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# WINTER SURVEY FOR BATS AND BAT ROOSTS AT THE PLASH MILL, LETHAM, ANGUS

**Report to Letham Feuars Committee**
**by**
**Dr Susan M. Swift**

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## 1.0 Introduction and Background

A traditional stone building dating from the late 18th Century, originally a plash mill for the local linen industry and now owned by Letham village and administered by the Feuars Committee, is due for repair and renovation, in order that it may again fulfil a useful purpose in the village. The mill is within the boundaries of the village of Letham (O.S grid reference **NO 534 487**). Having been unused for ten years, it is currently in poor condition, with part of the roof collapsed and repairs needed to the stonework. While Planning permission is not needed prior to repairs, SNH has recently advised the Feuars Committee that a bat survey should be carried out, in view of the European Protected Species status of all British bats and their tendency to roost in older stone buildings. While it was not possible to carry out a full bat survey, including dusk emergence or dawn activity surveys, in late October, it was agreed that an initial winter survey would include a thorough daylight search of the mill building for bats or signs of bats, and that further survey, if required, would be carried out in early summer, once bats become active. The winter survey was carried out by Dr Sue Swift on 24th October 2013.

## 2.0 The Conservation Status of Bats

Bats of all species in Scotland and their roosts are protected under the Conservation (Natural Habitats, &c) Amendment (Scotland) Regulations 2007. Following changes to legislation in Scotland, under this law it is illegal intentionally or recklessly to kill or injure a bat, to disturb a roosting bat or to damage, destroy or obstruct access to any bat roost. This applies to both summer and winter roosts, which may be in different

structures. Any action which is likely to disturb or damage a bat roost requires a licence from Scottish Natural Heritage (Licensing Section).

## 3.0 Site Description

The plash mill is located close to the edge of the village, within 30m of a burn beside which there is a line of mature deciduous trees. A road runs adjacent to the north face of the building, and there are cottages and houses on the far side of the road. Beyond the burn to the south, the habitat is farm land, mainly improved grazing, and there are no substantial areas of woodland within 200m. There are records of five species of bats within 5km of the site, but only of two/three in Letham itself.

The mill building is orientated roughly E-W, with its north face adjacent to the road. Walls are solid, unclad stone. Wall top height is 2.2m on the road face and 5m on the south face, since the mill is built into a hill. Ridge height is 7m. The roof is mainly corrugated iron sheeting on wooden trusses, with no sarking or other lining. There are no roof voids in the metal roofed sections. At the west end, one section has a stone-tiled roof with no sarking but with a roof void. The roof here has partly collapsed, leaving large holes which allow light and water ingress and have caused rotting of the roof timbers.

## 4.0 Biology of Bats - Aspects Relevant to the Survey

### 4.1 Bat species

Nine species occur in Scotland, of which five are known to occur in Angus. Pipistrelles. Two very similar species, 45kHz pipistrelles (*Pipistrellus pipistrellus)* and 55kKz pipistrelles (*Pipistrellus pygmaeus)*, are both common and widespread in Scotland. Both may occur in rural or built-up areas and their summer and winter roost sites are usually in man-made structures such as bridges and buildings. Summer maternity colonies of females and young are usually in heated buildings, but small groups of males sometimes roost in cooler or unoccupied buildings. Foraging habitat is tree lines, woodland edges and riparian vegetation. Both species are known to occur locally.

The brown long-eared bat, *Plecotus auritus,* is also usually found in buildings, particularly in rural and wooded areas. Although much less common than pipistrelles, it is frequently associated with old buildings containing large attics, and is the Scottish species most closely associated with older farm buildings. Again, maternity roosts are usually in heated houses, but males do also use outhouses and other unheated buildings on occasion. Brown long-eared bats have been recorded within 1.5km of the site.

Daubenton's bat, *Myotis daubentonii*, is strongly associated with water and almost always roosts within 50m of lochs or rivers. Roosts are usually in trees overhanging the water, and buildings are rarely used. It is known to be present within 3-4km.

Natterer's bat, *Myotis nattereri*, typically roosts in barns and steadings and is uncommon in Angus. Like the brown long-eared bat, it relies on woodland as foraging habitat. It is known to be present at Restenneth, within 5km.

### 4.2 Summer roosts

Bats are colonial mammals which live in large aggregations at some times of the year. Pregnant females form nursery colonies of up to 1000 individuals in spring, usually

early to mid May. Their young are born in mid-June to July and are reared in summer roosts, usually in warm, sheltered buildings, before colonies break up and leave the roosts in August-September (October for long-eared bats). Flightless babies are left inside the roost while their mothers go out to feed, and nursery colonies are thus very vulnerable to destruction or disturbance. Males live solitarily or in small groups during summer, often in cool roosts such as steadings, barns and tree holes.

**4.3 Hibernacula**

As facultative heterotherms, bats are able to undergo controlled reduction of their body temperature independently of ambient temperature. Besides daily torpor in summer, they enter longer periods of torpor (hibernation) in winter, when their insect food supply diminishes. During hibernation, body temperature drops, metabolic rate slows down and vasoconstriction occurs. Bats are vulnerable to predation at this time, since it takes time for them to warm up enough to escape, and also to disturbance, since if they arouse too often they may run out of stored energy and die. Hibernacula are selected for cool, constant temperature (5-10$^{o}$), high humidity, shelter and protection from disturbance. Some buildings containing deep, north-facing crevices may provide suitable sites, mainly for pipistrelles and long-eared bats – the other Scottish species rarely hibernate in buildings.

**4.4 Feeding ecology**

All British species are insectivorous, and feeding sites are in habitat, such as water and woodland, where numbers of flying insects are consistently high. The habitat around the plash mill is suitable for pipistrelles (both species) but probably too far from large water bodies or extensive woodland to be used by other Scottish species.

**4.5 Signs of bat roosts in buildings**

**Droppings.** Bat droppings are black, 5-10mm long and resemble those of mice except in that, when dry, they crumble easily to a fine dust consisting almost entirely of tiny pieces of undigested insect cuticle. Such droppings in attics, on windowsills, adhering to walls or windows or in heaps at the base of walls are a reliable indication that bats have been present in a building during summer. If long-eared bats are involved, a further sign is the presence of droppings and insect remains, mainly moth wings, below feeding perches. These bats take larger prey items to a perch to consume, and trim hard parts such as wings and legs off insects before consuming them.

**Staining.** Secretions on bats' fur rub off onto masonry as the bats enter and leave roost holes. This results in oily brown stains, which do not fade in winter, on walls directly beneath roost sites. Such stains would also be present on attic beams where large numbers of bats had roosted; small numbers of bats, however, rarely leave such staining.

Further signs in attics would be a distinct "batty" smell and the absence of cobwebs close to beams, since air movements created by bats' wings prevent their build-up. If any active bats are present at the time of the survey, they can be detected by their calls, both audible chittering sounds and ultrasonic calls which can be picked up on electronic bat detectors. However, torpid bats in winter will be silent and thus not detectable in this way.

## 5.0 Method

**5.1 Desk survey.** The SNH database was checked for bat records in the Forfar/Letham area. Other sources of information were Tayside Bat Group records and the author's own records of data accumulated from research projects and surveys carried out over twenty years.

**5.2 Daylight survey.**

All interior areas of the mill building were searched for bats or signs of bat roosts, using a powerful torch to check inaccessible areas and an optical endoscope to examine deep holes in the stonework. The search included wall bases, wall tops (accessed from a ladder) and any hanging cobwebs, which frequently catch bat droppings. It also included a search of stored items inside the building for droppings. A search was made of the exterior of the whole building for bat droppings or stains on walls, gable ends and skylights (see section 4.5), using binoculars to search high, inaccessible places and an optical endoscope to examine deep holes.

**5.3 Dusk and dawn surveys.**

In view of the time of year at which the survey was carried out (late October), dusk or dawn activity surveys were not carried out.

**5.4 Other Protected Species**

During the daylight search, any finding of signs of barn owls, swallows, swifts or house martins were recorded. Barn owl signs included pellets, feathers, droppings or nests, and signs of the other birds were nests inside the building or under eaves on the outside.

## 6.0 Findings of the Survey

**6.1 Desk survey**

There are records of two bat species in Letham, possibly three, since the records of pipistrelles do not give details of species. In addition, there are records of bats of all five Angus species within 5km of the site:-

**Pipistrelles**. A maternity roost of 100+ pipistrelles (species not identified) was recorded at Idvies House, 1.2km from the mill, in 2003. There are also pipistrelle records from Letham village (Dundee Road, Vinny Den and West Henry St), a large maternity roost of 55kHz pipistrelles at Balgavies (2.5km) and foraging records of both pipistrelle species at Balgavies Loch.

**Brown long-eared bats.** A maternity roost of this species is known at Idvies House.

**Daubenton's bats.** There is a large, long-established maternity roost of Daubenton's bats at Balgavies Loch (2.5km).

**Natterer's bats.** Signs have been recorded at Restenneth (5km).

**6.2 Daylight survey**

**6.2.1 Actual Roosts**. No roosting bats and no evidence of bats was found anywhere in or around the plash mill building. No staining was recorded on beams, nor at wall tops, and no droppings were found on wall tops, at bases of walls, under lintels or suspended in cobwebs. A quantity of mouse droppings were found in the east section, but no bat droppings. There were also no droppings below ridges in any parts of the building. Crevices above door and window lintels were covered in cobwebs (Plate 1),

confirming that no bats had roosted there. There were also no signs of bats on the outside of the building, on walls, wall tops or stonework

**6.2.2 Potential roosts.**
In the absence of sarking or other roof linings, the only potential roost sites were holes in the stonework of the walls. There were a number of holes on both the inside and outside walls where mortar had fallen out. There were also a few gaps at wall top level where holes under the roof would have allowed bats to gain access to roosts on the wall tops. However, these were all checked from the ladder, and no staining or droppings were found. Several of the holes high in the outer walls were deep (at least 10cm), but no signs of bats could be found using the endoscope. Thus, while in the absence of dusk/dawn surveys, I cannot rule out completely the possibility that pipistrelles could use these holes (particularly on the south face; Plate 2) as roost sites, at the moment, there is no evidence at all that they do so.

No signs of bats were found in the west section of the building, i.e. the section with a stone-tiled roof. Since there was no sarking or other roof lining, potential roosts under sarking could be ruled out. In addition, the large holes in the roof (Plate 3) and resulting damp, light and draughty conditions in the roof space made this section, in my opinion, very unlikely ever to be used by bats.

**6.2.3 Habitat for bats**
There was suitable habitat for pipistrelles locally along the burn and nearby tree line and over grazing fields, and flying pipistrelles have been sighted in summer by local residents. However, the mill is too far from large water bodies to be used by Daubenton's bats and too isolated from extensive woodland to be suitable for long-eared or Natterer's bats.


Plate 1. Thick cobwebs across entrances to gaps above lintels confirmed no bats had roosted there

Plate 2. South face of the mill, showing a few deep holes in the stonework (circled) which are potential bat roosts, although no signs of roosts were found. Care should be exercised when repairing these holes.


Plate 3. The stone-tiled (west) end of the building, from the north side, showing the partially collapsed roof. Water ingress and light conditions (both the ridge and the ceiling have large holes) make the area unsuitable for bat roosting.

**6.3 Other Protected Species**

**6.3.1 Barn owls.** No signs of barn owls were found in the building.

**6.3.2 Other nesting birds.** Two recently occupied swallows' nests were recorded, one in a middle section of the building under a broken skylight and the other in the west section, the part with the partially collapsed roof. No signs of swifts or house martins were found, and there were no overhanging eaves suitable for house martin nest sites. Since all British birds are afforded legal protection during the nesting season, it is important that *either:*

The roof repairs are carried out in winter and completed before swallows return in May, *or*

steps are taken before next summer to ensure the birds are not able to gain access to the building and start to nest.

## 7.0 Conclusions, impact assessment and recommendations to protect bats

**7.1** No roosting bats and no roost sites were identified in the mill building. No signs of bats were found inside or outside the building and there was no evidence it is, or has been, used by bats for roosting.

**7.2** Being unheated, it is not suitable for maternity colonies. Since maternity colonies of all bat species always leave signs of their presence, I am confident this building is not, and has not been, a maternity roost for any bat species. In addition, I am certain it has no possible relevance for any bat species other than pipistrelles.

**7.3** No signs of pipistrelles were found in or around the building. However, because a summer survey has not been carried out, I cannot rule out a slight possibility that one or two male pipistrelles could, occasionally, roost in deep holes in the stonework on the south-facing wall. However, there is no evidence they do so, and thus work to renovate the building could be carried out without the need for an EPS licence in respect of bats.

**7.4** Because no actual roosts were identified, because there was no chance of bat species other than pipistrelles ever using the building and because no maternity roosts were present, the magnitude of impact on bat populations locally of the proposed restoration will be minimal. Even if male pipistrelles did ever roost in the stonework, these bats are common in Angus and there are alternative roost sites available for them locally. The significance of impact on bats of the proposed works will be negligible.

**7.5** Because the occasional presence of pipistrelles cannot, at the moment, be completely ruled out, my advice is that reasonable caution is exercised when deep holes in the stonework of the outer walls are filled. A thorough check using a powerful torch would be enough to ensure no bats are in holes, and thus in danger from becoming trapped, when the holes are filled.

**7.6** Since swallows nest in the building in summer, in order to avoid disturbing them during the nesting season, *either* steps should be taken to prevent birds getting into the building in spring and starting to nest *or* work should be completed before the next nesting season (May 2014). No other Protected species are likely to be affected by the proposed works.

**7.7** While mitigation for bats is not specifically needed in this case, bat conservation could be promoted locally by installing bat boxes either on the south wall of the mill once repairs have been completed or by putting several on trees beside the burn (or, preferably, in both these sites). Traditional wooden bat boxes would be suitable for

the trees, and four or five of these should be installed at a height of at least 4-5m and facing in different directions, in order to offer bats a choice of roost temperature. If installing a box on the wall of the building, the most suitable type would be a ceramic box (e.g. Schwegler Model 1FQ) suitable for mounting on exterior walls. This should be placed on the south wall, as high on the building as possible.

## 8.0 Limitations of the survey

Environmental surveys have a limited lifespan, since they deal with animal ecology, which may change with time. In general, bat surveys remain relevant for 12-18 months, but if works are delayed beyond this time, the survey may need to be repeated.