

Wigan's Biodiversity



**An Audit of the Biodiversity Resource
within the Borough**



January 2010



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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.

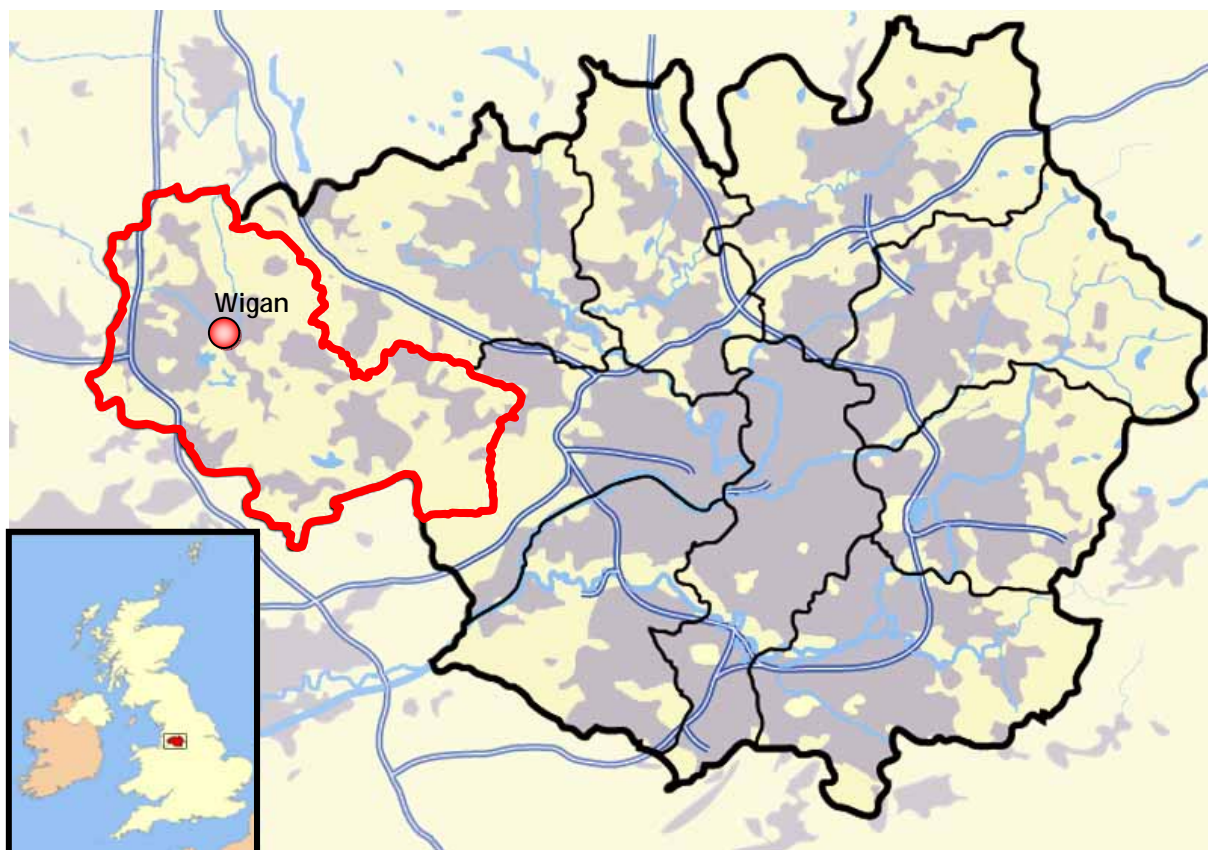
- 1.12 The framework acknowledges that the area is highly urbanised with a complex and fragmented landscape across its ten districts. The framework identified that the most likely future mechanisms to secure habitat creation, repair and connection included obligations placed on new development, changes 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.

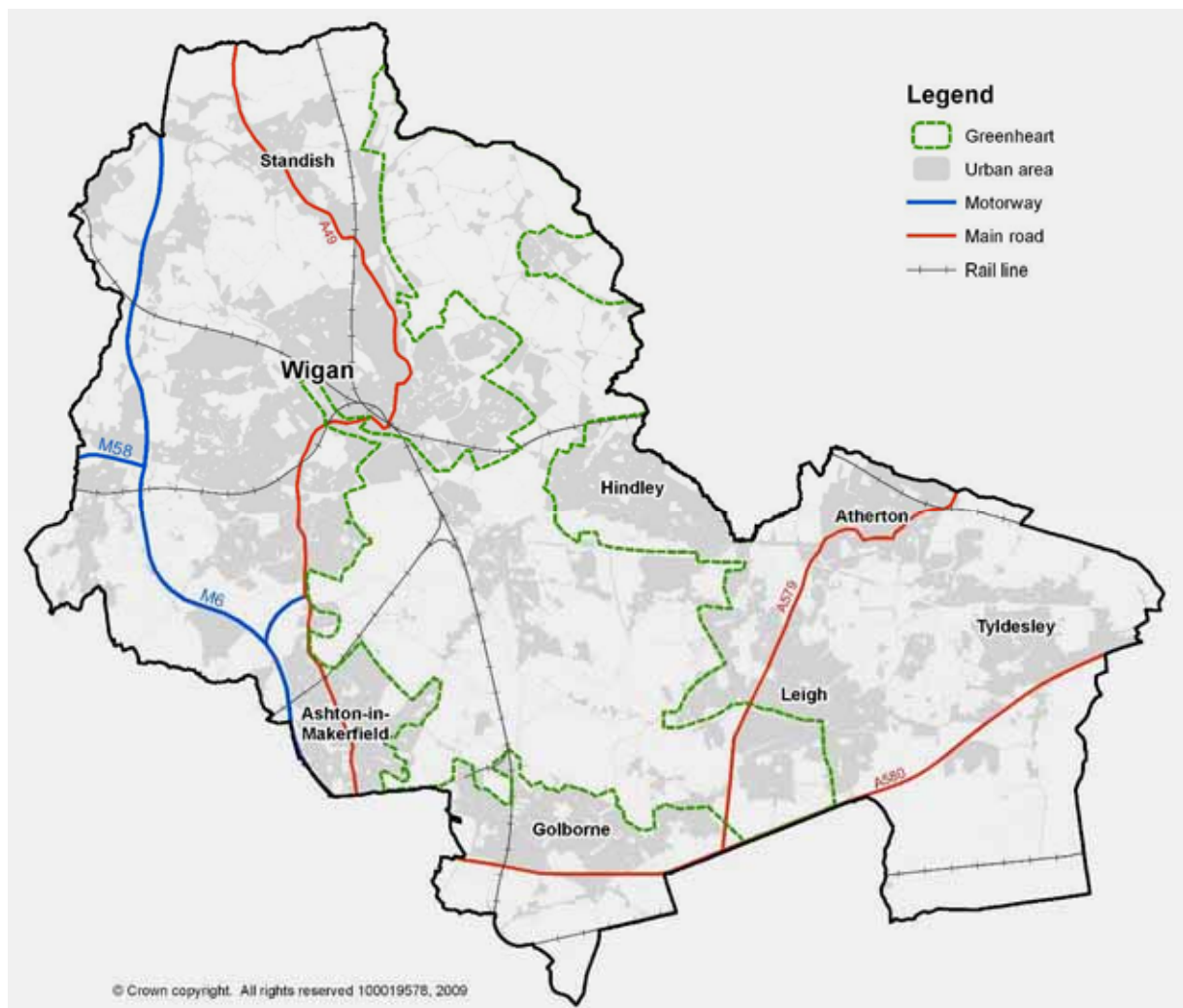
Figure 1: Map showing location of Wigan within the Greater Manchester area



- 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.

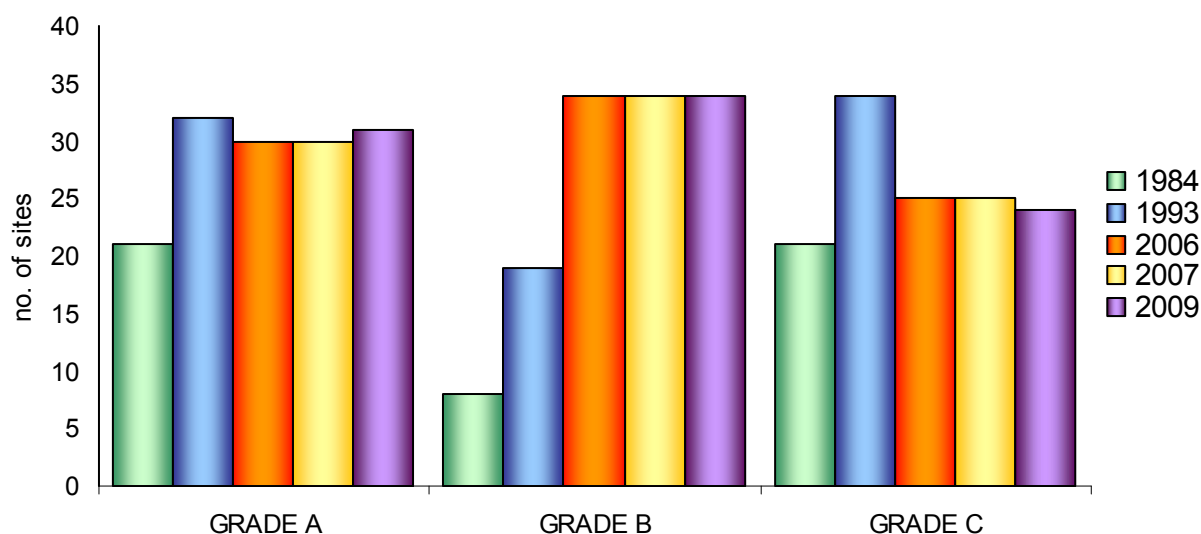
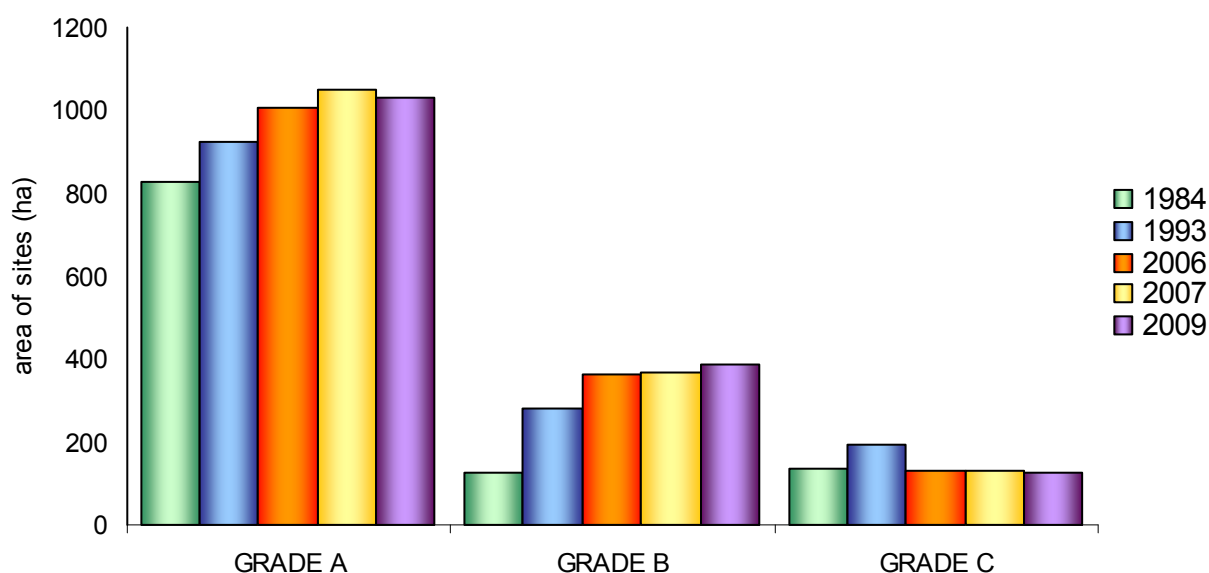
Constraints and Information Gaps

- 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*.

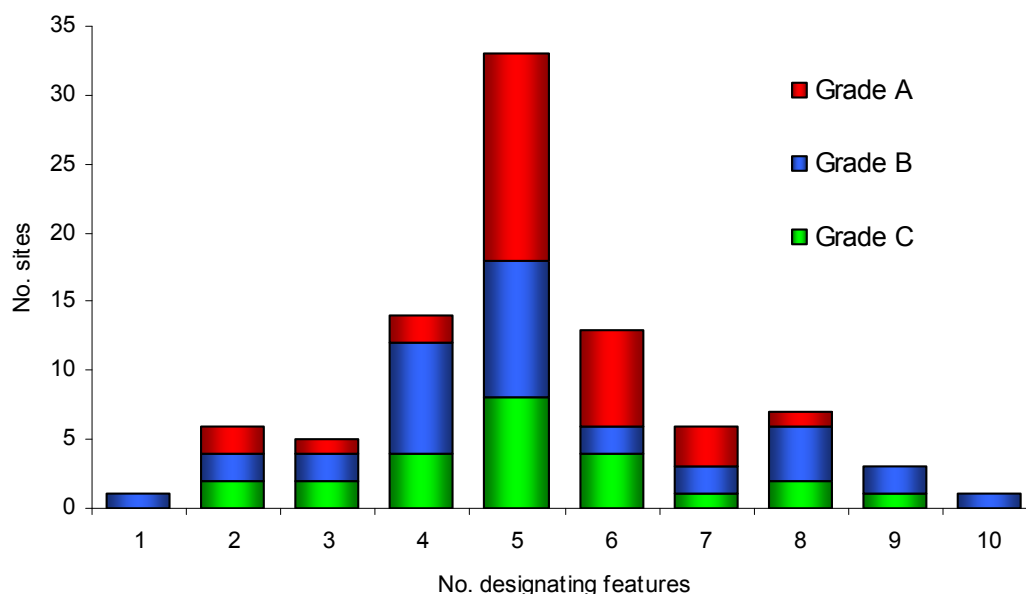
4.0 EVALUATION OF BIODIVERSITY WITHIN WIGAN

Sites designated for Nature Conservation

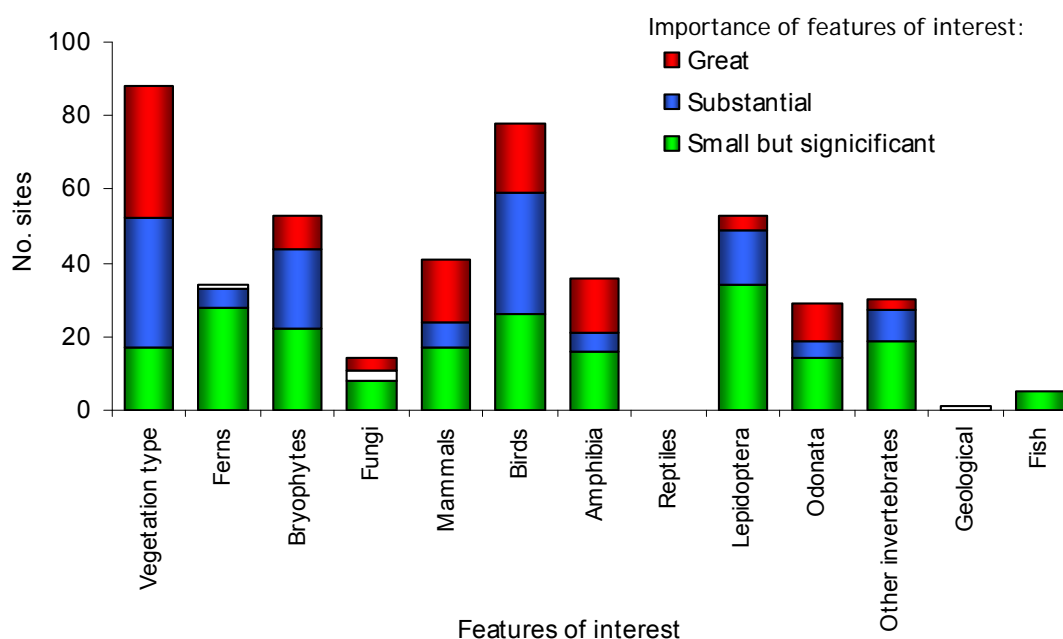
- 4.1 Wigan does not currently contain any Ramsar sites or Special Protection Areas (SPA). However, at the time of compiling this report, Lancashire Wildlife Trust has approached Natural England to look at designation of Wigan Flashes as an SPA, as the site meets the qualifying criteria.
- 4.2 Wigan 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.
- 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
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

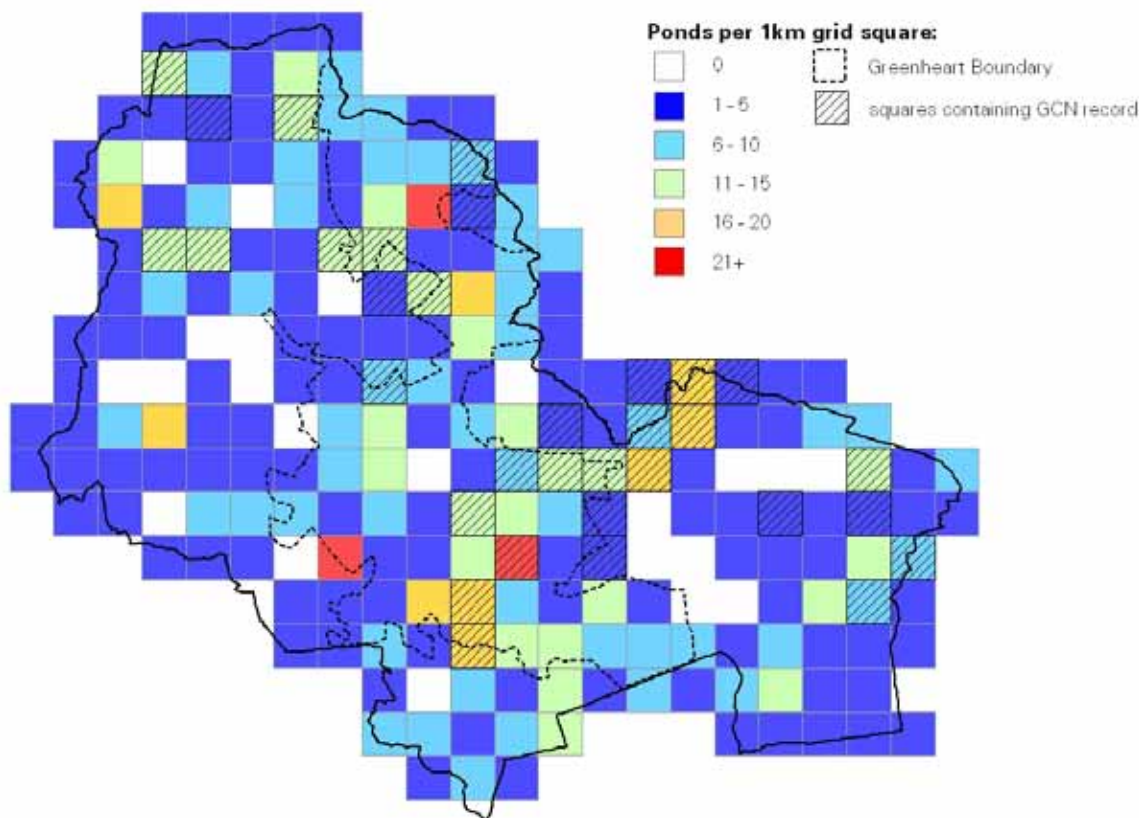
- 4.26 Species data for amphibians, and particularly great crested newts, was collated from Greater Manchester Ecology Unit and the National Biodiversity Database. The latter revealed only records dating prior to 1990 for Wigan, which were considered too unreliable for use in this study.



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.

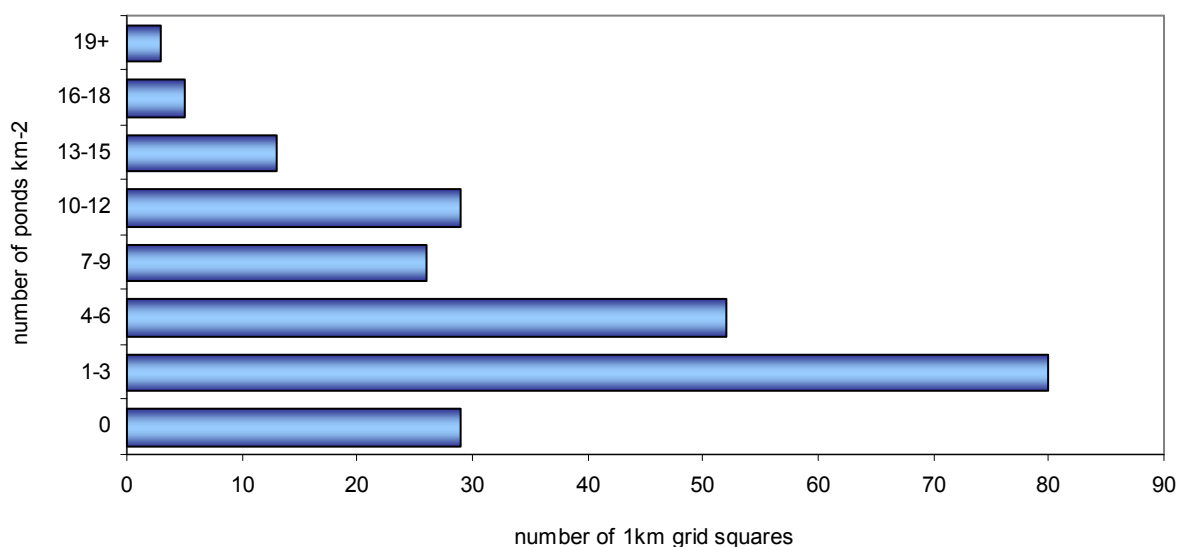
Figure 7: Pattern of pond density across Wigan



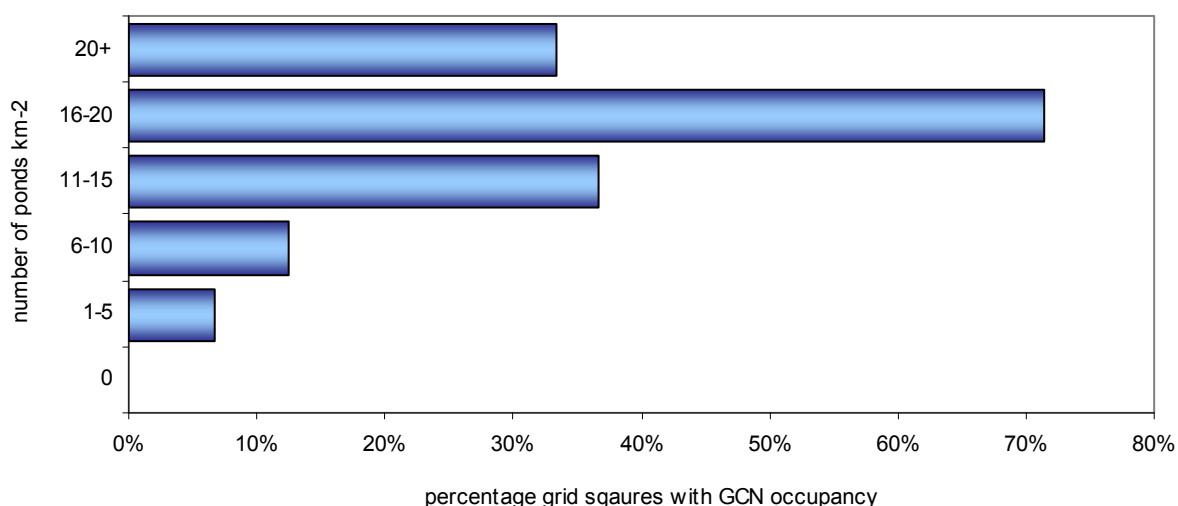
- 4.29 A strong corridor of high pond density (6 or more ponds per km²) exists from Golborne north-eastwards to Atherton. There is also a pattern of high pond density crossing north-westwards from Hindley through Haigh to Standish. Other areas of high pond densities, although in areas less well connected 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*

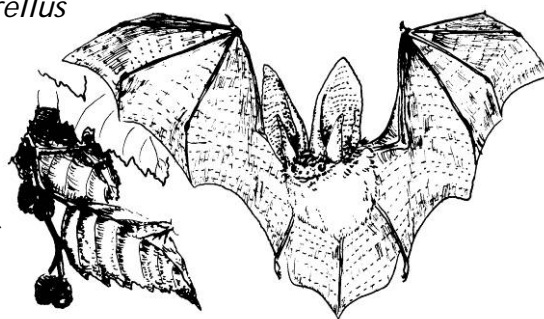
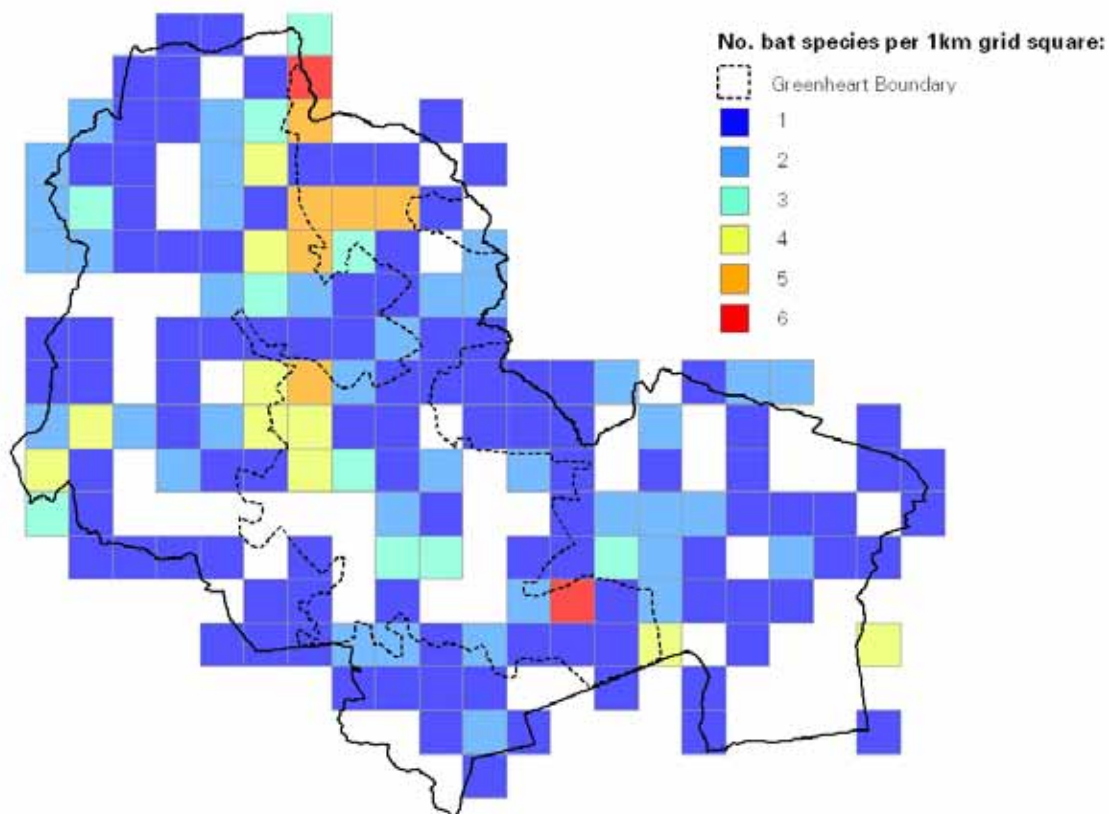
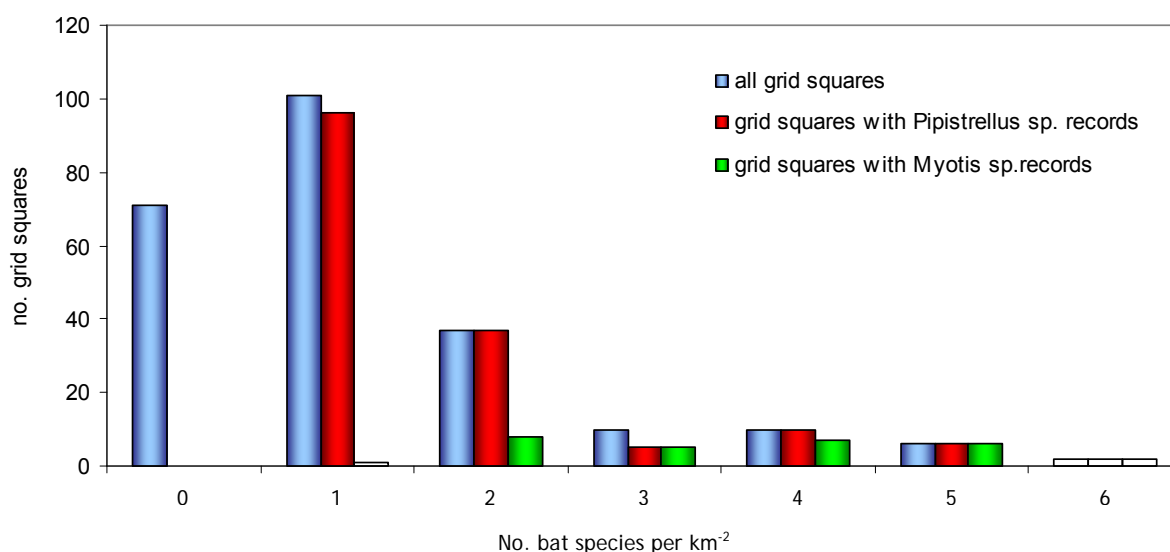


Figure 10: Pattern of bat species richness across Wigan



- 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



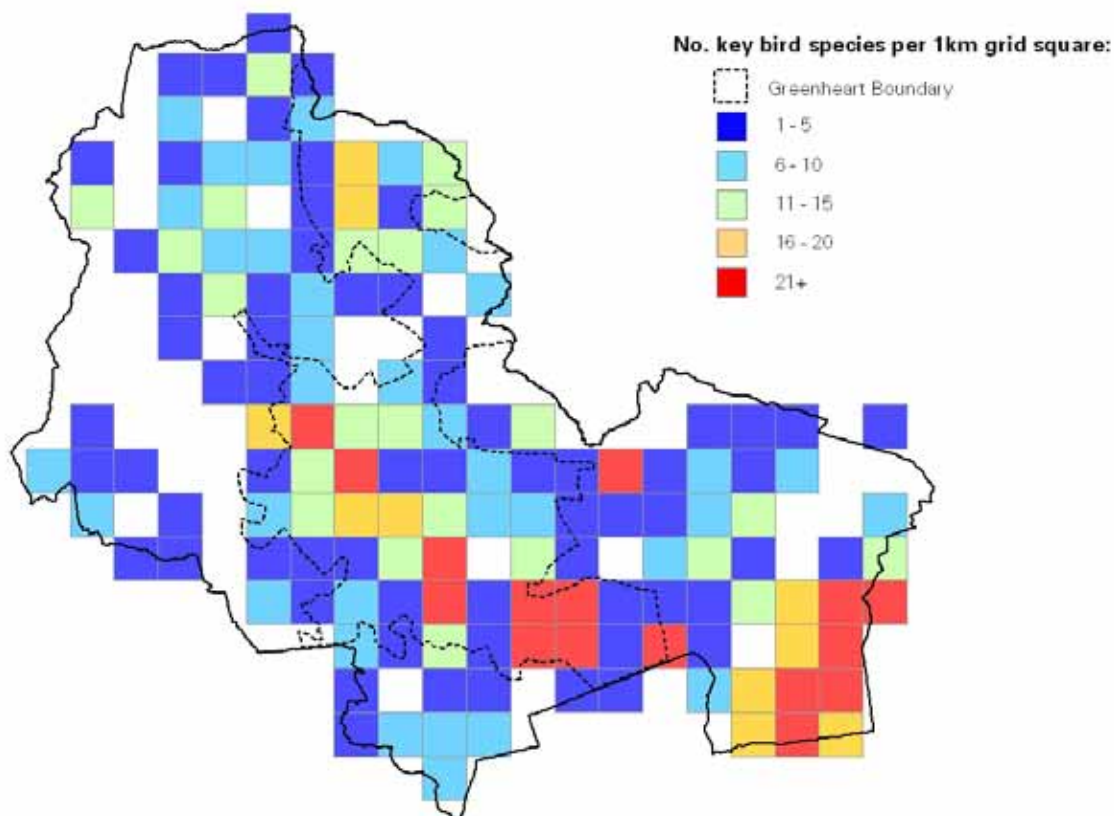
Birds

- 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.

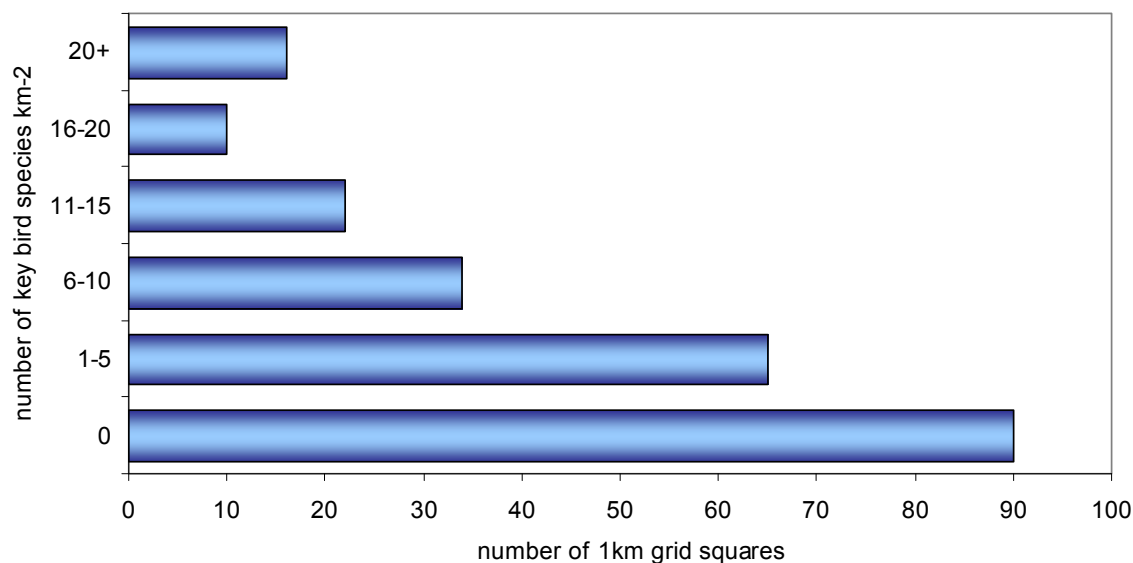
Figure 12: Pattern of key bird species richness across Wigan



- 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.

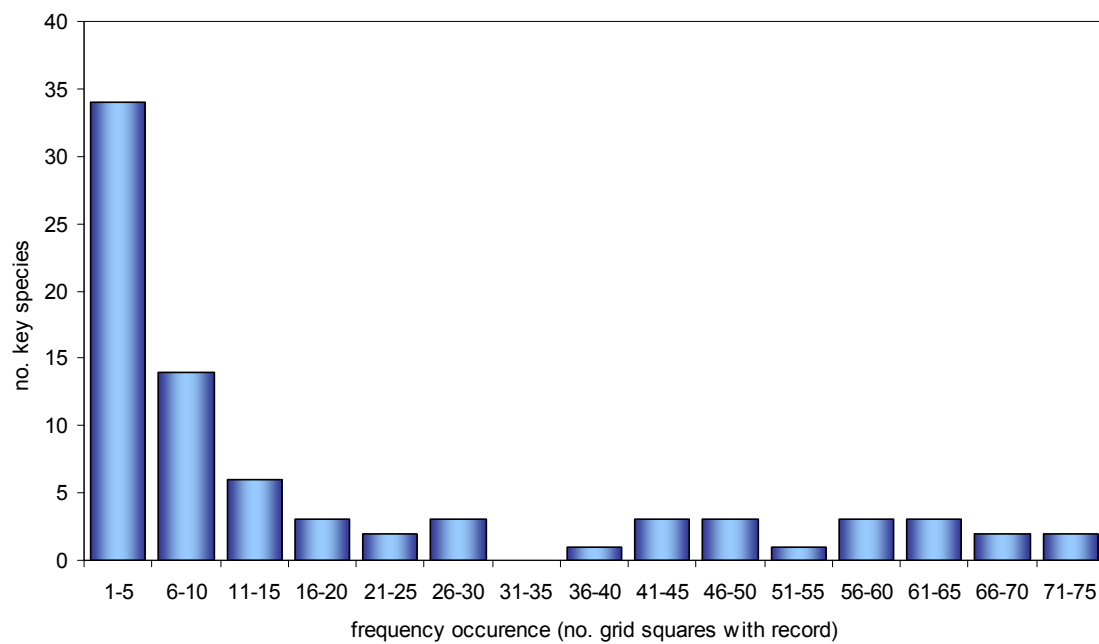
- 4.43 Twite was recorded only in 4 squares, which represents <2% occurrence across the Borough. It is likely the limited occurrence of preferred breeding habitats (open moorland and heath) which limits this species within the Borough, but its occurrence none the less typifies the wide ranging habitat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



5.0 IMPORTANT HABITATS SUMMARY

Standing water

Local Definition and Status

- 5.1 Standing water includes natural and man-made open waterbodies (pools, lakes, flashes, meres, ponds, lodges and reservoirs).
- 5.2 In the UKBAP, larger bodies of standing open waters tend to be classed by their nutrient status. This is a criterion that it is not possible to assess in the context of this audit (due primarily to budget and time constraints), although it can be stated with reasonable confidence, based on preceding studies and site assessments (e.g. for protected site condition monitoring and SBI reviews) that most of waterbodies within Wigan are eutrophic (nutrient-rich).

- 5.3 The habitat category of standing water in Wigan includes any habitat which qualifies as one or more of the following national or regional biodiversity priority habitats:

UK priority habitats

- Pond
- Eutrophic Standing Waters

Greater Manchester priority habitats

- Ponds and lodges

- 5.4 Descriptions and qualifying criteria for these national and regional priority habitat types can be found at *Appendix 3*.
- 5.5 In addition to any waterbody or reedbed that qualifies as either a UK or Greater Manchester priority habitat, there is a wealth of further standing water resource within Wigan that is likely to be important to Wigan's biodiversity resource, primarily within the size category of pond (between 1m² and 2ha in extent). For example, most ponds qualifying as a UK priority habitat in the Greater Manchester area will likely do so on the basis of the presence of a species or group of species, whether floral or faunal. However, these criteria may overlook many permanent or ephemeral waterbodies that possess high biodiversity value because of their other species assemblages, not used for the criteria assessments. For example, widespread amphibian species, such common frog (*Rana temporaria*), palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*), are important to Wigan's biodiversity make-up, not only for their own inherent value but also because of their contribution to the wider ecosystem in terms of prey for other species, notably many wetland birds and also reptiles. Invertebrate assemblages are also key to the health of Wigan's wetlands.
- 5.6 Ponds (and other forms of standing water, such as reedbed and lake) also perform an important function in their ecosystems, storing water and reducing flood risk and achieving important water quality improvements prior to the water reaching a stream or river.

- 5.7 Wigan's prime biodiversity is derived from its stock of standing water. It is therefore considered appropriate that if any pond or group of ponds (i.e. waterbodies containing water for at least 4 months of the year, between 1m² and 2ha in size) satisfies the criteria listed in the Greater Manchester SBI selection guidelines, at any grade, for flora or fauna assemblages; it should then be considered as an important standing water habitat within Wigan. Additionally, any pond within Wigan that falls within an "important pond area", to be identified within Greater Manchester by Pond Conservation Trust under the forthcoming Important Areas for Ponds project, should be considered an important standing water habitat.

Local Description

- 5.8 There are several large waterbodies (>2ha) present within the borough, notably within the Wigan Flashes area, much of which is designated as a local nature reserve. These lakes have been formed as a result of the widespread ground subsidence caused by coal mining in the 19th and 20th centuries. It has not been possible, without field analysis, to determine whether any waterbodies fit the definition for Eutrophic Standing Waters Priority Habitat Type, as no reference has been made to this priority habitat in SBI citations. However, as discussed above, large waterbodies, with nutrient status other than eutrophic, across the North West are described as rare or infrequent. It is therefore assumed that most of the lakes, meres, flashes and reservoirs in Wigan will be eutrophic. In general, eutrophic waters are nutrient rich and are characterised by having long-term populations of algae in mid-summer, often colouring the water green. Many lowland water bodies in the UK are now heavily polluted, with nutrient concentrations far in excess of normal eutrophic levels.

Figure 15: Wigan Flashes



Photo courtesy of Wigan Council

- 5.9 Within Wigan, the greatest concentration of extensive standing water habitats is found at Pennington Flash, leading along a corridor of smaller ponds and reedbed along Hey Brook to the Wigan Flashes. These large flashes in Wigan are the focus of the Borough's bird diversity; Wigan Flashes (*Figure 15*) are known to regularly support 80 species, while the cumulative total for Pennington Flash stands at approximately 250 species since recording began.
- 5.10 The large tracts of standing open water found within Wigan also support significant swamp, fen and bog habitats such as those found at Bryn Marsh and Ince Moss SSSI. These diverse wetland vegetation communities support large invertebrate species assemblages, notably dragonflies and damselflies and also butterflies and moths. Wigan's newest local nature reserve at Low Hall Park, illustrated at *Figure 16*, is one such site that supports a notable dragonfly and damselfly assemblage, including the banded demoiselle. Also present at the reserve is the water vole, a protected species which thrives in these wetland habitats.
- 5.11 Current data sources (Mastermap, supplemented by aerial photographs and field survey) indicate that 1128 ponds (waterbodies smaller than 2ha, and likely to also include lodges and pools) are present within the Borough. This is a significant increase compared with the one of the earliest attempts to quantify Wigan's pond resource; the Wigan Nature Conservation Strategy (1999) estimated only 200 or 300 ponds within the Borough. This increase is most likely due to improvements in mapping techniques.

Figure 16: Flashes at Low Hall Park Nature Reserve



Photo courtesy of Graham Workman

- 5.12 The ponds found in Wigan are generally man-made in origin, having been formed as a result of mineral extraction and industrial processes. The average size of the ponds within Wigan is 0.1ha. As discussed above, not all ponds within Wigan will meet the national or regional Priority Habitat definition, which is fairly prescriptive, though the presence of great crested newts, or other species of high conservation importance, is a qualifying factor for many.

Figure 17: Range of pond habitats found in Wigan



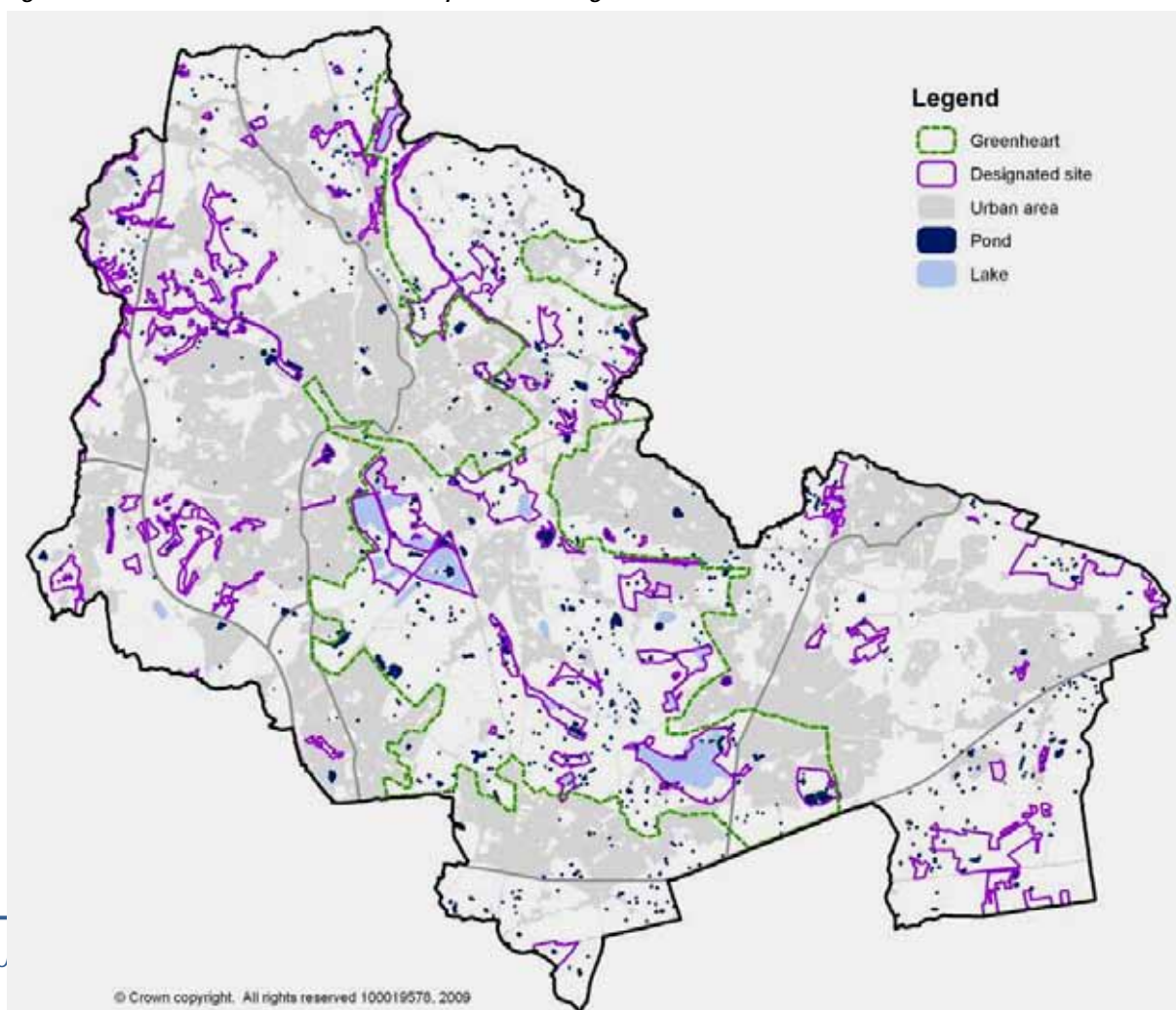
- 5.13 Ponds in Wigan are extremely diverse, ranging from densely vegetated swampy depressions in a field, to large open waterbodies ringed with marginal vegetation to hollows in woodlands or copses with dense leaf litter layers and little aquatic vegetation. The range in pond habitat provides very rich habitats for aquatic invertebrates, wetland plants and amphibians, as well as habitats for a variety of mammals, birds and fish.
- 5.14 For example, the Ponds North of Cleworth Hall (South) SBI includes a large number of waterbodies including typical marl ponds and seasonal pools. The majority of these support breeding amphibians, including great crested newt, and good assemblages of aquatic invertebrates. The site lies in a corridor with two other SBIs (Ponds Near Lomax Brow and Ponds Near New Manchester), which also support significant populations of amphibians.

- 5.15 The flora within these pond habitats is diverse, and includes rigid hornwort (*Ceratophyllum demersum*) (an uncommon species in Greater Manchester). Typical emergent vegetation includes common water plantain (*Alisma plantago-aquatica*), nodding bur-marigold (*Bidens cernuus*), marsh marigold (*Caltha palustris*), lady's smock (*Cardamine pratense*), common spike rush (*Eleocharis palustris*), flote grass (*Glyceria fluitans*), gipsywort (*Lycopus europaeus*), purple loosestrife (*Lythrum salicaria*), watermint (*Mentha aquatica*), branched bur-reed (*Sparganium erectum*) and bog stitchwort (*Stellaria uliginosa*). The surrounding, scrub and hedgerows often associated with these smaller waterbodies provide cover and foraging for amphibians as well as birds and mammals.

Location and Extent

- 5.16 There are approximately 309ha of standing water within Wigan, comprising 202ha of lakes, flashes & reservoirs (waterbodies in excess of 2ha extent) and 107ha of ponds (including lodges, i.e. waterbodies less than 2ha in extent). The total area of standing water within Wigan represents approximately 2% of the whole Borough area. The distribution of standing water habitats is illustrated in *Figure 18*, below.
- 5.17 There are in the region of 1128 individual ponds across the Borough of Wigan and a total of 20 lakes, flashes or reservoirs. The current number of ponds present in Wigan represents an average pond density of (approximately) 6 ponds km⁻².

Figure 18: Distribution of lakes and ponds in Wigan



- 5.18 Of the total resource of standing water within Wigan, 227ha can be found within, or largely within, sites currently designated for nature conservation (SBI, LNR and candidate LNR, SSSI and SAC). This represents 73% of the entire resource of standing water within Wigan. The majority of the standing water within designated sites comprises the larger lakes and reservoirs (187ha), mostly located within the flashes and mosslands sites. This represents 93% of the total area of lakes, flashes and reservoirs within Wigan.
- 5.19 In comparison, only 37% of all Wigan's ponds (290 ponds, comprising 40ha) are found within designated sites. However, pond density within designated sites is approximately 18 ponds km⁻², three times higher than the average across the Borough, indicating that primary concentrations of ponds are included within the designated sites.
- 5.20 The Greenheart contains 81% of all Wigan's standing water, comprising 198ha of lakes/flashes and 53ha of ponds. The Greenheart therefore contains 98% of Wigan's lakes and 49% of Wigan's ponds. Pond density within the Greenheart is approximately 9 ponds km⁻², slightly higher than the Borough wide pond density. This highlights the important focus of the Regional Park, possessing huge potential and responsibility to secure a significant extent and proportion of Wigan's wetland habitats.
- 5.21 The land holdings of Wigan MBC also present significant opportunities for enhancement and creation of important habitat types for Wigan. Wigan MBC assets contain 75% of all Wigan's lakes/flashes and approximately 35% of all ponds in Wigan, totalling 188ha (61%) of standing water habitats in Wigan. Pond density within Wigan Borough landholdings is approximately 8 ponds km⁻².

Trends

- 5.22 At a national level, it is estimated that approximately three quarters of a million ponds have been lost across the UK between the start of the 20th century and today. This is a 32% national decline in the last 100 years, or an average pond loss of about 8,500 ponds per year.
- 5.23 The North West Biodiversity Audit (1999) states that Wigan, in particular, has one of the highest pond densities in the North West of England. Similarly, the GMBAP published in 2000 stated that Wigan contained 20% of Greater Manchester's standing water resource and contained one of the highest concentrations of ponds, not only in Greater Manchester but in the North West.
- 5.24 The revised GMBAP action plan for ponds and lodges (2009) states that the current number of ponds in Greater Manchester is unknown but still confirms the importance of Wigan for its concentration of ponds compared to elsewhere in the region. There is therefore no reliable comparative data against which the data obtained in this study can be reviewed to assess trends. The current extent of

ponds across Wigan represents 0.6% of the total Borough area. All standing waters combined in Wigan represent 2% of the Borough.

Threats & Vulnerabilities

- 5.25 Pond loss can be attributed, nationally, to a combination of in-filling, land drainage and lowering of the water table. Ponds may be lost by in-filling for a variety of reasons, including development, brownfield restoration, expansion of land area available for agricultural production, and concerns over public health and safety. Severe degradation can also stem from development, leading to high recreation pressures and disturbance. Other factors in loss of pond value include neglect and climate change. Natural succession alone does not necessarily result in the loss of a pond; it usually creates a temporary pond, another important habitat.

- 5.24 Pond degradation can occur through various causes; pollution, inappropriate management, introduction of invasive non-native species, introduction of inappropriate native species, neglect (where management is required to maintain certain conditions for key species), deepening temporary ponds, linking ponds to water courses (most streams and ditches are polluted and would reduce the water quality of ponds), isolation and loss or degradation of surrounding habitats. In or near to densely populated areas other factors, such as duck-feeding, introduction of fish, and introduction of invasive non-native plants are a significant threat. The sale of invasive non-native plants from plant nurseries is still commonplace and is a significant factor in the spread of these problem species. Surface drainage from roads and other hard surfaces also poses a problem, flushing contaminants into ponds.

- 5.25 Whilst large numbers of new ponds are created each year, the poor quality of pond creation is a concern. The biodiversity potential of many new ponds is limited from the outset by poor water quality, poor design, unsuitable location, inappropriate planting schemes and a lack of management in the first few years.

- 5.26 Climate change can influence water levels and water quality and may threaten the water tables of standing waters. Seasonally wet waterbodies, an important resource for invertebrates in particular, may become permanently dry in prolonged warmer conditions. Other standing waters may suffer decline in quality as water temperatures warm and water levels lower. Invasive species may become more problematic in warmer conditions. Demands for water abstraction may also increase, which may exacerbate water level and quality concerns in standing waters.

- 5.27 Climate changes might also result in storm surges and flash flooding that can cause water quality problems and potentially loss of species supported by the waterbodies.

Reedbeds

Local Definition and Status

- 5.28 Reedbed is a biodiversity priority habitat within Wigan, Greater Manchester and the UK. Action plans for this habitat, including definitions and descriptions, are found at *Appendix 3*. Reedbeds are defined as stands of at least 60% common reed (*Phragmites australis*), with a water table at or above ground for most of the year.
- 5.29 It is unusual, in Wigan, to encounter a free-standing reedbed with no associated pool, pond, mere, flash or lake. According to their Phase 1 classification reedbeds must include standing water. Reedbed however, is a distinct habitat type recognised nationally, regionally and locally with a separate biodiversity action plan. Reedbed has therefore been separated from other bodies of standing water for the purposes of this audit.

Local Description

- 5.30 Reedbed is one of the more abundant known priority habitat types found in Wigan, largely occurring in man-made wetlands on former industrial sites. In total, 56ha have been mapped in this study.
- 5.31 The most extensive reedbeds occur in the series of subsidence flashes, the largest being in the Wigan Flashes Local Nature Reserve (part of which is designated SSSI). Wigan Flashes LNR and Pennington Flash (Figure 19) are the only two areas of important reedbed identified in Greater Manchester in the GMBAP.
- 5.32 Apart from the dominant species, common reed, other species most frequently found include common reedmace (*Typha latifolia*), yellow iris (*Iris pseudacorus*) and branched bur-reed (*Sparganium erectum*), as well as a variety of rushes. Grey clubrush (*Schoenoplectus tabernaemontani*) has also been recorded. Where succession has progressed, scrub species such as willow and alder can predominate.

Figure 19: Reedbed forming characteristic fringes around Pennington Flash



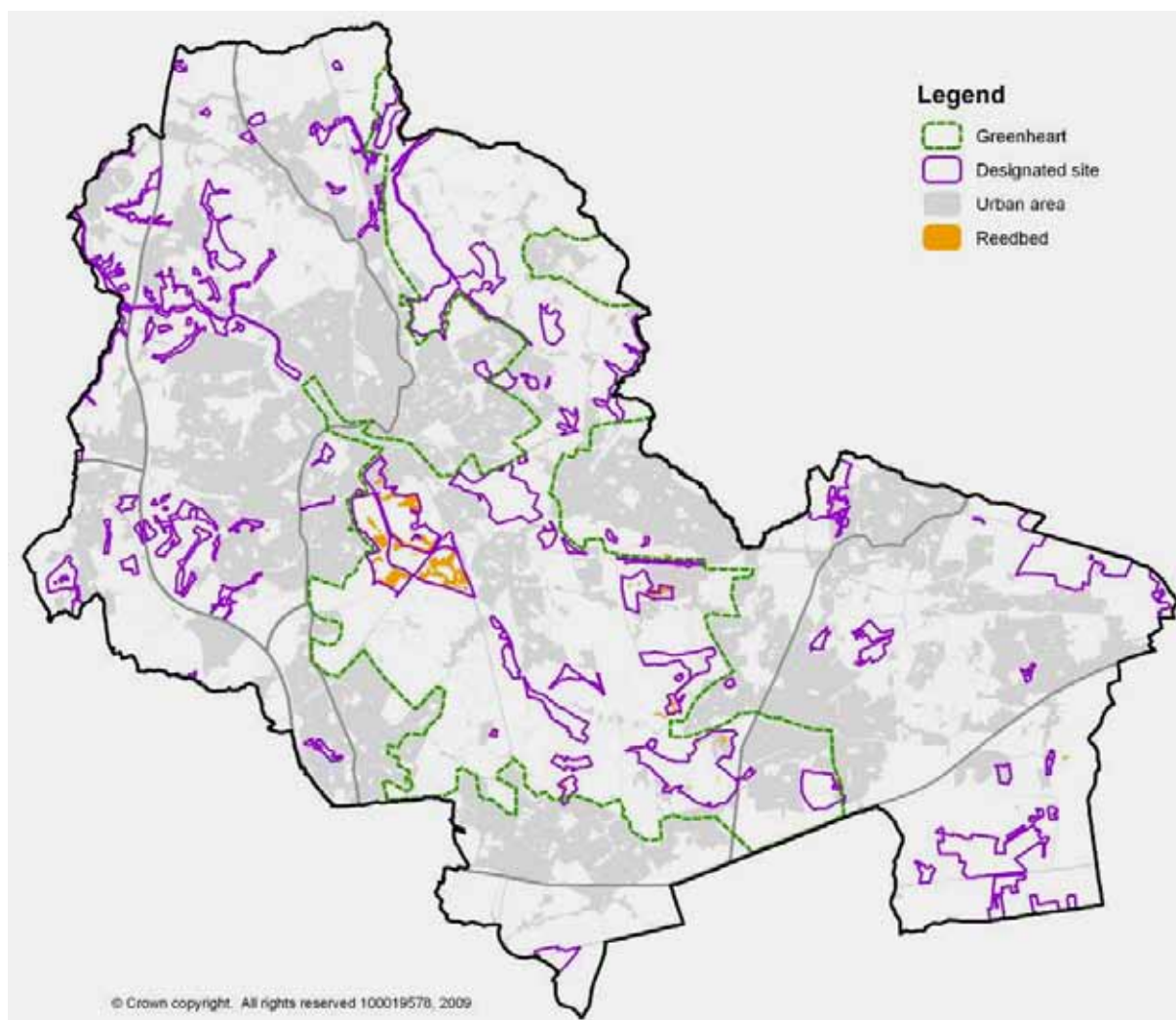
Photo courtesy of Wigan Council

- 5.33 Small areas of reedbed are also frequently found in ponds, ditches and other small waterbodies adjacent to flashes and other wetland areas in the countryside.
- 5.34 Reedbeds are amongst the most important habitats for birds in Wigan. They support a distinctive breeding bird assemblage including the nationally rare Red Data Bird the bittern (*Botaurus stellaris*), as well as providing roosting and feeding sites for migratory species, and several raptor species in winter.

Location and Extent

- 5.35 Reedbed is a difficult habitat to quantify without field survey and conflicting figures are reported for the extent of reedbed thought to occur in Wigan. The emerging GMBAP estimates 70ha can be found in the Wigan Flashes, whereas the Wigan BAP quotes approximately 50ha for the same site. This audit, using the habitat data available and refining it through consultation with the Wigan Biodiversity Partnership, estimates that there are approximately 56ha of continuous reedbed within Wigan, a proportion of which overlaps with certain lake areas, as to subtract the reed from the lake would diminish the quantification of the lake body.
- 5.36 *Figure 20*, illustrates the distribution of import reedbed areas in Wigan. Important reedbed areas are concentrated in the heart of the Borough at the Flashes. The reedbeds located within the Wigan Flashes is the most extensive stand in Greater Manchester. Other important stands occur at Hindley, Bickershaw and Pennington.
- 5.37 Of the total resource of reedbed within Wigan, 53ha can be found within sites currently designated for nature conservation (SBI, LNR and candidate LNR, SSSI and SAC). This represents 94% of the entire resource of reedbed within Wigan, confirming the important value of this particular habitat within Wigan. Both Greater Manchester and Wigan Biodiversity Habitat Action Plans agree that the greater majority of reedbeds in Wigan are found in SBIs and most are managed as nature reserves.
- 5.38 Approximately 55ha (98%) of the reedbed within Wigan falls within the Greenheart boundary. This reflects the association of reedbed with extensive open water areas and again highlights the important potential of the Greenheart to contribute to the safeguarding of Wigan's wetlands and the species they support.
- 5.39 The land holdings of Wigan Council similarly present significant opportunities for enhancement and creation of important habitat types for Wigan. Wigan Council assets contain 43ha (77%) of reedbed, emphasising the potential for the long-term maintenance of reedbed habitats.

Figure 20: Distribution of reedbeds in Wigan



Trends

- 5.40 There is no regional or local information from which trends in reedbed extent or distribution can be inferred. The 2005 UKBAP National Trends Report for reedbeds, found in the UKBAP habitat plan indicates an increase in the reedbed extent across England and the UK. Nationally, the UK BAP for reedbeds quotes 5,000ha across approximately 900 sites in the country. Only about 50 sites are more extensive than 20ha.

- 5.41 The largest continuous single stand of reedbed mapped in Wigan, located at Wigan Flashes, approaches 15ha in area. In combination with smaller individual stands at the site, the reedbed extent across Wigan Flashes is closer to 50ha.

Threats & Vulnerabilities

- 5.42 Reedbeds require management to secure their long-term survival. Reeds will gradually colonise open water areas and leaf litter and silt will build up in the stand until the reedbed dries out. This is compounded by colonisation by scrub species such as alder and willow which further deplete the water levels. Artificial lowering of water tables may also result from surface or ground water abstraction activities.
- 5.43 The importance of reedbed for supporting other species is generally dependent on their water quality. Water pollution, for example through pesticide use, run-off or heavy metal pollution, would have detrimental effects on existing reedbeds with significant wildlife interest.
- 5.44 As with standing waters, climate change may increase the vulnerabilities of reedbeds in the borough as the water table is put under pressure with warmer weather, longer growing seasons and increases in water demands. However, reedbeds may also present an opportunity to combat such changes as reedbeds can help with water quality improvements and slow the rates of evaporation from standing water. Reedbeds could also act as a storage system against potential storm surges and flash flooding, to reduce impacts of these events on other wetland habitats and mosslands.

Water Corridors

Local Definition and Status

- 5.45 Water corridors are linear habitat mosaics centred around a flowing or water-filled channel. Water corridors include any natural, man-made or modified linear watercourses, such as rivers, canals, streams, brooks and ditches.
- 5.46 This habitat type incorporates rivers and canals which qualify as national and/or regional priority habitats, in addition to other linear water features locally important to Wigan's landscape and wildlife connectivity.

Local Description

- 5.47 The Leeds-Liverpool Canal, turning into the Bridgewater Canal at Leigh lies centrally within the borough, and provides important links between a number of wetland habitats. Canal habitat runs adjacent to Scotman's and Pearson's Flashes, Bryn Marsh & Ince Moss SSSI, and southwards past Pennington Flash Country Park. Two sections of this canal have been designated as SBI within Wigan, and these are of general wildlife importance for birds, fish, invertebrates, mammals and plants. Waterfowl found within canal habitat in Wigan include coot (*Fulica atra*), moorhen (*Gallinula chloropus*), mallard (*Anas platyrhynchos*), great crested grebe (*Podiceps cristatus*) and little grebe (*Tachybaptus ruficollis*), with

nesting sites located within the reedbeds. Common tern (*Sterna hirundo*), kingfisher (*Alcedo atthis*), willow tit (*Poecile montanus*), grey heron (*Ardea cinerea*), Canada goose (*Branta canadensis*), mute swan (*Cygnus olor*) and goosander (*Mergus merganser*) are also present at varying times of the year. The BAP species grasshopper warbler (*Locustella naevia*), linnet (*Carduelis cannabina*) and yellowhammer (*Emberiza citrinella*) possibly breed within the canal corridor.

- 5.48 Parts of the canal are heavily used by fishermen and sticklebacks and coarse fish are plentiful in places. Butterflies can also be abundant along the canal corridor, including speckled wood (*Parage aegeria*), peacock (*Inachis io*), small white (*Pieris rapae*), green-veined white (*Pieris napi*), small heath (*Coenonympha pamphilus*), gatekeeper (*Pyronia tithonius*), meadow brown (*Maniola jurtina*), small tortoiseshell (*Aglaia urticae*), small copper (*Lycaena phlaeas*) and red admiral (*Vanessa atalanta*). Blue-tailed damselfly (*Ischnura elegans*), common blue damselfly (*Enallagma cyathigerum*) and brown hawker dragonfly (*Aeschna grandis*) are also known to be present. There are incidental records of water voles along some sections of the canal, and Daubenton's bats (*Myotis daubentonii*) are likely to use the canal corridor as feeding habitat. Aquatic plants include arrowhead (*Sagittaria sagittifolia*), yellow water-lily (*Nuphar lutea*), fennel pondweed (*Potamogeton pectinatus*) and unbranched bur reed (*Sparganium emersum*).

Figure 21: Leeds-Liverpool Canal with naturalistic bankside habitat corridors



- 5.49 Several more natural watercourses run through the borough, providing important wildlife corridors connecting the flashes and wetlands. These include Pennington Brook, and Hey Brook which connects Pennington Flash and the subsidence flash at Low Hall Park SBI.

- 5.50 Draft criteria are currently available for River priority habitats, and these include those which are known to support BAP priority species such as water vole (*Arvicola arvensis*), and those of 'high hydromorphological/ecological status'. Rules to identify such water bodies are currently being refined, and will be added to the UK BAP criteria when they are available. The current draft criteria for Rivers disqualify 'reaches which are heavily degraded and which have little scope for improvement, for example because they are heavily canalised, will not be considered for inclusion as BAP priority habitat.'

Figure 22: Brook flowing through Borsdane Wood



Photo courtesy of Graham Workman

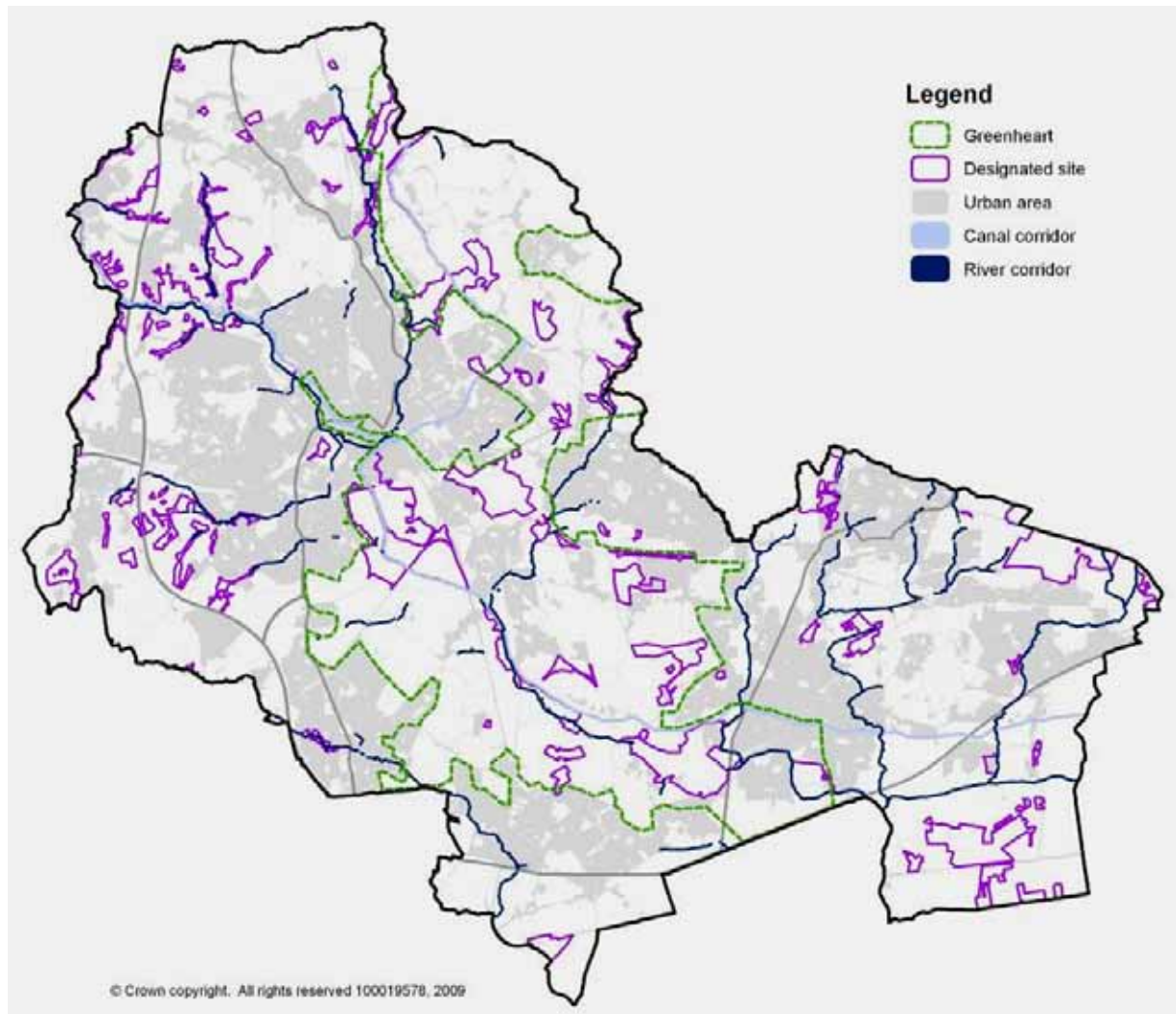
Location and Extent

- 5.51 Approximately 108ha of water corridor has been identified within Wigan. To be more precise, as mapping of water corridors will exclude the associated linear habitat mosaics, there are approximately 108ha of flowing or water filled channel within Wigan, illustrated in

Figure 23, below. This represents approximately 0.6% of the total Borough area. Of this total area of water corridor, 52% comprises canal, 41% rivers and the remainder small streams, brooks and/or ditch systems.

- 5.52 About 43% of the water corridors (47ha) are found within the Greenheart, 26% within designated sites and only 12% within Wigan Council land holdings.
- 5.53 The greater proportion of the canal system (59%) is contained within the Greenheart, whereas 31% is within designated sites and only 2% of canal habitats are located within Wigan Council land assets. The greatest land holding of canal system within Wigan under a single land owner is likely to belong to British Waterways.

Figure 23: Distribution of water corridor in Wigan



Trends

- 5.54 There is no data available to determine trends for water corridor habitats in Wigan.

Threats & Vulnerabilities

- 5.55 Water shortages and water level fluctuations arising from climate change and /or increases in water abstraction for developments could potentially have the greatest adverse affect on the Borough's water corridor networks. This is speculative, but wetland habitats are of prime importance to Wigan's biodiversity and the water corridors form vital connections between the wetland systems.
- 5.56 Threats specific to the canals in Wigan include unsympathetic restoration for navigational use, spread of native and alien invasive species (plants such as Japanese knotweed or Himalayan balsam and also animals such as signal crayfish and mink), intensive management of towpath and adjacent habitats and other recreational pressures such as angling leading to the introduction of inappropriate species and/or artificially high densities of fish.

- 5.57 Many of the threats facing the Borough's canals, including alien species and inappropriate or intensive management of bankside vegetation are also relevant to the semi-natural watercourses in Wigan.
- 5.58 Few lowland rivers and streams are naturally formed, having had physical modifications over the course of many years to provide flood defence, drainage and other uses. Impoundments, weirs and other artificial modifications can result in impoverished channel and bankside habitats and localised exclusion of species.

Figure 24: Leeds-Liverpool Canal, near Plank Lane showing significant modification



- 5.59 Water quality is a problematic issue for linear water corridors, because catchment areas are so much larger than those of confined waters. Sewage discharge and agricultural leaching are common factors which can affect lowland watercourses, leading to over nitrification and, particularly in times of low flow, de-oxygenation.
- 5.60 Another form of eutrophication of the waters in Wigan may occur through nitrification of surface waters resulting from increases in dissolved nitrogen in rain fall.
- 5.61 According to the Third Annual Monitoring Report for Wigan Council (2006), 'The chemical quality of rivers in Wigan remains high and is currently better than the Northwest and national averages.' However, 'Only 59.1% of Wigan's rivers are classified as being of 'fair' or 'good' biological quality. This is significantly worse than the northwest (89.3%) and national (95%) averages' (Environment Agency, 2006). Water quality is monitored by the Environment Agency under the WFD and Wigan Council is currently working with them to develop indicators for monitoring through the Core Strategy.

Mosslands

Local Definition and Status

- 5.62 Mossland is a biodiversity priority habitat for Wigan. Mosslands are included in the GMBAP for mosslands and nightjar. The key habitat of importance within mosslands is the UKBAP priority habitat lowland raised bog.
- 5.63 There are no pristine raised bogs within Wigan or indeed regionally and nationally they are exceptionally rare. Given the rarity of intact habitat, degraded examples which are considered to have potential to be restored, such as those found at Highfield Moss and Astley and Bedford Mosses, are considered of high conservation priority. Areas of raised bog still capable of restoration are of European Importance, notified under the European Habitats Directive.
- 5.64 The defining character of lowland raised bog in Wigan is having deep peat over fluvial deposits near rivers or on floodplains. Peat forming vegetation primarily includes *Sphagnum* mosses and cotton grass. In Wigan, *Sphagnum papillosum* is particularly characteristic. The dense moss layer acts like a sponge above the ground water layer and the bog surface is above the surrounding land, so that the primary water source of mosslands is rainwater and the characteristic vegetation is adapted to a nutrient poor acidic condition.

Local Description

- 5.65 The degraded nature of these habitats is reflected in the lack of species such as sundews (*Drosera* sp), bog-asphodel (*Narthecium ossifragum*), bog rosemary (*Andromeda polifolia*) and bog myrtle (*Myrica gale*), all of which are found in other areas of surviving mossland in the northwest region.
- 5.66 Astley & Bedford Moss and Highfield Moss are protected by SSSI designations.
- 5.67 Vegetation of Astley & Bedford Moss SSSI is characterised by the dominance of purple moor-grass (*Molinia caerulea*), with silver birch (*Betula pendula*) woodland established within much of the western half of the site, and scattered scrub encroaching to the east. Remaining Mossland species include *Sphagnum* species, common cotton-grass (*Eriophorum angustifolium*), hare's-tail cotton-grass (*E. vaginatum*), deergrass (*Trichophorum cespitosum*) and cranberry (*Vaccinium oxycoccus*).
- 5.68 Highfield Moss SSSI consists of a mosaic of several habitats, potentially including valley mire, lowland raised bog, acid grassland and heathland. According to the SBI citation, the main habitat in the south of the site is valley mire, which is included in lowland fen, a UK priority habitat (but not one which is listed as being present in Wigan, for example in the GMBAP District Summaries, nor has it been detected in this project). It states that 'Poor fen, of which Highfield Moss is an example, is listed in the EC Habitats Directive.

- 5.69 Areas of mire are dominated by purple moor-grass over deep peat. Other areas are dominated by soft rush (*Juncus effusus*) and sharp-flowered rush (*Juncus acutiflorus*). Sphagnum lawns occur in these areas, dominated by *Sphagnum recurvum* var *muconatum*. Other species include *Sphagnum papillosum*, *S. palustre*, *S. squarrosum*, *S. fimbriatum* and *S. subnitens*. *Sphagnum cuspidatum* occurs in small pools and hollows in the lawn. Common cotton-grass, hare's-tail cotton-grass and cranberry have also been recorded.' Highfield Moss is also known for its population of the nationally scarce marsh gentian (*Gentiana pneumonanthe*), growing in acid grassland over peat.

Figure 25: Astley Moss



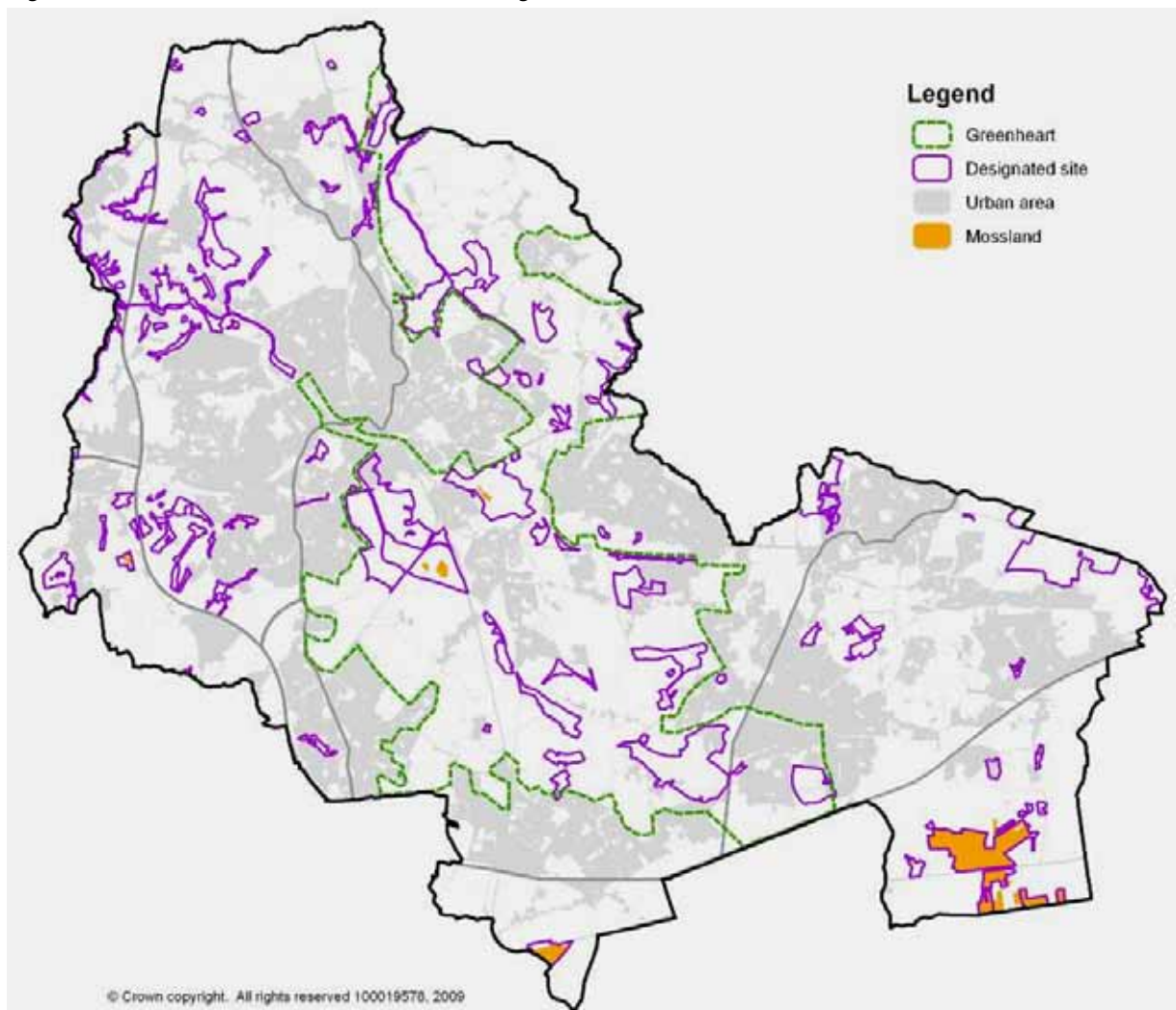
Photo courtesy of Graham Workman

- 5.70 Chat Moss Remnants consists of modified raised bog and wet woodland. The area of dried bog is dominated by purple moor-grass with heather (*Calluna vulgaris*), cotton-grass, soft rush, Sphagnum, silver birch and dense patches of bracken (*Pteridium aquilinum*) occurring. Numerous drainage ditches cross the area and a waterbody has been created in the east.
- 5.71 At Horrocks Flash (Ince Moss), small fragments of remnant peat support bracken and purple moor-grass on dry areas, and populations of early marsh-orchid (*Dactylorhiza incarnata*), southern marsh-orchid (*D. praetermissa*) and marsh helleborine (*Epipactis palustris*) occur on damp, base-rich peat. Purple loosestrife, common cotton-grass and northern marsh orchid (*D. purpurella*) are also recorded.

Location and Extent

- 5.72 The current known extent of Mosslands is almost entirely contained within statutorily protected sites, with the greatest proportion occurring at Astley & Bedford Mosses and Highfield Moss. Additional fragments are found at the Wigan Flashes. Mapped areas outside these sites are closely associated with the designated areas at Astley & Bedford Mosses.
- 5.73 The Wigan Mosslands BAP states that Wigan has less than 100ha of mossland remaining, with many of the larger remnants continuing to be excavated for peat. This review has mapped a total of 158ha mosslands, although this does include areas of associated habitats and mosaics (acid and marshy grasslands, for example). A significant improvement to the extent of mosslands has recently and is currently still being achieved through the control of scrub at Astley and Bedford Mosses.

Figure 26: Distribution of mosslands in Wigan



Trends

- 5.74 Mossland habitats once covered large areas of Greater Manchester, but have undergone tremendous loss since the late 19th Century. Across the UK, mosslands have been reduced from 95,000ha to only about 6,000ha. English mosslands have suffered even greater losses, with only about 1%, roughly 500ha, now remaining. This massive loss is mirrored in the North West, which once supported a large proportion of England's lowland raised bog resource across Lancashire, Greater Manchester and North Merseyside. Remaining habitats are fragmented and degraded and total less than 100ha.
- 5.75 Regionally, the former vast expanses of mosslands at Chat Moss, Carrington Moss, Ashton Moss and Clifton Moss have been lost to peat extraction, agricultural improvement or development. A recent survey of mossland habitat has recorded only 14 sites within Greater Manchester supporting deep peat deposits many of the sites being only a few hectares in size. Many of the larger remnants are currently under excavation with only a few being protected by statutory designations. Astley and Bedford Moss is protected, as part of the larger Manchester Mosslands Special Area of Conservation (SAC) and Red Moss in Bolton is a SSSI.

Threats & Vulnerabilities

- 5.76 Former peat cutting at Astley & Bedford Moss has caused the drying out of large areas of the mossland. Natural England condition monitoring identifies only 1.4% of the site as being in favourable condition, with 37.6% recovering but the remaining 39% being in unfavourable condition with no improvement or continuing to decline in condition.
- 5.77 However, the SBI citation considers that the site remains valuable because of its size, the lack of chemical modification of the peat and the depth of peat on the site. Bryn Marsh and Ince Moss SSSI is assessed as being 100% in favourable condition. Highfield Moss is approximately 80% in favourable condition, with the remaining 20% being considered unfavourable and declining. This decline is attributed in the condition report to the neutral grassland units within the SSSI, to the reduced abundance and distribution of Marsh Gentian within the grassland unit (reviewed in August 2008). The reason for the decline is stated as "inappropriate weed control".
- 5.78 Mosslands are almost entirely within statutorily protected sites, and it is therefore unlikely that these habitat types are threatened by typical development pressure. However, as discussed, other activities such as peat extraction and agricultural improvements and intensification, especially implementation of drainage regimes, have dramatically reduced and degraded the Borough and the regions habitats. Where attempts to convert mossland to agricultural uses, often arable, are unsuccessful, the result is usually eutrophication which prevents re-establishment of bog species, which are adapted to nutrient poor environments.

- 5.79 Land fill and other tipping activities still affect mossland sites. Antisocial behaviours such as arson can lead to uncontrolled fires that result in slow burning of the deep peat as well as destruction and damage of the above ground vegetations. Recreational pressures in open areas of mosslands can result in disturbance and damage to vegetation, often resulting in community changes. Animals supported by the mosslands habitats can often suffer disturbance and exclusion through such activities. Lack of management allows scrub encroachment which results in shading and lowering of the water table.
- 5.80 The substantial losses and degradation of the mossland habitats have left the remaining fragments isolated. This makes the mosslands vulnerable to further degradation. Hydrological changes in the small islands left may reduce the habitats ability to retain and/or maintain water levels. Historically, associated habitats such as marsh, reedbed and standing waters, would have buffered mosslands against such water level changes. However, these habitats too have suffered losses through land take and degradation through agricultural intensification.
- 5.81 Climate changes may result in more prolonged warmer drier periods but may also lead to storm surges and flash flooding. These could all adversely affect the mossland habitats, leading to the decline or local extinction of rare or specialist species. This would further isolate communities within fragmented landscapes with minimal opportunity for migration.
- 5.82 Air quality is an ongoing problem for mosslands and other habitats depending on low nutrient status. While trends for atmospheric nitrates are declining, levels remain substantially above those considered suitable for oligotrophic vegetation development.
- 5.83 A positive position is that the Mosslands of Wigan are included in the non-statutory Mosslands Strategy and the more recent Mossland project being undertaken jointly in Wigan, Salford and Warrington and for which a Vision has been produced. Regional initiatives are also becoming established which recognise and promote both the inherent value and also the functional importance of the Mosslands. One such example is the Carbon Compensation scheme set up by the Wildlife Trust for Lancashire, Manchester and North Merseyside which seeks to acquire, restore and maintain the Mosslands in the North West through government and corporate funding and offsetting schemes.

Grasslands

Local Definition and Status

- 5.84 At present, it is assumed that areas of acid and calcareous grassland surveyed within Wigan are unlikely to fit the UK priority habitat definitions, as they have developed largely on post-industrial sites, notably spoil heaps, disused quarries and railway banks. Therefore they are not strictly "unimproved" grassland.

However, they can be considered to be the urban counterparts to such habitats, and are similar in terms of species composition and importance and have significance as a habitat type within Wigan.

- 5.85 Such grasslands are often included within the regional definition for *Grasslands of high ecological value on areas of previously developed land*, but are generally unlikely to qualify as the national priority habitat *Open mosaic habitats on previously developed land*, as this latter definition is dependent on mixtures of sparse swards and significant areas of bare ground.
- 5.86 Calcareous grasslands are quite rare in Wigan and they are unlikely to be national BAP priority habitats as they are largely semi-improved, a result of industrial and mining activities. They are considered to qualify as the regional priority habitat.
- 5.87 Lowland acid grasslands, although more abundant than calcareous are similarly unlikely to qualify for the national priority habitat due to their semi-improved character. These grasslands too will be included within regional priority habitat.
- 5.88 There is no national priority habitat for marshy grassland, but these grasslands are included in the regional priority habitat.
- 5.89 Lowland Meadows are included under a national habitat priority. They would also be classed as species rich unimproved neutral grassland, a regional priority habitat.

Local Description

- 5.90 The small areas of calcareous grassland noted in Wigan generally occur within sites of developed land, as a result of the tipping of industrial by-products, or mining and can therefore largely included within the definition of Grasslands of High Ecological Value on Areas of Previously Developed Land priority habitat. Often these calcareous areas occur as mosaics with other priority habitats, for example at Horrocks Flash, where areas of boiler ash and lime dumps support a range of both calcifuge and calcicole species including a range of mosses and liverworts.
- 5.91 Lowland acid grassland tends to occur in relatively small isolated patches on areas of tipped colliery spoil throughout Wigan, as well as forming mosaics with more established areas of heathland. They are therefore not always considered to be 'natural', but rather an urban equivalent of this priority habitat type. The species recorded include those found within the heathland areas (described below), though with heather comprising less than 25% of the vegetation composition according to the national habitat description.
- 5.92 Typically, mat grass (*Nardus stricta*) and wavy-hair grass (*Deschampsia flexuosa*) form a large component of the sward, with other species occurring in variable quantities. Early hair-grass (*Aira praecox*) is very occasionally present. This habitat often forms a mosaic with neutral grass swards, and is in danger of succession to neutral grassland and scrub.
- 5.93 Marsh gentian is known to be present within acid grassland over peat at Highfield Moss SSSI. According to the citation, this species is nationally scarce in Britain and

the site is considered to be a major stronghold in northwest England for marsh gentian.

- 5.94 Little of the acid grassland in Wigan can be considered as species-rich (in excess of 25 species per 4m² according to the national priority habitat definition statement for this habitat). The Greater Manchester BAP definition for this habitat (species-rich acid grassland) requires that areas of 'lowland acid grassland should be relatively species rich examples' to qualify.
- 5.95 However, it must be noted that flowering species such as harebell (*Campanula rotundifolia*), grasses and sedges may have been under-recorded in this study due to the surveys being conducted relatively late in the season. Additionally, species of mosses and lichen can often comprise much of the diversity of a site, and these often require more specialist botanical knowledge for accurate identification of all species present.

Figure 27: Acid grassland showing typical mat grass dominated sward



- 5.96 The lowland meadows habitat definition is taken to include most forms of unimproved neutral grassland found in the enclosed lowland landscapes of the UK, including pastures, churchyards, road verges and recreational sites that tend to be cut or mown. Within Wigan, this habitat type is most likely to occur along road verges and within designated wildlife sites.

- 5.97 Though cited as one of the common locations for unimproved grassland within Greater Manchester, the majority of churchyards in Wigan appear to harbour little in the way of remnant diverse habitat. No indicator species listed in the Greater Manchester BAP definition for this habitat type were recorded during field survey, though this may be due to seasonality of flowering.
- 5.98 SBI citations frequently state that 'species-rich neutral grassland' is present on site; however, the species-lists given for such areas are generally composed of common plants such as black knapweed (*Centaurea nigra*), tufted vetch (*Vicia cracca*), common centaury (*Centaureum erythraea*), common spotted-orchid (*Dactylorhiza fuschii*), eyebright (*Euphrasia nemorosa*), oxeye daisy (*Leucanthemum vulgare*), meadow vetchling (*Lathyrus pratensis*), ribwort plantain (*Plantago lanceolata*), bird's-foot-trefoil (*Lotus corniculatus*), and rough hawkbit (*Leontodon hispidus*).
- 5.99 For example, the citation for Ackhurst Lane Sand Workings SBI describes an 'unusual and species-rich, neutral flora', though all species listed are all relatively common. Therefore, it is uncertain as to whether these areas would be included under the accepted definition of the priority habitat. Species recorded during field survey include relatively common species such as bladder campion (*Silene vulgaris*), common toadflax (*Linaria vulgaris*) and viper's bugloss (*Echium vulgare*).

Figure 28: Meadow grasslands at Haigh



Photo courtesy of Graham Workman

- 5.100 Calico Meadow SBI is known to be traditionally managed as a hay meadow, a rare habitat in Greater Manchester. Herbs include abundant yellow rattle (*Rhinanthus minor*) together with ragged-robin (*Lychnis flos-cuculi*), pignut (*Conopodium*

majus), devil's-bit scabious (*Succisa pratensis*), southern marsh-orchid and common spotted orchid

- 5.101 Whilst marsh is a common habitat within Wigan, relatively little of it is likely to qualify as the priority habitat. The priority habitat definition states that such habitats should include 'notable species', but could also include communities of more common sedges and rushes, if these are present in sufficiently diverse communities'. No notable species have been recorded during field surveys, though again this may be due to the late survey period.
- 5.102 However, diverse communities of sedges and rushes are likely to be present within Wigan. For example, the citation for Orrell Brick Works SBI states that 'glaucous (*Carex flacca*), common (*C. nigra*), hairy (*C. hirta*), oval (*C. ovalis*) and short stalked yellow sedges (*C. viridula*) are abundant and common cotton grass occurs locally. There are exceptional populations of common spotted, northern marsh and early marsh orchids and hybrids.' Other citations which describe species-rich marsh include Bickershaw Colliery, and Marsh & Reedbeds at Shakerley SBI, the latter containing an abundance of sedges (*Carex* species) and several species of marsh-orchid (*Dactylorhiza* species).
- 5.103 Several sites around Wigan, which have been developed, now consist of large areas of bare ground, often comprised of substrates with extreme pH levels. These include: colliery spoil (giving rise to acidic conditions), industrial by-products such as boiler ash and blast furnace slag (substrates deficient in nitrogen, and/or calcium-rich) and dry gravel and sand pits (which are water deficient). These habitats often include early successional stages of plant communities, as well as areas with more-developed open grasslands with a diversity of herbs and patches of bare ground and scrub. These areas make suitable candidates for definition as Grasslands of High Ecological Value on Areas of Previously Developed Land priority habitat.

Figure 29: example of grasslands forming on previously developed land (former coal spoil)



- 5.104 Potential examples of ecologically rich habitat types are found near to Ince Moss, around the area of Shevington and near to Higher Green, Astley. Frequently, ex-industrial sites show potential for this priority habitat, but at present are largely comprised of bare substrate in the very early stages of succession. Also, access difficulties are often an impediment to survey. The priority habitat definition for this habitat type states that 'grasslands fitting this priority type cannot be properly defined using botanical criteria alone', and that surveys of invertebrates will likely be required to confirm the presence of the priority habitat.
- 5.105 However, areas that show potential often support a mix of acid, neutral and calcareous elements, large areas of bare ground, and frequent birch and willow scrub. Acid areas often support species listed within the descriptions for acid grassland and heathland priority habitat type (see below). Within the more calcareous areas, fairy flax (*Linum catharticum*), wild parsnip (*Pastinaca sativa*), salad burnet (*Sanguisorba minor*), common quaking grass (*Briza media*), yellow-wort (*Blackstonia perfoliata*), kidney vetch (*Anthyllis vulneraria*) and bee orchid (*Ophrys apifera*) are all typical species found. Calcareous mosses include *Distichium capillaceum* recorded at Hindley Deep Pits, which is considered rare in Greater Manchester.

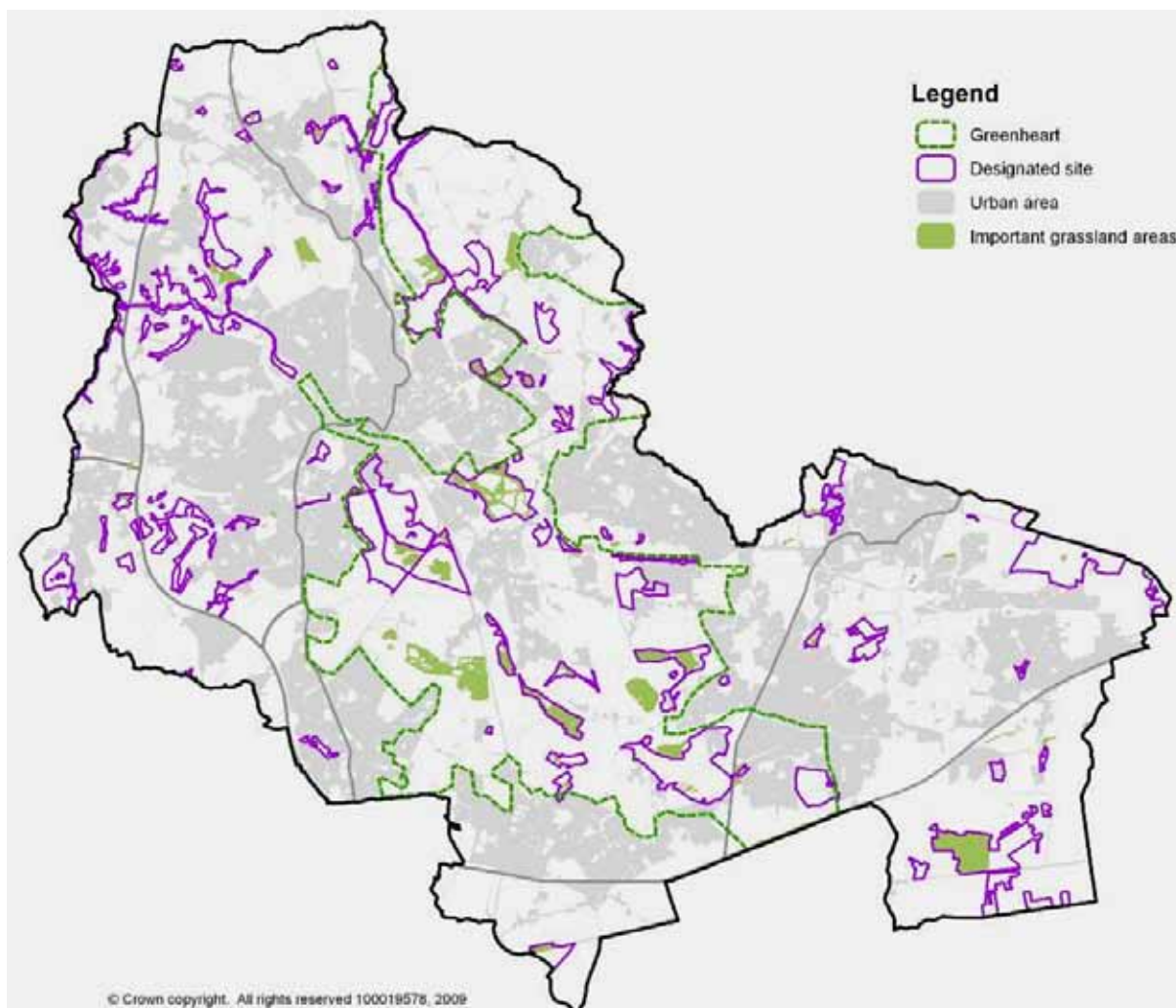
Location and Extent

- 5.106 All areas of grassland considered to be ecologically important within Wigan have been mapped, although many areas are unlikely to qualify as UK priority habitats. These areas, as discussed above, have been identified through review of SBI citations and consultation with the Wigan Biodiversity Partnership. There are approximately 365ha of important grasslands that have been identified during this study, many of which are mosaics of different grassland types, or of grassland with associated habitats such as scrub, heath or woodland.
- 5.107 Mosaic habitats incorporating important grasslands cover 209ha and accounts for 57% of Wigan's grasslands. Mosaic grasslands are widespread across the Borough, with the most extensive areas found at Bedford Moss (mosaic of acid grassland and bog with some woodland and scrub), at Abram Flashes, paralleling the canal (wet grazing marsh and species poor neutral grasslands) and also at Amberswood Common (a mosaic of several different grasslands including marshy grasslands, although most are species poor).
- 5.108 After mosaic grasslands, the next most abundant grassland resource, with nearly 85ha, are those which do not currently qualify as priority habitats, but which have great potential with correct management and/or maturity to become priority grasslands. Examples of such grasslands occur at Bryn Gates (a mosaic of neutral

grassland and woodland planting with importance for invertebrates and birds), former mounds at Bickershaw Colliery (neutral and marshy grassland mosaics on previously developed land) at also at Haigh County Park (an interesting albeit sown grassland mix surrounding woodland plantation blocks).

- 5.109 Acid grassland covers approximately 11ha in Wigan, although about 137ha of mosaic habitats were noted to include acid grassland. Precise areas of specific grassland types were not recorded or measurable within these mosaics. Similarly, marshy grassland, of which 4ha were mapped, is supplemented by nearly 183ha mosaic habitats containing marshy grassland or bog.
- 5.110 Wigan's rarest non-mosaic grasslands are neutral and calcareous grasslands, each covering only about 1.5ha. However, about 21ha of the mosaic habitats include calcareous grasslands and nearly 104ha were recorded with neutral grasslands.
- 5.111 This complexity in the grassland habitats was a contributing factor to the inclusion of all grasslands under the umbrella of important grasslands. This is a similar approach to the new regional grasslands BAP, which combines the three formerly separate BAPs for acid, marshy and unimproved neutral grasslands with the new category of grasslands of high ecological value on previously developed land. The BAP recognises that the threats facing all grassland habitats are similar, as are the actions required to maintain and preserve the habitat resource. The distribution of all Wigan's important grassland identified is presented in *Figure 30*, below.

Figure 30: Important grassland areas in Wigan



- 5.112 Reflecting Wigan's industrial past, there are approximately 50ha of diverse grassland swards established or establishing on previously developed land.
- 5.113 In addition to the important grasslands identified above, there is a significant resource of other grasslands, such as grasslands lying in agricultural use and those found in areas of parks and sports areas. These are largely improved species poor grasslands, of little botanical value, but which provide additional open spaces and potential linkages between those remaining areas of grasslands with greater ecological value.
- 5.114 Grasslands within designated sites were mapped to total about 216ha. This comprises nearly 180ha of mosaic habitat and 23ha of open mosaic grassland on previously developed land.
- 5.115 Acid grasslands within Wigan's designated sites total just over 7ha. This compares poorly to the 42ha noted in SBI citations. However, citations do not provide mapped extents of habitats and consequently many grassland types are necessarily grouped into mosaics within a wider area. Acid grasslands within such mosaics comprise nearly 70ha within the designated sites of Wigan.
- 5.116 Similarly, marshy grasslands total only 3.4ha but are supplemented by 183ha of mosaic habitats that contain substantial marshy grassland areas. Mapped calcareous grasslands totalled less than 1ha within designated sites, but this is supplemented by 19ha within mosaic habitats. Neutral grasslands cover approximately 1ha within designated sites, but a further 82ha of mosaic habitats contain neutral grasslands, most of which if not species rich have a diverse sward with potential to become species-rich. Coverage estimated for species rich neutral grasslands within SBI citations reaches 41ha, with a further 268ha of species poor neutral grassland.
- 5.117 As may be expected, the area of grasslands which are not considered of sufficient quality to qualify as priority habitats, but which have been identified in this review to have potential is low within the designated sites, being only 1ha.
- 5.118 The Greenheart contains 247ha of the Borough's important grasslands, of which 84ha were identified as having significant potential to become priority habitat types with correct management. This represents nearly a quarter of the Greenheart's important grassland resource and highlights the significant contribution that targeted efforts within the Greenheart could make to improving the Borough's biodiversity interest.

Trends

- 5.119 There is limited information regarding trends for important grasslands. The new GMBAP identifies a total of 4,400ha neutral grasslands, 6,800 acid grasslands (unimproved and semi-improved) and 2460ha marshy grasslands within Greater Manchester, totalling 11,460ha. The latter two habitats (acid grassland and marshy grassland) are considered to primarily cover the higher altitudes in Rochdale, such that other districts in Greater Manchester have only small isolated fragments. This correctly describes the situation for Wigan's marshes and acid grasslands.

- 5.120 Traditional hay meadows are extremely rare in Greater Manchester and most examples comprise of only one or two fields. Wigan is no exception, with only one mapped area of hay meadow identified covering less than 1ha, the classification for which is derived from the SBI citation. Management is unknown at the site.
- 5.121 Improved grasslands are the most extensive of grassland types in Wigan and are likely to be increasing. Most improved grasslands are managed for recreational or amenity use or are part of the agricultural landscape, both land uses which are discussed in more detail below. These grasslands are not likely to have biodiversity value for their botanical composition, but may support biodiversity species such as farmland bird species.

Threats & Vulnerabilities

- 5.122 Intensification and lack of management contribute to the impoverishment of species diversity in many grasslands. Changes in drainage regimes, usually associated with agricultural improvement and, now more commonly, transition to horseycultural uses result in additional losses of diversity and also changes to community compositions.
- 5.123 Over-grazing and lack of grazing can both be detrimental to species diversity in grasslands. Over grazing can prevent sward establishment while lack of grazing can allow coarse species to dominate the sward. Choice of grazing stock can also be highly influential upon a grassland's composition, as certain livestock species can be significantly more selective than others.
- 5.124 Changes in land use and land take for developments result in habitat loss and fragmentation. Changes in management, often associated with proximity to new developments also degrade diverse habitats as they are "tidied" through intensive management to make the open spaces more aesthetically acceptable or useful for recreational use.
- 5.125 Inappropriate tree planting or landscaping schemes can put grassland habitats at risk.
- 5.126 Climate change may result in longer growing seasons, requiring prolonged management activities and leading to increased disturbance of species (and, possibly, increased management costs).

Heath

Local Definition and Status

- 5.127 Heath occurs on mineralised soils and shallow peat deposits, generally around 0.5m deep or less. Vegetation is characterised by at least 25% canopy cover of shrub species dominated by ericaceous species and dwarf gorses. Lowland heathland (below 300m, although in more northerly areas this limit may be lower) is a national priority habitat. All types of heath occurring in Wigan will fall into this category.

- 5.128 Heath is generally a dynamic habitat undergoing successional changes that can allow multiple stages from bare ground, to open grassy areas to mature dense heath to co-exist within one site, providing the site is sufficiently viable.
- 5.129 Heath supports a characteristic range of other species, being particularly important for birds, lichens and bryophytes, reptiles and invertebrates.

Local Description

- 5.130 Lowland heathland occurs in generally small and isolated patches throughout Wigan, commonly colonising old colliery spoil sites as an element of mosaic with acid grassland, often amongst patches of bare ground. Some more-established heathland also occurs on older worked sites, and within mosslands such as Highfield Moss SSSI.

Figure 31: Heath habitat at Forshaw's Tip (Hindley)



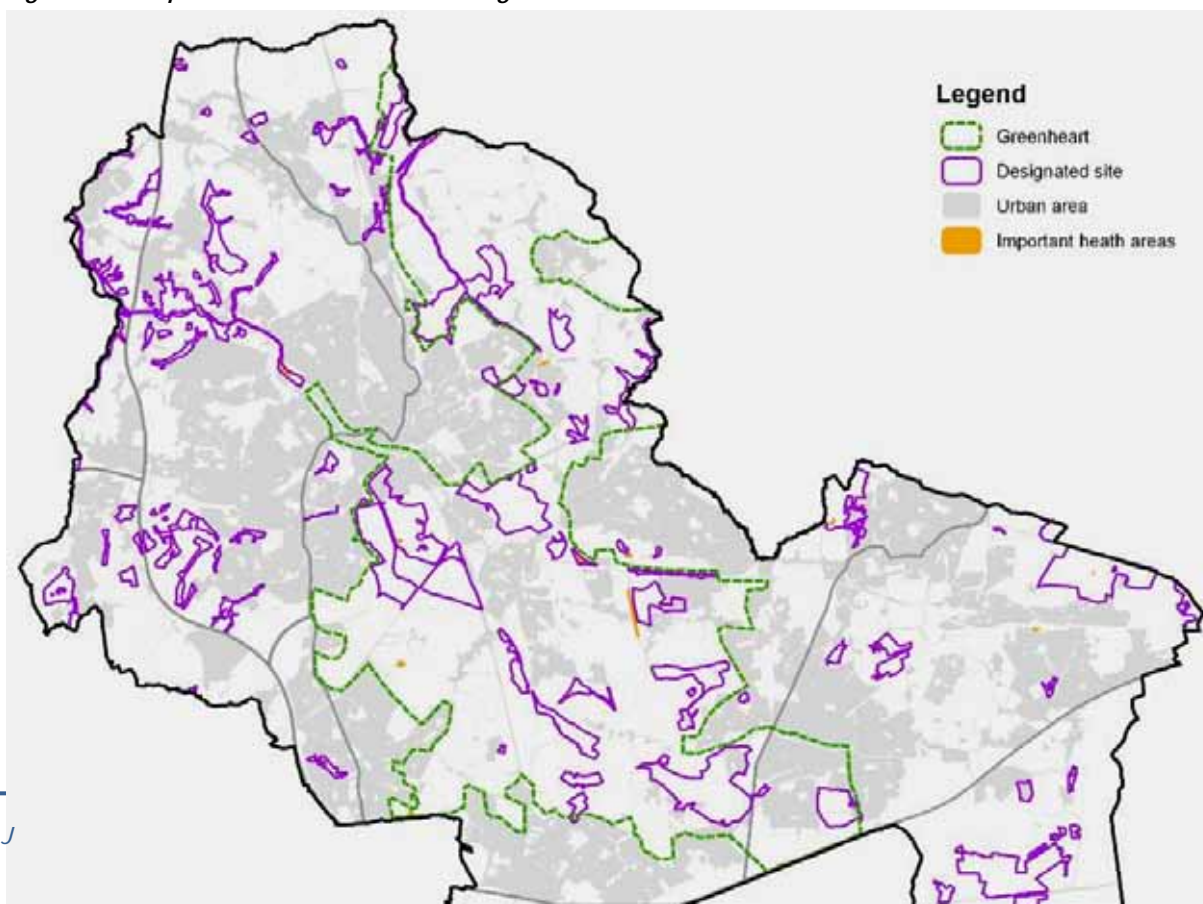
- 5.131 In Wigan, this habitat is characterised by dwarf shrubs, most notably heather, as well as very infrequent crowberry (*Empetrum nigrum*) and cross-leaved heath (*Erica tetralix*). Heathland grasses commonly include wavy hair-grass, common bent (*Agrostis capillaris*), mat grass, heath grass (*Danthonia decumbens*), purple moor-grass, sheep's fescue (*Festuca ovina*) and red fescue (*F. rubra*). Moss flora

tends to include species of *Hypnum*, as well as *Polytrichum commune*, *Polytrichum juniperinum*, *Campylopus introflexus*, *Rhytidiadelphus squarrosus* and Sphagnum mosses in wetter areas. Herbs include common cat's-ear (*Hypochaeris radicata*), autumn hawkbit (*Leontodon autumnalis*) sheep's sorrel (*Rumex acetosella*) and tormentil (*Potentilla erecta*). Lichens are often present, including *Cladonia* sp. and *Peltigera* sp). Rushes and sedges often occur within the sward, most frequently soft rush and wood-rushes (*Luzula* species).

Location and Extent

- 5.132 Heath is a rare habitat in Wigan and is found in small isolated fragments, as illustrated in *Figure 32*. Only 7ha of heath was identified in Wigan in this review, approximately 1.6ha of which is mosaic habitat with acid grassland.
- 5.133 The fragments of heath mapped in Wigan are generally small, the average size being less than 0.5ha. The largest continuous area of heath mapped, just over 2ha, is a mosaic habitat with woodland occurring along the former railway corridor running parallel to the west boundary of Bickershaw Colliery. The next most extensive area, at about 1ha, is also a mosaic habitat, co-occurring with acid grassland.
- 5.134 Ashton Heath was noted as having the largest area of lowland heathland in a 12 year DEFRA funded research project looking at the biota of Common Lands. However, the area of continuous heath at this site was mapped only at 0.4ha, although much of the commons has undergone a restoration

Figure 32: Important heath areas in Wigan



- 5.135 Nearly 3ha of Wigan's heath occurs within designated sites, primarily at Gibfield Park, Platt Bridge Heath, Pearson's Flash, Martland Heath and Marshes and Ponds North of Cleworth Hall (South). Areas not within the designated sites occur at Bickershaw, Tyldesley, Hindley, near Top Lock Reservoir and at Three Sisters (although this latter area is being considered for designation as a local nature reserve). The Greenheart contains approximately 4.5ha, or 63%, of the Borough's heath resources.

Trends

- 5.136 There is no data currently available to determine trends for heath occurring in Wigan, although it is expected that local trends mirror the trends identified regionally and nationally. The North West Biodiversity Audit identifies that lowland heath has become significantly fragmented in the region, particularly around population centres. Nationally there is estimated to be approximately 58000ha of lowland heath surviving, representing 20% of the global habitat resource. It is calculated that 56% of the Heathland surviving around the 1940's has since been destroyed.

Threats & Vulnerabilities

- 5.137 Wigan's heath areas are small and fragmented. Fragmentation of heathland habitats results from land take by development and management changes removing traditional management techniques. As fragmentation results in smaller and more isolated stands, they become more vulnerable to damage, degradation and loss of species.
- 5.138 Wigan's heaths are generally under threat of eutrophication or shading, with competitive neutral grasses such as cock's-foot (*Dactylis glomerata*) encroaching. As a result of their urban location, these areas are usually not grazed and many have no significant management input. Bramble (*Rubus fruticosus*) and birch (*Betula* spp.) scrub is encroaching in some areas (e.g. to the north of Kirkless Lane).
- 5.139 Recreational pressure also leads to both erosion and compaction of soil and disturbance to vegetation. Animals supported by heath subject to human disturbance can suffer localised exclusions. Unmanaged access can also result in antisocial events such as tipping and arson, the latter of which can result in

uncontrolled burning. In small fragments of heath, this could result in complete destruction of the habitat from an area.

- 5.140 Climate changes resulting in more prolonged warmer drier periods could result in an increased of uncontrolled fires. At the other end of the spectrum, storm surges and severe flooding could result in changes to the soil conditions (by erosion or sediment loading, for example) and alterations to the vegetation community composition.

Woodland and Scrub

Local Definition and Status

- 5.141 There are six categories of national priority woodlands, some of which may potentially occur in Wigan. The six woodland types are upland oakwood, lowland beech and yew woodlands, upland mixed ash woodlands, wet woodlands, native pine woods and wood pasture and parkland. To confirm their priority status requires specific information on species composition, management and soil conditions, data which has been largely unavailable in this study. Some descriptive information is available from which inferences may be made on the character of woodland, but ultimately further survey would be required to confidently determine whether the woods of Wigan fall within one or more of the national priority classifications.
- 5.142 In Wigan the majority of the woodland most resembles lowland deciduous woodland, a national priority habitat. There are also examples of wet woodland, traditional orchard and upland oak woodland. The latter woodland type, as noted at section 4 is not technically classed as upland given that the Borough lies entirely within the Urban Mersey Basin and no part rises sufficiently to be considered upland habitat. However, NVC data at Borsdane Wood most closely resembles an upland oak woodland habitat (W11) and this habitat has accordingly been included as present in Wigan.
- 5.143 Lowland deciduous woodlands commonly occur on a range of free draining soils. Oak *Quercus* and birch *Betula* species tend to dominate with ash *Fraxinus excelsior*, alder *Alnus glutinosa* and wych elm *Ulmus glabra* frequently occurring. A woody understorey will commonly include hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, holly *Ilex aquifolium*, rowan *Sorbus aucuparia*, although species composition will alter depending on soil conditions.
- 5.144 Wet woodland in Wigan is also likely to be a national priority habitat type. Wet woodlands are as diverse as woodlands occurring on dry substrate, although most commonly they occur over peaty soils. Common species dominating are willows such as grey *Salix cinerea* and alder but other willow species, ash and silver birch *Betula pendula* can also be frequent in the canopy.

- 5.145 All native woodlands, including lowland broadleaved, wet and upland woodlands are a regional priority habitat.

Local Description

- 5.146 Many native woodlands within Wigan are of great importance in terms of their wildlife value. The Lowland mixed deciduous woodland resource within Wigan contains several SBI ancient woodlands, including Dean, John Pit, Crooke, Borsdane, Otter's Croft, Porter's, Crooke and Greave Woods, as well as parts of Martland's Wood, Barton Clough, Big Wood and Callico & Hullet Hole Woods.

Figure 33: Borsdane Wood



Photo courtesy of Wigan Council

Figure 34: Dean Wood



Photo courtesy of Wigan Council

- 5.147 The canopies of much of this woodland are dominated by pedunculate oak (*Quercus robur*), sycamore (*Acer pseudoplatanus*) and ash (*Fraxinus excelsior*), with birch (*Betula* species), willows (*Salix* species), alder (*Alnus glutinosa*) and beech (*Fagus sylvatica*) frequently present, as well as a variety of understorey species. There tends to be a good regeneration of oak and other native species, and fallen deadwood is often cited to be plentiful. Potential Ancient Woodland Indicator species found within the ground flora include pignut, wood melick (*Melica uniflora*), bluebell (*Hyacinthoides non-scripta*), wood anemone (*Anemone nemorosa*) and opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*).
- 5.148 This Priority Habitat tends to support a wide diversity of birds, invertebrates, ferns, mosses and flowering plants, and forms an important element of the borough's landscape. Invasive species such as Himalayan balsam (*Impatiens glandulifera*), Japanese knotweed (*Fallopia japonica*) and rhododendron (*Rhododendron ponticum*) are often described in SBI citations as encroaching into woodland habitat.
- 5.149 Wet woodland is often associated with wetlands within the Borough, and is composed of species such as crack willow (*Salix fragilis*), osier (*S. viminalis*), white willow (*S. alba*), goat willow (*S. caprea*), grey willow (*S. cinerea*), alder and elder (*Sambucus nigra*). It is often found in SBIs in conjunction with other woodland priority habitat types, and is therefore difficult to distinguish through interpretation of aerial photos. Typical ground flora often includes marsh marigold (*Caltha palustris*), lesser spearwort (*Ranunculus flammula*), tufted hair-grass (*Deschampsia cespitosa*), meadowsweet (*Filipendula ulmaria*), large bittercress (*Cardamine amara*) hemlock water dropwort (*Oenanthe crocata*) and other wetland plants.

Figure 35: Wet woodland at Low Hall Park



Photo courtesy of Graham Workman

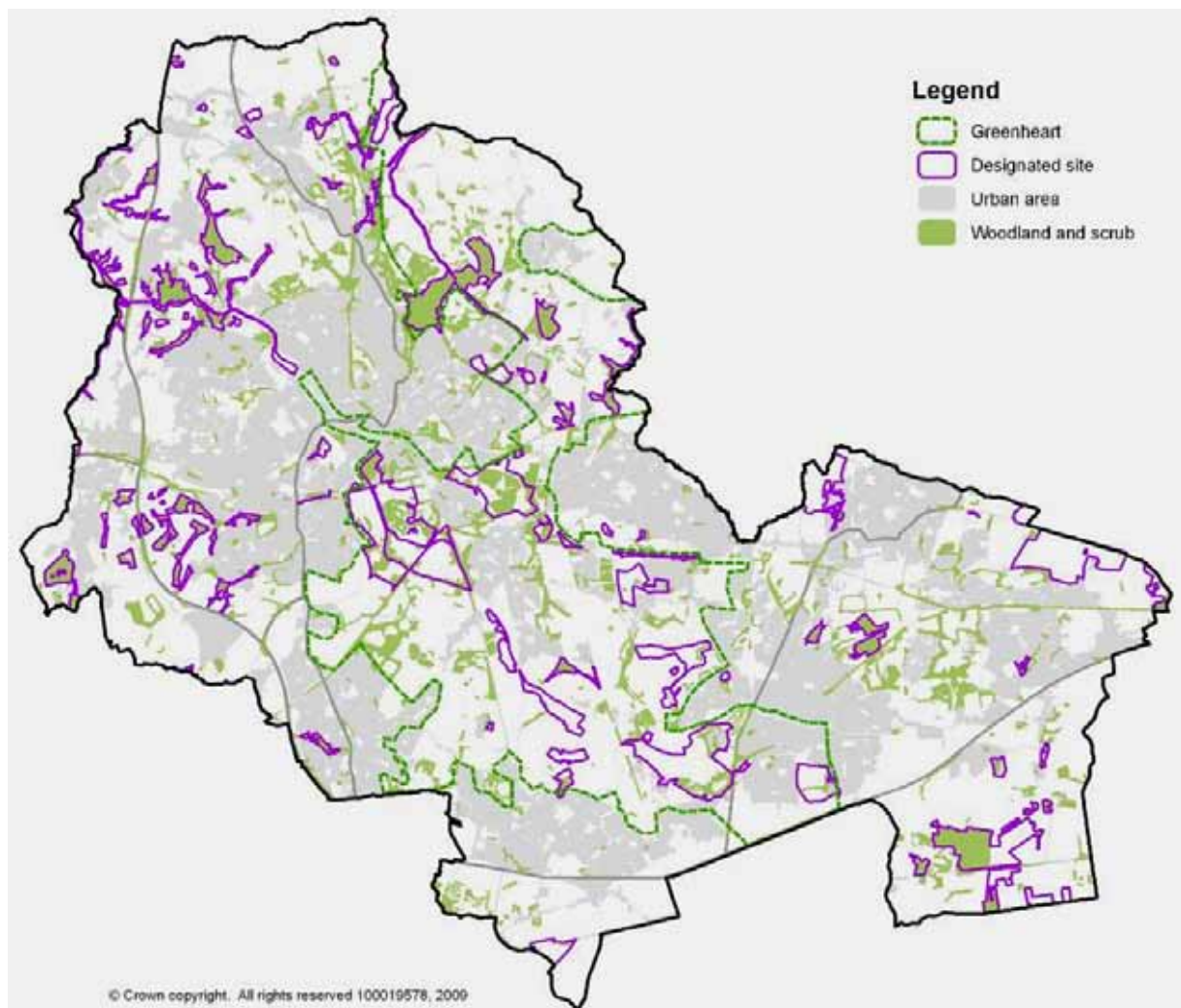
- 5.150 There are a very few orchards in Wigan, with only a couple known to be present within the boundaries of SBIs. One such orchard, to the north of Orrell Water Park, consists of old apple, pear, damson and cherry trees with some oak sycamore, alder, downy birch (*Betula pubescens*) and horse chestnut (*Aesculus hippocastanum*) and an understorey of hawthorn (*Crataegus monogyna*) with holly (*Ilex aquifolium*), elder, rhododendron and regenerating trees. The SBI citation describes this site - 'abundant standing and fallen dead wood. Common polypody (*Polypodium vulgare*) occurs on oak and both male (*Dryopteris filix-mas*) and broad buckler ferns (*D. dilatata*) are also present. Ramsons (*Allium ursinum*) and lesser celandine (*Ranunculus ficaria*) have been introduced. Other species include bramble, ivy (*Hedera helix*), honeysuckle (*Lonicera periclymenum*), gooseberry (*Ribes uva-crispa*) and wood avens (*Geum urbanum*). Fungi including Judas's-ear (*Auricularia auricula-judae*) and candlesnuff fungus (*Xylaria hypoxylon*) are abundant on trees, dead wood and on the ground'. Willow tit, a regional priority species, may breed at this site.
- 5.151 Astley Hospital SBI also contains a former orchard which has a few apple trees remaining. The description provided by the SBI citation states that 'woodland has developed around the orchard with ash, sycamore, sweet chestnut (*Castanea sativa*) and birch. A sparse understorey of hawthorn, holly and the invasive rhododendron is present. The ground flora is dominated by grasses such as Yorkshire-fog (*Holcus lanatus*) and cocksfoot, particularly where the canopy is open'.

Location and Extent

- 5.152 Woodlands and areas of dense continuous scrub associated with woodlands occur extensively across the Borough, as *Figure 36* illustrates. The total area of woodland (and dense scrub) is 1,797ha, representing 10% of the entire area of the Borough.
- 5.153 Woodlands range from ancient semi-natural broadleaved woodland to mixed woodlands and plantations to coniferous plantations. Although the latter categories are unlikely to represent priority habitat types in Wigan, they have been included because they may support priority species. For example, Wigan is the only district in Greater Manchester known to support colonies of red squirrel and this species is dependent on conifer woodlands.

- 5.154 There are approximately 121ha of woodland registered as ancient semi-natural woodland in Wigan, 113ha of which is located in designated sites. Ancient woodlands include lowland broadleaved and wet woodlands.
- 5.155 In addition to the ancient woodlands, broadleaved woodland covers approximately 434ha of Wigan, with a further 502ha of broadleaved woodland and scrub. Designated sites contain 137ha of Wigan's broadleaved woodland and an additional 115ha of broadleaved woodland and scrub.
- 5.156 Approximately 138ha of woodland has been mapped as wet woodland, although 113ha of this occurs in mosaic with other habitats such as lowland broadleaved woodland, marsh and bog. The majority of wet woodlands, totalling 35ha, occurs within designated sites.
- 5.157 Remaining woodlands in Wigan total about 602ha, comprising approximately 195ha mixed woodland, 41ha conifer, 88ha mature plantation with a further 127ha young plantation, 92ha of other woodland canopies for which data is unknown and about 60ha of dense continuous scrub. About 196ha of these woodlands occur within designated sites, although young plantations and trees in designated sites are very limited (only 1ha) as may be expected.

Figure 36: Distribution of woodland and scrub in Wigan



- 5.158 The Greenheart contains about 709ha woodlands, comprising predominantly of broadleaved woodland (113ha), broadleaved woodland and scrub (214ha) and wet woodland (112ha). Ancient woodland in the Greenheart covers about 31ha, with mixed woodland extending over 81ha and mature plantation covering 71ha. The Greenheart contains a further 51ha young plantation, 24ha dense woody scrub and 12ha of conifer woodland.
- 5.159 Wigan Council's land holdings contain 696ha of woodlands, again comprising mainly broadleaved woodland (158ha) and broadleaved woodland and scrub (184ha). Wet woodland extends to 119ha of the assets, while mixed woodland covers 62ha. Plantations cover 68ha of the Council's land holdings. Only 14ha ancient woodland is included within the Council land.

Trends

- 5.160 There is little data available for woodland trends in Wigan. The Wigan Nature Conservation Strategy dating 1991 stated that woodland comprised 6% of the Borough, although it is not clear what composition of woodland this figure comprises. There would therefore seem to be an increase in woodland canopy as this review has identified approximately 10% of the Borough comprises woodland and woodland scrub. If scrub and plantation woodlands are removed from the equation, the proportion of woodland covering Wigan is 8%, which would still seem to indicate an increase in extent. However, no data was available for the historic extent of different woodland types nor their quality.
- 5.161 The NCC estimated about 250,000ha of lowland deciduous woodland in the country in the late 1980s. The area of this priority type on ancient woodland sites has declined as a result of clearance, overgrazing and replanting with non-native species, by about 30-40% over the last 50 years. Wet woodlands are widespread across the country, estimated 50-70,000ha, but most are small sites. This pattern is common in Wigan, with extensive wet woodland blocks being rare and the average woodland block (excluding mosaic sites) reaching only about 1.5ha in size. Traditional orchards are put at the rarer end of the priority habitat spectrum, with only 28,000ha mapped in England.

Threats & Vulnerabilities

- 5.162 Lack of appropriate management is a significant long-term threat to the quality of the lowland broadleaved woodland habitats. Management of woodlands has declined historically as costs have risen and the market for timber has reduced.
- 5.163 Recreational pressures can result in soil compaction and erosion of ground flora. Scrambling, off road vehicles and other recreational activities such as paintballing can result in vegetation disturbance and local species exclusions, especially bird species. Anti-social and unauthorised activities such as arson and tipping can have significantly detrimental effects on woodland.
- 5.164 Grazing, either by inappropriate introductions or levels of livestock or by deer, can reduce ground flora diversity and, if over-grazing occurs, can cause physical damage to the tree stock and their biota and prevent natural regeneration.

- 5.165 Replacement of native species with non-natives, such as conifers, or spread of invasive species such as sycamore or rhododendron, reduces the biodiversity interest of these habitats.
- 5.166 Drainage that alters water levels and eutrophication of surface waters are threats specific to wet woodlands. Climate changes are likely to affect wet woodlands more significantly, although other woodland habitats may also be affected, as water tables are altered and seasonal droughts and floods become more magnified. Extended growing seasons and warmer conditions may also result in increased spread and number of alien invasive species.

Managed Greenspace and Gardens

Local Definition and Status

- 5.167 Urban managed greenspaces are included within the GMBAP. This habitat category includes all grassland areas in an urban or semi-urban setting that are managed for their purpose but which possess wildlife value. This can incorporate playing fields, golf courses, churchyards, cemeteries, road verges, parks, allotments and private and community gardens.
- 5.168 Wood pasture and parkland is a national priority habitat type which could potentially be included within this category of managed greenspace, rather than (or possibly in addition to) woodland habitat categories. Wood pasture and parkland can have varying tree cover from a few scattered individuals to almost complete canopy.. Information regarding history of the site and management regimes is required to determine whether any pasture habitats in Wigan could fall within this category.

Local Description

- 5.169 This habitat includes amenity grassland, privately owned gardens, allotments and community gardens, town parks, outdoor sports and school playing fields, golf courses, grounds of churchyards and cemeteries and some road verges.

Figure 37: Urban managed greenspace fringing residential development



- 5.170 These managed open spaces frequently provide important reservoirs for wildlife in urban settings, and can often retain a diverse range of semi-natural habitats including woods, scrub and ponds.

Figure 38: Urban managed greenspace - road verge



Location and Extent

- 5.171 Roughly 20.5 % (3,385.36ha) of Wigan is mapped as managed greenspace, whether a park, private garden, churchyard or playing fields. Potentially, managed greenspace and gardens represents the most abundant priority habitat in the

borough. *Figure 39* summarises the composition of managed greenspaces within the Borough, and within the search areas of the Greenheart, designated sites and the Council's land assets.

- 5.172 The vast majority of this habitat comprises of gardens (63.5%), as illustrated in *Figure 40*. Outdoor sports facilities make up 19.4% of the managed greenspace in Wigan, with amenity greenspace and parks and gardens comprising 9.4% and 4.1% respectively. Churchyards and cemeteries (2.3%), allotments and community gardens (0.9%) and provision for young people (0.3%) represent the remaining habitat.

Figure 39: Composition of managed greenspace in search areas

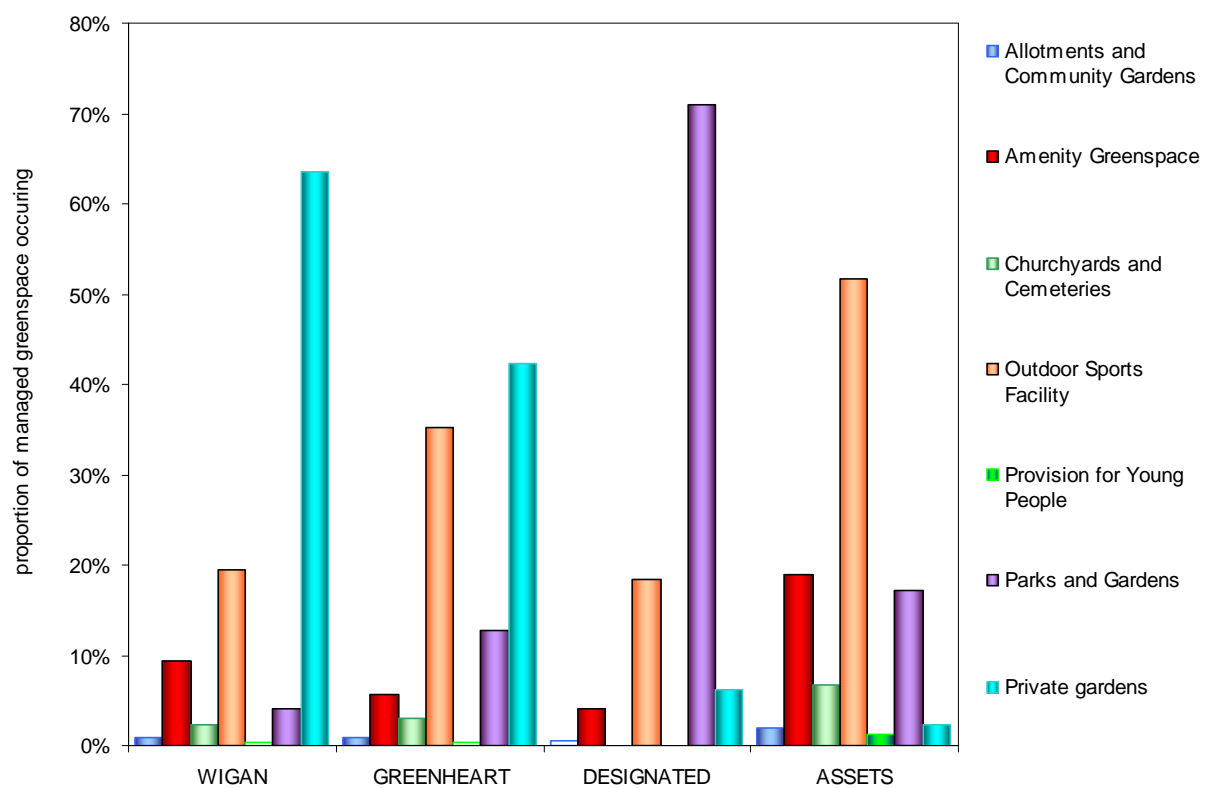
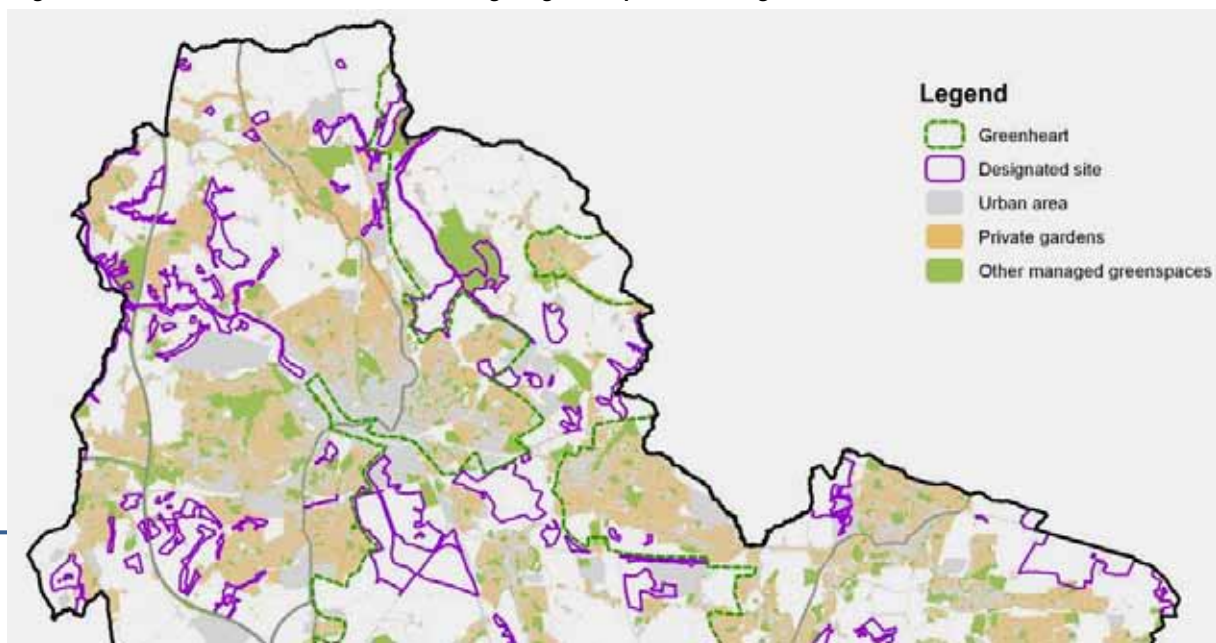


Figure 40: Distribution of urban managed greenspace in Wigan



- 5.173 No managed greenspace falls within any SAC or SSSI areas. No managed greenspace is located within 100m of any SSSI and less than 0.5ha private gardens falls within 100m of the SAC in Wigan. There are no managed greenspaces within any of the LNRs within Wigan.
- 5.174 Managed Greenspace does occur within SBIs and the majority is comprised of parks and gardens, as illustrated in the chart above. Approximately 35ha in Haigh Hall (woodland) is classed as parks and gardens. A number of golf courses contain woodland habitats that also fall within SBIs. Orrell Water Garden SBI is also mapped as parks and gardens in the Greenspace study. This category also includes habitats at Ponds North of Chellworth Hall SBI. In total, 41ha of land classed as parks and gardens, 11ha outdoor sports (golf) occur in the SBI designations. Additionally, 4ha private gardens and small areas of amenity and allotments/community gardens have been mapped within SBIs, but these are peripheral to boundaries and thus a possible mapping error.
- 5.175 The composition of managed greenspace within Wigan Council's land assets is dominated by outdoor sports provisions, covering 454ha (52%) of the land holdings. Amenity greenspaces (166ha or 19%) and parks and gardens (152ha or 17%) make up the bulk of the remaining managed greenspaces within the assets. Churchyards and cemeteries cover 7% (59ha) of the Council's landholding with small areas of allotments, provision for young people and gardens in combination representing less than 5% of the area of Wigan's land ownership. It is likely the small proportion of private gardens is a result of mapping error.

Trends

- 5.176 The GMBAP describes Greater Manchester as possessing 11,000ha amenity grassland, approximately 8.5% of the County. If all managed greenspace in Wigan is consolidated, the proportion within Wigan is significantly higher than this figure (21%), but if private gardens are removed from the equation, the figure is comparable, with 7% of Wigan comprising other managed greenspaces.

Threats & Vulnerabilities

- 5.177 Private gardens, the most abundant type of managed greenspace in Wigan and in the Greenheart, is most likely at threat of simplification, as gardens are put out solely to lawn or to paving, and also potentially to decreasing parcel sizes as areas

where garden sizes are traditionally large are redeveloped with smaller more dense plots and smaller gardens relative to each property. An opportunity is offered to combat loss of diversity from gardens as BREEAM can stimulate wildlife friendly gardens in new developments.

- 5.178 Introduction of alien species is not necessarily a threat in a garden environment, as many non-native garden varieties can be extremely beneficial for urban wildlife (especially invertebrates and birds). However, invasive species such as Japanese knotweed and competitive escapees, for example Spanish bluebells can pose a threat to botanical diversity outside of the garden.

- 5.179 Parks, sports areas and churchyards may be vulnerable to simplification of management reducing the variety of habitats and structural diversity. Uninformed management can result in the infilling of ponds or removal of scrub for example, to remove perceived health and safety risks or to present a more aesthetic and manicured environment.

- 5.180 Development pressures may also result in encroachment and degradation of fringes of greenspace areas.

- 5.181 Use of unsustainable materials in management activities can have an impact on resources outside of the managed greenspace. For example, use of peat-derived composts puts pressure on the important and valued but threatened resources of mosslands and heath.

- 5.182 Urban and semi-urban populations invariably increase the presence of domestic pets which can also have impacts on both managed greenspaces and semi-natural habitats within travelling distances. Presence of domestic pets will create species disturbance (by dogs, dog-walkers and cats), direct predation (of small mammals, herptiles and birds, in particular by cats), eutrophication (e.g. through dog fouling) and erosion and compaction (e.g. by dog walking).

- 5.183 Climate changes may bring about longer growing seasons, requiring more frequent management activities such as mowing. This will increase management costs in addition to increasing disturbance effects particularly on birds.

Agricultural (field systems)

Local Definition and Status

- 5.184 Arable field margins are a national priority habitat, generally defined as herbaceous strips usually sited on the outer 2-12m margin of the arable field or blocks, which may occasionally extend further into the field centre, which are managed specifically to provide benefits for wildlife. The arable field must be in a crop rotation which includes an arable crop, even if in certain years the field is in temporary grass, set-aside or fallow. In general terms, the physical limits of the arable field margin priority habitat are defined by the extent of any management undertaken specifically to benefit wildlife.

- 5.185 Ecologically valuable field boundaries would primarily comprise native hedgerows, defined under the national priority habitat as a boundary line of trees or shrubs over 20m long and less than 5m wide, where any gaps between the trees or shrub species are less than 20m wide, and where the composition of the hedgerow consists predominantly of 80% or more cover of at least one woody UK native species.

Local Description

- 5.186 There are several farms within Wigan which are registered under the Entry Level Stewardship scheme, particularly around the Three Sisters Recreation Area (south of the Wigan Flashes) and to the west of the borough, between Billinge and Winstanley. One of the options within this scheme is to create arable field margins to benefit wildlife, giving them the potential to qualify as the Priority Habitat Type. Although some fields would appear to have distinct field margins in aerial photographs, it is not possible to determine how these are managed. Fields next to Haigh Country Park and to the south of Lane Head are also registered as organic, though crop margins are not apparent in aerial photos. These areas would have the greatest likelihood of containing the priority arable field margins.

Figure 41: Typical agricultural landscape within Wigan



- 5.187 If present, this priority habitat would provide good foraging areas for several UK BAP farmland bird species such as grey partridge (*Perdix perdix*), and for brown hare (*Lepus europaeus*) and other small mammals. These latter would, in turn, be attractive for hunting barn owl (*Tyto alba*). Rare arable plants and insects also benefit from the provision of this habitat type. Even where priority type field margins are not present, Wigan's agricultural landscape will still provide important wildlife refuge and linkages across the Borough and will also buffer other semi-natural habitats such as woodlands and water corridors.
- 5.188 Although it is not possible to assess the current total length or area of hedgerow within the borough, the densest areas of hedged landscape within the farmed landscape can be identified by interpretation of aerial photography. This analysis has revealed that the densest field systems and by inference the greater occurrence of hedgerows as field boundaries, exists to the north of Wigan, around Aspull and to the north of Standish. Other areas of small field systems exist in the west of the Borough, across Shevington, Orrell and Longshaw.
- 5.189 Hedgerows within Wigan provide important habitat and refuge for butterflies and moths, farmland birds, bats, hedgehogs (*Erinaceus europaeus*) and woodland plant species. They may also act as wildlife corridors for many species, including reptiles and amphibians, allowing dispersal and movement between neighbouring habitats.

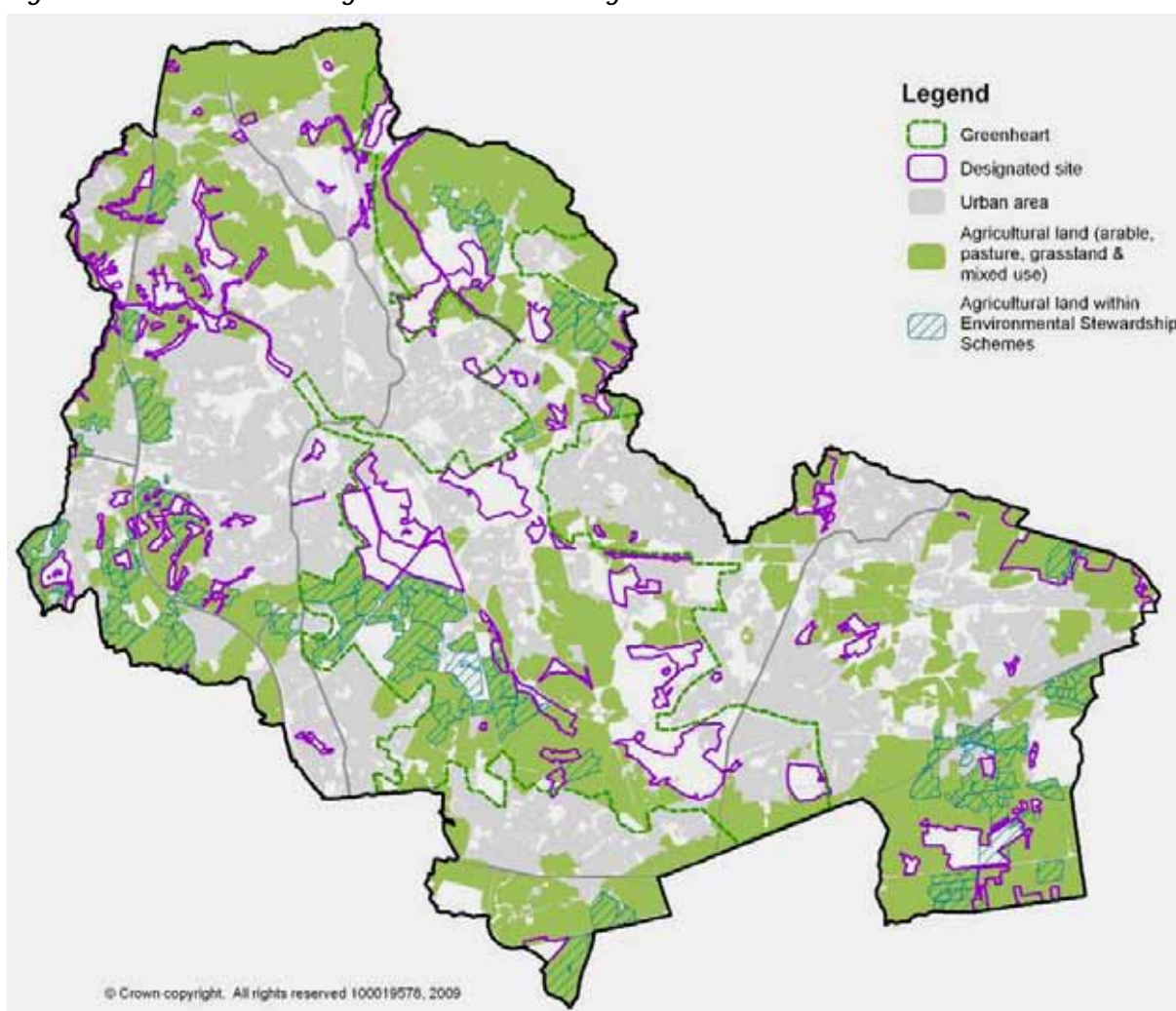
Location and Extent

- 5.190 Agricultural land covers 7142ha, representing 38% of the entire Borough. It is unlikely that the bulk of this land will be of such high ecological quality as to be considered as regional or priority habitat quality. However, the sheer quantity and widespread distribution of this habitat presents opportunities for biodiversity refuge and linkages.
- 5.191 Agricultural land in Wigan can be broadly categorised as arable (22%), pasture including livestock grazing and horseycultural uses (17%), mixed use (13%) and grasslands of unknown use (18%). The remaining agricultural lands identified in this review are of unknown agricultural use.
- 5.192 Arable field margins satisfying the criteria for the national priority habitat category would also occur in this landscape, with most potential within Environmental Stewardship Schemes. A total of 1524ha of Wigan's agricultural lands was identified as falling within these management schemes. *Figure 42* illustrates the distribution of agricultural land across Wigan, and the areas that fall within Environmental Stewardship Schemes.
- 5.193 Applying the national average of 12ha per field (as described in the UKBAP for arable field margins), it could be inferred that Wigan possesses in the region of 417km of field boundaries within its agricultural landscape and approximately 89km within Environmental Stewardship Schemes. A further assumption of an

average 6m wide field margin strip would result in approximately 53ha possible high quality field margin.

- 5.194 There is little information available relating to the mapped extent of native hedgerows or even a possible derivative of field size in Wigan. The Wigan Nature Conservation Strategy (1991) identified 300km of hedgerow in Wigan. However, the Phase 1 habitat survey provided no quantification for hedgerows and there are no quantities provided in the Wigan District Statement of the GMBAP. Agricultural lands will contain the highest densities of native hedgerows within the Borough. Highest field densities, and thus most likely the greatest quantities of hedgerows occur to the north and west of the Borough.

Figure 42: Distribution of agricultural land in Wigan



- 5.195 Whilst not all of these field systems will possess the priority field boundary habitat of native hedgerow, which must consist predominantly (i.e. 80% or more cover) of at least one woody UK native species, it has been estimated (in the new UKBAP habitat description) that 84% of countryside hedgerows in GB would be included, and this percentage could be roughly extrapolated to Wigan hedgerows (approximately 350km, applying the average field size of 12ha as above). No further analysis has been possible in this review.

- 5.196 Of total resource of agricultural land in the Borough, 33% falls within the Greenheart. This means that 43% of the Greenheart comprises land in agricultural use.
- 5.197 Coverage of agricultural land in designated sites is predictably low, with only about 4% of the total agricultural land resource, respectively. However, the quantity of agricultural land within designated sites does represent 18% of the total area of lands designated for nature conservation. So although the proportion of agricultural land which is contained within designated sites is only a small proportion of the total agricultural land in Wigan, agricultural use represents a significant proportion of the total area of land designated for nature conservation.
- 5.198 The proportion of Wigan's agricultural resource located within Wigan Council's land holdings is also predictably low, at only 3%. This currently comprises areas within the Countryside Stewardship Scheme (including lands at Wigan Flashes). The Council are currently developing a Higher Level Stewardship package for a range of Council owned sites.

Trends

- 5.199 The 1991 Nature Conservation Strategy estimated 17% of the Borough as arable land. This study can confirm only 8% of the Borough in arable use, although a further 6% is set to grass (but the use is unknown and so could include grazing) and a further 11% of the Borough is comprised of agricultural land of unknown origin. It could be inferred that at least a proportion of the agricultural grassland and unknown agricultural land is likely to be classed as arable, bringing the total percentage of the Borough comprising arable land closer to the 1991 figure. It is possible however, that a genuine decrease in arable land could have occurred over the past decade, especially as trends towards horse ownerships have increased and many fields have been put to horseycultural use, including grazing and paddocks.

Figure 43: "Horseyculture" is an increasingly common agricultural land use



- 5.200 Assuming that the total extent of agricultural land, specifically arable land, has remained stable within the Borough since 1991, there remains a trend towards a significant decrease in quality. Dramatic national declines of arable weeds, farmland birds and invertebrates have been observed in the country's landscape. Certain species of arable weed that we considered reasonably common in the North West countryside in the 19th century, such as shepherd's needle, corncockle and cornflower were considered largely extinct in the region by the late 1990s.

Threats & Vulnerabilities

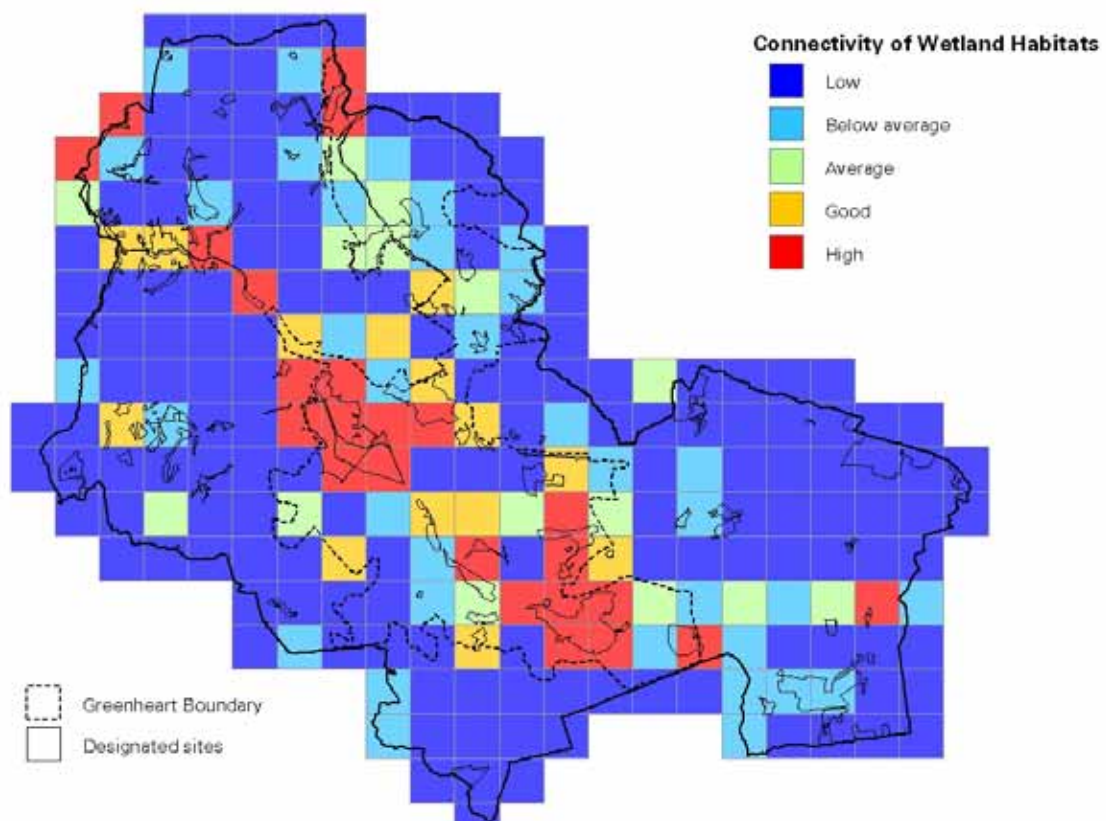
- 5.201 Intensification of farming has led to larger field sizes and subsequent loss of field boundaries and field margins. Additionally, the practice of spraying out field margins and replacing hedgerow boundaries with fence lines to maximise field size results in the loss of these important boundary and marginal habitats.
- 5.202 Intensification and improvement practices include the use of fertilisers and pesticides, which can result in surface water run-off, leaching and loss of native species, especially arable weeds and invertebrates. Drainage of agricultural land, another improvement measure, can result in changes to water levels affecting the diversity of habitats and also, potentially, may affect semi-natural habitats that might have been buffered from water level changes by the agricultural landscape.
- 5.203 Changes in farming practices, resulting in a severe reduction of spring sowing in favour of autumn sowing, has resulted in the loss of winter stubble which is an important resource for farmland birds and invertebrates.
- 5.204 Over grazing or grazing by inappropriate species can have a detrimental effect on sward diversity and subsequently on invertebrate and bird assemblages reliant on the sward for foraging or refuge.
- 5.205 Long term increases in the growing season as a result of climate change may have detrimental effects on arable fields and grasslands as disturbance by increased cropping and mowing may grow more significant, encroaching into breeding, nesting or significant foraging periods. Another reflection of climate change is the shift from hay making to silage production, resulting in significant ecological impoverishment of the grasslands.

6.0 KEY LINKAGES IN WIGAN (AREAS OF OPPORTUNITY)

Wetlands

- 6.1 The key to Wigan's biodiversity is in its wetland habitats, which support a huge variety of species of which wetland birds are a particularly valuable feature.
- 6.2 Connectivity of wetland habitats, including standing waters, water corridors and reedbeds, is presented in *Figure 44* as the occurrence of wetland habitats per km² across Wigan, relative to the mean hectarage of wetland habitats across the Borough. The primary wildlife corridor in Wigan is illustrated clearly in the figure.
- 6.3 It is of no great surprise that this primary corridor, which runs diagonally through the centre of Wigan from the northwest to the south east, also incorporates a significant number of designated sites. This confirms the importance of Wigan's wetland habitats, not just to the Borough but to the region and in some instances to the country. For example, Wigan is the only district in Greater Manchester to support the bittern, a species of international conservation concern.

Figure 44: Wetland Connectivity (standing waters, water corridors and reedbeds)



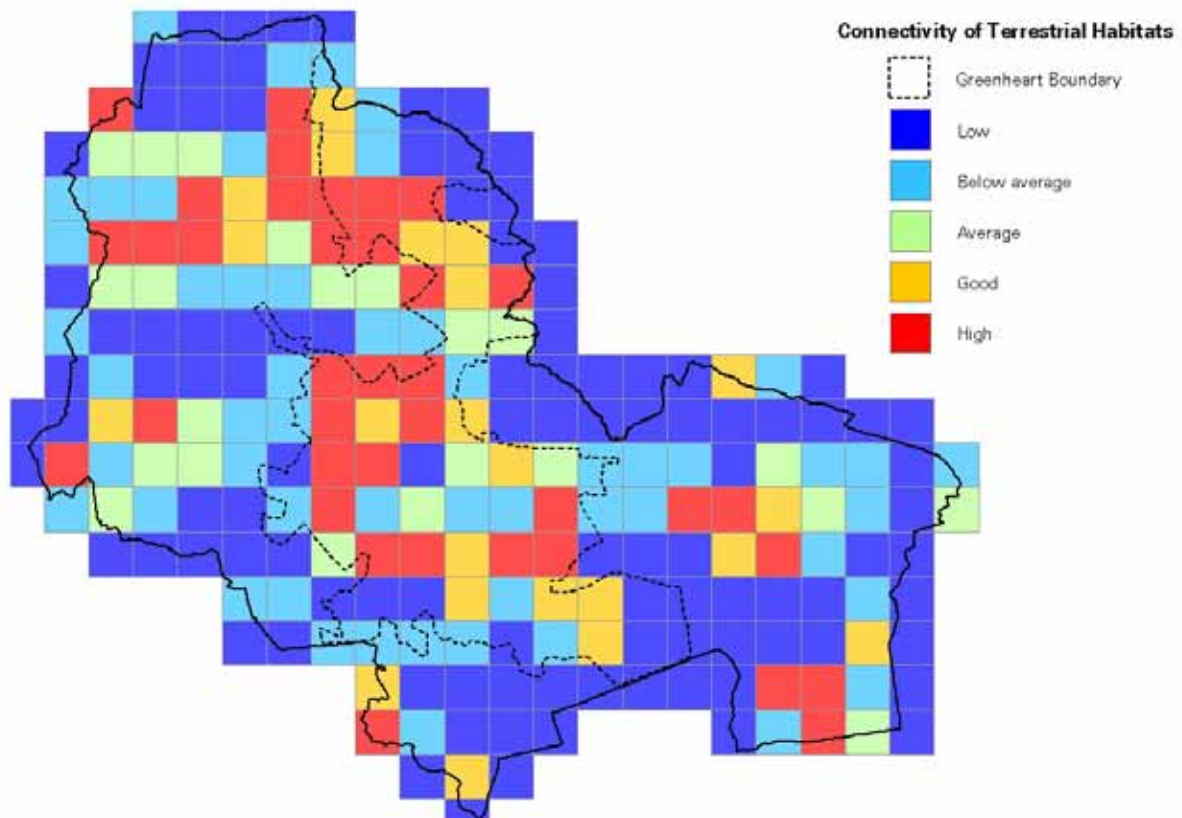
- 6.4 This key wildlife corridor follows the lines of the Leeds-Liverpool canal, as it forms a Y across the Borough, becoming the Bridgewater Canal in the south. This corridor also contains the greatest densities of ponds and areas of extensive standing waters, such as Pennington Flash, Wigan Flashes and the Abram Flashes. The wildlife value of this artery is reflected in the large numbers of Grade A SBI sites lying within or adjacent to the corridor. Sections of the canal itself are also designated for nature conservation.

- 6.5 The Hey Brook Corridor is an important water corridor, flowing through four SBIs and the overlapping Abram Flashes SSSI.
- 6.6 Wigan's resource of lake and lakeside habitats would appear relatively stable and well protected by means of designation and land ownership. The greatest opportunity for these extensive areas of standing water is therefore represented by the control and/or promotion of positive management to maintain open water areas and balanced marginal habitats. Opportunity to improve water quality may arise through management of lands within Wigan's assets surrounding the lakes to reduce run-off and nutrient enrichment. Similar opportunity may be presented within the Greenheart Regional Park and surrounding designated sites through the planning system, where new developments have means to improve water control systems.
- 6.7 Ponds naturally follow successional stages becoming gradually shallower and more scrubbed with age. Management is often recommended to reverse or delay this process to maintain open water. Although beneficial for certain species groups, intervention management may be detrimental to other specialist, more rare or localised species. Where management is not necessitated by human use of a pond, for educational, recreational or water storage purposes for example, the greatest opportunities to improve the pond resource lie with pond creation and water quality improvements to maintain a balance of water habitats for wildlife.
- 6.8 Offsetting the loss and degradation of the pond stock can be tackled by various means, including development control, Section 106 agreements and refinement of the Council's own land-management procedures and practices. Initiatives such as Pond Conservation's Important Areas for Ponds project, which has been piloted in Wales and is due to be extended across the UK, will identify areas with significant numbers of high quality ponds, thereby focussing conservation effort to these areas improving linkages and providing a framework to deliver the Pond Habitat Action Plan. The Million Ponds Project is another national initiative, run by Pond Conservation, which aims to create an extensive network of new ponds across the UK. Other initiatives such as the Greenheart Regional Park also present opportunities to promote habitat improvement surrounding important pond or lake areas and to promote pond creation.
- 6.9 Control of invasive species and raising public awareness as to the introduction and spread of inappropriate commercial varieties such as parrot's feather and fairy moss (*Azolla caroliniana*) would also contribute to the long-term enhancement of the ponds and lakes in Wigan.
- 6.10 Wigan supports probably the most significant reedbed areas within Greater Manchester. The greatest proportion occurs within SBIs, the Greenheart and on Council owned land. This represents a significant opportunity to maintain and extend the existing reedbed resource in Wigan, through management and habitat restoration or creation. The use of reedbeds for water quality improvements could be promoted for new developments, both of a large and smaller scale.

Other habitats

- 6.11 The pattern of connectivity for the terrestrial habitats of Wigan was reviewed by applying the same principal of analysis as that for the wetland habitats. The resultant pattern for the terrestrial habitats is slightly less clear (*Figure 45*) than that observed in the wetlands of Wigan. However, there is again a strong central core of connectivity crossing the Borough, with a preponderance of highly connected habitats within the Greenheart.

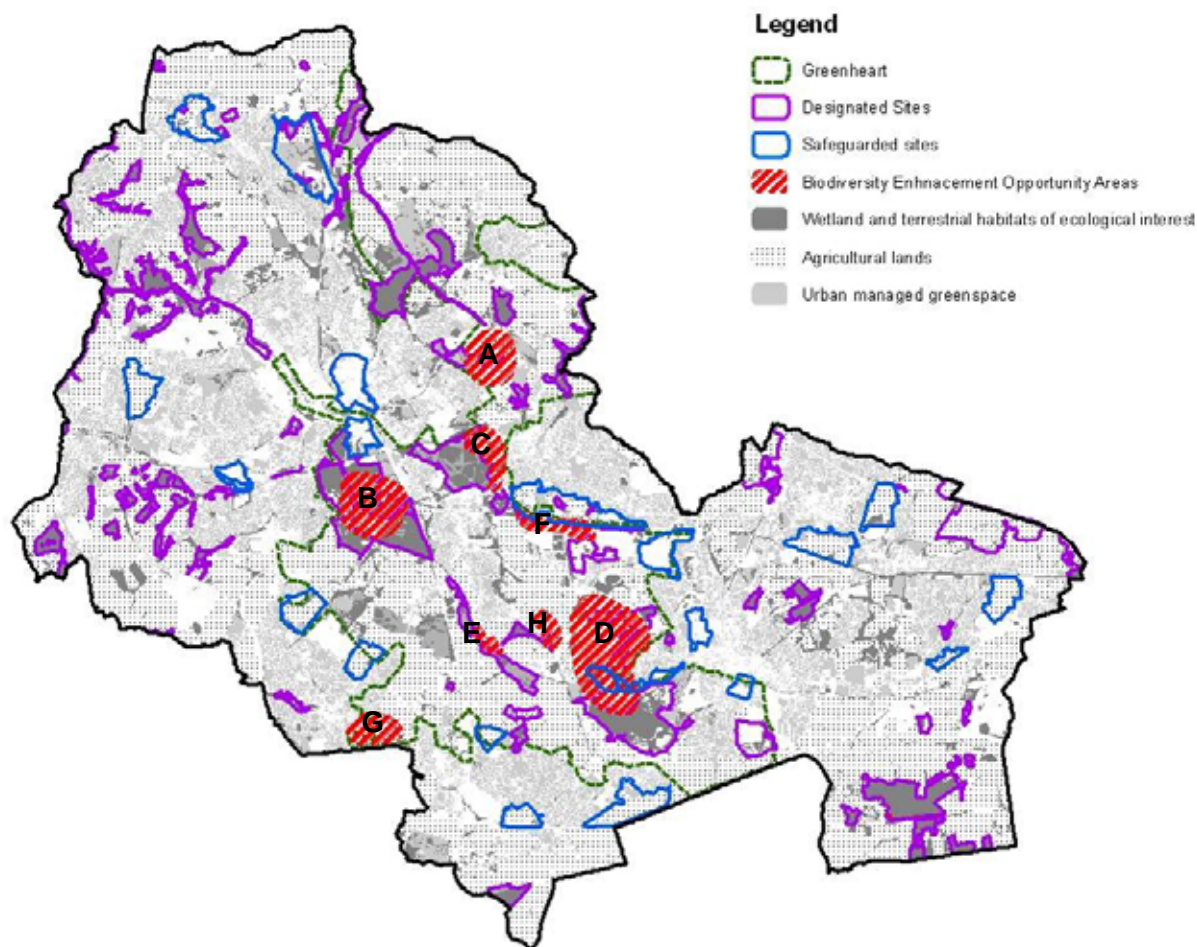
Figure 45: Terrestrial Connectivity (woodland/scrub, mossland, heath and grasslands)



- 6.12 This pattern of connectivity identifies secondary wildlife corridors across the borough, feeding into the main central corridor. Secondary corridors can be seen through Shevington in the northwest, through Tyldesley and Astley to the east and through Highfield, Orrell and Longshaw to the west although these latter corridors may be restricted to a degree by the M6 corridor.
- 6.13 Connectivity in the terrestrial landscape is primarily achieved between Wigan and surrounding districts to the north (through Standish and Haigh) and south (through Golborne and through Astley and Bedford), although the latter corridors are restricted in some respect by the A580 and, further south, by the M62 corridor.
- 6.14 These patterns of connectivity also re-emphasise the important role that the Greenheart plays in maintaining Wigan's wildlife interest, not only providing key linkages between Wigan's primary habitats but also across the wider landscape to the north (through Standish and Haigh and through Shevington) and south (through Pennington and through Astley and Bedford), although the latter corridors are restricted in some respect by the A580 and, further south, by the M62 corridor.

- 6.15 An appraisal of the opportunities presented by the Greenheart Regional Park in contributing to safeguarding and improving Wigan's diversity has been made in addition to appraisals of potential threats to Wigan's biodiversity posed by the possible future development within safeguarded sites. Results of the individual biodiversity appraisals of the Greenheart and the safeguarded sites (as identified in the Preferred Options), are presented at *Appendix 6*.
- 6.16 Eight biodiversity enhancement opportunity (BEOA) areas were identified in the Greenheart appraisal, summarised in *Figure 46* below and presented in more detail at *Appendix 6* (at Drawing G1771.002). Selection of BEOAs focused on sites where historical data indicates the presence of a priority habitat but where more recent data indicates the habitat may be in decline. Alternatively, these habitats may have been absent or lie within previously developed land, but now appear to be naturally regenerating. In both these scenarios available data indicates suitable conditions for the restoration or enhancement of significant priority habitat areas.
- 6.17 BEOAs have been prioritised to those primarily within Council ownership or control and also within the Greenheart. This would allow Section 106 Agreements to be established with potential developers within Strategic Sites, where restoration or enhancement is sought to offset for unavoidable loss within a Strategic Site.
- 6.18 In summary, the BEOAs are distributed across the Greenheart in locations where offsetting measures, to prevent net losses of important habitats, could be targeted to maximise biodiversity gain:
- **Area A** - An area of heathland/acid/neutral grassland mosaic located to the north of Kirkless Lane (now threatened by scrub encroachment and nutrient enrichment). Also, relatively large areas of Council-owned grassland located around the Recycling centre and associated landfill site, which had previously been mapped as acid grassland but have since become more neutral in character. Some of the landfill site has already been planted with broadleaved trees. These areas lie close to Kirkless SBI.
 - **Area B** - The area of open mosaic habitat which occurs at the ex-colliery directly south of Turner's Flash, which is considered likely to meet the Priority habitat definition. However, permission to survey the land is still required. Management of this area could potentially improve its value for wildlife further. Also, the area of Council-owned grassland (previously acid grassland) to the north of Turner's flash has potential for management. A small area of heathland is present at grid reference SD58396 03376. If acid grassland is restored at this site, the spread of heathland could also be encouraged.
 - **Area C** - The area of Council-owned landfill to the east of Amberswood Common (sparse Purple Moor grass has been recorded here, though the grassland is largely species-poor neutral). Also, the area of Council-owned neutral grassland to the east of this landfill, which is next to an old colliery site, and was recorded as acid in the 1986 Phase 1 survey. It still retains some areas of acid grassland and marshy habitat, although parts are being developed into football pitches.

Figure 46: Key areas of opportunity and locations of safeguarded sites



- **Area D** - Council-owned grassland within the area of Bickershaw Colliery. This may form the Priority habitat open grassland mosaic on previously developed land, and could potentially be managed as habitat for wildlife. Also, to the south of this site lies a large area of Council-owned grassland which was once a site for spoil tipping, but shows some level of diversity in patches.
- **Area E** - Along the Leeds-Liverpool Canal east of the Dover Bridge there is likely to be acid grassland on colliery spoil (although permission to access the track that runs along the canal is required). Remote survey with binoculars indicated that acid grassland was present, but may be suffering from nutrient enrichment and scrub encroachment.
- **Area F** - Heathland along the dismantled railtrack (and public footpath) south of Forshaws Tip, which is at risk of being shaded by trees. Also, the large area of colliery spoil tipped land to the north and east of Barlows Farm, some of which retains acid grassland and small patches of heather. However, these are all on privately-owned land.

- **Area G** - Ashton Heathland is currently being restored by the Ashton Heath Residential Group, an associate group of BCTV. However, there has been some difficulty in re-establishing Ling heather. The restoration project could benefit from opportunity represented by land within the Council's control. Areas of Council-owned neutral grassland (un-surveyed but mapped as neutral in the 1986 Phase 1 survey) lie to the north of this heathland, which could also potentially be managed to improve species diversity and contribute to a larger and more functionally viable and diverse ecosystem that will be less vulnerable to public pressures.
- **Area H** - To the west of Bickershaw and directly east of Park Lane Colliery is an area of bare ground on private land near to a disused shaft, which may be interesting but un-surveyed due to access issues. Potential areas of marshy grassland lie to the east, again un-surveyed.

6.19 In addition to the eight biodiversity enhancement opportunity areas, Commons land to the east of Leigh Road has been highlighted as potential land for redevelopment. A small section of this to the north is Council-owned, and holds potential for restoration of acid grassland on areas of colliery spoil if offsetting of other development is required.

6.20 Council-owned areas around and to the south of Westwood Park Gardens (east of Westwood Flash SBI) are also due to be developed, however, there may be some potential for restoration within and around the developed areas, to be incorporated within the planning design. Another possibility is that materials could be recovered from the mounds of Pulverised Fuel Ash and used elsewhere, to encourage the creation of calcareous habitats (further discussion can be found at the appraisal for Westwood in *Appendix 6* - site ref 015).

7.0 RECOMMENDATIONS FOR BIODIVERSITY OBJECTIVES AND POLICY TARGETS

- 7.1 To summarise Wigan's biodiversity interest, the habitats mapped within the Borough have been confirmed as, or have the potential to qualify as, the following priority habitats:
- Ponds (UKBAP and GMBAP)
 - Rivers (UKBAP)
 - Canals (GMBAP)
 - Reedbed (UKBAP, GMBAP, Wigan BAP)
 - Lowland raised bog (UKBAP)
 - Mossland (GMBAP, Wigan BAP)
 - Lowland deciduous woodland (UKBAP)
 - Wet woodland (UKBAP)
 - Traditional orchards (UKBAP)
 - Upland oak woodland (UKBAP)
 - Native woodland (GMBAP)
 - Wood pasture and parkland (UKBAP)
 - Grasslands (GMBAP)⁹
 - Lowland heath (UKBAP)
 - Urban managed greenspace (GMBAP)
 - Hedgerows (UKBAP)
 - Arable field margins (UKBAP)
- 7.2 The Greenheart Regional Park should be the focus of biodiversity improvements and environmental management, especially within SSSIs, SBIs, Biodiversity Enhancement Opportunity Areas and any wetland habitats falling outside these areas.
- 7.3 Water levels and water quality are vital characteristics of many of Wigan's prime biodiversity assets and are therefore fundamental to the Borough's biodiversity targets. All efforts should be made in land management, policy and conservation activities to ensure that water levels and quality are preserved and where ever possible, improved, across the Borough.
- 7.4 A monitoring framework is suggested for the management of designated sites and priority habitats, habitat creation targets, linking with the Wigan Biodiversity Action Plans, targets for safeguarded land and targets for urban and agricultural landscapes.

⁹ As discussed in Section 5, it is unlikely that grasslands in Wigan will fit criteria for individual UKBAP priority grassland habitats, but many of the grasslands identified will likely be included in the combined regional BAP priority of Grasslands, which includes species rich neutral and acid grasslands, marshy grassland and important grasslands on previously developed land.

- 7.5 Detailed discussion with planning officers, the Wigan Biodiversity Partnership, Greater Manchester Ecology Unit, Council land managers and representatives of the major landowners and funding bodies is needed to resolve:
- Feasibility;
 - Precise target-setting (measures and timeframes);
 - Mechanisms for implementation and monitoring.

Management of Designated Sites and Priority Habitats

- 7.6 Monitoring objectives for designated sites and overarching objectives for Wigan's biodiversity priority habitats are recommended as follows:
- (i) All SSSIs in favourable condition;
 - (ii) >80% of SBI's being managed for nature conservation; and
 - 95% of Council-owned SBIs
 - 95% of SBIs with reedbeds, mosslands, rivers and canals
 - (iii) >80% of the following priority habitats being managed for nature conservation:
 - Reedbeds
 - Rivers and Canals
 - Standing Water
 - Mosslands & Raised bog
 - Ancient and wet woodland
 - Heath
- 7.7 Monitoring targets can probably be achieved using existing knowledge, supplemented by questionnaire to landowners. A five-yearly monitoring cycle is appropriate. This links to Defra targets for Local Wildlife Sites.

Priority Habitats protected by SBI designation

- 7.8 Monitoring objectives for biodiversity priority habitats contained within SBI designations are recommended as follows:
- (i) 95% of the existing resource being included in SBIs for the following habitats:
 - Reedbeds
 - Mosslands
 - (ii) >75% of the existing resource being included in SBIs for the following habitats:
 - Standing Water
 - Water corridors
 - Important grasslands (definitions still need clarification)
 - Ancient and wet woodlands
- 7.9 *Table 2* summarises the baseline position. Performance is good in most categories.

Habitat Creation

- 7.10 Further work is needed to set targets and timeframes for creation of priority habitats. The following habitats should be included:
- Ponds - to achieve a density of $>10/\text{km}^2$ in each 1km grid square;
 - Marshy/wet/floodplain grassland - especially around existing protected mosslands and reedbeds; and
- 7.11 Where opportunities arise within the post-industrial landscape areas of the Borough, consideration should be given to the viability of heath restoration/creation. However, these areas are highly fragmented and the potential to restore or create fully viable heath systems may no longer be available, in which case effort for habitat creation schemes should be focussed upon the priority habitats above.

Wigan's Biodiversity Action Plan

- 7.12 Objectives and targets set out in Wigan's Biodiversity Action Plans can be complemented by biodiversity focussed efforts targeting the following:
- Key linkages for wetlands and terrestrial habitats defined and illustrated on Ordnance baseplan;
 - Biodiversity Enhancement Opportunity Areas (BEOAs) defined and illustrated on Ordnance baseplan; and
 - Specific policies for linkages, BEOA's and Greenheart's biodiversity included in BAP and thereby linked to the Local Development Framework
- 7.13 Linkages and BEOAs can be mapped on the basis of the grid-square figures shown in this document, especially in Chapters 4 and 6.

Evidence Base

- 7.14 Present data on grasslands and woodlands does not allow accurate estimation of priority types such as marshy grassland, wet woodland etc.
- 7.15 To fill these data gaps, targeted borough-wide monitoring surveys are needed for grasslands and woodlands in particular, in order to identify the location, distribution and classification of priority types.

Strategic Sites and Future Development

- 7.16 The Strategic Site forms presented at Appendix 6 provide an overview of the biodiversity potential of the major safeguarded sites.
- 7.17 There should be a presumption that all habitats discussed in this review are of priority status unless proven otherwise.

- 7.18 All safeguarded land should be subject to ecological survey and design for biodiversity should be included within development proposals.
- 7.19 Where proposed land use changes or management changes, in safeguarded sites and other areas across the Borough, have the potential to affect national, regional or local priority habitats, survey should quantify the extent and quality of the habitat. If national or regional priority habitats are confirmed, these should be protected and preserved with linkages to other semi-natural habitats.
- 7.20 If locally important habitats are identified, these should be protected and preserved with linkages to semi-natural habitats where possible. If this is not possible, the net habitat resource should be maintained through the restoration of existing but degraded habitats or the creation of new habitats. Restoration or creation of new habitats should concentrate on key areas of opportunity to extend, buffer or strengthen linkages between national and regional priority habitats, identified in the preceding section.
- 7.21 For any significant development, a BREEAM assessment should be carried out to ensure "Very Good" Rating, with the Land Use and Ecology section being mandatory.
- 7.22 BREEAM assessment can stimulate thinking about how to incorporate biodiversity protection and enhancement. Further discussion with development control managers will be needed on how to incorporate this into the planning application process and on thresholds of significance so the requirement does not burden householders.

Agricultural Land and Gardens

- 7.23 At least 75% of agricultural land should be brought into management under an Environmental Stewardship scheme, or an equivalent long-term management plan
- 7.24 It should be noted that some urban fringe agricultural land is not eligible for Defra's support (e.g. equestrian centres or short-term tenancies on land held by owners who aspire for development), but it may be possible through appropriately timed interventions using the planning system to secure management agreements.
- 7.25 Wildlife Gardening Awareness campaigns in areas where the garden resource is critical to Wigan's biodiversity (e.g. in the wildlife linkage areas, in areas that emerge through the Greater Manchester Ecological Framework and adjacent SBIs).

Council-owned Land

- 7.26 All Council-owned land should be subject to biodiversity audit, including:
- Identifying existing priority habitats;
 - Reviewing management practices to improve biodiversity;
 - Identifying and implementing habitat creation; and
 - Opportunities to partner with local community/wildlife groups.

- 7.27 Priority should be given to Council land in the Greenheart and in SBIs. Other priorities should include the major Council-owned urban and country parks, woodlands, schools and colleges. A simple proforma should be devised in conjunction with land managers, recognising there are safety and amenity issues.

Partnership-working and public awareness

- 7.28 In seeking biodiversity improvements, other green infrastructure benefits such as human access to nature, tourism, flood management should be incorporated. This can best be achieved through partnerships with owners such as the Environment Agency, Forestry Commission, Woodland Trust, British Waterways etc.
- 7.29 This is an area where agreement of priorities and targets is also needed within the Wigan Biodiversity Partnership. Areas for action might include:
- Broadening membership and participation in the Wigan Biodiversity Partnership;
 - Links to landowning and recreational and community groups which own or use priority habitats e.g. farmers, equestrians, anglers; and
 - Awareness-raising, especially with gardening and allotment enthusiasts.

8.0 REFERENCES

Legislation

Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora 1992

also known as the Habitats Directive

Countryside and Rights of Way Act (2000)

also known as the CROW Act

Council Directive 92/43/EEC on the Conservation of Wild Birds (as amended by 97/49/EC)

also known as the Wild Birds Directive

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Planning and Compulsory Purchase Act 2004 (Commencement No 1) Order 2004

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Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971

Statutory Instrument 2010 No. 490 The Conservation of Habitats and Species Regulations 2010

also known as the Habitats Regulations

Statutory Instrument 1997 No. 1160 The Hedgerows Regulations 1997

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, July 2007

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The Convention on the Conservation of Migratory Species of Wild Animals

also known as the Bonn Convention or CMS

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