

# Luton District Wildlife Sites

## Selection Guidelines

VERSION 1  
September 2012

BEDFORDSHIRE AND LUTON LOCAL SITES PARTNERSHIP





## 6 SITE SELECTION THRESHOLDS

### BOUNDARIES (all DWS)

The current suite of DWS sites has been derived from the 1:10, 000 scale Phase 1 survey and subsequent Phase 2 survey. Boundaries have been drawn along existing enclosure boundaries to encompass features or habitats considered to qualify for DWS status. As discussed previously, this may mean that not all parts of the site are of equally high wildlife value, but it is considered unrealistic and unwise to attempt to exclude all lower value areas from a site for the reasons given above. In general boundaries must be drawn along features recognisable on the ground, and should include all features considered to be of DWS status. Boundaries should be regarded as including within the DWS those boundary features along which they have been drawn.

### WOODLAND, TREES and HEDGES

**Table 1: Habitat Status**

<p><u>Bedfordshire BAP priority habitats:</u></p> <ul style="list-style-type: none"> <li>• <u>Woodland</u></li> <li>• <u>Wet woodland</u></li> <li>• <u>Wood pasture and parkland</u></li> <li>• <u>Hedgerows</u></li> </ul>	<p><u>Habitats listed as being of Principal Importance for the conservation of biodiversity in England (NERC Act 2006, Section 41):</u></p> <ul style="list-style-type: none"> <li>• <u>Lowland mixed deciduous woodland</u></li> <li>• <u>Wet woodland</u></li> <li>• <u>Wood pasture and parkland</u></li> <li>• <u>Hedgerows</u></li> </ul>
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**Table 2: Relationship between selection criteria and BAP Priority Habitats.**

<b>Selection criteria</b>	<b>BAP Priority habitats</b>
a, b, c, d)vi, d)vii	Lowland mixed deciduous woodland
d)ii, d)iii, d)iv, d)v	Wet woodland
f, j, h	Wood Pasture and Parkland
h, i	Hedgerows

*Appendix 2 – Woodland plants, ancient woodland indicators and woody species*

#### MINIMUM THRESHOLD

- a) **Semi-Natural Broadleaved Woodland** with:
- i. All Semi-Natural Broadleaved Woodland sites of more than 1 ha.
  - ii. All Semi-Natural Broadleaved Woodland sites of more than 0.5 ha with more than 5 ancient woodland indicator species
  - iii. All Semi-Natural Broadleaved Woodland sites of more than 0.2 ha with more than 10 ancient woodland indicator species
  - iv. All Semi-Natural Broadleaved Woodland sites with more than 15 woodland plants
- b) **Good examples of the following secondary woodlands which are more than**

**0.1ha in size:**

- a. NVC W1C (grey willow-marsh bedstraw);
  - b. NVC W2 (grey willow-downy birch-common reed);
  - c. NVC W4 (downy birch-purple moor-grass);
  - d. NVC W5 (alder-tussock-sedge);
  - e. NVC W6 (alder-stinging nettle);
  - f. NVC W 12 (beech-dog' s mercury);
  - g. NVC W14 (beech-bramble).
- d) **Areas of scrub more than 0.1 ha** in extent with NVC W21 (hawthorn-ivy-wayfaring tree) with more than 4 woody species at least occasional to frequent.
- e) **Pasture woodland and Parkland** with an average of more than 3 biologically significant trees per hectare. The minimum population size should be 4 trees.
- f) **Pollard willows and black poplars:**
- i) groups of 3 or more mature pollard native willows or black poplars when in association with other semi-natural features such as semi-improved or unimproved grassland, ditches and rivers.
- g) **Hedges:** hedgerow systems at least 100m in length, with an average of 4 or more woody species in a 30m length, and with at least part of the hedgerow allowed to flower and fruit every year.
- h) **Trees:** any site supporting 2 or more native veteran trees, 4 or more mature native pollards or a Biologically significant tree as defined in the CWS guidelines.

These guidelines are intended to assist in the identification of trees that could be considered biologically significant, whether they are native or non-native, singular or in groups. These guidelines will be used to consider wood pasture, parkland, hedgerow, and in exceptional circumstances trees in their own right as County Wildlife Sites.

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**SUPPLEMENTARY FACTORS SPECIFIC TO THESE HABITATS**

**Positive supplementary factors**

Areas currently or recently (within 30 years) under sympathetic management such as coppicing, pollarding, small-scale felling of standards, maintenance of open rides and laying of hedges.

Presence of historical features, which often support additional wildlife. These include ancient pollards, ancient coppice stools, medieval wood banks.

Good quantities of old trees (diameter of >60cm at 1.2m above ground level) and standing or fallen deadwood.

Varied structure including features such as open sunny areas within the wood, either along rides, in glades or as a result of woodland management, and ponds or streams.

**Negative supplementary factors**

Large and actively invasive populations of species which are not native to Bedfordshire e.g. sycamore, rhododendron.

Significant recent coniferous or deciduous plantation.

**SUPPLEMENTARY FACTORS FOR BIOLOGICALLY SIGNIFICANT TREES**

In addition, to identifying features of high value assessment should also consider the following:

- Naturalness will be considered an important criterion where one or more of the following

applies:

- The tree is a native species characteristic of Bedfordshire and the tree is associated with other biologically significant trees, semi-natural habitat or within or close to a wildlife corridor or other linear habitat.
- Fragility will be considered an important criterion where the survival of the tree or important species it supports depends upon appropriate management
- Recorded history will be considered an important criterion where one or more of the following applies:
  - There are historical records dating back for example to World War II or back before the start of the 20<sup>th</sup> century or before the 1<sup>st</sup> edition OS Map
  - The tree is associated with archaeologically important features e.g. woodbank or earthworks
  - The tree shows evidence of historic management e.g. pollarding
- Intrinsic appeal will be considered an important criterion where one or more of the following applies
  - The tree contributes to local landscape character or is dominant in the local landscape.
  - The tree supports specific interest e.g. mammal interest, lichens, ferns, moss or invertebrate interest.
  - The tree has specific links with community history or folklore.

#### **Further reading**

Bedfordshire and Luton Wildlife Working Group (2001) Bedfordshire and Luton Biodiversity Action Plan. Bedfordshire and Luton Wildlife Working Group (unpublished) Bedfordshire and Luton Red Data Book

#### **References**

Read, H. (2000) Veteran Trees A Guide to Good Management English Nature and Veteran Trees Initiative

Veteran Trees Initiative (2000) Veteran Trees A Guide to Risk and Responsibility English Nature

## TRADITIONAL ORCHARDS AND FRUIT TREES

**Table 3: Habitat Status**

Bedfordshire BAP priority habitats: <ul style="list-style-type: none"> <li>• Traditional orchards</li> </ul>	Habitats listed as being of Principal Importance for the conservation of biodiversity in England (NERC Act 2006, Section 41): <ul style="list-style-type: none"> <li>• Traditional orchards</li> </ul>
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**Table 4: Relationship between selection criteria and BAP Priority Habitats.**

Selection criteria	BAP Priority habitats
a)	Traditional Orchards

- a)
- i) An orchard is defined as a group of five or more mature, traditional, cultivated fruit or nut trees in close proximity. It is recognised that a District Wildlife Site will be identified where an orchard includes at least **one** of the following features:-
  - ii) Evidence that the trees have extensive or significant populations of fungi, lichens or mistletoe.
  - iii) The orchard includes trees of unusual fruits ('folk fruits'), such as medlar, quince or mulberry.
  - iv) The orchard includes trees of identified fruit varieties originating in Bedfordshire or these three adjacent counties (Buckinghamshire, Hertfordshire and Cambridgeshire).
  - v) One or more of the orchard trees show evidence of structural characteristics of veteran or biologically significant trees.
- b) It is recognised that small groups of fruit trees of biodiversity value may occur in non-traditional orchard settings, including smallholdings, active or former allotments and in parkland. These will be identified as DWS if standard orchard criteria do not apply but **two or more** mature trees are present in which features iv) or v) must be present.

*Please note:* It is recognised that single or groups of fruit trees of whatever species or variety, in any setting, can be assessed as DWS as veteran or biologically significant trees (BSTs).

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### SUPPLEMENTARY FACTORS SPECIFIC TO THIS HABITAT

The orchard or group of trees is closely associated with other priority habitats, such as hedgerows or semi-improved grasslands, or with good ecotones along site boundaries.

The trees show evidence of traditional fruit-tree management, such as pruning by hand rather than mechanically.

There is public access to the trees and fruit, such as in a community orchard.

The site is of historical interest with extended use as an orchard or shows evidence of a traditional landscape e.g. field boundaries, seepages or dewponds for grazing stock, or relics of former allotment plots with features such as baulks and stoneheaps.

A comprehensive list of all orchard species from Bedfordshire, Hertfordshire and Cambridgeshire is available at on the East of England Apples and Orchard Project <http://www.applesandorchards.org.uk>. Varieties from Buckinghamshire and Northamptonshire can be obtained from the Midshires orchard group at [www.msog.btik.com](http://www.msog.btik.com) or at the Common Ground website at <http://www.england-in-particular.info>





## NEUTRAL AND CALCAREOUS GRASSLAND

**Table 7: Habitat Status**

<p><u>Bedfordshire BAP priority habitats:</u></p> <ul style="list-style-type: none"> <li>• Lowland meadows</li> <li>• Floodplain grazing marsh</li> <li>• Lowland calcareous grassland</li> </ul>	<p><u>Habitats listed as being of Principal Importance for the conservation of biodiversity in England (NERC Act 2006, Section 41):</u></p> <ul style="list-style-type: none"> <li>• Lowland meadows</li> <li>• Coastal and Floodplain grazing marsh</li> <li>• Lowland calcareous grassland</li> </ul>
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**Table 8: Relationship between selection criteria and BAP Priority Habitats.**

Selection criteria	BAP Priority habitats
a (all), c, e	Lowland meadows
a (all), c, e	Floodplain grazing marsh
b (all), d, e	Lowland calcareous grassland

### *Appendix 4 - Bedfordshire neutral and calcareous grassland indicators*

#### MINIMUM THRESHOLDS

- a) **Neutral grasslands** supporting good examples at least 0.01 ha (either in a block or as a number of smaller areas) in size of one or more of the following NVC communities:
  - i) MG4 (timothy-greater burnet flood meadow);
  - ii) MG5 (common knapweed-crested dog's-tail meadow and pasture);
  - iii) MG8 (crested dog's-tail-marsh marigold flood pasture);
  - iv) MG13 (creeping bent-marsh foxtail inundation grassland)
- b) **Calcareous grasslands** supporting good examples at least 0.01 ha (either in a block or as a number of smaller areas) in size of one or more of the following NVC communities:
  - i) CG2 (sheep's fescue-meadow oat-grass grassland);
  - ii) CG3 (upright brome grassland);
  - iii) CG4 (tor grass grassland);
  - iv) CG5 (upright brome-tor grass grassland);
  - v) CG6 (hairy oat-grass grassland);
  - vi) CG7 (sheep's fescue - mouse-ear hawkweed - wild thyme grassland).
- c) Neutral grassland sites supporting good populations of either:
  - two or more strong neutral grassland indicator species;**
  - four or more neutral grassland indicator species in total.**
- d) Calcareous grassland sites supporting good populations of either:
  - three or more strong calcareous grassland indicator species;**
  - eight or more calcareous grassland indicator species in total.**
- e) Sites supporting good populations of **more than 25 grassland species.**

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## SUPPLEMENTARY FACTORS SPECIFIC TO THESE HABITATS

### **Positive supplementary factors**

Areas currently under sympathetic and appropriate management by hay-cutting or grazing.

Improvement through herbicide or fertiliser application, harrowing or drainage works over the majority of the site.

### **Negative supplementary factors**

Excessive populations of species which are indicative of past mismanagement e.g. creeping thistle, ragwort, dock.

Excessive amounts (>50% of site area) of dense, species-poor scrub or larger areas of young invasive scrub which is adversely affecting the grassland and would be difficult to control in the future.

## HEATHLAND AND ACID GRASSLAND

**Table 9: Habitat Status:**

<p><u>Bedfordshire BAP priority habitats:</u></p> <ul style="list-style-type: none"> <li>• Lowland dry acidic grassland</li> <li>• Lowland heathland</li> </ul>	<p><u>Habitats listed as being of Principal Importance for the conservation of biodiversity in England (NERC Act 2006, Section 41):</u></p> <ul style="list-style-type: none"> <li>• Lowland dry acid grassland</li> <li>• Lowland heathland</li> </ul>
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**Table 10: Relationship between selection criteria and BAP Priority Habitats.**

Selection criteria	BAP Priority habitats
a)i, a)ii, b	Lowland dry acidic grassland
a)iii, a)iv, b	Lowland heathland

*Appendix 5 - Bedfordshire heathland and acid grassland indicators*

### MINIMUM THRESHOLDS

- a) **Heathland and acid grassland** supporting good examples at least 0.01 ha (either in a block or as a number of smaller areas) in size of the following NVC communities:
- i) U1 (sheep's fescue - common bent - sheep's sorrel grassland);
  - ii) U2 (wavy hair-grass grassland);
  - iii) H1 (heather - sheep's fescue heath);
  - iv) H9 (heather - wavy hair-grass heath).
- b) Sites supporting good populations of either:
- two or more strong heathland and acid grassland indicator plant species;**
  - three or more heathland and acid grassland indicator plant species in total.**

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### SUPPLEMENTARY FACTORS SPECIFIC TO THESE HABITATS

#### **Positive supplementary factors**

Areas currently under sympathetic management, for example by grazing.

Evidence that the heathland has been cultivated in the recent past or evidence of other damaging disturbance including herbicide or fertiliser application, harrowing or drainage works.

#### **Negative supplementary factors**

Extensive scrub development or coniferisation which is threatening the existence of open heathland and is unlikely to be reversible in the medium to long-term.

Presence of populations of species which are indicative of past mismanagement e.g. creeping thistle, ragwort, dock.

## FENS, SWAMPS AND MARSHES

**Table 11: Habitat Status:**

<p><u>Bedfordshire BAP priority habitats:</u></p> <ul style="list-style-type: none"> <li>• Reedbeds</li> <li>• Floodplain grazing marsh</li> </ul>	<p><u>Habitats listed as being of Principal Importance for the conservation of biodiversity in England (NERC Act 2006, Section 41):</u></p> <ul style="list-style-type: none"> <li>• Reedbeds</li> <li>• Lowland fens</li> <li>• Coastal and floodplain grazing marsh</li> </ul>
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**Table 12: Relationship between selection criteria and BAP Priority Habitats**

Selection criteria	BAP Priority habitats
a)	Reedbeds
a)	Floodplain grazing marsh

### *Appendix 6- Wetland plants and indicator species*

#### MINIMUM THRESHOLDS

- a) Any examples of **topogenous fen, swamp or mire of at least 0.01 ha** (either in a block or as a number of smaller areas) which is not appreciably degraded.
- b) Sites of at least 0.01 ha containing well developed **vegetation mosaics** which represent hydrosereal zonation.
- c) **Grasslands containing flushes, seepages or** springs which are not appreciably degraded.
- d) Sites supporting good populations of either:
  - one or more strong wetland indicators;**
  - three or more general wetland indicators.**

#### SUPPLEMENTARY FACTORS SPECIFIC TO THESE HABITATS

##### **Positive supplementary factors**

Semi-natural site with little evidence of past improvement through drainage or the application of fertiliser or herbicide.

Areas currently under sympathetic and appropriate management through grazing, sedge and/or reed cutting.

Satisfactory long-term water supply and, if appropriate, the means or potential to control water levels.

A range of sub-habitats including bare ground, permanently damp areas, temporary pools, springs and Hushes, ponds, streams and ditches.

##### **Negative supplementary factors**

Evidence that the marsh has been irreversibly damaged in the recent past through herbicide or fertiliser application, harrowing or drainage works.

Evidence of significant pollution or eutrophication.

Features which indicate that the marsh is drying out.

Extensive scrub or carr development, or plantations of willow or poplar, which are threatening the existence of open marsh and are unlikely to be reversible in the medium to long-term.

Excessive populations of species which are indicative of past mismanagement e.g. marsh ragwort,

dock.

## FRESHWATER HABITATS

**Table 13: Habitat Status:**

<p><u>Bedfordshire BAP priority habitats:</u></p> <ul style="list-style-type: none"> <li>• Ponds</li> <li>• Rivers</li> </ul>	<p><u>Habitats listed as being of Principal Importance for the conservation of biodiversity in England (NERC Act 2006, Section 41):</u></p> <ul style="list-style-type: none"> <li>• Ponds</li> <li>• Rivers</li> <li>• Eutrophic standing waters</li> <li>• Mesotrophic lakes</li> <li>• Oligotrophic and dystrophic lakes</li> </ul>
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**Table 14: Relationship between selection criteria and BAP Priority Habitats**

Selection criteria	BAP Priority habitats
a)	Ponds
d)	Rivers

*Appendix 6 - Wetland plants and indicator species*

**MINIMUM THRESHOLDS**

**a) Ponds, Lakes and Ditches - Freshwater Habitats**

Water Bodies (seasonal or permanent) above 0.0001 ha (1mx1m) in area which meet one (or more) of the following:

- i) Have good populations of 3 or more general indicators.
- ii) Have one or more species of pondweed (*Potamogeton*).
- iii) Have populations of taxa of high conservation importance, such as water voles, amphibians or dragonflies.

**SUPPLEMENTARY FACTORS SPECIFIC TO PONDS**

The following factors should be considered in cases where ponds are just below the threshold for recognition.

The pond forms part of a network of wetland habitats.

The pond's successional stage cannot be readily reproduced.

A long history of existence.

**b) Rivers and Streams – freshwater Habitats**

Flowing water following a natural channel which may have been modified by drainage operations.

All main rivers (as defined by the Environment Agency) are CWS by virtue of their fish populations, invertebrate assemblages, submerged/floating/emergent plants and bird and mammal populations, unless it is demonstrated that they do not meet any of the specific CWS selection guidelines. Therefore:-

- a) The River Lea County Wildlife Site comprises the main river together with its feeder streams and adjacent semi-natural habitat (grassland, marsh, swamp, scrub, trees and woodland, and vegetation mosaics representing hydroseral zonation) except where the river has been grossly modified through canalisation and poor water quality.
- b) Where the River Lea is grossly modified through canalisation and/or poor water quality, it will be considered as a DWS owing to its habitat corridor function through the built up area.
- c) Areas of undeveloped floodplain, directly associated with the River Lea, and which do not meet CWS or DWS criteria in their own right will be selected as DWS in association with the River Lea CWS.
- d) All chalk streams together with adjacent semi-natural habitat (grassland, marsh, swamp, scrub, trees and woodland, and vegetation mosaics representing hydroseral zonation) unless they have been grossly modified through canalisation and poor water quality.

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## SUPPLEMENTARY FACTORS SPECIFIC TO DITCHES AND; RIVERS AND STREAMS

### **Positive supplementary factors**

Good water quality with no evidence of gross pollution or eutrophication

Satisfactory long-term water supply and, if appropriate, the means or potential to control water levels.

Sufficiently large or in a suitable surrounding environment to prevent long-term loss of wetland species through outside factors.

Abundant aquatic vegetation in clear water.

Shallow margins with extensive stands of marginal vegetation, and no evidence of severe recent damage or disturbance to margins.

A range of geomorphological features in a stretch of river including riffles, pools, steep banks, meanders, ox-bows.

### **Negative supplementary factors**

Evidence that the wetland has been irreversibly damaged in the recent past through bank stabilisation or other flood defence or drainage works.

Evidence of significant pollution or eutrophication.

Extensive recent scrub or carr development around the margins, which is limiting the viability of wetland communities, and are unlikely to be reversible in the medium to long-term.

## HABITAT MOSAICS

- a) Sites of more than 1ha in size which **support three or more of the following habitat features in close association:**

- unimproved/semi-improved grassland;
- species-rich ruderal communities;
- mature trees;
- woodland (ancient and secondary);
- scrub;
- hedgerows;
- marshy grassland;
- swamp;
- open water including rivers, streams, ditches, ponds, pits and lakes.

At least one habitat feature should either be of or closely approaching District Wildlife Site status in its own right.

(Many of these sites will be of value for birds and/or invertebrates, and may qualify under these criteria if sufficient data is available for evaluation. The positive and negative factors affecting selection of these sites are listed under the individual habitats. Many of these sites could be socially important, particularly if they are located in a major centre of population and have the potential for public access).



## OPEN MOSAIC HABITATS ON PREVIOUSLY DEVELOPED LAND

Open Mosaic Habitats on Previously Developed Land (also known as Brownfield Sites) are included in the list of UKBAP Priority Habitats and represent a diverse range of sites, largely because of the range of previous land uses associated with the sites, which include colliery mining, industry and housing. This habitat is concentrated in, but not confined to, urban and former industrial landscapes and it is at substantial risk of destruction and serious degradation from a number of factors including urban development, landfill, unsuitable reclamation, eutrophication, lack of appropriate management and succession.

These habitats often have impoverished soils where the top soil has been removed or is composed of a mixture of aggregates, broken concrete etc. This can support a diverse range of ruderal species as well as garden escapes and common native species. Due to the mix of substrates and vegetation present these sites are also being increasingly recognised as having value for rare invertebrates.

### Other Urban Habitats

Allotments have some characteristics of open mosaic habitats supporting weed communities on recently managed areas and developing rough grassland and ruderal communities where abandoned that often contain a range of garden escapes. The distinguishing feature of allotments is that nutrient levels are much higher as they are usually on rich soils and have been regularly fertilised, so in many respects they have more in common with farmland than with open mosaic habitats. Actively managed allotments could be of interest for the arable weed communities they may support, and if so, should be assessed using the arable field margin guidelines. Where abandoned, the rough grassland and ruderal communities that develop on them could be assessed against the particular grassland criteria though these are generally of limited biodiversity interest due to the high nutrient levels in the soils that allow a few coarse plant species to dominate.

Encapsulated countryside within urban areas consisting of semi-natural habitats surviving from the past such as woodland, scrub, parkland, hedgerows, heathland, unimproved grassland and wetland should be assessed against the appropriate habitat selection guidelines as for those sites in rural locations. Where a mix of habitats is present these should be assessed under the habitat mosaics guidelines. Their location within an urban environment could, however, be considered to increase their value for biodiversity, especially if they form links with other habitats, so it is recommended that sites that are considered to be at or just below the minimum thresholds should still be strongly considered for identifying as DWS's.

Species of importance on urban sites should also be assessed using the relevant selection guidelines, with the exception of some invertebrates (see below).

### MINIMUM THRESHOLDS

- A) Sites at least 0.1ha in area supporting at least **75 flowering** plants, native or non-native, of grassland, ephemeral and ruderal communities. Scattered individuals of woody species can also be counted though dense stands of scrub and trees should be assessed under the scrub criteria.
- B) Sites where the invertebrate interest is likely to be significant based on the diversity of habitat features, as described by Kirby (2000), and exceeds a score of four on the site attribute form.

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## SUPPLEMENTARY FACTORS SPECIFIC TO THIS HABITAT

A range of sub-habitats including exposed aggregate based surfaces, bare ground, old stonework or masonry, old tombstones, disused railway sidings or platforms, excavated pits, derelict building(s), overgrown tree belts or shrubberies, piles of rubble or wood, steep slopes, seasonally wet areas, drainage channels, and relicts of semi-natural habitats e.g. woodland, grassland, wetland, ponds, streams, and hedgerows.

### **Positive supplementary factors**

Sufficiently large or in a suitable surrounding environment to prevent long-term loss of interest through outside factors.

Proximity to other areas of undeveloped land or urban greenspace.

Good ecotone along the site margin with scrub, hedge, ditch or long grassland.

Important mammal, bird, reptile, amphibian, invertebrate or lower plant species or communities.

Availability to the local population for quiet recreation or educational use, and with sufficient robustness to withstand some public pressure.

A rare or unique example of a particular community or habitat in an otherwise built-up environment.

Historical interest or evidence of a pre-urban landscape e.g. former field boundaries.

### **References**

Beds Wildlife Working Group, *Bedfordshire and Luton Biodiversity Action Plan* (2001)

Beds Wildlife Working Group, *Bedfordshire and Luton county Wildlife Sites Selection Guidelines* (1998)

Beds Wildlife Working Group, *Bedfordshire Red Data Book* (2001)

Beds Wildlife Working Group, *County Wildlife Site Reporting Procedure* (2000)

Boon C. R. and Stapleton P. G., *Botanical Surveys of Bedford and Dunstable Urban Sites* (2000)

English Nature, *A Space for Nature* (1996)

Gregory RD, et al, *The population status of birds in the United Kingdom, Channel Islands and the Isle of Man; an analysis of conservation concern 2002-2007*. *British Birds* 95:410-450 (2002)

Kirby P., *Bedfordshire Urban Sites Invertebrate Survey* (2000)

London Ecology Unit, *Policy, criteria and procedures for identifying nature conservation sites in London* (2000)

Nightingale B *The Bird Club Summer Garden Bird Feeding Survey 2001*: *The Hobby* 60: 9-13. (2002)

Nightingale B *The Garden Bird Feeding Survey – Winter 2001/2002*: *The Hobby* 63: 5-10 (2002)

Ratcliffe D. A., *A Nature Conservation Review* (1977)

## Invertebrate Site Attribute Form

<b>Positive key attributes</b>			
Habitat mosaic	Local 1	Patchy 2	Widespread 3
Varied herbaceous structure	Local 1	Frequent 2	Predominant 3
Bare ground	Local 1	Patchy 2	Extensive 3
Well drained and friable soil/substrate	Local 1	Extensive 2	Predominant 3
Varied flora	Local 1	Moderate 2	Good 3
Mature trees	One 1	Few 4	Many 6
Areas of wetland/impeded drainage	Small 1	Moderate 2	Extensive 3
Old hedges/grass/marsh	Small 1	Moderate 2	Extensive 3
Varied topography	Low bank 1	Hummocks 2	Large slope(s) or face(s) 3
Special positive features			
Ancient woodland	5		
Springs and seepages	5		
<b>Negative key attributes</b>			
Dense scrub	Limited -1	Moderate -2	Extensive -5
Dense tall ruderals	Local -1	Moderate -2	Extensive -5
Dense non tussocky grassland and amenity grassland	Local -1	Moderate -2	Extensive -3
Nutrient enrichment	Suggested -1	Apparent -2	Dominant -3

## FLORA AND FAUNA.

- a) At this stage, it is felt that detailed criteria based on specific plants and animals in the Luton area, beyond those identified as part of habitat-based surveys, would not be especially useful. However, presence of any species that is listed in the CWS selection guidelines as other than an indicator species is worthy of note and might therefore trigger additional survey of the relevant taxa. These can be used as positive supplementary factors in assessing sites. For example:-
- b) Signs of **UK BAP Priority and International RDB Mammal Species** should be noted during site survey as supplementary factors but site recognition on these species alone is not appropriate at present.
- c) All breeding sites of **red or amber list breeding bird species** should be noted.
- d) All signs of **amphibians or reptiles** on site should be noted, especially if breeding is suspected.
- e) Presence of any **notable invertebrate species** listed in the CWS selection guidelines, should be noted as a potentially supplementary factor, especially if breeding is suspected.
- f) Invertebrate data needs to be carefully interpreted, not least because, more than in most groups, the apparent interest of a site can be greatly influenced by recording effort. Also, a site may score highly on a miscellany of species without these collectively indicating a site or habitat of very high quality. Specialist advice should be sought from the Wildlife Trust for all prospective sites.

## APPENDIX 1 - TECHNIQUES TO ENSURE SURVEY CONFORMS TO NVC REQUIREMENTS

1. Within a site identify the boundaries of areas that are structurally and floristically homogeneous. This may include vertical boundaries as well as horizontal (e.g. in woodland there may be a woodland canopy, tall woodland field layer and short woodland field layer.)

2. Within in each homogeneous area take random samples of the following size:

- |    |                                    |        |
|----|------------------------------------|--------|
| a) | Woodland canopy and shrub layer    | 50x50m |
|    | Sparse scrub                       |        |
| b) | Dense scrub                        | 10x10m |
|    | Tall woodland field layer          |        |
|    | Species poor herbaceous vegetation |        |
| c) | Short woodland field layer         | 4x4m   |
|    | Tall herbaceous vegetation         |        |
|    | Heaths                             |        |
|    | Open vegetation                    |        |
| d) | Short herbaceous vegetation        | 2x2m   |
|    | Dwarf shrub heaths                 |        |

All samples should be square where possible

- |                           |  |           |
|---------------------------|--|-----------|
| e) Linear vegetation      |  |           |
| Linear aquatic vegetation |  | 10m strip |
| Wall vegetation           |  | 10m strip |
| Hedgerow woody vegetation |  | 30m strip |
| Hedgerow field layer      |  | 10m strip |

3. Within each sample record on the recording form each species present together with its dominance code using:

Code	% cover
10	91-100
9	76-90
8	51-75
7	34-50
6	26-33
5	11-25
4	4-10
3	<4 many individuals
2	<4 several individuals
1	<4 few individuals

4. Repeat up to 5 times within the homogeneous area

5. As an addition record any species which occur in the area but have not appeared within the samples.

## APPENDIX 2 - WOODLAND PLANTS, ANCIENT WOODLAND INDICATORS AND WOODY SPECIES

Nomenclature follows *New Flora of the British Isles* 1st Edition C.A.Stace CUP 1991

*Species in italics* = woody species or determining scrub and hedgerow value

**bold** = signifies ancient woodland indicators

8 = species fully protected through listing on Schedule 8 of the Wildlife & Countryside Act 1981 (plus amendments)

B = UK BAP Priority Species

N = Species listed as being of principal importance for the conservation of biodiversity in England under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

### ***Acer campestre***

*Adoxa moschatellina*

*Ajuga reptans*

*Alliaria petiolata*

### **Allium ursinum**

*Alnus glutinosa*

### **Anemone nemorosa**

*Arctium minus*

*Arum maculatum*

### **Athyrium filix-femina**

*Atropa belladonna*

*Betula pendula*

*Betula pubescens*

*Blechnum spicant*

*Brachypodium sylvaticum*

*Bromopsis ramosus*

### **Calamagrostis canescens**

*Calamagrostis epigejos*

### **Campanula latifolia**

### **Campanula trachelium**

*Cardamine flexuosa*

### **Carex pallescens**

### **Carex pendula**

### **Carex remota**

### **Carex strigosa**

### **Carex sylvatica**

*Carpinus betulus*

*Cephalanthera damasonium*

*Chrysosplenium oppositifolium*

*Circaea lutetiana*

*Clematis vitalba*

### **Field Maple**

*Moschatel*

*Bugle*

*Hedge Garlic*

### **Ramsons**

*Alder*

### **Wood Anemone**

*Burdock*

*Cuckoo pint*

### **Lady Fern**

*Deadly Nightshade*

*Silver Birch*

*Downy Birch*

*Hard Fern*

*Wood False-brome*

*Hairy Brome*

### **Purple Small-reed**

*Wood Small-reed*

### **Broad-leaved Bellflower**

### **Nettle-leaved Bellflower**

*Wavy Bittercress*

### **Pale Sedge**

### **Pendulous Sedge**

### **Remote Sedge**

### **Thin-spiked Wood-sedge**

### **Wood Sedge**

*Hornbeam*

*White Helleborine* B N

*Opposite-leaved Golden-saxifrage*

*Enchanter's Nightshade*

*Traveller's Joy*

Conopodium majus  
**Convallaria majalis**  
*Cornus sanguinea*  
 Corydalis claviculata  
**Corylus avellana**  
*Crataegus monogyna*  
**Crataegus laevigata**  
 Dactylorhiza fuchsii  
 Daphne laureola  
 Deschampsia cespitosa  
 Deschampsia flexuosa  
 Digitalis purpurea  
 Dipsacus pilosus  
**Dryopteris affinis**  
 Dryopteris carthusiana  
 Dryopteris dilatata  
 Dryopteris filix-mas  
**Elymus caninus**  
 Epilobium montanum  
**Epipactis helleborine**  
**Epipactis purpurata**  
**Euonymus europaeus**  
**Euphorbia amygdaloides**  
 Festuca gigantea  
 Filipendula ulmaria  
 Fragaria vesca  
*Fraxinus excelsior*  
*Frangula alnus*  
**Galium odoratum**  
 Geranium robertianum  
**Geum rivale**  
 Geum urbanum  
 Glechoma hederacea  
 Hedera helix  
 (Helleborus foetidus)  
 Helleborus viridis  
**Hordelymus europaeus**  
**Hyacinthoides non-scripta**  
**Hypericum hirsutum**  
**Hypericum humifusum**  
**Hypericum pulchrum**

Greater Pignut  
**Lily-of-the-valley**  
*Dogwood*  
 Climbing Corydalis  
**Hazel**  
*Common Hawthorn*  
**Midland Hawthorn**  
 Common Spotted-orchid  
 Spurge Laurel  
 Tufted Hair-grass  
 Flexuous Hair-grass  
 Foxglove  
 Small Teasel  
**Scaly Male-fern**  
 Narrow Buckler-fern  
 Broad Buckler-fern  
 Male Fern  
**Bearded Couch**  
 Broad-leaved Willowherb  
**Broad-leaved Helleborine**  
**Violet Helleborine**  
**Spindle**  
**Wood Spurge**  
 Giant Fescue  
 Meadowsweet  
 Wild Strawberry  
 Ash  
*Alder Buckthorn*  
**Sweet Woodruff**  
 Herb Robert  
**Water Avens**  
 Wood Avens  
 Ground Ivy  
 Ivy  
 Stinking Hellebore)  
 Green Hellebore  
**Wood Barley**  
**Bluebell 8**  
**Hairy St. John's-wort**  
**Trailing St John's-wort**  
**Beautiful St John's-wort**

*Ilex aquifolium*  
Iris foetidissima  
**Lamium galeobdolon**  
Lapsana communis  
Lathraea squamaria  
**Lathyrus linifolius**  
**Lathyrus sylvestris**  
*Ligustrum vulgare*  
Lithospermum officinale  
Listera ovata  
Lonicera periclymenum  
**Luzula forsteri**  
**Luzula pilosa**  
Luzula sylvatica  
Lychnis flos-cuculi  
**Lysimachia nemorum**  
Lysimachia nummularia  
**Malus sylvestris**  
**Melampyrum cristatum**  
**Melampyrum pratense**  
**Melica uniflora**  
Mercurialis perennis  
**Milium effusum**  
**Moehringia trinervia**  
**Narcissus pseudonarcissus**  
Neottia nidus-avis  
**Ophrys insectifera**  
**Orchis mascula**  
**Oxalis acetosella**  
**Paris quadrifolia**  
**Pimpinella major**  
**Platanthera chlorantha**  
**Poa nemoralis**  
Polypodium vulgare  
Polystichum aculeatum  
Polystichum setiferum  
*Populus tremula*  
Potentilla sterilis  
**Primula elatior**  
**Primula vulgaris**  
Prunella vulgaris  
*Prunus avium*

*Holly*  
Stinking Iris  
**Yellow Archangel**  
Nipplewort  
Toothwort  
**Bitter Vetch**  
**Narrow-leaved Everlasting-pea**  
*Wild Privet*  
Common Gromwell  
Common Twayblade  
Honeysuckle  
**Southern Woodrush**  
**Hairy Woodrush**  
Great Woodrush  
Ragged Robin  
**Yellow Pimpernel**  
Creeping Jenny  
**Crab Apple**  
**Crested Cow-wheat B N**  
**Common Cow-wheat**  
**Wood melick**  
Dog's Mercury  
**Wood Millet**  
**Three-veined Sandwort**  
**Wild Daffodil**  
Bird's-nest Orchid  
**Fly Orchid B N**  
**Early Purple-orchid**  
**Wood Sorrel**  
**Herb Paris**  
**Greater Burnet-saxifrage**  
**Greater Butterfly-orchid**  
**Wood Meadow-grass**  
Polypody  
Hard Shield-fern  
Soft Shield-fern  
*Aspen*  
Barren Strawberry  
**Oxlip**  
**Primrose**  
Self-heal  
*Wild Cherry*



*Prunus cerasifera*

*Prunus spinosa*

*Pteridium aquilinum*

*Quercus robur*

***Quercus petraea***

**Ranunculus auricomus**

*Ranunculus ficaria*

*Rhamnus catharticus*

*Ribes rubrum*

*Ribes uva-crispa*

*Rosa canina* agg.

*Rubus caesius*

*Rubus fruticosus* agg.

*Rubus idaeus*

*Rumex sanguineus*

*Salix alba*

*Salix caprea*

*Salix cinerea*

*Salix fragilis*

*Sambucus nigra*

*Sanicula europaea*

*Scirpus sylvaticus*

*Scrophularia nodosa*

*Senecio sylvaticus*

**Sedum telephium**

*Silene dioica*

***Sorbus aria***

*Sorbus aucuparia*

*Sorbus torminalis*

*Stachys sylvatica*

*Stellaria holostea*

*Tamus communis*

*Taxus baccata*

*Teucrium scorodonia*

***Tilia cordata***

*Ulmus* spp.

*Ulmus glabra*

*Ulmus minor*

***Veronica montana***

*Viburnum lantana*

*Viburnum opulus*

*Cherry Plum*

*Blackthorn*

*Bracken*

*Pedunculate Oak*

***Sessile Oak***

**Goldilocks buttercup**

*Lesser Celandine*

*Purging Buckthorn*

*Redcurrant*

*Gooseberry*

*Dog Rose*

*Dewberry*

*Bramble*

*Raspberry*

*Wood Dock*

*White Willow*

*Goat Willow*

*Grey Willow*

*Crack Willow*

*Elder*

*Sanicle*

*Wood Club-rush*

*Common figwort*

*Heath Groundsel*

**Orpine**

*Red Champion*

*Whitebeam*

*Rowan*

**Wild Service**

*Hedge Woundwort*

*Greater Stitchwort*

*Black Bryony*

*Yew*

*Wood Sage*

*Small-leaved Lime*

*Elm*

*Wych Elm*

*Small-leaved Elm*

**Wood Speedwell**

*Wayfaring Tree*

*Guelder Rose*

Vicia sepium

**Vicia sylvatica**

Viola odorata

**Viola reichenbachiana**

Viola rivinana

Bush Vetch

**Wood Vetch**

Sweet Violet

**Early Dog-violet**

Common Dog-violet

## APPENDIX 3 - QUALIFYING LEVELS FOR ARABLE PLANTS FOUND IN BEDFORDSHIRE

The following thresholds for arable plants are taken from: Byfield, A.J. Wilson, P.J. (2005). *Important Arable Plant Areas: identifying priority sites for arable plant conservation in the United Kingdom*. Plantlife International, Salisbury, UK. The methodology adds up the weighted individual score of each species present in a site according to its rarity and decline in the UK.

Nomenclature follows *New Flora of the British Isles* 2nd Edition C.A.Stace CUP 1997.

The taxa included are those recorded in Bedfordshire from 1987 to 2008.

8 = species fully protected through listing on Schedule 8 of the Wildlife & Countryside Act 1981 (plus amendments)

B = UK BAP Priority Species

LoB = Local BAP Priority Species

N = Species listed as being of principal importance for the conservation of biodiversity in England under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Species in **bold** = can be both native and alien species

Species in *Italics* = thought to be extinct in the county

Common Name	Scientific Name	Score (1-9)
<b><i>Corncockle</i></b>	<b><i>Agrostemma githago</i></b>	<b>9</b>
Ground Pine 8 B N LoB	<i>Ajuga chamaepitys</i>	8
Black Grass	<i>Alopecurus myosuroides</i>	2
Blue pimpernel	<i>Anagallis arvensis</i> ssp. <i>foemina</i>	5
Bugloss	<i>Anchusa arvensis</i>	1
Corn Chamomile	<i>Anthemis arvensis</i>	8
Stinking Chamomile	<i>Anthemis cotula</i>	7
Bur Parsley	<i>Anthriscus caucalis</i>	3
Dense silky-bent	<i>Apera interrupta</i>	4
Loose silky-bent	<i>Apera spica-venti</i>	6
Slender Parsley-Piert	<i>Aphanes inexpectata</i>	1
Black mustard	<i>Brassica nigra</i>	2
Field Brome	<i>Bromus arvensis</i>	6
Rye Brome	<i>Bromus secalinus</i>	7
Great Pignut	<i>Bunium bulbocastanum</i>	6
Thorow-Wax B N LoB	<i>Bupleurum rotundifolium</i>	9
Gold-Of-Pleasure	<i>Camelina sativa</i>	5
<b>Cornflower</b> B N LoB	<b><i>Centaurea cyanus</i></b>	<b>8</b>
Small toadflax	<i>Chaenorhinum minus</i>	1
Nettle-leaved Goosefoot	<i>Chenopodium murale</i>	7
Many-Seeded Goosefoot	<i>Chenopodium polyspermum</i>	2
<b>Corn Marigold</b>	<b><i>Chrysanthemum segetum</i></b>	<b>7</b>
Basil- thyme B N	<i>Clinopodium acinos</i>	<b>6</b>
Flixweed	<i>Descurainia sophia</i>	3
Common Stork's-Bill	<i>Erodium cicutarium</i>	1
Musk Stork's-Bill	<i>Erodium moschatum</i>	3
Treacle Mustard	<i>Erysimum cheiranthoides</i>	2
Dwarf Spurge	<i>Euphorbia exigua</i>	6
Broad-leaved spurge	<i>Euphorbia platyphyllos</i>	3
Common Cudweed	<i>Filago vulgaris</i>	6
Dense flowered fumitory	<i>Fumaria densiflora</i>	3
Fine Leaved Fumitory	<i>Fumaria parviflora</i>	7
Few-flowered Fumitory	<i>Fumaria vaillantii</i>	7

Narrow-leaved Hemp-nettle B N LoB	Galeopsis angustifolia	9
Large-flowered Hemp-nettle	Galeopsis speciosa	7
False Cleavers	Galium spurium	8
<i>Corn Cleavers</i> B N LoB	<i>Galium tricornutum</i>	9
Long-Stalked Crane's-Bill	Geranium columbinum	2
Small-Flowered Crane's-Bill	Geranium pusillum	2
Henbane	Hyoscyamus niger	7
Smooth Cat's-ear	Hypochoeris glabra	7
Wild Candytuft LoB	Iberis amara	7
Sharp-Leaved Fluellen	Kickxia elatine	2
Round-Leaved Fluellen	Kickxia spuria	3
Hen-Bit Dead-Nettle	Lamium amplexicaule	1
Yellow Vetchling	Lathyrus aphaca	7
Venus's-Looking-Glass	Legousia hybrida	3
Field Pepperwort	Lepidium campestre	3
Field Gromwell	Lithospermum arvense	8
Dwarf Mallow	Malva neglecta	2
Field Cow-wheat 8	Melampyrum arvense	8
Corn Mint	Mentha arvensis	1
Annual Mercury	Mercurialis annua	2
Mousetail	Myosurus minimus	7
Cat-mint	Nepeta cataria	7
Common Broomrape	Orobanche minor	2
Prickly Poppy	Papaver argemone	7
Yellow-Juiced Poppy	Papaver dubium ssp. lecoqii	2
Rough poppy	Papaver hybridum	3
Corn Parsley	Petroselinum segetum	3
Corn Buttercup B N LoB	Ranunculus arvensis	9
Small flowered buttercup	Ranunculus parviflorus	3
Wild radish	Raphanus raphanistrum	1
Shepherd's Needle B N LoB	Scandix pecten-veneris	9
Annual Knawel 8 B N LoB	Scleranthus annuus	8
Field Madder	Sherardia arvensis	1
White Mustard	Sinapis alba	2
Corn Spurrey	Spergula arvensis	7
Field woundwort	Stachys arvensis	6
Spreading Hedge-parsley B N LoB	Torilis arvensis	8
Knotted Hedge-Parsley	Torilis nodosa	3
Narrow-fruited Cornsalad	Valerianella dentata	8
Broad-fruited Cornsalad B N LoB	Valerianella ramosa	8
Green Field-Speedwell	Veronica agrestis	1
Grey field speedwell	Veronica polita	2
Slender Tare	Vicia parviflora	7
Smooth Tare	Vicia tetrasperma	2
Pansy	Viola tricolor ssp. tricolor	6

## APPENDIX 4 - BEDFORDSHIRE NEUTRAL AND CALCAREOUS GRASSLAND INDICATORS

Nomenclature follows *New Flora of the British Isles* 1st Edition C.A.Stace CUP 1991

\* = signifies a strong indicator

B = UK BAP Priority Species

LoB = Local BAP Priority Species

N = Species listed as being of principal importance for the conservation of biodiversity in England under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

### Neutral Grassland

	Man Orchid B N
Achillea ptarmica*	Sneezewort
Agrimonia eupatoria	Agrimony
Agrimonia procera	Fragrant agrimony
Ajuga reptans	Bugle
Alchemilla filicaulis ssp. vestita*	Lady's-mantle
	Pyramidal Orchid
	Kidney vetch
	Squinancywort
	Purple Milk-vetch B N
	Yellow-wort
	Tor Grass
Briza media*	Quaking grass
	Upright Brome
Bromus commutatus*	Meadow Brome
	Great Pignut
Caltha palustris*	Marsh-marigold
	Clustered Bellflower
	Harebell
Cardamine pratensis	Cuckoo flower
	Musk thistle
Carex caryophyllea*	Spring sedge
Carex disticha*	Brown sedge
Carex flacca*	Glaucous Sedge
Carex hirta	Hairy Sedge
Carex nigra*	Common Sedge
Carex panicea*	Carnation Sedge
Carex spicata*	Spiked Sedge
	Carline Thistle
Centaurea nigra	Black Knapweed
	Greater Knapweed
Centaureum erythraea	Common Centaury
Cirsium acaule*	Dwarf Thistle

### Calcareous Grassland

Aceras anthropophorum*
Agrimonia eupatoria
Anacamptis pyramidalis*
Anthyllis vulneraria*
Asperula cynanchica*
Astragalus danicus*
Blackstonia perfoliata*
Brachypodium pinnatum*
Briza media*
Bromopsis erecta*
Bunium bulbocastanum*
Campanula glomerata*
Campanula rotundifolia*
Carduus nutans
Carex caryophyllea*
Carex flacca*
Carlina vulgaris*
Centaurea nigra
Centaurea scabiosa*
Centaureum erythraea
Cirsium acaule*

	Woolly Thistle	<i>Cirsium eriophorum</i> *
	Basil-thyme B N	<i>Clinopodium acinos</i> *
	Wild Basil	<i>Clinopodium vulgare</i> *
	Frog Orchid B N	<i>Coeloglossum viride</i> *
<i>Conopodium majus</i>	Pignut	
<i>Dactylorhiza fuchsii</i> *	Common Spotted Orchid	<i>Dactylorhiza fuchsii</i> *
<i>Dactylorhiza incarnata</i> *	Early Marsh Orchid	
<i>Danthonia decumbens</i> *	Heath Grass	
<i>Eleocharis palustris</i>	Common spike-rush	
<i>Euphrasia nemorosa</i> *	Eyebright B N	<i>Euphrasia nemorosa</i> *
	Chalk Eyebright	<i>Euphrasia pseudokerneri</i> *
	Sheep's Fescue	<i>Festuca ovina</i>
<i>Filipendula vulgaris</i> *	Dropwort	<i>Filipendula vulgaris</i> *
<i>Galium uliginosum</i> *	Fen Bedstraw	
<i>Galium verum</i>	Lady's Bedstraw	<i>Galium verum</i>
<i>Genista tinctoria</i> *	Dyer's Greenweed	<i>Genista tinctoria</i> *
	Autumn Gentian	<i>Gentianella amarella</i> *
	Chiltern Gentian	<i>Gentianella germanica</i> *
<i>Geranium pratense</i>	Meadow Crane's-bill	
	Fragrant Orchid	<i>Gymnadenia conopsea</i> *
	Common Rock-rose	<i>Helianthemum nummularium</i> *
<i>Helictotrichon pratense</i> *	Meadow Oat-grass	<i>Helictotrichon pratense</i> *
<i>Helictotrichon pubescens</i> *	Downy Oat-grass	<i>Helictotrichon pubescens</i> *
	Musk Orchid B N	<i>Herminium monorchis</i> *
	Horseshoe Vetch	<i>Hippocrepis comosa</i> *
<i>Hordeum secalinum</i>	Meadow Barley	
<i>Hypericum perforatum</i>	Perforate St. John's-wort	<i>Hypericum perforatum</i>
<i>Hypericum tetrapterum</i>	Square-stemmed St. John's wort	
	Spotted Cat's-ear	<i>Hypochaeris maculata</i> *
	Wild Candytuft B LoB N	<i>Iberis amara</i> *
	Ploughman's-spikenard	<i>Inula conyzae</i> *
<i>Juncus compressus</i>	Round-fruited Rush	
<i>Knautia arvensis</i> *	Field Scabious	<i>Knautia arvensis</i> *
<i>Koeleria macrantha</i> *	Crested Hair-grass	<i>Koeleria macrantha</i> *
<i>Lathyrus nissolia</i> *	Grass Vetchling	



**Neutral Grassland**

Rumex acetosa  
 Salvia horminioides\*  
 Sanguisorba minor ssp. minor\*  
 Sanguisorba officinalis\*  
 Saxifraga granulata\*  
  
 Senecio aquaticus\*  
 Senecio erucifolius  
 Serratula tinctoria\*  
  
 Silaum silaus\*  
  
 Stachys officinalis\*  
 Stellaria graminea  
 Succisa pratensis\*  
  
 Thalictrum flavum\*  
  
 Trifolium fragiferum  
 Trifolium ochroleucon\*  
 Triglochin palustris\*  
 Trisetum flavescens  
 Valeriana dioica\*  
  
 Viola canina\*  
 Viola hirta\*

Common Sorrel  
 Wild Clary  
 Salad Burnet  
 Great Burnet  
 Meadow Saxifrage  
 Small Scabious  
 Marsh Ragwort  
 Hoary Ragwort  
 Saw-wort  
 Moon Carrot  
 Pepper-saxifrage  
 Bladder Campion  
 Betony  
 Lesser Stitchwort  
 Devil's-bit Scabious  
 Field Fleawort B N  
 Common Meadow-rue  
 Lesser Meadow-rue  
 Wild Thyme  
 Large Thyme  
 Strawberry Clover  
 Sulphur Clover  
 Marsh Arrow-grass  
 Yellow Oat-grass  
 Marsh Valerian  
 Dark Mullein  
 Heath Dog-violet  
 Hairy Violet

**Calcareous grassland**

Sanguisorba minor ssp. minor\*  
  
 Scabiosa columbaria\*  
  
 Senecio erucifolius  
 Serratula tinctoria\*  
 Seseli libanotis\*  
  
 Silene vulgaris  
 Stachys officinalis\*  
  
 Succisa pratensis\*  
 Tephrosia integrifolia\*  
  
 Thalictrum minus\*  
 Thymus polytrichus\*  
 Thymus pulegioides\*  
  
 Verbascum nigrum  
  
 Viola hirta\*



## APPENDIX 5 - BEDFORDSHIRE HEATHLAND AND ACID GRASSLAND INDICATORS

Nomenclature follows *New Flora of the British Isles* 1st Edition C.A.Stace CUP 1991

\* = signifies a strong indicator

Agrostis capillaris	Common Bent
Aira caryophyllea*	Silver Hair-grass
Aira praecox	Early Hair-grass
Anchusa arvensis	Bugloss
Anthriscus caucalis	Bur Chervil
Calluna vulgaris*	Heather
Carex echinata	Star sedge
Carex muricata ssp lamprocarpa	Small-fruited prickly-sedge
Carex pilulifera*	Pill sedge
Cerastium semidecandrum*	Little Mouse-ear
Corydalis claviculata	Climbing Corydalis
Cytisus europaeus	Broom
Danthonia decumbens	Heath Grass
Deschampsia flexuosa	Wavy Hair-grass
Echium vulgare	Viper's Bugloss
Filago minima*	Small Cudweed
Filago vulgaris*	Common Cudweed
Galium saxatile	Heath Bedstraw
Hieracium umbellatum	Hawkweed ssp.
Hypericum humifusum	Trailing St.John's-wort
Jasione montana*	Sheep's-bit
Juncus squarrosus	Heath Rush
Luzula multiflora	Heath Wood-rush
Molinia caerulea	Purple Moor-grass
Montia perfoliata	Spring-beauty
Myosotis discolor*	Changing Forget-me-not
Myosotis ramosissima*	Early Forget-me-not
Ornithopus perpusillus*	Bird's-foot
Plantago coronopus	Buck's-horn Plantain
Polygala serpyllifolia	Heath Milkwort
Polystichum aculeatum	Hard Fern
Potentilla erecta	Tormentil
Pteridium aquilinum	Bracken
Rumex acetosella	Sheep's Sorrel
Silene dioica	Red campion
Solidago virgaurea*	Golden-rod
Spergularia rubra*	Sand spurrey

*Trifolium arvense*\*

*Ulex europaeus*

*Vaccinium myrtillus*\*

*Veronica officinalis*\*

Hare's-foot Clover

Gorse

Bilberry

Heath Speedwell

## APPENDIX 6 - BEDFORDSHIRE WETLAND INDICATORS

B = UK BAP Priority Species

N = Species listed as being of principal importance for the conservation of biodiversity in England under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

### Strong Indicators

<i>Achillea ptarmica</i>	Sneezewort
<i>Alisma gramineum</i>	Narrow-leaved Water-plantain
<i>Alopecurus aequalis</i>	Orange Foxtail
<i>Anagallis tenella</i>	Bog Pimpernel
<i>Apium inundatum</i>	Lesser Marshwort
<i>Baldellia ranunculoides</i>	Lesser Water-plantain
<i>Bidens cernua</i>	Nodding Bur-marigold
<i>Blysmus compressus</i>	Flat Sedge B N
<i>Bolboschoenus maritimus</i>	Sea Club-rush
<i>Butomus umbellatus</i>	Flowering Rush
<i>Callitriche hamulata</i>	Intermediate Water-starwort
<i>Callitriche obtusangula</i>	Blunt-fruited Water-starwort
<i>Callitriche platycarpa</i>	Various-leaved Water-starwort
<i>Cardamine amara</i>	Large Bittercress
<i>Carex acuta</i>	Slender Tufted-sedge
<i>Carex curta</i>	White Sedge
<i>Carex demissa</i>	Common Yellow-Sedge
<i>Carex distans</i>	Distant Sedge
<i>Carex echinata</i>	Star Sedge
<i>Carex hostiana</i>	Tawny Sedge
<i>Carex nigra</i>	Common Sedge
<i>Carex ovalis</i>	Oval Sedge
<i>Carex panicea</i>	Carnation Sedge
<i>Carex paniculata</i>	Greater Tussock-sedge
<i>Carex pseudocyperus</i>	Cyperus Sedge
<i>Carex pulicaris</i>	Flea Sedge
<i>Carex rostrata</i>	Bottle Sedge
<i>Carex viridula</i>	Long-stalked Yellow-sedge
<i>Catabrosa aquatica</i>	Whorl-grass
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved Golden Saxifrage
<i>Cuscuta europaea</i>	Greater Dodder
<i>Dactylorhiza incarnata</i>	Early Marsh Orchid
<i>Dactylorhiza praetermissa</i>	Southern Marsh Orchid
<i>Eleocharis uniglumis</i>	Slender Spike-rush
<i>Epilobium palustre</i>	Marsh Willowherb
<i>Eriophorum angustifolium</i>	Common Cottongrass
<i>Galium uliginosum</i>	Fen Bedstraw
<i>Glyceria declinata</i>	Small Sweet-grass

Groenlandia densa	Opposite-leaved Pondweed
Hippurus vulgaris	Mare's-tail
Hottonia palustris	Water Violet
Hydrocharis morsus-ranae	Frogbit
Hydrocotyle vulgaris	Marsh Pennywort
Isolepis setacea	Bristle Club-rush
Juncus bulbosus	Bulbous Rush
Juncus compressus	Round-fruited Rush
Juncus subnodulosus	Blunt-flowered Rush
Lemna gibba	Fat Duckweed
Limosella aquatica	Mudwort
Lysimachia vulgaris	Yellow Loosestrife
Lythrum portula	Water Purslane
Mentha x verticillata	Whorled Mint
Menyanthes trifoliata	Bogbean
Molinia caerulea	Purple Moor-grass
Montia fontana	Blinks
Myriophyllum verticillatum	Whorled Water-milfoil
Nymphaea alba	White Water-lily
Oenanthe aquatica	Fine-leaved Water-dropwort
Oenanthe crocata	Hemlock Water-dropwort
Oenanthe fistulosa	Tubular Water-dropwort B N
Oenanthe fluviatilis	River Water-dropwort
Oenanthe lachenalii	Parsley Water-dropwort
Osmunda regalis	Royal Fern
Persicaria laxiflora	Tasteless Water-pepper
Potamogeton alpinus	Red Pondweed
Potamogeton berchtoldii	Small Pondweed
Potamogeton friesii	Flat-stalked Pondweed
Potamogeton lucens	Shining Pondweed
Potamogeton obtusifolius	Blunt-leaved Pondweed
Potamogeton perfoliatus	Perfoliate Pondweed
Potamogeton praelongus	Long-stalked Pondweed
Potamogeton pusillus	Lesser Pondweed
Ranunculus aquatilis	Common Water-crowfoot
Ranunculus circinatus	Fan-leaved Water-crowfoot
Ranunculus flammula	Lesser Spearwort
Ranunculus fluitans	River Water-crowfoot
Ranunculus hederaceus	Ivy-leaved Crowfoot
Ranunculus lingua	Greater Spearwort
Ranunculus peltatus	Pond Water-crowfoot
Ranunculus penicillatus	Stream Water-crowfoot
Rumex maritimus	Golden Dock
Rumex palustris	Marsh Dock
Sagittaria sagittifolia	Arrowhead

Salix aurita  
Salix pentandra  
Samolus valerandi  
Scirpus sylvaticus  
Scirpus tabernaemontani  
Sium latifolium  
Sparganium emersum  
Spirodela polyrhiza  
Thalictrum flavum  
Triglochin palustris  
Typha angustifolia  
Utricularia australis  
Valeriana dioica  
Veronica scutellata  
Viola palustris

Eared Willow  
Bay Willow  
Brookweed  
Wood Club-rush  
Grey Club-rush  
Greater Water-parsnip B N  
Unbranched Bur-reed  
Greater Duckweed  
Common Meadow-rue  
Marsh Arrowgrass  
Lesser Reedmace  
Bladderwort  
Marsh Valerian  
Marsh Speedwell  
Marsh Violet

### **General Indicators**

Alisma plantago-aquatica  
Alopecurus geniculatus  
Angelica sylvestris  
Apium nodiflorum  
Berula erecta  
Bidens tripartita  
Callitriche stagnalis  
Caltha palustris  
Carex acutiformis  
Carex disticha  
Carex riparia  
Ceratophyllum demersum  
Cirsium palustre  
Dipsacus pilosus  
Eleocharis palustris  
Equisetum fluviatile  
Equisetum palustre  
Equisetum telmateia  
Eupatorium cannabinum  
Filipendula ulmaria  
Galium palustre  
Glyceria fluitans  
Glyceria maxima  
Glyceria x pedicellata  
Glyceria plicata  
Hypericum tetrapterum  
Iris pseudacorus

Common Water-plantain  
Marsh Foxtail  
Wild Angelica  
Fool's Watercress  
Lesser Water-parsnip  
Trifid Bur-marigold  
Common Water-starwort  
Marsh Marigold  
Lesser Pond-sedge  
Brown Sedge  
Greater Pond-sedge  
Rigid Hornwort  
Marsh Thistle  
Small Teasel  
Common Spike-rush  
Water Horsetail  
Marsh Horsetail  
Great Horsetail  
Hemp-agrimony  
Meadowsweet  
Marsh Bedstraw  
Floating Sweet-grass  
Reed Sweet-grass  
Hybrid Sweet-grass  
Plicate Sweet-grass  
Square-stalked St John's Wort  
Yellow Iris

<i>Juncus acutiflorus</i>	Sharp-flowered Rush
<i>Juncus articulatus</i>	Jointed Rush
<i>Juncus bufonius</i>	Toad Rush
<i>Lemna minor</i>	Common Duckweed
<i>Lemna trisulca</i>	Ivy-leaved Duckweed
<i>Lotus pedunculatus</i>	Greater Birdsfoot-trefoil
<i>Lychnis flos-cuculi</i>	Ragged Robin
<i>Lycopus europaeus</i>	Gipsywort
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Mentha aquatica</i>	Water Mint
<i>Myosotis laxa</i>	Tufted Forget-me-not
<i>Myosotis scorpioides</i>	Water Forget-me-not
<i>Myosoton aquaticum</i>	Water Chickweed
<i>Myriophyllum spicatum</i>	Spiked Water-milfoil
<i>Nuphar lutea</i>	Yellow water-lily
<i>Persicaria amphibia</i>	Amphibious bistort
<i>Persicaria hydropiper</i>	Water-pepper
<i>Petasites hybridus</i>	Butterbur
<i>Populus nigra</i>	Black Poplar
<i>Potamogeton crispus</i>	Curled Pondweed
<i>Potamogeton natans</i>	Broad-leaved Pondweed
<i>Potamogeton pectinatus</i>	Fennel Pondweed
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Phalaris arundinacea</i>	Reed Canary-grass
<i>Phragmites australis</i>	Common Reed
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Ranunculus sceleratus</i>	Celery-leaved Buttercup
<i>Ranunculus trichophyllus</i>	Thread-leaved Water-crowfoot
<i>Rorippa amphibia</i>	Great Yellow-cress
<i>Rorippa microphylla</i>	Narrow-fruited water-cress
<i>Rorippa nasturtium-aquaticum</i>	Water-cress
<i>Rorippa palustris</i>	Marsh Yellow-cress
<i>Rorippa sylvestris</i>	Creeping Yellow-cress
<i>Rumex hydrolapathum</i>	Water Dock
<i>Salix purpurea</i>	Purple Willow
<i>Salix triandra</i>	Almond Willow
<i>Scirpus lacustris</i>	Common Club-rush
<i>Scrophularia auriculata</i>	Water Figwort
<i>Scutellaria galericulata</i>	Skullcap
<i>Senecio aquaticus</i>	Marsh Ragwort
<i>Sparganium erectum</i>	Branched Bur-reed
<i>Stachys palustris</i>	Marsh Woundwort
<i>Stellaria alsine</i>	Bog Stitchwort
<i>Symphytum officinale</i>	Common Comfrey
<i>Typha latifolia</i>	Reedmace

Valeriana officinalis	Common Valerian
Veronica anagallis-aquatica	Blue Water-speedwell
Veronica beccabunga	Brooklime
Veronica catenata	Pink Water-speedwell
Zannichellia palustris	Horned Pondweed

**Introduced species, do not use in assessing sites**

Acorus calamus	Sweet Flag
Azolla filiculoides	Water Fern
Crassula helmsii	Australian Swamp Stonecrop
Elodea canadensis	Canadian Waterweed
Hydrocotyle ranunculoides	Floating Pennywort
Impatiens capensis	Orange Balsam
Impatiens glandulifera	Himalayan Balsam
Lagarosiphon major	Curly Water-thyme
Myriophyllum aquaticum	Parrot's Feather
Nymphoides peltata	Fringed Water-lily
Stratiotes aloides	Water Soldier

## APPENDIX 7 - BEDFORDSHIRE'S CRITICALLY ENDANGERED AND ENDANGERED SPECIES OF VASCULAR PLANTS AND THEIR HABITATS

These taxa are based on IUCN criteria.

Nomenclature follows *New Flora of the British Isles* 2nd Edition C.A. Stace CUP 1997.

Typeface indicates date class of most recent record: *italics* = pre-1970; normal = 1970-86; **bold** = post-1986.

8= species fully protected through listing on Schedule 8 of the Wildlife & Countryside Act 1981 (plus amendments)

B = UK BAP Priority Species

LoB = Local BAP Priority Species

N = Species listed as being of principal importance for the conservation of biodiversity in England under section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

### CRITICALLY ENDANGERED

Scientific Name	Common Name	Habitat
<b>Ranunculus arvensis</b>	<b>Corn Buttercup B N LoB</b>	<b>Arable field margins</b>
<b>Galium tricornutum</b>	<b>Corn Cleavers B N LoB</b>	<b>Arable field margins</b>
<b>Galeopsis angustifolia</b>	<b>Narrow-leaved Hemp-nettle B N LoB</b>	<b>Arable field margins</b>
<b>Scandix pecten-veneris</b>	<b>Shepherd's Needle B N LoB</b>	<b>Arable field margins</b>

### ENDANGERED

<i>Astragalus danicus</i>	Purple Milk-vetch B N	Calcareous grassland <b>Calcareous/neutral grassland</b>
<b>Euphrasia pseudokernerii</b>	<b>Eyebright B N</b>	Acid grassland/heath <b>urban, dry/ bare stony places</b>
<i>Gnaphalium sylvaticum</i>	Heath Cudweed	Woodland
<b>Minuartia hybrida</b>	<b>Fine-leaved Sandwort B N</b>	<b>Calcareous grassland</b>
<i>Monotropa hypopitys</i> ssp. <i>hypophegea</i>	Yellow Bird's-nest B N	<b>Calcareous grassland</b>
<b>Neotinea ustulata</b>	<b>Burnt Orchid B N</b>	<b>Calcareous grassland</b>
<b>Orchis anthropophora</b>	<b>Man Orchid B N</b>	<b>Calcareous grassland</b>
<b>Tephrosieris integrifolia</b> ssp. <i>integrifolia</i>	<b>Field Fleawort B N</b>	Urban, dry grassy places
<i>Dianthus armeria</i>	Deptford Pink B N	Ditches
<i>Sium latifolium</i>	Greater Water-Parsnip B N	<b>Arable field margins</b>
<b>Scleranthus annuus</b>	<b>Annual Knawel 8 B N LoB</b>	<b>Arable field margins</b>
<b>Anthemis arvensis</b>	<b>Corn Chamomile</b>	<b>Arable field margins</b>
<b>Lithospermum arvense</b>	<b>Field Gromwell</b>	<b>Arable field margins</b>
<b>Ajuga chamaepitys</b>	<b>Ground Pine 8 B N LoB</b>	<b>Arable field margins</b>
<b>Valerianella dentata</b>	<b>Narrow-fruited Cornsalad</b>	<b>Arable field margins</b>
<b>Torilis arvensis</b>	<b>Spreading Hedge-parsley B N LoB</b>	<b>Arable field margins</b>
<b>Valerianella rimosa</b>	<b>Broad-fruited Cornsalad B N LoB</b>	<b>Arable field margins</b>