

BUILT ENVIRONMENT HABITAT ACTION PLAN

HABITAT PROFILE

Habitat description: The built environment covers any man-made structure including buildings and their surrounding hard standing (both domestic and industrial), bridges, tunnels and walls (excluding farm dykes), pylons and aerials.

Habitat name: Buildings

UK Biodiversity status: Identified as a Broad Habitat within Urban areas.

Associated Priority species: Pipistrelle bats *Pipistrellus pipistrellus* and *Pipistrellus pygmaeus*.

Associated species of Conservation Concern: Daubenton's bat *Myotis daubentonii*, natterer's bat *Myotis nattereri*, whiskered bat *Myotis mystacinus*, brown long eared bat *Plecotus auritus*, pied wagtail *Motacilla alba*, dipper *Cinclus cinclus*, kestrel *Falco tinnunculus*, house martin *Delichon urbica*, swallow *Hirundo rustica* and barn owl *Tyto alba*.

Associated species of Local Concern: Swift *Apus apus*.

Statutory protection: The Wildlife and Countryside Act (1981) covers disturbance to bats and nesting birds.

BIODIVERSITY CONTEXT

The built environment has become an increasing part of Scotland's landscape since the industrial revolution. It covers 3% of the land area of Scotland, is where the bulk of the population lives and is the environment where they will have their day to day contact with biodiversity. For these reasons it can be seen as of equal importance as other more natural habitats such as oak woodland and lowland raised bogs.

On a species level, pipistrelle bats, which breed and roost mainly in buildings, are of national concern having suffered up to a 70% decrease in population between 1978 and 1993. Supposedly common urban species are declining too, the house sparrow *Passer domesticus* has recently disappearing as a breeding species from Edinburgh's Princes Street gardens, although over Scotland it appears to be increasing in number.

OBJECTIVES

Objective 1 Identify key areas for biodiversity of the built environment in the Stirling Council Area.

Target By 2005, identify key buildings or areas of built environment with high biodiversity value.

Objective 2 Ensure that the built environment of the Stirling Council Area is managed to maximise its value to biodiversity.

Target Encourage householders to make the outside of their homes as biodiversity friendly as possible.

Target By 2004, ensure that Stirling Council examines its maintenance on all owned or managed properties to make it as biodiversity friendly as possible within existing budgets.

Target By 2005, ensure that the planned built environment will be constructed to maximise its attractiveness to biodiversity.

Objective 3 Raise awareness of the value of the built environment to biodiversity.

Target Encourage local communities to participate in survey of the biodiversity of their built environment.

Target Organise event to highlight and celebrate the biodiversity of the built environment.

CURRENT STATUS

1.2% of Stirling is a built up area or a garden. This type includes urban and rural settlements, farm buildings, caravan parks and other man made built structures such as industrial estates, retail parks, waste and derelict ground, urban parkland and transport infrastructure. It also includes domestic gardens and allotments. This type does not include amenity grassland, which should be included in the improved grassland broad habitat type.

There are 2,689ha of built up areas and gardens in the Stirling Area. Not surprisingly, these areas are wholly associated with population centres.

The number of houses in Stirling is set to get bigger, with a projected need for 6,455 new houses by 2017, 2500 of these will be in a major growth area to the east of Stirling (figures from the Clackmannanshire and Stirling Structure Plan).

The built environment is concentrated in the area east of the M9. Outside of rural settlements, farm buildings are the main forms of built environment in rural areas.

The existing information on the built environment is listed below.

Housing.

From 2000 figure the breakdown of Stirlings housing is:

Type	Number of houses	Percentage
Owner occupier	24,532	68.3
Scottish Homes	155	0.4
Housing Associations	1199	3.3
Local Authority	8042	22.4
Private rented	2019	5.6
Total	35,947	100

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Bridges.

There are 616 bridges on the Stirling Council database, of these 60 are footbridges, 14 are road bridges owned by British Railways Property Board, 14 are road bridges owned by Railtrack. The latter 14 are a mixture of bridges that either carry roads over railways or take railways over roads

The breakdown by construction method is; Masonry arches 343, metal superstructures 49, precast concrete box culverts 35 and reinforced or prestressed concrete slabs 119. Corrugated, plastic or concrete pipes have not been listed.

Listed buildings.

When buildings are listed, by Historic Scotland, the protection afforded relates to the inside of the building as well as the outside, and includes curtilage buildings and features such as stables, lodge houses, walls and gatepiers

Category A – 79.

Buildings of national or international importance, either architectural or historic, or fine little altered examples of some particular period, style or building type.

Category B – 678.

Buildings of regional or more than local importance, or major examples of some particular period, style or building type which may have been altered.

Category C(s) – 556.

Buildings of local importance, lesser examples of a particular period, style or building type, as originally constructed or altered; and simple traditional buildings which group well with others in categories A and B or are part of a planned group such as an estate or an industrial complex.

Total **1313 listed buildings**

Listed buildings in the main Burgh areas:

Stirling Burgh -	569
Dunblane Burgh -	68
Bridge of Allan -	123
Doune Burgh -	66
Callander Burgh -	25
Total	851 listed buildings

There are 462 listed buildings outwith the Burghs, covering the rural areas and rural settlements of the Stirling Council Area.

ECOLOGY AND MANAGEMENT

Buildings.

Buildings are extremely variable according to their age, the material they are built of and their use. Species making use of buildings form two groups, those that spend all, or the majority, of their lifecycle within the structure e.g. plants and those for which buildings

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are only used for part of their lifecycle e.g. birds. Older buildings tend to be constructed of natural materials and can be important for lichens.

Buildings provide nesting and roosting sites for many different species of animals. Such as swallow, swift, house martin, barn owl, Daubenton's, pipistrelle and long eared bats. Old buildings are more biodiversity friendly than new ones, as they have more nooks and crannies. Bats often form nursery roosts in more modern buildings (with central heating!), frequently those less than 30 years old.

Farm outbuildings are a major nesting site for Swallows. Sheds and garages can provide good nesting sites for garden bird species such as blackbird *Turdus merula*, robin *Erithacus rubecula*, wren *Troglodytes troglodytes*.

On the whole modern buildings represent a poorer habitat for wildlife due to there being less openings, nooks and crannies for them to nest or rest in. However there are easy no-cost measures that can be incorporated into modern designs that will increase the availability of resting and nesting habitat without causing nuisance to householder.

Derelict buildings are often very good structures for wildlife for their variety of habitats found there and lack of disturbance. The wildlife found in and around these structures are vulnerable to insensitive redevelopment or the complete razing of the building prior to development of a site.

Stone structures with lime mortar commonly have maidenhair spleenwort *Asplenium trichomanes*, common polypody *Polypodium vulgare*, ivy leaved toad flax *Cybalaria muralis* and wall rue *Asplenium ruta-muraria* growing in the mortar.

Bats and Bridges.

Older bridges again provide many nesting sites for species such as dippers and substrate for plants and ferns to grow on. Modern concrete structures may seem to be very unfriendly to any occupation from wildlife but as long as there are small nooks they can be very attractive to bats. Some concrete bridges in the USA have thousands of bats roosting in them.

In a survey of Cumbria's bridges (Billington and Norman 1996), 2,555 roosts surveyed. Of these 320 (12.5%) were confirmed as bat roosts and 1039 (41%) had suitable crevices for bats. Daubenton's bat was the most frequently recorded species in 92 (3.6%). Natterer's bat were recorded in 25 (1%), other species recorded in small numbers were pipistrelle, brown long eared bat and whiskered bat. Most roosts were found in bridge spans (75%). The main requirements for a roost site is that they should be at least 100mm deep and protected from the elements. Roosts showed a strong association with flowing water and broad-leaved trees. The bats seemed not to be too fussy about arch height unless it was less than a metre.

While feeding and commuting to and from roosting and feeding sites bats often choose to fly along linear landscape features such as woodland edges, hedges and watercourses. These features are believed to provide protection from predation, good feeding opportunities and as an aid to navigation. The National Bat Habitat Survey (Walsh et al, 1995) also emphasised the importance of linear habitats. It was suggested that feeding opportunities and cover were the most important factors influencing this choice of

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habitat, based on the avoidance by bats of linear features without one or both of these characteristics i.e. stone walls and fragmented hedges.

The importance of the riparian environment to bats has been reviewed by Racey (1996). In this review he concluded that bat roosts are concentrated in buildings and bridges in river valleys: Daubenton's bat, pipistrelle and whiskered bat have a strong association with water bodies when feeding and pipistrelles use bridges as mating stations.

In general bat roosts were most likely to be found in

- Larger bridges +3 metres in span.
- Bridges made from either brick or sandstone
- Bridges crossing watercourses with broadleaved riparian woodland.

Identification of key bridge sites.

From this information the larger stone or brick bridges over the Forth, Teith, Allan, Endrick, Blane and Dochart are the key sites to begin survey on. It is expected that these will hold the largest numbers of bats and so are the best to concentrate on if resources for surveying are limited.

CURRENT FACTORS CAUSING LOSS OF DECLINE AND FUTURE THREATS

- Current building design, restricting access to potential nesting and roosting sites.
- Current maintenance regimes, filling all cavities and blocking access to roof space.
- People's negative attitude to biodiversity around or on their home.
- Loss of feeding habitats for these species within urban areas (biodiversity unfriendly landscaping and development).
- Lack of knowledge of existing biodiversity value of buildings in the planning of developments/ re-developments.
- Demolition of derelict buildings.
- Disturbance, both human and mechanical, many sites are subject to almost constant disturbance including light pollution.
- Bridge maintenance and strengthening work.
- Repointing stonework with cement where lime was the original mortar.

OPPORTUNITIES AND CURRENT ACTION

- Policy SD1.1 of the Stirling And Clackmannanshire Structure Plan – **That full account has been taken of the impact on the environment. New development will only be permitted where it can be accommodated in an environmentally acceptable manner.**
- Policy SD1.3 of the Stirling And Clackmannanshire Structure Plan – **That the potential of the development to contribute to the enhancement of the quality and distinctiveness of the built and natural environment.**
- Policy ENV 1.3 of the Stirling And Clackmannanshire Structure Plan - **All development proposals will be considered in the light of the recommendations**

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of the Stirling Biodiversity Action Plan and the related Habitat and Species Action Plans.

- Policy ENV1.4 of the Stirling And Clackmannanshire Structure Plan – **Where a development is consistent with parts 1-3 of this policy, there will be a requirement to provide a net environmental benefit through enhancement of the nature conservation interest on the site.**
- The presence of many potential wildlife recorders and habitat improvers in this habitat.
- It is a legal requirement that any building works take account of known bat roosts. In Stirling only a small proportion of the roosts have been discovered or recorded and it is likely that many are unknowingly destroyed.
- Growing awareness of urban biodiversity.
- Possible SPUR (Stirling Partnership for Urban Renewal) funding for integrated biodiversity improvement in the urban Stirling town area
- Changing small design details in new build housing too make them more biodiversity friendly.
- Cheap retrofitting of bat accommodation on concrete bridges.
- The opportunity for building policy to include the protection of Hirundines such as swifts, swallows and house martins.
- Awareness raising to protect bat species in the roof space of private and public buildings.
- Re-pointing lime mortared joints with lime mortar instead of cement, so as not to exclude masonry bees and where appropriate, to encourage lime-loving plants such as spleenworts, ferns, liverworts and mosses.
- The opportunity to incorporate Sustainable Urban Drainage Systems (SUDS) into proposed and existing developments to reduce surface run off.

REFERENCES

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Racey. 1996. **The importance of the riparian environment as a habitat for British bats. In Behaviour and Ecology of Riparian Mammals.** *Symp. Zool. Soc. Lond. No. 73.* Eds Dunstone, N & Gorman, M. L.

Walsh et al. 1995. **Abundance and habitat selection of foraging vespertilionid bats in Britain: a landscape scale approach.** *Symp. Zool. Soc. Lond. No.67:325-344.*

Web sites.

Bat Conservation International www.batcon.org

Bat Conservation Trust www.bat.co.uk

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