



The countryside charity Sussex

Biodiversity Enhancement in New Housing Developments

Providing added value for people and their communities.

1. Introduction:

With the current pressures for building new houses, it becomes more essential than ever that we do so in a way that does not damage, and indeed enhances, the natural environment on which we all depend for our quality of life.

It would be easy to just assume that new houses, even when built in appropriate locations, will destroy or damage the local wildlife environment. However, when built in the right way and incorporating simple and cost effective features, new housing can significantly contribute to enhancing wildlife habitat. This should now be the aim of all those involved in such developments, including the developers, the builders, the local planning authority, future residents and the local community.

This documents sets out ways in which such enhancements can be incorporated into all new developments, based on building in wildlife friendly features at the construction stage and ensuring appropriate planting of native and wildlife friendly trees, shrubs and plants.

As well as improving the immediate environment of the development site, these measures can also contribute substantially to establishing and maintaining wildlife corridors that support the wider landscape.

These approaches have been put together jointly by Campaign to Protect Rural England (CPRE) Sussex and Royal Society for the Protection of Birds (South East). **It is our hope that planning authorities will adopt these principles formally as part of their planning policies and guidance** so that such provisions become the normal expectation for all those involved in new developments.

2. Broad Principles

- a) New developments should be designed to integrate space for both wildlife and people, as well as to reduce carbon emissions and minimise water usage.
- b) They should be designed to retain and fit in with existing wildlife friendly features, such as meadows, wetlands, hedges, trees and woodland. They should enhance this network and establish green corridors that contribute to the wider ecological networks.
- c) They should incorporate wildlife-rich gardens and other green spaces.
- d) They should include structural features that enable birds, bats and other creatures to live in harmony with people (see below).

3. Building for wildlife

In addition to larger scale wildlife-friendly features, such developments should include environmentally sustainable features such as:

- a) Trees, hedgerows, water and other habitats
- b) Wildflower verges along roads
- c) Lighting designed to reduce light pollution and avoid disturbing wildlife
- d) Integrated bird and bat boxes/bricks built into new houses
- e) Wildlife –friendly green walls and roofs, which do not need to be the preserve of the houses but could also extend to communal bin areas, bus shelters and bike stores.
- f) Native wildlife-friendly plants, trees and shrubs
- g) Street trees
- h) Interpretation panels to explain the role of these features.
- i) Hedgehog highways maintaining connectivity through gardens

- j) Wildlife-friendly sustainable drainage (SuDS)

4. The benefits for people

- a) Daily enjoyment of nature
- b) Improved health
- c) Sense of community
- d) More attractive places to live

5. The benefits for developers

- a) A more attractive product
- b) Satisfied customers
- c) Higher market values
- d) Enhanced reputation – community responsible developers
- e) Happier communities.
- f) Can reduce costs by working with nature rather than against it, e.g. less management required on wildflower grass vs” traditional” amenity grass.

6. The benefits for local planning authorities

- a) Sets a standard for the authorities on biodiversity
- b) Clarifies the position for all applicants on planning expectations
- c) Show the authority as an upholder of high biodiversity standards
- d) Helps to meet national requirements for enhanced biodiversity in new developments.

SPECIFIC FEATURES FOR INCORPORATION IN NEW HOUSING DEVELOPMENTS

Introduction:

It is essential that all new development sites are properly assessed and surveyed so that a clear picture develops of the existing wildlife features and ecology of the local area. It will also be important for planners and developers to be aware of habitat features and wildlife data for a wider area around the development, as this will provide information on helpful aspects to be incorporated in the development.

Expert advice should be sought on specific wildlife requirements and support for protected and endangered species in the local area.

The following provisions are for general application and should normally be incorporated into all new houses unless there is an exceptional reason why this is not possible.

BIODIVERSITY OPPORTUNITIES WITHIN THE BUILT FABRIC

1. BIRDS

Provision of artificial nest sites is required because of the lack of nesting opportunities in modern building design. This loss of suitable opportunities is implicated in the substantial decline of these species. In addition to the nesting features, it will also be important to consider the features needed to support these species, such as food sources and connectivity to the wider landscape.

Species	Actions	Notes
Swift	Install internal (swift) boxes at soffits/eaves level/in gable ends	<ul style="list-style-type: none">• At least five metres above ground level with unimpeded access• A northerly or well-shaded aspect is essential. Avoid southerly aspects and immediate vicinity of windows. Out of sunlight under deep eaves or on walls that do not receive much sun.

		<ul style="list-style-type: none"> • Nest sites should be reasonably close to support swift colonies • Broadcasting recorded calls (breeding season) will increase likelihood of occupation
House Sparrow	Install internal boxes at soffits/eaves level	<ul style="list-style-type: none"> • Suitable buildings will be within reasonable proximity of open spaces and green infrastructure • At least two metres above ground level with somewhere to perch in the vicinity. Thick hedges and trees are helpful. • Needs to be shaded. Easterly or Northerly aspect is best. Avoid southerly aspects. • Sparrows prefer to nest in loose colonies of 10 to 20 pairs so boxes can be next to each other in groups of six or more. Alternatively, put up a few boxes in each of several adjacent buildings.
Starling	Install internal boxes at soffits/eaves level	<ul style="list-style-type: none"> • Suitable buildings within close foraging range of open spaces and green infrastructure. • At least three metres above ground level with somewhere to perch in the immediate vicinity – e.g. trees, hedges • Needs to be shaded. Easterly aspect best. Avoid southerly aspects • Starlings can be noisy, so site nests where they will not be a nuisance.
Swallow	Create purpose-built ledges inside buildings where secure from predation (cats, rats etc.) Install pre-formed nest cups to encourage establishment	<ul style="list-style-type: none"> • Open sided buildings eg carports, porches and cycle stores etc. within close proximity of green infrastructure. • Swallows need access to their main building materials, which is mud collected from puddles and the edges of standing water, ponds, or slow-flowing streams. • Avoid locations where droppings may cause a nuisance.
House Martin	Install pre-cast nest cups to encourage establishment.	<ul style="list-style-type: none"> • Buildings with wide soffits/eaves in close proximity to green infrastructure. • At least five metres of clear space above ground level. Adequate shelter from sun and prevailing weather essential. Avoid southerly elevations. • House martins breed in close-knit groups and will build clusters of nests, so long as there is a good supply of mud from standing water or slow streams.

		<ul style="list-style-type: none"> • Fixing over doors or windows should be avoided,
Garden Birds (e.g. robin, wren, thrush, blackbird, finches and tits.)	Install appropriate nest boxes	<ul style="list-style-type: none"> • Where there is access to adequate public and private open space including gardens. • Sites should be sheltered from direct sunlight and prevailing weather. • Trees at an appropriate height for the species make good sites.
Owls and Kestrels	Install appropriate nest boxes	<ul style="list-style-type: none"> • At the interface between built areas and open spaces/green infrastructure • Direct access to suitable hunting areas • Site must have low risk of disturbance • Seek specialist advice on suitability of sites and design of boxes.

2. BATS: When considering artificial; bat nesting sites, it is important to consider the availability of other resources that are needed to support these species, for example flight lines, feeding sites, etc.

Species	Actions	Notes
Crevice-dwelling bats (eg Pipistrelles, Brandt's and Whiskered)	<ul style="list-style-type: none"> • Leave or create spaces in the wall or behind cladding • Install ready-made bat bricks into the walls or under the eaves • Create sandwich boards (Kent bat box) of at least three layers with a one 	<ul style="list-style-type: none"> • Crevice-dwelling bats can crawl into small spaces, although areas of 1 square metre would be useful for summer nursery roosts. • Height of entry can be from 2 to 7 metres above ground • Summer nursery roosts will have a southerly or westerly aspect. Male roosts and winter hibernation roosts should have a northerly aspect. • Materials for the roosts should be rough (for grip), non-toxic or corrosive, with no risk of entanglement. • The access should not be close to artificial lighting. • Maintain or enhance linear features in the landscape such as tree-lines and hedgerows that bats can use for cover and flight paths.

	inch gap to place inside roof void, against the battens.	
Roof-dwelling bats (Noctule, Serotine, Daubenton's, Greater Mouse-eared, Barbastelle, Bechstein)	<ul style="list-style-type: none"> • Leave timber joists and/or beams exposed. • Install access points such as spaces under the eaves or specially-made holes in roof tiles. 	<ul style="list-style-type: none"> • The height of entry should be 2 to 7 metres above ground • Locations, aspects and features as per 'Crevice-dwelling Bats' above.
Bats that need flight spaces eg Natterer's Brown and Grey Long-eared Bats.	Keep roof spaces untrussed to allow flight.	<ul style="list-style-type: none"> • Height of entry should be over 2m above ground level • Roosting/nesting dimensions of untrussed roof spaces should be 2 – 2.8 (h), 5 m (w) 5 m (l). • Maintain or enhance linear features in the landscape such as tree-lines, hedgerows that bats can use for cover and flight paths.

LIVING (GREEN) ROOFS

- Design in green or brown roofs wherever suitable
- Green/living roofs can enhance the wildlife of urban areas and can also replace habitat lost at ground level to building works; for example, brown roofs can recreate brownfield habitat features which are important to site biodiversity.
- Can be particularly useful when the development site is too small to incorporate biodiversity enhancement features at ground level and on high-rise flats/apartments.

Illustrations of how nest sites can be incorporated into buildings

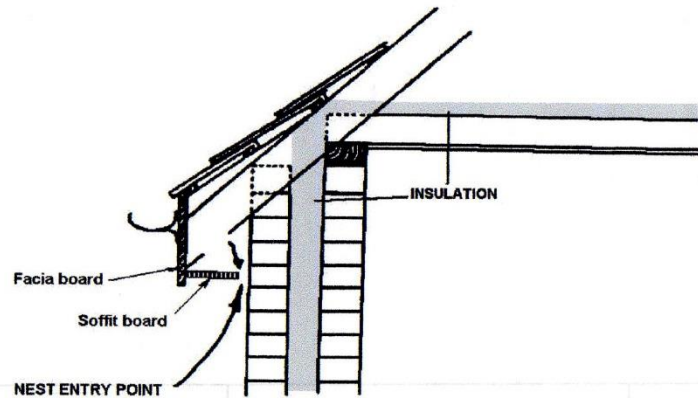


Diagram showing detail of traditional boxed eaves

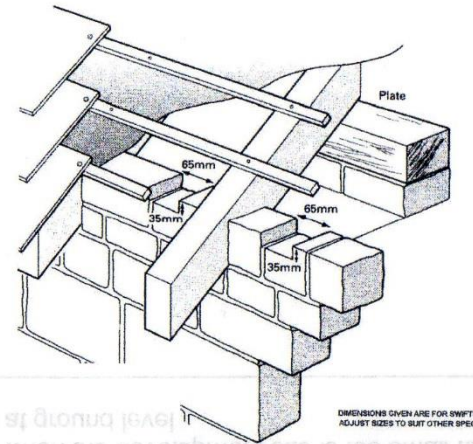


Diagram showing typical detail for open-soffit roofs

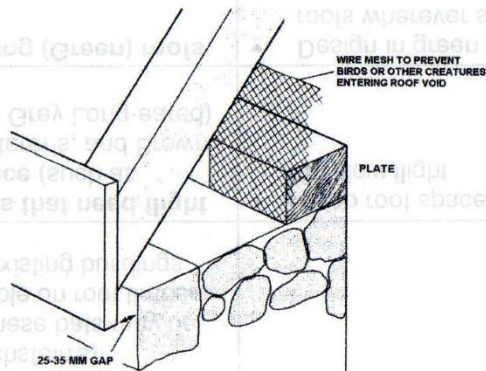


Diagram showing typical detail for solid walls construction - and access points for nesting birds

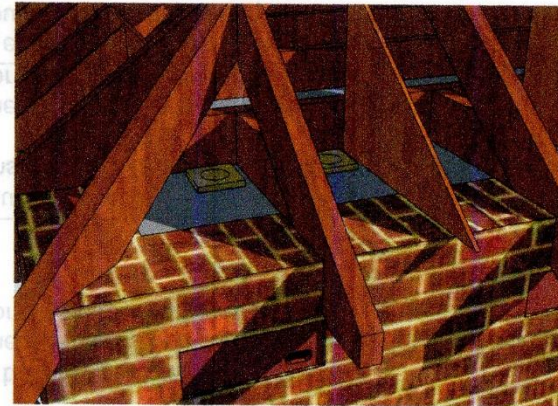


Diagram showing an Ibstock style brick and boxed joists for open eave access with artificial swift nest platforms in place.

Note: These approaches are not an exhaustive list, other design solutions are likely to be appropriate depending upon the built form and construction methodology. Early involvement of the ecologist in the design process is essential to ensure nest/roosting sites are appropriately designed into the building fabric. Images courtesy of Swift Conservation – <http://www.swift-conservation.org/>

BIODIVERSITY OPPORTUNITIES WITHIN THE LANDSCAPING

Before making any changes to habitat features or management, an ecological survey should be undertaken and interpreted by a suitably qualified professional.

Biodiversity feature	Actions	Notes
Hedges	<p>Plant hedges consisting of a number of wildlife friendly species to provide fruit, seed and nectar throughout most of the year.</p> <p>Provide sufficient space for dense hedges to grow to at least 2 metres wide with a wider margin on each side for long grasses to grow at the base.</p> <p>Locate new hedges so they will contribute towards forming a local wildlife habitat network with neighbouring hedges, trees, shrubs, scrub, grassland and water.</p> <p>Plant native hedges such as hawthorn, blackthorn and holly along boundaries where security is important.</p>	<p>Hedges provide shelter, breeding, nesting and foraging sites for a wide variety of species and act as wildlife corridors if they are dense and wide enough.</p>
Trees and shrubs	<p>Provide wildlife-friendly tree and shrub species with varying heights and structure which will benefit more wildlife species.</p> <p>Locate trees and shrubs so they provide, where possible, continuity with nearby existing habitat.</p> <p>Retain trees with holes and dead wood as these are valuable for birds, bats, insects and fungi. Retain woody cuttings, stumps and fallen branches on site.</p> <p>Herbaceous plants and/or long grass in front of shrub/tree areas will provide additional wildlife interest.</p> <p>Retain areas of patched or bare earth for invertebrates to bask, nest and forage.</p> <p>Native plants (100%) of UK provenance in structural landscaping, and species with a known value to wildlife in the built landscape.</p>	<p>Trees and shrubs provide shelter, nesting sites and fruit for birds. Their flowers provide nectar for bees and other insects.</p> <p>Dead and decaying wood is valuable to a range of invertebrates which depend on it to complete their life cycles.</p> <p>Phenology of native plants synchronised to life cycles of native invertebrates.</p> <p>Foliage of native species palatable to wider range of invertebrate fauna.</p>

		Native species will be more disease and frost resistant.
Climbing plants	<p>Locate climbing plants so they cover otherwise bare walls and fences.</p> <p>Locate climbing plants close to existing hedges, trees, shrubs and flowering grassland so they will help to connect local wildlife habitat networks.</p> <p>Non-invasive: ensure any ornamental climbers are non-invasive.</p>	Climbers such as ivy, clematis and honeysuckle provide nesting, shelter and berries for birds and nectar for insects.
Scrub	Consider generating scrub habitat adjacent to existing wildlife-rich habitat.	Dense scrub provides good cover and food for birds, insects and reptiles.
Wildflower-rich grass	<p>Provide this as part of informal landscaping on areas of poor soil or poor drainage (see lists below).</p> <p>Embed spring flowering bulbs and plugs of nectar rich flowering plants</p> <p>Maintain patches of long grass, enabling plants to flower and seed</p> <p>Remove cuttings</p>	Wildflower rich grassland provides cover for small mammals and invertebrates, and sources of nectar. Short grass can be enhanced by adding flowering species tolerant of frequent mowing and trampling. Cutting and collecting needs to be managed at pre-defined intervals.
Watercourses and their banks	<p>Enhance and restore the naturalness of existing watercourses by buffer planting, soft contouring of steep sides and removal of culverts.</p> <p>Avoid developments and hard landscaping adjacent to the watercourse.</p>	Streams, wet ditches and seasonal watercourses and their banks are important wildlife habitats.
Reptiles	<p>Provide areas of long grass, interspersed with sheltered sunny areas of bare ground and rocks where reptiles can bask.</p> <p>Provide rockeries where reptiles can hibernate in cavities below ground</p> <p>Locate these habitat features so they provide continuity with existing habitat.</p>	Reptiles are likely to include slow worms, common lizard, adder and grass snakes.
Amphibians	<p>Provide wildlife-friendly ponds, water channels and wetland areas, with associated vegetation, both independently and as part of a sustainable urban drainage system</p> <p>Locate these features so they provide, as far as possible, continuity with nearby existing habitats.</p>	Amphibians may include frogs, common toads, smooth and palmate newts. Clean water is essential.
Invertebrates	Provide flower rich grassland with areas of long and undisturbed grass. Also wildlife friendly hedges, native trees and shrubs.	Invertebrates include bees, butterflies, moths, ants. Flies, beetles, spiders,

	Provide wildlife friendly ponds with buffer zones and good water quality. Retain and create “brownfield” open mosaic habitats with landscaping featuring bare ground and early successional pioneer habitats.	molluscs etc. Many rely on brownfield sites.
Small mammals	Provide long grass and habitats which provide a variety of fruit and seeds for small mammals. Provide access routes between garden areas to support hedgehogs.	Small mammals include mice, voles, shrews and hedgehogs.
Bird nest sites and bat roosts	Provide hedges, shrubs and trees, which will provide natural nesting sites as the plants mature. Install appropriate bird boxes and bat roosts on suitable existing trees, avoiding southerly elevations.	

PLANTING – SUGGESTED SPECIES LISTS.

The lists below are advisory and are not exhaustive. In general, native plant species should be the first choice. The specific choice of species may vary according to local soil types and the proximity of other habitats. The sensitive use of non-native species can provide additional food and shelter for wildlife and can be considered for use as part of the range of plant species for new developments. **NB Invasive species** must be avoided as they can have a seriously detrimental effect on habitats established within a development and on existing local habitats.

List 1 – HEDGE SPECIES

Species	Scientific name
Hawthorn	<i>Crataegus monogyne</i>
Hazel	<i>Corylus avellana</i>
Blackthorn	<i>Prunus spinose</i>
Crab apple	<i>Malus sylvestris</i>

Holly	Ilex aquifolium
Field maple	Acer campestre
Wild privet	Ligustrum vulgare
Dog rose	Rosa canina
Dog wood	Cornus sanguinea
Wayfaring tree	Viburnum iantana
Guelder rose	Viburnum opulus

List 2 – TREES AND WOODLAND SPECIES

Species	Scientific name
Hazel	Corylus avellana
Field maple	Acer campestre
Hawthorn	Crataegus monogyna
Blackthorn	Prunus spinose
Crab apple	Malus sylvestrus
Rowan	Sorbus aucuparia
Bird cherry	Prunus padus
Whitebeam	Sorbus aria
Elder	Sambucus nigra
Holly	Ilex aquafolium
Alder	Alnus glutinosa
Ash	Fraxinus excelsior
Pedunculate oak	Quercus robur
Sweet chestnut	Castanea sativa

List 3 – HERBACEOUS WILDFLOWER AND GRASS SPECIES which may be seeded or over-sown into wildflower rich grassland.

Species	Scientific name
Crested dog's tail	<i>Cynosurus cristatus</i>
Sweet vernal grass	<i>Anthoxanthum odoratum</i>
Common bent	<i>Agrostia capillaris</i>
Red fescue	<i>Festuca rubra</i>
Birdsfoot trefoil	<i>Lotus corniculatus</i>
Black knapweed	<i>Centaurea nigra</i>
Common sorrel	<i>Rumex acetosa</i>
Field scabious	<i>Knautia arvensis</i>
Ribwort plantain	<i>Plantago lanceolata</i>
Lady's bedstraw	<i>Gallium verum</i>
Meadow buttercup	<i>Ranunculus acris</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Red clover	<i>Trifolium pratense</i>
Selfheal	<i>Prunella vulgaris</i>
Wild carrot	<i>Daucus carota</i>
Yarrow	<i>Achillea millefolium</i>
Yellow rattle	<i>Rhinanthus minor</i>

List 4 – HERBACEOUS WILDFLOWER SPECIES which may be seeded or over-sown into amenity grassland

Species	Scientific name
Birdsfoot trefoil	<i>Lotus corniculatus</i>
Common cats ear	<i>Hypochoeris radicata</i>
Daisy	<i>Bellis perennis</i>
Goat's beard	<i>Tragopogon pratensis</i> agg.

Ribwort plantain	Plantago lanceolata
Selfheal	Prunella vulgaris
Yarrow	Achillea millefolium
Lady's bedstraw	Galium verum
Autumn hawkbit	Leonodon autumnalis
Black medick	Medicago lupulina
Salad burnet	Sanquisorba minor

List 5 – NATIVE WILDLIFE ATTRACTING BULBS which may be introduced within amenity grassland and/or below shrub, tree or woodland planting.

Species	Scientific name
Ramsons	Allium ursinum
Snowdrop	Galanthus nivalis
Bluebell	Hyacinthoides non-scriptus
Primrose	Primula vulgaris
Wild daffodil	Narcissus pseudonarcissus
Lesser celandine	Ranunculus ficaria
Snake's head fritillary	Fritillaria meleagris

List 6 – PLANTS FOR POND MARGIN HABITATS

Species	Scientific name
White water lily	Nymphaea alba
Common water starwort	Callitriche stagnalis
Hornwort	Ceratophyllum demersum
Water crowfoot	Ranunculus hederaceus
Brookline	Veronica beccabunga
Burr-reed	Sparganium erectum

Greater spearwort	Ranunculus lingua
Marsh marigold	Caltha palustris
Meadowsweet	Filipendula ulmaria
Purple loosestrife	Lythrum salicaria
Water forget-me-not	Myosotis scorpioides
Water milfoil	Myriophyllum spicatum
Water plantain	Alisma plantago-aquatica
Yellow flag iris	Iris pseudacorus

ADDITIONAL SOURCES OF INFORMATION

We are grateful to the following organisations whose work has contributed to this document:

Exeter City Council <https://exeter.gov.uk>

Sussex Wildlife Trust - <https://sussexwt.org.uk>

Royal Society for the Protection of Birds (RSPB) – <https://rspb.org.uk>

Bat Conservation Trust <https://bats.org.uk>

Buglife <https://buglife.org.uk>

FOR BIODIVERSITY RECORDS IN SUSSEX

Sussex Biodiversity Records Centre <https://sxbrc.org.uk>

ALSO SEE:

Homes for People and Wildlife, published by the Wildlife Trusts 2018