TETLOW STREET, WALTON, LIVERPOOL, MERSEYSIDE

CODE FOR SUSTAINABLE HOMES ECOLOGICAL ASSESSMENT

A Report to: Liverpool Mutual Homes

Report No: RT-MME-118883

Date: February 2015

MIDDLEMARCH ENVIRONMENTAL

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REPORT VERIFICATION AND DECLARATION OF COMPLIANCE

This study has been undertaken in accordance with British Standard 42020:2013 “Biodiversity, Code of practice for planning and development”.

Report Version	Date	Completed by:	Checked by:	Approved by:
Final	10/02/2015	Indre Barsketyte MSc Grad CIEEM (Ecological Consultant) Helen Bird (Ecological Project Officer)	Joscelin Tilley BSc (Hons) (BREEAM Manager)	David Smith BSc MCIEEM (Ecology and Landscapes Director)

The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management’s Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

VALIDITY OF DATA

The findings of this study are valid for a period of 24 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified ecologist to assess any changes in the habitats present on site, and to inform a review of the conclusions and recommendations made.

NON-TECHNICAL SUMMARY

- Liverpool Mutual Homes are involved in the construction of a new residential development at Tetlow Street in Liverpool, Merseyside.

- At the time of the survey, the site was dominated by unmanaged grassland with brash piles and several semi-mature trees located around the perimeter of the site. Introduced shrubs were scattered throughout the site.

- We recommend that a total of **1 credit** for ecology can currently be awarded. If the client provides written confirmation that the recommendations in this report are carried out a further **8 credits** may be awarded:

    - Eco 1: We recommend **0 credits** are awarded at present, however if the condition set out in Section 5.1 is followed then **1 credit** may be awarded.

    - Eco 2: We recommend **0 credits** may be awarded at present; however **1 credit** is available subject to the site enhancement recommendations in Section 5.2 being observed.

    - Eco 3: We recommend **0 credits** are awarded at present but if the conditions set out in Section 5.3 are followed then **1 credit** may be awarded.

    - Eco 4: We recommend **1 credit** of the 4 available credits may be awarded at present but a further **3 credits** may be available on receipt of a planting scheme.

    - Eco 5: We recommend **0 credits** may be awarded as the net internal floor area: net internal ground floor ratio of the development could not be calculated using current client information. A total of **2 credits** are available in this section.

CONTENTS

1. INTRODUCTION

BYA Ltd on behalf of Liverpool Mutual Homes commissioned Middlemarch Environmental Ltd to conduct a Code for Sustainable Homes Ecological assessment at Tetlow Street in Liverpool, Merseyside.

Middlemarch Environmental Ltd is a member of the Association of Wildlife Trust Consultancies (AWTC) and is accredited to conduct Code for Sustainable Homes ecological assessments.

The ecological assessment aims to identify the important ecological features of the site and details measures that should be taken to protect and enhance them. It also appraises the ecological diversity of the site before and after development.

This report is divided into five chapters:

- Chapter 1 provides an explanation of the Code for Sustainable Homes concept.
- Chapter 2 provides a brief introduction to the development.
- Chapter 3 describes the methodology used in the ecological assessment.
- Chapter 4 provides a description of the site and the current ecological value of the site.
- Chapter 5 details the ecological credits.

1.1 CODE FOR SUSTAINABLE HOMES– THE ENVIRONMENTAL RATING FOR HOMES

1.1.1 Code for Sustainable Homes – The Environmental Rating for Homes assesses the environmental impact of new home schemes. It aims to provide guidance on ways of minimising the adverse effects of new home buildings on the global and local environments, whilst promoting healthy internal conditions.

1.1.2 The basis of the scheme is a certificate awarded to individual buildings on the basis of points for a set of performance criteria determined by the Government in close working consultation with the Building Research Establishment (BRE). The certificate enables the owners to gain recognition for building environmental performance. Trained personnel, appointed by BRE, assess the building and it's environment. The number of points attained is interpreted in the form of an overall rating of *Code Levels 1 - 6*. Some points are optional.

1.1.3 The performance criteria are grouped under the following categories: energy, water, pollution, materials, surface water run-off, waste, ecology, management and health and well being. Some categories are optional.

1.1.4 This report assesses site ecology, which is carried out at Stage 3 of the overall assessment. The aim is to reduce the ecological impact of the development project, such as by minimising the loss of important wildlife habitats, and maximising the wildlife potential of the site by the enhancement and creation of new habitats and their subsequent sympathetic management.

1.2 ECOLOGICAL CREDITS

1.2.1 There are nine ecological credits available, these are as follows:

a) Ecological Credit: Eco 1

1 credit for building on land of *low ecological value* by either:

- Building on land which meets defined criteria checklist for low ecological value; or
- Where land is ecologically valuable, designing within recommendations following an audit by the AWTC (Association of Wildlife Trust Consultancies – The Wildlife Trusts Partnership) or another qualified organisation recognised and audited by a recognised authority.

b) Ecological Credit: Eco 2
1 credit for designing-in features for positive *enhancement of the site ecology* in accordance with advice from the AWTC.

c) Ecological Credit: Eco 3
1 credit for the *protection of existing features* of ecological value.

d) Ecological Credit: Eco 4
- 1 credit for a change of ecological value of between –9 and –3 natural species hectares;
- 2 credits for a change of ecological value of between –3 and +3 natural species hectares;
- 3 credits for a change of ecological value of between +3 and +9 natural species hectares;
- 4 credits for a change of ecological value of greater than +9 natural species hectares.

e) Ecological Credit: Eco 5
- 1 credit for houses where the net internal floor area: net internal ground floor area ratio is greater than 2.5:1, or for blocks of flats where the net internal floor area: net internal ground floor area ratio is greater than 3:1, or for a combination of houses and flats where the ratio of total net internal floor area: total ground floor area is greater than the area weighted average of the two ratios above.
- 2 credits for a development of houses where the net internal floor area: net internal ground floor area ratio is greater than 3:1, or for a block of flats where the net internal floor area: net internal ground floor area ratio is greater than 4:1, or for a combination of houses and flats where the ratio of total net internal floor area: total ground floor area is greater than the area weighted average of the two ratios above.

2. PROJECT INTRODUCTION

BYA Ltd are building fifteen residential houses on Tetlow Street in Liverpool, Merseyside.

3. METHODOLOGY

This chapter details the methodology used by the AWTC to carry out a Code for Sustainable Homes Ecological Assessment.

3.1 CODE FOR SUSTAINABLE HOMES ECOLOGICAL ASSESSMENT

Code for Sustainable Homes Ecological Assessment methodology consists of:

- A site survey
- An assessment of the sites ecological value
- A set of recommendations for the protection and enhancement of the site
- An appraisal of landscape proposals and other documents

Whilst every effort is made to notify the client of any plant species listed on Schedule 9 of the Wildlife and Countryside Act (1981, as amended) present on site, it should be noted that this is not a specific survey for these species.

3.2 ECOLOGICAL ASSESSOR

A site visit was conducted by Indre Barsketyte, Ecological Consultant. Please see Appendix 1 for ecologist qualifications and verification statement from a suitably qualified ecologist.

3.3 SITE SURVEY

A full site survey was conducted on the 4th February 2015. This included an assessment of the habitat types, floral and faunal species and any features of ecological value.

3.4 DOCUMENTATION PROVIDED

The documentation provided by the client and used in completion of this assessment report is outlined in Table 3.1.

Document Name/Drawing Number	Author
Location Plan: 1712-01	BYA Limited
Proposed Site Plan: 1712-05F	BYA Limited

Table 3.1: Documentation Provided by the Client

4. CURRENT ECOLOGICAL VALUE

4.1 SITE LOCATION

The residential development is located in Liverpool, Merseyside at National Grid Reference SJ 357 936.

4.2 EXISTING SITE

The development site measures approximately 0.38 ha, is irregular in shape and is located within a residential area.

At the time of the survey, the site was dominated by unmanaged grassland with brash piles and several semi-mature trees located around the perimeter of the site. Introduced shrubs were scattered throughout the site.

4.3 SPECIES

Species recorded at the time of the site visit are listed in Table 4.1 and 4.2.

English Name	Scientific Name
Introduced shrub	
Buddleia	*Buddleja davidii*
Cotoneaster	*Cotoneaster* sp.
Privet	*Ligustrum* sp.
Willow	*Salix* sp.
Scattered trees	
Maple	*Acer* sp.
Poor semi-improved grassland	
Bramble	*Rubus fruticosus* agg.
Cock's-foot	*Dactylis glomerata*
Daisy	*Bellis perennis*
Dandelion	*Taraxacum officinale* agg.
Fat-hen	*Chenopodium album*
Meadow-grass	*Poa* sp.
Ragwort	*Senecio* sp.
Ribwort plantain	*Plantago lanceolata*

Table 4.1: Floral Species Recorded at the Time of the Site Visit

English Name	Scientific Name
Pigeon	*Columba* sp.

Table 4.2: Faunal Species Recorded at the Time of the Site Visit

4.4 HABITATS

At the time of the site visit the area comprised the following habitats (listed in alphabetical order not that of ecological importance).

- Introduced shrub;
- Scattered trees; and,
- Poor semi-improved grassland.

Introduced shrub
Introduced shrubs were scattered throughout the site. Cotoneaster was recorded adjacent to the western site boundary (several of the cotoneaster species are considered invasive and are included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended)). This habitat was deemed to have low ecological value as it can be easily replaced post development and provides limited foraging opportunities for wildlife.

Scattered trees
Several semi-mature maple trees were located around the perimeter of the site, most of which were present along the northern site boundary. One of the trees on site was dead; another had been felled; and another had been severely damaged by fire. Due to their age, the trees on site cannot be readily replaced if removed and therefore this habitat is considered to have moderate ecological value. The trees also provide foraging opportunities for wildlife and nesting habitat for birds.

Poor semi-improved grassland
Unmanaged grassland dominated the site and comprised common grass and forb species. Brash piles were recorded along the southern site boundary and in the north-eastern corner of the site. This habitat is considered to have low ecological value as it is common within the area and provides limited foraging opportunities for wildlife.

5. ECOLOGICAL CREDITS

5.1 ECO 1: ECOLOGICAL VALUE OF THE SITE

1 credit is available for *building on land of low ecological value.*

Due to the presence of semi-mature trees, the site does not meet with defined criteria of low ecologically valuable land. However, Middlemarch Environmental Ltd judges that the ecological damage of the development will be minimal if the following condition is met:

Trees
The semi-mature trees on site must be retained and protected (see Section 5.3 for details of the protection requirements). This excludes any specimens recommended for removal by an arboriculturalist.

The client must provide written confirmation that this criterion has been followed, prior to Middlemarch Environmental Ltd recommending that this credit may be awarded.

5.2 ECO 2: ECOLOGICAL ENHANCEMENT OF THE SITE

There is **1 credit** available for designing-in features for positive *enhancement of the site ecology.*

We recommend that this credit should be awarded if the following criteria are undertaken. Section 5.2.1 contains the key recommendations, which must all be adopted and Section 5.2.2 contains additional recommendations, of which over 30 % must be adopted.

5.2.1 KEY RECOMMENDATIONS

Good Horticultural Practice
It is important to implement good horticultural practice in any landscaping scheme, including the use of peat-free composts, mulches and soil conditioners. The use of pesticides (herbicides, insecticides, fungicides and slug pellets *etc*) should be discouraged to prevent cumulative fatal effects to animals via the food chain, particularly invertebrates, birds and/or mammals. Any pesticides used should be non-residual.

Tree Planting
Plant at least twelve trees, which must be native or wildlife attracting species (Appendix 2).

Shrub Planting
At least 100 m^2 of shrubs must be planted in the gardens and communal areas; these must be native species or species attractive to wildlife (Appendix 2).

5.2.2 ADDITIONAL RECOMMENDATIONS

Bulb Planting
At least 25 m^2 of bulbs should be planted in the gardens and communal areas, suitable species include:

Snowdrop *Galanthus nivalis*
Bluebell *Hyacinthoides non-scripta*
Wild Daffodil *Narcissus pseudonarcissus*
Winter Aconite *Eranthis hyemalis*
Ramsons *Allium ursinum*
Round Headed Leek *Allium sphaerocephalon*
Lesser Celandine *Ranunculus ficaria*
Angular Solomons Seal *Polygonatum odoratum*
Wood Anemone *Anemone nemorosa*
Lily of the Valley *Convallaria majalis*

Bat Boxes
Two bat boxes or bricks should be installed on site. The bat boxes can either be attached to the buildings or to suitable existing trees (Appendix 3).

In general, bats seek warm places and for this reason boxes should be located where they will receive full/partial sun. Although, installing boxes in a variety of orientations will provide a range of climatic conditions. Position boxes at least 3m above ground to prevent disturbance from people and/or predators.

Bird Boxes
Two bird boxes should be erected; these should be either open-fronted, terraced, or hole-entrance nesting boxes (see Appendix 3 for further details).

Log Pile
Create a log pile in the garden or communal areas to provide a habitat for invertebrates, including stag beetles. Use wood from broadleaved trees, particularly oak, beech or fruiting trees with bark still attached. Partially bury these vertically in the soil in the shade and allow plants to grow over these to retain the moisture.

Climbing Plants
Climbing plants should be planted against the building walls or boundary fences; these should be supported by a trellis system. Climbers can provide nesting sites for birds and a haven for insects. Native climbing plants include: ivy *Hedera helix*, clematis *Clematis vitalba*, honeysuckle *Lonicera periclymenum* and dog-rose *Rosa canina*.

Provision of Water for Birds
In addition to foraging and nesting areas, birds also need drinking water. There are often few places in urban areas where rainwater is captured. Provision of one container capable of capturing rainwater would provide an important source of drinking water for birds within the area.

5.3 ECO 3: PROTECTION OF ECOLOGICAL FEATURES

1 credit is available for the *protection of existing features during site preparation and construction works.*

If the following conditions are met Middlemarch Environmental Ltd will judge that all features of ecological value have been sufficiently protected and site relevant EU and UK legislation has been adhered to:

Existing Trees: The trees specified in Section 5.1 must be retained and protected in accordance with British Standard 5837: 2012, Trees in relation to design, demolition and construction – recommendations.

Nesting Birds: The removal of scattered trees must be undertaken outside of the bird nesting season (this generally extends between March and September but is weather dependent). If this is not possible the area concerned should be checked immediately prior to removal by a suitably qualified ecologist. Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended). Some species (listed in Schedule 1 of the WCA) are protected by special penalties.

The contractor is required to construct ecological protection prior to any preliminary or preparation works on site. The client must provide written confirmation that these criteria have been followed, prior to Middlemarch Environmental Ltd recommending that this credit may be awarded.

5.4 ECO 4: CHANGE IN ECOLOGICAL VALUE OF THE SITE

There are **4 credits** available for *minimising reductions and improving the ecological value of the site.*

Tables 5.1 and 5.2 provide the calculations to assess the species change post development based on current client information.

The species diversity prior to the commencement of development was calculated and the results are given in Table 5.1.

Plot Type	Area of Plot Type (m²)		Species (No.)		Species x Area of Plot Type
Introduced shrub	15	X	4 (Actual)	=	60
Poor semi-improved grassland	3,785	X	8 (Actual)	=	30,280
Scattered trees	85	X	1 (Actual)	=	85
Total (1)	**3,885**			**Total (2)**	**30,425**
Total species x area of plot type/Total site area = (2)/(1) =					**7.83**

Table 5.1: Pre-development Ecological Value

The post-development score can be calculated using current client information, as shown in Table 5.2.

Plot Type	Area of Plot Type (m²)		Species (No.)		Species x Area of Plot Type
Amenity grassland	1,009	X	4.6	=	4,641
Buildings and hardstanding	2,750	X	0	=	0
Wildlife planting	126	X	unknown	=	0
Total (1)	**3,885**			**Total (2)**	**4,641**
Total species x area of plot type/Total site area = (2)/(1) =					**1.20**

Table 5.2: Post-development Ecological Value

There is a loss of 6.63 species and therefore we recommend **1 credit** out of an available 4 credits may be awarded for the current planting schedule. Table 5.3 details the number of plant species required as part of a wildlife planting scheme to earn the further **3 credits** available for this section.

Number of Credits	Change in Ecological Value Required	Ecological Value Required	Number of Plant Species Required *
2	-3 to +3	4.83	113
3	+3 to +9	10.83	298
4	9+	16.83	483

Table 5.3: Ecological Value and Number of Plant Species Required for Further Credits

* The calculation is based on 126 m² of wildlife planting as indicated on the proposed site plans. Please note that only native or wildlife attracting species count towards the totals.

5.5 ECO 5: DEVELOPMENT FOOTPRINT

There are **2 credits** available for ensuring *land and material use is optimised for each dwelling on the development*.

- 1 credit for houses where the net internal floor area: net internal ground floor area ratio is greater than 2.5:1, or for blocks of flats where the net internal floor area: net internal ground floor area ratio is greater than 3:1, or for a combination of houses and flats where the ratio of total net internal floor area: total ground floor area is greater than the area weighted average of the two ratios above.

- 2 credits for a development of houses where the net internal floor area: net internal ground floor area ratio is greater than 3:1, or for a block of flats where the net internal floor area: net internal ground floor area ratio is greater than 4:1, or for a combination of houses and flats where the ratio of total net internal floor area: total ground floor area is greater than the area weighted average of the two ratios above.

The net internal floor area: net internal ground floor ratio of the development could not be calculated using current client information; therefore we recommend **0 credits** may be awarded at present. However, on receipt of the detailed floor plans/floor areas (m^2), recalculations can be made and up to **2 credits** may be available.

APPENDICES

APPENDIX 1:

ECOLOGIST QUALIFICATIONS

Ecologist Details

Name: Indre Barsketyte – Ecological Consultant
Company: Middlemarch Environmental Ltd
Address: Triumph House, Birmingham Road, Allesley, CV5 9AZ
Contact Telephone Number: 01676 525880
Ecology Report Reference: RT-MME-118883

Qualifications in Ecology or related subject:

BSc (Hons) in Biomedical Science
MSc Environmental Bioscience in a Changing Climate

Memberships:

Graduate member of The Chartered Institute of Ecology and Environmental Management (Grad CIEEM)

Relevant Experience:

Indre has gained a range of ecological skills through academic and professional experiences in biological research, habitat management and species surveys. She is a qualified ecologist, and is experience in undertaking extended phase 1 habitat surveys and completing protected species surveys and mitigation, including bat, badger, reptile, water vole and great crested newt projects. Indre holds a great crested newt licence.

REPORT VERIFICATION

Name: Dr Philip Fermor
Managing Director - Middlemarch Environmental Ltd

Qualifications in ecology or related subject:

PhD Habitat Creation
BSc Environmental Science

Memberships:

Vice chairman of The Association of Wildlife Trust Consultancies (AWTC)
The Institute of Ecology and Environmental Management (MIEEM)
Chartered Environmentalist (CEnv)

Relevant Experience:

Over nineteen year's environmental consultancy experience (experience within the last 5 years) providing effective and sustainable biodiversity solutions within a range of environmental and hydrological disciplines for landmark UK Biodiversity projects. Responsible for business development and company management with a priority of client engagement. Managing a range of large commercial consultancy projects, including biodiversity masterplanning; hydroecological assessment; biodiversity action planning and strategy for corporate clients; and training.

I find the report to:

- represent sound industry practice
- report and recommend correctly, truthfully, and objectively
- be appropriate given the local site conditions and scope of works proposed
- avoid invalid, biased, and exaggerated statements.

I confirm that the information provided in this document is truthful and accurate at the time of completion.

Signed: Dated: 10/02/2015

Dr Philip Fermor
Managing Director

APPENDIX 2:
LIST OF WILDLIFE ATTRACTING PLANTS

Species	Height/Spread	Colours	Flowers/Berries	Wildlife benefits	Plant conditions and notes	Deciduous or Evergreen
Native Trees						
Field Maple *Acer campestre*	To 25m	Leaves: Green then amber in Autumn. Flowers: Yellow/green. Seeds: Green then brown with wings.	Flowers May to June	51 species of insects/mites and 24 species of lepidoptera. Fruits eaten by small mammals.	Calcareous or clay soils preferably in full sun.	Deciduous
Alder *Alnus glutinosa*	6-15m	Leaves: Green, Catkins: Yellow/brown, Fruits: Cone-like, small and brown.	Catkins in March to April	141 species of insects/mites and 71 species of lepidoptera. Seeds are good for birds such as siskins.	Damp soil. Plant hardwood cuttings in the open in late autumn.	Deciduous
Silver Birch *Betula pendula*	To 18m	Leaves: Green turning yellow in Autumn, Catkins: Yellow/brown then seeding, Bark: White.	Catkins open in April and break up in winter releasing it's seeds.	Excellent for insects and to attract inset eating birds. Best tree for moth larvae. Catkins good food source for birds such as redpolls and tits.	Dry acid best.	Deciduous
Downey Birch *Betula pubescens*	To 24m	Leaves: Green turning yellow in Autumn, Catkins: Yellow/brown then seeding, Bark: White.	Catkins open in April and break up in winter releasing it's seeds.	Excellent for insects and to attract inset eating birds. Catkins good food source for birds.	Favours wetter more peaty soil.	Deciduous

Hornbeam *Carpinus betulus*	To 24m	Leaves: Green, Catkins: Green/crimson then seeding.	Flowers in May	51 species of insects/mites and 32 species of lepidoptera. Seeds for birds. Can provide dense nesting cover.	Woods and copses on clay soils, will tolerate shade. Sow seeds or fruits in spring.	Deciduous
Hazel *Corylus avellana*	To 10m	Leaves: Green, Flowers: Long Yellow/Crimson tassels. Seeds: Brown nuts.	Flowers in February	106 species of insects/mites and 68 species of lepidoptera. Nuts eaten by birds and mammals i.e. squirrels, mice and jays.	Hedgerows, scrub and woodland in well-drained soil. Full sun or light shade preferable. Remove and plant rooted suckers or offsets in autumn.	Deciduous
Beech *Fagus sylvatica*	To 46m	Leaves: Green then orange to red/brown in Autumn, Flowers: Green/white. Seeds: Brown nuts encased in a brown husk.	Flowers March to April.	98 species of insects/mites and 51 species of lepidoptera. The masts are eaten by birds and mammals including wood mice and Jays.	Well-drained soils. Can survive in shallow soil. Sow seeds or fruits in autumn.	Deciduous. Can hold dead leaves through the winter.
Ash *Fraxinus excelsior*	To 37m	Leaves: Green, Flowers: Green/Purple prior to the leaves. Seeds: Green single seeds in bunches with a long wing.	Flowers: April-May	68 species of insects/mites and 32 species of lepidoptera. Seeds eaten by birds and mammals.	Will survive on most soils with reasonable light. Sow seeds or fruits in autumn.	Deciduous
Juniper *Juniperus communis*	Shrub or tree to 7m	Leaves: Spiky Green needles, Flowers: Small green to yellow flowers, Berries: Green ripening to purple in the second year.	Flowers May to June. Berries take two years to ripen.	32 species of insects/mites and 14 species of lepidoptera.	Well-drained limestone and acid sandstone.	Evergreen

Crab Apple *Malus sylvestris*	To 10m	Leaves: Green, Flowers: White and pink. Fruits: Green/yellow/red apples.	Flowers: April to May. Fruits ripen in Autumn.	118 species of insects/mites and 76 species of lepidoptera. Fruits are eagerly consumed by birds and mammals despite its bitter taste.	Well-drained soil in full sun.	Deciduous
Scots Pine *Pinus sylvestris*	To 36m	Leaves: Green needles, Flowers: Yellow and crimson, Cones: Short and brown.		172 species of insects/mites and 36 species of lepidoptera. Cones are a valuable food source for birds and other mammals.	Prefers sandy well-drained soil in full sun.	Evergreen
Black Poplar *Populus nigra*	33m	Leaves: Green turning yellow in Autumn, Flowers: Green and crimson catkins, turning fluffy when fruiting.	Catkins produced in March.	153 species of insects/mites and 69 species of lepidoptera found within all the poplar species. Good for larger moth species i.e. Hawk moths	Fertile soil near water. Remove and plant rooted suckers or offsets in autumn. Reduced in numbers due to easy hybridisation with other poplars	Deciduous
Aspen *Populus tremula*	To 24m	Leaves: Green turning yellow in Autumn, Flowers: Green and brown catkins, turning fluffy when fruiting.	Catkins arrive in March and set seed in May.	Good for invertebrates and birds. Food plant of the hairstreak butterfly.	Will survive on most soils with full sun or partial shade.	Deciduous
Wild Cherry *Prunus avium*	9-12m	Leaves: Green turning crimson in Autumn, Flowers: White, Berries: Bright red.	Flowers: April, Berries: July	Birds feed on the cherries.	Prefers fertile soil, will tolerate some shade.	Deciduous
Bird Cherry *Prunus padus*	Shrub or tree to 19m	Leaves: Green, Flowers: White, Berries: Black cherries.	Flowers in May.	9 species of lepidoptera. Berries eaten by birds	Woods and scrub. Well-drained soil with full sun or light shading.	Deciduous

Oaks (native) *Quercus spp.*	To 42m	Leaves: Green, Flowers: Slim yellow catkins, Seeds: Green acorns turning brown when ready to fall.	Flowers in May. Acorns produced in Autumn.	423 species of insects/mites and 193 species of lepidoptera. Acorns eaten by a variety of birds and mammals. Very important for insect eating birds.	Variety of soils with reasonable depth and preferably in full sun, below 300m altitude. Sow seeds or fruits in autumn.	Deciduous
Willows *Salix spp.*	To 25m (species dependent)		Flowers February to March.	450 species of insects/mites and 166 species of lepidoptera.	Damp areas. Plant hardwood cuttings in the open in late autumn.	Deciduous
Goat Willow aka 'pussy willow' *Salix caprea*	Shrubby tree to 10m	Leaves: Oval, dark grey/green on top with a hairy underside, Flowers; Green and yellow short catkins turning fluffy when seeding.	Flowers March to April	Early provider of pollen and nectar for insects.	Most soils as long as they are at least slightly damp.	Deciduous
Grey Willow *Salix cinerea*	Shrubby tree to 6m	Leaves: Grey/green on top with a lighter hairy underside, Flowers; Yellow catkins turning fluffy when seeding.	Flowers March to April	Good for insects and birds.	Most soils as long as they are at least slightly damp.	Deciduous
Crack Willow *Salix fragilis*	Can reach 25m	Leaves: Long, shiny green on top with a grey/green underside, Flowers; Green and yellow catkins turning fluffy when seeding.	Flowers in April with the catkins appearing in May and ripening in the summer.	Good for insects and birds.	Most soils as long as they are at least slightly damp.	Deciduous
Bay Willow *Salix pentandra*	To 10m	Leaves: Long, shiny green on top with a grey/green underside, Flowers: Yellowish catkins,fluffy when seeding.	Flowers May to June	Good for insects and birds.	Wet ground by water.	Deciduous

Elderberry *Sambucus nigra*	To 10m	Leaves: Green, Flowers: Small creamy white flowers in large numbers. Berries: Dark purple/black in bunches.	Flowers May to June	Berries for birds and nectar for insects.	Sun or partial shade.	Deciduous
Whitebeam *Sorbus aria*	10 to 24m	Leaves: Green with white hairy underside turning yellow/crimson in Autumn, Flowers: White, Berries: Green ripening to bright red.	Flowers: May	Flowers attract insects and the fruits are eaten by birds.	Prefers calcareous soil.	Deciduous
Rowan *Sorbus aucuparia*	18m	Leaves: Pinnate green leaves turning crimson in Autumn, Flowers: Small white flowers in clusters, Berries: Bright red.	Flowers in May. Produces berries in autumn.	58 species of insects/mites and 28 species of lepidoptera. The ripe berries attract birds such as redwings and field-fares.	Will tolerate most soils apart from very heavy soils.	Deciduous
Wild Service Tree *Sorbus torminalis*	To 20m	Leaves: Shiny green with a lighter coloured underside, turning purple/red in Autumn, Flowers: Creamy white in clusters, Seeds: Brown speckled seeds in clusters.	Flowers: May or June Fruit: September	Good for insects. Fruits eaten by birds	Withstands shade. Prefers clay and limestone soil.	Deciduous
Lime *Tilia europaea*	To 46m	Leaves: Green heart-shaped with slightly hairy underside, Flowers: Greenish/ yellow flowers, Seeds: Small round and hairy with a grey-brown colour.	Flowers June to July.	57 species of insects/mites and 31 species of lepidoptera. The nectar is highly sought by bees.	Needs well-drained soil with full or partial sun.	Deciduous

Wych Elm *Ulmus glabra*	To 37m	Leaves: Green turning yellow in autumn , Flowers: very small purplish flowers, Seeds: Circular winged fruits with the seed in the centre.	Flowers produced in spring prior to the leaves, with winged fruits produced in July.	Good tree for insects and birds.	Full sun or light shade on most soils especially limestone. This species is less suseptable to Dutch elm disease.	Deciduous
Dutch Elm *Ulmus hollandica*	To 32m	Leaves: Green, Seeds: Circular winged fruits with the seed in the centre.	Winged fruits produced in July.	Good tree for insects and birds.	A native tree which has occurred naturally as a hybridisation between two other elms. Full sun or light shade. This species is less suseptable to Dutch elm disease.	Deciduous
English Elm *Ulmus procera*	To 33m	Leaves: Green, Flowers: Small crimson flowers, Seeds: Circular winged fruits with the seed in the centre.	Crimson flowers produced in spring with winged fruits produced in July.	124 species of insects/mites and 24 species of lepidoptera are associated with elm trees.	Full sun or light shade. 1 in 5 trees have caught Dutch elm disease which the English elms are suseptable to.	Deciduous

Species	Height/Spread	Colours	Flowers/Berries	Wildlife benefits	Plant conditions and notes	Deciduous or Evergreen
Introduced Trees						
Sweet Chestnut *Castanea sativa*	To 35m	Leaves: Green, Flowers: Long yellow tassels. Seeds: Brown nuts encased in a green spiky husk.	Flowers July. Seeds produced in autumn decreasing in size the further north the plants are situated.	11 species of insects/mites and 1 species of lepidoptera. Seeds eaten by a variety of mammals.	Well-drained soil, in full or partial sun. Sow seeds or fruit in spring.	Deciduous
European Larch *Larix decidua.*	To 46m	Leaves: light green needles, Flowers Yellow/dull-red small globes, Cones: Light brown	Spring	38 species of insects/mites and 15 species of lepidoptera. Cones provide food for tits and finches.	Likes plenty of space in full sun.	Deciduous
Magnolia *Magnolia*				Early source of nectar for insects		
Apple *Malus domestica*	To 11m	Leaves: Green, Flowers: Deep pink. Fruits: Reddish-purple.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Purple Crab *Malus purpurea*	To 10m	Leaves: Green, Flowers: White and pink. Fruits: Green/yellow/red apples.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous

Norway Spruce *Picea abies*	To 46m	Leaves: Green needles, Flowers: Yellow and pink, Cones: Long and brown.	Flowers open in May. Cones ripen in autumn.	70 species of insects/mites and 13 species of lepidoptera. The cones are eaten by birds and mammals which include crossbills, treecreepers and red squirrels.	Any reasonable soil, preferably in good sun.	Evergreen
White Poplar *Populus alba*	24m	Leaves: Dark green upper with pale hairy underside, Flowers: Green catkins, turning fluffy when fruiting.	Catkins produced in March.	Good for invertebrates and birds especially larger moth species.	Full sun or partial shade. Remove and plant rooted suckers or offsets in autumn. Can tolerate pollution well, but the roots can damage pipelines and paving.	Deciduous
Wild Plum *Prunus domestica*	To 8m	Leaves: Green, Flowers: White, Fruits: Small purple plums.	Flowers: March to May. Fruits ripen in Autumn.	Nectar and fruits for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Peach *Prunus persica*	6m	Leaves: Dark green, Flowers: Deep pink, Fruits: Usual peach.	Flowers: April to May. Fruits ripen in Autumn.	Nectar and fruits for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Pear *Pyrus communis*	To 15m	Leaves: Dark glossy green, Flowers: White, Fruits Yellow-green to brown.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous
Wild Pear *Pyrus pyraster*	To 15m	Leaves: Dark glossy green, Flowers: White, Fruits Yellow-red to brown, 1-4cm. The tree/shrub is usually spiny.	Flowers: April to May. Fruits ripen in Autumn.	Good for invertebrates. Fruits are eagerly consumed by birds and mammals.	Well-drained soil in full sun.	Deciduous

Native Shrubs						
Box *Buxus sempervirens*	To 3m	Leaves: Small, dark green and glossy, Flowers: Small green/yellow, Seeds: Black encased in blue green capsules turning brown in September	Flowers April to May	Provides good nesting cover and winter roosting cover for birds.	Calcareous soils in full sun or partial shade.	Evergreen
Heather *Calluna vulgaris*	50-100cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers.	Flowers in July to November	Good for invertebrates with a late supply of nectar	Well-drained acid soil in full sun.	Evergreen
Dogwood *Cornus sanguinea*	To 4m	Leaves: Green and hairy turning crimson an Autumn, Flowers: Greenish white in groups, Berries: Black in clusters.	Flowers in June. Produces bitter black berries in August-September.	17 species of lepidoptera. Larval food plant of the green hairstreak butterfly. Flowers produce an unpleasant smell which is attractive to insects. Some birds manage to eat the berries.	Woods and scrub on limestone or base rich clays.	Deciduous
Hawthorn *Crataegus monogyna*	6m	Leaves: Small and green, Flowers: Bright yellow, Seeds: In green pods.	Flowers: White – mid May. Berries: Red/orange in Autumn	Nectar. Berries good food source for thrushes, redwings and fieldfares. Good nesting if dense. Excellent for moth larvae.	Any soil.	Deciduous
Broom *Cytisus scoparius*	2.5m	Leaves: Small green and deeply lobed, Flowers: White, Berries: Red.	Yellow flowers April-June	Good for 39 species of lepidoptera. Food plant of the hairstreak butterfly.	Calcifuge, heathland, sandy banks, open woodland and rough ground. Well drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Semi-evergreen

Spurge Laurel *Daphne laureola*	1m	Leaves: Light green, Flowers: White/green, Berries: Black.	Flowers in February to April	Early source of nectar for insects. Berries for birds which are poisonous to man.	Well-drained humus-rich or chalky soil in full sun or deep shade.	Evergreen
Mezereon *Daphne mezereum*	1m	Leaves: Light green with cream tinged edges, Flowers: Bright pink, Berries: Red.	Flowers in February to April	Early source of nectar for insects.	Well-drained humus-rich soil in full sun or light shade.	Deciduous
Heath 'Bell' *Erica cinerea*	To 50cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers.	Flowers July to August.	Provides nectar for invertebrates.	Well-drained acid soil in full sun.	Evergreen
Heath 'Cross-leaved' *Erica tetralix*	To 50cm	Leaves: Green and minute, Flowers: Pink/purple, Seeds: Very small replacing flowers.	Flowers July to August.	Provides nectar for invertebrates.	Damp acid soil in full sun	Evergreen
Spindle *Euonymus europaeus*	5m (8m max)	Leaves: Light green turning to crimson in Autumn, Flowers: Greenish yellow, Seeds: encased in a four lobed pink capsule.	Fruit October to December.	10 species of lepidoptera. Nectar is good for insects. Berries are good for birds but induce vomiting in people.	Woods, hedgerows and scrub on calcareous or base rich clays. Plant semi-ripe cuttings in a cold frame in summer	Deciduous
Alder Buckthorn *Frangula alnus*	2.5m	Leaves: Shiny green, Flowers: very small greenish flowers, Berries: Green berries turning red then purple.	Flowers: Early summer. Berries: Autumn	Berries for birds. Important food plant for brimstone butterfly larvae.	Damp acidic soil/peat	Deciduous
Tutsan *Hypericum androsaemum*	80cm	Leaves: Green turning red in autumn, Flowers: Yellow, Berries: Black	Flowers June to October followed by berries.	Flowers attract insects especially bees. Berries are eaten by birds and small mammals.	Full sun or light shade in damp soil. Plant semi-ripe cuttings in a cold frame in summer.	Deciduous

Holly *Ilex aquifolium*	300 x 150+ cm	Leaves: spiky glossy green, Flowers: Small pink/white, Berries: Bright red.	Flowers: May. Berries: (only on female trees) October to December.	Berries good for birds and small mammals. Caterpillars of the holly blue butterfly feed on the leaves. Holly leaf miner provides winter food for birds.	Not wet. Layer stems in spring. Need male and female plants near each other to produce berries.	Evergreen
Privet *Ligustrum vulgare*	3m	Leaves: Green, Flowers: White, Berries: Small black berries	Flowers: July.	24 species of insects/mites, nectar for the butterflies. Berries eaten by birds.	Hedgerows and scrub, especially on base rich soil. Plant hardwood cuttings in the open in late autumn.	Deciduous or semi-evergreen in mild areas.
Shrubby Cinquefoil *Potentilla fruticosa.*	1m	Leaves: Green, Flowers: Yellow.	Flowers May to September.	Nectar source for bees and butterflies	Well-drained soil in full sun or light shade. Semi-ripe cuttings in a cold frame in summer.	Deciduous
Blackthorn *Prunus spinosa*	4m	Leaves: Green, Flowers: White, Berries: Blue/black.	Flowers: spring.	Good for nesting birds if grown as thicket or in hedge. Rich in insects. Fruit for birds. Black hairstreak butterfly lays its eggs mainly on blackthorn.	Well-drained soil preferably in a sunny location.	Deciduous
Buckthorn *Rhamnus catharticus*	5m	Leaves: Yellow green, Flowers: Yellow/green, Berries: Black. Stems with spines.	Flowers: May to June	Larval food plant for brimstone butterfly.	Damp, peat or base-rich soils.	Deciduous
Dog Rose *Rosa canina*	3-4m	Leaves: Green , Flowers: Pink/white, Hips: Red.	Flowers: June to July. Hips: autumn	Provides nectar for bees and butterflies. Hips good for small birds and mammals.	Dislikes wet or exposed sites Can tolerate poor fertility.	Deciduous
Sweet Briar *Rosa rubiginosa*	240 x 240cm	Leaves: Green , Flowers: Pink, Hips: Red/orange.	Flowers: mid summer. Berries: autumn	Hips food source for small mammals and birds. Good nesting cover.	Prefers sun and well drained soil.	Deciduous

Raspberry *Rubus idaeus*	1.5-2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Red, Stems also have thorns.	Flowers May to August with berries following.	Nectar source for bees and butterflies. Berries for birds and mammals.	Any reasonable soil in full sun or partial shade.	Deciduous shrub
Gorse *Ulex europaeus*	2-2.5m	Leaves: Thin and spiky, green in colour, Flowers: Yellow.	Autumn flowers, can flower throughout the year.	29 species of insect. Provides good protection for birds nests frequently used by linnets, whinchats and stonechats.	Sandy or peaty well-drained soil in full sun. Grassland, heathland and open woods. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Wayfaring Tree *Vibernum lantana*	3m	Leaves: Green, Flowers: Whitish yellow, Berries: Red then becoming black.	Flowers in June to July.	Berries for birds and nectar for insects.	Most soils especially base rich.	Deciduous
Guelder Rose *Viburnum opulus*	300 x 250cm	Leaves: Green, Flowers: White, Berries: Bright red.	Flowers: May to June. Berries: autumn	Nectar for insects, particularly hoverflies. Fruits for birds and small mammals, especially liked by woodmouse. Note: leaves, bark and berries are all poisonous.	Plant semi-ripe cuttings in a cold frame in summer.	Deciduous
Introduced Shrubs						
Juneberry *Amelanchier lamarkii*	To 6m	Leaves: Pink when unfolding, turning green then yellow-brown in Autumn, Flowers: White in large quantities, Berries: Round red fruits turning purple when ripe.	Flowers April to May with berries in the summer.	Nectar source for bees and butterflies. Berries for birds.	Full sun or partial shade on light acid soils.	Deciduous

Spotted Laurel *Aucuba japonica*	2-3m	Leaves: Dark green with yellow speckles, leathery in texture, Flowers: Small and white, Berries: Green, ripening to red the following spring	Berries: October-January	Berries for birds.	Sun or deep shade, all soils.	Evergreen
Darwin's Barberry *Berberis darwinii*	To 3m	Leaves: Sharp holly-like green leaves, Flowers: Orange in small clusters, Berries: Blue berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Evergreen
Hooker's Barberry *Berberis hookeri*	To 3m	Leaves: Sharp green leaves, Flowers: Yellow in small clusters, Berries: Black berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Evergreen
Hedge Barberry *Berberis stenophylla*	To 3m	Leaves: Small sharp green leaves, Flowers: Yellow in small clusters, Berries: Blue/black berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Evergreen
Thunberg's Barberry	To 1.5m	Leaves: Bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous

Thunberg's Barberry *Berberis thunbergii 'Atropurpurea'*	To 2m	Leaves: Bronze leaves bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous
Thunberg's Barberry *Berberis thunbergii 'Atropurpurea Nana'*	60cm	Leaves: Bronze leaves bright red in Autumn, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: Almost spineless.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous
Barberry *Berberis vulgaris*	To 3m	Leaves: Green leaves, Flowers: Yellow in small clusters, Berries: Red berries in bunches, Stems: with spines.	Flowers in spring. Berries in autumn.	Berries for birds and nectar for insects. Can provide good nesting cover for small passerines.	Sun or light shade. Various propagation methods. Note: this shrub is a winter host for wheat rust - agricultural fungal pest.	Deciduous
Alternate-Leaved Butterfly-Bush *Buddleia davidii*	Willow like shrub to 8m	Leaves: Green , Flowers: Lilac found on long drooping stems covered in globular shaped flower bunches, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers July to September	Nectar for bees and butterflies. The best bush available for butterflies especially if planted in a sun trap.	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn.	Deciduous

Buddleia (butterfly-bush) *Buddleia davidii*	300 x 180cm	Leaves: Dark green above with a lighter hairier underside, Flowers: Long spikes with a lavender colour, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers July to September	Nectar for bees and butterflies. The best bush available for butterflies especially if planted in a sun trap.	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn.	Deciduous
Orange Ball Tree *Buddleia globosa*	To 5m	Leaves: Dark green above with a lighter hairier underside, Flowers: Orange in a globular shape, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers May to June	Nectar for bees and butterflies.	Dryish soil.	Deciduous to semi-evergreen
Weyer's Butterfly-Bush *Buddleia weyeriana*	300 x 180cm	Leaves: Green, Flowers: Yellow found on inflorescence which is interrupted with spaces slightly globular in shape, Seeds: Found in the flower heads which stay on the plant for most of the winter.	Flowers May to June	Nectar for bees and butterflies. Flowers slightly later then *davidii* attracting the butterflies from these bushes.	Dryish soil in full sun or partial shade. Plant semi-ripe cuttings in a cold frame in summer or plant hardwood cuttings in the open in late autumn.	Deciduous to semi-evergreen
Blue Spiraea *Caryopteris clandonensis*	1m	Leaves: Blue/green, Flowers: Blue in clusters.	Flowers, September to October.	Provides a late source of pollen and nectar.	Requires well-drained soil in full sun.	Deciduous
Californian Lilac *Ceanothus 'Autumnal Blue'*	1.8 x 1.8+m	Leaves: Green and shiny, Flowers: Purple in clusters.	Flowers in July to October.	Nectar for bees and butterflies.	Fertile soil in a sunny location.	Evergreen

Californian Lilac *Ceanothus 'Gloire de Versailles'*	1.8 x 1.8m	Leaves: Dark green and shiny, Flowers: Light blue in clusters.	Flowers in July to October.	Nectar for bees and butterflies.	Fertile soil in a sunny location.	Deciduous
Japanese Quince *Chaenomeles japonica*	1m	Leaves: Green , Flowers: Red, Fruits: Large, golden brown.	Flowers March-May followed by fruits which ripen in October.	Berries for birds and mammals.	Full sun	Deciduous
Quince variety *Chaenomeles speciosa*	Bush to 1.5m or train as a Climber to 3m x 30cm thick	Leaves: Green sparser then *japonica* , Flowers: depends on variety, Fruits: Large, golden brown.	Flowers March-May and the fruits ripen in October.	Nectar source for bees and butterflies. Berries for birds and mammals. Good for birds to nest in as branches are sturdy with spines to deter cats.	Sun or shade.	Deciduous
Smoke Bush *Cotinus coggygria*	3m	Leaves: Green turning orange or red in autumn, Flowers: Light pink feathery flowers.	Flowers June - July	Good for bees and birds	Sandy infertile soil best, full sun preferred.	Deciduous
Cotoneaster 'Coral Beauty' *Cotoneaster conspicuous 'Decorus'*	Spreading shrub To 1.5m	Leaves: Small green, Berries: Red.	Berries October to January.	Berries good for birds and small mammals. Nectar for invertebrates.	Any reasonable soil, preferably in good sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Francchet's Cotoneaster *Cotoneaster franchetii*	To 3m	Leaves: Small green and glossy with silvery hairy underneath, Flowers: Light Purple, Berries: Orange.	Berries October to January.	Berries good for birds and small mammals. Nectar for invertebrates.	Any reasonable soil, preferably in good sun. Plant semi-ripe cuttings in a cold frame in summer.	Semi-evergreen

Cotoneaster *Cotoneaster frigidus*	To 8m	Leaves: Small green and glossy, Flowers: White, Berries: Red.	Berries October to January.	Berries good for birds and small mammals. Attracts waxwings and pheasants.	Plant semi-ripe cuttings in a cold frame in summer.	Deciduous to semi-evergreen
Daphne *Daphne odora*	1m	Leaves: Dark green, Flowers: Bright pink.	Flowers in February to April	Early source of nectar for insects.	Well-drained humus-rich soil in full sun or light shade.	Evergreen
Broad-leaved Oleaster *Elaeagnus macrophylla*	To 3m	Leaves: Silvery when unfolding turning dark glossy green, Flowers: Creamy yellow bell shaped, Berries: Red	Flowers in October to November.	Provides a late source of pollen and nectar.	Any reasonable soil, preferably in good sun.	Evergreen
Spreading Oleaster *Elaeagnus umbellata*	2-6m	Leaves: Silvery when unfolding turning bright green, Flowers: Creamy yellow bell shaped, Berries: Red	Fragrant flowers in May to June. Berries in October to December.	Provides nectar for bees and butterflies, and food for wild birds	Any reasonable soil, preferably in good sun.	Deciduous
Escallonia *Escallonia macrantha*	1-3m (Species dependent)	Leaves: Dark green and glossy, Flowers: Pinkish red, Berries:	Flowers June to September	Provides nectar for bees and butterflies.	Full sun or light shade.	Evergreen
Fuchsia *Fuchsia magellancia*	2-3m	Leaves: Dark green leaves, Flowers: Purple and red.	Flowers: July to October	Attracts bees.	Full sun or light shade.	Deciduous
Hebe *Hebe spp.*	80cm		Flowers May-September (depending on variety).	Food source for 26 species of butterfly including the Speckled Wood	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Hebe *Hebe albicans.*	30cm x 90cm	Leaves: Small and Green, Flowers: White	Flowers in June to July.	Nectar for bees and butterflies.	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen

Hebe *Hebe andersonii 'variegata'.*	To 2m	Leaves: Small and Green, Flowers: Mauve	Flowers in August to September.	Good for invertebrates with a late supply of nectar	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Hebe *Hebe brachysiphon.*	To 2m	Leaves: Small and Green, Flowers: White	Flowers in June to July.	Nectar for bees and butterflies.	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Hebe *Hebe salicifolia.*	90-150cm	Leaves: Small and Green, Flowers: White	Flowers in June to September.	Nectar for bees and butterflies.	Well-drained soil in full sun. Plant semi-ripe cuttings in a cold frame in summer.	Evergreen
Shrubby Helichrysum *Helichrysum italicum*	60cm	Leaves: Grey-green silvery leaves, Flowers: Yellow.	Yellow flowers in June to August.	Nectar source for bees and butterflies	Well-drained sandy soil in full sun.	Evergreen
Hydrangea *Hydrangea spp.*	1-2.5m	Leaves: Green, Flowers: Depends upon species/varieties.	Flowers July to September	Provides nectar for bees and butterflies.	Well-drained fertile soil in full sun. needs watering through dry spells.	Deciduous
St. John's Wort aka 'Rose of Sharon' *Hypericum calycinum*	To 1m	Leaves: Green turning red in autumn, Flowers: Yellow, Berries: Red	Flowers June to October.	Flowers attract insects especially bees. Berries are eaten by birds and small mammals.	Full sun or light shade. Plant semi-ripe cuttings in a cold frame in summer.	Semi-evergreen
Hyssop *Hyssopus officinalis*	60cm	Leaves: Green, Flowers: Small blue flowers on spikelets.	Low evergreen shrub	Attractive for some butterflies	Well-drained fertile soil in full sun.	Semi-evergreen
Holly 'Golden King' *Ilex altaclerensis*	300 x 150+ cm	Leaves: Glossy green with yellow borders and small spines, Flowers: Small pink/white, Berries: Bright red.	Flowers: May. Berries: (only on female trees) October to December.	Berries good for birds and small mammals. Holly leaf miner provides winter food for birds.	Any reasonable soil in full sun or partial shade. Need male and female plants near each other to produce berries.	Evergreen
Lavender *Lavandula angustifolia*	75 x 75 cm	Leaves: Greyish-green, Flowers: Blue/purple.	Flowers: July to September	Attracts butterflies	Plant semi-ripe cuttings in a cold frame in summer.	Evergreen

Oregon Grape *Mahonia aquifolium*	1m	Leaves: Green and glossy with small spikes, Flowers: Yellow.	Flowers March to April	Nectar for bees and butterflies.	Thrives best in partial shade.	Evergreen
Daisy Bush *Olearia haastii*	1-2m	Leaves: Green and glossy, Flowers: White.	Flowers white, July to August	Nectar for bees and butterflies.	Well drained soil in full sun.	Evergreen
Russian Sage *Perovskia atriplicifolia*	1m	Leaves: Greyish-green, Flowers: Blue/purple.	Flowers: August to October	Good for bees	Full sun essential	Deciduous
Mock Orange *Philadelphus coronarius*	1.5-3m	Leaves: Yellow and green, Flowers: White.	Flowers June to July.	Nectar for bees and butterflies.	Full sun.	Deciduous
Firethorn *Pyracantha atalantioides*	3m	Leaves: Dark green, Flowers: White, Berries: Red/orange	Berries: October-January	Good for nesting thrushes and a site or an open robin box. Nectar for bees, berries for birds.	Thrives in most good soils.	Evergreen
Firethorn *Pyracantha coccinea*	To 3.5m	Leaves: Dark green, Flowers: White, Berries: Red/orange	Berries: October-January	Good for nesting thrushes and a site or an open robin box. Nectar for bees, berries for birds.	Thrives in most good soils.	Evergreen
Black Current *Ribes nigrum*	2m	Leaves: Green , Flowers: Pink, Berries: Black.	Flowers: April.	Good for bees, birds and small mammals	Thrives in full sun or partial shade.	Deciduous
Ornamental Current *Ribes odoratum*	2m	Leaves: Green turning purple in Autumn, Flowers: Yellow, Berries: Black.	Flowers: April.	Good for bees and birds	Thrives in full sun or partial shade.	Deciduous
Flowering Currant *Ribes sanguineum*	2m x 1.5m	Leaves: Green , Flowers: Pink, Berries: Black.	Flowers March to April	Provides nectar for bees and butterflies.	Full sun or light shade.	Deciduous

Rosemary *Rosemarinus officinalis*	1.5m	Leaves: Green and thin, Flowers: Lilac.	Flowers April to May.	Nectar source for bees and butterflies	Well-drained soil in full sun.	Evergreen
Blackberry *Rubus fruticosus*	Sprawling plant 1.5-2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Red turning black when ripening	Flowers May to September with berries following the flowers until mid September.	Nectar source for bees and butterflies. Berries for birds and mammals.	Any soil in full sun or partial shade. Can be very invasive.	Deciduous shrub
Loganberry *Rubus loganobaccus*	1.5-2.5m	Leaves: Green with thorns on underside, Flowers White, Berries: Dark red, Stems also have thorns.	Flowers May to August with large berries following.	Nectar source for bees and butterflies. Berries for birds and mammals.	Any reasonable soil in full sun or partial shade.	Deciduous shrub
Shrubby Ragwort *Senecio greyi*	1m	Leaves: Bluish green upper with silvery hairy underside, Flowers: Yellow.	Flowers in June.	Nectar source for bees and butterflies	Well-drained soil in full sun.	Evergreen
Skimmia *Skimmia japonica*	To 1m	Leaves: Dark glossy green, Flowers: White, Berries: Red (but only if male and female trees are located near each other).	Flowers in April to May.	Nectar source for bees and butterflies	Well-drained, neutral to acid soil in full sun or partial shade.	Evergreen
Bridal Wreath *Spiraea arguta*	2m	Leaves: Green, Flowers: Masses of white flowers.	Flowers April to May	Nectar for bees and butterflies.	Full sun on most soils	Deciduous
Snowberry *Symphoricarpos albus*	1-2m	Leaves Green, Flowers: Small and pink in terminal spikes, Berries: White.	Flowers: June to September.	Caterpillars of the death's head hawk moth feed on the leaves. Good ground cover. Birds may feed on the berries when other food is scarce.	Forms dense thickets unless regularly pruned.	Deciduous

Lilac *Syringa vulgaris*	150 x 300cm	Leaves Green, Flowers: Colour depends on variety, in terminal spikes.	Flowers May to June	Nectar for bees and butterflies.	Best in full sun.	Deciduous
Viburnum *Viburnum bodnantense*	1-2.5m	Leaves: Green, Flowers: Pink.	Flowers January to March.	Provides early nectar source for invertebrates and berries for birds. One of the most valuable winter flowering shrubs.	Sun or shade in most soils.	Deciduous
Laurustinus *Viburnum tinus*	2-6m	Leaves: Green, Flowers: White to pink, Berries: Blue/black.	Flowers November - February	Provides late nectar source for invertebrates and berries for birds.	Sun or shade in most soils.	Evergreen
Weigela *Weigela florida*	1.2m x 1.2m	Leaves: Green or green with yellow tinges (variety dependant), Flowers: Pink.	Flowers May to June	Provides nectar for bees and butterflies.	Rich, moist soils in full sun or partial shade.	Deciduous
Native Herbaceous						
Teasel *Dipsacus fullonum*	2m	Leaves: Green, Flowers: Light purple.	Flowers: July to August.	A food source of the Brimstone butterfly. Attracts other insects for its nectar and birds for its seeds.	Well-drained soil in full sun or light shade.	Biennial
Purple Loosestrife *Lythrum salicaria*	To 1.8m	Leaves: Green, Flowers: Purple.	Flowers in June to September.	Provides nectar for bees and butterflies.	Humus-rich soil in full sun or light shade with plenty of water, preferably boggy.	Border perennial
Musk Mallow *Malva moschata*	60cm	Leaves: Green Flowers: Pink	Flowers between July and August.	Provides nectar for bees and butterflies.	Well-drained soil in full sun.	Border perennial
Cat-mint *Nepeta cataria*	60-90cm	Leaves: Green above, white below. Flowers: White	Flowers July to September	Berries for birds and nectar for insects.	Well-drained soil in full sun.	Perennial

Wild Marjoram *Origanum vulgare*	50-70cm	Leaves: Green Flowers: Pale pink	Flowers July to September	Good plant for butterflies and bees	Dry soil preferably on calcareous soil.	Perennial
Tormentil *Potentilla erecta*	30-45cm	Leaves: Green, Flowers: Yellow.	Flowers June to September	Good plant for butterflies and bees	Well drained soil preferably acidic.	Perennial
Goldenrod *Solidago virgaurea*	70-100cm	Leaves: Green. Flowers: Yellow	Flowers July to September	27 species of lepidoptera.	Open woodland, grassland and hedgerows. Well-drained soil. Full sun or light shade.	Perennial
Betony *Stachys officinalis*	To 60cm	Leaves: Green. Flowers: Pink/purple	Flowers June to September	Nectar source for bees and butterflies	Well-drained soil in full sun or partial shade.	Border perennial
Common Valerian *Valeriana officinalis*	Stems to 1m	Leaves: Green. Flowers: Pink/white.	Flowers June to September	Provides nectar for bees and butterflies.	Dry or damp grassy or rough ground.	Perennial
Introduced Herbaceous						
Rockery Alyssum *Alyssum saxatile*	20cm	Leaves: Green, Flowers: Bright yellow.	Flowers April to June	Provides nectar for bees and butterflies.	Grows well in poor, well-drained soil in full sun. It can soon spread if left unchecked.	Perennial
Michaelmas Daisy *Aster novae-belgii*	To 75cm	Leaves: Green, Flowers: Dark pink.	Dark pink flowers in September to October.	Good for invertebrates with a late supply of nectar.	Well-drained soil in full sun. Needs watering in dry weather.	Border perennial
Perennial Wallflower *Erysimum 'Bowles Mauve'*	To 75cm	Leaves: Dark green, Flowers: Mauve.	Blooms nearly all year round.	Provides nectar for insects.	Well-drained non-acid soil in full sun.	Evergreen perennial
Dame's-violet *Hesperis matronalis*	60-100cm	Leaves: Green Flowers: Pink	Flowers May to July.	Very good nectar source for bees and butterflies.	Well-drained soil in full sun or partial shade.	Border perennial

Candytuft *Iberis sempervirens*	20cm high with 60cm spread.	Leaves: Dull yellowish green, Flowers: White.	Flowers May to June	Very good nectar source for bees and butterflies.	Well-drained soil in full sun.	Rocky perennial
Golden Rays aka Leopardplant *Ligularia dentata*	To 1m	Leaves: Bluish green, Flowers: Yellow.	Flowers July to September	Provides nectar for bees and butterflies.	Humus-rich soil in light shade with plenty of water, preferably boggy.	Border perennial
Ice Plant *Sedum spectabile*	60 x 30cm	Leaves: Grey/green. Flowers: Pink	Flowers, June to October.	Provides nectar for bees and butterflies. The plant is extremely good for butterflies.	Average garden soil in full sun	Perennial
Nasturtium *Tropaelumm majus*	1.8m	Leaves: Green. Flowers: Red, orange and yellow.	Flowers: June-October	Good for bees and beetles. Seeds eaten by birds and small mammals. Good insect plant.	Plant in sun or partial shade. Likes poor soil.	Climbing annual
Native Climbers						
Clematis 'Old Mans Beard' *Clematis vitalba*	Climber to 30m	Leaves: Green. Flowers: White/green	Flowers in July	Provides nectar for bees and butterflies.	Prefers calcareous and alluvial soils	Deciduous
Ivy *Hedera helix*	Climber	Leaves: Dark green, shiny. Flowers: Green/yellow. Berries: Black	Flowers October to November.	Provides late nectar source and cover/hibernating sites for invertebrates. Food source for the Holly Blue butterfly larva.	Trees, banks, rocks and crawling over the floor. Thrives in shade. Remove and plant rooted runners in spring.	Evergreen
Hop *Humulus lupulus*	Climber to 8m	Leaves: Yellowish-green, Flowers: Small yellowish brown.	Flowers July to August	Provides nectar for bees and butterflies.	Well-drained soil in full sun or light shade.	Perennial
Honeysuckle *Lonicera periclymenum*	Climber to 6m	Leaves: Dark green on top and bluish underneath. Flowers: red outside cream within Berries: Bright red.	Flowers July to August	Excellent food source for invertebrates including the Speckled Wood butterfly. Berries eaten by birds.	Woods, scrub and hedges. Sun or light shade. Plant semi-ripe cuttings in a cold frame in summer or Layer stems in spring	Deciduous

Introduced Climbers						
Everlasting Pea *Lathyrus latifolius*	Spreading climber to 1.8m.	Leaves: Green, Flowers: Pink-purple. Has long thin seed pods.	Flowers in July to September.	Provides nectar for bees and butterflies.	Well-drained soil in full sun or light shade.	Border perennial
Japanese Wisteria *Wisteria floribunda*	Climber (needs tying)	Leaves: Yellowish-green Flowers: Blue-purple in large drooping clusters.	Flowers early to mid summer but may not flower for the first year or two.	Provides nectar for bees and butterflies.	Well-drained soil in full sun or light shade. Needs plenty of space.	Evergreen

APPENDIX 3:
BIRD BOX, BAT BRICK & LADYBIRD/LACEWING BOX DETAILS

BIRD BOXES

ATTRACTING BIRDS TO GARDENS

Initially to entice birds to an area, a good source of food must be available, so to attract birds to a garden provision of a bird table may be a good idea. The choice of plants within the garden must also be considered.

Plants producing large seed heads such as Sunflowers or Michaelmas Daisies are recommended, as are berry producing plants and shrubs such as Cotoneaster, Honeysuckle, Holly and Hawthorn. Larger shrubs also provide branches for birds to perch on and roosting sites. A source of water, not only for drinking but also for bathing, is also of an advantage.

In many new developments there may be a plentiful supply of food, however there may be nowhere for birds to nest. Provision of nesting boxes is therefore also vital to minimise the net biodiversity loss.

MATERIALS

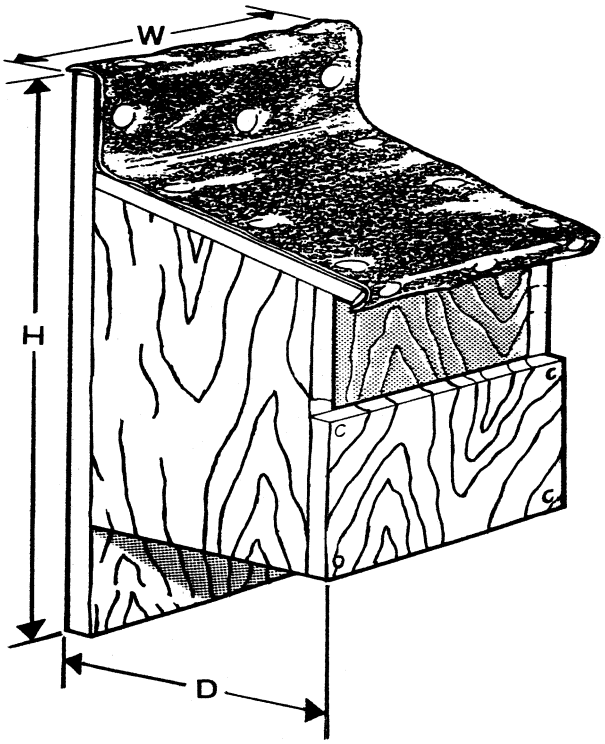
Bird boxes are generally constructed from wood or woodcrete (a concrete and wood paste). Any wood may be used, however it should be at least 15 mm thick, 20mm is ideal. Wood preserver should never be used on the inside of the nesting box.

TIME TO ERECT BOXES

Boxes should be erected by March, but the earlier the better, as most birds seek out suitable nest sites some time before they start to construct their nest.

POSITIONING THE BOX

Position the entrance facing away from the midday sun (south), ideally facing east to take advantage of the early morning sun. Boxes should not be positioned on the north of buildings. Angle the box slightly forward to keep out sun and rain. All boxes should have a clear flight path to the entrance. Most boxes should be positioned at a height of 2–3 metres however this varies between bird species. The optimum density for boxes depends on the species and habitat.



HOLE ENTRANCE BOXES

Hole entrance boxes will attract a variety of birds, including the following species which are detailed further below:

- Barn Owl
- Nuthatch
- Jackdaw
- Starling
- All Tit species

BARN OWLS

Size: 450mm wide, 450mm high, 750mm Deep. Entrance: 150mm wide by 200mm high. The bigger the box the better! But allow for an extended floor for the young birds to exercise on. Siting: Boxes can be placed in trees, inside buildings or in straw stacks. Density: Two boxes sited in one territory would be of an advantage as they require both roosting and nesting sites. Barn owls are sensitive to disturbance. Try to position boxes at least 5 metres above ground level. Boxes sited on the edge of existing owl strongholds will bring the best results. Clean out the box every year, leaving a thin layer of pellets, new boxes should be lined with bark chippings.

BLUE TIT

Size: 100mm wide, 100mm deep and 150mm high, 25mm diameter entrance hole. Siting: 2-6 metres high. Density: Up to 6 per Ha. prefer a small box (see Blue tit) but still with a 28mm diameter entrance hole. Density: Up to 4 per Ha.

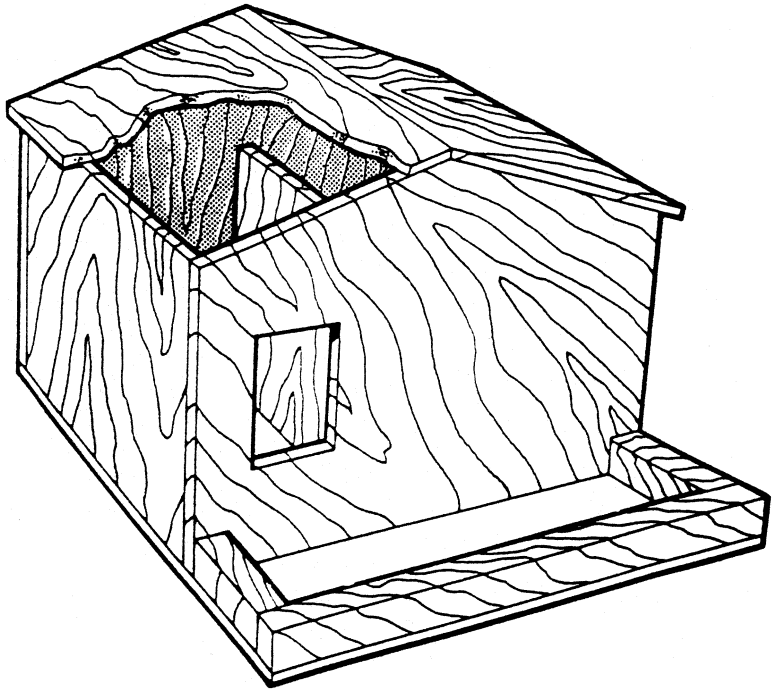
MARSH TIT

Size: 100mm wide, 100mm deep and 150mm high, 25mm diameter entrance hole. Sited: Up to 2 metres high. Density: No more than 1 box every 2 Ha.

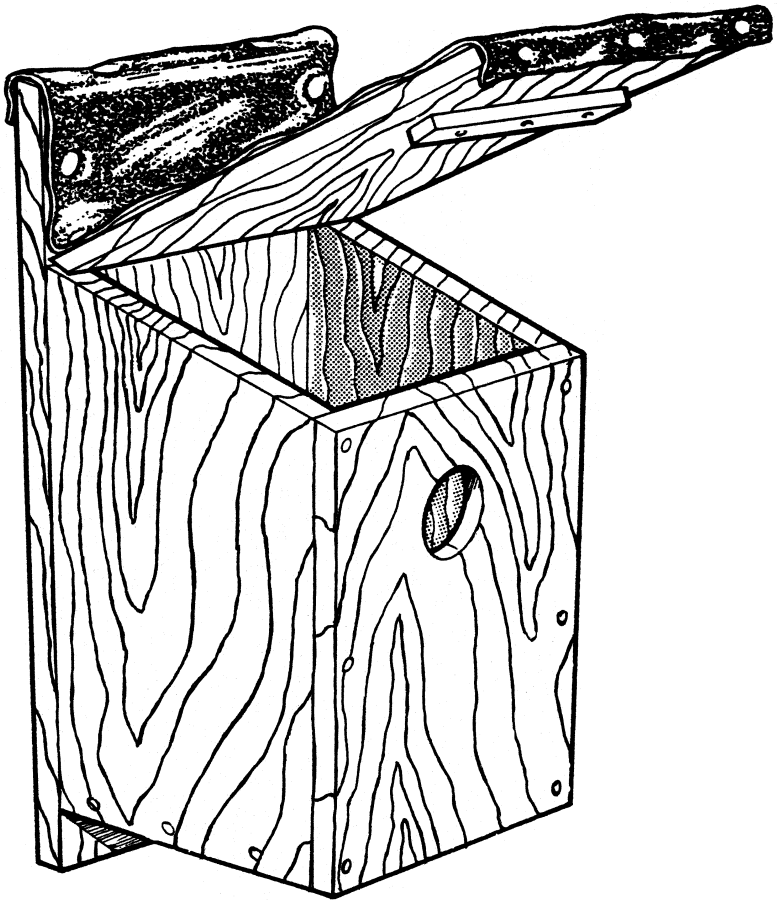
GREAT TIT

Size: 130mm wide, 130mm deep and 500mm high, 28mm entrance hole. Siting: 2-6 metres high. For roosting these birds

BARN OWL BOX



BASIC HOLE ENTRANCE BOX



COAL TIT

Size: 100mm wide, 100mm deep and 150mm high, 25mm diameter entrance hole. Siting: Up to 2 metres in deciduous woodland or on an isolated conifer tree. Density: No more than 1 box every 2 Ha.

WILLOW TIT

Size: 100mm wide, 100mm deep and 150mm high, 25mm diameter entrance hole. Siting: Up to 2 metres high in thick cover. Will only colonise new areas if existing population is located near by. Fill box with wood shavings. Density: No more than 1 box every 2 Ha.

NUTHATCH

Size: 130mm wide, 130mm deep and 200mm high, 32mm diameter entrance hole. Siting: 2-6 metres high. Density: 1 box per hectare

JACKDAW

Size: 200mm wide, 200mm deep and 450mm high, 150mm diameter entrance hole. Siting: 6+ metres high. These birds are very secretive and need an inconspicuously placed entrance. Density: May nest colonially, therefore several boxes can be placed close together.

STARLING

Size: 200mm wide, 200mm deep and 450mm high, 45mm diameter entrance hole. Siting: Boxes can be located on trees or high up in the eaves of houses. Density: May nest colonially; can erect boxes on adjacent trees or buildings.

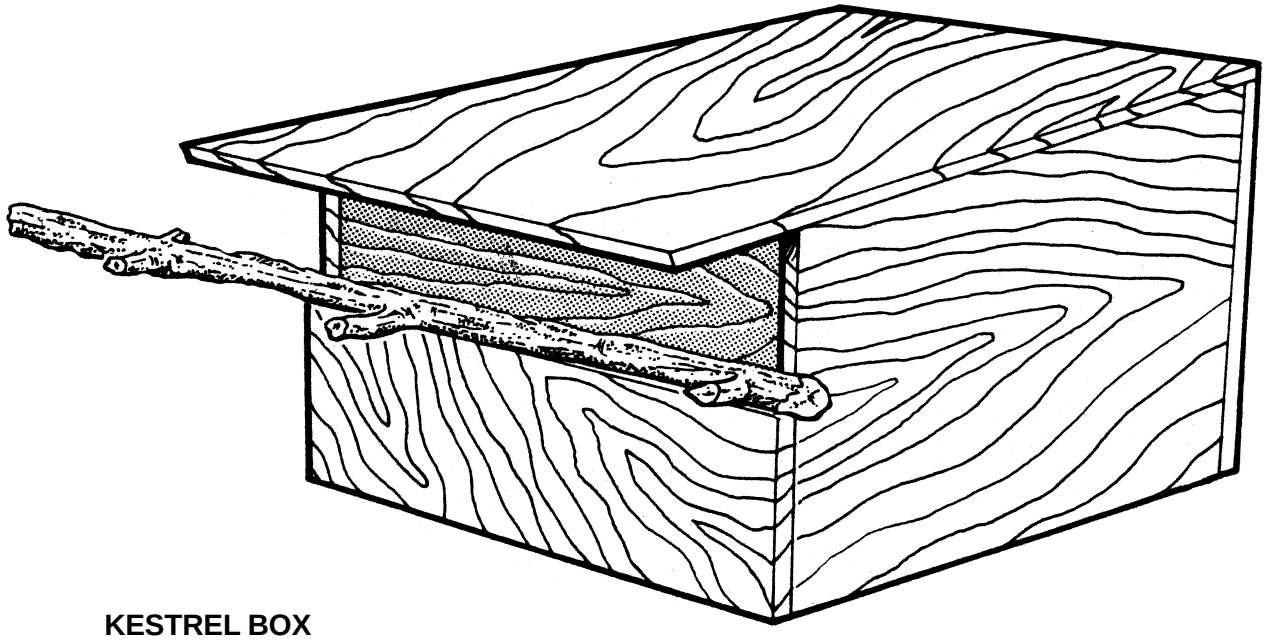
OPEN FRONTED BOXES

These boxes will attract a number of species, including the following birds:

- Kestrel
- Robin
- Wren
- Black Redstart
- Blackbird
- Pied Wagtail
- Spotted Flycatcher

KESTREL

Size: 300mm wide, 500mm deep, 300mm high, front 150mm high. Siting: Box should be mounted at least 5 metres above the ground, sloping slightly backwards to keep the eggs and young at the rear of the box. The opening should be south-east facing with a clear flight path to the entrance. The box can be tree or pole mounted. The pole needs to be fixed firmly in the ground, using concrete, extending to a height of 3 metres or more, enabling the use of a ladder for maintenance purpose. Fix a strong perch along the top of the entrance, extending to one side, to allow both the adult and young to sit outside the box. Density: 1 box per 100 Ha.



KESTREL BOX

SPOTTED FLYCATCHER

Size: 150mm wide, 100mm high, 100mm deep, front 25mm high. Siting: These boxes should be erected on walls covered in ivy or honeysuckle overlooking a glade or lawn, positioned at a medium height (2-6 metres). Ensure a perch is available close by, a simple stick stuck in the ground a couple of metres from the box will suffice. Density: 1 box per ha.

ROBIN

Size: 100mm wide, 100mm deep and 150mm high. Siting: Boxes should be sited up to 2 metres high in a well hidden location, protected by thorny shrubbery. Density: No more than 1 box per 0.5 Ha.

WREN

Size: 100mm wide, 100mm deep and 150mm high. Sited: Up to 2 metres high. Wren will use both open fronted and hole entrance nesting boxes. A 30mm entrance is required in a small or very small box (see Blue tit). Siting: The box needs to be mounted low, up to 2 metres in thick undergrowth. Density: Clusters of 2 or 3 boxes per 0.5 Ha will cater for successive broods by the resident pair.

PIED WAGTAIL

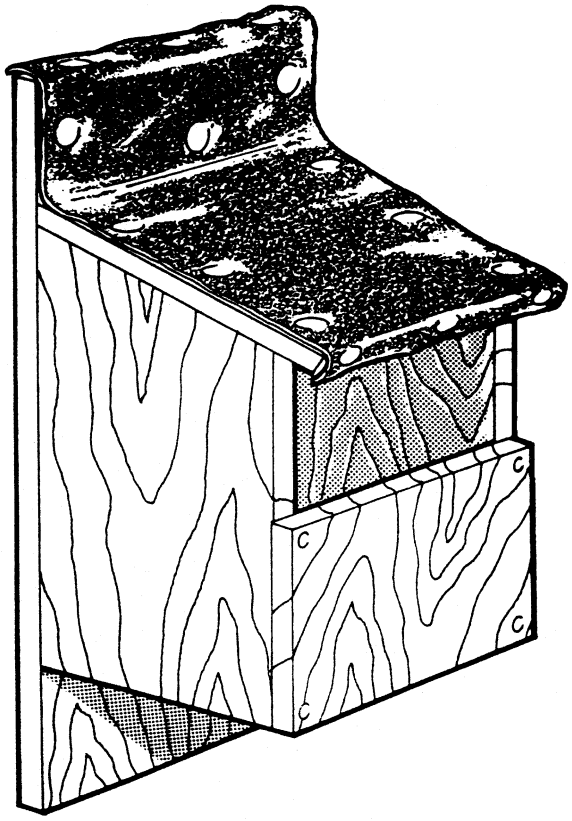
Size: 100mm wide, 100mm deep and 150mm high. Siting: These birds are very adaptable and the box can be sited in almost any situation – walls overlooking lawns, farm outbuildings, under bridges etc. Density: 1 box per 5 Ha.

BLACK REDSTART

Black redstarts are rare in Britain, with its populations concentrated in urban centres. They prefer complex vertical structures which provide them with high singing posts.

Size: 100mm wide, 100mm deep and 150mm high. Nest box entrance should not allow access to larger birds like feral pigeons. Siting: Boxes should be placed on tall buildings underneath structures like overhangs, balconies and escape routes. Density: A large number of nest boxes should be erected to give pairs some selection.

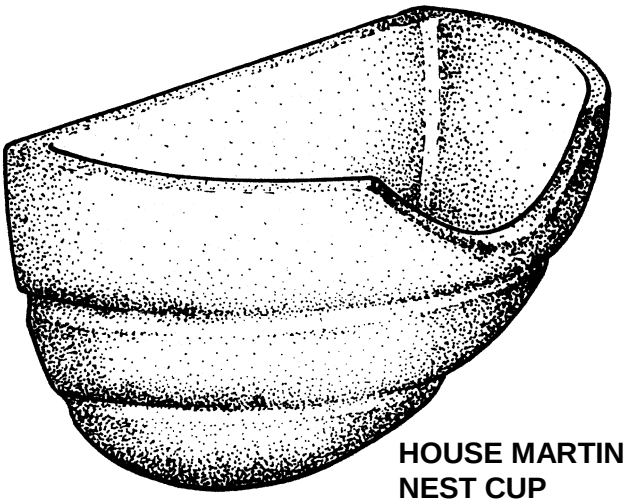
BASIC OPEN FRONTED NEST BOX



SPECIAL BOXES

HOUSE MARTIN

Internal dimensions: 70mm high, 120mm wide at back, 90mm deep.
Material: Concrete.
Siting: Boxes should be mounted under eaves, at least 2 metres high. Eaves should have an overhang of at least 150 mm to provide sufficient shelter. Ensure water cannot trickle into box. Density: House martins nest colonially; therefore nest cups should be grouped to encourage colonisation.



HOUSE MARTIN NEST CUP

HOUSE SPARROW

Size: 555 mm wide, 210 mm high (front) and 265 mm high (back), 170 mm deep. 32mm entrance hole. House sparrows prefer to nest communally in boxes called terraces. Each box has three discreet nesting compartments, with entrance holes (one or two per compartment) located just under the lid. Siting: Boxes should be positioned at least 3 m above ground level; placing boxes under the eaves is ideal.
Density: This species nests colonially, but individual nest entrances should be at least 150mm apart.

SWALLOW

Size: This simple bowl shaped nest is 110 mm high, 250 mm wide and 14 cm deep.
Siting: Nesting bowls should be sited as high as possible on ledges or rafters within buildings. Nest should be mounted with at least 100 mm of headroom.
Density: Swallows are sociable birds, however, nests should be placed no closer than 1 m apart.

HOUSE SPARROW BOX Photo by Dr Roger Chittock

BAT BOXES & BAT BRICKS

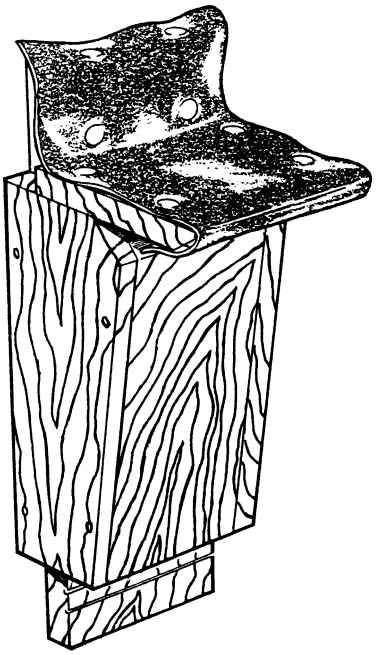
All British bat species present are protected by law, as their numbers have decreased rapidly within recent years. Bats, along with birds and spiders, are important insect predators, and are a vital part of the biological control of pests. An individual bat can eat up to 3,000 midges per night. For these reasons it is vital to incorporate features suitable for bats into developments.

BAT BOXES

Most British species of bats will use bat boxes, to varying degrees, but those most commonly found include pipistrelles, leisler's, noctules and *Myotis* species. Bat boxes should be positioned in sunny locations, on trees or walls, mainly to the south or west, but a variety of different positions would provide a range of climatic conditions. Boxes should be placed as high as possible, at heights of between 3 to 6 metres. The entrance should be free from obstruction. As bats use a number of different roosts throughout the year, it is best to erect them in groups of 3 to 5 boxes across the site, to include a range of different aspects.

WOODEN BAT BOXES

Size: 100mm wide, 80mm deep and 400mm high.
The entrance should be a narrow slot at least 20mm wide underneath the box, allowing the animal to crawl up into the roost
Wood should be rough and at least 20mm thick. The thickness of the wood helps to protect the bats from changes in temperature. Most importantly, wood should be left untreated internally as some wood treatments are toxic to bats and smell unpleasant.



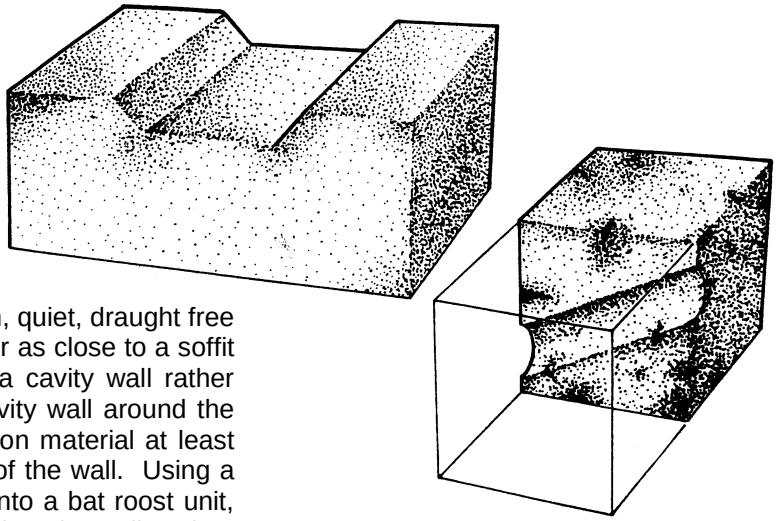
WOODCRETE BAT BOXES

Commercially made bat boxes, such as Schwegler boxes, are available in a number of designs for use in many of different locations, including trees, buildings and bridges. Certain models can also be designed into the fabric of buildings or bridges. The advantage of these boxes is that woodcrete is much longer lasting and more weather resistant than wood.

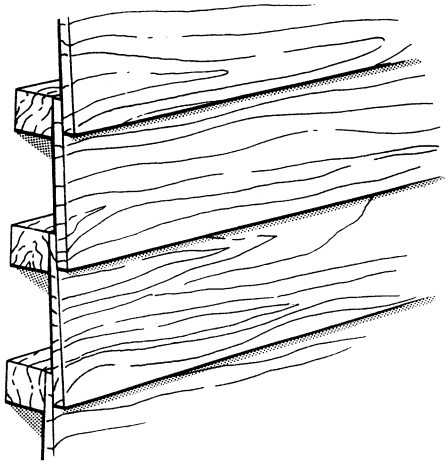
WOODCRETE BAT BOXES SUITABLE FOR PIPISTRELLES (L) AND NOCTULES (R)

BAT BOXES FOR BUILDINGS
Photo by Nick Steggall

OTHER ROOSTING FEATURES
An alternative to bat boxes is to incorporate roosting features into the buildings structure.



BAT BRICKS
Bat bricks should be placed in a clean, quiet, draught free environment, ideally on a gable end or as close to a soffit as possible. Most bats will roost in a cavity wall rather than in a loft or large space. The cavity wall around the bat brick should be free from insulation material at least from the level of the brick to the top of the wall. Using a good quality bat brick, which enters into a bat roost unit, can prevent bats from gaining access into the wall cavity.



OUTSIDE WALLS
Battens and overlapping boards positioned on the outside of a building can also provide a roosting location. Fix 30mm battens to the upper part of a gable end wall, ideally facing south or west, and nail on horizontal overlapping boards or hanging tiles making sure to leave holes of sufficient size (at least 20mm x 100mm) allowing the bats to enter the roosting site.

Bat Access and Bat Roost Bricks

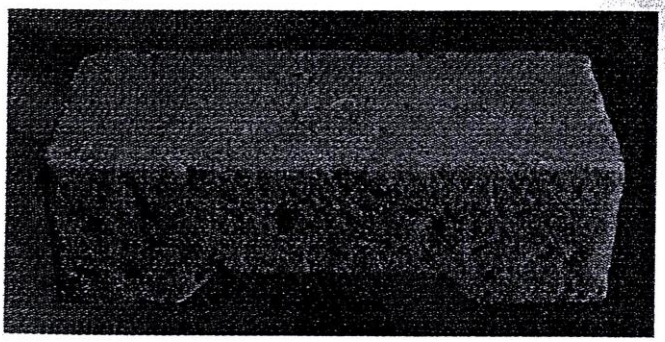
Approved by the Bat Conservation Trust

Over recent years Marshalls Clay Products has become almost as well known for the success of its award winning environmental work as it is for the quality of its brick products. Our land restoration and nature conservation schemes, first developed by Yorkshire Brick Company, have become an integral part of our activities over the years and have been recognised as some of the most successful of their kind anywhere.

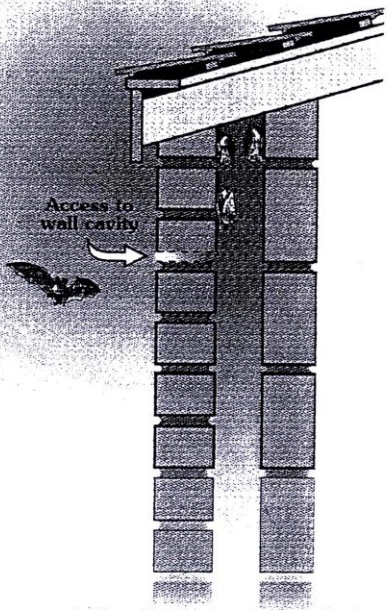
As part of this ongoing philosophy, Marshalls Clay Products have been producing a special Bat Access Brick, specially designed to help the country's badly depleted bat population by providing access to wall cavities or roof spaces where most bat colonies tend to be. *(see diagram)*

In recent years bats have been declining at an alarming rate, (estimates suggest as much as 60%) loss of habitat being a key factor in this decline. Nearly all colonies tend to be on the outside of houses, in wall cavities, under slates, flashing or tiles, etc.

Contrary to popular opinion bats do not make nests and do absolutely no damage to buildings or roof timbers, indeed many people encourage bat colonies in their area because of the large number of insect pests, woodworm, etc. which they eat. Most colonies will use a house for only a few weeks in summer before dispersing by the autumn.



Marshall's Bat Access Brick, which is now also available in stone

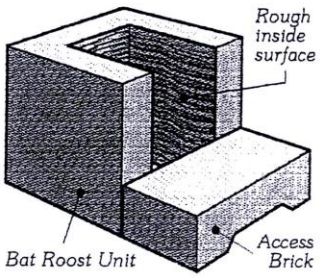


A Bat Brick should ideally be placed as high as possible, at the gable apex or close to the soffit.

Bat Roost Unit

A recent survey of bridges in Yorkshire found that 25% were being used by bats. Other reports showing similar findings suggest that large number of tunnels and bridges are occupied by bats. As bats are protected under the 1981 Wildlife and Countryside Act, engineers should attempt to preserve the bat habitat while carrying out essential maintenance to these structures. If bats are known to use the structure, the Country Agency for Nature Conservation should be consulted.

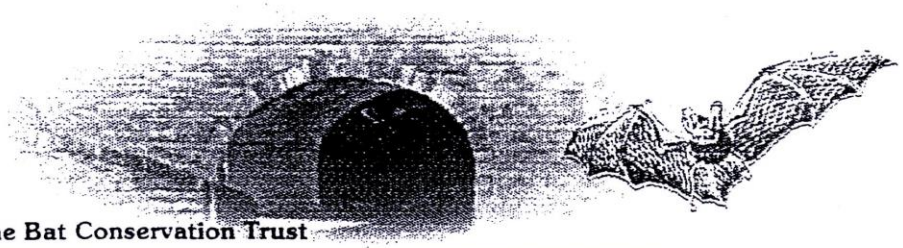
Following a meeting with The Bat Conservation Trust and British Waterways Technical Services Department, Marshalls Clay Products have developed an elegant solution in the form of their Bat Roost Unit. Used in conjunction with the Bat Access Brick, the unit provides a rough surfaced cavity of 110 X 150 X 215 mm. The module can be used in repairs to bridge arches and abutments as well as in many new construction projects.



Marshalls

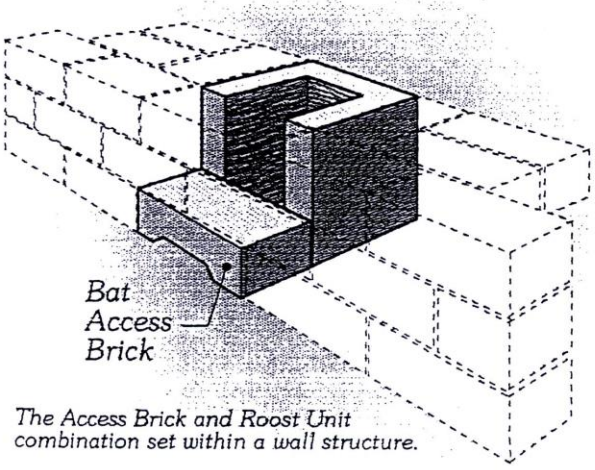
CLAY PRODUCTS
Quarry Lane, Howley Park, Woodkirk, Dewsbury, West Yorkshire WF12 7JJ
Tel (01132) 203535 Fax (01132) 203555

Bat Roost Unit

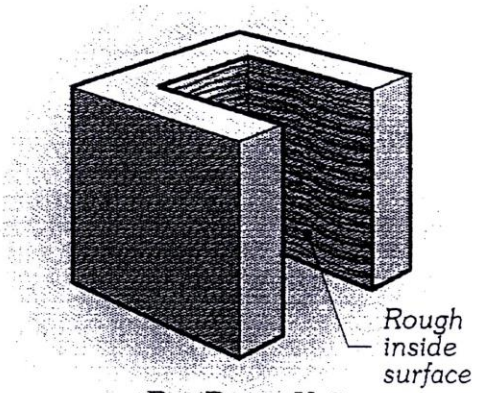


Approved by The Bat Conservation Trust

The preservation of bat habitats is very important to help maintain the diversity of bat species in this country. Engineers and specifiers can now play a significant role by specifying Bat Access Bricks and Bat Roost Units in repair and maintenance work. The Access Unit/Roost Unit combination has been carefully designed to work not just in new or existing walls but also within brick and stone arch structures.



The Access Brick and Roost Unit combination set within a wall structure.



Bat Roost Unit

Bat Access Bricks have been supplied in significant numbers to large organisations such as British Waterways and British Rail, who operate continuous maintenance programmes on bridges and tunnels.

Other organisations are ordering smaller numbers for incorporation into building works and some private individuals are using Bat Access Units in their own homes.

Marshalls Bat Access and Roost Units are approved by the Bat Conservation trust.

For more information on these innovative products contact **Julie Cull** at **Marshalls Clay Products**.
Telephone 01132 203535 ext. 3458

Marshalls

CLAY PRODUCTS

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

The Bat Conservation Trust

The Bat Conservation Trust is Britain's only organisation solely devoted to the conservation of bats and their habitats. The BCT aims to prevent further declines in bat populations and to encourage the recovery of threatened species.

If you would like more information about bats or would like to become a bat supporter please contact us at the address

The Bat Conservation Trust
15 Cloisters House
8 Battersea Park Road
London
Tel 0171 627 2629
Fax 0171 6272628

LADYBIRD & LACEWING BOX

Introduction

Ladybirds and Lacewings are natural predators and valuable consumers of common garden pests such as aphids (greenfly and blackfly etc.). By encouraging these natural predators, a greater number of garden pests are consumed, reducing the need for chemical pesticides.

Ladybird and Lacewing boxes provide a number of locations where these insects can spend the winter, ready to consume the common garden pests the following spring.

As most people are familiar with ladybirds and happy to have them in their garden, they make an ideal natural pest control method.

Materials

Cedar or Deal at least 20mm thick should be ideal. Never use wood preserver on the inside of the box. Inside the box, various diameters of hollowed bamboo canes should be used; canes should be a minimum of 100 mm long.

Positioning the Box

The boxes should be placed in sunny positions in hedgerows, shrubs, on tree trunks, fence and garden sheds.