

CONTENTS

1.0	CONTEXT	1
2.0	INTRODUCTION	5
3.0	OBJECTIVES AND METHODS	8
	Scope.....	8
	Aims of the study	8
	Data Review.....	8
	GIS.....	9
	Constraints and Information Gaps	9
4.0	EVALUATION OF BIODIVERSITY WITHIN WIGAN.....	10
	Sites designated for Nature Conservation.....	10
	Priority Habitats.....	13
	Priority Species.....	16
5.0	IMPORTANT HABITATS SUMMARY	24
	Standing water	24
	Reedbeds	30
	Water Corridors	34
	Mosslands	40
	Grasslands.....	44
	Heath	52
	Woodland and Scrub.....	56
	Managed Greenspace and Gardens	62
	Agricultural (field systems).....	66
6.0	KEY LINKAGES IN WIGAN (AREAS OF OPPORTUNITY)	72
	Wetlands	72
	Other habitats	74
7.0	RECOMMENDATIONS FOR BIODIVERSITY OBJECTIVES AND POLICY TARGETS	78
	Management of Designated Sites and Priority Habitats.....	79
	Priority Habitats protected by SBI designation.....	79
	Habitat Creation	80
	Wigan's Biodiversity Action Plan	80
	Evidence Base	80
	Strategic Sites and Future Development	80
	Agricultural Land and Gardens.....	81
	Council-owned Land	81
	Partnership-working and public awareness	82
8.0	REFERENCES	83

LIST OF FIGURES

Figure 1: Map showing location of Wigan within the Greater Manchester area	5
Figure 2: Map of Wigan showing major conurbations, transport routes and the Greenheart	7
Figure 3: Comparisons of numbers of SBIs since 1984	11
Figure 4: Comparisons of areas of SBIs since 1984	11
Figure 5: Review of SBI designatory features	12
Figure 6: Review of features of interest within SBIs	12
Figure 7: Pattern of pond density across Wigan	17
Figure 8: Chart illustrating frequency of pond density per 1km grid square across Wigan ..	18
Figure 9: Chart illustrating frequency of great crested newt occupancy.....	18
Figure 10: Pattern of bat species richness across Wigan.....	19
Figure 11: Chart illustrating frequency of bat species richness per 1km grid square across Wigan.....	20
Figure 12: Pattern of key bird species richness across Wigan.....	21
Figure 13: Chart illustrating frequency of BOCC per 1km grid square across Wigan	22
Figure 14: Chart illustrating BOCC abundance relative to frequency occurrence	23
Figure 15: Wigan Flashes	25
Figure 16: Flashes at Low Hall Park Nature Reserve.....	26
Figure 17: Range of pond habitats found in Wigan.....	27
Figure 18: Distribution of lakes and ponds in Wigan	28
Figure 19: Reedbed forming characteristic fringes around Pennington Flash	31
Figure 20: Distribution of reedbeds in Wigan	33
Figure 21: Leeds-Liverpool Canal with naturalistic bankside habitat corridors	35
Figure 22: Brook flowing through Borsdane Wood.....	36
Figure 23: Distribution of water corridor in Wigan.....	38
Figure 24: Leeds-Liverpool Canal, near Plank Lane showing significant modification	39
Figure 25: Astley Moss	41
Figure 26: Distribution of mosslands in Wigan	42
Figure 27: Acid grassland showing typical mat grass dominated sward.....	46

Figure 28: Meadow grasslands at Haigh	47
Figure 29: example of grasslands forming on previously developed land (former coal spoil)	48
Figure 30: Important grassland areas in Wigan	50
Figure 31: Heath habitat at Forshaw's Tip (Hindley)	53
Figure 32: Important heath areas in Wigan	54
Figure 33: Borsdane Wood	57
Figure 34: Dean Wood	57
Figure 35: Wet woodland at Low Hall Park.....	58
Figure 36: Distribution of woodland and scrub in Wigan	60
Figure 37: Urban managed greenspace fringing residential development	62
Figure 38: Urban managed greenspace - road verge.....	63
Figure 39: Composition of managed greenspace in search areas	64
Figure 40: Distribution of urban managed greenspace in Wigan.....	64
Figure 41: Typical agricultural landscape within Wigan.....	67
Figure 42: Distribution of agricultural land in Wigan	69
Figure 43: "Horseyculture" is an increasingly common agricultural land use	70
Figure 44: Wetland Connectivity (standing waters, water corridors and reedbeds).....	72
Figure 45: Terrestrial Connectivity (woodland/scrub, mossland, heath and grasslands)	74
Figure 46: Key areas of opportunity and locations of safeguarded sites	76

ANNEXES

Annex 1: Data Baseline

Annex 2: Designated Sites

Annex 3: Biodiversity Priority Habitat Action Plans

Annex 4: Priority Habitats in Wigan

Annex 5: Key Species

Annex 6: Strategic Sites

1.0 CONTEXT

- 1.1 Changes to the planning system have been introduced through the *Planning and Compulsory Purchase Act 2004* (and associated Statutory Instruments). This new legislation sets out the law governing production of development plan documents. The new planning system requires that local development documents are responsive and spatially based, contributing to creation of sustainable communities at national, regional and local levels. All Local Authorities are currently working towards replacing their former development plan systems with a new Local Development Framework.
- 1.2 The new system is supported by revised Government guidance, particularly the new Planning Policy Statement 12 (PPS12) *Local Spatial Planning* and the accompanying *Plan-Making Manual*. PPS12 sets out the objectives of this new spatial planning system. This has implications for biodiversity and the natural environment as the changes result in a more flexible system, providing Local Authorities with more options for the way in which they consider biodiversity within the various Development Plan Documents included within the LDF.
- 1.3 PPS12 states that spatial planning provides a means of safeguarding the area's environmental assets, both for their intrinsic value and for their contribution to social and economic well being by:
- protecting and enhancing designated sites, landscapes, habitats and protected species; and
 - creating a positive framework for environmental enhancement more generally.
- 1.4 It is widely recognised in national planning policy and guidance that biodiversity and the natural landscape are important both inherently and for their contribution to the health and the social and economic well being of individuals and communities. Despite this recognition, however, our valued biodiversity resources are becoming threatened by unsustainable consumption and rapid population growth. Expanding and intensifying agriculture, industry and urbanisation threaten to fragment, degrade and destroy our local natural environments. In addition, introduction of exotic species is having significant environmental and economic repercussions and pollution is altering biogeochemical and climate cycles.
- 1.5 The statutory environment agencies in England published *Environmental Quality in Spatial Planning: Incorporating the natural, built and historic landscapes, and rural issues into plans and strategies (2005)*. This guidance promotes an integrated approach to the consideration of biodiversity and the natural environment into all aspects of planning, through the recognition that:
- “Our quality of life, health and well being rely on clean land, water and air, productive soils, available minerals and water resources, natural coastal and fluvial systems and processes. They also depend on distinctive and inspirational landscapes, a wealth of wildlife, vibrant communities, a healthy, well managed countryside and open spaces accessible for everyone to enjoy.”*

- 1.6 Wigan Council supports this need for effective policy integration. This biodiversity audit has been commissioned to provide a robust evidence base in simultaneous support of the Core Strategy and Sustainability Appraisal for the emerging Local Development Plan. This approach was adopted to streamline the documentation produced and avoid duplication. It also aims to help ensure that sustainable development is embedded in the planning process and that sustainability appraisal is one of the main drivers that informs the preparation of the Local Development Framework.
- 1.7 To achieve comprehensive spatial planning, account must be taken of all other relevant plans, strategies, policies and programmes within the framework set by national and European legislation and national and regional planning policy. Of particular importance to the Biodiversity Study is Planning Policy Statement 9 *Biodiversity and Geological Conservation* (PPS9) and the Regional Spatial Strategy (RSS), which is part of the 'development plan' for the Borough. *The North West of England Plan Regional Spatial Strategy to 2021 (2008)* (RSS) is referred to for the purposes of this evidence base. Also of important consideration is the Climate Change Action Plan North West (2006).
- 1.8 Policy EM1 of the RSS states that *Plans, strategies, proposals and schemes should deliver an integrated approach to conserving and enhancing the landscape, natural environment, historic environment and woodlands of the region. Plans and strategies should define spatial objectives and priorities for conservation, restoration and enhancement as appropriate, and provide area-based guidelines to direct decisions and target resources. These will be founded on a sound understanding of the diversity, distinctiveness, significance and sensitivity of the region's environmental assets, and informed by sub-regional environmental frameworks.*
- 1.9 Policy EM1 continues at EM1(B) to state that *Plans, strategies, proposals and schemes should secure a 'step change' increase in the region's biodiversity resources by contributing to the delivery of national, regional and local biodiversity objectives and targets for maintaining extent, achieving condition, restoring and expanding habitats and species populations. This should be done through protecting, enhancing, expanding and linking areas for wildlife within and between the locations of highest biodiversity resources, including statutory and local wildlife sites, and encouraging the conservation and expansion of the ecological fabric elsewhere.*
- 1.10 Specifically, Policy EM1(B) outlines that *local authorities should develop functional ecological frameworks that will address habitat fragmentation and species isolation, identifying and targeting opportunities for habitat expansion and re-connection.*
- 1.11 This latter policy driver has resulted in the formulation of An Ecological Framework for Greater Manchester (Greater Manchester Ecology Unit 2008). This approach addresses the need identified in the RSS to adopt cross-boundary working in the interests of ecological coherence, whilst complying with Natural England guidance to formulate Ecological Frameworks at a sub-regional scale to facilitate the implementation of Biodiversity Action Plans.

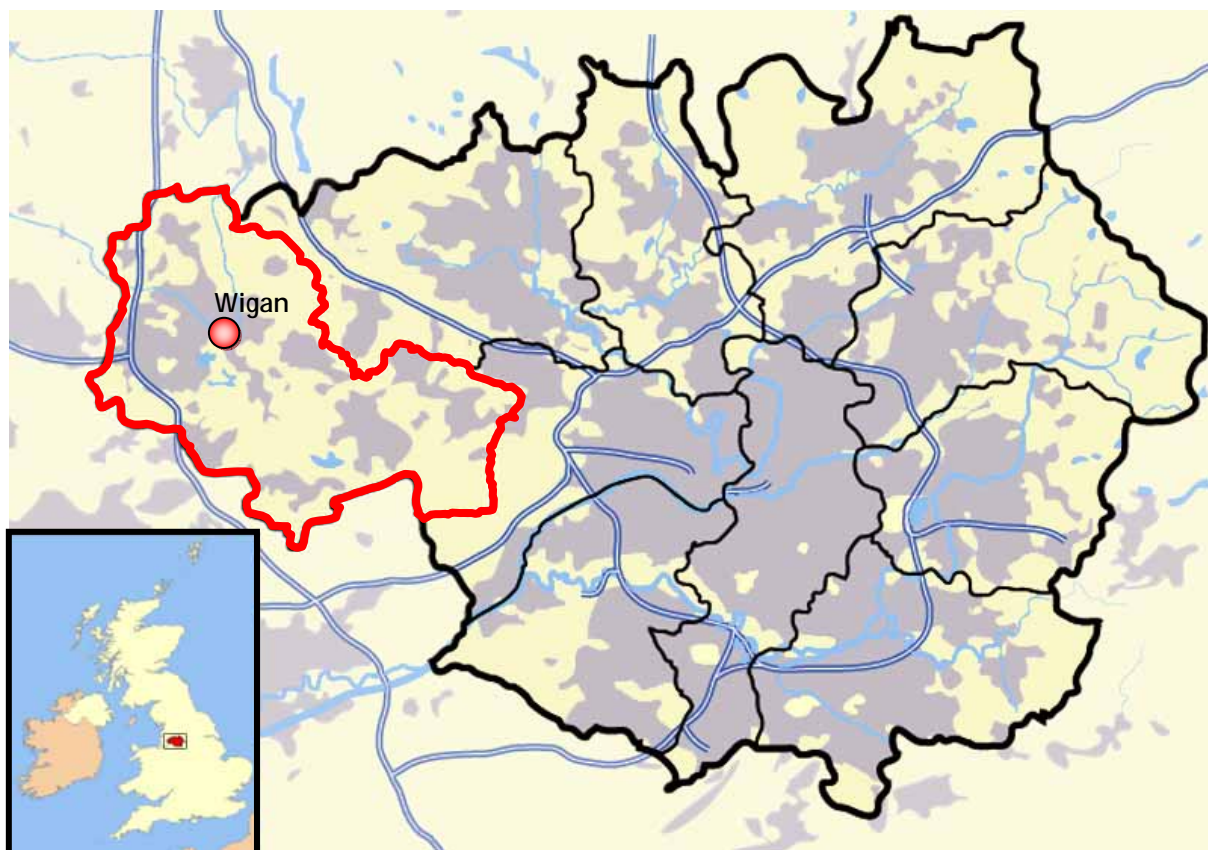
- 1.12 The framework acknowledges that the area is highly urbanised with a complex and fragmented landscape across its ten districts. The framework identified that the most likely future mechanisms to secure habitat creation, repair and connection included obligations placed on new development, changes to the management of existing greenspace (primarily publicly managed greenspace), land regeneration schemes and influencing behaviour and perception of the general populace (recognising the importance and opportunities presented for sensitive management of gardens). A key factor in the framework is that it is as inclusive as possible, incorporating areas of planned development and areas of dense population.
- 1.13 PPS9 states that local planning authorities should base policies on up-to-date information about the environmental character of their area. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics, local authorities should assess the potential to sustain and enhance those resources. This theme is reiterated in PPS12, which states "*The policies prepared by the local planning authority should be founded on a thorough understanding of the needs of their area and the opportunities and constraints which operate in that area*".
- 1.14 This report seeks to expand upon the contents of the Wigan LDF 'Wildlife Habitats and Species' topic paper, contributing further to the development of the Preferred Options for the Core Strategy for new developments and also for policies in respect of future protection and enhancement of Wigan's biodiversity resources. This report aims to identify those aspects of Wigan's biodiversity character that are critical to the identity of the Borough, which are the most important characteristics that require protection from development and where opportunities exist to invest in and enhance the landscape and biodiversity character. It also seeks to identify gaps in the available data resources and determine where future work could be targeted.
- 1.15 Regional PPS12 also requires the local planning authority to seek the involvement of relevant groups and organisations in the development of the evidence base. Consultation with local and special interest groups has been a key process in establishing the biodiversity evidence base. Meetings with Wigan Council and the Wigan Biodiversity Partnership have been undertaken during the compilation of this report, and an iterative process of consultation was completed.
- 1.16 Effective biodiversity conservation depends on accurate, up-to-date and accessible information. The goal of this audit is to analyse the state of Wigan's biodiversity, assess trends and provide a mechanism by which early warning of emerging threats can be identified. There is therefore a need to establish a baseline for the nature conservation resource so that the future threats, including effects of climate change, can be properly monitored.
- 1.17 Climate change is a threat to biodiversity, forcing biodiversity to adapt either through shifting habitat, changing life cycles, or the development of new physical traits, but at the same time, biodiversity can serve a role in adaptation to and mitigation for climate change. Additionally, the more functionally diverse an ecosystem is, the more readily it may be able to adapt to climate change and climate variability than impoverished systems, just as high genetic diversity within a species may increase its long-term persistence.

- 1.18 Responding to threats such as climate change introduces the requirement to better link important sites and areas for biodiversity and for more habitat creation to be carried out. This report provides a good evidence base for identifying these key linkage and habitat creation opportunities. The baseline audit will therefore have a key role in providing the baseline for monitoring the effects of climate change.
- 1.19 'Land and biodiversity' is one of the 11 benefits of green infrastructure identified by Natural Economy Northwest and agreed by partners in the region. Green Infrastructure (GI) describes the network of greenspaces, landscapes and natural elements that intersperse and connect our cities, towns and villages. More than this, it is a holistic approach to viewing the natural and historic environment which acknowledges the multiple benefits and vital functions it provides for the economy, wildlife, local people and communities alike.
- 1.20 Public and local authorities have a key part to play in conserving biodiversity through their role in developing and influencing local policies and strategies, in planning and development control and in managing their estates. They have a duty under the Natural Environment and Rural Communities Act (2006) to have regard to the conservation of biodiversity in exercising their functions. DEFRA has published guidance on the subject for local authorities and one for public authorities, which specifically includes reference to green infrastructure and the need to balance biodiversity conservation with other needs.
- 1.21 This audit will therefore also have an informative role to help identify and assess opportunities for contributing to and enhancing the Green Infrastructure of the Borough and Greater Manchester.

2.0 INTRODUCTION

- 2.1 Wigan is one of the ten metropolitan districts of Greater Manchester, forming the most north-westerly point of the region. The location of Wigan within the North West is illustrated at *Figure 1*, below.

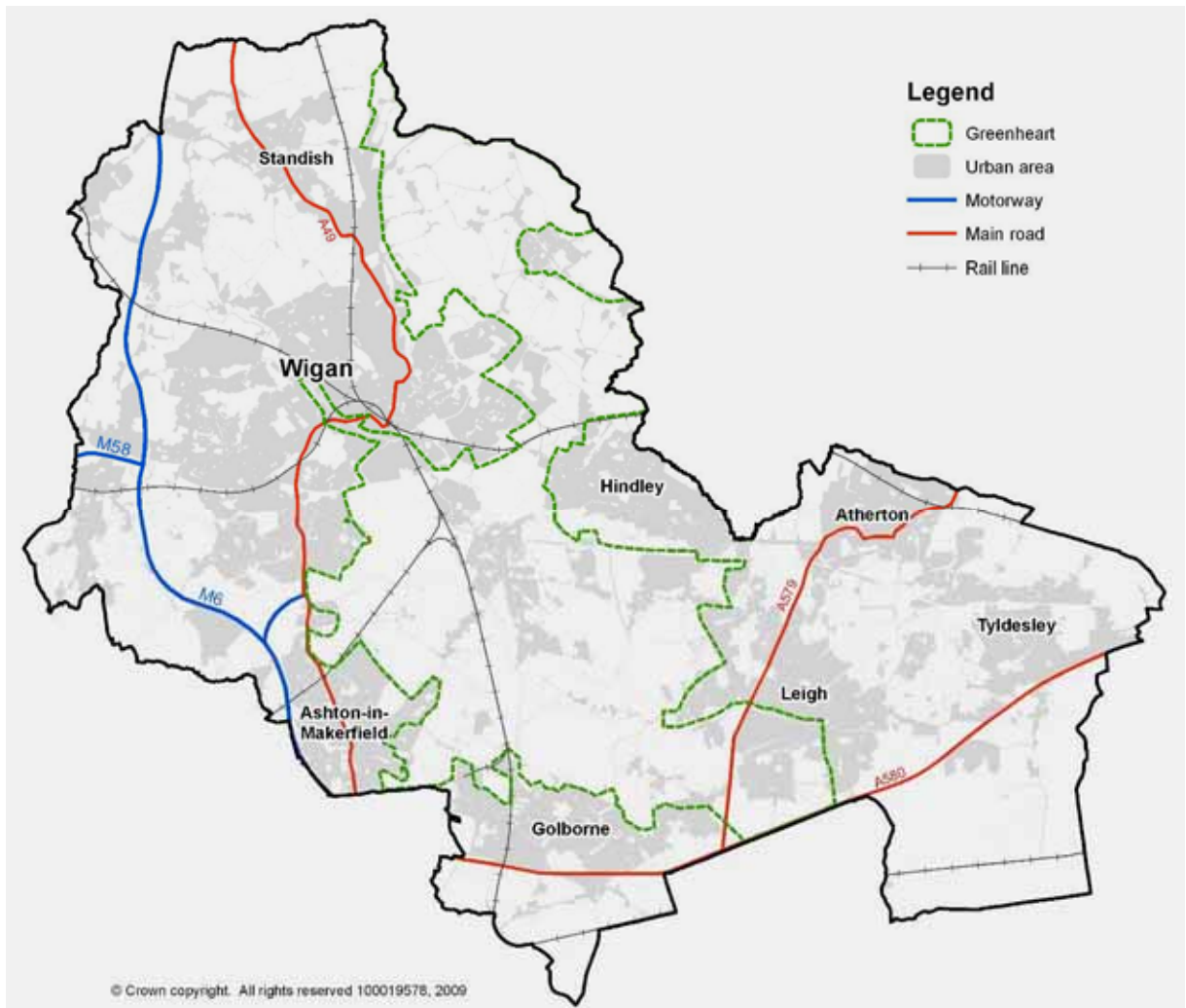
Figure 1: Map showing location of Wigan within the Greater Manchester area



- 2.2 The Borough of Wigan is entirely located within the Urban Mersey Basin Natural Area, at the northern extent of the Natural Area, adjacent to the Lancashire Plains and Valleys Natural Area. Natural Areas have been formally defined as *“biogeographic zones which reflect the geological foundation, the natural systems and processes and the wildlife in different parts of England, and provide a framework for setting objectives for nature conservation”* (Biodiversity: The UK Steering Group Report, HMSO, 1995). Natural Areas provide a consistent, ecologically coherent countrywide framework to focus national targets to a level that can be used locally, such as the breakdown of national targets or priorities, such as those set out in the Biodiversity Action Plan and the Habitats Directive, to a more local Natural Area level.
- 2.3 Wigan’s biodiversity has been heavily influenced by the long history of industrial development within the borough. The presence of many of the habitats of ecological importance in Wigan is a consequence of its coalmining and other past industries. Being the largest of the ten Greater Manchester boroughs Wigan has large proportions of habitats considered important at the sub-regional level.

- 2.4 Wigan's natural environment is rich in wildlife and full of potential for countryside recreation. This is recognised by much of the borough being identified as one of a number of Regional Parks within the North West region. The borough contains four Sites of Special Scientific Interest and 89 Sites of Biological Importance. Specific areas of focus for the borough relate to biodiversity, protection and enhancement of priority habitats and species and management of non-native invasive species.
- 2.5 Ecologically valuable habitats known to occur within Wigan Borough include:
- ponds and lodges;
 - running water;
 - reedbed;
 - mosslands (including bog, swamp and fen);
 - woodland and scrub;
 - ecologically rich grassland; and
 - heath.
- 2.6 Information on the presence and extent of these, and other habitats, is however quite dated as the most recent Phase 1 Habitat Survey was completed in 1990.
- 2.7 Priority species have been regularly recorded in the borough (through studies accompanying planning applications, research projects and voluntary surveys). Key species noted in the Greater Manchester BAP as occurring within Wigan include, but will not be exclusive to:
- amphibians, including great crested newt;
 - water vole;
 - bats, including common and soprano pipistrelle bats, Daubenton's bat, whiskered bat, Natterer's bat, noctule bat and brown long-eared bat; and
 - a wide range of bird species, including bittern and willow tit.
- 2.8 Wigan is rightly recognised as an enterprising and rapidly-regenerating borough. Its good strategic location and affordability means it is likely to remain as a focus for inward investment. However the pressures for development and regeneration can have negative impacts through loss of habitat mosaics on brownfield sites and general fragmentation of open land. Increased recreational pressure is an outcome of improving quality of life, but this can negatively impact on wildlife.
- 2.9 The Greenheart Regional Park (*Figure 2*) is another area of rapid landscape transformation which is requiring ongoing investment. There are opportunities here to maximise biodiversity, but choices sometimes have to be made between the promotion of widely differing options, such as open habitats or wooded habitats. There is not always clear guidance to help decision-makers and designers plan for the optimum habitat types during large-scale restoration of sites, such as Bickershaw and Hindley Green, which occur in the Greenheart.
- 2.10 On a smaller scale, the probable pace of development offers numerous opportunities to guide developers as to the most appropriate biodiversity habitats and features to design into their developments - in some cases, woodland planting is optimal, while elsewhere wetland habitats would be critical to connectivity. Site specific biodiversity studies can provide tailored guidance to assist developers.

Figure 2: Map of Wigan showing major conurbations, transport routes and the Greenheart



3.0 OBJECTIVES AND METHODS

Scope

- 3.1 This report presents the results of a comprehensive review of the data regarding habitats present within Wigan's administrative boundaries. The review has been based upon information historically and currently available from third parties and supplemented by a limited degree of field survey.
- 3.2 Habitat types are assessed and described in terms of their importance nationally and regionally and also in terms of their local status. The distribution and extent of priority habitats is assessed, identifying areas where significant changes may have occurred, likely development pressures and opportunities for enhancement.

Aims of the study

- 3.3 The main aims of this report are to:
- identify the UK biodiversity priority habitats present within the borough;
 - identify additional habitats considered important at a regional level present within the borough;
 - help in the identification of sites that have the potential to support protected species and biodiversity priority species.
- 3.4 The study is also intended to :
- identify areas where development pressures are likely to threaten the ecology of the borough;
 - contribute to the identification of areas of habitat that have the potential for enhancement, including key linkages between these habitats;
 - provide ecological information to support the evolving concept of Greenheart, Wigan's Regional Park proposal; and
 - to consider the vulnerability of habitats and any key threats such as climate change, threats from 'pest' species and the habitats ability to adapt to these threats.

Data Review

- 3.5 The data made available for this audit and assessment are listed at *Appendix 1* in *Table 1.1*. The data review included:
- Previous Phase 1 habitat survey maps and target notes (1986);
 - Aerial photographs;
 - Land use GIS layers (including Mastermap, GLUD and Woodland Inventories);
 - Register of Sites of Biological Importance (SBI) for Wigan;
 - Citations of statutorily protected sites including Special Areas for Conservation (SAC) and Sites of Special Scientific Interest (SSSI);
 - UK Biodiversity Action Plan, including emerging new habitat descriptions;

- Greater Manchester Biodiversity Action Plan, including emerging new habitat plans;
- Wigan Biodiversity Strategy and Action Plans;
- Wigan Nature Conservation Strategy (1994)
- North West Biodiversity Audit
- Existing records for certain target species groups;
- Other records and observations provided by the Council's environmental team, local recorders and TEP's surveys.

GIS

- 3.6 Phase 1 survey data was not available in digitised format, but only in hard copy of the original 1km hand drawn tiles. A total of 252 1km² tiles were provided, of which 237 covered the current Wigan Borough boundary area. These tiles were scanned and georeferenced using ArcMap version 9.2, allowing a preliminary comparison of the historic Phase 1 data against georeferenced aerial photographs, Ordnance Survey mapping layers and other available datasets representing more current land use and character.
- 3.7 GIS land use layers were compiled using a range of data sources and aerial photograph interpretation, supplemented with limited field survey results, to provide up to date layers for target habitat types and land use including:
- Urban managed greenspace and private gardens;
 - Woodlands and scrub;
 - Standing and running water;
 - Mosslands;
 - Reedbed;
 - Heathland;
 - Grasslands and open habitat mosaics;
 - Search area boundaries including Wigan Borough, Greenheart Regional Park, Designated Sites, Safeguarded Land;
- 3.8 Species data acquired from consultees was converted from Excel spreadsheet with national grid reference data to coordinate data and imported into ArcMap allowing the data to be mapped as individual GIS layers.
- 3.9 GIS data layers were then incorporated into a single database allowing overlaying and querying.
- 3.10 GIS data is not updated as part of this study, but the database compiled is designed to accommodate future additions of data as it is acquired by the Council.

Constraints and Information Gaps

- 3.11 Limitations of the available data and mapping, in terms of their age and present accuracy, were noted during the review of information available. Constraints and information gaps are discussed in *Appendix 1*.

4.0 EVALUATION OF BIODIVERSITY WITHIN WIGAN

Sites designated for Nature Conservation

- 4.1 Wigan does not currently contain any Ramsar sites or Special Protection Areas (SPA). However, at the time of compiling this report, Lancashire Wildlife Trust has approached Natural England to look at designation of Wigan Flashes as an SPA, as the site meets the qualifying criteria.
- 4.2 Wigan possesses one Special Area for Conservation (SAC) in the southeast - Manchester Mosses, designated for its surviving (albeit degraded) raised bog.
- 4.3 The first Site of Special Scientific Interest (SSSI) to be designated in Wigan was Highfield Moss in 1987. By 1994 there were four SSSIs, with Bryn Marsh & Ince Moss, Abram Flashes and Astley & Bedford Mosses added to the list. No new SSSIs have been designated in Wigan since this time. Astley & Bedford Mosses forms part of the Manchester Mosses SAC.
- 4.4 Wigan also now contains four Local Nature Reserves (LNR). Borsdane Wood was the first to be designated, with The Wigan Flashes and Orrell Water Park following. Low Hall Park is the latest LNR, designated in 2008.
- 4.5 There are currently 89 Sites of Biological Interest (SBI) within Wigan, totalling 1,538.8ha. There are 31 sites of regional or county importance (Grade A - total 1,028.7ha, ranging from 1.5ha to 33.2ha). There are 34 sites of district importance (Grade B sites - total 386.3ha, ranging from 0.7ha to 11.4ha). The remaining 24 sites are of local importance (Grade C sites - total 123.8ha, ranging from 0.6ha to 5.2ha).
- 4.6 *Figure 3* summarises the changes in the Borough's SBIs since the first Nature Conservation Strategy was published in 1984. The number of SBIs currently is the same as the number present in the Borough in 1993. However, 9 new SBIs have been designated during a review in 2000, but a number of SBIs were also removed from the register, some due to consolidation into one site as occurred at Bickershaw.
- 4.7 On a purely numerical basis the SBI designation appears to have been stable for the past 20 or so years, as illustrated in *Figure 3*, but this does not accurately reflect the increasing quality of the biodiversity of the Borough. This is more accurately revealed in the changes in the composition of different grades and the changes in area coverage of the different grades of site. There are substantially more Grade B sites and less Grade C sites now, and the areas of Grade A and B sites have significantly increased since 1984, while Grade C coverage has declined slightly. These changes, illustrated in *Figure 3* and *Figure 4* indicates that the quality of some sites has improved since 1984.
- 4.8 Additionally, until this study, there has not been an updated comprehensive ecological audit of the Borough. With this new baseline, an assessment of new sites meriting designation as SBI can now be made.

Figure 3: Comparisons of numbers of SBIs since 1984

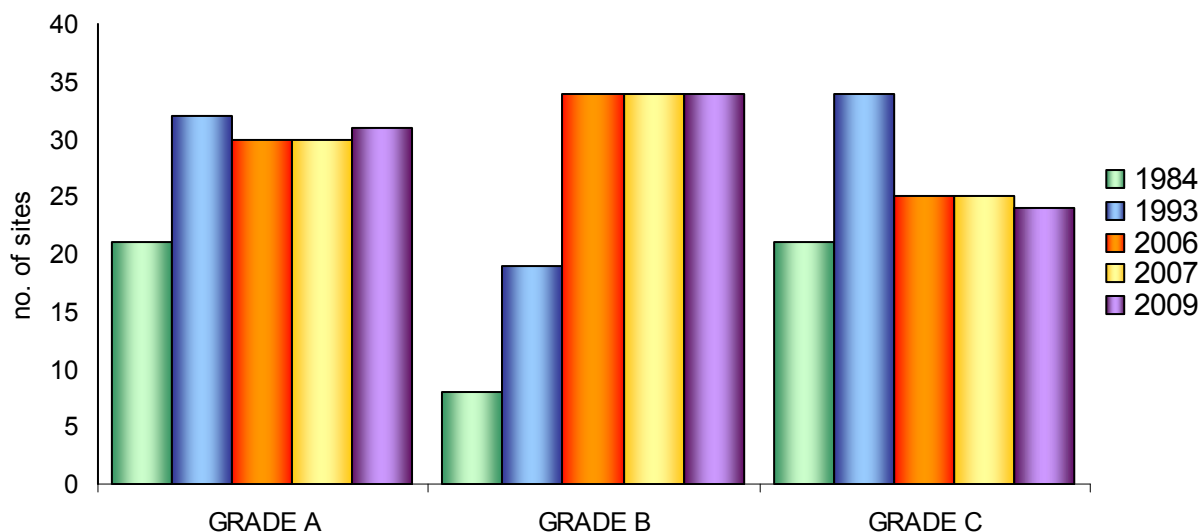
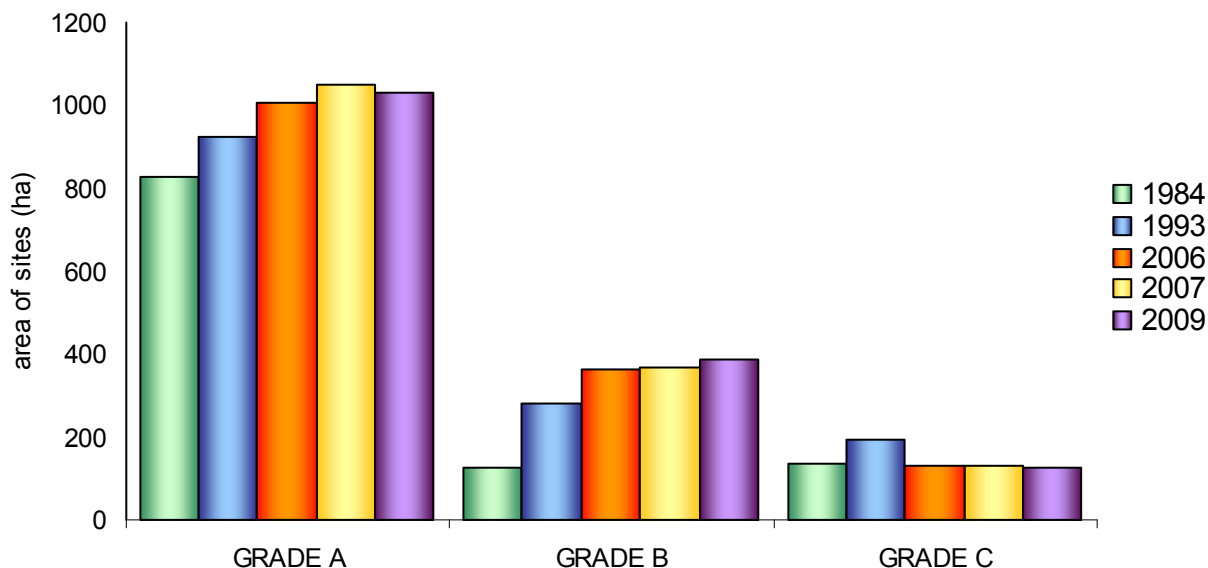
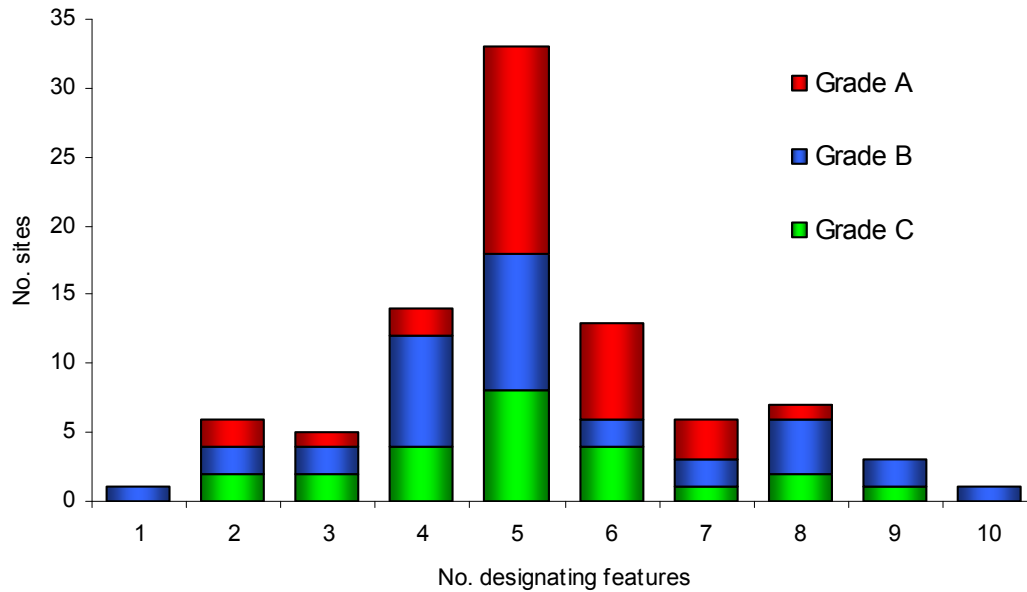


Figure 4: Comparisons of areas of SBIs since 1984



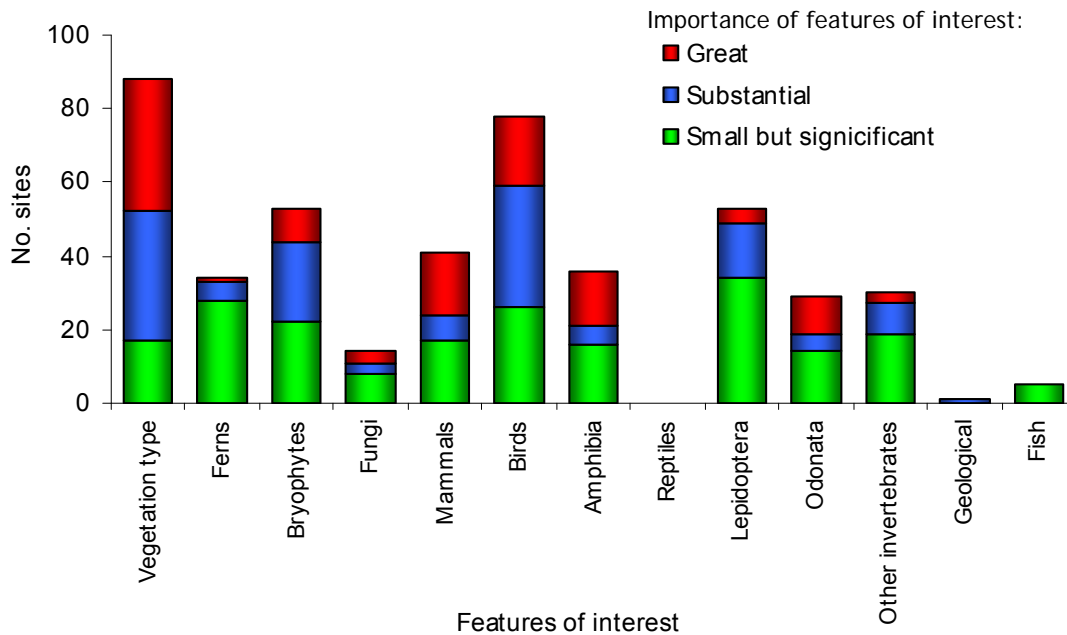
- 4.9 *Appendix 2* summarises, at *Tables 2.1 and 2.2*, the location, size and features of biodiversity interest of all the sites within Wigan that are currently designated specifically for nature conservation. Citations and a location plan of all the designated sites in Wigan can also be found at *Appendix 2*.
- 4.10 *Figure 5* presents a comparison of the SBIs in Wigan according to their biodiversity complexity, as represented by the number of features of interest listed in each SBI citation (such as vegetation groups or faunal groups). This provides a basic appraisal of the range of biodiversity interest supported within each site. It does not, however, purport to represent the ecological value of the site in question nor does it rank the sites by their biological importance; a site designated for two or three features, for example, is not necessarily any less important to the Borough than a site designated for ten or more features of interest. The review of the number of designated features within each SBI simply reflects the biological variety across the sites. Importance and quality of the SBI is represented by the grading of the SBI.

Figure 5: Review of SBI designatory features



4.11 Figure 6 presents a review of the SBIs in Wigan according the different types of features of interest for which each site is noted and the relative importance of each of the features as recorded in the SBI citations.

Figure 6: Review of features of interest within SBIs



4.12 Later sections in this report discuss key habitats and species groups in Wigan in more detail. However, the preliminary review of the SBI list, summarised in the figures above, provides an initial insight into the biodiversity interest in Wigan. For example, 88 of the 89 sites are designated at least in part for their vegetation types and 36 of the SBIs with vegetation type identified as a feature of interest (40%) scored maximum importance for the vegetation feature(s) in question.

- 4.13 Aquatic habitats feature highly in the citations, with 72% of sites containing lakes or ponds, 58% containing rivers, streams or ditches, 54% containing mossland habitats and 51% containing reedbed.
- 4.14 When reviewing the areas of habitats types within the SBIs, woodland features strongly, comprising 29% of the total SBI area within Wigan. Grasslands and grassland mosaics comprise 18% of the SBI resource with ponds and lakes making up 15% of the SBIs. All other habitat types individually comprise less than 10% of the total SBI area in Wigan.
- 4.15 A review of the species assemblages for which SBIs are designated shows that 78 SBIs in Wigan (88%) are designated in part for their bird assemblages and 53 for their Lepidoptera assemblages (60%). Mammals feature highly in 41 sites (46%), with bats, red squirrel or water vole having special note in most of these citations. Amphibians are listed as a feature of importance at 36 sites (40%), primarily where great crested newts occur. Odonata and other invertebrates are each cited at approximately one third of the SBIs. No current SBI citations for Wigan have reptile species occurring on their species lists, nor do any possess reptiles as a designatory feature. However, since the compilation of the SBI citations, common lizard has been recorded at Astley Moss which would represent 1% of the sites.

Priority Habitats

- 4.16 The broad groupings of habitats found in Wigan (water, reedbed, woodland, grassland etc) are listed at *Table 1*, below. There are UK, GM or Wigan action plans for priority habitats. The relationship between the Wigan broad habitat types and those of UK and GM priority is shown in this table. A full list of UK priority habitat action plans with descriptions is available online:

<http://www.ukbap.org.uk/library/UKBAPPriorityHabitatDescriptionsfinalAllhabitats20081022.pdf>.

- 4.17 The action plans for UK and regional priority habitats occurring within Wigan are presented at *Appendix 3*.
- 4.18 Wigan has two local priority habitats: reedbeds and mosslands, action plans for which are also presented at *Appendix 3*. When considering the status of Wigan's primary habitats in following sections, habitat descriptions and definitions refer to those in local, regional or national action plans.

Table 1: Summary of primary habitat types within Wigan and corresponding national and regional biodiversity priority classifications

Habitat Type	GM Priority Habitat ¹ (occurring in Wigan)	UK Priority Habitat (occurring in Wigan)
Standing water (includes pools, ponds, lodges, meres, flashes, lakes and reservoirs)	Ponds and lodges	Eutrophic Standing Waters
		Ponds
Reedbeds	Reedbeds	Reedbeds
Water corridor (includes rivers, streams, ditches and canals)	No transferable regional plan	Rivers
	Canals	Included within Broad Habitat "Standing Open Waters"
Mossland	Lowland Mossland (lowland raised bog & associated habitats)	Lowland Raised Bog
	No transferable regional plan	Lowland Fens
Woodland and scrub ²	Native Woodland (includes lowland broadleaved woodland, wet woodland, upland woodlands)	Lowland Mixed Deciduous Woodland
		Wet Woodland
		Upland Oak Woodland ³
	No transferable regional plan	Traditional Orchards
No transferable regional plan	Wood-Pasture and Parkland	
Grassland	Grasslands (including species rich neutral grassland, species rich acid grassland, marshy grassland, important grasslands on previously developed land)	Lowland Calcareous Grassland
		Lowland Dry Acid Grassland
		Open Mosaic Habitats on Previously Developed Land
	No transferable regional plan	Lowland Meadows
No transferable regional plan	Purple Moor Grass and Rush Pastures	
Heath	No transferable regional plan	Lowland Heathland
Managed greenspace and gardens	Urban Managed Greenspace	Included within Broad Habitat "Urban"
Agricultural (field systems)	Hedgerows	Hedgerows
	No transferable regional plan	Arable Field Margins

¹ Based on the revised list of GM habitat plans 2008 provided by GMEU

² Woodland / continuous scrub is included where the habitat area is at least 15m in width.

³ Technically no upland habitat types occur in Wigan, according to definitions provided by Natural England. Upland habitats are generally defined as 300m above sea level and no part of Wigan rises above this level. Additionally, the Natural Area profile states that all habitats within the Urban Mersey Basin should be characterised as lowland habitats. All of Wigan Borough lies within the Urban Mersey Basin. However, NVC data provided for Borsdane Wood indicates a very small proportion of habitat data makes a best fit with W11 type - Upland Oak Woodland and accordingly this habitat type has been included.

4.19 *Table 2* summarises the distributions of primary habitat types within Wigan, across the entire Borough, within the Greenheart, within sites designated for nature conservation and also within land areas owned by Wigan MBC. Habitats may not be mutually exclusive, although attempts to minimise overlaps have been made.

Table 2: Summary of habitat extent across Wigan

Habitat Type	Area of Habitat Type in Wigan	Area of Habitat Type in Greenheart	Area of Habitat Type in designated sites	Area of Habitat Type within Wigan MBC Land Ownership
Standing water (ponds and lakes)	309 ha (2 % Wigan)	251 ha (81% habitat type)	227 ha (73% habitat type)	188 ha (61% habitat type)
Reedbeds	57 ha ⁴ (<1% Wigan)	55 ha (97% habitat type)	53 ha (94% habitat type)	43 ha (77% habitat type)
Water corridors	108 ha (1% Wigan)	47 ha (43% habitat type)	27 ha (25% habitat)	13 ha (12% habitat type)
Mosslands	158 ha ⁵ (1% Wigan)	6 ha (4% habitat type)	149 ha (93% habitat type)	19 ha (12% habitat type)
Woodland and scrub	1797 ha (10 % Wigan)	709 ha (39% habitat type)	696 ha (39% habitat type)	696 ha (39% habitat type)
Grasslands	365 ha (2% Wigan)	247 ha (68% habitat type)	216 ha (59% habitat type)	123 ha (34% habitat type)
Heath	7 ha ⁶ (<0.1% Wigan)	4 ha (63% habitat type)	3 ha (41% habitat type)	5 ha (65% habitat type)
Managed greenspace and gardens	3,860 ha (21% Wigan)	656 ha (17% habitat type)	58 ha (2% habitat type)	879 ha (23% habitat type)
Agricultural (field systems)	7142 ha ⁷ (38% Wigan)	2377 ha (43% habitat type)	279 ha (18% habitat type)	230 ha (8% habitat type)

4.20 Habitat areas quoted in *Table 2* are calculated using GIS by a location search of a particular habitat type and applying a clipping process selected according to a search boundary, such as the designated sites, Borough or Greenheart boundaries. This measure of search was considered more accurate than selecting by centroid of the habitat feature or applying a buffer around a boundary, as most polygons are irregularly shaped or linear and several overlap boundaries of search, so could skew the search and discount or include irrelevant habitat features.

⁴ Areas of reedbed include some stands located within lake habitats, creating overlap with standing water habitats

⁵ Total area of mossland includes approximately 70ha located in habitat mosaics

⁶ Total area of heath include nearly 4ha located in grassland/heath habitat mosaics

⁷ Areas of agricultural land include arable, pasture, mixed use and unknown use

- 4.21 Later sections in this report discuss and illustrate the distribution of the primary habitats within Wigan. *Appendix 4* presents additional maps of each of the primary habitats highlighted according to their status as biodiversity priority habitats.

Priority Species

- 4.22 The remit of the biodiversity audit included, as far as the information available would allow, an assessment of target species group diversity. Species investigated focused on three main groups identified as good indicators of the general biodiversity across the region. These three groups are amphibians (notably the great crested newt), bats and birds.
- 4.23 Data for great crested newts (*Triturus vulgaris*) (and other amphibians) were obtained from Wigan MBC, Greater Manchester Ecology Unit and the National Biodiversity Network Gateway (data from 1980 to the present). Data for bat species were obtained from the South Lancashire Bat Group. Data for bird species was obtained from the Greater Manchester Bird Recording Group, although was restricted to only those species listed on Schedule 1 of the Wildlife and Countryside Act (as amended), the JNCC Red List and/or as a UK or GMEU biodiversity priority species.
- 4.24 Additional biodiversity interest within Wigan, such as invertebrate assemblages, that are unlikely to include listed priority species, are discussed during review of the SBI citations and in individual habitat appraisals later in this report.
- 4.25 A summary of national biodiversity priority species and/or protected species previously recorded⁸ within Wigan which are discussed in this review is presented in *Appendix 5*. A summary of the conservation status is also provided in this Appendix, together with the primary habitat types in Wigan with which each species is primarily associated, according to the categories in *Tables 1 and 2*, above.

Amphibians

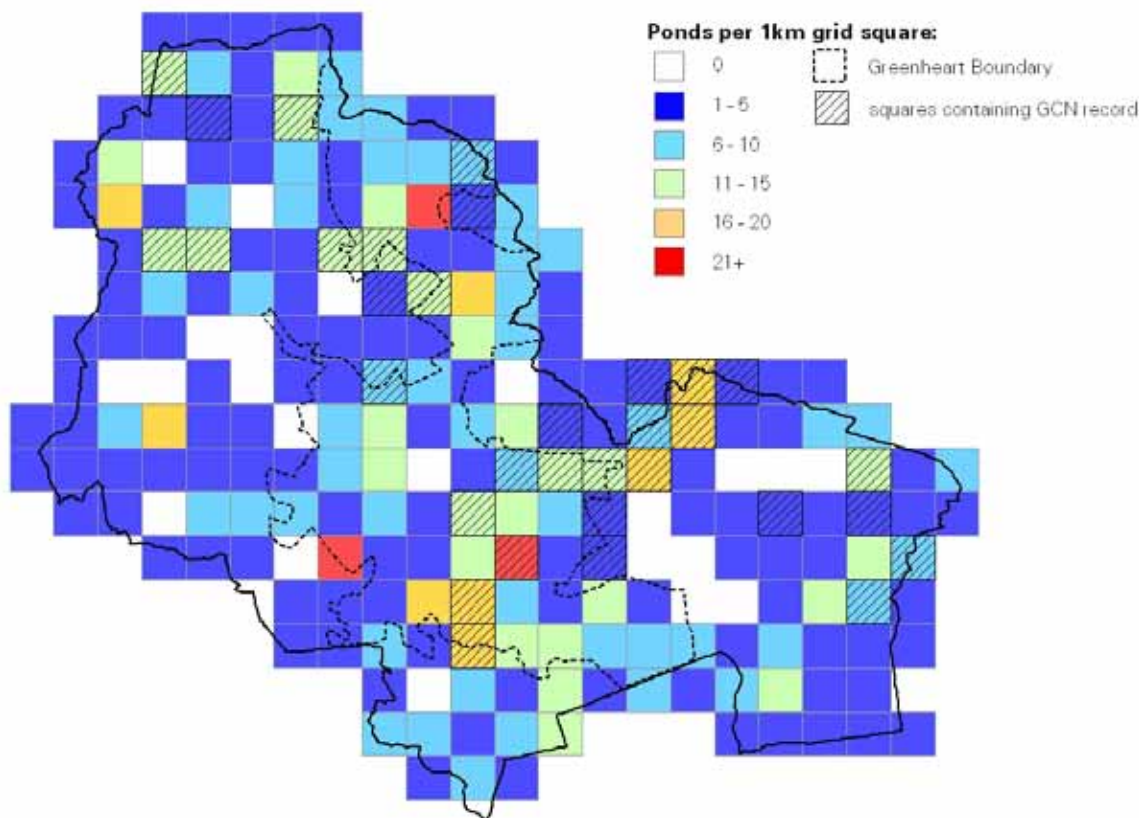
- 4.26 Species data for amphibians, and particularly great crested newts, was collated from Greater Manchester Ecology Unit and the National Biodiversity Database. The latter revealed only records dating prior to 1990 for Wigan, which were considered too unreliable for use in this study.



⁸ Species previously recorded in: *Biodiversity Audit for the North West of England*; in *Greater Manchester BAP Wigan Borough text*; species list downloads from *National Biodiversity Network Gateway*; and/or species records provided by consultees listed in *Table 1*.

- 4.27 A total of 171 great crested newt records were received from GMEU, of which only 88 were dated post 1990 which is insufficient to make a comprehensive analysis of the distribution and dynamics of the amphibian assemblages in Wigan. Data for great crested newts is often development-led, with development applications that have potential to affect ponds requiring survey data to support the application. With a small data sample, it is possible that the distribution of data points is biased to areas with development interest. Pond density has therefore been used as an indicator of potential amphibian diversity.
- 4.28 Wigan has a high pond density, with an average of 6 ponds per km² and hotspots of up to 21 ponds per km². Pond density within the spread of designated sites is highest, with an average pond density of 18 ponds per km². *Figure 7* illustrates the pattern of pond density across Wigan. The pond density grid is overlaid with those grid squares possessing records for great crested newts (GMEU data, post 1990), although as stated above, this data does not represent reliable distribution of the species.

Figure 7: Pattern of pond density across Wigan

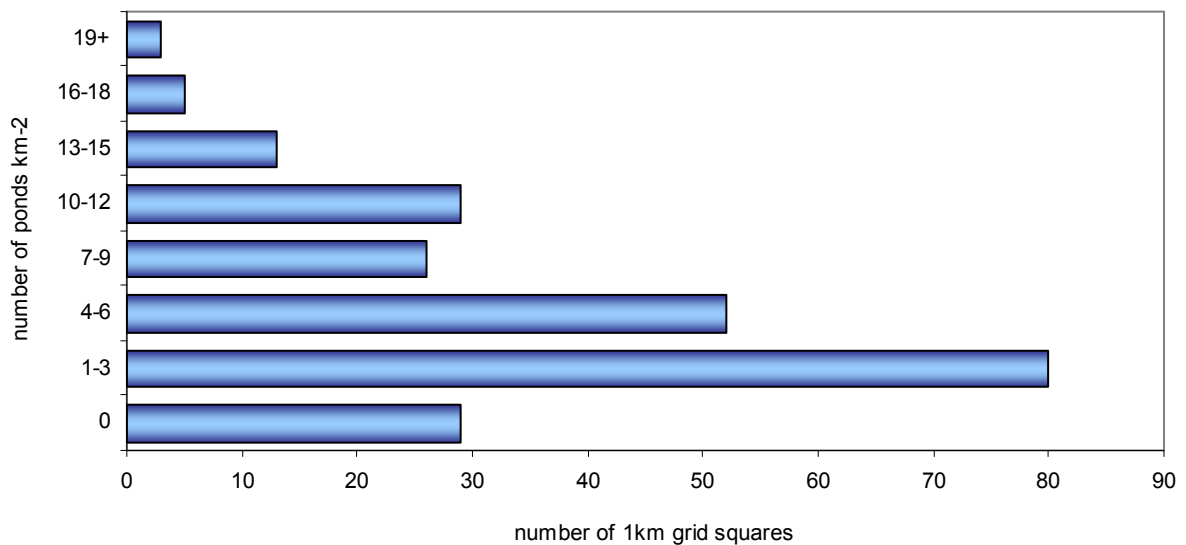


- 4.29 A strong corridor of high pond density (6 or more ponds per km²) exists from Golborne north-eastwards to Atherton. There is also a pattern of high pond density crossing north-westwards from Hindley through Haigh to Standish. Other areas of high pond densities, although in areas less well connected with other dense pond landscapes, occur at Winstanley, Ashton, Bedford and Astley Green.
- 4.30 There are approximately 237 1km grid squares covering the extent of Wigan, although some are only partially within the borough boundaries. *Table 3* and *Figure 8* assess the pond density across Wigan.

Table 3: Pond density recorded across Wigan

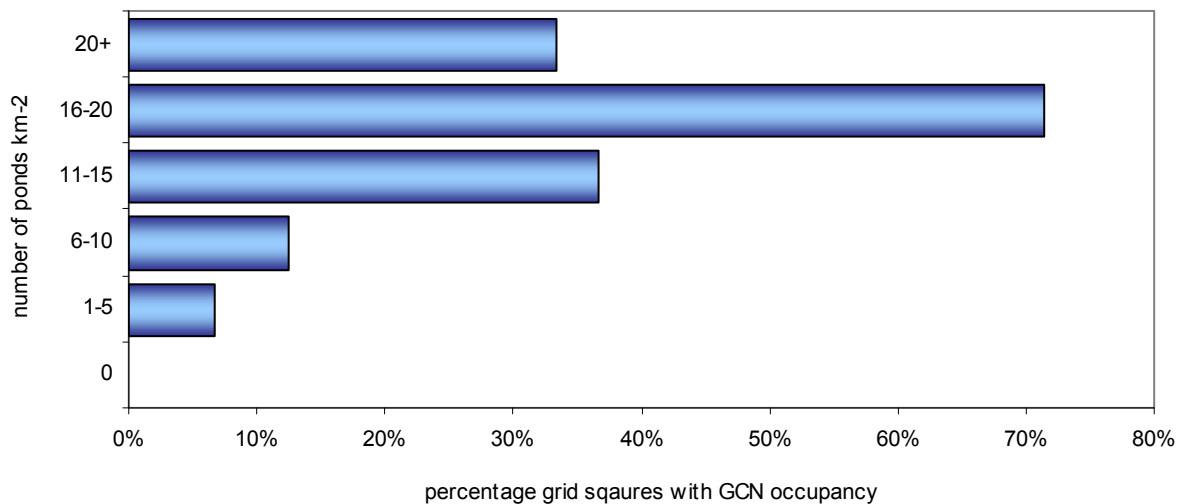
No. ponds per km ²	No. grid squares covering Wigan with pond count	Proportion of Wigan with pond count	No. (and proportion) of grid squares possessing GCN
0	30	12.7%	0 (0%)
1-5	119	50.2%	10 (8%)
6-10	48	20.3%	6 (13%)
11-15	30	12.7%	11 (37%)
16-20	7	3.0%	5 (71%)
20+	3	1.3%	1 (33.3%)

Figure 8: Chart illustrating frequency of pond density per 1km grid square across Wigan



4.31 Although potentially biased or incomplete, a brief review of the relationship between the presence of great crested newts records and pond density shows that approximately one third of all grid squares with a pond count of 11 or more pond have occupation by great crested newts. The percentage of occupancy in grid squares is summarised in *Table 1* illustrated in *Figure 9*, below.

Figure 9: Chart illustrating frequency of great crested newt occupancy



Bats

4.32 Bat records supplied by the South Lancashire Bat Group were analysed according to species richness across Wigan. As with the records for great crested newts, caution must be applied to the records, as they will not represent an absolute distribution or species occurrence. An absence of records is unlikely to represent an actual absence of bat species. Records provided by the bat group are less likely to be biased towards development-led data collection, but may have a slight bias towards location of recorder or specific sites known to be of value for bats in Wigan. The pattern of species richness for bats in Wigan is illustrated in *Figure 10*.

4.33 Hotspots for bats occur at Pennington Flash, Wigan Flashes, Haigh and Red Rock. A maximum species diversity of six bats per grid square was plotted, although a total of 10 bat species were recorded overall:

- common pipistrelle *Pipistrellus pipistrellus*
- soprano pipistrelle *P.pygmaeus*
- Daubenton's bat *Myotis daubentonii*
- Natterer's bat *M.nattereri*
- whiskered bat *M.mystacinus*
- Brandt's *M.brandtii*
- brown long-eared bat *Plecotus auritus*
- noctule *Nyctalus noctula*
- Leisler's bat *N.leisleri*
- serotine *Eptesicus serotinus*

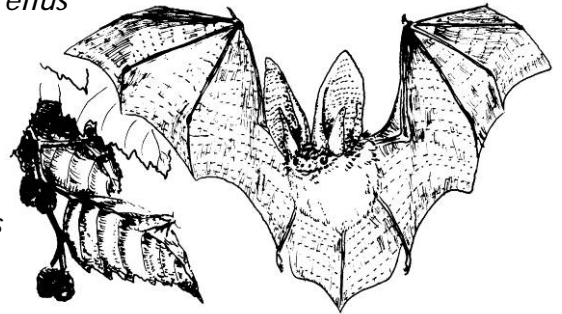
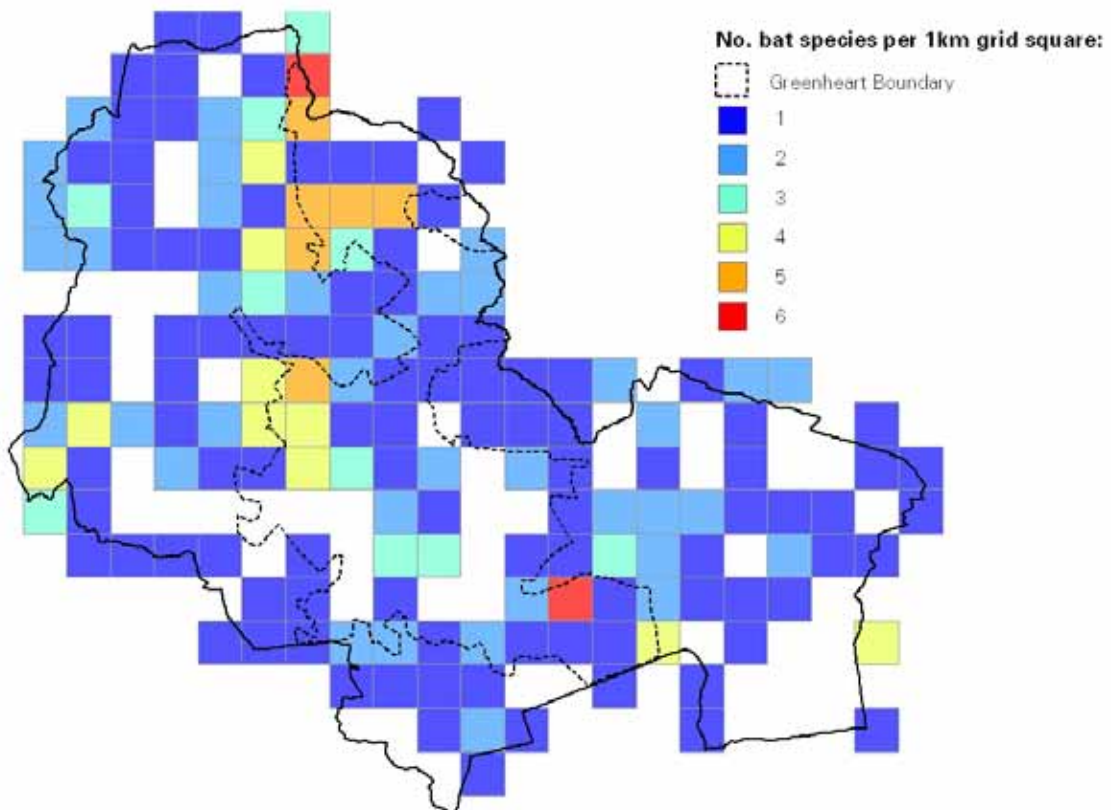
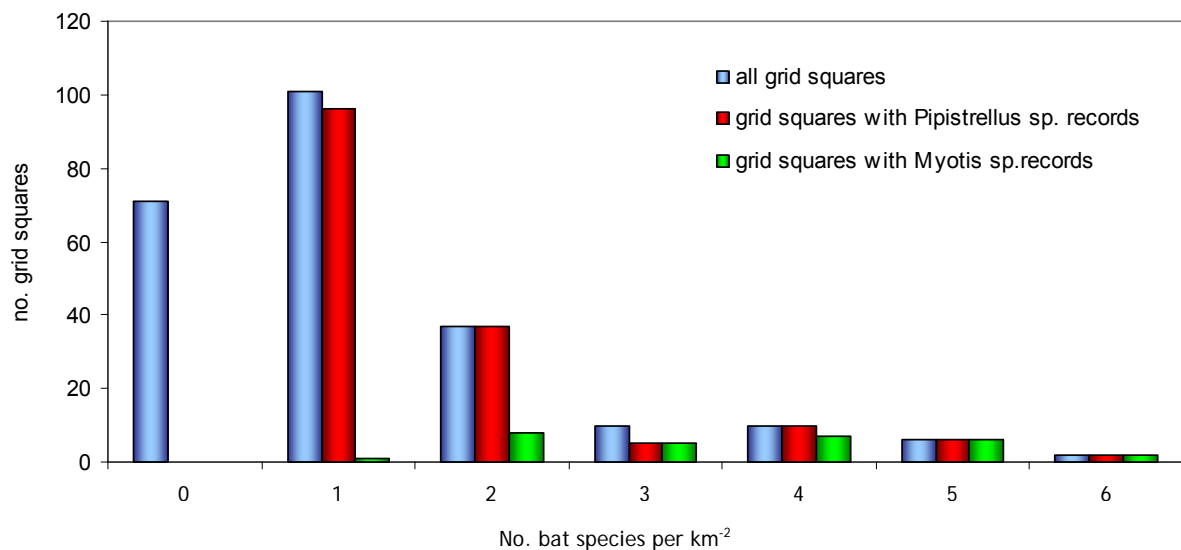


Figure 10: Pattern of bat species richness across Wigan



- 4.34 A total of 237 grid squares covering Wigan were analysed for their bat records and a total of 166 squares (70%) possessed a record for a bat of any species. Most grid squares with bat records contained only one species (43%). Grid squares with 2 bat species accounted for 16%, with only 1% of squares possessing the maximum 6 species per grid square. No grid square was recorded with all species known to occur in Wigan.
- 4.35 *Figure 11* illustrates the relative frequency of the two most common bat groups, *Pipistrellus* and *Myotis*, beside the species richness for all grid squares across Wigan. *Pipistrellus* species were by far the most abundant, with 97% of squares holding bat records possessing *Pipistrellus* records. *Myotis* species occurred in 17% of squares holding bat records.

Figure 11: Chart illustrating frequency of bat species richness per 1km grid square across Wigan



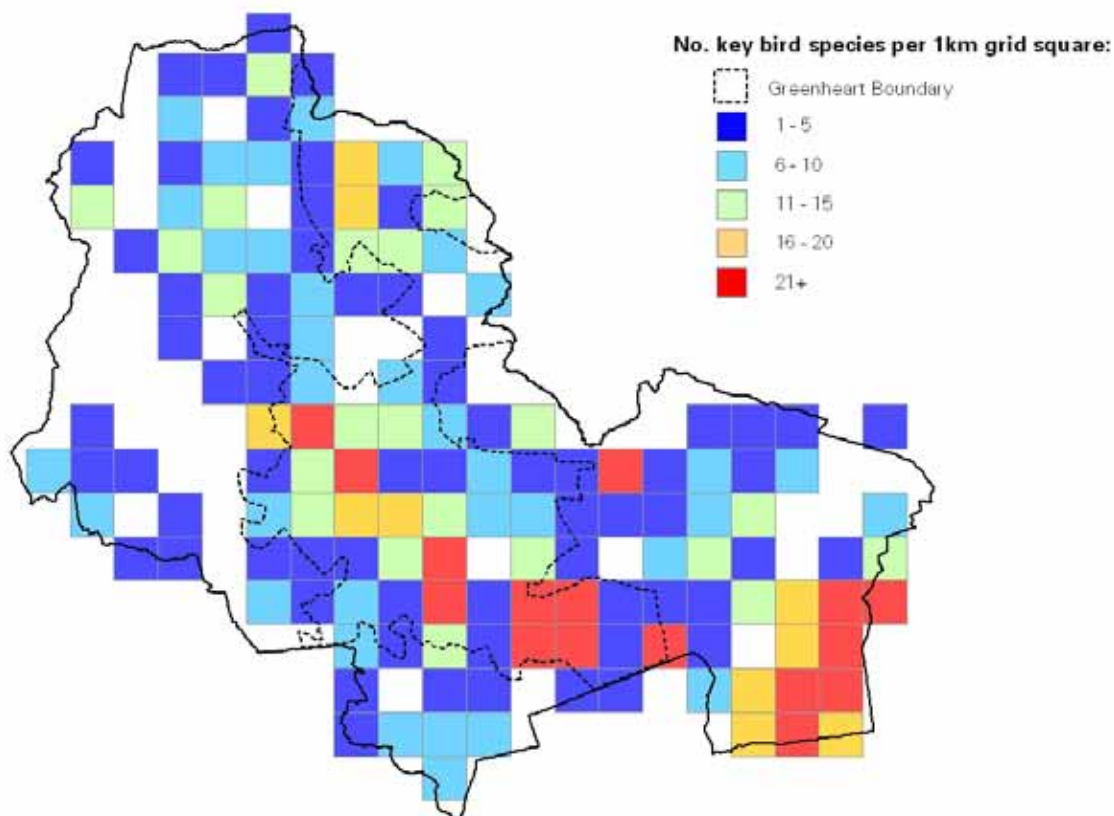
Birds

- 4.36 Records for birds of conservation concern (BOCC) in Wigan, which included UK priority bird species and red or amber listed species, were received from the Greater Manchester Bird Recording Group for 1km grid squares in Wigan excluding Pennington Flashes, for the past five years (2003 to 2008).
- 4.37 Pennington Flashes was excluded from the search due to the high number of records noted for these four grid squares and the complexity of data retrieval. A species list for the four squares covering Pennington Flashes was compiled from the website for the site hosted by the GMBRG, although no dates were available from this list.



- 4.38 A total of 81 BOCC have been recorded across Wigan, listed in the records provided by GMBRG and in the species list for Pennington Flash. There are apparently 90 grid squares across Wigan with no BOCC species present, as illustrated in *Figure 12* and summarised in *Figure 13*. This does not imply that these squares lack bird interest, as this review does not include the more common and widespread species. It also does not imply a complete absence of any of the BOCC found in Wigan (listed at *Appendix 5*). It may, however, reflect a lower than average species diversity due either to an actual lack of suitable habitats or possibly a lack of sites interesting to the recorder.

Figure 12: Pattern of key bird species richness across Wigan



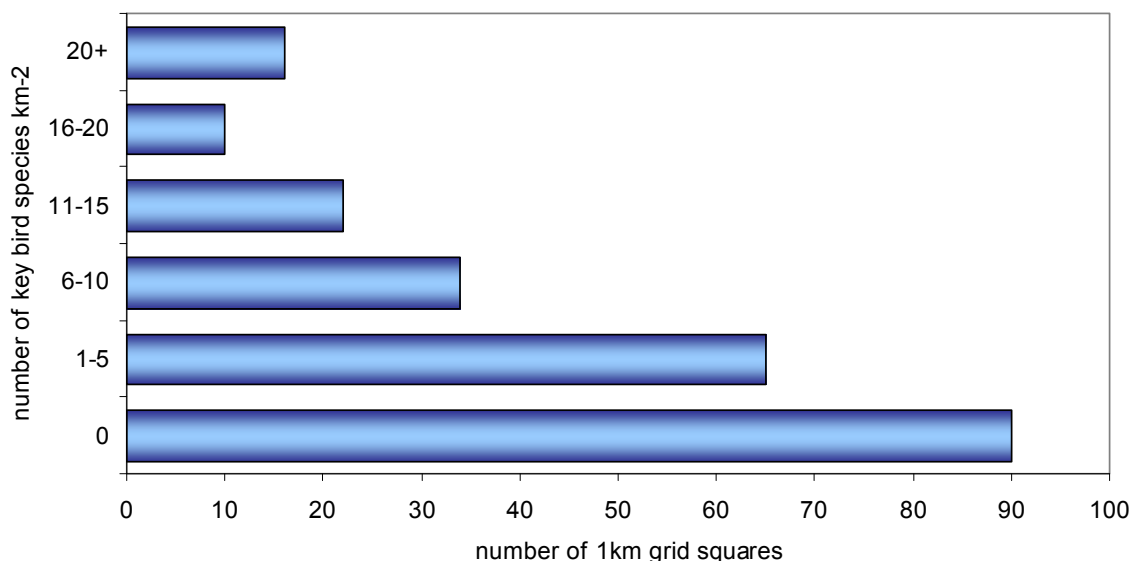
- 4.39 Of the 237 grid squares analysed, starling was the most widely distributed species, with 72 grid squares. The most localised species, with only one site recorded, were the honey buzzard (at Arley Wood) and the woodlark (at Amberswood), however these latter records are only historic/single occurrence (in addition to being recorded in only one grid square).
- 4.40 Key BOCC for Wigan (those possessing single species action plans) are the bittern (in reedbeds), the willow tit (in damp woodlands and wetlands) and the twite (in heath and grassland).
- 4.41 Bittern was recorded in 11 grid squares (<5% occurrence across the Borough), reflecting 8 different sites - Bryn Marsh, Byrom Hall Floods, Dover Basin, Hawkley Reedbed, Horrocks Flash, Pennington Flash, Scotmans Flash and Westwood Flash.
- 4.42 The willow tit was present in 62 squares (26% occurrence across the Borough), which reflects the wide distribution of wetland habitats suitable for supporting this species.

- 4.43 Twite was recorded only in 4 squares, which represents <2% occurrence across the Borough. It is likely the limited occurrence of preferred breeding habitats (open moorland and heath) which limits this species within the Borough, but its occurrence none the less typifies the wide ranging habitat diversity within Wigan.

- 4.44 In addition to the key BOCC, the species group of farmland birds is also important regionally. The Greater Manchester group species action plan is currently under review, so the constituent members of the group plan are unknown. However, farmland bird groups often include indicator species such as bullfinch, linnets, starling, corn bunting, grey partridge, house sparrow, lapwing, skylark, song thrush and yellowhammer. In combination these 10 species are present in 132 grid squares (56% occurrence in the Borough). There are a total of 5 squares supporting all 10 farmland indicator species, which represents 2% occurrence in the Borough. A total of 45 squares supported over half the species within the indicator group (6 or more), representing an occurrence of 19% across the Borough.

- 4.45 The average number of BOCC per grid square in Wigan is 6 species. Approximately 27% of grid squares within Wigan possess below average (5 or less) key bird species richness, 14% possess 6 to 10 key species, 9% possess 11-15 key species, 4 % possess 16-20 key species while 7% possess 20 or more key species.

Figure 13: Chart illustrating frequency of BOCC per 1km grid square across Wigan



- 4.46 *Figure 14* summarises the abundance of BOCC relative to the number of grid squares possessing that level of species richness. Five grid squares possess an assemblage of more than 30 BOCC. Pennington Flash (covering four grid squares) holds the greatest BOCC diversity, with Chat Moss the only other area with over 30 BOCC recorded. Astley Moss, Pearson's, Horrock's and Turner's Flashes also support particularly high species diversity with between 25 - 30 BOCC within their assemblages. These sites are those which form the focus of most of the recording within the Borough, so it must be acknowledged that this concentrated effort of recorded may bias the species abundance. However, by the same merit, the fact that these sites draw the focus of recording activity may indicate that they are considered to present one of the greatest sources of bird diversity and importance for the Borough.

Figure 14: Chart illustrating BOCC abundance relative to frequency occurrence

