# BAT BOX INSTALLATION IN ENVIRONMENT AGENCY GAUGING STATIONS

**(Hampshire & Isle of Wight Area)**

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ENVIRONMENT AGENCY

SPARSHOLT
COLLEGE HAMPSHIRE

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## EXECUTIVE SUMMARY

The Environment Agency owns or leases many hundreds of gauging station sites in England and Wales. Many of these sites include small brick huts within which hydrometric monitoring equipment is kept. This report describes how six of these Environment Agency gauging huts in Hampshire and the Isle of Wight were augmented to increase their potential as roosting habitat for bats during the early part of 1999.

The project size was limited by the budget, which was only one thousand pounds. It is the intention that more resources will be found to augment further gauging stations for bats in Hampshire and the Isle of Wight in future years. It is also hoped that this report will help similar augmentation work to be carried out on Environment Agency sites elsewhere in England and Wales.

The work described in this report and the report itself were produced as part of a student work placement. Ken Monro, a BSc Wildlife Management student from Sparsholt College Hampshire, led a multi-functional Environment Agency team through all phases of the project. The project team included Environment Agency staff from Water Resources; Direct Works; and Fisheries, Ecology and Recreation.

The project took approximately six weeks from start to finish and was completed within the £1000 budget.

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# 1. INTRODUCTION

The Environment Agency's duty to further conservation and recreation interests whilst carrying out its work extends to the management of its land and buildings. Waterways are often a habitat over and around which bats can thrive, carrying as they do large numbers of insects, the staple diet of British bats.

Early in 1999 a number of Agency gauging stations were visited with a view to identifying methods to augment their suitability as bat roost habitat. Resources of time and money were not sufficient to allow all gauging stations in the Hampshire and Isle of Wight Environment Agency Area to be included in the project. Gauging stations are usually brick huts. Size and design varies. Some have pitched roofs and some have flat roofs. The spare roof space in pitched roof huts offers particularly interesting possibilities. To match the project size to the resources available, only gauging stations with pitched roofs in the Test and Itchen river valleys were considered for augmentation.

It is hoped that, in the future, the work can be extended over a wider geographical area and range of hut designs, including those with flat roofs. Flat roofed huts often have cavity walls suitable for use by bats.

The work carried out for bats at chosen sites was varied and included:

- fitting a variety of specially built bat boxes within roof spaces;
- encouraging access to roof spaces by drilling holes in soffit boards and/or knocking corners out of gable end air bricks;
- encouraging access to cavity walls by cutting slits in the mortar between bricks;
- attaching bat boxes to trees within gauging station compounds.

Of the 14 species of British bat, 11 species have been known to use bat boxes and of those, 6 have bred in them. [2] The riverside location of the gauging stations suggests that the most likely visitors to the sites might be Pipistrelle (*Pipistrellus pipistrellus*) and Daubenton's *(Myotis daubentonii).* It is possible that other species might use these buildings, including hopefully Natterer's (*M. nattereri*), Brown long-eared (*Plecotus auritus*) and Whiskered (*M. mystacinus)* which have also been recorded near watercourses (the first four of these species have been recorded using bat boxes for breeding purposes).

The list of gauging stations included in this project, and a breakdown of the work carried out at each one is given in Appendix 1.

## 2. DESIGN, CONSTRUCTION & INSTALLATION

### 2.1. Bat access

Often, bat access to the roof space was already possible via existing gaps and holes. In most cases extra access routes were provided: by drilling holes in the soffit boards; chiselling out slot gaps in the mortar of gable end walls; or chipping gaps in the corners of air bricks. Access to cavity wall habitat was also provided by creating small, slot gaps in the mortar.
Where the gauging hut did not contain a ceiling, only box designs with their own direct external access route were used to deny bats access to the general workspace of the hut.

### 2.2. Construction materials

The choice of construction materials is important. Bats must not be exposed to treated wood:

- Boxes must not be constructed using tanalised timber - this can release cyanide if it gets damp.
- Where the condition or treatment history of the timber frame of a roof is in doubt, it is necessary to fit a box which allows no access to the rest of the roof space.

Historically, the most successful boxes have been constructed from softwood – pine, fir and spruce – and this should be rough sawn so as to be "grip friendly" for the bats. All boxes built as part of this project were constructed from rough sawn untreated pine.

### 2.3. Box type

A variety of box designs were installed. There were two main reasons for this:

- Bats have differing requirements for roosts depending on the species and also on the time of year. For example, Pipistrelles are more likely to colonise a bat box than an open roof space, whereas Daubentons may prefer a crevice to a box. Similarly, Brown long-eared are more often found in open roof spaces.
- The differing designs of the gauging stations meant a single design of box was inappropriate.

### 2.4. Tree boxes

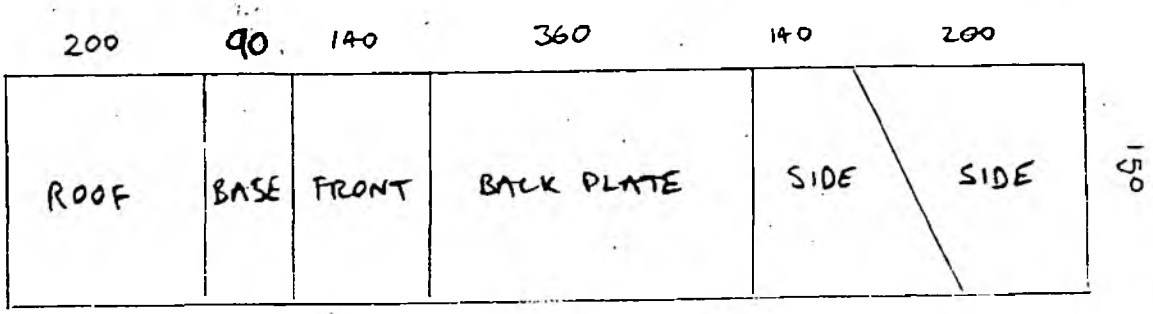
Many sites include trees within the landholding. For little extra cost, tree boxes were fitted to create alternative summer roosts. Boxes were fitted between one and a half metres and five metres off the ground (different heights attract different bat species – Long-eared bats prefer low boxes for instance). However it should be noted that higher boxes will be out of the reach of less determined vandals. A variety of aspects were provided by fitting three boxes "in a ring" on each chosen tree. As these softwood boxes are going to be open to the elements they can be expected to last around ten years before they need replacing.

### 2.5. Health and safety note

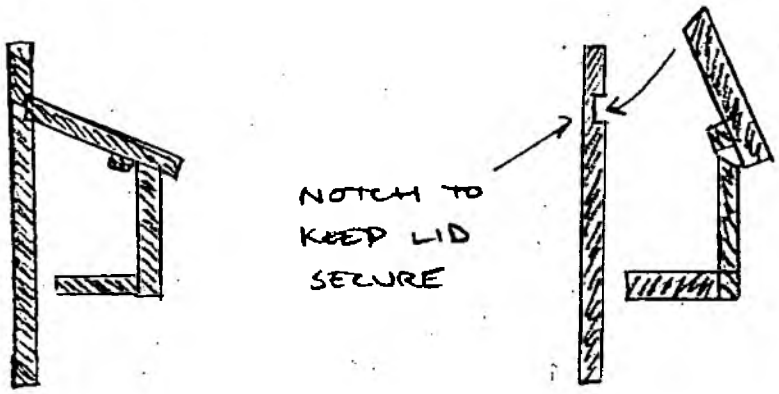
Roof spaces are a potentially dangerous working environment. Dust from insulation materials, confined spaces, electrical cables/equipment, heights and unsafe ceilings are amongst hazards that should be considered.

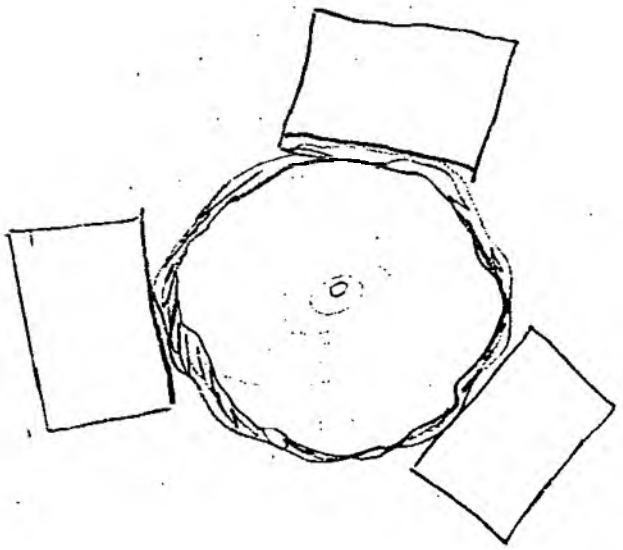
**Drawings and photographs demonstrating the work are included on pages 4 to 13.**

# TREE BOX




PLANK 1185mm x 150mm x 25mm (10mm for SAW CUTS)
(ROUGH SAWN PINE)



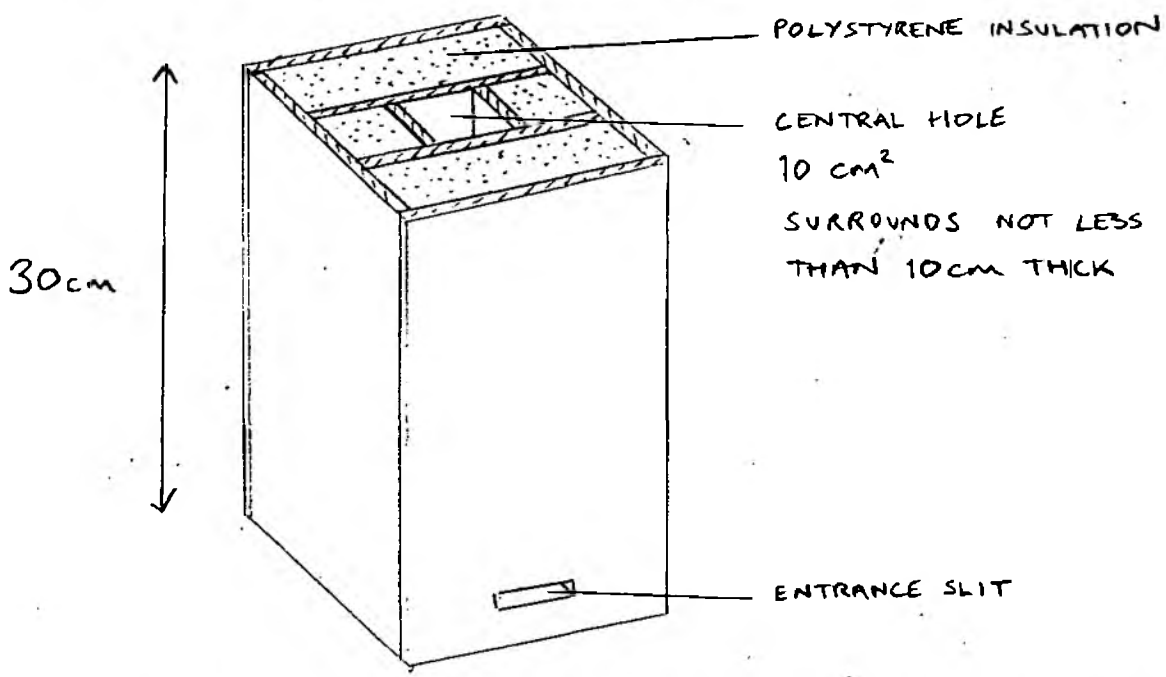



2 or 3 BOXES FITTED AROUND TRUNK
3-5 m OFF THE GROUND

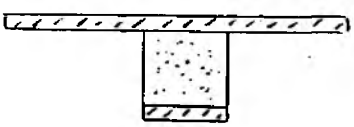
| SITE - ANY SUITABLE TREE ON AGENCY LAND |
|---|

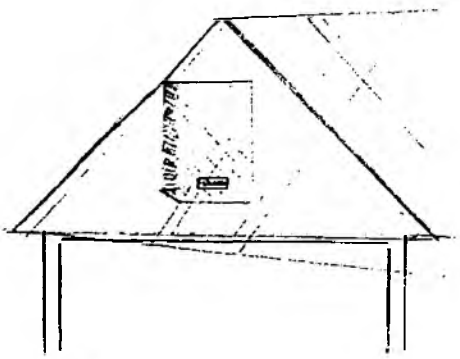
## HIBERNATION BOX

SUITABLE FOR "OPEN LOFT"




WITH LID

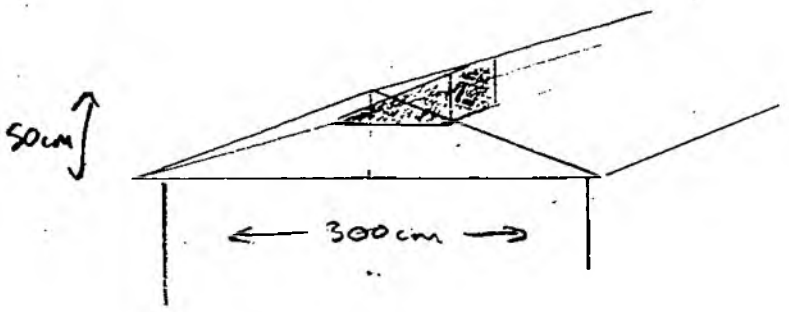


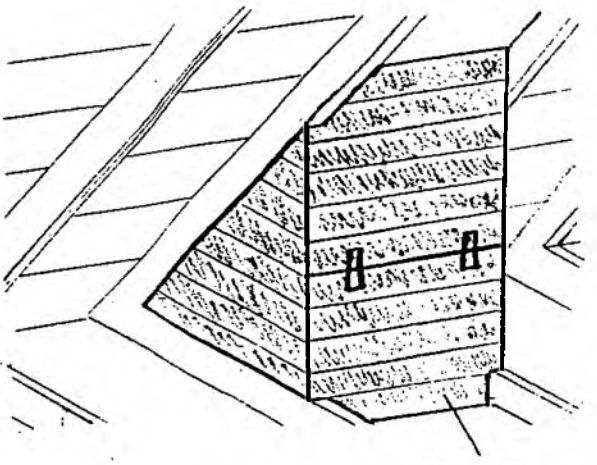


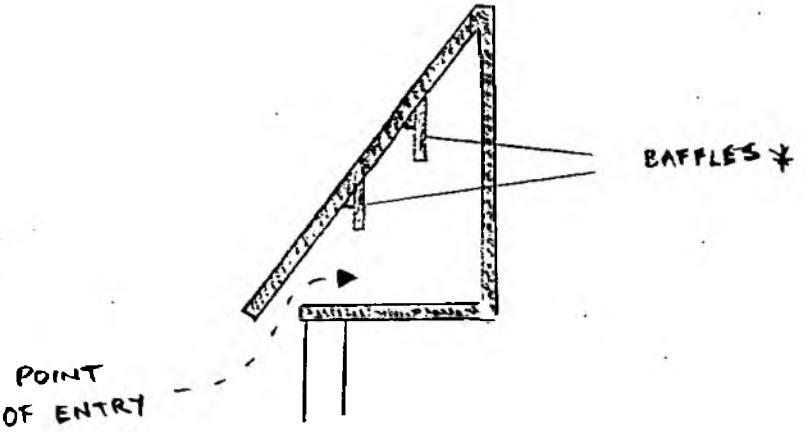
| | | |
|---|---|---|
| SITES | : | BOURNE<br>BOSSINGTON<br>LONGBRIDGE |

POSITION - (INSIDE)
ATTACHED TO GABLE END AND RAISED ABOVE LEVEL OF FALSE CEILING TO PREVENT RODENT ENTRY

## EAVES BOX

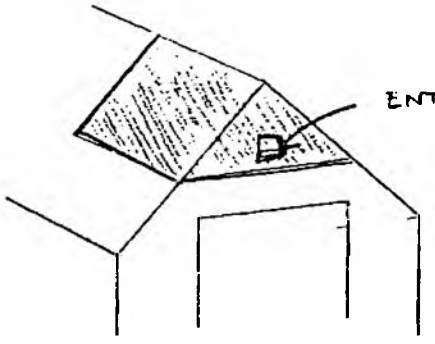


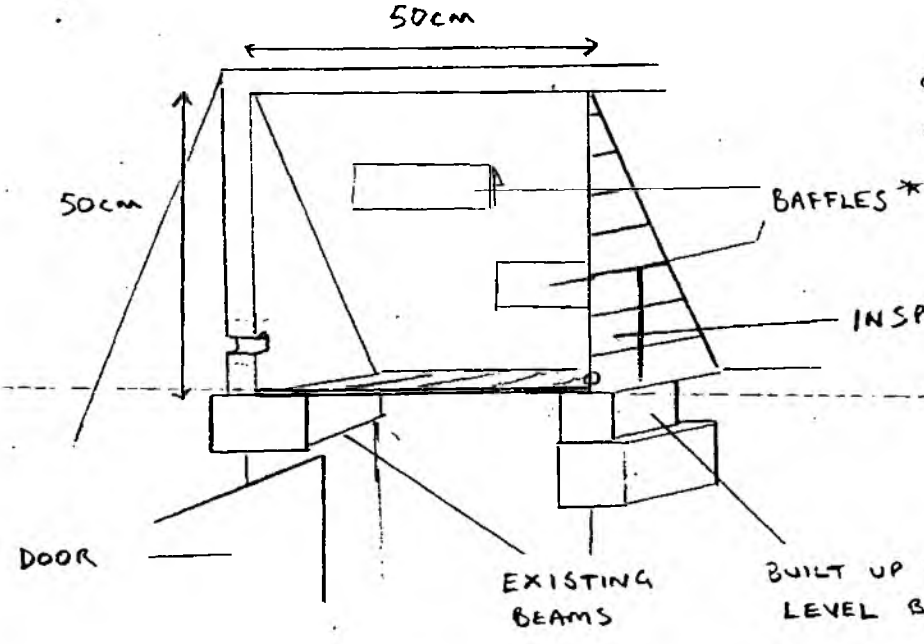




SITE - LONGBRIDGE

# FULLERTON RIDGE BOX



ENTRY POINT - VIA AIR VENT BRICK
(OR VIA BAT ROOF/RIDGE TILE IF DROPPINGS ON DOORSTEP ARE OFFENSIVE!)




CROSS SECTION
eg. ½ BOX

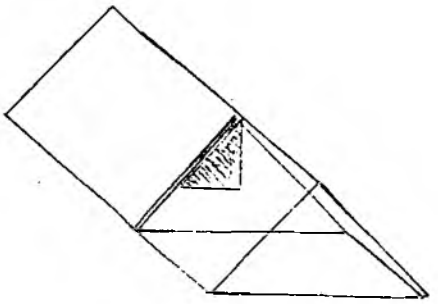
AS THERE IS NO CEILING AT THIS STATION, IT IS IMPORTANT THAT THERE IS NO WAY OUT OF THE BOX EXCEPT VIA DESIGNATED ENTRY POINT

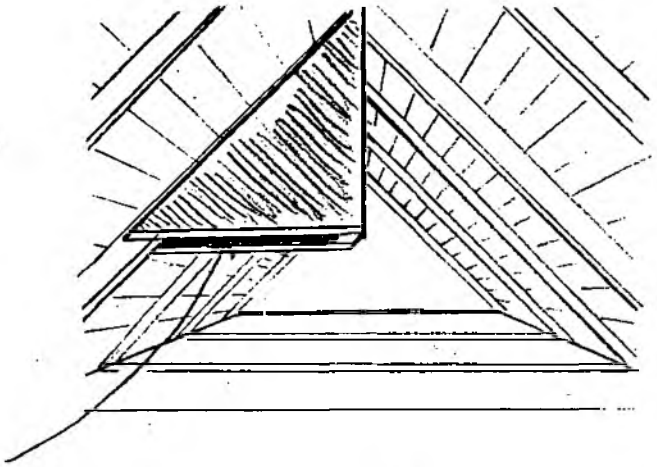
| |
|---|
| SITE : FULLERTON |
| ADAPTED FOR : BOURNE<br>BOSSINGTON |

* BAFFLES SHOULD SPAN WHOLE WIDTH OF BOX (EAVES & RIDGE)

## NEW CREVICE DESIGN

SUITABLE FOR "OPEN LOFT"





2 PANELS NAILED EITHER SIDE OF BEAM ie CREVICE ONE BEAM WIDTH THICK

POINT OF ENTRY

SITES : CHILBOLTON
LONGBRIDGE
EASTON

A TYPICAL ENVIRONMENT AGENCY GAUGING STATION HUT

(FULLERTON GAUGING STATION – RIVER TEST – HAMPSHIRE)

THE FULLERTON RIDGE BOX – INSPECTION FLAP OPEN

(FULLERTON GAUGING STATION – RIVER TEST – HAMPSHIRE)

THE HIBERNATION BOX — LID ALONGSIDE

(BOSSINGTON GAUGING STATION - RIVER TEST - HAMPSHIRE)

THE NEW CREVICE DESIGN — LOOKING UP THROUGH LOFT HATCH

(BOSSINGTON GAUGING STATION - RIVER TEST - HAMPSHIRE)

AIR BRICK ACCESS POINT

(BOURNE GAUGING STATION - RIVER TEST - HAMPSHIRE)

SOFFET ACCESS POINT

(CHILBOLTON GAUGING STATION - RIVER TEST - HAMPSHIRE)

## 3. MONITORING

No formal monitoring is planned as part of this project - though occasional checks will be made and positive findings will be recorded.

**It is important to be aware that only trained Bat Wardens licensed by English Nature, Countryside Council for Wales or Scottish Natural Heritage can inspect bat boxes. Under the Wildlife and Countryside Act 1981:**

- ***It is an offence for any person to damage, destroy or disturb a place used by bats for shelter or protection without such a licence unless that person can show that the act was the incidental result of a lawful operation and could not reasonably have been avoided.***

**In short, Environment Agency staff can not inspect bat boxes, even if they are on Agency property, unless they are properly licensed.**

The best and least intrusive method of monitoring is to check visually and with a bat detector for bat activity at dusk on mild summer evenings. In most circumstances remote observation such as this can be carried out without a licence. Torches must not be directed at bats or the places from which they are emerging. However, as dusk and dawn observation involves working unsociable hours it may not always be a viable proposition.

An alternative, if a licence holder is available, is to formally inspect the boxes, roof space and entry points for droppings once a year. This annual inspection should be carried out during the winter months (summer in the case of the hibernation boxes). There is a possibility that the hibernation boxes might be used as summer roosts and so the inspection lids need to be taken off with caution. Any bats found in this situation should be removed from the lid and then reintroduced to the box via the entrance slit so as not to risk pinching or trapping bats when replacing the lid.

During any annual inspection the boxes and the area beneath them should be cleaned of droppings if this is required. For ease of dropping collection, line the floor of the boxes (or the ceiling beneath them) with newspaper. Dust masks and gloves should be worn for this work (see also - health and safety note, page 3, para. 2.5).

Most of the gauging huts augmented for bats in this project are situated in locations where they are unlikely to be disturbed by the general public. Whilst minimising disturbance is obviously desirable, operational visits to the sites by Agency staff going about their jobs can not reasonably be avoided. Such visits are therefore not illegal and can continue to be made as long as there is no unnecessary, deliberate interference with the bats entry and exit points and the roost quarters themselves.

## 4. ADDITIONAL INFORMATION & REFERENCES

Under the Wildlife and Countryside Act of 1981 all species of British bat and the places they use for shelter or protection are legally protected. Any study of bats (or other activity) which involves handling them or disturbing their places of shelter or protection requires a licence from English Nature, Countryside Council for Wales, or Scottish Natural Heritage. Where small colonies exist, great care should be taken to avoid action which may make them leave.

With the exception of the "Crevice" design, the boxes recommended in this report are all tried and tested. More information about them and other designs is readily available from the Bat Conservation Trust and also Scottish Natural Heritage. Some of the most useful publications are listed below.


**1.** Hutson, A.M. (1993) — Bats in Houses, The Bat Conservation Trust, London

**2.** Stebbings, R.E. and Walsh, S.T. (1991) — Bat Boxes – A Guide to the History, Function, Construction and Use in the Conservation of Bats, The Bat Conservation Trust, London

**3.** Scottish Natural Heritage (1996) — The Design and Construction of Bat Boxes in Houses.

# APPENDIX 1 – LOCAL INFORMATION

A summary of the work carried out is given below:

**Easton Gauging Station – Itchen Catchment – SU 512 325**
- Droppings in the roof space suggest bats were using this site prior to this project.
- No bat boxes were fitted at this site.
- 3 extra entry points were provided: 2 slots in soffits; 1 hole in corner of air brick.

**Longbridge Gauging Station – Test Catchment – SU 355 178**
- 3 bat boxes were fitted: 1 eaves box; 1 crevice box; 1 hibernation box.
- 4 extra entry points were added: 2 slots in soffits; 2 slots in wall mortar to give access to cavity wall habitat.

**Bossington Gauging Station – Test Catchment – SU 334 313**
- 2 bat boxes were fitted: 1 crevice box; 1 hibernation box.
- 1 extra entry points was added - a hole in corner of air brick.
- A man-way inspection hatch was added to the ceiling of the building.

**Fullerton Gauging Station – Test Catchment – SU 379 392**
- 1 "Fullerton Ridge" bat box was fitted.
- 1 direct-to-box entry point was provided – a hole in corner of air brick.

**Chilbolton Gauging Station – Test Catchment – SU 385 394**
- Droppings in the roof space suggest bats were using this site prior to this project.
- 2 bat boxes were fitted: 1 eaves box; 1 crevice box.
- 3 extra entry points were added: 2 slots in soffits; 1 hole in corner of air brick.

**Bourne Gauging Station – Test Catchment – SU 442 463**
- 2 bat boxes were fitted: 1 crevice box; 1 hibernation box.
- 1 extra entry points was added - a hole in corner of air brick.
- A man-way inspection hatch was added to the ceiling of the building.

**Note**
Highbridge Gauging Station on the River Itchen (SU 467 214) is noteworthy. It was decided that augmentation work was not appropriate at this site. Bat droppings suggest that bats are already making good use of the space between the roof lining and the tiles. This needs special consideration if maintenance to the hut is carried out in the future

**Tree boxes**
10 tree boxes were built and installed on Agency land as part of this project.