

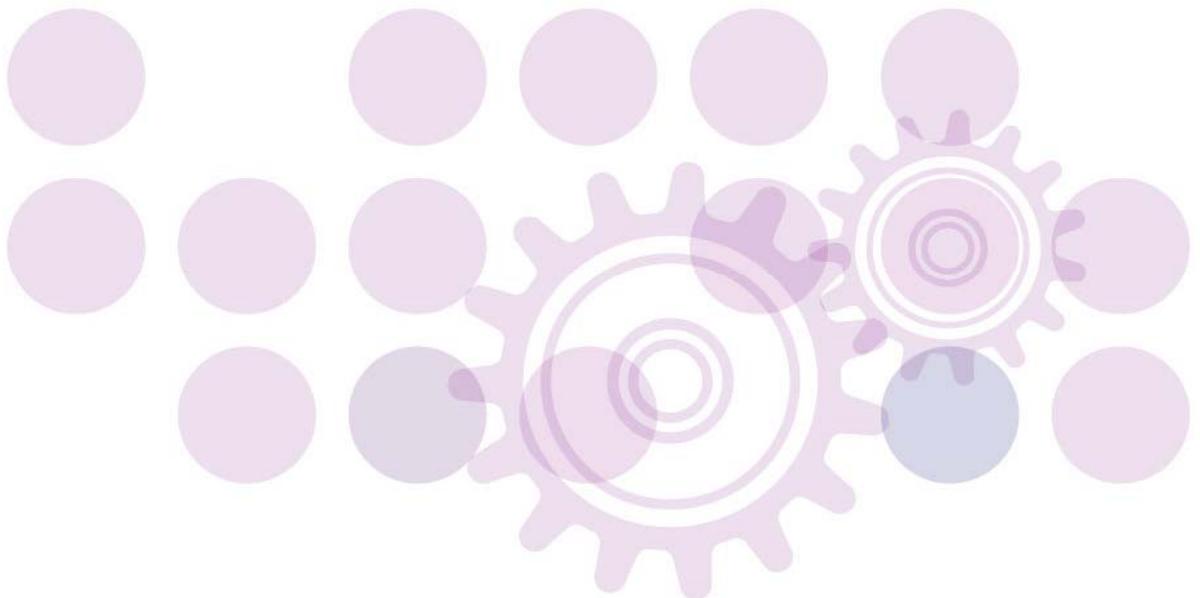
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supplementary planning document

Brighton & Hove City Council Local Development Framework

Adopted 25th March 2010

Nature Conservation and Development - Annexes



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Annex I: Habitats and species of importance in Brighton and Hove

The table below lists habitats and species of particular importance which are known to occur in Brighton and Hove. It can be used as a useful checklist for assessing the nature conservation value of development sites. Note that the table includes several urban habitat types which may not have specific recognition by the national BAP process, but do have particular value in the context of urban Brighton and Hove.

The table should not be regarded as entirely comprehensive for the purposes of development control. For example a variety of nature conservation features can occur, such as particularly large, old trees or piles of dead wood, which are not listed below but which should nevertheless be conserved where possible as part of development proposals.

Feature - species		Legal / policy protection	NERC Section 41*	UK BAP	Sussex BAP
English name	Latin name				
Adder	<i>Vipera berus</i>	W&C Act Schedule 5 Killing & injuring S.9(1) (part); sale S.9(5)			

Adonis Blue butterfly	<i>Lysandra bellargus</i>	W&C Act Schedule 5 (Sale only S.9(5))	Y	Y	
Badger	<i>Meles meles</i>	Protection of Badgers Act 1992			
Barn Owl	<i>Tyto alba</i>	W&C Act Schedule 1			Y
Bats – all species	<i>Vespertilionidae and Rhinolophidae</i>	W&C Act Schedule 5, (full protection) Habitat Regs S. 2	(some)	(some)	Pipistrelle only
Black Redstart	<i>Phoenicurus ochruros</i>	W&C Act Schedule 1			
Brown Hare	<i>Lepus europaeus</i>		Y	Y	Y
Bullfinch	<i>Pyrrhula pyrrhula</i>		Y	Y	
Corn Bunting	<i>Miliaria calandra</i>		Y	Y	
Early Spider Orchid	<i>Ophrys sphegodes</i>	W&C Act Schedule 8			
English Elm	<i>Ulmus procera</i>	Brighton holds the National Collection of this species			
Firecrest	<i>Regulus ignicapillus</i>	W&C Act Schedule 1			
Glow Worm	<i>Lampyris noctiluca</i>				Y
Grass Snake	<i>Natrix natrix</i>	W&C Act Schedule 5 Killing & injuring S.9(1) (part); sale S.9(5)			
Great Crested Newt	<i>Triturus cristatus</i>	W&C Act Schedule 5 (full protection), Habitat Regs S. 2	Y	Y	Y
Grey Partridge	<i>Perdix perdix</i>		Y	Y	
Hoary Stock	<i>Matthiola incana</i>				
Hornet Robberfly	<i>Asilus crabroniformis</i>		Y	Y	
House Sparrow	<i>Passer domesticus</i>	'red list' of birds of conservation concern			
Juniper	<i>Juniperus communis</i>		Y	Y	
Linnet	<i>Carduelis cannabina</i>		Y	Y	
Meadow Clary	<i>Salvia pratensis</i>	W&C Act Schedule 8			
Peregrine	<i>Falco peregrinus</i>	W&C Act Schedule 1			
Pennyroyal	<i>Mentha pulegium</i>	W&C Act Schedule 8	Y	Y	
Red Star-thistle	<i>Centaurea calcitrapa</i>				
Sea Knotgrass	<i>Polygonum maritimum</i>	W&C Act Schedule 8			
Shepherd's Needle	<i>Scandix pecten-veneris</i>		Y	Y	
Skylark	<i>Alauda arvensis</i>		Y	Y	Y
Slow Worm	<i>Anguis fragilis</i>	W&C Act Schedule 5 Killing & injuring S.9(1) (part); sale S.9(5)			
Song Thrush	<i>Turdus philomelos</i>		Y	Y	Y
Stag Beetle	<i>Lucanus cervus</i>		Y	Y	Y
Starling	<i>Sturnus vulgaris</i>	'red list' of birds of conservation concern			

Stinking Hawk's-beard*	<i>Crepis foetida</i>		Y	Y	
Swift + House Martin + Swallow	<i>Apus apus</i> + <i>Delichon urbica</i> + <i>Hirundo rustica</i>				Y (swift only)
Tree Hedgehog fungus	<i>Hericium erinaceum</i>	W&C Act Schedule 8	Y	Y	
Tree Sparrow	<i>Passer montanus</i>		Y	Y	
Turtle Dove	<i>Streptopelia turtur</i>		Y	Y	
Viviparous Lizard	<i>Lacerta vivipara</i>	W&C Act Schedule 5 Killing & injuring S.9(1) (part); sale S.9(5)			
Wild birds (most species)	-	W&C Act			
Yellowhammer	<i>Emberiza citrinella</i>	'red list' of birds of conservation concern			
Feature – habitats					
	Legal / policy protection	NERC Section 41*	UK BAP	Regional BAP+	Sussex BAP
Ancient and/or species-rich hedgerows		Y	Y		Y
Ancient woodland and 'veteran' trees	PPS 9				
Arable land					Y
Cereal field margins		Y	Y		
Coastal vegetated shingle		Y	Y	Y	Y
Littoral and sublittoral chalk		Y	Y	Y	
Lowland calcareous (chalk) grassland		Y	Y	Y	Y
Lowland mixed deciduous woodland		Y	Y	Y	Y
Lowland wood-pasture and parkland		Y	Y	Y	Y
Maritime cliff and slopes		Y	Y	Y	Y
Road verges					Y
School grounds (Brighton & Hove BAP)					
Standing fresh water (including ponds of all types)				Y	
The Downs					Y

* 'NERC Section 41' refers to Section 41 of the Natural Environments and Rural Communities Act 2006. This Section of the Act requires the Secretary of State to publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity in England. The species and habitats with a 'Y' in this column are included in those lists.

+ At the time of writing the South East Regional BAP contains targets for habitats only.

For further information see:

UK BAP:	www.ukbap.org.uk
Regional BAP:	www.sebiodiversity.org.uk
Sussex BAP:	www.biodiversitysussex.org
Brighton & Hove BAP:	www.citywildlife.org.uk/fbx_index.cfm?fuseaction=bio.home

Annex 2: Legislation, policy and nature conservation

1. **The Wildlife and Countryside Act 1981** includes the following offences of relevance to development control:

Subject to exceptions, it is a criminal offence to intentionally kill, injure, or take any wild bird or their eggs or nests. Special penalties are available for offences related to birds listed on Schedule 1, for which there are additional offences of intentionally or recklessly disturbing these birds at their nests, or their dependent young.

Subject to exceptions, it is a criminal offence to intentionally or recklessly kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5. The Act also prohibits interference with places used by them for shelter or protection and intentional or reckless disturbance to animals occupying such places.

Subject to exceptions, to pick, uproot, or possess (for the purposes of trade) any wild plant listed in Schedule 8. The Act also prohibits the unauthorised intentional uprooting of such plants.

2. Annex I of this SPD includes the species listed in Schedules 1, 5 and 8 of the Wildlife & Countryside Act which could occur on development sites in Brighton and Hove.
3. The Act contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, including prohibition of the release of animals and the introduction of a plant to the wild or to otherwise cause it to grow or spread there of plants listed in Schedule 9. A species of particular concern in the Brighton and Hove context is Japanese Knotweed (*Polygonum cuspidatum*). Applicants will be expected to demonstrate that they have taken all reasonable steps and exercised all due diligence to ensure Schedule 9 species are not permitted to grow as part of the implementation of planning permission. Planning conditions and obligations can be used to ensure adequate measures are taken.
4. For a full review of the Wildlife and Countryside Act 1981, see the Joint Nature Conservation Committee web site at: www.jncc.gov.uk/page-1377.
5. **The Conservation (Natural Habitats &c.) Regulations 1994** provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites. For a full review of the Regulations, see the Joint Nature Conservation Committee web site at: <http://www.jncc.gov.uk/page-1379>.

6. Under the Regulations, the local planning authority has a general duty, in the exercise of its functions, to have regard to the EC Habitats Directive.
7. The Regulations establish the process for identifying, designating and conserving Special Areas of Conservation (SACs). Brighton and Hove has one SAC site at Castle Hill, north of Woodingdean. Detailed guidance for development proposals which may affect SACs is provided in Part I of ODPM Circular 06/2005, which is available on the Internet at www.communities.gov.uk.
8. The Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. Animals listed in Schedule 2 of the Regulations which may occur on development sites in Brighton and Hove are listed in Annex I of this SPD. None of the plants listed in Schedule 4 of the Regulations are likely to occur on development sites in Brighton and Hove.
9. Detailed guidance for development proposals which may affect European protected species is provided in Part IV of ODPM Circular 06/2005.
10. **The Countryside and Rights of Way (CROW) Act 2000** Schedule 9 places a duty on public bodies to further the conservation and enhancement of SSSIs. There are two SSSIs in Brighton and Hove; Castle Hill (also a SAC) and Brighton to Newhaven Cliffs. The boundaries of both these sites can be viewed at www.citywildlife.org.uk.
11. Schedule 12 of the Act strengthens the legal protection for threatened species. This includes making certain offences 'arrestable', and creating a new offence of reckless disturbance.
12. **DETR Circular 04/2001** provides guidance to local authorities on the provisions of the Countryside and Rights of Way Act 2000. Paragraph 48 of the Circular encourages local authorities to produce Local BAPs.
13. A full review of the Countryside and Rights of Way Act 2000 can be found at <http://www.jncc.gov.uk/page-1378>.

14. **The Natural Environment and Rural Communities Act 2006** Section 40 places a duty on all public authorities to have regard, so far as is consistent with the proper exercise of their functions, to the purpose of conserving biodiversity. 'Biodiversity' is defined as including restoring or enhancing a species population or habitat.
15. Section 41 places a duty on the Secretary of State to maintain a list of organisms and habitats of principal importance for which conservation steps should be taken or promoted. The Government has published a list of these organisms and habitats species and habitats. Annex I of this SPD lists NERC Act Section 41 organisms and habitats which may occur on development sites in Brighton and Hove.
16. **The Protection of Badgers Act 1992** makes it an offence to interfere with a badger sett, whether by obstructing the entrance, destroying the sett or in any way disturbing the occupant. The 1992 Act defines a badger sett as: "any structure or place which displays signs indicating current use by a badger". The onus is on the defendant to prove they were not attempting to kill, injure or take the badger, rather than on the police to prove that they were.
17. Detailed guidance for development proposals which may affect badgers is provided in Part IV of ODPM Circular 06/2005.
18. **The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999** require the submission of Environmental Impact Assessments for certain types of larger developments (listed in Schedules 1 and 2 of the Regulations) which are likely to have significant effects on the environment. The fundamental test to be applied is whether that particular type of development and its specific impacts are likely, in that particular location, to result in significant effects on the environment.
19. **DETR Circular 02/99** gives guidance on whether 'Schedule 2 developments' are likely to have significant effects on the environment. Paragraph 39 of the Circular states that in certain cases, non-statutory designations (such as SNCIs) which are not included in the definition of 'sensitive areas' in the Regulations, but which are nonetheless environmentally sensitive, may be relevant in determining whether EIA is required. Local authorities are also encouraged to take LBAPs into consideration.

20. **Planning Policy Statement 9** 'Biodiversity and Geological Conservation' establishes six 'key principles' to ensure that the potential impacts of planning decisions on biodiversity are fully considered. These can be summarised as:

- The need for up-to-date biodiversity information from which to develop planning decisions.
- Planning should aim to maintain, enhance, restore or add to biodiversity, giving appropriate weight to site designations of national through to local importance and to biodiversity in the wider environment. Elsewhere in PPS 9 Local Nature Reserves and Sites of Nature Conservation Importance are recognised as having "a fundamental role to play in meeting overall national biodiversity targets; contributing to the quality of life and the well-being of the community; and in supporting research and education."
- The form and location of development should take a strategic approach to biodiversity and recognise the contributions of individual biodiversity elements to conserving biodiversity resources.
- Promoting opportunities to incorporate biodiversity into the design in and around development.
- Permitting development where the principle objective is to conserve or enhance biodiversity.
- Only granting planning permission for development which causes harm to biodiversity if the development cannot be located elsewhere. If there are no alternatives, adequate mitigation should be required. If this is not possible, appropriate compensation measures should be required. If none of these can be achieved, applications should be refused.

21. Addressing the protection of habitats, PPS 9 singles out ancient woodland, 'veteran' trees and 'Section 74 habitats' (see CROW Act, above) for survey, protection and (in the case of S74 habitats), enhancement and extension. Local authorities are also encouraged to avoid fragmentation of habitats by establishing and strengthening habitat networks which may be done as part of a wider strategy for the protection and extension of open space.

22. In conformity with Annex C of PPS 3, PPS 9 states that biodiversity of recognised local importance within previously developed land should be retained or incorporated into development.

23. With regards to the protection of species, PPS 9 states that the habitats of 'S74 species' (see CROW Act, above) should be protected from decline and the species should be protected from the adverse effects of development.

24. **ODPM Circular 06/2005** compliments PPS 9 by providing detailed guidance on the protection of designated nature conservation sites and protected species by the planning system.

25. **Planning for Biodiversity and Geological Conservation: a Guide to Good Practice** provides guidance on ways local planning authorities can help deliver the national policies in PPS9 and comply with the legal requirements set out in the Circular.

26. Planning Policy Statement 9, Circular 06/2005 and their accompanying good practice guide are available for download from the Internet at: www.odpm.gov.uk.
27. **The South East Plan** Section 9 (Natural Resource Management) deals with biodiversity issues. It recognises that Planning has an important and positive role to play in protecting and enhancing the region's biodiversity. Local authorities are encouraged to work with other organisations to conserve biodiversity, by:
- ensuring that opportunities for biodiversity improvement are sought and realised as part of development schemes.
 - identifying and securing measures to help implement biodiversity improvement including, for example, developer contributions.
28. Policy NRM5 of the South East Plan ('Conservation and Improvement of Biodiversity') requires local authorities to avoid a net loss of biodiversity and to 'actively pursue' opportunities to achieve a net gain. They are to ensure appropriate access to areas of wildlife importance, identifying areas of opportunity for biodiversity improvement and require green infrastructure to be identified, developed and implemented in conjunction with new development.
29. . Damage to SNCIs should be avoided wherever possible. Unavoidable damage to wildlife interest should be minimised through mitigation, any damage should be compensated for, and such measures should be monitored.
30. **Biodiversity Action Plans (BAPs)**: PPS 9 paragraph 4 states that local planning authorities should ensure that policies in local development documents are consistent with biodiversity objectives and priorities set nationally, regionally and locally.
31. National biodiversity objectives and priorities are established in the England Biodiversity Strategy (see www.defra.gov.uk/wildlife-countryside/biodiversity) and for habitats and species by the UK Biodiversity Action Plan (see www.ukbap.org.uk). At the regional scale, targets for habitats are set out in Figure NRM2 (see section D5) of the draft South East Plan (see http://www.southeast-ra.gov.uk/southeastplan/plan/march_2006/core_document/008_seera_sep_d05.pdf). The Sussex Biodiversity Action Plan identifies further biodiversity objectives and priorities at the 'sub-regional' level (see www.biodiversitysussex.org). Habitats and species of value locally have also been identified (see www.citywildlife.org.uk/fbx_index.cfm?fuseaction=bio.develop) and at the time of writing a local BAP and biodiversity strategy are in preparation.

32. The table in Annex I of this SPD includes a list of all the habitats and species of biodiversity value at national, regional and local level which may occur on development sites in Brighton and Hove.
33. Natural England has produced **Standing Advice Notes** to support the determination of planning applications affecting nature conservation interests. For more information see :
http://www.naturalengland.org.uk/regions/south_east/ourwork/standingadvice/default.aspx

Annex 3: The Biodiversity Checklist (Indicators for carrying out a ‘first impressions’ survey of a development site)

National Planning Policy (Planning Policy Statement 9) requires planning decisions to be based on up-to-date information about the natural environment (fauna, flora, habitats and geology). Planning decisions should aim to maintain, and enhance, restore or add to the natural environment. Local Plan policies QD17, QD18 and NCI- NC4 apply national policy to Brighton and Hove.

This Biodiversity Checklist is designed to identify those developments which may have an impact on the natural environment. It allows developers to identify and address any nature conservation issues before a planning application is submitted.

The Checklist need not be used for the following types of planning application:

Advertisement applications, air conditioning units, changes of use, conversion to flats (if not effecting the roof), crossovers (where no hard standing needs to be created), extract ducting, fences, householder applications, listed building consent, removal of fire escapes, roller blinds/shutters, roof lights, satellite dishes, shop fronts, solar panels, walls and gates, windows and doors.

All other types of development proposal must include a completed Biodiversity Checklist for the application to be validated. Failure to complete the checklist accurately will cause unnecessary delay in the application process and may lead to application refusal.

The Checklist includes indicative thresholds and criteria which have been designed to ensure that applications are only highlighted when it is likely that natural features of importance are affected. Natural features are difficult to predict and therefore using the Checklist cannot guarantee that every feature will be detected in all cases.

Applicants should use the Checklist to carry out a ‘first impressions’ survey of their application site. A first impressions survey should be carried out while on site, and does not require ecological expertise. Applicants should work their way down column 2, indicating ‘yes’ or ‘no’ to each of the indicators in reference to the proposed development site. If ‘the answer is ‘yes’ to any of the indicators listed in column 1, the planning application must include a biodiversity report before the application can be validated.

The biodiversity report must be prepared by a qualified ecologist and must describe:

- which indicators (column 1) have been triggered;
- whether or not the relevant feature is indeed present (refer to column 3)
- any other nature conservation features which may come to light during the ecological survey and
- what has been done to mitigate, compensate and enhance biodiversity as part of the development.

1: Biodiversity Indicators – do any of the following features apply to the application site?	2. Please answer yes or no to the indicator	3: Notes (indicators of :)
1. Development involves clearance of shrubs/scrub or woodland of more than 100m ² (about the size of half a tennis court)		Nesting birds
2. Modification, conversion, demolition or removal of barns or farm buildings of brick or stone construction, or with exposed wooden beams, whether derelict or in use		Barn Owl, Bats, Swallow
3. Change to coastal shingle east of the Palace Pier or west of Hove Lagoon		Coastal vegetated shingle
4. Removal or modification of hanging tiles or weather boarding on buildings of any age within 50m (about the width of a football pitch) of woodland or mature trees		Bats
5. Change to pre-1914 roof structures with opportunities for access into the eaves (missing tiles, cracks in brickwork, missing bricks or missing soffit boards) but not to roofs made with metal or prefabricated sheeting.		Sparrow, Starling, Swift, Bats
6. Proposals involving external floodlighting of churches and listed buildings within 50m (about the width of a football pitch) of a green space or woodland		Bats
7. Change to derelict areas with exposed soil, brambles, piles of rubble, etc. of more than 100m ² (about the size of half a tennis court)		Reptiles (Adder, Viviparous Lizard, Slow-worm), invertebrates, plants of value
8. Application site is inside or within 10m (about the width of a tennis court) of a Site of Special Scientific Interest, Local Nature Reserve or Site of Nature Conservation Importance.		Indirect effects on sites designated for their nature conservation importance. The boundaries of these sites are shown on the development plan proposals map or see www.CityWildlife.org.uk , 'special sites' section.
9. Loss of modification of grassland grazed by horses, cattle or sheep, of more than 100m ² (about the size of half a tennis court)		Hornet Robberfly, Red Star-Thistle
10. Loss of a hedge (including garden hedges) of 10m or more (about the width of a tennis court or more)		Nesting birds. Dormouse (Waterhall area only)
11. 'Veteran' trees on or overhanging the development site, 'Veteran' trees, are trees with holes, cracks or cavities, or with peeling bark, or with large dead branches, or which support well established Ivy growth.		Bats, Stag Beetle, nesting birds, veteran trees. Trees adjacent to a development may still be affected by it.
12. Loss of grassland of more than 100m ² (about the size of half a tennis court), typically abandoned allotments, which is cut infrequently, or which supports a variety of flowers, particularly on south-facing slopes or close to the sea		Sunny, open rough grass sites which do not receive regular management often support reptiles, Glow Worm and (on the coast) Hoary Stock. This indicator also detects

		chalk grassland plant communities.
13. Any of the following observed on the application site: Narrow paths passing under thick vegetation or fences; small soil excavations; burrows of a diameter greater than 20cm		Badger setts can occur almost anywhere in Brighton and Hove. Even single sett entrances benefit from full protection under the Protection of Badgers Act 1992.
14. Ponds of all types (including garden ponds) on the application site		Great Crested Newt. Note that the terrestrial habitat may be inside the development site even if its breeding pond is outside it.

Annex 4: Useful contacts and further reading

Mention on this list does not necessarily constitute an endorsement by the Council of any company, supplier or organisation, their services or products and any associated claims made by them. Neither is it necessarily a full or complete list of suppliers. Inclusion of companies and suppliers on this list is at the discretion of the Council.

The Council accept no liability whatsoever: for the omission of a company or supplier from this list, any claims or consequences arising from the publication of this list, or resulting from any trade undertaken or advice provided by companies or individuals included in or omitted from this list.

Further Advice

CityWildlife: www.citywildlife.org.uk. Information on the Local Biodiversity Action Plan, local nature conservation sites and species.

Dr Gerald Legg, the Booth Museum of Natural History, 194 Dyke Road, Brighton, BN1 5AA. tel: 01273 292777

Natural England, Sussex & Surrey Team, Phoenix House, 32-33 North Street, Lewes, East Sussex, BN7 2PH tel: 01273 476595 facsimile: 01273 483063 Facsimile: 01273 494500

Institute of Ecology and Environmental Management (IEEM), 45 Southgate Street, Winchester SO23 9EH, UK. Tel: 01962 868626, Fax/ans: 01962 868625, Email: enquiries@ieem.demon.co.uk, Web site: www.ieem.net

Institute of Environmental Management and Assessment, St Nicholas House, 70 Newport, Lincoln, LN1 3DP, tel: 01522 540 069, fax: 01522 540 090, web: www.iema.net

Matthew Thomas, Ecologist, Brighton & Hove City Council Environment Department, Countryside Team, Stanmer Nursery, Stanmer Park, Lewes Road, Brighton, BN1 9SE. tel.: 01273 292371. Facsimile: 01273 292470. e-mail: matthew.thomas@brighton-hove.gov.uk

Phil Belden, Chair, Brighton Urban Wildlife Group, c/o the Booth Museum of Natural History (see above).

Sussex Wildlife Trust, Woods Mill, Henfield, West Sussex, BN5 9SD. tel: 01273 492630

The Sussex Biodiversity Record Centre, c/o Sussex Wildlife Trust, Woods Mill, Henfield, West Sussex, BN5 9SD. tel: 01273 497553 Fax: 01273 494500 email: sxbrc@sussexwt.org.uk Website: www.sxbrc.org.uk

Sussex Biodiversity Action Plan: See www.biodiversitysussex.org

UK Biodiversity Action Plan: See <http://www.ukbap.org.uk>

Advice on environmentally conscious building techniques

Association of Environment Conscious Builders, Windlake House, The Pump Field, Coaley, Gloucestershire, GL11 5DX. tel. 01559 370908

CIRIA, 6 Storey's Gate, London SW1P 3AU, UK. Tel: (+44) (0)20 7222 8891, Fax: (+44) (0)20 7222 1708. Web: www.ciria.org.uk Email: enquiries@ciria.org.uk

Wild flower and native tree and shrub suppliers

Advice on sources of local provenance seed and wild flower plants:

Flora locale, 36 Kingfisher Court, Hambridge Road, Newbury RG14 5SJ. e-mail: floralink@naturebureau.co.uk. Web: <http://www.naturebureau.co.uk/pages/floraloc/homepage.html>

List of specialist growers and suppliers who claim to supply British native plants and seed and say they can provide information on the native-origin or local provenance of their stock.

British Seed Houses Ltd Bewsey Industrial Estate, Pitt Street, Warrington, WA5 5LE. Tel: 01925 654411

British Wild Flower Plants 31 Main Road, North Burlingham, Norwich, Norfolk, NR13 4TA
Tel: 01603 716615

BTCV Enterprises (Trees & Wildflowers), Conservation Centre, Balby Road, Doncaster, BN4 0RH tel: 01302 859522

Emorsgate Seeds, Limes Farm, Tilney All Saints, King's Lynn, Norfolk PE34 4RT Tel: 01553 829028

Flower Farms Carvers Hill Farm, Shalbourne, Marlborough, Wiltshire, SN8 3PS Tel: 01672 870782

Heritage Seeds, Osmington, Weymouth, Dorset DT3 6EX tel: 01305 834504

H. V. Horticulture Ltd., Spring Mead, Bedchester, Shaftesbury, Dorset, SP7 0JU tel: 01747 811778

Landlife, National Wildflower Centre, Court Hey Park, Liverpool L16 3NA Tel: 0151 737 1819

Special Branch Tree Nursery: Native trees and shrubs from seed sourced in the Brighton and Hove area; based at Stanmer Organics. Nursery open Fridays 11am – 3pm Tel: 01273 205886 evenings or 07884 390742.

Other Specialist Suppliers

Sustainable compost:

T J Composting Group Ltd., Benimons Road, Beddingham, A26, Lewes, East Sussex, BN8 6JX. Tel: 01273 858511 e-mail: enqu@tjcomposting.co.uk. Web: www.tjcomposting.co.uk

Bat Bricks:

Marshalls Clay Products. Quarry Lane, Howley Park, Woodkirk, Dewsbury, West Yorkshire WF12 7JJ Tel (01132) 203535 Fax (01132) 203555.

Norfolk Bat Brick: The Norfolk Bat Group, The Barn Cottage, Wheelers Lane, Seething, Norwich, Norfolk, NR15 1EJ. tel: 01508 550784 Fax: 01508 550850

Bird boxes and Brick Boxes for bats and swifts :

Jacobi Jayne & Company, Maypole, Hoath, CANTERBURY, CT3 4LW. Tel: 01227 860388 • Fax: 01227 860521.
<http://www.birdcare.com/jacobijayne>

Jamie Wood Products, 1 Green Street, Old Town, Eastbourne, BN21 1QN. Tel: 01323 727291 Fax: 01323 727291 www.birdtables.com

Alana Ecology, The Old Primary School, Church Street, Bishop's Castle, Shropshire, SY9 5AE. tel: 01588 630173 Fax: 01588 630176 Web: <http://www.alana-eco.net>

Eco-watch Ltd., Cheriton Fitzpaine, Crediton, Devon, EX17 4JX. Tel: 01363 866969. FAX: 01363 866502. E-mail: enquiries@eco-watch.com. web: <http://www.eco-watch.com>

Green wall systems:

Mendip Manufacturing Agency Limited, Green Acres, Green Ore, Wells, Somerset, BA5 3ET. Tel: 0845 1300 135, e-mail sales@mma.gb.com. See <http://www.buildingdesign.co.uk/arch-3/mendip-manufacturing/wire-netting.htm>

Green roofs: See www.livingroofs.org

Amphibian advice / sources of captive-bred amphibia for stocking ponds:

British Herpetological Society c/o Zoological Society of London Regent's Park London, NW1 4RY

Wastewater treatment involving natural wetlands, reed beds and pond creation:

Cresswater Tel: +44 (0) 1905 422707 - Fax: +44 (0) 1905 422744. <http://www.cresswater.co.uk/>

Green roof water recycling:

<http://www.wwuk.co.uk/GreenRoofs.htm>

Suppliers of butyl rubber pond liners:

Plastics By Post Ltd., FREEPOST, Ventnor, Isle of Wight, PO38 1BR PHONE 01983 852241. www.plasticsbypost.net

Butyl Products Ltd., 11 Radford Crescent, Billericay, Essex, CM12 0DW. Tel: 01277 653 281 www.butylproducts.co.uk

Pond/wetland plant specialists:

Paul Bromfield Aquatics, Maydencroft Lane, Gosmore, HITCHIN, Hertfordshire, SG4 7QD. Tel: 01462 457399. www.bromfieldaquatics.co.uk

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Sussex Biodiversity Action Plan. Sussex Biodiversity Partnership, c/o Sussex & Surrey Team, Natural England, Phoenix House, 32-33 North Street, Lewes, East Sussex, BN7 2PH. tel : 476595

The Natural City. A Biodiversity Strategy for Brighton and Hove. Brighton & Hove City Council (in prep.)

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Working with the grain of nature. A biodiversity strategy for England. DEFRA 2002

Working with wildlife: A CIRIA training pack and resource centre for developers to effectively tackle wildlife issues on development sites. Includes briefing sheets and toolbox talks to deal with a range of species and habitats. For further information see www.ciria.org/wildlife.htm or www.ecologyconsultancy.co.uk/publications.htm.

Species advice

Barn Owls

Barn Owls: The Hawk and Owl Trust, c/o Zoological Society of London, Regent's Park, London, NW1 4RY. tel: 01582 832182.

The Barn Owl Trust, Waterleat, Ashburton, Devon, TQ13 7HU. tel: 01364 653026 (Tues & Thurs)
www.barnowltrust.org.uk/Forms/BarnOwlsOnSite.pdf

Bats

Sussex Bat Group

Bat Conservation Trust, 15 Cloisters house, 8 Battersea Park Road, London SW8 4BG Tel 0845 1300228 www.bats.org.uk

Natural England's Bat Mitigation guidelines: www.english-nature.org.uk/pubs/publication/PDF/batmitigationguide2.pdf

Bat workers Manual, JNCC 2004 A.J. Mitchell Jones and A.P. Mcleish

Habitat management for bats, JNCC, 2001

Bat Conservation Trust, 2002, Bats and Buildings in the UK

Badgers

Badger Trust-Sussex Tel 07910 198720 web site: www.badgertrust-sussex.org.uk

www.english-nature.org.uk/pubs/publication/PDF/badgerdev.pdf

Reptiles

www.english-nature.org.uk/pubs/publication/PDF/Reptileslft.pdf

Great Crested Newt

www.english-nature.org.uk/pubs/publication/PDF/gcn0801w.pdf

Biodiversity and Buildings

www.london.gov.uk/mayor/auu/docs/living_roof_casestudies.pdf

www.livingroofs.org

www.ciria.org/buildinggreener/index.html

www.wwuk.co.uk/GreenRoofs.htm

www.alanaecology.com/acatalog/Brickboxes.html

Ecological Consultants with urban ecology experience who have carried out work on development sites in Brighton and Hove

The list is intended as a guide only and is not comprehensive. The council is not to be taken as recommending any of the firms listed and will not guarantee their standing or competence. Employing any company (on this list or not) for an assessment does not guarantee that planning permission will be granted.

Biodiversity by Design. Dr Michael Wells, Director, 5 Prince's Buildings, George Street, Bath, BA1 2ED Tel: 01225 318444. e-mail: mike.wells@biodiversitybydesign.co.uk

Dolphin Ecological Surveys, 6a Northfield Cottages, Isfield, Uckfield, East Sussex, TN22 5XN. Tel: 01825 750645 e-mail: eco.dolphin@virgin.net

Environment Assessment Services Ltd, London Road, Hickstead, Haywards Heath, West Sussex, RH17 5LZ. Tel: 01273 857300. e-mail: info@easLtd.co.uk

Environmental Assessment & Design Ltd, 3 Colleton Crescent, Exeter, EX2 4DG Tel: 01392 260420. e-mail: info@eadconsult.co.uk

The Ash Partnership (UK) Ltd., Unit 2, 3a Courtlands Road. Eastbourne. East Sussex. BN22 8TR. Tel: 01323 720020 e-mail: ashley.l@ashpartnership.co.uk

The Ecology Consultancy, The Old Granary, Upper Stoneham, Lewes, East Sussex., BN8 5RH Tel: 01273 471 369, enquiry@ecologyconsultancy.co.uk.

Badger Specialist

Julian Brown Consultancy, 7 Houndstone Court, Brympton, Yeovil, Somerset, BA22 8TR. 01935 433339 jb@jbconsultancy.fsnet.co.uk

Reptiles and Amphibians

Gareth Matthes, GPM Ecology, 10 Bartholomew Close, Haslemere, Surrey, GU27 1EN. Tele/Fax: 01428 664473 garethmatthes@yahoo.co.uk

Annex 5: Nature conservation features on development sites: A hazard prevention checklist

Hazard	Notes
Construction Phase	
Ancillary structures such as paths and other hard surfaces.	These are often excluded from planning application drawings but their construction and location can damage nature conservation features. Ensure their design, location and construction method take account of nature conservation features e.g. pervious paving systems are available which can integrate vegetation.
Assembly areas for components of construction.	Plan locations in advance and site well away from sensitive areas. Include in NCR site plan.
Demolition operations.	Falling rubble and storage areas for demolished structures can cause unnecessary damage if not properly planned for.
Fires.	Plan locations in advance and site well away from sensitive areas. Include in NCR site plan.
Interruptions to established management regimes	It is important to maintain established habitat management regimes throughout the construction process. In some cases it may be necessary to modify these to help buffer nature conservation features from construction affects. Seek ecological advice.
Introduction of alien soils	Often landscaping schemes involve the importation of top soil which is inappropriate to the locality or the nature conservation feature. In general, nutrient-rich topsoil should be AVOIDED in habitat management and creation schemes. Introduction of top soil can also promote the spread of invasive plant species.
Lighting.	Floodlighting can interfere with animal behaviour patterns. All lighting schemes should be designed to minimise light pollution effects.
Provision of services and utilities (e.g. underground power lines, water supply and drainage)	These are often excluded from planning application drawings but their construction and location can damage nature conservation features. Ensure their location is included in the NCR and their effects considered.
Removal of site offices/compounds and final site clear away after construction.	Due care is needed, for example to ensure protective fencing is maintained in good condition until all danger of damage to nature conservation features by construction-related activity is passed.
Storage areas for construction and landscaping materials.	Ensure such storage areas are identified and considered in the NCR
Structural works to existing buildings, including conversions.	Although the footprint of the development may be the same as existing, construction activity may affect nearby nature conservation features. Such development may also affect species which use buildings, such as bats and nesting birds.
Temporary access routes for construction vehicles - both on and off site.	Plan locations in advance and site well away from sensitive areas. Include in NCR site plan.
Temporary fencing	Protective fencing should be sturdy and form a sufficiently robust barrier to prevent accidental damage to nature conservation features. Chestnut pale or equivalent is the normal minimum requirement. Temporary fencing for construction purposes should avoid severing areas of habitat.
Temporary offices and compounds.	Plan locations in advance and site well away from sensitive areas. Include in NCR site plan.
Top soil and sub-soil removal.	Consider locations for storage and include in NCR. Ensure topsoil removal does not promote the spread of invasive species to new locations.
Vegetation clearance.	Direct loss of habitat; timing of removal to minimise impact and meet legislative requirements (e.g. nesting birds); ensure

	controlled removal of undesirable species (e.g. Japanese Knotweed)
Occupation/Operational phase	
Landscape management	Appropriate aftercare is crucial to the successful integration of nature conservation features into development. Specialist contractors may be required at particularly sensitive locations.
Pets	Pets can have a severe predation and disturbance effect on reptiles, mammals and birds. Scheme design should aim to minimise this risk, for example in the location and types of nest boxes and bird feeders used.
Public access	Increased public access to urban nature conservation features should be encouraged but such access should be carefully considered in the design and management of schemes to ensure nature conservation benefits are sustained
Vandalism.	The design of nature conservation features within development should take account of potential vandalism issues and other anti-social behaviour
Vehicle access around and on/off-site.	Plan locations for all roads and paths in advance and site well away from sensitive areas. Soil compaction issues. Ensure temporary access is Included in NCR site plan.

Annex 6: Calculating developer contributions and new nature conservation benefits

1. This guidance explains how:

- developments are expected to compensate and enhance biodiversity in Brighton and Hove to comply with Planning Policy Statement 9 (Biodiversity and Geological Conservation, PPS 9) and local planning policy and
- to calculate commuted payments to the local planning authority in cases where developments are unable to provide adequate nature conservation compensation or enhancement. In accordance with the guidance set out in ODPM Circular 05/2005, commuted payments will be used by the council to create nature conservation features elsewhere in the city. Payments may be pooled over a period of time to achieve strategic nature conservation objectives.

2. This guidance does not apply to the following types of development:

Advertisement applications, air conditioning units, changes of use, conversion to flats (if not effecting the roof), crossovers (where no hard standing needs to be created), extract ducting, fences, householder applications, listed building consent, removal of fire escapes, roller blinds/shutters, roof lights, satellite dishes, shop fronts, solar panels, walls and gates, windows and doors.

Compensation for damage to nature conservation features

3. Occasionally planning permission may be granted for developments which involve a reduction in nature conservation features. In such cases the developer will be required to compensate by creating new nature conservation features, either within the development site or on other land under their control within Brighton and Hove. Compensation is explained in more detail in paragraphs 5.20-5.35 of this SPD.

4. If it is not possible for the developer to provide adequate compensatory nature conservation features, the figures in Table 6.1 of this Annex should be used to calculate a commuted standard charge. The standard charge should include the annual maintenance costs of the features for no less than ten years. The table addresses the nature conservation features which are mostly likely to be encountered in development scenarios in Brighton and Hove; sums for any features not addressed can be negotiated separately. The figures in Table 6.1 are based on the best available data and are adopted from various sources (see the footnotes after Table 6.1 for more details). They should be taken as correct as of 2009 and Index Linked.

Table 6.1: Compensation payments for lost or damaged nature conservation features

Nature Conservation Feature	Cost per m ² (all figures include maintenance for 10 years)
Chalk grassland ^[1]	£1.54
Coastal vegetated shingle ^[1]	£1.26
Hedgerow (with ground flora) ^[1]	£7.30 per linear metre
Native woodland (with ground flora) ^[1]	£1.10
Pond (including planting) ^[2]	£131.57
Reptile habitat (from continuous scrub) ^[3]	£1.72
Saline lagoon ^[1]	£2.76
Scrub of value to breeding birds ^[1]	£1.10

[1]: Costs adapted from: 'UK Biodiversity Action Plan: Preparing Costings for Species and Habitat Action Plans' GHK Consulting Ltd, 2006. Land purchase costs for habitat creation in Brighton and Hove (typical urban fringe farmland) are approximately 6 times the national average and this has been taken into account in the adapted figures.

[2] Costs adapted from: High Level Stewardship Payments Booklet – Second Edition October 2008

[3] Reptile Habitat Translocation based on actual quotes. Figures apply to land owned by the council which is suitable for reptile translocation, should on-site translocation not be possible. The existing vegetation of the council's receptor site is continuous, dense scrub. Developers wishing to use this site to translocate reptiles from development sites will be required to pay the council a commuted sum to cover the costs of creating and managing the habitat in a suitable condition for a period of not

less than 10 years. Because the land is already under council ownership, the land purchase price is not included in the costs. The minimum acceptable area of reptile translocation habitat to be created is 500m² with a total commuted payment of £860 (equivalent to a rate of £1.72 per m² for larger areas). In all cases, the initial scrub clearance and the reptile translocation will be paid for and carried out by the developer.

Enhancement of nature conservation features

5. PPS 9 states that one of the Government's objectives for planning is to conserve, enhance and restore the diversity of England's wildlife by sustaining and, where possible, improving the quality and extent of natural habitat. Local planning authorities should maximise opportunities to build-in beneficial biodiversity in and around developments (paragraph 14).
6. A maximum attainable biodiversity opportunity for any site is that 100% of the land area (or equivalent supports) habitats of biodiversity value. Modern techniques for greening the walls and roofs of buildings, and for incorporating biodiversity into landscaping, have made this achievable on development sites. This target is therefore used by this SPD as a benchmark for assessing the biodiversity potential of developments in Brighton and Hove.
7. To assess nature conservation potential, 'nature points' are first allocated to a site, where one point is equivalent to one square metre of the development site, excluding any area of existing nature conservation value. Each nature point must then be accounted for by creating nature conservation features or by paying a commuted sum to the council.
8. Table 6.2 shows the number of nature points which can be 'earned' by a menu of different nature conservation features. In table 6.2, points are allocated according to the cost of creating these features on development land in Brighton and Hove. A baseline value of 1 point reflects the cost of creating 1m² of woodland, calcareous grassland or coastal vegetated shingle and more points are allocated for features which are proportionately more expensive.
9. If it is not possible to account for all the nature points by creating new features on the development site, the developer can create features of equivalent value on other land under their control in Brighton and Hove. If this too is not possible, a commuted sum must be paid to the council to create the features on non-building land elsewhere in the city. This is calculated by multiplying the number of remaining points by the average cost of creating and managing for ten years, 1m² of the features listed in Table 6.1, or £21.
10. At least 10% of the nature points of a development site must be accounted for on-site (not by off site improvements or commuted payments).

11. If a developer plans to create a nature conservation feature not listed in Table 6.2, they should approach the council before the planning application is submitted to discuss whether the feature is appropriate at that location and to agree the number of nature points to be allocated. Proposals for creating new nature conservation features should always be ecologically appropriate to the site and the development.

Table 6.2: Points available for new nature conservation features on development sites

Nature Conservation Feature ⁴	Minimum size permitted	Points per m ²
Off-building features		
native woodland / scrub	50m ²	1
hedgerow (assumes 1m wide)	10m	3
pond	7m ²	12
Chalk grassland	50m ²	1
coastal vegetated shingle	50m ²	1
saline lagoon	50m ²	3
On-building features*		
Sedum green roof (all green roof costs are additional costs over a bitumen flat roof) ⁵	20m ²	7
Intensive green roof with wetland / open water plant community ⁵	20m ²	13
Chalk grassland extensive green roof or 'brown' / rubble roof ⁵	20m ²	5
Intensive green roof with woodland community ⁵	50m ²	13
Green wall ⁵	20m ²	15
Other features		
Bird nest box (woodcrete)	1 box	3 per box
Bat roosting box (woodcrete)	1 box	5 per box

⁴ On-building features do not include land purchase costs because they require no additional land and are based on costs over and above those of a conventional bitumen roof (adapted from 'Whole Live Costs & Living Roofs, The Springboard Centre, Bridgewater'. Sarnofil January 2005) or wall. Off-building costs are adapted from Table 6.1, but using the cost of building land in Brighton and Hove, estimated at £500,000 per hectare.

⁵ Green roofs and green walls are not appropriate for Listed Buildings, Buildings of Local Interest and traditional buildings. Green roofs are also not appropriate for new buildings in conservation areas where the roofs are not concealed behind parapets. Where it can be demonstrated that these restrictions prevent applications from fully achieving the habitat points required, compensation for this shortfall will not be required.

How to guide

11. The following step-by-step guide shows how to apply this Annex:

1. Determine the site area of the development
e.g. 0.5 ha
2. Deduct the area of any habitats protected on site from the total site area
e.g. $0.5\text{ha} - 0.1\text{ha} = 0.4\text{ha}$
3. Is a loss of nature conservation features proposed? If so, their loss should be compensated for, either by translocation/re-creation (on site or elsewhere within Brighton and Hove) or by a commuted sum (using Table 6.1).
e.g. 10m of hedgerow lost and not replanted: $10 \times \pounds 7.3 = \pounds 730$
4. Deduct the area of any on or off-site compensatory features from the total site area
e.g. $0.4\text{ha} - 0.1\text{ha} = 0.3\text{ha}$
5. Convert the remaining site area to 'nature points' where $1\text{m}^2 = 1$ point
e.g. $0.3\text{ha} = 3,000$ points
6. Account for the nature points allocated by calculating the value in nature points of any proposed new nature conservation features, using **Table 6.2** (below). These features may be proposed either on the development site or on another site in Brighton and Hove
e.g. 1000m^2 of woodland + 20m^2 pond + 100m^2 green wall = $1000+240+1500 = 2,740$ points.
7. If the new nature conservation features are not sufficient to account for all the nature points allocated to a site, the remaining points should be converted to a commuted payment, by multiplying the number of outstanding points by $\pounds 21$ (which is the average cost of creating 1m^2 of the features in Table 6.1)
e.g. $3,000 - 2,740$ points = $260 \times \pounds 21 = \pounds 5,460$.

8. The total commuted sum is the cost of compensating for lost nature conservation features (see 3) + cost of compensating for insufficient new features (see 6).
 e.g. £730 + £5,460 = £6,190

Worked Example

A development is proposed on a site of 1,000m² which includes 200m² of chalk grassland and 300m² of scrub of value to breeding birds. The development proposal protects the chalk grassland on site but requires the loss of 200m² of the scrub. The developer is unable to compensate for the lost scrub habitat by recreating it within Brighton and Hove and therefore opts to pay a commuted sum to the council. To address the policy requirement to enhance biodiversity on site, the new development also includes 100m² of chalk grassland green roof, a green wall of 10m² and three bat roosting boxes.

Compensation for loss of existing nature conservation features (refer to Table 6.1)

Calculate compensation for loss of existing nature conservation features:
 200m² bird nesting habitat lost = (£1.10 x 200) = £220 in compensation

Habitat Creation (refer to Table 6.2):

Total site area: 0.1 ha = 1,000 nature points

Deduct from the total nature points, 200m² of chalk grassland + 100m² of scrub retained on the site 1,000 – (200+100) = 700m² = 700 nature points to earn

Using table 6.2, calculate the points value of the new nature conservation benefits

New habitat created by the developer on site:
 100m² chalk grassland green roof (5 x 100) = 500 points
 10m² of green wall (15 x 10) = 150 points
 3 bat boxes (3 x 5) = 15 points

Total nature points accounted for: = 665 points

Total nature points outstanding (700-665) = 35

Total commuted sum required (35 x £21) + £220 = £955

Definitions

For the purposes of this Annex, the features listed in Tables 6.1 and 6.2 are defined as follows:

Nature Conservation Feature

A feature which contributes to local biodiversity and providing opportunities for people to experience and benefit from it. The benefits to local people provided by nature conservation features are wide ranging. They include valuable 'ecosystem services', such as mitigating the damaging affects of air pollution and climate change, as well as aesthetic and amenity benefits. For example, installing green roofs helps to reduce summer temperatures in urban areas, slows storm water runoff and can lower energy consumption, as well as benefitting local biodiversity.

Native woodland

Woods containing a mix of trees and shrubs from the list provided in Table 7.4 of Annex 7 with a ground flora of herbaceous plants from the list provided in Table 7.2 of Annex 7. The guidelines provided in Table 7.3 of Annex 7 should be followed to create this habitat.

Hedgerow

Hedgerows containing 5 or more woody species from the list provided in Table 7.4 of Annex 7 (within a 30 metre length) and with a rich basal flora of herbaceous plants from the list provided in Table 7.2 of Annex 7. The guidelines provided in Table 7.3 of Annex 7 should be followed to create this habitat.

Pond

A permanent body of water, saucer shaped in profile, supporting a range of suitable plants selected from Table 7.6 of Annex 7. Ponds should normally be lined with 0.75mm butyl and a suitable underlay.

Lowland calcareous grassland

Grassland developed on a shallow, lime-rich soil overlaying chalk and supporting a diverse range of native plants requiring a chalk substrate (calciholes). The guidelines provided in Table 7.5 of Annex 7 should be followed to create this habitat.

Coastal vegetated shingle

Shingle within 200m of Mean High Tide supporting a sparse mix of vegetation. Created and maintained using the guidance set out in Table 7.7 of Annex 7

Saline lagoon

Bodies, natural or artificial, of saline water partially separated from the adjacent sea. They retain a proportion of their seawater at low tide and may develop as brackish, full saline or hyper-saline water bodies. Sea water exchange in lagoons occurs through a natural or man-modified channel or by percolation through, or over topping of, the barrier.

Reptile habitat

A site in full sun of no less than 500m² supporting a mosaic of herb-rich short, long grassland and scrub with frequent 'refugia' of piled branches, soil and turves

Green Roof

See Section 7.8 of Annex 7

Green wall

See Section 7.9 of Annex 7

Bird Nest Box

A nest box manufactured from 'woodcrete' or equivalent and designed to be fixed securely to a wall or built into a wall.

Bat roosting box

A nest box manufactured from 'woodcrete' or equivalent and designed to be fixed securely to a wall or built into a wall, suitable for use by roosting bats at all times of the year.

Annex 7: Notes on habitat creation and enhancement

Table 7.1 General Principles

The following general principles should be applied to development schemes involving habitat creation:

Planning				Implementation		
Location	Timing	Design	Species	Site Preparation	Site Management	Aftercare
<p>Identification of nature conservation features All proposed and existing nature conservation features should be identified on the site plans submitted as part of a planning application. Advice and survey by a professional ecologist may be required. The Sussex Biodiversity Record Centre and the Booth Museum¹ may also need to be consulted. The City Council's Ecologist can provide informal, pre-application advice.</p>	<p>Works Works should be scheduled to minimise any risk of disturbance to species and habitats and to maximise the successful establishment of new features.</p> <p>Surveys Some species and habitats are only available for conservation work at specific times of the year. Such requirements should be factored in during the earliest planning stages of a scheme.</p>	<p>Integration at an early stage The design of nature conservation enhancements should be integrated from the early planning stage of a scheme. The aim should be to maximise opportunities and minimise impacts.</p> <p>Linear features Avoid the fragmentation of linear nature conservation features. These are often important for allowing movement from one area of habitat to another.</p> <p>Buffer Zones Buffer areas between new nature conservation features and development may be needed to avoid damaging impacts.</p>	<p>Choice of species Full details of all species to be planted should be provided for all schemes. Generally, native species guaranteed to be of local provenance must be used and definitely in open countryside and on the urban fringe. In the urban area, non-native species with particular nature conservation benefits may also be appropriate.</p> <p>Integration New nature conservation features should integrate with and complement habitats and species already present in the vicinity. Ensure that habitat creation proposals will not lead to damage to existing nature conservation</p>	<p>Avoid topsoil Most semi-natural habitats are adapted to nutrient-poor conditions, so habitat creation schemes should avoid the use of nutrient-rich topsoil. Topsoil will encourage competitive weed species of low conservation value.</p> <p>Adequate fencing Sturdy fencing (rather than temporary, plastic fencing or tape) should be used to protect nature conservation features throughout the construction phase and in some cases, subsequently. Details of the location, type and means of installation of such fencing should be provided as part of the planning application.</p>	<p>On-site personnel All on-site personnel should be made aware of any nature conservation features affected and of the conservation measures required. There should be an identified person responsible for overseeing ecological works and their contact details should be made available to the Planning Officer. An ecological clerk of works and/or specialist contractor may be required, particularly for complex or difficult habitat management works.</p> <p>Plant handling All plants should be handled and planted in accordance with the relevant clauses in 'Handling and Establishing Landscape Plants' (available on the Internet at http://www.jcli.org.uk/jcli/JCLI%20Plant%20Handling%20Code.pdf)</p>	<p>Provision for management Developments involving new and existing nature conservation features must make provision for their on-going management.</p>

Table 7.2 Native plants of local provenance and other plants suitable for landscaping schemes in Brighton and Hove

The use of native species of local provenance should be used in all habitat creation schemes unless there is adequate reason for using plants from other sources agreed with the council ecologist. Proposals using such species must demonstrate at least UK (and preferably local) seed / plant origins. Habitat creation schemes in open countryside and the urban fringe must use such species. However in inner urban areas within the built up area boundary, non-native species which attract beneficial wildlife may also be used if these are aesthetically better suited to the development and the local environment (see Table 7.2.1).

Table 7.2 is not intended to be entirely comprehensive. Contact the Council Ecologist for further advice.

Species	Latin name	chalk grassland (c) woodland (w) hedge bank / woodland edge (h)	Spring Meadow	Summer meadow
Agrimony	<i>Agrimonia eupatoria</i>	c,h	N	Y
Black Medic	<i>Medicago lupulina</i>	c	N	Y
Bladder Campion	<i>Silene vulgaris</i>	c	Y	Y
English Bluebell	<i>Hyacinthoides non-scripta</i>	w,h	-	-
Bugle	<i>Ajuga reptans</i>	w	-	-
Burnet Saxifrage	<i>Pimpinella saxifraga</i>	c	N	Y
Butcher's Broom	<i>Ruscus aculeatus</i>	wh		
Centauray	<i>Centaureum erythraea</i>	C	N	Y
Common Bird's-foot Trefoil	<i>Lotus corniculatus</i>	c,h	Y	Y
Common Dog Violet	<i>Viola riviniana</i>	W	-	-
Common Knapweed	<i>Centaurea nigra</i>	C	N	Y
Common Milkwort	<i>Polygala vulgaris</i>	c	Y	Y
Common Restharrow	<i>Ononis repens</i>	c	N	Y
Cowslip	<i>Primula veris</i>	c	Y	N
Creeping thyme	<i>Thymus drucei</i>	c	N	Y
Crested dog's-tail	<i>Cynosurus cristatus</i>	c	Y	Y
Cuckoo Pint	<i>Arum maculatum</i>	h,w	-	-
Devil's-bit Scabious	<i>Succisa pratensis</i>	c	N	Y
Dog Violet	<i>Viola riviniana</i>	c,h	Y	N
Dog's Mercury	<i>Mercurialis perennis</i>	w,h	-	-
Dropwort	<i>Filipendula vulgaris</i>	c	N	Y
False Brome	<i>Brachypodium sylvaticum</i>	h	-	-
Field Scabious	<i>Knautia arvensis</i>	c	N	Y
Foxglove	<i>Digitalis purpurea</i>	h	-	-

Garlic Mustard	<i>Allaria petiolata</i>	h	-	-
Germander Speedwell	<i>Veronica chamaedrys</i>	h,c,g	Y	N
Glaucous Sedge	<i>Carex flacca</i>	c	Y	Y
Greater Knapweed	<i>Centaurea scabiosa</i>	c	N	Y
Greater Stitchwort	<i>Stellaria holostea</i>	h,c	Y	N
Harebell	<i>Campanula rotunifolia</i>	c	N	Y
Herb Bennet	<i>Geum urbanum</i>	w	-	-
Hoary Plantain	<i>Plantago media</i>	c	Y	Y
Honeysuckle	<i>Lonicera periclymenum</i>	w,h	-	-
Horseshoe Vetch	<i>Hippocrepis comosa</i>	c	N	Y
Kidney Vetch	<i>Anthyllis vulneraria</i>	c	Y	Y
Lady's Bedstraw	<i>Galium verum</i>	c	N	Y
Marjoram	<i>Origanum vulgare</i>	c	N	Y
Meadow Buttercup	<i>Ranunculus acris</i>	c	Y	Y
Mouse-ear Hawkweed	<i>Pilosella officinarum</i>	c	N	Y
Nettle-leaved Bellflower	<i>Campanula trachelium</i>	w,h	-	-
Oxeye Daisy	<i>Leucanthemum vulgare</i>	c,h	Y	Y
Perforate St John's wort	<i>Hypericum perforatum</i>	c	Y	Y
Primrose	<i>Primula vulgaris</i>	w,h	-	-
Quaking Grass	<i>Briza media</i>	c	Y	Y
Ramsons	<i>Allium ursinum</i>	w,h	-	-
Red Campion	<i>Silene dioica</i>	w,h	-	-
Red Fescue	<i>Festuca rubra</i>	c	Y	Y
Rock Rose	<i>Helianthemum nummularium</i>	c	N	Y
Salad Burnet	<i>Sanguisorba minor</i>	c	Y	Y
Self-heal	<i>Prunella vulgaris</i>	c,h	Y	Y
Sheep's Fescue	<i>Festuca ovina</i>	c	Y	Y
Small Scabious	<i>Scabiosa columbaria</i>	c	N	Y
Stinking Hellebore	<i>Helleborus foetidus</i>	w	-	-
Stinking Iris	<i>Iris foetidissima</i>	w	-	-
Sweet Violet	<i>Viola odorata</i>	w,h	-	-
Tufted Vetch	<i>Vicia cracca</i>	w	-	-
Vipers Bugloss	<i>Echium vulgare</i>	c	N	Y
White Campion	<i>Silene alba</i>	c	Y	Y
Wild Basil	<i>Clinopodium vulgare</i>	c	N	Y
Wild Carrot	<i>Daucus carota</i>	c,h	N	Y
Wild Strawberry	<i>Fragaria vesca</i>	w,h	-	-
Wood Anemone	<i>Anemone nemorosa</i>	w	-	-
Yarrow	<i>Achillea millefolium</i>	c,h	Y	Y
Yellow Archangel	<i>Lamium galeobdolon</i>	w	-	-
Yellow Rattle	<i>Rhinanthus minor</i>	c	Y	N

Yellow Wort	<i>Blackstonia perfoliata</i>	c	N	Y
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Table 7.2.1 Ornamental Plants of Wildlife Value (adapted from a list supplied by The Ecology Consultancy)

In the urban area of Brighton and Hove (within the built up area boundary) a wide range of horticultural plant varieties are valuable sources of food for wildlife including nectar, seeds, berries and sap. Others provide nesting or roosting opportunities. In urban areas these may be more appropriate to use in landscaping schemes for aesthetic or horticultural reasons than native species. Alternatively native and ornamental plants can be combined to create colourful, 'near-natural' plantings.

The lists below are not exhaustive, but merely a selection of the more widely available species. For an up-to-date list, contact the Council Ecologist. They should not be used in the countryside or the urban fringe, where they may invade and damage semi-natural habitats.

Trees

Apple	<i>Malus domestica</i> (several ornamental forms available)
Cherry	<i>Prunus spp.</i> (but not ornamental flowering cherries)
Foxglove tree	<i>Paulownia tomentosa</i>
Lacebark	<i>Hoheria spp.</i> , e.g. <i>H. glabrata</i> , <i>H. lyallii</i>
Pear	<i>Pyrus spp.</i> e.g. <i>Pyrus calleryana</i> 'Chanticleer'

Shrubs

Many of the shrub species below will form small trees when mature

Barberry	<i>Berberis darwinii</i> , <i>B. thunbergii</i> 'Bagatelle', <i>B. x stenophylla</i>
Broom	<i>Genista spp</i>
Buddleia	<i>Buddleia davidii</i> , <i>B. alternifolia</i> , <i>B. globosa</i>
California lilac	<i>Ceanothus arborea</i> / <i>spp.</i>
Cherry laurel	<i>Prunus laurocerasus</i>
Common myrtle	<i>Myrtus communis</i>

Creeping Cotoneaster	<i>Cotoneaster adpressus</i> (some Cotoneasters are invasive and should be avoided – e.g. <i>C. horizontalis</i>)
Hazels	<i>Corylus spp.</i>
Hawthorns	<i>Crataegus spp.</i>
Holly	<i>Ilex</i> (various cultivars –self-pollinating varieties recommended)
Daisy Bush	<i>Olearia x hastii</i> , <i>O. macrodonta</i> and <i>O. traversii</i>
Elderberry	<i>Sambucus</i> ‘Black Lace’
Firethorn	<i>Pyracantha spp.</i>
Flowering currant	<i>Ribes sanguineum</i>
Flowering Quince	<i>Chaenomeles speciosa</i>
Gorse	<i>Ulex spp</i>
Himalayan honeysuckle	<i>Leycesteria formosa</i>
Japanese quince	<i>Chaenomeles japonica</i>
June berry	<i>Amelanchier Canadensis</i>
Laurustinus	<i>Viburnum tinus</i>
Lavender	<i>Lavandula angustifolia</i> , <i>L. x intermedia</i>
Mahonia	<i>Mahonia spp</i>
Mock Orange	<i>Philadelphus spp</i>
Portuguese Laurel	<i>Prunus lusitanica</i>
Rock rose	<i>Cistus spp.</i>
Rosemary	<i>Rosmarinus officinalis</i>
Shrubby Veronica	<i>Hebe spp.</i> (select varieties with light coloured flowers)

Herbaceous perennials

A wide variety of herbaceous perennials support wildlife and the list below is only a small selection. The following general rules can also be used to select good wildlife-friendly plantings:

- Plants with 'Single' flowers (those where the stamens are visible) rather than double flowers.

- Most 'traditional' herbs Rosemary, Sage, Lavenders, Fennel, alliums (chives)
- Plants with flat-topped umbels or (daisy-like) heads
- Most Mints (dead-nettles, *Salvia* spp.)
- Carrot family (Umbellifers),
- Cabbage (Crucifers) family

Sterile hybrid flowers (e.g. Hydrangea hybrids, Busy Lizzie) should be avoided.

Good wildlife friendly herbaceous perennials include:

Aster	<i>Aster spp</i>
Black-eyed Susan	<i>Rudbeckia hirta</i> or <i>R. fulgida</i>
Cinquefoil	<i>Potentilla fruticosa</i>
Echinacea	<i>Echinacea purpurea</i>
Escallonia	<i>Escallonia spp</i>
Foxglove	<i>Digitalis purpurea</i> varieties, <i>D. lutea</i> , <i>D. x mertonensis</i>
French Marigold	<i>Tagetes patula</i>
Globe thistle	<i>Echinops ritro</i>
Ice plant	<i>Sedum spectabile</i>
Michaelmas Daisy	<i>Aster novi-belgii</i> , <i>Aster x salignus</i> etc.
Purple Verbena	<i>Verbena bonariensis</i>
Red valerian	<i>Centranthus rubra</i>
Russian Sage	<i>Perovskia atriplicifolia</i>
Ice plant	<i>Sedum spectabile</i>
Soapwort	<i>Spanoria officinalis</i>
Sweet rocket	<i>Hesperis matronalis</i>
Teasel	<i>Dipsacus fullonum</i>
Tobacco plant	<i>Nicotiana affinis</i>

Wildlife friendly annuals:

Blue Wax Flower	<i>Cerithe major</i> 'purpurascens'
Californian Poppy	<i>Eschscholzia californica</i>
French Marigold	<i>Tagetes patula</i> . Avoid the double flowered varieties
Poached Egg Plant	<i>Limnanthes douglasii</i>
Sunflowers	<i>Helianthus annus</i>
Tobacco plant	<i>Nicotiana affinis</i>

Climbers

Clematis spp.	<i>Clematis vitalba</i> , <i>C. armandii</i> , <i>C. alpina</i> , <i>C. montana</i> , <i>C. tangutica</i>
Climbing Hydrangea	<i>Hydrangea petiolaris</i>
Honeysuckle	<i>Lonicera japonica</i> , <i>L. fragrantissima</i> , <i>L. standishii</i>
Ivy	<i>Hedera helix</i>
Jasmine	<i>Jasminum officinale</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>

Table 7.2.2 Terrestrial Species to avoid in landscaping schemes

The following terrestrial species have comparatively few benefits for wildlife in urban areas and their use is discouraged in landscaping schemes without specific justification:

Cherry Laurel	<i>Prunus laurocerasus</i>
Evergreen Oak	<i>Quercus ilex</i>
False Castor Oil Plant	<i>Fatsia Japonica</i>
Japanese Rose	<i>Rosa rugosa</i>
Phormium	<i>Phormium spp.</i>
Spotted laurel	<i>Aucuba japonica</i>

Table 7.3 Planting woodland, hedgerows and scrub

Brighton and Hove has a relatively small number of mature, deciduous woodlands. The best examples can be found in the Eldred Avenue area and at Stanmer Park and there are also surviving remnants of ancient semi-natural woodland (i.e. woodland which has survived with little change since 1600AD) in the Falmer area.

There is a Sussex Local Biodiversity Action Plan for woodland which promotes improved management of existing woods and the expansion of deciduous woodland (see www.biodiversitysussex.org/woodland.htm). The conservation of existing woodland and the creation of new deciduous woodland are therefore encouraged, where this is consistent with other nature conservation objectives.

The following general guidelines should be followed in any development involving the creation of new woodland. Proposals should also conform to BS 5837 'Guide for trees in relation to construction' (see also SPD 6 'Trees and Development Sites'):

Planning				Implementation		
Location	Timing	Design	Species	Preparation	Management	Aftercare
<p>Trees too close to buildings and car parks can lead to complaints about leaf fall, shade and other problems.</p> <p>Do not plant in locations which could damage other nature conservation features or which coincide with underground or overhead services.</p> <p>New woods are particularly appropriate where they connect or</p>	<p>Bare root trees should be planted during a frost-free period between mid-October and early December.</p> <p>Container-grown trees can be planted throughout the year (avoiding periods of drought and frost), provided adequate provision is made for regular</p>	<p>Trees and shrubs for woodland/scrub habitats should be spaced between 1-2m apart.</p> <p>Two-year old feathered seedlings or transplants should be planted (larger sizes are more expensive, slower to establish have a higher failure rate and are</p>	<p>Mixes of species should be used which reflect local, natural associations.</p> <p>In inner urban areas, non-native species and varieties (such as Firethorn and Cotoneaster) may be appropriate if they provide good wildlife habitat (e.g. berries and nesting habitat for birds). These species should definitely not be used where they could spread to nearby</p>	<p>Compacted soils should be deep-ploughed or 'ripped' before planting.</p> <p>Eliminate competing vegetation by exposing the surface soil and spraying emergent regrowth with a non-persistent contact herbicide during summer (ready for an autumn planting).</p>	<p>Trees should be planted the same day or as soon as possible after delivery. Roots should be protected from desiccation and frost damage during transit and storage.</p>	<p>Trees may need protection from rabbit damage following planting and should be kept free of weeds 1m diameter around each stem. Use mulch and spring treatment with a non-persistent contact-herbicide for five years following planting.</p> <p>Each tree should be drenched with 5 litres of water immediately following planting. Thorough and regular watering may also be necessary for the first two seasons, depending on location.</p> <p>Dead saplings should be replaced for the first 3 years following planting. Thinning should take place when tree branches become interlaced and growth is suppressed. Wood waste from thinning should be left scattered under the trees to promote woodland floor species. Piles of dead wood should be avoided where they can create a fire risk.</p> <p>Existing woods may require enhanced management to</p>

extend existing woodlands.	watering.	prone to vandalism).	semi-natural habitat.			remove invasive species, manage access, diversify the range of species present, increase light reaching the woodland floor or to promote particularly desirable species.
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Table 7.4 Native trees and shrubs suitable for planting in Brighton and Hove

Species	Latin name	Suitable for planting on the urban fringe / downland?	Pioneer species	Tolerant of infertile soil	Cliffs and coast	Pollution tolerant	Tree or shrub
Field Maple	<i>Acer campestre</i>	N		y		y	small tree
Hawthorn	<i>Crataegus monogyna</i>	Y	y	y	y	y	shrub
Beech	<i>Fagus sylvatica</i>	Y					tree
Ash	<i>Fraxinus excelsior</i>	Y	y	y	y	y	tree
Juniper	<i>Juniperus communis*</i>	N	y	y	y		shrub
Wild Privet	<i>Ligustrum vulgare</i>	Y	y			y	shrub
Crab Apple	<i>Malus spp.</i>	Y				y	small tree
Blackthorn	<i>Prunus spinosa</i>	Y	y		y		shrub
Pedunculate Oak	<i>Quercus robur</i>	Y				y	tree
Buckthorn	<i>Rhamnus catharticus</i>	Y				y	small tree
Dog Rose	<i>Rosa canina</i>	Y		y			scrambler/shrub
Goat Willow	<i>Salix caprea</i>	N	y		y	y	shrub
Elder	<i>Sambucus nigra</i>	Y	y	y		y	shrub
Yew	<i>Taxus baccata</i>	Y		y		y	small tree
Dogwood	<i>Cornus sanguinea</i>	Y	y	y			shrub
Small-leaved Lime	<i>Tilia cordata</i>	N					tree
Gorse	<i>Ulex europaeus</i>	Y	y	y	y		shrub
Wych Elm	<i>Ulmus glabra</i>	Y				y	tree
Wayfaring Tree	<i>Viburnum lantana</i>	Y	y	y			shrub

after Emery (1986), BS 5837, BTCV Catalogue

The introduction of native woodland ground flora is one way of enhancing existing, established woodlands. Table 7.2 includes recommended species for woodland floor planting. These should be introduced in discrete blocks within woodlands where light levels are between 10% and 40% of daylight in summer, as plug plants or seed. Woodland seed sowing should be at a high rate (10kg of seed per hectare), whereas plant plugs can be introduced at about 5 plants per m².

Hedgerow creation and management follows similar principles to those needed for woodland and scrub. Shrub plants for new hedgerows should be selected from the list provided in Table 7.3, planted at 200mm centres in two rows 150-450mm apart. A 'hedge line' mulch should be used and species should be planted in blocks of five, which helps to give the developing hedge a naturalistic appearance. After planting, cut hard back to encourage bushy basal growth.

Table 7.5 Flower-rich Grassland

Fragments of ancient, species-rich chalk grassland are scattered across the Downs within the City Council's administrative area. Larger blocks of this internationally rare habitat can be found at Beacon Hill, Wild Park, Whitehawk Hill, Ladies Mile and Benfield Hill.

Ancient, species-rich chalk grassland cannot be recreated but it is possible to create attractive, flower-rich chalk grassland as part of new developments. Although these are only approximations to ancient chalk grassland, they are still of nature conservation value. Chalk grassland creation is encouraged by the Sussex Chalk Grassland BAP. The following general guidelines should be followed:

Planning				Implementation		
Location	Timing	Design	Species	Site Preparation	Site Management	Aftercare
<p>Flower-rich grassland should not be located where:</p> <ul style="list-style-type: none"> - it will be heavily shaded by trees. - the soil is rich in nutrients or will be fertilised <p>Locations suitable for flower-rich grassland include :</p>	<p>Sow wild flower seed in autumn (September - November), a month after soil treatments have been completed (see Site Preparation)</p>	<p>Avoid small grass patches. These are expensive to maintain and tend to be of low nature conservation value. Aim to create fewer, larger spaces which can incorporate low-maintenance wild flower areas.</p>	<p>A mix of species should be used which reflect local, natural associations (see table 7.2).</p> <p>Plant plugs, not seeds, should be used to diversify existing grassland. They should be planted 50cm apart. However Yellow Rattle (<i>Rhinanthus minor</i>); can be seeded into existing grassland where it will reduce grass vigour.</p>	<p>Nutrient-rich topsoil should be removed or buried (by deep-ploughing) before sowing.</p> <p>Expensive soil improvements, such as drainage, deep ripping and fertiliser treatment, should be avoided.</p> <p>Work the soil in midsummer to minimise compaction problems when wet. Cultivate to an even tilth (breaking up, raking, harrowing and rolling) and firm surface. Remove large stones (may</p>	<p>Flower-rich meadows should be protected from access and from storage of plant and machinery throughout the construction process</p>	<p>New grassland</p> <p>In the spring of the first year after sowing, roll and then cut to 10cm high and remove clippings. Cut to 10cm about every 2 months thereafter to prevent any species from becoming dominant. Allow a 5 week break in June/July for the cornfield annual nurse crop to flower. In the second year, revert to the cuts described below.</p> <p>Some weed species may require occasional spot treatment with herbicide.</p> <p>Timing of cutting and cutting frequency have an important influence on the species found in new and existing grasslands. In all cases, cuttings should be removed and no fertilisers should be added at any time:</p>

<ul style="list-style-type: none"> - areas of low soil fertility, - dry slopes with thin soils. 			<p>Seed mixes should be used to establish new flower-rich grassland (see Annex 4 for sources of seed) Recommended seeding rate: 2g of seed/m², Cornfield annuals should be used as a 'nurse crop'.</p>	<p>damage grass cutting equipment). Leave for a month, then treat germinating weeds using a non-persistent contact herbicide. Leave for 2-3 weeks before sowing wild flower seeds. Scuffle the surface after sowing to incorporate seeds in the surface soil.</p>		<ul style="list-style-type: none"> - Spring meadow: Do not cut until late June, then cut to 50mm. Thereafter cut regularly to 100mm. Because spring meadows are cut before the school summer holidays, they can double as 'kick about' areas. - Summer meadow: Do not cut between mid-May and late August. Regular cutting to 50mm between March and mid May helps to eliminate coarse grasses during their maximum growth period. <p>Flower-rich grassland should look intentional. Use mown borders, paths, benches, etc to give flower-rich grassland areas a 'cared for' appearance.</p>
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Table 7.6 Aquatic plant species suitable for planting in Brighton and Hove

There are no permanent, naturally occurring freshwater bodies in Brighton and Hove. However, 'dew ponds' have been created on the Downs for centuries and more recently, amenity garden ponds and associated wetland areas have become important for wildlife.

Wildlife ponds can be a way of controlling runoff water flow at source as part of Sustainable Urban Drainage Systems (SUDS). This reduces the impact of construction on the environment, giving green credentials as well as amenity and nature conservation value to a new development.

Submerged		Floating		Emergent		Marginal	
Common name	Scientific name	Common name	Scientific name	Common name	Scientific name	Common name	Scientific name
Common Water Crowfoot	<i>Ranunculus aquatilis</i> agg.	Yellow Water Lily	<i>Nuphar lutea</i>	Flowering Rush	<i>Butomus umbellatus</i>	Marsh Marigold	<i>Caltha palustris</i>
Curled Pondweed	<i>Potamogeton crispus</i>	White Water Lily	<i>Nymphaea alba</i>	Branched Bur-reed	<i>Sparganium erectum</i>	Brooklime	<i>Veronica beccabunga</i>
Spiked Water Milfoil	<i>Myriophyllum spicatum</i>			Water Plantain	<i>Alisma plantago</i>	Bogbean	<i>Menyanthes trifoliata</i>
Water Violet	<i>Hottonia palustris</i>					Water Forget-me-not	<i>Myosotis scorpioides</i>

Hornwort	<i>Ceratophyllum demersum</i>					Water Mint	<i>Mentha aquatica</i>
						Reed Sweet Grass	<i>Glyceria maxima</i>
						Yellow Flag	<i>Iris pseudacorus</i>
						Purple Loosestrife	<i>Lythrum salicaria</i>

Aquatic Plants which must NOT be used under any circumstances (very invasive)

Swamp Stonecrop	<i>Crassula helmsii</i>	Water Fern	<i>Azolla filiculoides</i>			Marsh Pennywort	<i>Hydrocotyle ranunculoides</i>
Parrot's Feather	<i>Myriophyllum aquaticum</i>	Fringed Water Lily	<i>Nymphoides peltata</i>			Himalayan balsam	<i>Impatiens glandulifera</i>
Canadian Pondweed	<i>Elodea canadensis</i>						
Nuttall's Pondweed	<i>Elodea nuttallii</i>						
Curly Waterweed	<i>Lagarosiphon major</i>						

Table 7.7 Coastal Vegetated Shingle

Coastal vegetated shingle is both a national and Sussex BAP habitat and listed in Annex I of the EC Habitats Directive. The Sussex BAP specifically includes an action to “take advantage of coastal development to create new shingle areas”.

Due to the intensive amenity use of the beaches in Brighton and Hove, very few areas of coastal shingle retain natural vegetation. However opportunities may arise through landscaping associated with new coastal developments to integrate new vegetated areas.

Coastal shingle is an inhospitable environment for plant growth. Plants experience high-temperature stress and desiccation in summer; salt water spray, high winds and substrate movement in winter. The substrate itself is nutrient-poor and with very little organic matter. Many species survive by accumulating substantial underground reserves.

Planning				Implementation		
Location	Timing	Design	Species	Site Preparation	Site Management	Aftercare
Any site within 100m of the beach	Pot planting should take place in spring (March/April) to give plants time to	Aim to vary the substrate, aspect and slope of a site to maximise the	Annuals and short-lived plants can be established from seed. Perennials colonise too slowly and	New shingle habitats should be profiled to contain about 20% sand to promote seedling establishment. A depth of at least 20cm shingle is	Ensure vegetated shingle areas are protected from disturbance	Add boardwalks, interpretation boards, etc. to encourage

(other than cliffs).	establish before summer desiccation and winter storms. Sow seed in the autumn or spring	variety of shingle species that can successfully establish.	are too susceptible to disturbance when young for seedling establishment. These species require container-grown plants (9cm pots or greater).	required. Organic matter and fertiliser are not required (may attract weed species). Aim for a matrix of areas of different textures to promote the establishment of different species.	throughout the construction period.	appreciation of this rare habitat.
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Suitable species for new vegetated coastal shingle are:

Sea Kale
 Sea Holly
 Sea Campion
 Biting Stonecrop
 English Stonecrop
 Viper's Bugloss
 Rock Samphire
 Yellow-horned Poppy

Crambe maritima
Eryngium maritimum
Silene maritima
Sedum acre
Sedum anglicum
Echium vulgare
Crithmum maritimum
Glaucium flavum

7.8 Green Roofs

Green roofs are constructed from layers of impermeable membrane, cushioning and a growth medium to provide a habitat for vegetation.

Intensive living roofs, with soil depths of over 350mm can support trees, shrubs and even water features. Intensive roofs add a significant additional load to the roof structure and usually require substantial maintenance.

Extensive living roofs have substrate depths of between 25mm and 125mm. They can support a range of plants and growing mediums and add much lower loading to the roof structure than intensive roofs. Extensive roofs can be planted with *Sedum spp.* (either plug planted or as pre-planted mats) or a range of native grassland plants, using locally sourced growing mediums ('biodiverse roofs'). Biodiverse roofs tend to be more attractive to wildlife. Biodiverse roofs are self-sustaining, although they often benefit from an autumn clean-up.

Green roofs are widely used in Continental Europe and increasingly in the UK. In addition to ecological and aesthetic improvements, green roofs can provide a range of other benefits. For example, because a typical green roof can hold 55% of its volume in water, they can slow

storm runoff and reduce flood risks. They can also help to cool urban areas in summer and promote energy efficiency. Green roofs also tend to attract media interest and can be used to create a positive company image. They also have lower maintenance costs than conventional flat roofs because the roof itself is protected from UV radiation, frost and other mechanical damage.

For further information on Green Roofs see <http://www.ciria.org/buildinggreener>, www.livingroofs.org or www.london.gov.uk/mayor/auu/docs/living_roof_casestudies.pdf.

7.9 Green walls

'Green walls' normally incorporate permanent trellis work, spaced off the masonry, to support non-clinging climbers. They can be designed to avoid structures, gutters and downpipes, confining climbing vegetation to the wall itself. Climbing plants should be planted at least 40cm away from the wall in an irrigated plant pit stocked with nutrient-rich topsoil. Green walls have also been combined with trickle irrigation systems and growing media to support non-climbing plants directly on the walls themselves.

Green walls protect masonry from extreme temperatures, air pollution and rainfall. They can also provide nesting and feeding habitat for birds (particularly Wren, Robin and Blackbird), honeybees and other insects. Native plant species suited to creating climbing green walls include Honeysuckle (*Lonicera periclymenum*), Hop (*Humulus lupulus*) and Traveller's Joy (*Clematis vitalba*). In urban areas, exotic climbing species can also provide nature conservation benefits.

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