urban areas.

Food: Beetles (especially cockchafer), large moths.

Status: Common over large areas of Europe and possibly spreading north. Some colonies have declined. Widespread in southern Britain extending from Somerset and south-east Wales across to east coast as far north as the Wash.

Gloucestershire records: This species is found in neighbouring counties in England and Wales and is almost certainly present in areas other than that shown on the map. Many of our bat roosts are found by householders and members of the various building trades. We hope that among future calls will be further sites used by this handsome species.



MAP 7. Records of Serotine in Gloucestershire 1983-1993

NOCTULE *Nyctalus noctula*

Size: Forearm length 47-57 mm; Wingspan 320-400 mm; Body mass 17-40 g.

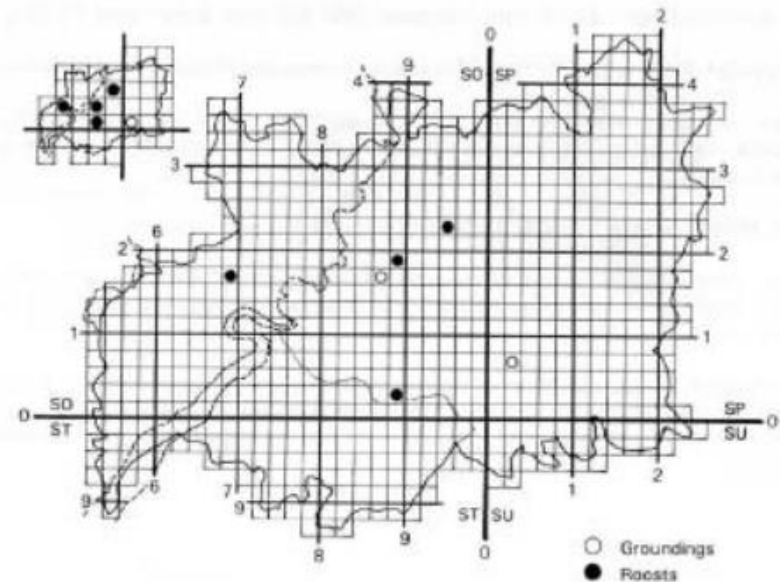
Distribution: Most of Europe (excluding Ireland) including Mediterranean islands, east to Japan.

Habitat: Roosts in trees throughout the year, but also occurs in caves and rock crevices, especially in south east Europe, and occasionally in buildings. An arboreal bat preferring to feed around deciduous woodland.

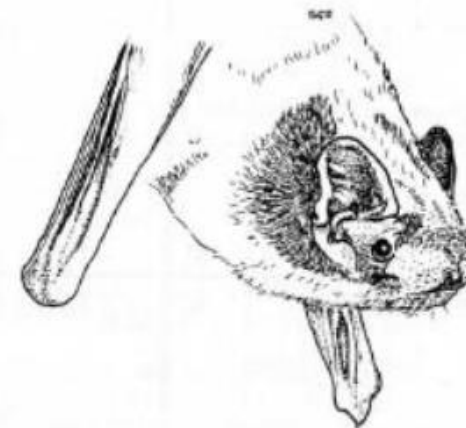
Food: Beetles (especially cockchafer and dor), crickets, moths.

Status: Declining in many areas of Europe due to loss of roosts and food. Undertakes long migrations. In Britain, rare in some lowlands but common in well wooded areas.

Gloucestershire records: There are few instances of grounded bats on record and fewer still of roost locations (due undoubtedly to the preference for tree roosts). However we can confidently identify this bat in flight (using the naked eye and an ultrasonic bat detector) and sightings of this bat are widespread. The distribution of the Noctule is therefore not as sparse as suggested by the map.



MAP 8. Records of Noctule in Gloucestershire 1983-1993



Noctule

LEISLER'S BAT *Nyctalus leisleri*

Size: Forearm length 38-47 mm; Wingspan 260-320 mm; Body mass 11-20 g.

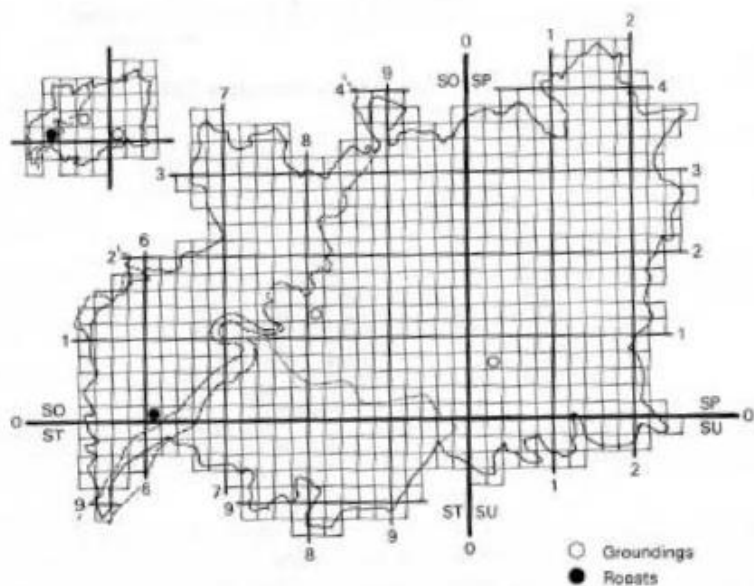
Distribution: From western Europe (including Azores and Madeira) to Afghanistan.

Habitat: Nursery colonies found in trees and buildings. Hibernates mostly in trees and rock crevices, occasionally in caves. Feeds in open woodland in rural and urban areas.

Food: Moths, beetles, caddis, Diptera (e.g. dung-fly).

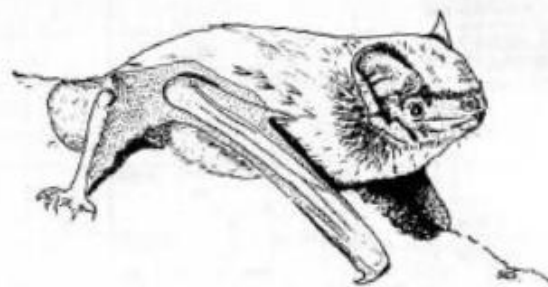
Status: Rare over most of its range within Europe but abundant in Ireland where large colonies of hundreds are found. Small numbers widespread in England and Wales.

Gloucestershire records: Records for this species date between 1955 and 1986. Of the four records on file, identification of two is uncertain; of the other two both were found dead, in the second case the roost had probably been ruined by timber treatment.



MAP 9. Records of Leisler's Bat in Gloucestershire 1983-1993

Leisler's Bat

**PIPISTRELLE** *Pipistrellus pipistrellus*

Size: Forearm length 28-35 mm; Wingspan 180-250 mm; Body mass 4-9 g.

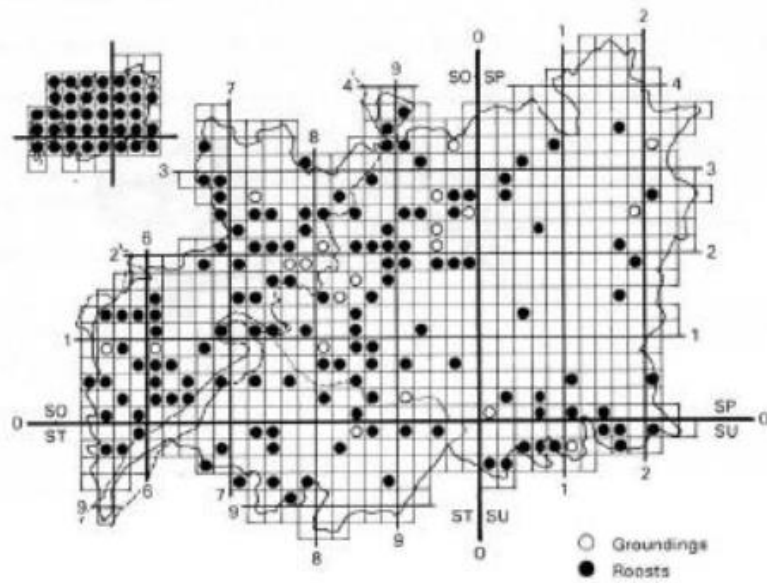
Distribution: Almost all Europe east of Afghanistan and including north and west Africa.

Habitat: Roosts predominantly in buildings throughout the year, but also hibernates in caves in southern and eastern Europe. An urban bat, feeds in agricultural and lightly wooded areas.

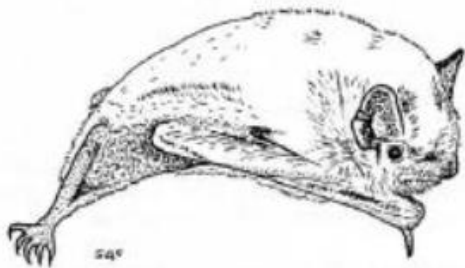
Food: Diptera, caddis, moths, mayflies, lacewings.

Status: Across Europe many large colonies have disappeared or been killed. Agricultural and timber treatment chemicals have killed many bats. Very common everywhere in Britain including many off-shore islands.

Gloucestershire records: For this species the map shows a fall in density towards the north-east, as for those other species where there are sufficient records for a clear picture to emerge. Otherwise distribution can be seen to be widespread. However, some of the known roosts close together may be sites for the same colony of bats, in use at different times of the summer.



MAP 10. Records of Pipistrelle in Gloucestershire 1983-1993



Pipistrelle



Barbastelle

BARBASTELLE *Barbastella barbastellus*

Size: Forearm length 36-44 mm; Wingspan 245-290 mm; Body mass 6-13 g.

Distribution: Western Europe (excluding Ireland) east to Caucasus, also Morocco and most large Mediterranean islands.

Habitat: Nurseries mostly in buildings and hollow trees but roosts in exposed sites among leaves and tree roots. Feeds over water and in riparian woodland. Hibernates in caves and tunnels especially in cold.

Food: Diptera.

Status: Rare bat. Colonies destroyed by loss of roosts and remedial timber treatment. In Britain, very rare and erratic but widespread in England and Wales. No maternity colonies known.

Gloucestershire records: Only one recent record in the county when a Barbastelle collided with a car windscreen in February 1988. Six old records date from before 1959, including one roost. Generally identification is reliable with this distinctive bat.

BROWN LONG-EARED BAT *Plecotus auritus*

Size: Forearm length 34-42 mm; Wingspan 230-285 mm; Body mass 5-12 g.

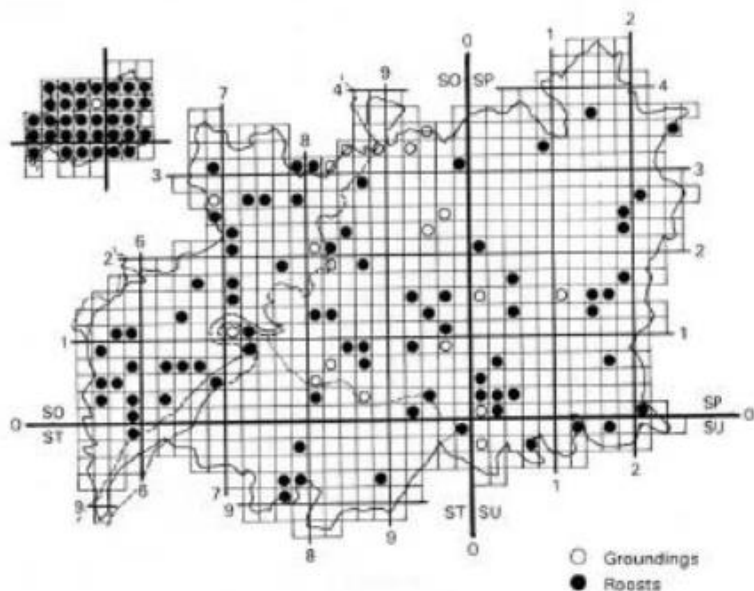
Distribution: Central and northern Europe, east to Japan.

Habitat: Nursery roosts found in buildings and trees. Hibernates in same sites as well as caves and cellars. Feeds in and around coniferous and deciduous trees.

Food: Moths (especially Noctuids), cranefly, caddis, beetles (especially scarab), Diptera (especially midges).

Status: Many colonies killed by remedial timber treatment in buildings. Also threatened by loss of hollow trees. Very common and widespread throughout Britain.

Gloucestershire records: From the map, roost distribution can be seen to be widespread, with the highest density in the Forest of Dean.



MAP 11. Records of Brown Long-eared Bat in Gloucestershire 1983-1993



Brown Long-eared Bat

GREY LONG-EARED BAT *Plectotus austriacus*

This is very similar to the previous species and is rare in Britain. It occurs in a few small colonies near the south coast of England, but has not yet been found in Gloucestershire.

R.E. Stebbings, 1988, *Conservation of European Bats*, (Helm).
F. Greenaway and A.M. Hutson, 1990, *A Field Guide to British Bats*, (Bruce Coleman).
P. Richardson, 1985, *Bats*, (Whittet).

A. Nicholls and R.A. Wells, Gloucestershire Bat Group

Address for correspondence:
Gloucestershire Bat Group, c/o 2 Sandfield Road,
Churchdown, Gloucester GL3 2EZ

POSTSCRIPT: The updating of bat records to produce these distribution maps was one of the last tasks performed by Albert (Nick) Nicholls for the Gloucestershire Bat Group before his death in December 1993. His unstinting effort and wise counsel are greatly missed.

CHECK-LIST OF GLOUCESTERSHIRE ORTHOPTERA AND ALLIED INSECTS

D.J.R.Haigh

These insects comprise bush crickets, crickets, grasshoppers, cockroaches, earwigs, mantids and stick insects (Orthopteroids).

Before the war the only continuous attention paid to this group in the County was by T.Bainbrigge-Fletcher who collected in his home district, Rodborough Common and the surrounding area. He also had available the information in *British Grasshoppers and their Allies*, by M.Burr (1936). Since the war there has been a steady flow of new records of both native and casual species. In the 1950s the County Entomological Recorder, R.S.George, produced a synopsis of the information available on this group of insects. Of the 52 species of orthopteroid insects (including the 14 aliens) recognised as breeding in Britain, George was able to record 25 from Gloucestershire, vcs 33 and 34. However, some of the records were doubtful and have since been dropped.

The study of this group was given great impetus by the publication of *Grasshoppers, Crickets and Cockroaches of the British Isles* (Ragge 1965). In addition to descriptions of the species, there were distribution maps showing the recorded distribution at vice-county level. Much of this information came from D.K.McE.Kevan's studies, summarised in his 1961 paper. Eight years after Ragge published his book, Skelton reported on the progress of the Orthoptera distribution maps scheme of the Biological Records Centre using 10 km national grid squares. He requested many more records for 10 km squares to make the maps sufficiently complete to be an acceptable substitute for vice-county maps. At this time E.C.M.Haes had completed a survey of the Orthoptera of Sussex using 2 km squares (tetrads).

The Orthoptera Recording Scheme was set up in 1977 to collect and coordinate records with a view to producing comprehensive distribution maps based on 10 km squares. E.C.M.Haes took on the role of organiser.

Finally in 1988 Harley Books published *Grasshoppers and Allied Insects of Great Britain and Ireland* by J.Marshall and E.C.M.Haes. This excellent book is the standard reference work. Included in this book are 10 km square dot distribution maps of all records received by the organiser of the Orthoptera Recording Scheme up to mid-1988. The book has provided considerable impetus to further recording and the Newsletter of the Scheme circulates to contributors, updating records on individual species. The 10 km square *National Atlas of British and Irish Orthopteroids* is now in final draft and will include records to November 1992.

The Gloucestershire Check-list is based on records compiled by R.S.George and from field recording which started in the mid-1970s. Recording has proceeded each season with a steady accumulation of records. GNS members have provided many records and the inception of the Gloucestershire Invertebrate Group in 1988 increased knowledge of this group considerably.

As with most invertebrate recording the status and distribution of species is to a degree incomplete and one species in particular, the Common Earwig, is grossly under-recorded.

The check-list is in three parts:

- (a) native and established alien species recorded since 1960
- (b) native and established alien species recorded before 1960
- (c) occasional casual introductions

The classification follows that laid out in Marshall and Haes (1988). The area covered by this list is the present day county of Gloucestershire, post 1974, and does not include the Avon and Bristol part of vc 34.

Following the scientific and vernacular names is a letter code describing whether the species is a native, alien or migrant:

n	native
ea	established alien
oc	occasional casual introduction
m	occasional migrant

The next column gives an indication of the distribution of species in the county as follows (refers to part (a) only):

W	widespread, recorded in more than 25 squares
FW	fairly widespread, recorded in 15-24 squares
P	patchy, recorded in 5-14 squares
L	local, recorded in 1-4 squares (10 km squares in all cases)

Like butterflies, grasshoppers and bush-crickets vary in number from year to year depending on weather conditions of that year or the previous year, but an indication can be given for an average year. The lower case letter code in the final column is an attempt to do this and again applies only to part (a):

ab	abundant, good numbers in suitable habitat
co	common, lesser numbers in suitable habitat
nu	not uncommon, single numbers in suitable habitat
u	uncommon, not always met with in suitable habitat
r	rare, rarely met with even in suitable habitat

There is insufficient information on status for the two established alien cockroaches.

Britain and Ireland possess 52 orthopteroid species, which includes the 14 known established aliens. Gloucestershire species recorded since 1960 number 20 species which includes 3 established aliens. To this county list can be added three further native species and two established aliens if records are taken before 1960.

CHECK-LIST OF GLOUCESTERSHIRE ORTHOPTERA AND ALLIED INSECTS

(a) Native and Established Alien Species Recorded since 1960

ORDER ORTHOPTERA

Family TETTIGONIIDAE

<i>Meconema thalassinum</i> (De Geer)	Oak Bush-cricket	n	FW	nu
<i>Tettigonia viridissima</i> (Linn.)	Great Green Bush-cricket			
(Stroud Region)		n	L	r
<i>Pholidoptera griseoaptera</i> (De Geer)	Dark Bush-cricket	n	FW	co
<i>Conocephalus dorsalis</i> (Latreille)	Short-winged Cone-head			
(marshes, R.Severn)		n	L	u
<i>Leptophyes punctatissima</i> (Bosc)	Speckled Bush-cricket	n	FW	nu

Family GRYLLIDAE

<i>Acheta domestica</i> (Linn.)	House Cricket	ea	L	r
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Family TETRIGIDAE

<i>Tetrix subulata</i> (Linn.)	Slender Ground-hopper	n	P	u
<i>Tetrix undulata</i> (Sowerby)	Common Ground-hopper	n	FW	co

Family ACRIDIDAE

<i>Stenobothrus lineatus</i> (Panzer)	Stripe-winged Grasshopper			
(Cotswolds)		n	P	u
<i>Omocestus viridulus</i> (Linn.)	Common Green Grasshopper			
		n	FW	co
<i>Chorthippus brunneus</i> (Thunberg)	Field Grasshopper	n	W	ab
<i>Chorthippus parallelus</i> (Zetterstedt)	Meadow Grasshopper	n	W	ab
<i>Chorthippus albomarginatus</i> (De Geer)	Lesser Marsh Grasshopper			
(grassland, near R.Severn and R.Wye)		n	P	u
<i>Gomphocerippus rufus</i> (Linn.)	Rufous Grasshopper	n	P	u
(Cotswolds)				
<i>Myrmeleotettix maculatus</i> (Thunberg)	Mottled Grasshopper	n	P	nu
(requires bare ground)				

ORDER DICTYOPTERA

Family Blattidae

<i>Blatta orientalis</i> (Linn.)	Common or Oriental Cockroach			
		ea	L	?

Family BLATTELLIDAE

<i>Blattella germanica</i> (Linn.)	German Cockroach	ea	L	?
<i>Ectobius lapponicus</i> (Linn.)	Dusky Cockroach	n	L	r
(two records, Foxes Bridge, June 1990 and Cannop Ponds July 1993)				

ORDER DERMAPTERA

Family LABIIDAE

<i>Labia minor</i> (Linn.)	Lesser Earwig	n	L	r
(one record, Cirencester, August 1989)				

Family FORFICULIDAE

<i>Forficula auricularia</i> (Linn.)	Common Earwig	n	?	ab
(few records, though considered widespread)				

(b) Native and Established Alien Species Recorded before 1960

<i>Metriopectera brachyptera</i> (Linn.)	Bog Bush-cricket	n		
(T.Bainbrigg-Fletcher, <i>Ent. Rec.</i> , 51, 173, 22 July 1939, Woodchester, Stroud)				

<i>Gryllotalpa gryllotalpa</i> (Linn.)	Mole Cricket	n		
(L.Ridgeway, <i>The Field</i> , 27 May 1939, "pair of <i>G.gryllotalpa</i> " given to him 30 years previously, and taken in a garden at Inchbrook, Nailsworth)				

<i>Omocestus rufipes</i> (Zetterstedt)	Woodland Grasshopper	n		
(W.Shaw, <i>Entomological Monthly Magazine</i> , 25, Synopsis of British Orthoptera; Wotton-under-Edge, 1889; T.Bainbrigg-Fletcher, <i>Entomologist</i> , 4 October 1937, Oddington, 25 October 1937)				

<i>Periplaneta americana</i> (Linn.)	American or Ship Cockroach	ea		
(Specimen in 'The Wild Collection', Gloucester City Museum, labelled 'Oil-cake Mills', Gloucester, 10 January 1943)				

<i>Periplaneta australasiae</i> (Fabricius)	Australian Cockroach	ea		
(Determined by R.S.George: 1 in a crate of pears, Gloucester, 21 September 1953; 1 in bananas, Gloucester, 3 December 1953)				

(c) Occasional Casual Introductions and Migrants

<i>Jamaicana subguttata</i> (Walker)	Mottled-winged Bush-cricket	oc		
(R.S.George, 1955 and 1957, determined by D.Ragge: imported with bananas from Central America, storehouse, Gloucester)				

<i>Locusta migratoria</i> (Linn.)	Migratory Locust	m/oc		
(F.Beasley, September 1929, Lower Quinton, specimen now in British Museum; RAF Barrwood, 25 January 1960)				

<i>Anacridium aegyptium</i> (Linn.)	Egyptian Grasshopper	oc		
(J.Coles, among vegetables in a Gloucester cafe, 20 December 1951, determined by Uvarov)				

Ailopus strepens (Latreille) (a long-winged grasshopper) oc
 (D.J.R.Haigh, in a garden, Cheltenham, accidentally brought back from France in camping gear, May 1991, determined by J.Marshall)

Nauphoeta cinerea (Olivier) (a cockroach) oc
 (W.P.R.Brindley, bananas, Gloucester 16 May 1955, determined by D.R.Ragge)

Chelisochea plagiatus (Fairmaire) (an earwig) oc
 (C.G.Roberts, bananas, Gloucester, determined by D.R.Ragge, 17 December 1953)

R.S.George, 1956, A synopsis of the information available concerning Dictyoptera and Orthoptera in Gloucestershire.

D.R.Ragge, 1965, *Grasshoppers, Crickets and Cockroaches of the British Isles*, (Warne, London).

J.Marshall and E.C.M.Haes, 1988, *Grasshoppers and Allied Insects of Great Britain and Ireland*, (Harley Books, Colchester).

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CHECK-LIST OF GLOUCESTERSHIRE MOTHS: ADDITIONS AND CORRECTIONS

R.G.Gaunt

Publication of a "Check-list of Gloucestershire Moths" in *The Gloucestershire Naturalist* No.6 (Gaunt 1992) and comparison with records held elsewhere, in particular those being used by A.Maitland Emmet in editing *The Moths and Butterflies of Great Britain and Ireland*, has resulted in a considerable number of new records coming to light. These are listed below. The deletions arise mainly from re-classification, and the corrections are nearly all name changes. Further up-dates of this supplement can be obtained from me on receipt of a stamped addressed envelope.

(a) MICROLEPIDOPTERA

To be deleted:

- 155 *Heliozela stanneella* FvR (junior synonym for 154 *H.sericiella* Haw)
 184 *Luffia lapidella* Goeze (replaced by 185 *L.ferchaultella* Steph)
 494 *Coleophora coracipennella* Hb
 517 *C.frischella* L
 572 *C.vestianella* L
 615 *Elachista dispunctella* Dup
 928 *Phalonidia permixtana* D&S (refer to 960 *F.ruficiliana* Haw)
 976 *Archips oporana* L
 1070 *Olethreutes mygindiana* D&S
 1502 *Platyptilia isodactylus* Zell

To be corrected:

78	<i>Stigmella incognitella</i> H-S	<i>S.pomella</i>	2L	
158	<i>Antispila metalella</i> D&S	<i>A.pfeifferella</i> Hb	5R 1L	2R 3L
218	<i>Nemopogon variatella</i> Clem	<i>N.personella</i> Pier & Met		2L
227	<i>Monopis laevigella</i> D&S	<i>M.rusticella</i> Hb	C	
229	<i>M.obviella</i> D&S	<i>M.ferruginella</i> Hb	5+R	
237	<i>Niditinea fuscella</i> L	<i>Tinea fuscipunctella</i> Haw	C	1L
252	<i>Ochsenheimeria urella</i> FvR	<i>O.bisontella</i> Lien & Zell	1L	1R
260	<i>Leucoptera malifoliella</i> Costa	<i>L.scitella</i> Zell	C	2R
275	<i>Bucculatrix bechsteinella</i> B&S	<i>B.crataegi</i> Zell	1R 2L	
329	<i>Phyllonorycter spinicolella</i> Zell	<i>P.pomonella</i> Zell	3L	5+R
337	<i>P.hilarella</i> Zell	<i>P.spinolella</i> Dup	C	
362	<i>P.acerifoliella</i> Zell	<i>P.sylvella</i> Haw	2R 2L	
393	<i>Glyphipteryx equitella</i> Scop	<i>G.minorella</i> Snell	C	1L
414	<i>Argyresthia curvella</i> L	<i>A.arcella</i> Fabr	5+R	

417	<i>A. spinosella</i> Stt	<i>A. mendica</i> auct	3R	1L	
421	<i>A. bonnetella</i> L	<i>A. curvella</i> L		C	
440	<i>Paraswammerdamia albicapitella</i> Scharf	<i>P. spiniella</i> Hb		CL	
476	<i>Acrolepia autumnitella</i> Curt	<i>A. pygmeana</i> Haw	5R	1L	
489	<i>Coleophora albella</i> Thunb	<i>C. leucapennella</i> Haw			
		RDB2			1L
518	<i>C. mayrella</i> Hb	<i>C. spissicornis</i> Haw	5 + R	4L	
555	<i>C. follicularis</i> Vallot	<i>C. troglodytella</i> Dup	5R	2L	
565	<i>C. saxicolella</i> Dup	<i>C. benanderi</i> Kanerva			3R
638	<i>Denisia augustella</i> Hb	<i>Chambersia augustella</i> Hb			
		pRDB1	2R	2L	
680	<i>Depressaria aegopodiella</i> Hb	<i>D. albipunctella</i> Hb		1R	
688	<i>Agonopteryx heracliana</i> L	<i>Depressaria applana</i> Fabr		C	
698	<i>A. kaekeritziana</i> L	<i>A. liturella</i> D&S		CL	
942	<i>A. piercei</i> Obraz	<i>Chlidonia baumanniana</i> D&S			
		Nb	5 + R	5 + L	
1119	<i>Ancyliis diminutana</i> Haw	<i>A. geminana</i> Don	1R	2L	4R 2L
1293	<i>Chrysoteuchia culmella</i> L	<i>Crambus hortuellus</i> Hb		C	
To be added:					
31	<i>Ectoedemia rubivora</i> Wocke				1R
35	<i>E. minimella</i> Zett			C	
36	<i>E. quinqueella</i> Bedell	Nb		1R	
37	<i>E. albifasciella</i> Hein			C	
45	<i>Trifurcula griseella</i> Wolff	Nb		1R	
46a	<i>T. squamatella</i> Stt		1R		
65	<i>Stigmella speciosa</i> Frey			1R	
70	<i>S. obliquella</i> Hein	<i>S. vimineticola</i> auct		C	
82	<i>S. paradoxa</i> Frey			1R	
85	<i>S. suberivora</i> Stt			1R	
99a	<i>S. mespilicola</i>			1R	
103	<i>S. nylandriella</i> Tengst	<i>S. aucupariae</i> Frey		C	
107	<i>S. regiella</i> H-S			C	
110	<i>S. betulicola</i> Stt			C	
113	<i>S. discidia</i> Sch & Wilk	<i>S. distinguenda</i> Hein		C	
114	<i>S. glutinosae</i> Stt			C	
211	<i>Haplotinea ditella</i> Pier & Metc			1R	
243	<i>Tinea dubiella</i> Stt	<i>T. turicensis</i> Mull-Rutz		1R	
272	<i>Bucculatrix cidarella</i> Zell			FC	
308	<i>Parornix finitimella</i> Zell			FC	
327	<i>P. cydoniella</i> D&S			1R	
404	<i>Argyresthia praecocella</i> Zell	Nb		1R	
447	<i>Roeslerstammia erxebella</i> Fabr		2R	2L	
453	<i>Ypsolopha dentella</i> Fabr			C	
495	<i>Coleophora spinella</i> Schr			1L	
512	<i>C. binderella</i> Koll			1R	
523	<i>C. hemerobiella</i> Scop	Nb		1R	

538	<i>C. vibicella</i> Hb			1L	
553	<i>C. striatipennella</i> Nyl				2L
573	<i>C. atriplicis</i> Meyr			1L	
607	<i>Elachista canapennella</i> Hb			C	
612	<i>E. collitella</i> Dup	Nb			
614	<i>E. triseriatella</i> Stt	Nb			1L
622	<i>E. revinctella</i> Zell	Nb			
631	<i>Cosmiotes freyerella</i> Hb				
660	<i>Pseudatemelia josephinae</i> Toll				2L
668	<i>Ericostoma lobella</i> D&S				1R
672	<i>Depressaria pastinacella</i> Dup	<i>D. heracliana</i> auct		3R	4L
891	<i>Mompha nodicolella</i> Fuchs	Nb		1L	
914	<i>Scythris crassiuscula</i> Hb	<i>S. fletcherella</i> Meyr		1R	
960	<i>Falseuncaria ruficiliana</i> Haw				1L
977	<i>Archips podana</i> Scop	<i>Cacoecia oporana</i> L		C	
998	<i>Epiphyas postvittana</i> Walk				1L
999	<i>Adoxophyes orana</i> FvR				1R
1039	<i>Acleris comariana</i> Lien & Zell				1L
1045	<i>A. notana</i> Don				2L
1091	<i>Apotomis lineana</i> D&S	Nb		2L	
1099	<i>Endothenia marginana</i> Haw			2L	
1100	<i>E. pullana</i> Haw	<i>E. fuligana</i> auct	pRDB3	1L	
1112	<i>Bactra robustana</i> Christ	Nb		1L	
1184a	<i>Epiblema cirsiana</i> Zell			C	
1202	<i>Eucosma obumbratana</i> Lien & Zell	<i>E. expallidana</i> Haw		1R	2L
1205a	<i>Spilonota laricana</i> Hein				1L
1275	<i>Dichrorampha flavidorsana</i> Knaggs				1L
1277	<i>D. senectana</i> Guen	Nb		1L	
1304	<i>Agriphila straminella</i> D&S	<i>Crambus culmellus</i> L		C	C
1307	<i>A. latistria</i> Haw				1R
1363	<i>Pyrausta ostrinalis</i> Hb				1R
1400	<i>Antigastra catalaunalis</i> Dup			1R	
1408	<i>Palpita unionalis</i> Hb				2R
1467	<i>Ancylosis oblitella</i> Zell				1R

(b) MACROLEPIDOPTERA

To be added:					
1679	<i>Cyclophora porata</i> L	False Mocha			1R
2087	<i>Agrotis segetum</i> D&S	Turnip Moth		C	C
2102	<i>Ochropleura plecta</i> L	Flame Shoulder		C	C
2251	<i>Trigonophora flammea</i> Esp	Flame Brocade		1R	
2333	<i>Apamea anceps</i> D&S	Large Nutmeg		4R	5L
2355	<i>Luperina dumerilii</i> Dup	Dumeril's Rustic		1R	
2436	<i>Macdunnoughia confusa</i> Steph	Dewick's Plusia			1R

With these additions and corrections the total numbers of species recorded in Gloucestershire become:

Microlepidoptera	909
Macrolepidoptera	624
Total	1533

R.G. Gaunt, 1992, Check-list of Gloucestershire moths, *The Gloucestershire Naturalist*, 6, 2-35.

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