Breeding Bird Indices By Habitat

Compiled by the
Records and Research Committee
Bedfordshire Bird Club

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Introduction

This document forms part of the bird criteria for identifying county Wildlife Sites.

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- Graham Goodall; Research Officer.
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Most bird species have specialised requirements that can only be met in certain locations, usually where their chances of survival are enhanced. These sites are probably those that are familiar in terms of food resources, predator risk, and nesting habitat. Losses of these sites force the birds to try other areas, which may not be so beneficial. The increased density of birds forced into smaller areas, results in competition, possibly greater mortality, and a decline in numbers (Pritchard *et. al.* 1992). As a result, population levels are influenced by the availability of food, the productivity of the previous breeding season, the weather, and other environmental factors, some of which may be man-made. The final measure of diversity is the number of species recorded in a given area, or in a defined community or habitat type (Fuller, 1982. Elkins, 1983).

These ecological factors make it imperative that sites of importance for breeding bird assemblages are identified, conserved and protected, particularly those that may face the threat of future built development. To do so, their value must be demonstrated using sound ecological methodologies and reasoning. It must also be recognised that sites can be damaged, lost, or their value diminished by a lack of, or the way in which they are managed (Collis and Tyldesley, 1993).

Criteria used for the identification of important bird sites in Bedfordshire

A system has been devised for Bedfordshire, using a national system that has been adapted to accurately reflect the bird species and semi-natural habitats in the county at this time.

The national system

The Nature Conservancy Council (later evolved into Natural England), devised a set of national guidelines which were used to select biological SSSIs. *Guidelines for Selection of Biological SSSIs* (NCC, 1989), uses a national Threshold Site-Index Value system which operates on points (indices) given for breeding bird assemblages found in different habitats. Sites were considered important if they supported an especially good range of breeding bird species characteristic of the habitat.

Breeding bird assemblages for various habitat types consist of characteristic species, including abundant species (100 -1 million pairs) that are primarily associated with the habitat – these species have scores of 1-4; plus scarcer species with populations of less than 100 pairs, which have scores of 5 and 6.

Indices scores in the national system were based on the estimated population size at the time and are shown in the table below.

Score	Population (breeding pairs)
0	**greater than a million**
1	**100,000 - 1 million**
2	**10,000 - 100,000**
3	**1,000 - 10,000**
4	**100 - 1,000**
5	**10 - 100**
6	**1 - 10**

The theoretical maximum index value (total score) for a site was calculated by summing the indices scores (1-4) for the species breeding there. Species with scores of 5 and 6 were excluded because of their small populations and restricted geographical distribution. Threshold Site-index Values were set to reflect a 'good' breeding bird community.

The text states that for most habitats, a site reaching half (50%) the theoretical maximum would be ***an especially good example of the breeding bird community associated with that habitat***.
However, the text does not explain how the Threshold site-index values for each habitat were arrived at. It is assumed therefore, that they were agreed by a panel of suitably qualified ecologists.

If two or more habitat types occur within one site the indices for all the recorded species should be counted. For the site to qualify, its total score must exceed the threshold value for all the habitats combined.

Calculating site scores; Threshold Site-index values.
All species were included in the site score if they had been recorded as probably breeding at a site in a majority of recent years, including rare/scarce species with scores of 5 or 6, provided information was available to support that statement. Species regularly using a site for essential activities (such as feeding) whilst breeding, were included even if they nested outside the site. To qualify, the index value for a site must exceed the Threshold Site-index value given for that habitat (NCC, 1989).

The county system

The Bedfordshire system is an adaptation of the national system using threshold site-index values to determine the criteria for identifying important sites for breeding bird assemblages in the county. County Red List breeding species (Goodall *et. al.* 2016) and Rare Breeding Bird (RBB) species (Goodall *et. al.* 2014), including potential breeders, are identified for each habitat assemblage. Because the NCC habitat lists are national, some of the birds included would never be expected to occur in Bedfordshire. These species have been removed from the respective habitat list in the county system. Similarly, there are species that do not currently breed in Bedfordshire or have not done so for twenty years or more. The indices for these species - marked with an asterisk (*) - have been retained as these species may breed in the future. However, their individual indices are ***not*** included in the Theoretical maximum scores. In addition, the indices for individual species have been adjusted to reflect current estimated population levels (Musgrove *et. al.* 2013). The county system adds an additional measure of value (+1) for county Red List and Rare Breeding Bird species, including those with an asterisk that have bred in the last twenty years or have the potential to breed. Threshold Site-index Values have been set to reflect 'good' (better than average) breeding bird communities relative to Bedfordshire.

Calculating site scores; Threshold Site-index values.

The following methodology should be used to calculate whether a site can be identified as a county Wildlife Site using ornithological criteria. The site-index value (total score) for a site is calculated by summing the indices for ***all*** the species recorded there, including those with a score of 4 (+1), an asterisk, and rare species with scores of 5 and 6, provided information is available to support that statement. Species regularly using a site for essential activities (such as feeding) should also be included even if they nest outside the site. To qualify, the index value for a site must exceed the Threshold Site-index value given for that habitat. In all cases, it must be proven that a site has reached the threshold value **within the last five years.** Species should be present on more than one occasion and **in at least two of the years under review.** Conditions at the site must be conducive (provided there is no intentional effort to destroy part or whole of the site) to this value being typical or consistently reached. If a site has more than one habitat, the threshold site-index should be the sum of the habitats present, and species should be double-counted if they occur in more than one habitat. An additional habitat list has been compiled for farmland, not covered by the national system, and a percentage value of 49% has been set for this habitat.

Breeding

The breeding season is accepted as running from 1st April to 31st August, with the proviso that resident species may breed during February and March depending on prevailing weather conditions at the time. Proof of breeding or an attempt to breed can take several forms; therefore, the British Trust for Ornithology (BTO) definitions have been used:

Probable breeder:

- Pair in suitable nesting habitat.
- Permanent Territory (defended over at least 1 week).
- Visiting probable nest site.
- Agitated behaviour.
- Brood patch of incubating bird (seen on bird in the hand).

- Nest building or excavating a nest hole.

Confirmed breeder:

- Distraction display or injury feigning.
- Used nest or eggshells found from current season.
- Recently fledged young or downy young.
- Adults entering or leaving nest site in circumstances indicating occupied nest.
- Adult carrying faecal sac or food for young.
- Nest containing eggs.
- Nest with young seen or heard.

Habitats

The NCC national system uses generic titles for the habitats lists. Therefore, in order to facilitate the use of the county system, additional descriptions for each habitat type have been added (Lake *et. al.* 2015); see below. Reference should be made to the *Handbook for Phase 1 Habitat Survey* (JNCC, 2010) when identifying the various habitats that are present at a site, and it should be recognised that in some instances, habitat mosaics will have formed, in which case a combination of habitats lists will need to be used in order to assess the full value of a site. National Vegetation Classifications (NVC) for specific communities can be found in the habitats section of the County Wildlife Site Selection Guidelines; Version 8 (February 2013).

Lowland Open Water and Margins:

- Nutrient-rich eutrophic waterbodies.
- Nutrient-poor waterbodies; formed on former minerals sites, particularly those where sand and gravel has been excavated.

Lowland Fen:

- Fens, swamps and marshes with reed, rushes, sedges and tall herbs.

Lowland Damp Grassland:

- Lowland meadow and pasture.
- Floodplain marshy grassland.

Woodland:

- Lowland mixed deciduous; Oak, Ash and Birch, with shrub species; also Beech.
- Wet woodland; alluvial and riparian with Alder and willow.
- Wood Pasture; parkland with scattered mature trees.
- Conifer plantations.
- Note: young (years 1-10) plantation woodland would be best described as Scrub.

Lowland Heath:

- Dry heath on sandy soils.
- Dry acid grassland.

Scrub:

- Excludes Heathland. Mixed shrubs, usually Hawthorn, Blackthorn, Bramble, Elder. Travellers Joy can form dense cover in some instances.

Farmland:

- Arable; cultivated ground with winter and spring crops, and vegetables.
- Improved grassland, usually Rye Grass. Cut for silage or grazed.
- Permanent grass field margins.
- Hedgerows.
- Mature single trees.

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LOWLAND OPEN WATER AND MARGINS; including FEN

NCC national system; breeding species	NCC score	National List	County Red List	County system; breeding species
Little Grebe	2.5	Green		3
Great Crested Grebe	3	Green		3
Black-necked Grebe	5	Amber		5
Eurasian Bittern [RBB]	5	Amber	**YES**	4 (+1)
Grey Heron	3	Green		2
Mute Swan	3	Amber		3
Common Shelduck [RBB]	2	Amber		2 (+1)
Gadwall [RBB]	4	Amber		3 (+1)
Eurasian Teal * [RBB]	3	Amber		3 * (+1)
Garganey [RBB]	5	Amber		5 (+1)
Shoveler [RBB]	4	Amber		4 (+1)
Common Pochard [RBB]	4	Red	**YES**	4 (+1)
Tufted Duck [RBB]	3	Green		2 (+1)
Montagu's Harrier * [RBB]	6	Amber		5 * (+1)
Marsh Harrier * [RBB]	5	Amber		4 * (+1)
Spotted Crake *	6	Amber		5 *
Water Rail [RBB]	3	Green		3 (+1)
Little Ringed Plover [RBB]	4	Green		3 (+1)
Ringed Plover [RBB]	3	Red	**YES**	3 (+1)
Common Snipe* [RBB]	2	Amber		2* (+1)
Common Redshank [RBB]	2	Amber		2 (+1)
Common Tern [RBB]	3	Amber		2 (+1)
Common Cuckoo	2	Red	**YES**	2 (+1)
Common Kingfisher [RBB]	3	Amber		3 (+1)
Yellow Wagtail	1	Red	**YES**	2 (+1)
Grey Wagtail	2	Red	**YES**	2 (+1)
Cetti's Warbler [RBB]	4	Green		3 (+1)
Grasshopper Warbler	2	Red	**YES**	2 (+1)
Savi's Warbler [RBB]	5	Red		6 (+1)
Sedge Warbler	1	Green		1
Reed Warbler	2	Green		1
Bearded Tit	4	Green		4
Reed Bunting	1	Amber	**YES**	1 (+1)
Theoretical maximum: (scores 1 to 4)	**70.5**			**82**
Threshold Site-index Value	**28**			**33**
Percentage value of total	40			40
				Score for County Wildlife Site: 33

LOWLAND DAMP GRASSLAND AND MARSH

NCC national system; breeding species	**NCC score**	**National List**	**County Red List**	**County System; breeding species**
Mute Swan	3	Amber		3
Common Shelduck [RBB]	2	Amber		2 (+1)
Gadwall [RBB]	4	Amber		3 (+1)
Eurasian Teal * [RBB]	3	Amber		3 * (+1)
Garganey [RBB]	5	Amber		5 (+1)
Shoveler [RBB]	4	Amber		4 (+1)
Marsh Harrier * [RBB]	5	Amber		4 * (+1)
Common Quail	5	Amber		4
Corncrake *	4	Red		3 *
Northern Lapwing	1	Red	**YES**	1 (+1)
Ruff *	5	Red		5 *
Common Snipe* [RBB]	2	Amber		2* (+1)
Black-tailed Godwit *	5	Red		5 *
Eurasian Curlew	2	Red	**YES**	2 (+1)
Common Redshank	2	Amber		2
Common Cuckoo	2	Red	**YES**	2 (+1)
Short-eared Owl *	3	Amber		3 *
Yellow Wagtail	1	Red	**YES**	2 (+1)
Whinchat *	2	Red		2 *
Grasshopper Warbler	2	Red	**YES**	2 (+1)
Sedge Warbler	1	Green		1
Reed Bunting	1	Amber	**YES**	1 (+1)
Theoretical maximum: (scores 1 to 4)	**39**			**38**
Threshold Site-index Value	**16**			**15**
Percentage value of total	41			39
				Score for County Wildlife Site: 15

WOODLAND

NCC national system; breeding species	NCC score	National List	County Red List	County system; breeding species
Grey Heron	3	Green		4
Honey Buzzard *	5	Amber		5 *
Red Kite	5	Green		3
Northern Goshawk *	5	Green		4 *
Eurasian Sparrowhawk	2	Green		2
Common Buzzard	3	Green		2
Hobby	4	Green		3
Woodcock *	2	Red		2*
Stock Dove	1	Amber		1
Common Cuckoo	2	Red	**YES**	2 (+1)
Tawny Owl	2	Amber		2
Long-eared Owl [RBB]	3	Green		3 (+1)
European Nightjar* [RBB]	3	Red	**YES**	3 * (+1)
Green Woodpecker	2	Green		2
Great Spotted Woodpecker	2	Green		1
Lesser Spotted Woodpecker [RBB]	3	Red	**YES**	3 (+1)
Tree Pipit* [RBB]	1.5	Red	**YES**	2 * (+1)
Common Nightingale [RBB]	3	Red	**YES**	3 (+1)
Common Redstart	1	Amber		2
Garden Warbler	1	Green		1
Blackcap	1	Green		1
Wood Warbler *	2	Red	**YES**	3 * (+1)
Common Chiffchaff	1	Green		1
Goldcrest	1	Green		1
Firecrest [RBB]	5	Green		4 (+1)
Spotted Flycatcher	1	Red	**YES**	2 (+1)
Long-tailed Tit	1	Green		1
Marsh Tit	1	Red	**YES**	2 (+1)
Willow Tit*	2	Red		3*
Coal Tit	1	Green		1
Eurasian Nuthatch	2	Green		1
Eurasian Treecreeper	1	Green		1
Eurasian Jay	1	Green		1
Common Raven	3	Green		3
Siskin	2	Green		1
Lesser Redpoll [RBB]	1	Red	**YES**	1 (+1)
Common Crossbill	3	Green		2
Bullfinch	1	Amber	**YES**	1 (+1)
Hawfinch *	3	Red	**YES**	4 * (+1)
Theoretical maximum: (scores 1 to 4)	**65.5**			**67**
Threshold Site-index Values	**31**			**31**
Percentage value of total	47			47
				Score for County Wildlife Site: 31

LOWLAND HEATH (DRY: no standing water)

NCC national system; breeding species	NCC score	National List	County Red List	County system; breeding species
Montagu's Harrier * [RBB]	6	Amber		5 * (+1)
Hobby	4	Green		3
Common Quail	5	Amber		4
Stone Curlew *	4	Amber		4 *
Common Cuckoo	2	Red	**YES**	2 (+1)
Long-eared Owl [RBB]	3	Green		3 (+1)
European Nightjar* [RBB]	3	Red	**YES**	3 * (+1)
Woodlark [RBB]	4	Green	**YES**	3 (+1)
Tree pipit* [RBB]	1.5	Red	**YES**	2 * (+1)
Whinchat *	2	Red		2 *
European Stonechat * [RBB]	2	Green		2 * (+1)
Northern Wheatear [RBB]	2	Green		1 (+1)
Grasshopper Warbler	2	Red	**YES**	2 (+1)
Dartford Warbler *	3	Amber		3 *
Linnet	1	Red	**YES**	1 (+1)
Theoretical maximum: (scores 1 to 4)	**33.5**			**25**
Threshold Site-index Value	**17**			**12**
Percentage value of total	50			48
				Score for County Wildlife Site: 12

SCRUB

NCC national system; breeding species	NCC score	National List	County Red List	County system; breeding species
Turtle Dove [RBB]	1.5	Red	**YES**	2 (+1)
Common Cuckoo	2	Red	**YES**	2 (+1)
Long-eared Owl [RBB]	3	Green		3 (+1)
European Nightjar* [RBB]	3	Red	**YES**	3 * (+1)
Tree Pipit* [RBB]	1.5	Red	**YES**	2 * (+1)
Common Nightingale [RBB]	3	Red	**YES**	3 (+1)
Whinchat *	2	Red		2 *
European Stonechat * [RBB]	2	Green		2 * (+1)
Grasshopper Warbler	2	Red	**YES**	2 (+1)
Common Whitethroat	2	Green		1
Lesser Whitethroat	2	Green		2
Garden Warbler	1	Green		1
Blackcap	1	Green		1
Linnet	1	Red	**YES**	1 (+1)
Theoretical maximum: (scores 1 to 4)	**27**			**24**
Threshold Site-index Values	**13**			**11**
Percentage values	48			45
				Score for County Wildlife Site: 11

FARMLAND

National breeding species	NCC score	National List	County Red List	County system; breeding species
Marsh Harrier * [RBB]	5	Amber		4 * (+1)
Common Kestrel	2	Amber		2
Hobby	4	Green		3
Grey Partridge	1.5	Red	**YES**	2 (+1)
Common Quail	5	Amber		4
Stone Curlew *	4	Amber		4 *
Northern Lapwing	1	Red	**YES**	1 (+1)
Turtle Dove [RBB]	1.5	Red	**YES**	2 (+1)
Barn Owl	3	Green		3
Skylark	0	Red	**YES**	1 (+1)
Yellow Wagtail	1	Red	**YES**	2 (+1)
Spotted Flycatcher	1	Red	**YES**	2 (+1)
Common Whitethroat	2	Green		1
Lesser Whitethroat	2	Green		2
Garden Warbler	1	Green		1
Blackcap	1	Green		1
Tree Sparrow [RBB]	1	Red	**YES**	1 (+1)
Linnet	1	Red	**YES**	1 (+1)
Yellowhammer	0	Red	**YES**	2 (+1)
Reed Bunting	1	Amber	**YES**	1 (+1)
Corn Bunting	2	Red	**YES**	2 (+1)
Theoretical maximum: (scores 1 to 4)	**30**			**45**
Threshold Site-index Values	**15**			**22**
Percentage values of total	50			49
				Score for important farmland: 22

It is recommended that important areas of farmland are identified and owners encouraged to apply for funding from the Countryside Stewardship Scheme.