NE09/1055/F

Protected Species Survey
of
Gold Hill Farm,
Clenchers Mill Lane,
Eastnor, Nr Ledbury,
Herefordshire.
HR8 1RE

Grid reference SO736364
On 4th July 2008

Site investigation undertaken by:
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PLANNING SERVICES
DEVELOPMENT CONTROL
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Executive Summary

Shropshire Wildlife Surveys were commissioned by Mr Christopher Knock on behalf of Eastnor Castle Estate to carry out an ecological survey of Gold Hill Farm, Clenchers Mill Lane, Eastnor, Nr Ledbury, Herefordshire, HR8 1RE in relation to the conversion of farm buildings to commercial use.

Species included in the survey were Birds and Bats.

In the opinion of the wildlife surveyor, the development of the site will affect the status of the following protected species:

- Birds
- Bats

Birds.
The impacts which the proposed development might have on breeding birds should be small. The past presence of Little Owl and records of Barn Owl within 1km should be encouraged with the provision of suitable nest box facilities.

Bats
Whilst an impressive number of eleven bat species were recorded around the site, numbers are small, typically individual foraging bats.

The records of Barbastelle and Greater Horse-shoe would be considered significant; the large diversity of species recorded is an example of good habitat and landscape management

From the observations during the survey period the surveyors are of the opinion that three Common Pipistrelles, two Whiskered, individual Soprano Pipistrelle, Brown Long-eared, Natterer's and Lesser Horse-shoe bats roost within the buildings at the site.

Roost sites were confirmed at six locations along with two feeding perches around the site. No evidence of any maternity roosts was found.

Individual bats are typically male or non breeding females during the summer months. These individuals typically move roost sites on a regular basis around a site, possibly as an anti-predator defence. For this reason, it is important that a variety of potential roost sites are maintained during the conversion or refurbishment of a large site such as Gold Hill.

Important commuting flight routes exist through the Gold Hill site, these must be retained and preferably improved, and with the expected additional disturbance, alternative routes around the perimeter of the site should be encouraged.

Sympathetic landscaping and suitable mitigation should compensate for any losses or disturbance on the site due to the proposed conversion of its buildings.

If planning permission is granted for this project, an EPS licence in respect of bats must be obtained before development of the Gold Hill Farm can commence.

J Morgan.

John Morgan
December 2008

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1.0 INTRODUCTION

Shropshire Wildlife Surveys were commissioned by Mr Christopher Knock on behalf of Eastnor Castle Estate to carry out a protected species survey of Gold Hill Farm, Clenchers Mill Lane, Eastnor, Nr Ledbury, Herefordshire, HR8 1RE in relation to the conversion of the building into a single dwelling.

Species included in the survey were Birds and Bats; other protected species were not included due to the lack of suitable habitat or expected low impact of the proposed works.

The survey was carried out between 4th July 2008 and 31st August 2008 by John Morgan and Adrian Bayley, both experienced wildlife surveyors and licensed bat workers.

The area and buildings investigated are highlighted in red on the appended documents:

Ordnance Survey map abstracts (Appendix 1)
Aerial photograph (Appendix 2)
Site plan (Appendix 3)

In accordance with the guidance given in Planning Policy Statement No. 9. evidence was sought of the presence or absence of protected species as defined in:

The Wildlife and Countryside Act 1981 - as listed in:
Schedule 1. Birds protected by special penalties at all times,
Schedule 5. Protected animals
The Conservation [Natural Habitats, &c.] Regulations 1994 - as listed in:
Schedule 2. European protected species of animals

At the request of:- Mr Christopher Knock on behalf of Eastnor Castle Estate. The whole of the site was surveyed for completeness to demonstrate its usage by any protected species that may be found and to enable suitable mitigation / compensation for any losses that may be envisaged by the proposed conversion and any future plans for the buildings including renovation and repairs.

Species which might be associated with such a building in its given settings would be Bats and nesting birds.

2.0 Site Description

Gold Hill Farm appears to be a traditional farmstead with a range of buildings dating from mid 19th Century to modern. The Georgian style house appears to be built around an earlier timber frame house.

It is surrounded by arable farmland to the south, sheep pasture to the north and east and to the west an orchard which is in excess of 100 years old.

Eastnor Castle and lake are within 400m with ancient and replanted ancient woodland within 1km.

This well established parkland landscape provides excellent habitat for bats of all species expected within the area.

The Farm buildings are a mixture of stone and brick with tiled roofs which where original are torched with lime mortar. Modern repairs have included bitumastic felt sarking. Building 3 is of a timber frame construction with timber and corrugated iron cladding with a corrugated iron roof. This building is probably one of the original for the site, dating from the now obscured original timber framed farmhouse.

The general state of the buildings was from good to poor, with some areas showing neglect.

The Farm buildings are still used by the estate on a commercial basis, little activity was apparent during the surveys other than general farm storage and a mobile workshop for vehicles.

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3.0 Methodology

Weather conditions for all surveys was seasonal with no adverse conditions that would affect foraging bats.

A photographic record was made of each area of any evidence of protected species. A selection of photographs describing the site is shown in the adjoining appendices.

3.2 Birds

Mukes, pellets and feathers would indicate the presence of Owls and the nests of birds would be found during the course of the bat survey.

3.3 Bats.

All of the buildings were searched systematically for any signs of bats. The signs included droppings, urine stains, feeding signs, colouration of access points or perches by rubbing and scratch marks.

Ladders, a Medit PF9-13 fibrescope, mirrors, bright torches and binoculars were used to examine parts which were otherwise inaccessible.

Anabat detectors with Zciam recorders were left on site within buildings to ascertain usage by bats for periods of up to six days.

Four evening activity surveys and three dawn activity surveys were carried out by two persons using a maximum of nine Anabat with Zciam recorders and on one evening a Duet Bat detector to identify bats during these surveys. They were left in position over night for three night / dawn activity surveys.

Prior to each evening activity survey a quick search of each loft or room with potential for roosting bats was carried out for any emerging bats prior to light sampling.

Two infra red cameras with video recording were set up to monitor blind spots from the surveyors on two of the evenings. A Batbox Duet detector or Anabat was connected for Audio recording during the video recording depending on availability and location.

A Yukon Ranger 5 x 42 digital night vision scope and a Night Owl image intensifier were available for use where required.

Binatone Trek 100 hand held radios were used by the surveyors to co-ordinate observations.

4.0 Constraints.

No access was available to the interior of building 5 for security reasons. There are no plans for any works on this building.

5.0 Results.

5.1 Birds.

A quantity of very old Little Owl pellets were found within the first floor of building 1 at its Northern end. The surveyor is of the opinion that these pellets are more than one year old.

The nests of Several Barn Swallows and Wrens with individual nests of Blackbird and House Sparrow were found within the buildings. The nests were found where ever suitable access was available; their locations would vary according to usage of the building during the nesting season.

A Barn Owl was heard calling during activity surveys on two evenings from the south, in the direction of Clenchers Mill.

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5.2 Bats.

5.2.1 Visual surveys.

All of the buildings on the site give many potential roosting places for bats; many walls were found to have deep fissures and cracks, the majority of roofs are tiled and have been repaired or re-roofed in recent years, many of the roof timber joints were too tight for roosting bats.

The amount of visible evidence of bats was less than expected.

Building 1:- This two storey building has a tiled roof with lime mortar torching. The roof timbers were substantial but the joints were in general too tight for bats. Several old droppings contusive to flying bats were found scattered within the first floor 'loft', the droppings were in a poor state and identification was limited to possibly Pipistrelle. This loft is well lit by the windows.

No other evidence was found within this building.

Building 2:- This building is divided up into a stone walled area with cider mill and appeared to be last used as cattle pens. The southern end is a mixture of brick and stone with many deep fissures and cracks suitable for roosting bats.

The roof of this building is tiled and unlined; some timber beams have been replaced in recent years.

Mixed remains of several Yellow Under wing moths, Small Tortoiseshell and Peacock butterflies were found beneath the ridge in a loft above south end.

No other evidence was found within this building.

Building 3:- This timber framed barn has a corrugated iron roof. Its walls are partially covered with the same material, in places the walls are ship lap timber cladding. The south end of this building is of stone and two storeys high with a loft. The timber frame has many suitable joints for roosting bats.

Several droppings typical of Pipistrelle bats were found within the open area of this building, their location was contusive to flying bats.

No other evidence was found within this building.

Building 4:- This building adjoins building 3. It comprises of an open fronted cattle house with disused stables and storage to the south. Its stone and brick walls have many cracks and crevices suitable for roosting bats. The south gable wall to this building had several holes and gaps within the pointing and stones, the majority of these holes appeared to be deliberate within modern mortar. Droppings contusive to Pipistrelle were found within two of these holes. No bats were observed with the endoscope during the search.

The roof is tiled above the cattle pen and two storey section with bitumastic felt sarking. The southern section is of corrugated fibre cement.

A room used as work shop was found to have Brown Long-eared bat droppings beneath the ridge at two areas. A single Brown Long-eared bat was observed on the 4th and 10th July and again on 29th August, each time in a different position along the ridge. Further Brown Long-eared droppings were also found on a plastic sheet in the first floor room within this building. The open access at the gable apex gives opportunity for bats to fly through out this building.

Building 5:- This building was kept locked for security reasons. The exterior was checked for signs of bats, none was found.

Building 6:- This stone and brick built former cattle shed has a tiled roof which has been replaced within the last few years with several new timbers and bitumastic felt sarking.

The deep straw litter precluded the floor of this section being fully searched for droppings.

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Several fresh Pipistrelle droppings were found within the main section of this building. They were all found on pallets which had been used to section off the area into pens for sheep and were contusive to flying bats.

A first floor loft at the southern end has been refurbished and currently used as storage. No evidence of bats was found within this loft area. Spider's webs stretched from the roof to the floor in several places indicating a high probability of no flying bats

Building 7:- This large modern steel and fibre sheet building gave no obvious areas for roosting bats. Its floor was covered with cattle slurry so was impossible to determine any activity by bats.

Several open Dutch Barns or similar exist around the site. All were empty at the time of the survey, no obvious roost sites were observed within these structures.

Farmhouse:- This substantial two storey house has former servant quarters in the attic and a large cellar. It appeared to have been inhabited until recently. It was noted that the roof is falling into a state of disrepair with many loose tiles and loose flashing around the hipped ridges.

Cellar: No evidence of roosting bats was found within the cellar, it was found to be quite damp. A window and external door are in its east side, giving suitable access for bats.

Ground Floor: A single Pipistrelle dropping was found on the window sill beneath a missing pane of glass in the study (east side). The loft above the scullery was entered via the open access over the wall from the covered porch. No evidence of bats was found inside this loft. It was noted that there was a strong smell of creosote or similar within this loft.

First Floor: Approximately 100 Lesser Horse-shoe droppings were found on the top steps of the main stairs leading to the attic, they appeared to be last seasons and fresh. The door at the head of the stairs was nailed shut with no access the attic. These droppings were removed to ascertain current usage, from further counts it was estimated that the quantity of droppings were from a single bat using the area as a night roost, no feeding signs were found at this location, the only obvious access point was from the ground floor study via the broken window.

A single Brown Long-eared dropping was found behind a door dividing the landing of the servant's stairs and games room. No other evidence of bats was found on this floor.

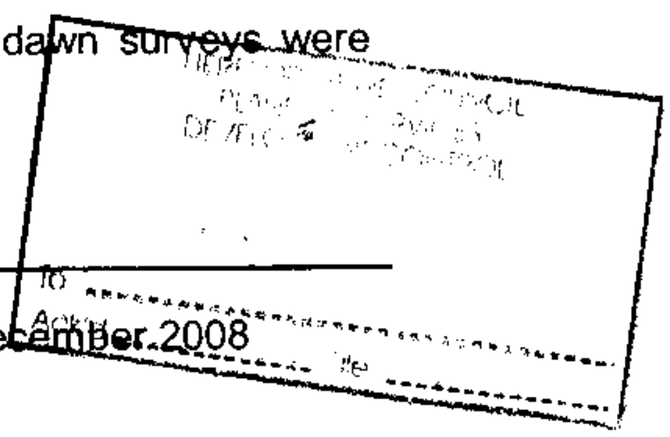
Roof space: the roof space is divided up into three distinct areas. The west wing is confined to a loft space with access via a small trap door next to a glazed window that opens into this loft giving away the former structure of the house. This loft has unlined tiles and was found to be quite draughty. No evidence of bats was found within this loft.

The central part of the attic appears to have been servant's quarters with skylights on the northern face of the roof. Voids have been created by the construction of walls and ceiling. These were entered via trap doors and a hole in the ceiling. No evidence of bats was found within these voids. Several old droppings of Lesser Horse-shoe and Brown Long-eared bats were found scattered within this living area, no accumulation was evident of roosting sites.

The area of the east wing appears to have been used for storage, several old droppings from Lesser Horse-shoe, Brown Long-eared and Pipistrelle were found within this section, no accumulation indicated anything other than occasional night roosts or flying bats. However; following the sighting of two Common Pipistrelle bats entering beneath flashing on the valley of the south side of this roof during the dawn activity survey of the 22nd August a further search of the area found fresh Pipistrelle droppings beneath the general area that they had been seen to enter, Fresh feeding signs of Yellow Under-wing moth remains and Brown Long-eared droppings were found beneath the ridge in this area.

5.2.2 Activity Surveys.

Evening activity surveys were carried on 4th July. Combined evening and dawn surveys were carried out on 10th / 11th July, 21st / 22nd August and 29th / 30th August.



Four Anabats were left on site between 4th and 7th July, within building 2 loft, house attic, building 3 loft and first floor of building 4.

Two Anabats were left within the house first floor main stair landing and ground floor reception hall between the 23rd and 29th August and a single Anabat was left within building 6 between 27th and 29th August following the observation of a Lesser Horse-shoe bat roosting during a site planning meeting on the 27th August.

Anabats were left in position all night of the three evening / dawn activity surveys to record any foraging activity.
A break down on activity at each building is given below, identification of species is given from Anabat recordings unless stated otherwise:-

Building 1:- On 4th July, three Myotis bats were observed flying within the first floor of this building prior to expected emergence times. This was the only time bats were observed within this room. Anabat recordings of Common Pipistrelle, Natterer's, Whiskered and unidentified Myotis were made within this room on two further occasions.

Building 2:- On 4th July three Myotis bats were observed flying beneath the open cattle pen area. Identification was difficult as calls recorded were of Natterer's and Whiskered. It is believed these bats were the ones observed earlier in Building 1. Records from an Anabat located within the loft area of this building between the 4th & 7th July were of Natterer's (8 passes), Noctule (1 Pass) and Greater Horse-shoe (1 pass). The latter was recorded at 03:37 on 5th July.

During the 11th July dawn survey two Myotis, most likely Whiskered were observed to enter an area at the ridge inside the open cattle pen area of this building.

During the 22nd August dawn survey a Common Pipistrelle was observed swarming around the chimney stack / roof junction at the east side of this building. Unfortunately, the observer was distracted and lost sight of the bat before it disappeared. No bat was observed leaving this area during the 29th August activity survey.

On 30th August a Common Pipistrelle was observed entering a large crack in the south gable wall beneath the blocked off window.

Building 3:- An Anabat was left within the loft of this building from the 4th to 7th July only 3 passes by Common Pipistrelle, all within 5 minutes were recorded during this period.

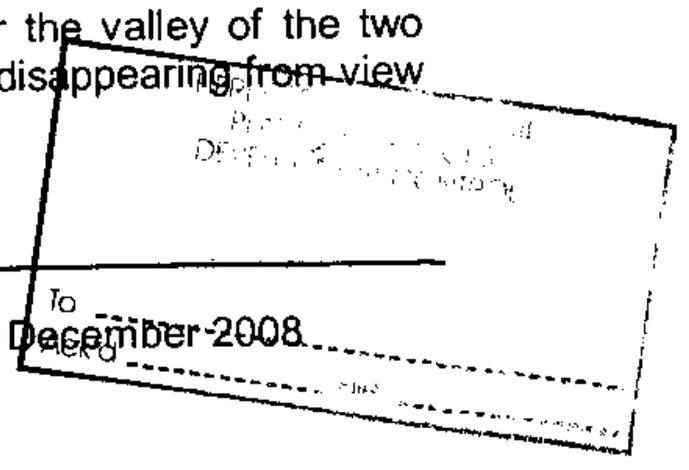
During the activity survey of 10th / 11th July an Anabat was left within the North end of this building, the general construction would allow calls to be recorded from bats outside. Many Common Pipistrelle calls were recorded during the period of 21:37 to 04:56. Two passes by Lesser Horse-shoe bat were recorded at 00:04 and 01:44hrs. Two Myotis bats (Natterer's or Whiskered possibly one of each) were observed flying within the open section of this building during the evening.

Building 4:- A Brown Long-eared bat was known to be roosting within the workshop area of this building. Infra red cameras were set up to monitor likely exit points for this bat and to cover the south gable wall where Pipistrelle droppings had been found in two of the crevices.

An Anabat was left recording during the nights of 10th / 11th July and 21st / 22nd August. From approximately midnight to 04:00hrs. No bats were recorded during these periods.

On 21st August at 20:10hrs a bat, most likely Pipistrelle was observed exiting a crevice to the right of the door to the two storey section of this building, the surveyors were still preparing for the evening activity survey so no recording equipment was switched on. This was at least 15 minutes before sunset. Inspection of this crevice with an endoscope on the morning of 22nd did not discover any evidence of roosting bats.

During the dawn activity surveys of 22nd and 30th August a single bat believed to be, a Brown Long-eared was observed swarming near the ridge of this building near the valley of the two storey section. It was not observed to enter any specific location as it kept disappearing from view over each ridge in the area.



No bats were observed to enter or exit the crevices in the south gable wall.

Building 5:- This building was observed on the 4th July and 21st August. An Anabat was positioned to the west of this building on the 21st & 29th August to monitor potential flight routes along the hedge following the track from the south and the building. An infra red camera was attached to the Anabat on the 21st. No bats were observed leaving the building and no swarming bats were observed during the dawn surveys. The timings of recorded bats did not indicate any bats emerging from the building.

Building 6:- On the 4th July, an infra red camera was set up inside the main area of this building along with Batbox Duet to pick up audio of bat calls. Only a single bat was recorded at any one time, this bat appeared to enter the building from one of the open windows in the east wall of the building. Whiskered and Common Pipistrelle bats were recorded within this building during a walk round by the surveyors on subsequent nights.

Following the observation of a Lesser Horse-shoe bat within this building during a site planning meeting an Anabat was left on the roof of a makeshift office from the 27th to the 29th August. Passes by Lesser Horse-shoe, Common Pipistrelle and Whiskered bats were recorded both nights; the amount of activity was typical of individual foraging bats. At 05:04 on the 29th August, a single pass by a Greater Horse-shoe was recorded.

Building 7: Common & Soprano Pipistrelle, Whiskered and Natterer's bats were all recorded flying and foraging within this open building. The maximum number of bats seen at one time was three. The significance of this is no more than a sheltered feeding area.

Farmhouse:- On 4th July the Lesser Horse-shoe droppings on the top steps of the main stair way were swept away to determine usage of roost site.

An Anabat was left within the attic of this building between 4th and 7th July.
A Lesser Horse-shoe bat was recorded on two of the three nights for brief intervals only.

On 10th July the Lesser Horse-shoe droppings were counted at approximately 30, these were cleared away.

During activity survey of 10th / 11th July Anabats were left overnight on the first floor main stairs landing giving no recordings and on the wall top between the covered porch and loft above scullery where 8 passes within 38 minutes around midnight by Lesser Horse-shoe and a single pass by Common Pipistrelle, these recordings are believed to be of foraging bats beneath the covered porch.

On 21st August the Lesser Horse-shoe droppings were counted at approximately 150 spread over two steps.

During dawn survey of 22nd August, two Common Pipistrelles were seen to enter beneath flashing on the valley of the south side of the east wing of the roof.

An Anabat was left between the 23rd and 28th August in the ground floor main hall way near the study to try and determine the most likely flight route of the Lesser Horse-shoe to the roost place on the first floor. Activity was recorded by a Lesser Horse-shoe on all nights. The recordings indicated that a single bat was mostly showing activity early evening around sunset and around two hours before sunrise.

Farmyard and surrounding area: The surveyors were equipped with SD1 Anabats with PDA's to determine species, night vision scopes, bright torches and radios. Anabats were located around the site on likely flight routes mounted on tripods.

For the evening exit survey, the surveyors remained at fixed points until bats were expected to have exited potential roosts. They were then mobile around the site until the activity had declined.

usually two & half hours after sunset. With the use of radios, the surveyors maintained close contact to exchange species, numbers and flight routes.

Table 1 below gives a break down of Anabats in use through out the site during the activity surveys. Building usage has been documented above. A more detailed table is available at Appendix 4.

Table 1

Abbreviations:
Mn = Natterers Md = Daubentons
Mmys = Whiskered
Bb = Barbastelle Nn = Noctule
Ppip = Common Pipistrelle
My = Unidentified Myotis Species
Rhip = Lesser Horse-shoe
Mbr = Brandts Rfer = Greater Horse-shoe
Paur = Brown Long-eared
Ppyg = Soprano Pipistrelle

Date	4 July	10 / 11 July	21 / 22 Aug	29 / 30 Aug
No Anabats in bldgs	4	5	8	7
No Anabats in open	4	4	1	1
Species recorded in open	Ppip	Ppip	Ppip	Ppip
	Ppyg	Ppyg	Ppyg	Ppyg
	Paur	Paur	Paur	Paur
	Mmys	Mmys	Mmys	Mmys
	Mn	Mn	Mn	Mn
	My	Md	Md	Md
		Mbr	Mbr	Mbr
		My	My	My
		Nn	Nn	Nn
			Bb	Bb
			Rfer	Rfer
				Rhip

6.0 Concluding remarks.

In the opinion of the wildlife surveyor, this development will affect the status of the following protected species:

- Nesting Birds
- Bats

6.1 Birds

The impacts which the proposed development might have on breeding birds should be small. The past presence of Little Owl and records of Barn Owl within 1km should be encouraged with the provision of suitable nest box facilities.

6.2 Bats

Whilst an impressive number of eleven bat species recorded around the site, the numbers are small typically individual foraging bats. The use of Anabat recording equipment set out in grids around a site does involve the capture of many more species records than traditional methods. This must be viewed with caution as to the importance of the number of species recorded. The majority of species have been significantly under recorded with surveys carried out in the past. There is still an open debate as to the identification of individual Myotis Species using the Anabat System. Best efforts have been used to identify species against known parameters and recording library. Where any uncertainty exists, the species has been recorded as Myotis Species.

The records of Barbastelle and Greater Horse-shoe would be considered significant; the large diversity of species recorded is an example of good habitat and landscape management

The use of radios between surveyors can give more accurate estimates of bat numbers and flight routes.

From the observations during the survey period, the surveyors are of the opinion that three Common Pipistrelles, two Whiskered, individual Soprano Pipistrelle, Brown Long-eared, Natterer's and Lesser Horse-shoe bats roost within the buildings at the site.

It is most likely that when local food resources are high, i.e. when farm animals are housed in the various sheds, numbers of these species would increase accordingly.

Roost sites were confirmed at six locations along with two feeding perches around the site. No evidence of any maternity roosts was found.

Individual bats are typically male or non breeding females during the summer months. These individuals typically move roost sites on a regular basis around a site, possibly as an anti-predator defence. For this reason, it is important that a variety of potential roost sites are maintained during the conversion or refurbishment of a large site such as Gold Hill.

Important commuting flight routes exist through the Gold Hill site, these must be retained and preferably improved, and with the expected additional disturbance, alternative routes around the perimeter of the site should be encouraged.

If planning permission is granted for this project, an EPS licence in respect of bats must be obtained before conversion of the Gold Hill Farm can commence. This will most likely to be phased according to planned works at the site.

7.0 Legislation and Species Information

7.1 Nesting Birds

All birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981. It is an offence, with certain exceptions, to:

a) intentionally kill, injure or take any wild bird

b) intentionally take, damage or destroy the nest of any wild bird while it is in use or being built

c) intentionally take or destroy the egg of any wild bird

d) have in one's possession or control any wild bird (dead or alive) or part of a wild bird which has been taken in contravention of the Wildlife and Countryside Act 1981 or the Protection of Birds Act 1954

e) have in one's possession or control an egg or part of an egg which has been taken in contravention of the Act

f) have in one's possession or control any birds of a species occurring on Schedule 4 of the Act unless registered and ringed in accordance with the Secretary of State's regulations.

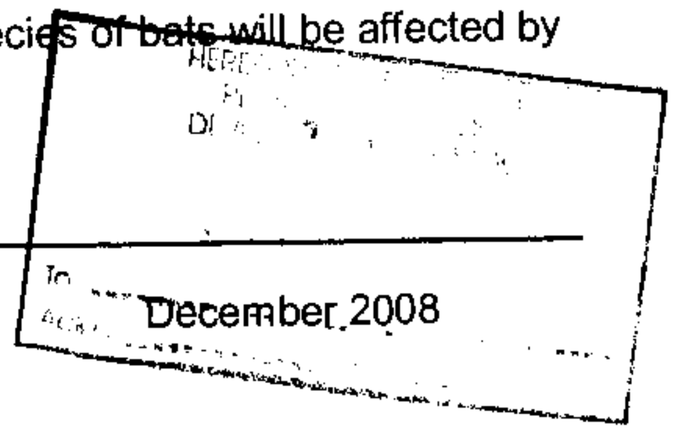
g) intentionally (or recklessly, in England and Wales only) disturb any wild bird listed on Schedule 1 while it is nest building or is at (or near) a nest with eggs or young; or disturb the dependent young of such a bird.

The impacts which the proposed development might have on breeding birds should be small.

If birds gain access to the buildings and start nesting during the development phase, delays will be inevitable, up to the moment when the young birds leave the nest.

7.2 Bats

On the basis of the evidence found so far, small numbers of six species of bats will be affected by the development.



Any permitted work which may disturb or damage a 'breeding site or resting place' would constitute an offence under current legislation.

Therefore, in order to comply with current legislation, an EPS licence from Natural England will be required to legally carry out any conversion of the Gold Hill Farm.

The basic protection afforded to bats is listed below:

It is illegal to:

- intentionally or deliberately kill, injure or capture (or take) bats;
- deliberately disturb bats (whether in a roost or not);
- recklessly disturb roosting bats or obstruct access to their roosts;
- damage or destroy bat roosts;
- possess or transport a bat or any part of a bat, unless acquired legally;
- sell (or offer for sale) or exchange bats, or parts of bats.

The word 'roost' is not used in the legislation, but is used here for simplicity.
The actual wording in law is 'any structure or place which any wild animal...uses for shelter or protection' or 'breeding site or resting place'.

Because bats tend to re-use the same roosts after periods of vacancy, legal opinion is that the roost is protected whether or not the bats are present at the time.

Appendix 6 (3 pages) outlines in more detail the legal status of bats in England, the fines that may accrue if an offence against bats and/ or their roost is committed, and the circumstances under which a Natural England licence is required in respect of bat species.

A flow diagram illustrates the steps it will be necessary to undertake in order to proceed with the permitted development. (Appendix 7.)

Appendix 8 illustrates 'The scale of main impacts at the site level that a development can have on bat populations'.

On the basis of the evidence found the surveyor is of the opinion that the scale of impact on the loss of the places of rest (roost) for small numbers of Common Pipistrelle, Soprano Pipistrelle, Natterer's, Whiskered and Lesser Horse-shoe bats would be **LOW.**

Appendix 9 is a copy of Figure 4 taken from English Nature's "Bat Mitigation Guidelines", Jan. 2004, which indicates the type of mitigation/ compensation Natural England will expect any developer to provide, dependent upon the impact of that development.

8.0 Bats - Required Licensing and Mitigation/ compensation

On the basis of the evidence found the surveyor is of the opinion that **an EPS licence in respect of bats will need to be obtained before any development that may affect any roost at Gold Hill Farm can commence.**

Licences can be granted under regulation 44(2)(e) of the Conservation (Natural Habitats & c.) Regulations 1994 for the purpose of **preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment,** to allow people to carry out activities which would otherwise be illegal.

Under the Conservation (Natural Habitats & c.) Regulations 1994 licences can only be issued if Natural England are satisfied that:

- There is no satisfactory alternative and
- The action authorised will not be detrimental to the maintenance of the population of protected species concerned at a favourable conservation status in their natural range.

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If any protected species are found at any stage of the development then work in that area must stop and Natural England contacted (01743 282000) for advice.

The developer and the licensed bat worker who will be responsible for overseeing the bat -related work should work closely together in filling in the Natural England application form.

This can only take place once Planning Permission has been received for the proposed development. Since the development will affect the resting places of common and restricted and scarce species of bats, the developer will need to be able to show at the planning application stage that their loss/modification is compensated for by the following features and provisions.

A full description of typical works required is shown in appendix 10, specific details are sown below.

- A stone building approx 2m x 2m X 4.5m with a pitched roof built for housing Barn Owl nest, Little Owl Nest box and facilities for other birds to nest, namely Barn Swallows under the eaves. This structure will also incorporate suitable 'roost' areas for bats. Its preferred location is to the north east of the site within the orchard. (Appendix 10d shows example)

- Building 1: Access beneath tiles and ridge incorporated into new roof.

- Building 2: Access beneath tiles and ridge incorporated into new roof. A large 'American Style' bat box to be attached to south gable wall into unused window recess. (Appendix 10d for typical example.)

- Building 3: Access beneath tiles and ridge incorporated into new roof. Gaps in replacement timber cladding to voids behind boards.

- Building 4: Bat loft to be constructed at south end of building by inclusion of ceiling. Crevices and holes within South gable wall to be retained where structural repairs allow.

- Building 6: Access beneath tiles and ridge incorporated into roof. Crevices and holes within South gable wall to be retained where structural repairs allow.

- Farmhouse: Bat lofts to be constructed within the West and East wing roof spaces. Access beneath tiles and ridge incorporated into refurbished or new roof.

- Site landscaping should incorporate low level and low energy lighting. This lighting should point inwards towards the site and not spill into surrounding fields and orchard.

- Existing hedges should be improved with any gaps replanted, new hedges should replace post and wire fencing around the site and the track entering the site from the north. Stands of trees should be incorporated within the hedgerows around the site.

- Car parking should be surrounded where practical with planting and trees to give cover for foraging bats.

- The majority of trees should be native species.

- Gaps in the orchard should be replanted, preferably with local varieties. Existing dead wood should be left standing or in place unless disease requires its removal.

Below is what would be typically expected for a Bat Loft.

- Bats provided with a means of access to the roof spaces (bat lofts) created for their use as part of the development. (Appendix 9)

- In this (these) designated loft space(s) the developer will need to ensure that:

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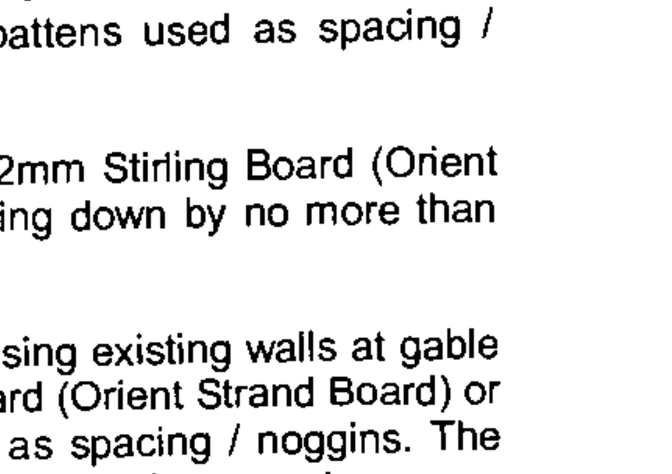
- The roof is in good order.
- The roof space(s) runs the whole length of this section of the loft space(s) and provides an unimpeded flight path for bats within that (those) space(s). Modern 'W' style trusses are not deemed acceptable. Queen / King post or collar beam construction or similar are recommended.
- The inner lining of this section of the roof space will be of a traditional bitumastic and hessian roofing felt or suitable breathable membrane of dark colour ie Klober 'Permo Forté ®, Tyvek 'Supro ®' or Monarperm 700 ®.
- The internal roof height will be a minimum of 2.8m, when measured from the edge of the ridge board down to the 'floor' of these loft spaces.
- Bat access points will be provided for the bats to access the roof space. The location of the proposed access points will be agreed following discussion with the licensed bat worker.
- Modified Ridge tiles to allow access for bats.
- Access points at the apex of each gable wall, the external and internal faces of the wall in the immediate vicinity of the access points will be roughened to facilitate landing by bats before they crawl into the roost. (Appendix 10c)
- When the ridge tiles are laid it is important to ensure that the spaces within the ridge tiles remain unfilled with mortar and that there are lengths of tile which remain unobstructed.
- Some blockages in the ridge are needed to prevent through draughts.
- A series of holes will be cut by the bat worker in the roofing felt to give access to the tiles.
- At about two metre, intervals along the ridge the roof felt should have 30x 100mm slots cut out beside the ridge boards to allow bats access to the ridge tiles (where most loft dwelling bats prefer to roost).
- A series of 1m lengths of timber 100mm wide to be attached to the side of roof timbers to create a series of half bridged over crevices, 25mm wide battens used as spacing / noggins. (These are to be placed by the bat worker)
- Warm zones will be created within the roof space as using 22mm Stirling Board (Orient Strand Board) or similar cut to fit the apex of the roof extending down by no more than 800mm.
- Two internal secluded areas / bat boxes will be constructed using existing walls at gable end and main wall using 600mm x 600mm x 22mm Stirling Board (Orient Strand Board) or similar. Spaced off the walls using 25mm wide battens used as spacing / noggins. The space will be sealed at the top using suitable batten to increase internal temperature.
- External lighting will be of the 'down lighting' type and will not light up the sky around the buildings, or any bat access points. Greeting lights will be adjusted to have a short timer and to detect only large objects. Any existing lighting that fails to meet this requirement will be replaced or moved.
- A trap door or similar access to the loft spaces will be provided, suitably secured and warning notice attached to prevent unnecessary access.
- Within the bat loft a 'walkway' providing safe access to the whole of the roof space will be provided.
- It is recommended that the whole of the 'floor' of the roof space will be covered by heavy



duty (2000 gauge) plastic or similar breathable fabric, to facilitate the future management of any accumulation of bat droppings which may occur.

- A programme of monitoring is recommended subsequent to the development being completed.

- The above should be reflected in the drawings submitted with the planning application documents.

Any drawings submitted at the time of application should reflect the listed mitigation/ compensation. Licences can be granted under regulation 4(2)(e) of the Conservation (Natural Habitats & c.) Regulations 1994 for the purpose of **preserving public health or public safety or other imperative reasons of overriding public interest including those of social or economic nature and beneficial consequences of primary importance for the environment, to allow people to carry out activities which would otherwise be illegal.**

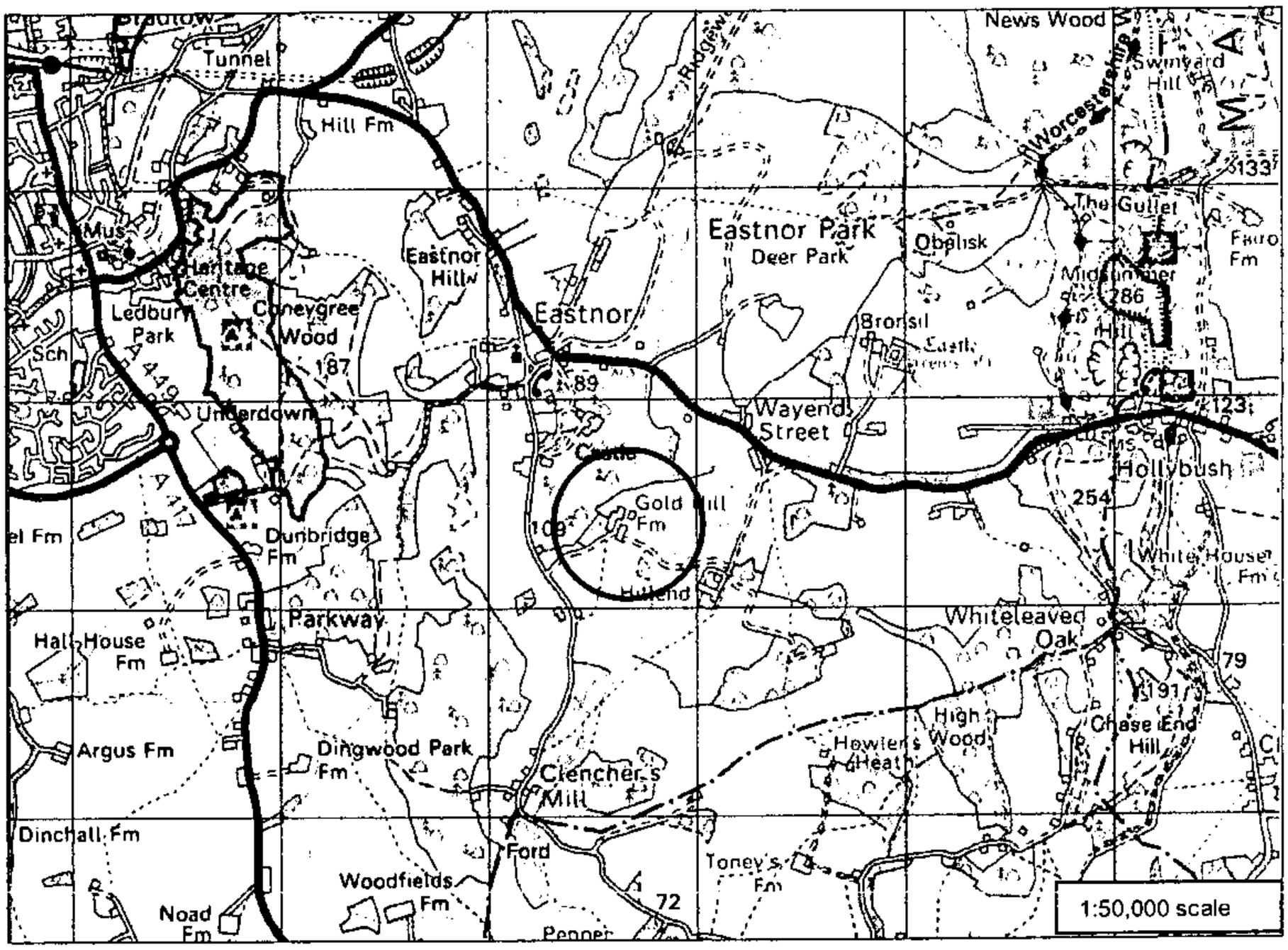
Under the Conservation (Natural Habitats & c.) Regulations 1994 licences can only be issued if Defra are satisfied that:

- There is no satisfactory alternative and
- The action authorised will not be detrimental to the maintenance of the population of protected species concerned at a favourable conservation status in their natural range.

If any protected species are found at any stage of the development then work in that area must stop and Natural England contacted (01743 282000) for advice.

JMorgan.

John Morgan.
December 2008



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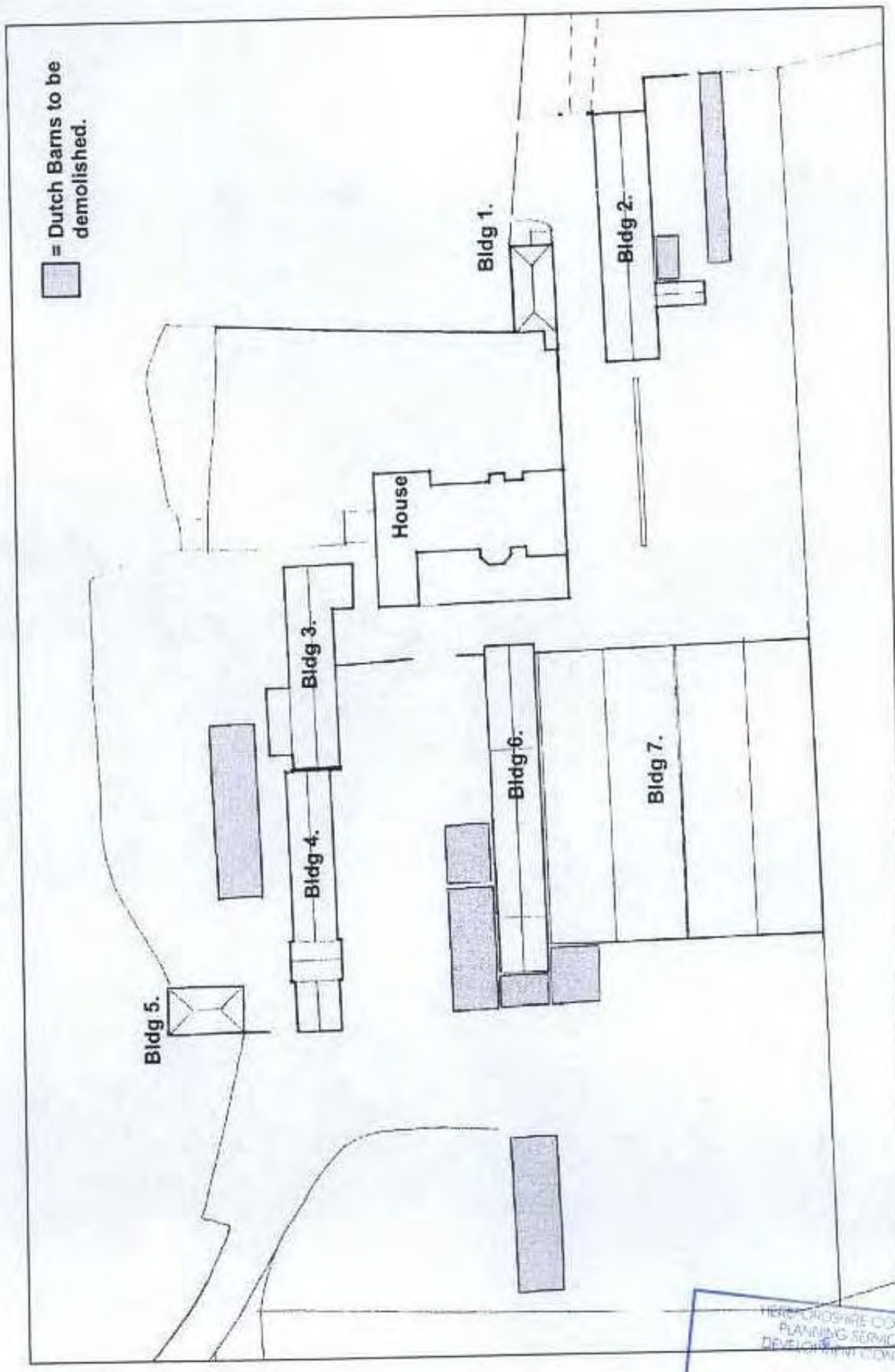

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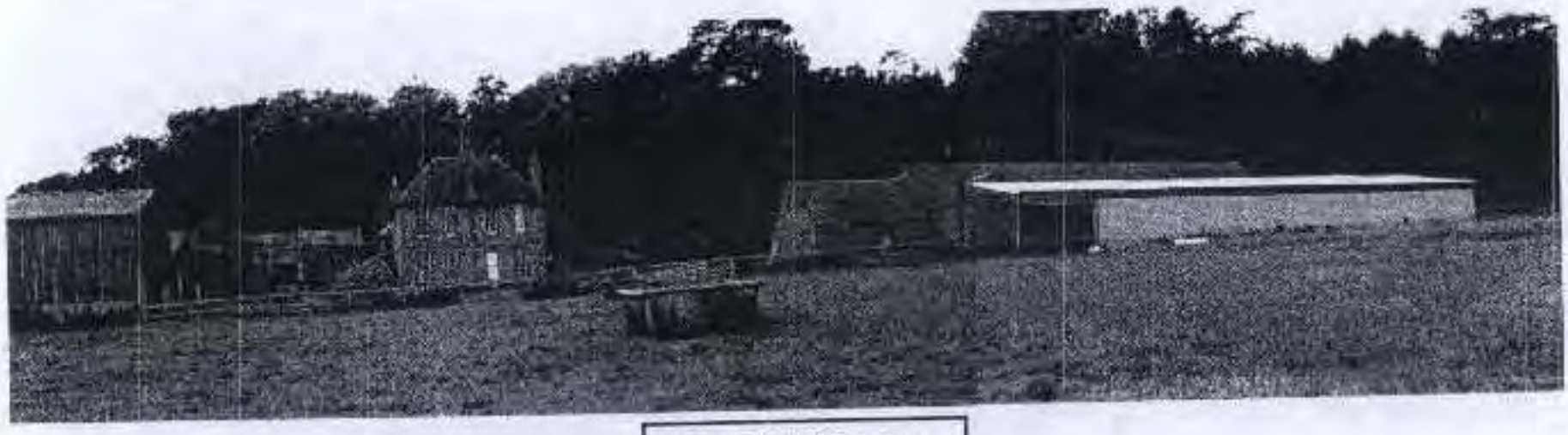


View of site from east

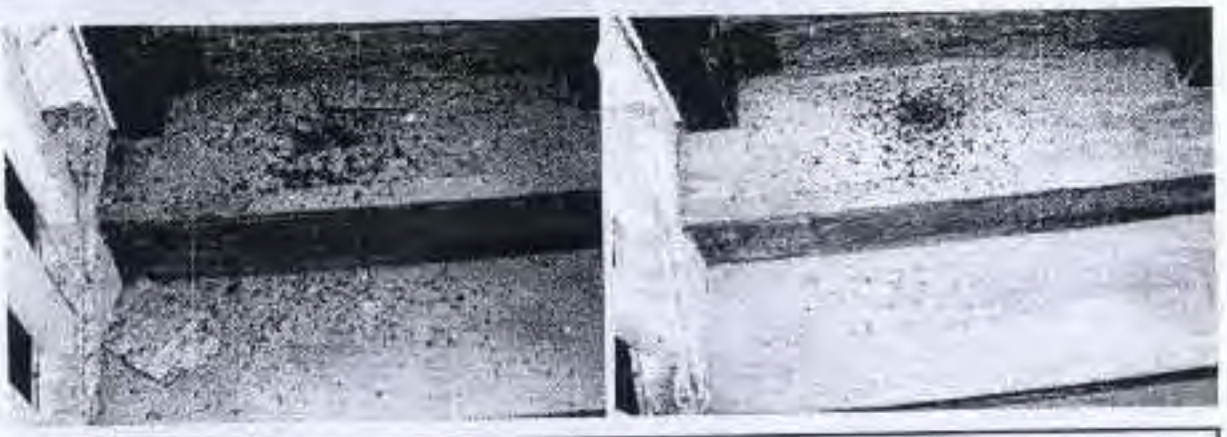
South gable wall, location of proposed Bat box

Common Pipistrelle seen to enter crevice on morning of 30th August

Common Pipistrelle was observed swarming around the chimney stack / roof junction during the 22nd August dawn survey.

North end Bldg 2.
During 11th July dawn survey two Myotis, most likely Whiskered were observed to enter an area at the ridge.

North face of Farmhouse.
Broken window in study where Lesser Horse- believed to be accessing house.



Top of main stairway into attic, Lesser Horse-shoe night roost.

Sequence of photographs showing original quantity droppings. Cleared away 10th July

Approximately 150 on 21st August (43 days later)

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Bldg 4

Brown Long-eared in workshop. Present most days.

21st August a bat, most likely Pipistrelle was observed exiting a crevice to the right of the door.

Proposed Bat Loft in the south section of bldg 4

Bldg 4

Bldg 3

Two holes in this wall had Pipistrelle dropping just inside entrance. Several other holes would provide suitable roosting places

Similar holes were found in Bldg 3 and Bldg 6

Bldg 6

Whiskered and Common Pipistrelle bats were recorded foraging within this area of the building.
A Lesser Horse-shoe bat was observed during a site planning meeting on the 27th August. An Anabat was left on the roof of a makeshift office from the 27th to the 29th August. Passes by Lesser Horse-shoe, Common Pipistrelle and Whiskered bats were recorded both nights; the amount of activity was typical of individual foraging bats. At 05:04 on the 29th August, a single pass by a Greater Horse-shoe was recorded.

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Table 2. Activity surveys for Bats

Abbreviations:

Mn = Natterers Md = Daubentons Rhip = Lesser Horse-shoe
Mmys = Whiskered Mbr = Brandts Rfer = Greater Horse-shoe
Bb = Barbastelle Nn = Noctule Paur = Brown Long-eared
Ppip = Common Pipistrelle Ppyg = Soprano Pipistrelle
My = Unidentified Myotis Species

Date	4 July	10/11 July	21/22 Aug	29/30 Aug
Time (start)	20:30hrs	20:30hrs	20:00hrs	20:00hrs
Air Temp	15^{0}C	18^{0}C	18^{0}C	23^{0}C
Time (Fin)	00:10hrs	07:00hrs	07:45hrs	07:45hrs
Air Temp	14^{0}C	16^{0}C	12^{0}C	18^{0}C
Weather at start of survey	Cloud:8/8 As: Wind:F3 SE: occ drizzle by end of evening	Cloud:3/8 Ac: Wind:F2 S:	Cloud:5/8 Cu: Wind:Still	Cloud:8/8 Sc: Wind:Still
Anabats in buildings	4	4	1	1
Anabats in open.	4	5	8	7
Other equipment	2 x Infra red cameras set on tripods with Bat box Duets to provide audio. Yukon Ranger digital night scope & Night Owl image intensifier. Bright Torches. Binatone Trek 100 Radios	2 x Infra red cameras set on tripods with Anabat to provide audio. Yukon Ranger digital night scope & Night Owl image intensifier. Bright Torches. Binatone Trek 100 Radios	Yukon Ranger digital night scope & Night Owl image intensifier. Bright Torches. Binatone Trek 100 Radios	Yukon Ranger digital night scope & Night Owl image intensifier. Bright Torches. Binatone Trek 100 Radios
Sunset / Sunrise	21:37hrs	21:33hrs 04:59hrs	20:25hrs 06:03hrs	20:07hrs 06:16hrs
Species Recorded outside	Ppip, Ppyg, Paur, Mmys, Mn, My	Ppip, Ppyg, Paur, Mmys, Mn, Md, Mbr, My, Nn	Ppip, Ppyg, Paur, Mmys, Mn, Md, Mbr, My, Nn, Bb, Rfer	Ppip, Ppyg, Paur, Mmys, Mn, Md, Mbr, My, Nn, Bb, Rfer, Rhip
Finish Reason	Light Gone, bat activity declining.	Daylight	Daylight	Daylight
Remarks	Max 3 Ppip, 2 Ppyg around site. 3 Mn/Mmys in Bldg 1 then Bldg 2. Believed to be same bats. Paur observed flying along north track towards site. Individual Mmys & Mn around site later. Paur present in Bldg 4	Max 4 Ppip, 1 Ppyg around site. 2 Mmys in Bldg 2 2 Mmys /Mn Bldg 3. Paur present in Bldg 4 All other species were individual bats flying through or foraging for short time.	20:10hrs Bat from wall Bldg 4, Paur present in Bldg 4 in morning only Bldg 2, Mmys x2 seen to enter beneath ridge inside building north end. Ppip x 2 entered beneath flashing on valley SE roof of house. Ppip around south east side Bldg 2	Ppip seen to enter crevice south gable wall bldg 2. All other species were individual bats flying through or foraging for short time.

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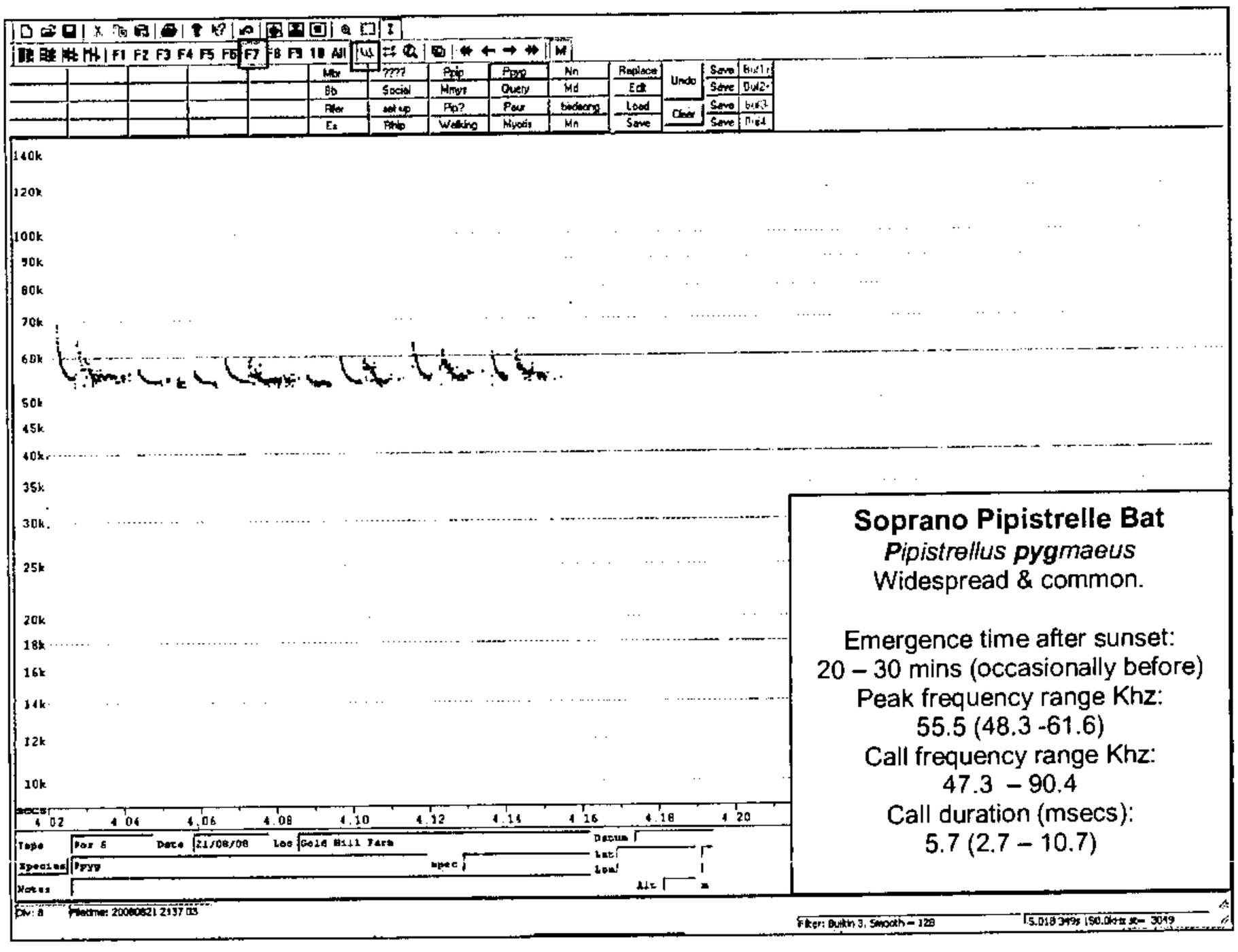

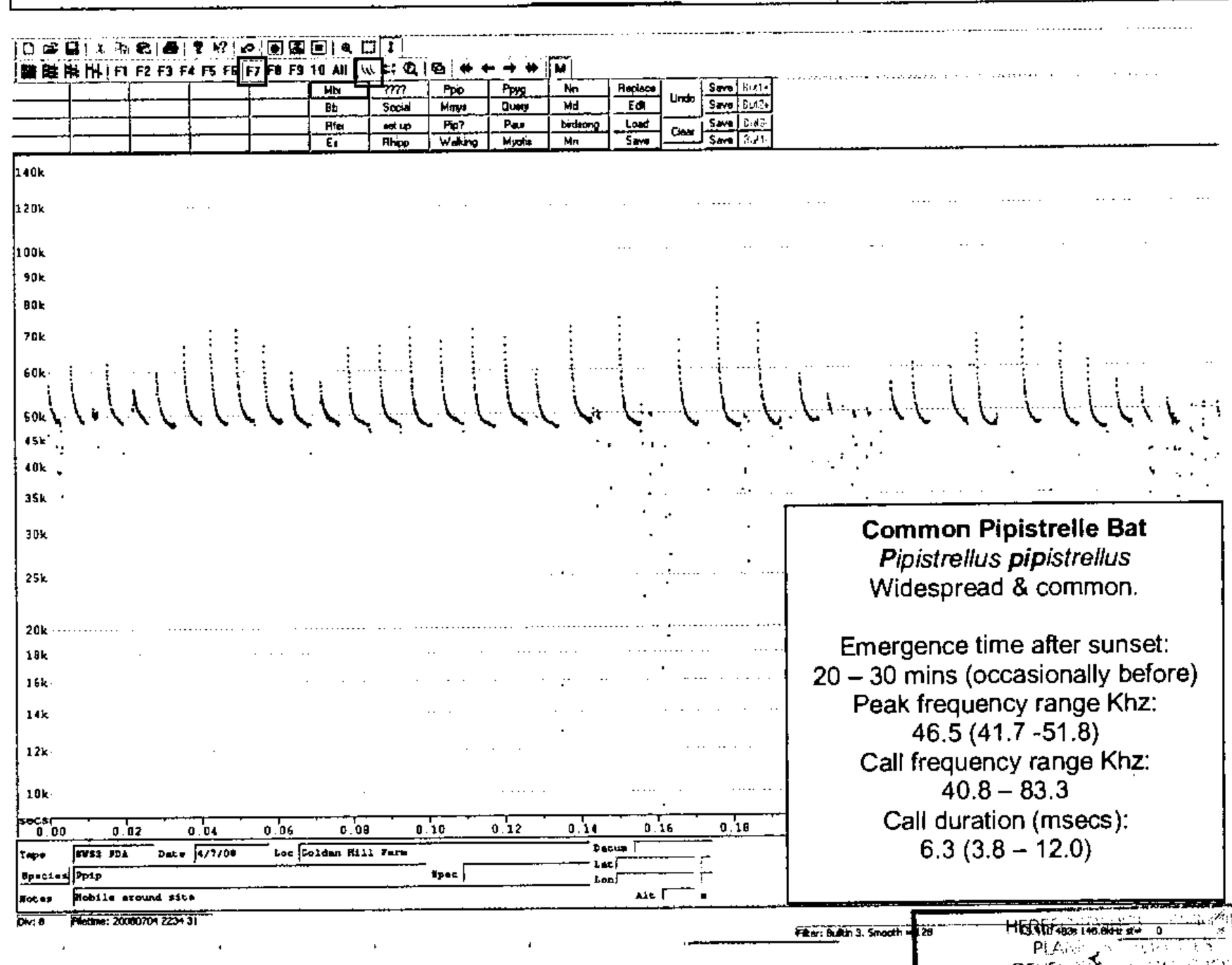

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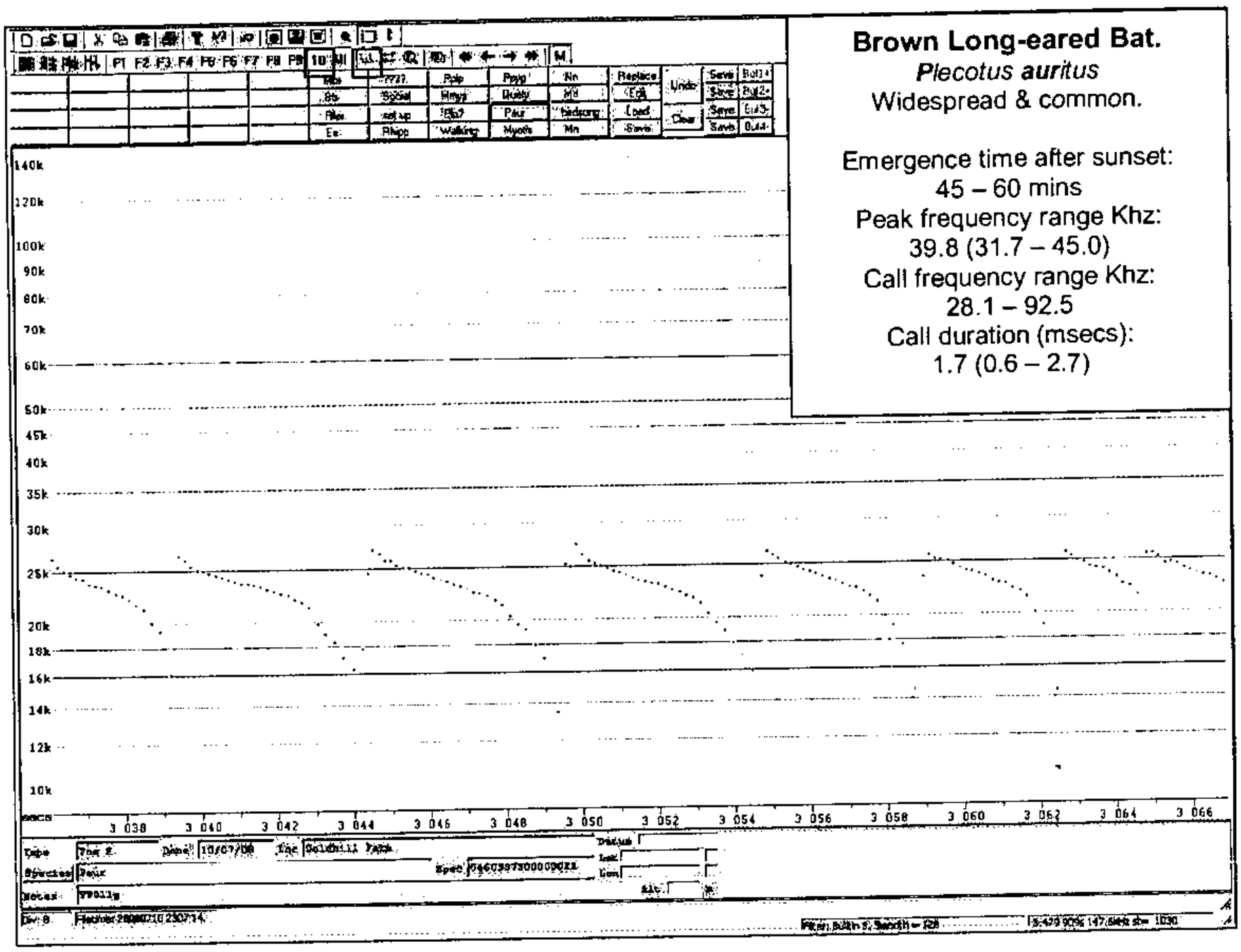
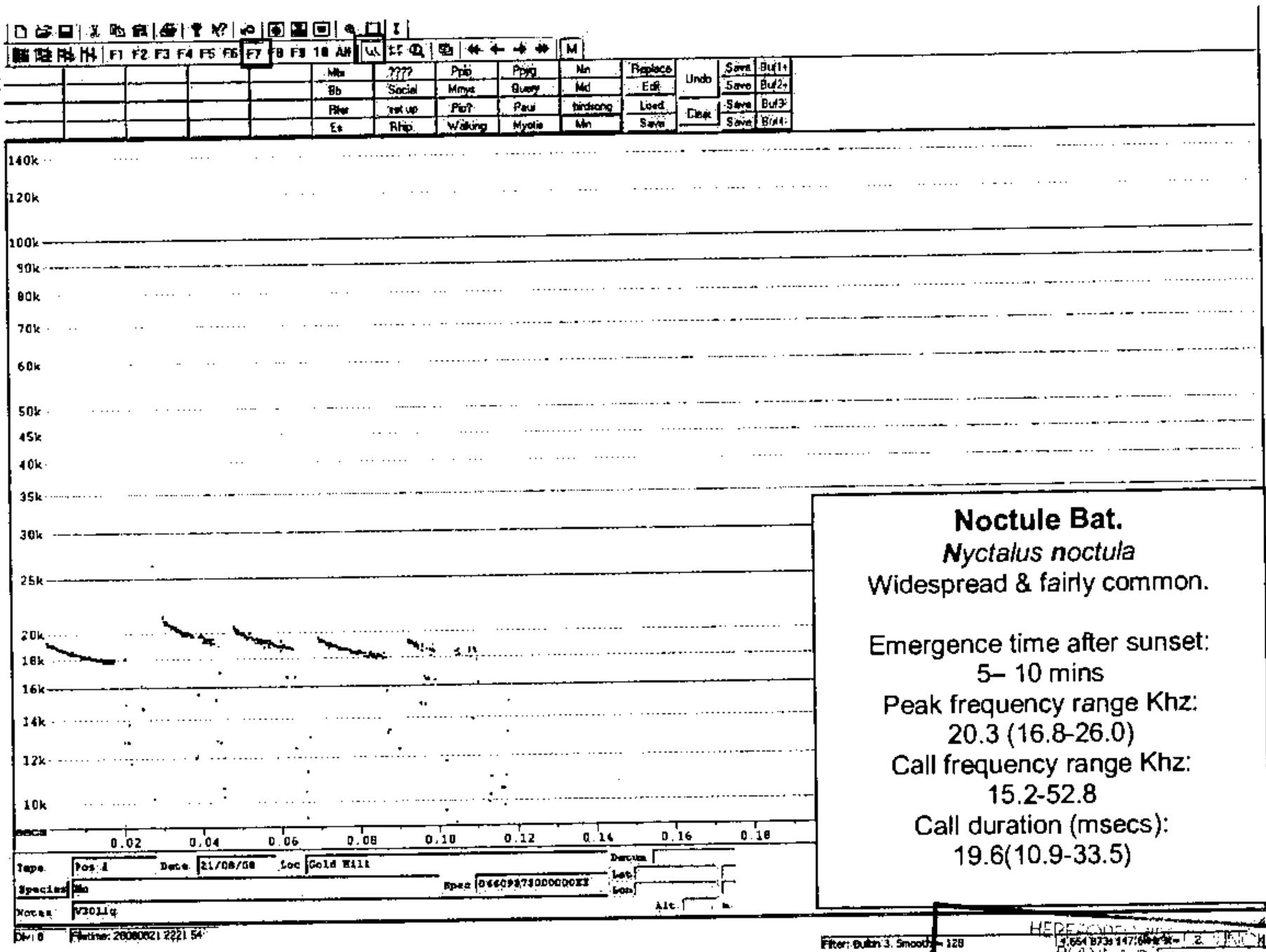


Brown Long-eared Bat.
Plecotus auritus
Widespread & common.

Emergence time after sunset:
45 – 60 mins
Peak frequency range Khz:
39.8 (31.7 – 45.0)
Call frequency range Khz:
28.1 – 92.5
Call duration (msecs):
1.7 (0.6 – 2.7)



Noctule Bat.
Nyctalus noctula
Widespread & fairly common.

Emergence time after sunset:
5– 10 mins
Peak frequency range Khz:
20.3 (16.8-26.0)
Call frequency range Khz:
15.2-52.8
Call duration (msecs):
19.6(10.9-33.5)

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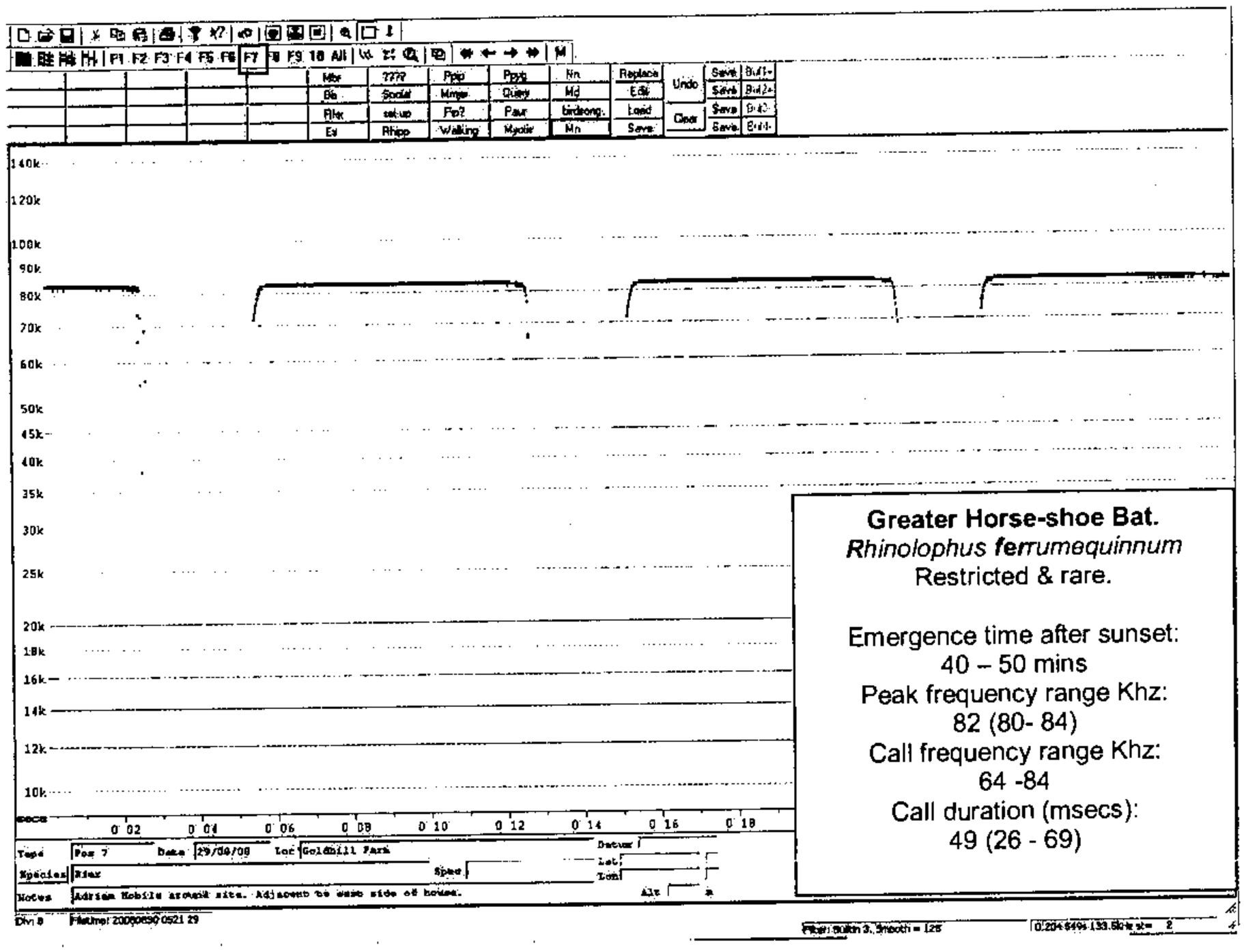
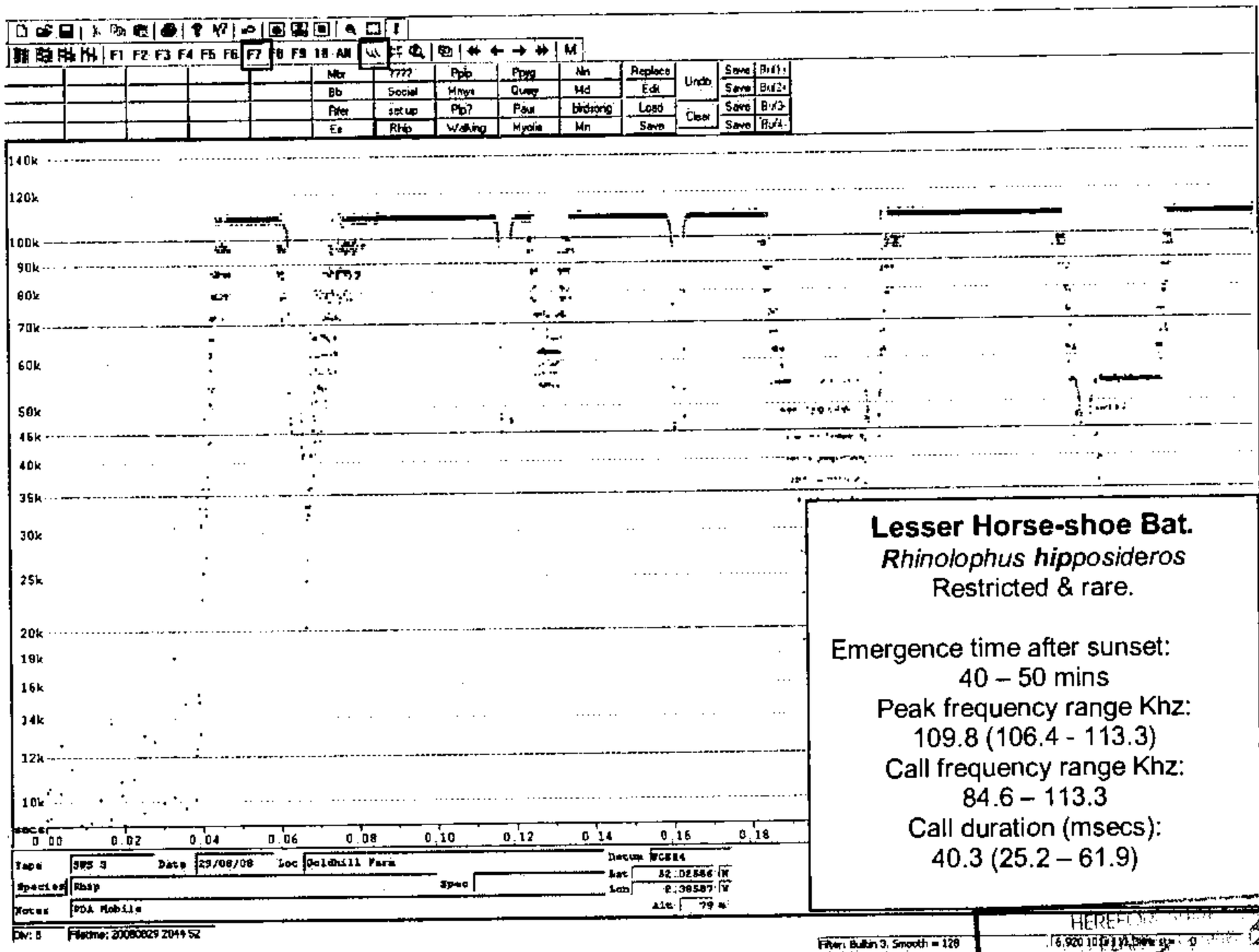


Greater Horse-shoe Bat.
Rhinolophus ferrumequinnum
Restricted & rare.

Emergence time after sunset:
40 – 50 mins
Peak frequency range Khz:
82 (80- 84)
Call frequency range Khz:
64 -84
Call duration (msecs):
49 (26 - 69)



Lesser Horse-shoe Bat.
Rhinolophus hipposideros
Restricted & rare.

Emergence time after sunset:
40 – 50 mins
Peak frequency range Khz:
109.8 (106.4 - 113.3)
Call frequency range Khz:
84.6 – 113.3
Call duration (msecs):
40.3 (25.2 – 61.9)

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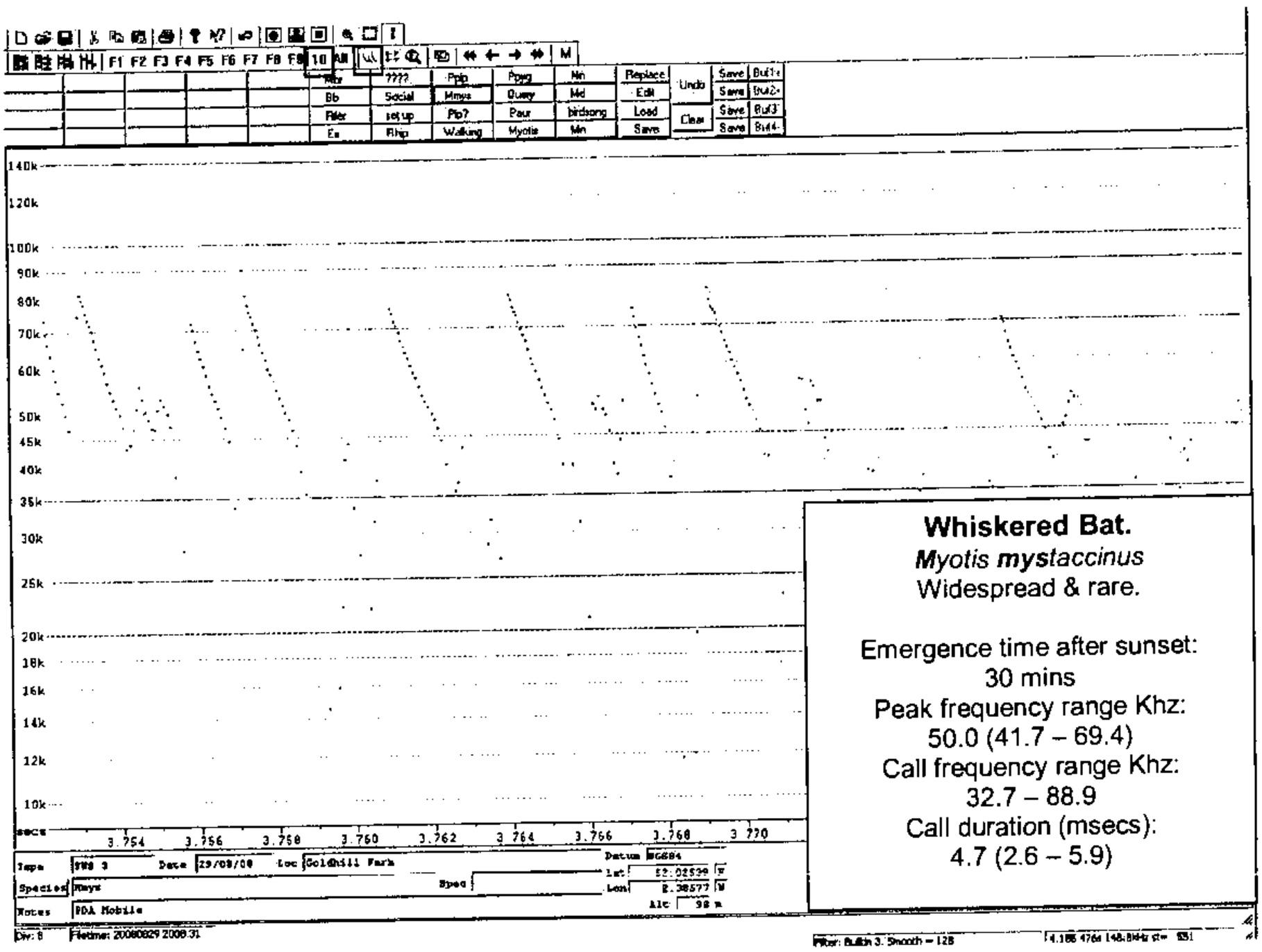
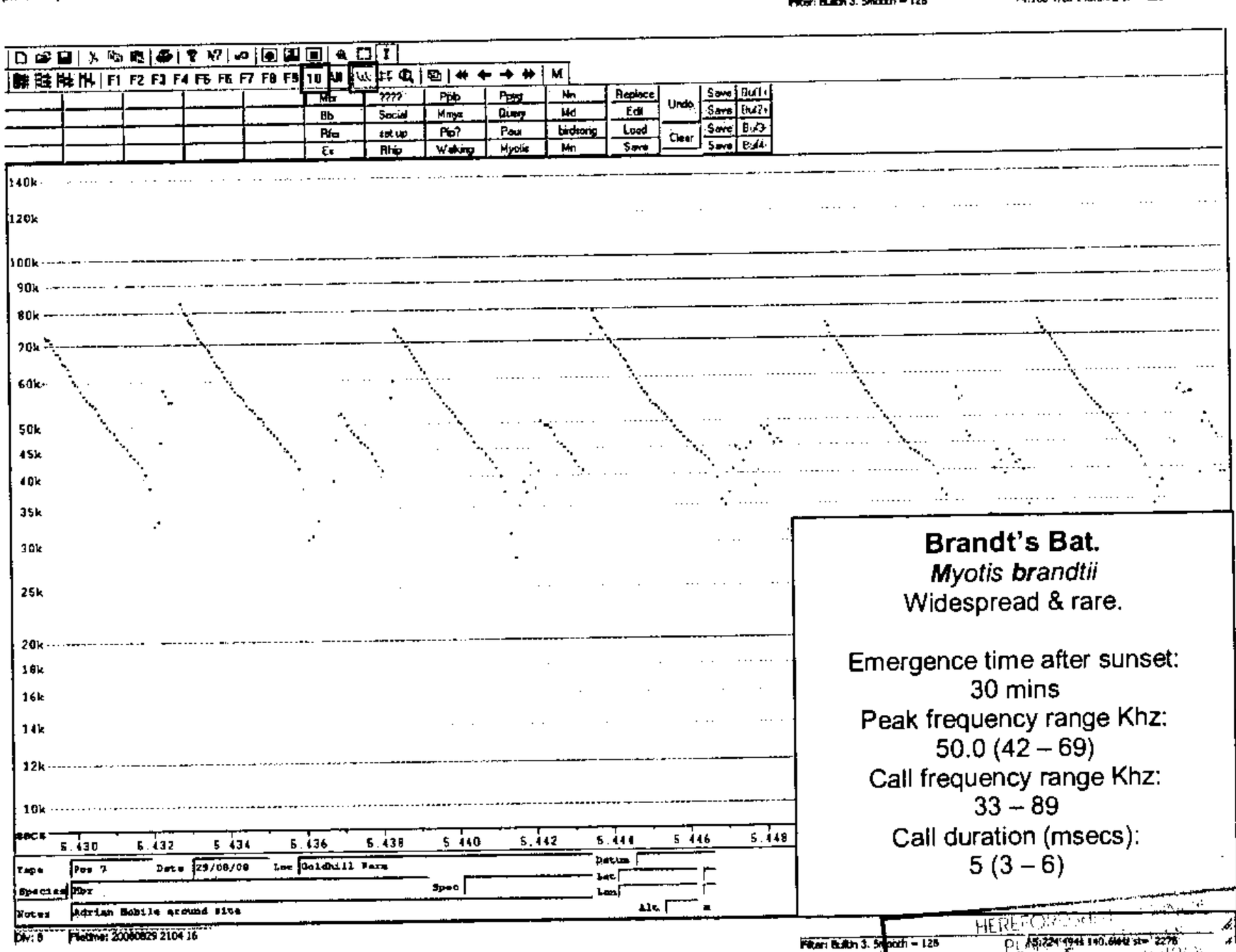


Whiskered Bat.
Myotis mystaccinus
Widespread & rare.

Emergence time after sunset:
30 mins
Peak frequency range Khz:
50.0 (41.7 – 69.4)
Call frequency range Khz:
32.7 – 88.9
Call duration (msecs):
4.7 (2.6 – 5.9)



Brandt's Bat.
Myotis brandtii
Widespread & rare.

Emergence time after sunset:
30 mins
Peak frequency range Khz:
50.0 (42 – 69)
Call frequency range Khz:
33 – 89
Call duration (msecs):
5 (3 – 6)

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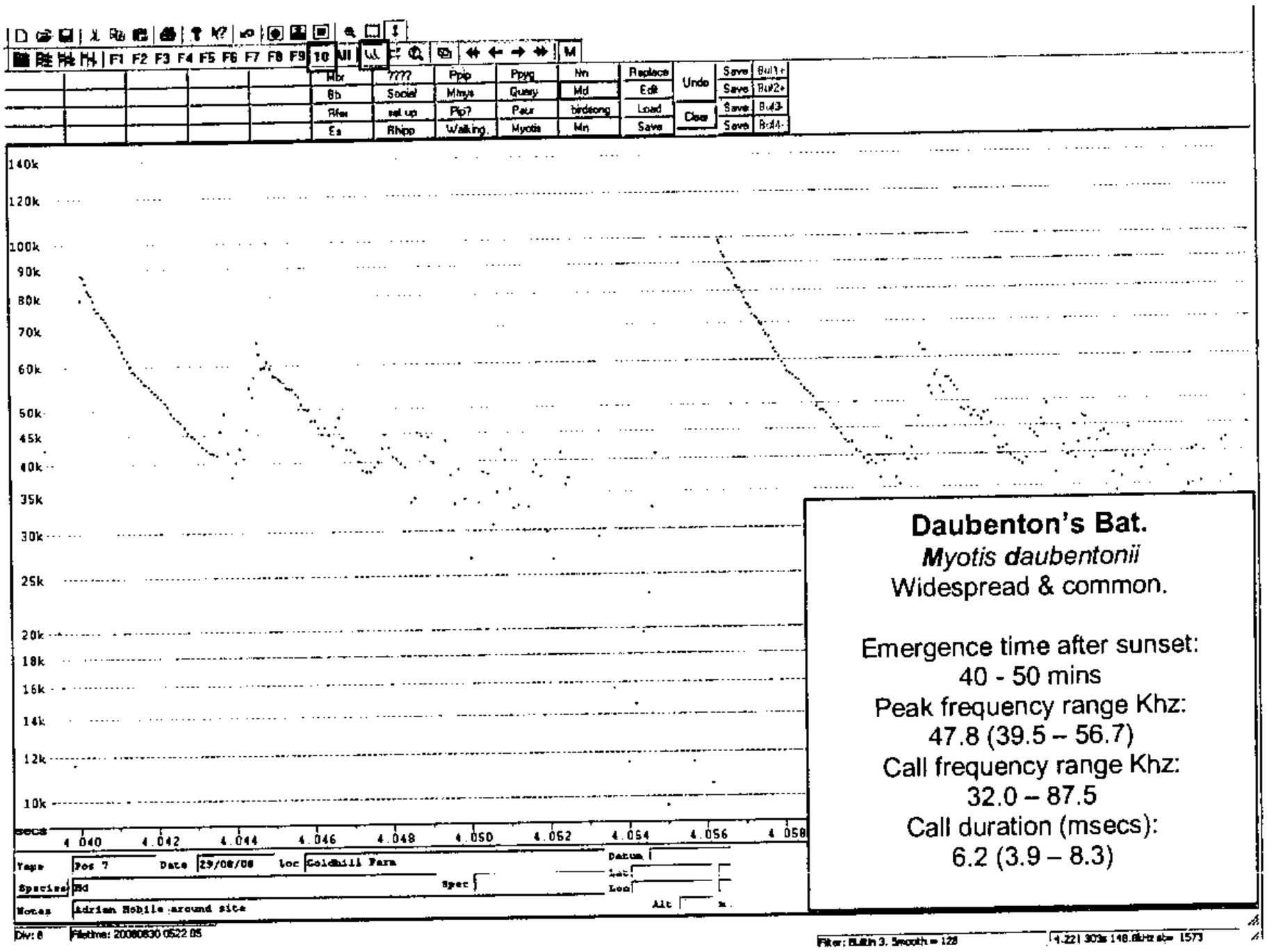

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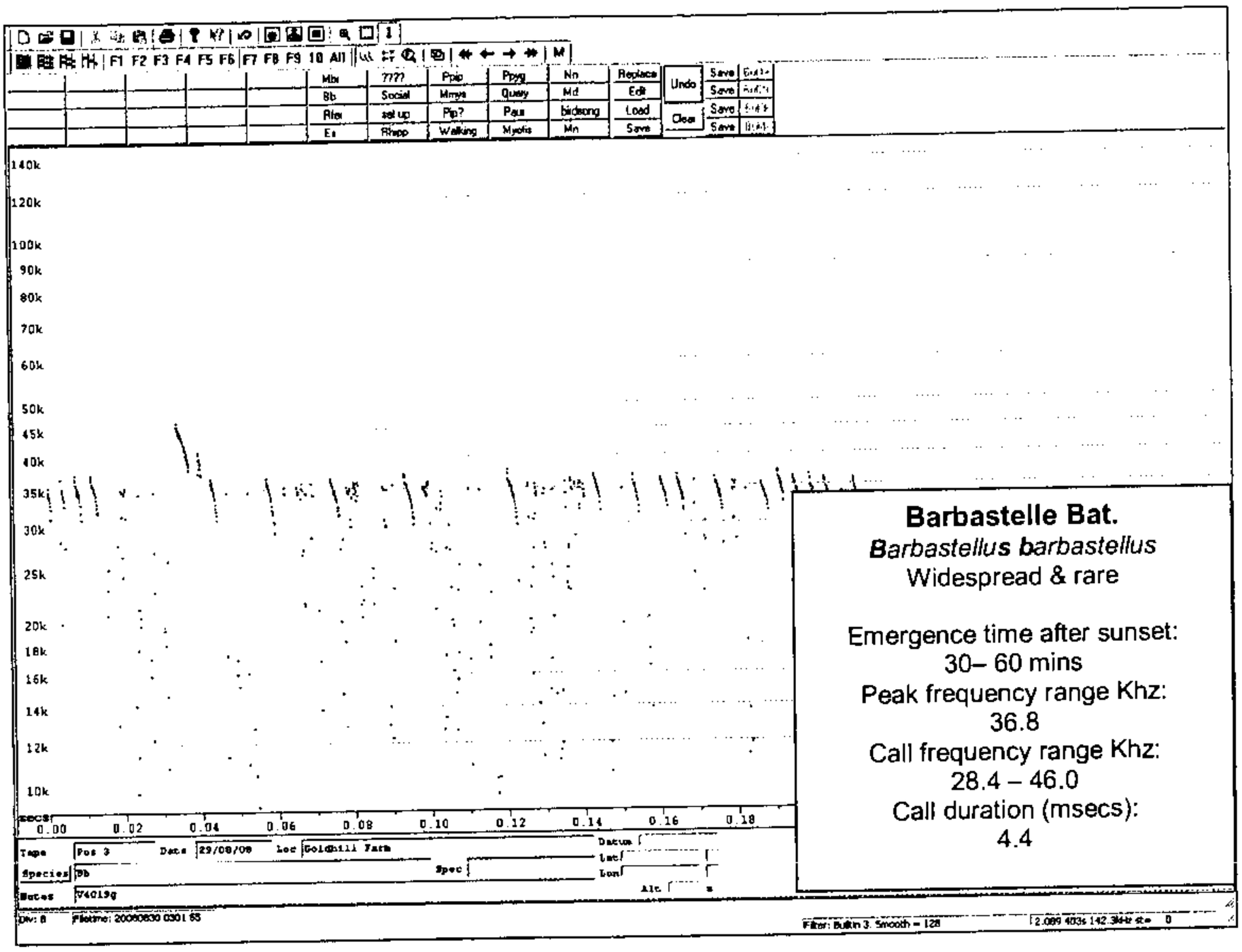

Barbastelle Bat.

Barbastellus barbastellus

Widespread & rare

Emergence time after sunset:
30– 60 mins
Peak frequency range Khz:
36.8
Call frequency range Khz:
28.4 – 46.0
Call duration (msecs):
4.4

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Bats and the Law

Taken together, the Wildlife and Countryside Act 1981 (WCA) (as amended), the Countryside and Rights of Way Act 2000(CRoW), and the Conservation (Natural Habitats, &c.)Regulations 1994, make it illegal to:

- intentionally or deliberately kill, injure or capture (or take) bats;
- deliberately disturb bats (whether in a roost or not);
- recklessly disturb roosting bats or obstruct access to their roosts.
- damage or destroy bat roosts;
- possess or transport a bat or any part of a bat, unless acquired legally;
- sell (or offer for sale) or exchange bats, or parts of bats.

The word 'roost' is not used in the legislation, but is used here for simplicity.
The actual wording in the legislation is 'any structure or place which any wild animal...uses for shelter or protection' (WCA) or 'breeding site or resting place' (Habitats Regulations).

Because bats tend to re-use the same roosts after periods of vacancy, legal opinion is that the roost is protected whether or not the bats are present at the time.

Enforcement
The police are the main enforcement body for wildlife offences, and in some cases local authorities may also take action.
Section 24(4) of the 1981 Act gives English Nature the function of providing advice or assistance to the police in respect of alleged offences.

The maximum fine on conviction of offences under Section 9 of the 1981 and Regulation 39 currently stands at £5000.
The CRoW Act 2000 amended the 1981 Act to allow for a custodial sentence of up to six months instead of, or in addition to, a fine.

Note: Fines may be imposed in relation to each offence committed, so operations involving many animals or repeated offences can potentially accrue large fines.
In addition, items which may constitute evidence of the commission of an offence may be seized and detained.
The CRoW Act 2000 also amends the Police and Criminal Evidence Act 1984 to render Section 9 offences 'arrestable', giving the police significant additional powers.

The use of an EPS licence in respect of bat species
An EPS licence is a licence which permits an action that is otherwise unlawful,

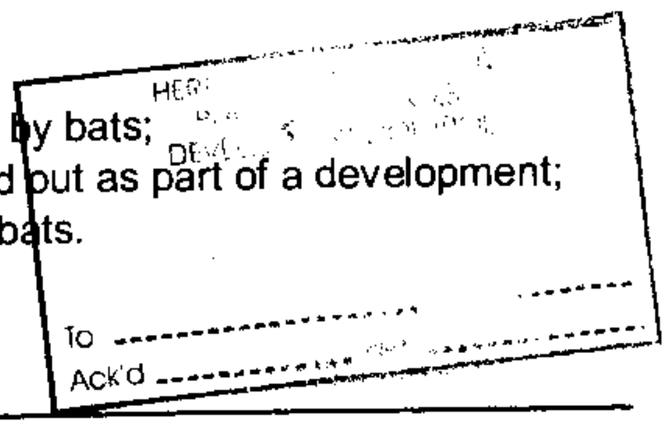
To ensure that no illegal activities are undertaken during the course of a development, it is recommended that a licence is applied for if, on the basis of survey information and specialist knowledge, it is considered that

- the site in question is demonstrably a breeding site or resting place for bats
- the proposed activity is reasonably likely to result in an offence

No licence is required if the proposed activity is unlikely to result in an offence.

Examples of works that are likely to need an EPS licence
Works that are likely to need a licence because they may result in the destruction of a breeding or resting place and/ or disturbance of bats include:

- Demolition of buildings known to be used by bats;
- Conversion of barns or other buildings known to be used by bats;
- Removal of trees known to be used by bats, when carried out as part of a development;
- Significant alterations to roof voids known to be used by bats.



Examples of works that may not need an EPS licence
Examples of works that, if carefully planned, may not need a licence include:

- Re-roofing, if carried out while bats are not present and the access points and roosting area are not affected
- Remedial timber treatment, carried out with the correct chemicals while bats are not present.

Conditions under which an EPS licence may be issued
Under the Conservation (Natural Habitats, &c.) Regulations 1994, DEFRA issues licences for the purposes of:

- preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance/or the environment [R. 44(2)(e)].

- Preventing the spread of disease [R. 44(20)9f)].

- Preventing serious damage to livestock, foodstuffs for livestock, crops, vegetables, fruit, growing timber or any other forms of property or to fisheries [R. 44(2)(f)].

In every case, a licence cannot be granted unless:

- There is no satisfactory alternative" [R. 44(3)(a)], and

- The action authorised will not he detrimental to the maintenance of the population of the species concerned at a favourable conservation status * in their natural range" [R. 44(3)(b)].

* Favourable conservation status' is defined in the Habitats and Species Directive (Article I(i)). Conservation status is defined as "the sum of the influences acting on the species concerned that may affect the long term distribution and abundance of its population within the territory".

It is assessed as favourable when:
"population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, or will probably continue to he, a sufficiently large habitat to maintain its populations on a long term basis."

In order to obtain a licence to allow the destruction of bat roosts etc, in advance of any otherwise legitimate development which may impact on the favourable conservation status of bats, it must be demonstrated by the applicant that all reasonable steps have been taken to minimise the impact (to satisfy R. 44(3) (a)) and any remaining damage will be adequately compensated for (to satisfy R. 44(3)(b)).

Current Natural England advice is that there should be no net loss in local bat population status, taking into account factors such as population size, viability and connectivity. Hence, when it is unavoidable that a development will affect a bat population, the mitigation should aim to maintain a population of equivalent status in the area.

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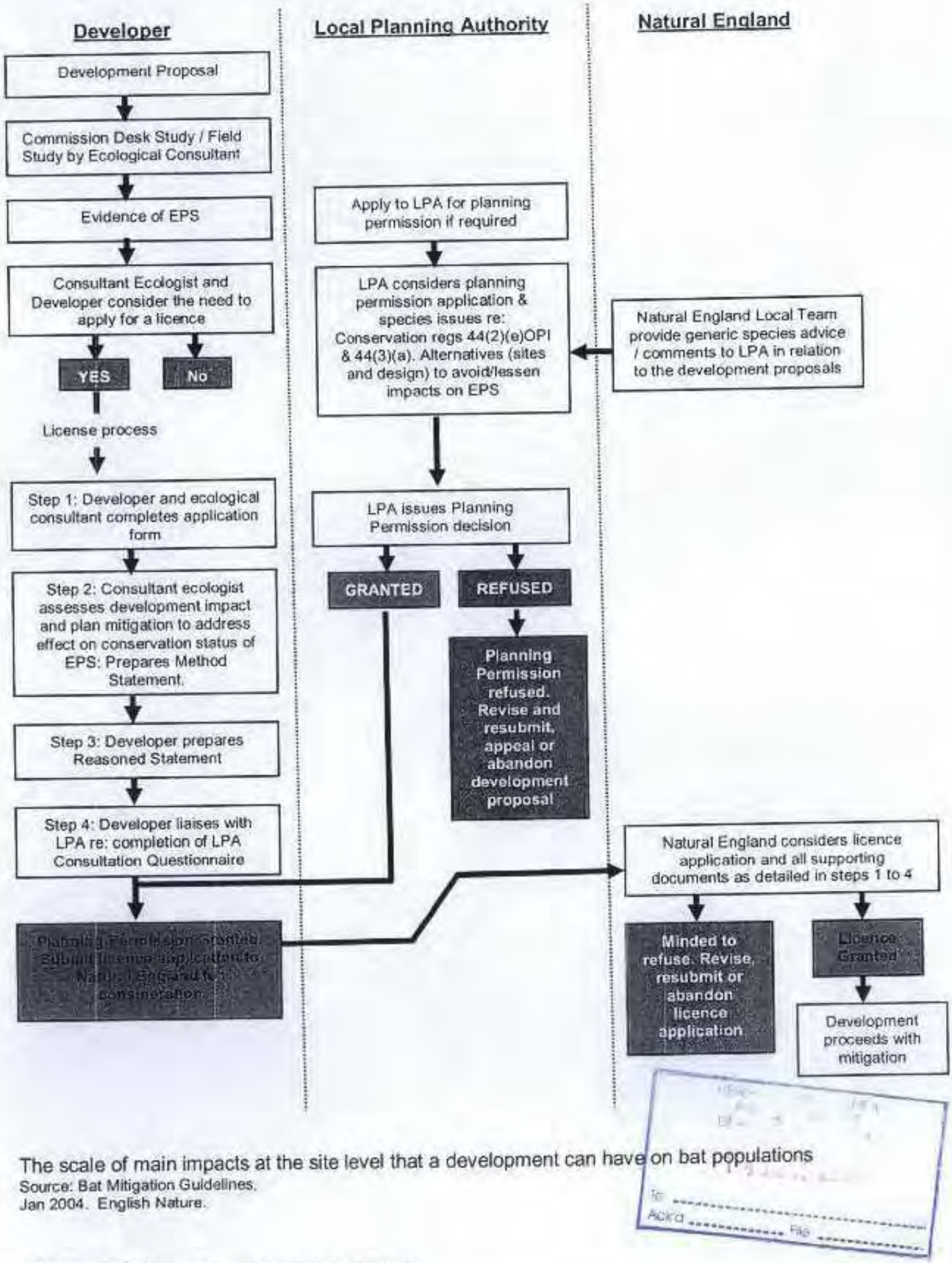
The main steps involved in ensuring that EPS issues are properly considered in developments requiring planning permission are presented below:



The scale of main impacts at the site level that a development can have on bat populations
Source: Bat Mitigation Guidelines.
Jan 2004. English Nature.

Appendix 7 (Planning considerations flow diagram)

Roost type	Development effect	Scale of impact		
		Low	Medium	High
Maternity	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside breeding season	✓		
	Post-development interference			✓
Major hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference			✓
Minor hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction, modification		✓	
	Modified management		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference		✓	
	Temporary destruction, then reinstatement	✓		
Mating	Destruction		✓	
	Isolation caused by fragmentation		✓	
	Partial destruction	✓		
	Modified management	✓		
	Temporary disturbance	✓		
	Post-development interference	✓		
	Temporary destruction, then reinstatement	✓		
Night roost	Destruction	✓		
	Isolation caused by fragmentation	✓		
	Partial destruction	✓		
	Modified management	✓		
	Temporary disturbance	✓		
	Post-development interference	✓		
	Temporary destruction, then reinstatement	✓		

NB This is a general guide only and does not take into account species differences. Medium impacts, in particular, depend on the care with which any mitigation is designed and implemented and could range between high and low.

Table 6.1. The scale of main impacts at the site level on bat populations.

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Conservation significance	Roost status	Mitigation/compensation requirement (depending on impact)
Low	Feeding perches of common/rarer species Individual bats of common species Small numbers of common species. Not a maternity site	Flexibility over provision of bat-boxes, access to new buildings etc. No conditions about timing or monitoring
	Feeding perches of Annex II species Small numbers of rarer species. Not a maternity site	Provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements
	Hibernation sites for small numbers of common/rarer species Maternity sites of common species	Timing constraints. More or less like-for-like replacement. Bats not to be left without a roost and must be given time to find the replacement. Monitoring for 2 years preferred.
	Maternity sites of rarer species	Timing constraints. Like-for-like replacement as a minimum. No destruction of former roost until replacement completed and usage demonstrated. Monitoring for at least 2 years.
	Significant hibernation sites for rarer/rarest species or all species assemblages	
	Sites meeting SSSI guidelines	Oppose interference with existing roosts or seek improved roost provision. Timing constraints. No destruction of former roost until replacement completed and significant usage demonstrated. Monitoring for as long as possible.
High	Maternity sites of rarest species	

Figure 4. Guidelines for proportionate mitigation. The definition of common, rare and rarest species requires regional interpretation.

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Examples of mitigation/ compensation.

(To be used should a bat loft be considered?)
Sources: English Nature's "Bat Mitigation Guidelines", Jan. 2004:
Joint Nature Conservation Committee 'Bat Workers Manual' 3rd Edition, 2004:
Internet.

Walls

Walls can be faced with any type of brick or block, but if hanging tiles or weather boarding is not to be installed, then the face should be rough to facilitate landing by bats before they crawl into the roost.

Walls should be of standard hollow construction as these areas are used as roosts by most species. Part of the inner walls on the north, cool side of the building, should be thickened with an additional 220mm thick hollow block wall spaced 30mm away from the normal inner wall.

There will need to be various small gaps leading into the wall through the mortar lines to allow bats to crawl into crevices.

During construction, timber battens measuring 15x50mm should be inserted between blocks, both horizontal and vertical mortar lines and these battens can be withdrawn a few hours after laying the blocks to create access crevices into the hollows.

Roof structure

Bats tend to search for roost entrances around the apexes of gable ends. This is where most roost entrances are found.
The aim is to provide a number of gables (usually four for each roost) to give adequate opportunities for bats to adopt their preferred aspect. Also, by having gable ends there is the convenience of installing roosting space behind hanging tiles or weather boarding, both being favoured roosting sites for several crevice dwelling species.

Roofs should be constructed traditionally with a ridge board but not with trusses

Within the roof there should be unobstructed flying space. This should be a minimum of 2.5m high, when measured from the roof apex (ridge board) to the floor of the loft space.

Roofing felt should be traditional bitumastic and hessian which allows bats to hang from almost any point. Plastic or breathable membranes are can be unsuitable because bats have difficulty hanging up. If they (e.g. Tyvec, Klober or similar) are to be used wind break netting or Netlon 10x10mm hard plastic mesh stretched beneath membrane will be necessary.

Assuming the inside roof height is at least 1.5m, then internal partitioning of the apex allows a variety of secluded spaces to be created. Use a 50mm thick insulation board (many types), with a rough surface to facilitate bats landing, fitted to rafters and hanging down about one metre. These can be installed at about two metre intervals.

The top slate/tile batten needs to be placed 20mm from the ridge board.

At about two metre intervals along the ridge the roof felt should have 30x 100mm slots cut out beside the ridge boards to allow bats access to the ridge tiles (where most loft dwelling bats prefer to roost).

When the ridge tiles are laid it is important to ensure that the spaces within the ridge tiles remain unfilled with mortar and that there are lengths of tile which remain unobstructed.
Some blockages in the ridge are needed to prevent through draughts.

In addition it is useful to have a few small torn holes through the felt at several levels from apex to halfway down the roof slope to allow bats into the space between tile and felt (40x60mm holes torn on three sides and one end allowed to hang down).

Roofs often have double beams or rafters with small gaps between which provide crevices preferred by bats. One metre lengths of rafter can be added alongside the roof timbers spaced 20-

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25mm away with half bridged over to create a long enclosed cavity - It is always worth closing one end completely and always the upper end if the roost is adjacent to a rafter.

Features such as these are most easily installed by the bat consultant after the roof has been constructed.

If timbers can be recovered from the structure being replaced, this is the ideal time to introduce them.
Before using treated wood in a roof where bats are expected to roost the wood should be placed on the ground in the open and vigorously brushed with a stiff yard broom. The purpose is to remove the loose deposits of copper, chrome and arsenic salts which remain on the surface and which are poisonous if ingested while a bat is grooming.

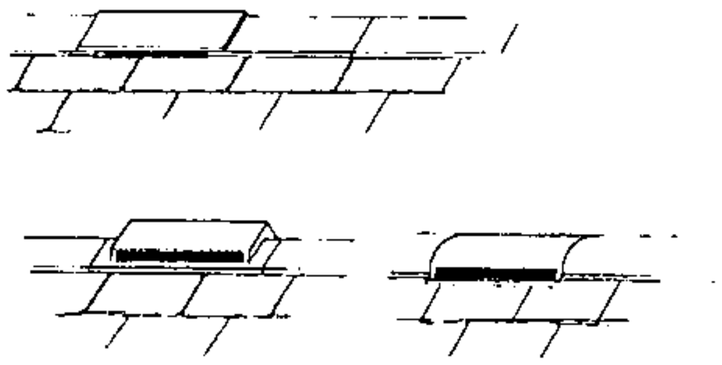
The gable ends should have an overhanging style with soffits to give bats a sheltered approach to the entrance.

When the roof felt is being placed over the end of the wall it should be supported by thin slate to ensure it does not fall by fatigue onto the brickwork, thus blocking the route bats gain access to the roof space. The work will need inspecting by the bat consultant before tiles are fixed.

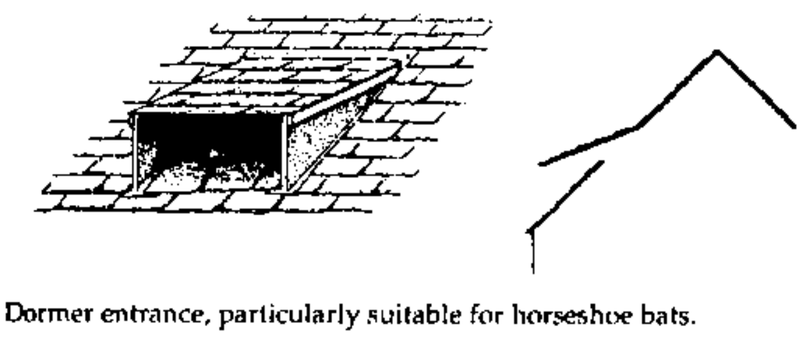
Roosts on walls
A variety of crevices can be provided on the walls at all heights from close to the floor (about 400mm above) to close to the ceiling. Indeed, some of the ceiling joists can have additional lengths added, with narrow gaps, similar to that described for the roof.

Narrow 'boxes' constructed of rough soft wood measuring 300mm deep and 450 - 600mm long with a narrow space about 30mm wide can be attached to the walls. The top and sides should be closed and, for longer boxes, some of the base. Such sites are used for hibernation by various species.

Entrances
Access can be both through crevice routes over walls and into the roof space as well as directly through a hole in the wall. A range of entrance types is illustrated below:

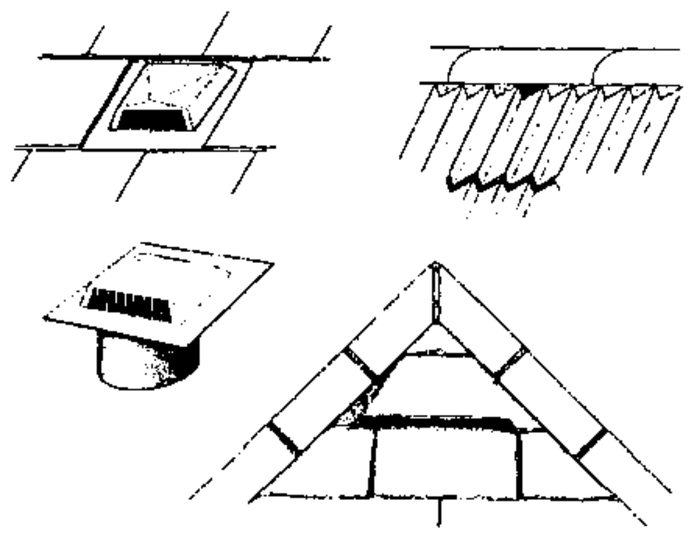


Ridge ventilators can be adapted as bat access points. It may be necessary to remove internal mesh or plastic mouldiogs.

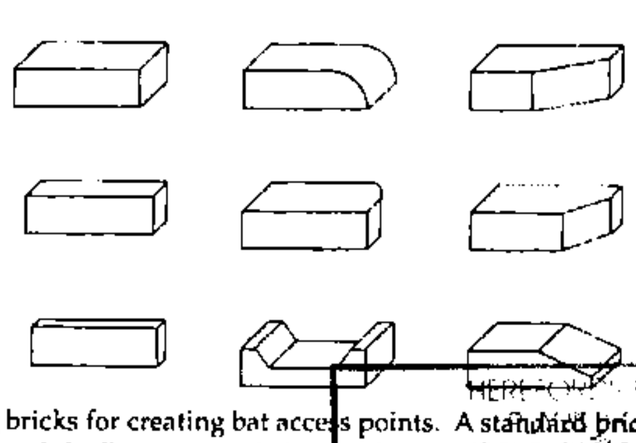


Dormer entrance, particularly suitable for horseshoe bats.

Access slits in soffits.



Lead saddle in place of a slate to allow bats access to ridge or roof void. Lead flashing around chimneys or other features can also be moulded to form bat access points.



Walling bricks for creating bat access points. A standard brick is shown top left. Purpose-made bat bricks can also be used.

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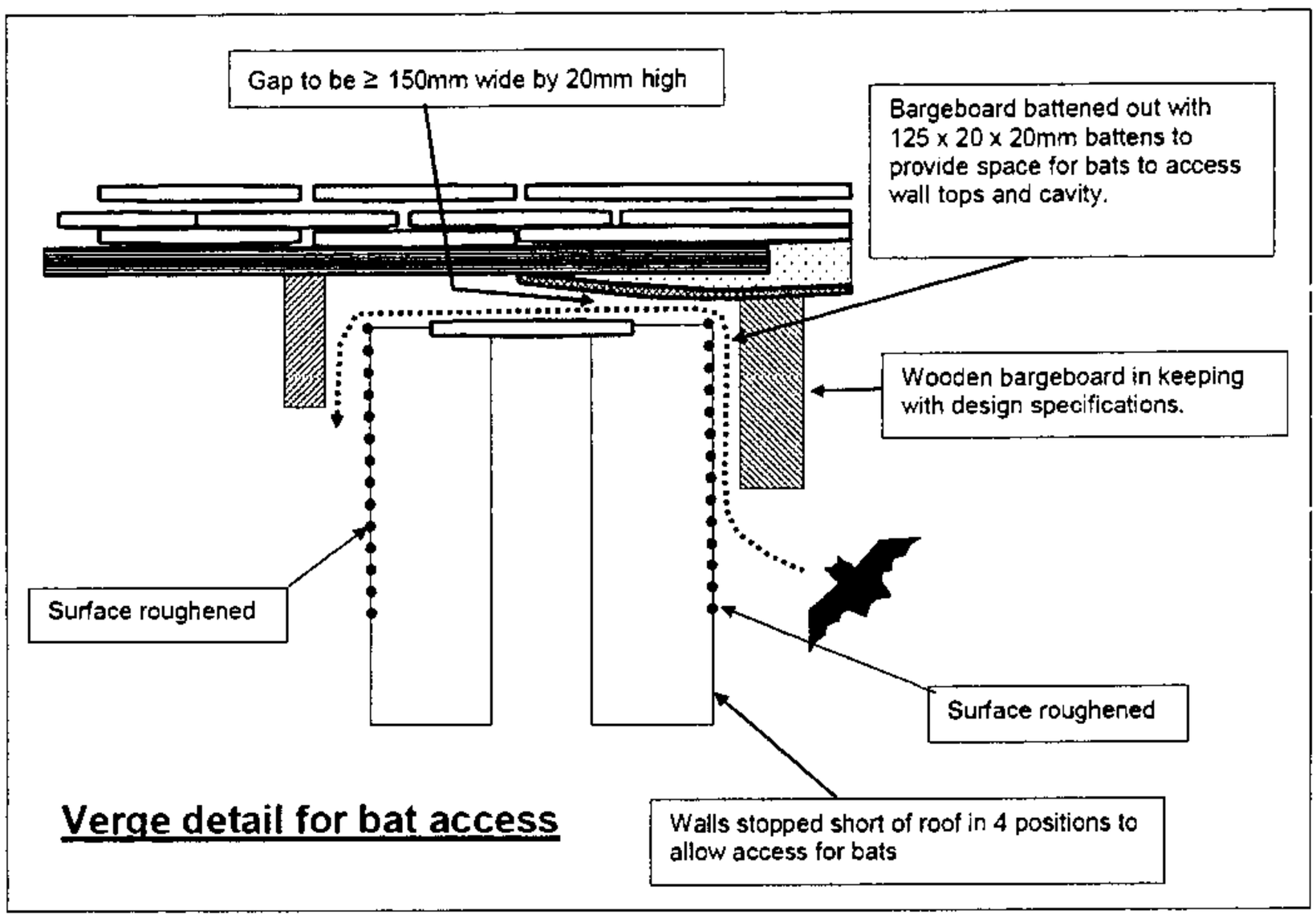

Bat access holes.
Horseshoe bats prefer to fly into their roosts, but only small holes or slots are needed for other species and this also helps to deter colonisation by birds.

Note: The brick manufacturer Marshalls Clay Products, Howley Park, Quarry Lane, Woodkirk, Dewsbury, West Yorkshire WF12 7JJ,
Tel. 01132 203535, supply bat access bricks.

If hanging tiles and weather boarding are provided, small spaces should be created through the wall behind the coverings to give alternative routes into the cavity and building.

Waney edge boarding usually warps thus providing access crevices to the battening attached to the wall.

Access for monitoring and other purposes
One or more loft access points/trap doors should be provided.

Within the loft a walkway providing safe access to the whole of the roof-space should be provided.

The floor of the loft should be completely covered by a layer of heavy duty plastic to facilitate future management of any accumulations of bat droppings which may occur.

Light disturbance
Eternal lighting should be of the 'down lighting' type and should not light up the sky around the building or any bat access points.

Heating
Although the provision of heating is not essential, it seems to increase the probability of bats moving into a new roost.
Preferred alternatives are the use a remote heating system with appropriate heat transfer arrangement such as hot water fed by convection from the ground floor, or the use of a passive heating installation with solar panels on the lower part of the southerly facing roof and partially insulated water reservoir hung in the upper part of the roof. This set up also works by convection and should run without maintenance for at least 40 years.

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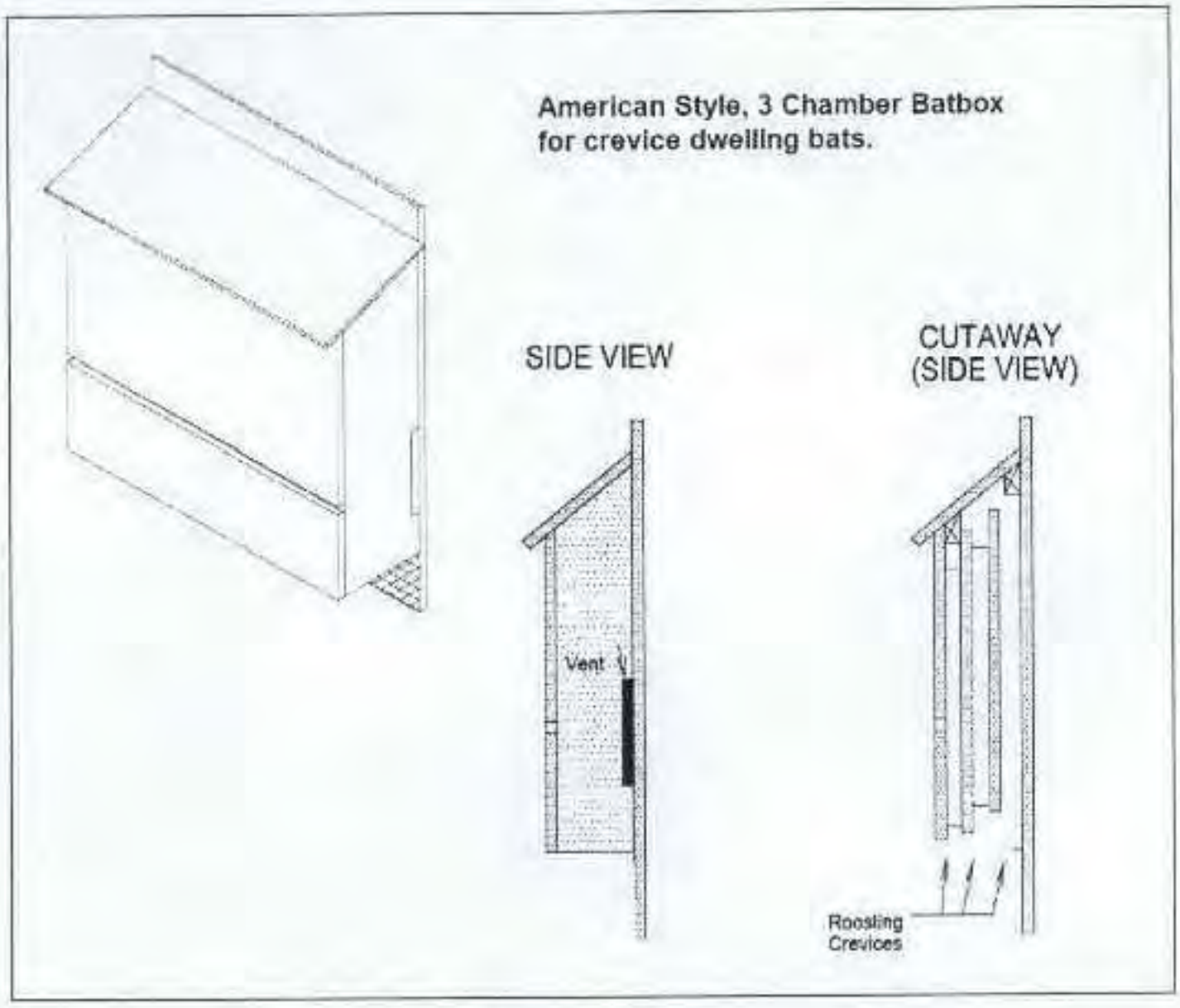
Seeding the roost with droppings recovered from the roost being replaced
Droppings and any other materials impregnated with odours from the existing roost can be added to the completed building as these may encourage rapid colonisation. It is best to place these to one side of the roof in a line on polythene sheet, away from where an observer is likely to walk and clear of the apex where most roosting will occur and new droppings should be produced.



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