AN ECOLOGICAL FRAMEWORK FOR GREATER MANCHESTER

Frame-work def. a support used as a basis for something being constructed

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ASSOCIATION OF GREATER MANCHESTER AUTHORITIES.

SUMMARY

The main mechanisms operated through the land use planning system for nature conservation include the identification, designation and protection of sites identified as being of high nature conservation value and the protection of a small list of specially protected species. These measures, although successful in their own right, have not been effective in preventing significant declines in habitats and species in the wider landscape. National and sub-regional policies now require additional, new approaches to nature conservation to be adopted involving habitat creation, repair and maintenance in the wider landscape and the establishment of connections between areas of important habitats. One of these required new approaches is the development of Ecological Frameworks. An Ecological Framework is a spatial model developed using the principles of landscape ecology to inform and guide habitat creation and repair. This document summarises the work undertaken so far to develop an Ecological Framework for Greater Manchester.

The guiding principles used in the development of the Ecological Framework for Greater Manchester were that the Framework should be as inclusive as possible and capable of implementation through the land-use planning system.

Analysis of the extent and distribution of habitats and land uses in Greater Manchester has shown that although the sub-region is biologically diverse, habitats generally occur in small patches and are very fragmented. Linking and buffering these habitat patches to form an interconnected habitat network will be difficult. An alternative approach is proposed that identifies broad areas sharing similar ecological characteristics rather than concentrating on recreating and connecting selected habitat types. Following this approach five broad 'Biodiversity Opportunity Areas' have been identified; these are the most natural areas, garden spaces, habitat mosaics, areas where locally specific actions will apply and species hotspots. Suggestions are put forward as to the best policy mechanisms to use to achieve effective habitat enhancement in each of the identified Opportunity Areas.

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An Ecological Framework for Greater Manchester

1 Introduction

Currently the conservation of biodiversity is effected through the land use planning system largely through the identification, designation and protection of sites with existing substantive nature conservation value, and the protection of a small list of species. Planning policies protect designated sites from inappropriate development or, if there are considered to be overriding reasons for development of the site to take place, seek mitigation to reduce the impact of the development or compensation for any habitat losses that cannot be mitigated.

There is a hierarchy of protected sites, ranging through sites designated for their international value, sites designated for their national value and sites designated for their sub-regional or local value. The degree of protection offered to sites varies depending on the designation; generally the higher the 'status' of the site, the higher the degree of protection that is offered. The hierarchy of sites is listed in table 1.

Table 1 Hierarchy of protected sites designated for their nature conservation value

Designation	**Relative importance**
Special Area of Conservation (SAC)	European
Special Protection Area for Birds (SPA)	European
National Nature Reserve (NNR)	UK
Site of Special Scientific Interest (SSSI)	UK
Site of Biological Importance (SBI)	Sub-regional or District
Local Nature Reserve (LNR)	Local

The protection of designated sites for nature conservation value through the land –use planning system has been very effective in preventing harmful development of these important sites. It is now rare for development to be permitted on designated sites, and even in cases where development is allowed for overriding reasons mitigation and compensation measures are invariably implemented to safeguard nature conservation value.

However, the system of protecting designated sites has not been effective in preventing severe declines in habitats and species in the wider landscape. In England in the past twenty years 71% of butterfly species, 56% of bird species and 28% of plant species have either suffered significant declines or have become extinct. There are a number of reasons for the apparent lack of effectiveness of designated sites in preventing these declines:

- The designated sites can only be properly protected from damaging operations that can be controlled through the land-use planning system. Damaging farming and forestry operations cannot be properly prevented from causing harm to sites through the land-use planning system

- Many of the designated sites are not managed appropriately for nature conservation
- Many of the designated sites are small and fragmented. This means that important species can easily be lost from sites but are not easily replaced, and also leads to pronounced 'edge effects' where the boundaries of sites suffer encroachment and degradation from surrounding land uses

If nature conservation efforts through the land-use planning system are to be made more effective in the future, mechanisms must be developed that encourage habitat repair and habitat creation in the wider landscape and facilitate connections between areas of important habitats. These measures should enable species to at least maintain current population levels and at best increase their populations. Ambitious policies in the emerging North West Regional Spatial Strategy (RSS) call upon local authorities to achieve a 'step-change increase in biodiversity resources' rather than simply conserving existing resources.

In the UK a number of initiatives are developing that seek to address these issues and provide mechanisms for implementing habitat creation, repair and connection. The most important of these are:

Biodiversity Action Plans (BAPS)

BAPS are Plans that identify a list of habitats and species considered as priorities for nature conservation and then set out actions considered necessary for their effective conservation. The Greater Manchester Biodiversity Action Plan was adopted in 2003 and is currently being updated as part of a planned five-year review. The Plan is prepared and implemented by the GM Biodiversity Project. One of the barriers to the successful implementation of the BAP is that there has never been accurate spatial information concerning the extent and distribution of priority habitats and species available from which realistic targets could be set and the success of the Plan monitored. The development of an Ecological Framework for Greater Manchester has enabled the collection of new spatial information that will help to implement and monitor the BAP.

Ecological Networks and Ecological Frameworks

These models use the principles of landscape ecology to identify priority areas for habitat creation and repair. The basic idea is to identify sites and areas with the best potential for the creation and repair of important habitats and then to encourage appropriate nature conservation efforts in these areas through various mechanisms, including the land-use planning system. The terms 'network' and 'framework' are to some extent interchangeable, but this report recognises a distinction between the terms. Ecological Networks concentrate on buffering and linking existing sites considered important for nature conservation to form a physical network of large, interconnected sites. An Ecological Framework does not place the same emphasis on buffering and linking important sites, concentrating rather on the provision of an informed Framework for nature conservation actions in the wider landscape

In a number of areas Ecological Networks/Frameworks have been designed primarily as the spatial representations of Biodiversity Action Plans. Priority habitats for conservation have been mapped and it is suggested that measures for habitat creation and repair are prioritised adjacent to or close to these existing habitat patches. In effect the Action Plans tell you *what* habitats to conserve and *how* to do it, while the Network/Framework tells you *where* best to repair and create these habitats. Guidance in the NW Regional Spatial Strategy recommends

that Ecological Frameworks are used to inform and underpin efforts to repair and enhance priority habitats identified in BAPS.

Ecological Frameworks are often described as 'functional' or 'coherent'. This simply means that they have been properly informed by ecological context so that efforts for habitat creation and repair can be properly targeted. For example, although tree planting could be described as habitat creation it would not be appropriate to plant trees on areas supporting peat soils. It is important to recognise that Ecological Frameworks *complement* the existing system of protected nature conservation sites rather than *replacing* it. The principles of habitat creation and repair are in their infancy and we simply do not know how to recreate many important habitat types. Planting trees will not recreate an ancient woodland, and it is impossible to restore peat bog vegetation in areas where the peat soils have disappeared.

The need to develop functional Ecological Frameworks is now becoming more urgent as climate change becomes a reality. Climate change will put further pressure on designated sites and will likely lead to large-scale changes in the distribution and abundance of species. If species are to be able to change distribution patterns they will need functional Ecological Frameworks to aid this distribution.

2 The Policy Background

Policy EM1 of the North West Regional Spatial Strategy (RSS) states that:

'Plans, strategies, proposals and schemes should seek to deliver 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, 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'.

and

'Local authorities should develop functional ecological frameworks that will address habitat fragmentation and species isolation, identifying and targeting opportunities for habitat expansion and reconnection'

An indicative 'biodiversity opportunity diagram' for the North West has been prepared as part of RSS, identifying broad areas of habitat creation potential in the North West of England. Policy EM 1 states that local authorities should develop a more detailed representation of this spatial information for use in their Local Development Frameworks.

In the technical guidance prepared to support RSS it is recommended that habitat expansion and reconnection should be targeted on habitats identified as 'priority' habitats for conservation in Biodiversity Action Plans.

3 The Context of Greater Manchester

The 'conventional' approach to the development of functional ecological networks seeks to identify core nodes of a network (usually the existing system of designated sites) and then seeks

to expand these core sites and link together sites of similar ecological function. This approach is illustrated in Fig 1.

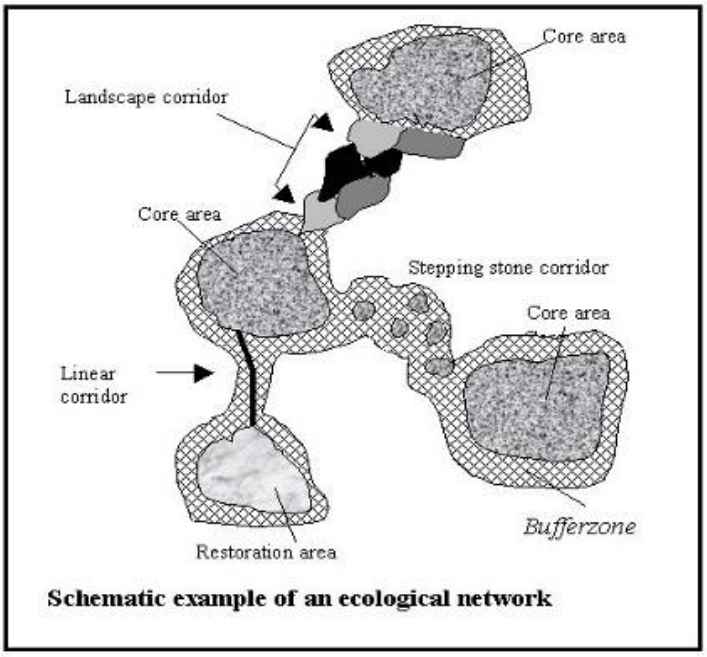


Fig 1 A 'conventional' ecological network model

Landscape analysis of Greater Manchester has shown that developing such a 'conventional' ecological network model in the GM sub-region is likely to be difficult, except at the fringes of the conurbation. This is illustrated in Fig 2, which shows the distribution of core nodes (designated sites) that would need to form the basis of such a network.

It can be seen that the node sites are generally small and very fragmented, except for moorland blocks on the fringes of the conurbation in the west and south Pennines and some woodland blocks along river valleys. Analysis of the known extent and distribution of certain priority habitats for conservation as identified in national and local biodiversity action plans indicates that these follow a similar pattern; that is, priority habitats generally occur in small patches and are fragmented, except for the upland habitats on the fringes of the sub-region.

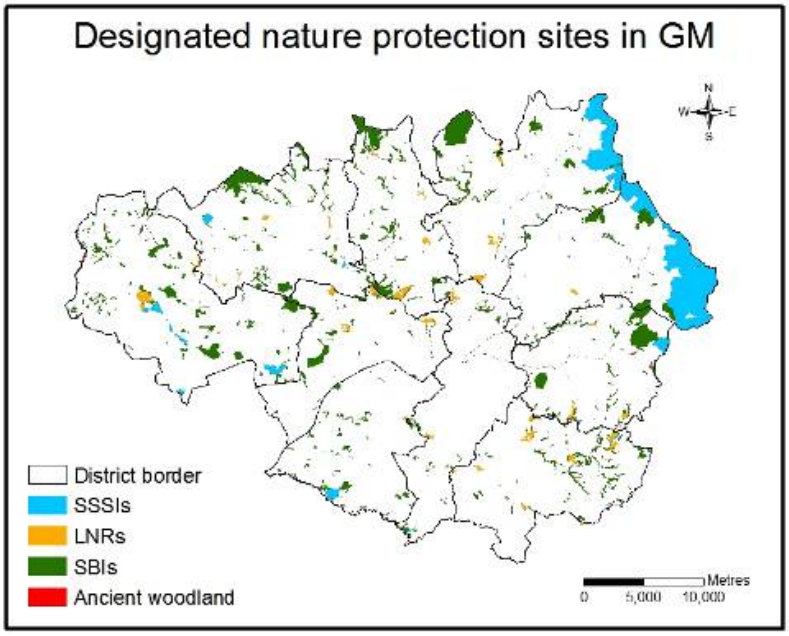


Fig 2 The fragmented character of designated nature conservation sites in GM

Development pressures on land use is intense in Great Manchester, and has been for more than two centuries. Greater Manchester is classified as more than 50% urban; it has a population of more than 2.5 million people and is criss-crossed with major road and rail links. There are very many land owners and very many land uses. The land area is dominated by built structures across large areas. In addition, types of soil substrate can vary greatly, often across small distances, a result of rapidly changing intensive land use over a long period of time. Put simply, the rapid and intense development seen in urban areas, policies encouraging the concentration of development in urban centres and fragmentation of land ownership and land use do not allow for the creation of large, un-fragmented areas of semi-natural habitat or for protective buffer zones around designated areas. Further, while the tradition of establishing 'wildlife corridors' is strong in British land-use planning, their ecological functionality is sometimes dubious. It is therefore considered that developing a network of large, connected areas of semi-natural habitat to form a conventional ecological network would be practically impossible across all of Greater Manchester.

This does not mean, however, that habitat repair, habitat creation and greater habitat connectivity is impossible or without merit in Greater Manchester as a whole, or that nature conservation efforts are better concentrated in selected areas where the creation of coherent, conventional ecological networks are considered to be more achievable (for example along River Valleys). There is in fact great biological diversity in Greater Manchester, ironically resulting from the very varied land uses that have caused habitat fragmentation. So while intense urbanisation and industrialisation have minimised the natural diversity of cities, human activity has at the same time created a very wide spectrum of different land-uses and environments across a relatively small area. There may not be many large un-fragmented blocks of semi-natural habitats remaining, but there are small areas of many different types of habitat

supporting small populations of a very wide variety of species, including priority habitats and species. Greater Manchester supports three sites designated for their international importance for nature conservation, 23 sites designated for their national importance and 526 sites designated for their sub-regional or local importance. The list of protected and priority habitats and species found in Greater Manchester is long and impressive, and includes peregrine falcons, great crested newts, five species of bat, water voles, barn owls, kingfishers, little ringed plovers and badgers (a full list is given in Appendix 1). Parts of Greater Manchester have bucked national trends by increasing recorded numbers and types of habitats and species, a result of changing land uses and pro-active initiatives to improve the quality of land, water and air. Thanks to far-sighted strategic planning initiatives implemented over the last thirty years greenspace penetrates into the heart of the conurbation along the main river valleys and in a wide variety of well-managed public and private greenspaces. These environmental improvements have been achieved against a background of almost unprecedented economic regeneration in the sub-region, demonstrating that economic development and environmental improvement need not be mutually exclusive. The development of the Ecological Framework will build on the environmental improvements already achieved.

Further, the assumption that the urban matrix is generally ecologically hostile and impermeable to species movement is open to question. According to a land-use analysis carried out by Gill (2006) every type of land use in Greater Manchester contains at least 20% vegetated areas; it would appear that there is a significant quantity of 'hidden greenspace' within the conurbation. One of the conditions for 'ecological matrix utility' (that is, the facilitation of dispersal) for many invertebrates, animals and birds is the presence or absence of vegetation, so the data reported by Gill challenges the perception of impermeability. Further, although direct environmental linkages between habitat patches of similar character are important in aiding the dispersal of species, habitat 'stepping stones' can be just as valuable for many species in urban areas, particularly invertebrates and birds.

Recent research undertaken by Sheffield University on urban and suburban gardens has also demonstrated that areas of urban greenspace that do not support 'native' habitats or species or large blocks of habitat can nevertheless be rich in biodiversity. There is now significant evidence that it is *niche diversity* (vertical and horizontal structure and temporal diversity) that is often of the greatest importance in determining the species diversity of urban and suburban areas rather than the presence of large blocks of un-fragmented natural and semi-natural habitats.

There are also good social and economic reasons for practising habitat creation and repair in the areas where people live and work. In general, people tend to be healthier and happier if they have access to greenspaces close to home. If people lose touch with the natural environment in their everyday lives then support for nature conservation in the wider UK landscape may be compromised.

The **conclusion** is that although the creation of an ecological *network* focussing on priority habitats and species and applicable across all of Greater Manchester may not be achievable, it ought to be possible to apply sound ecological principles to conserve and enhance biodiversity, and achieve the 'step change' in biodiversity resources required by RSS throughout the sub-region, by developing a set of principles to guide habitat creation, repair and management that, if applied appropriately, would serve to develop a coherent Ecological Framework for Greater Manchester as a whole.

4 The approach to the development of a Functional Ecological Framework in Greater Manchester

Although Policy EM1 of the RSS calls upon 'local authorities' to develop functional Ecological Frameworks, it also makes reference to the need for cross-boundary working in the interests of ecological coherence (habitats and species do not recognise administrative boundaries). Natural England recommends that Ecological Frameworks should be developed at a sub-regional scale so that they can be designed to facilitate implementation of Biodiversity Action Plans prepared at sub-regional scales.

In Greater Manchester there are significant advantages in developing an Ecological Framework at a sub-regional scale because -

- An Ecological Framework will be more ecologically robust if developed at a relatively large scale (wildlife does not respect administrative boundaries).
- The main information base concerning the habitats and species of Greater Manchester is held at a sub-regional level by the Greater Manchester Ecology Unit and others, rather than being held at district level.
- The local Biodiversity Action Plan has been prepared at a sub-regional scale.
- There are undoubted cost savings for districts in developing a cross-boundary framework rather than developing individual local frameworks.
- Since implementation of the Framework will in part rely on developers being required to make a contribution to habitat creation and repair there are advantages in developing a consistent approach to nature conservation policies across Greater Manchester (creating a level playing field)

In 2006 the Chief Planning Officers Group of the Association of Greater Manchester Authorities commissioned the Greater Manchester Ecology Unit (GMEU) to undertake the necessary research work involved in developing a coherent Ecological Framework at a Greater Manchester scale. GMEU has worked in partnership with the Urban Nature group of the University of Salford, the University of Manchester and the Red Rose Forest, with support from the district authorities of GM, to progress the project.

4.1 Timescales

The project to develop a functional Ecological Framework for greater Manchester will run for three years, from April 2006 to April 2009.

4.2 Reporting

The results of the project to develop a functional Ecological Framework for Greater Manchester will be reported in three parts –

Part One comprises this summary report

Part Two comprises guidance notes on methods for repairing, creating and connecting habitats in the identified Biodiversity Opportunity Areas

Part Three comprises an analysis of the public perception of greenspace to inform future work to implement the ecological framework

4.2 Relationship to the Greater Manchester Biodiversity Action Plan

It is envisaged that the implementation of the Greater Manchester Ecological Framework will assist in the implementation of the Greater Manchester BAP, particularly in the 'most natural areas' Biodiversity Opportunity Area, but the Framework has not been designed specifically as the spatial representation of the BAP since it was considered that to do this would make the application of the Framework too restrictive (see below). However, the technical guidance concerning methods of habitat connection, repair and creation being prepared as part of the Ecological Frameworks project will refer directly to methods for the conservation and restoration of priority habitats as listed in the BAP.

5 Guiding Principles

From the start of the process the development of an Ecological Framework for Greater Manchester considered possible future mechanisms for the implementation of the Framework. It was recognised that a Framework based predominantly on ecological principles in isolation of social and economic factors was unlikely to be capable of implementation. This is illustrated in Table x, but to give one example it may be ecologically valid to identify the Manchester Ship Canal corridor as one area where nature conservation initiatives should be a paramount land use, but this ignores the important economic regeneration role of the Canal corridor.

Table x Possible mechanisms for the implementation of an Ecological Framework and their validity in Greater Manchester

Possible Mechanisms for Implementing an Ecological Framework	**Validity in Greater Manchester**
Acquisition by national or local government or voluntary nature conservation organisations of areas of land and establishing nature conservation as the predominant land use in these areas.	Difficult to achieve because of high land prices, pressure for other land uses and highly fragmented land ownership. From available evidence there is little enthusiasm for cash-strapped local authorities to acquire land for nature conservation and limited interest from voluntary organisations in establishing new reserves in GM.
Influencing agri-environment schemes to target farming subsidies on habitat creation and repair.	Agriculture is a minority land use in Greater Manchester and as a consequence very few areas of Greater Manchester are considered

	suitable areas for the targeting of agri-environment schemes.
Encourage and promote habitat creation and repair with large-scale land owners.	Land ownership in Greater Manchester is very fragmented. Those land owners who do own large tracts of land are generally more concerned with land uses other than nature conservation.
Require and/or encourage habitat creation and repair as part of development through the land-use planning system.	Possible in Greater Manchester where development is commonplace.
Encourage habitat creation and repair in the general population.	Possible in Greater Manchester where a high proportion of the population of the North West lives and works.

The conclusion is that habitat creation, repair and connection will be most likely implemented in GM through obligations places on development and through influencing the behaviour of the general population. The spatial implication of this conclusion is that the Ecological Framework should be as inclusive as possible, and include areas of planned development and areas of dense population. It is recognised that this conclusion may appear rather counter-intuitive for conservationists, since development is often associated with damaging ecological effects. However, it was considered that excluding these areas from the framework would mean missing valuable opportunities for enhancing biodiversity.

The guiding principles behind the development of the Ecological Framework for Greater Manchester, bearing in mind the analysis summarised in table, are -

- The Framework should be ecologically robust ('coherent').
- The Framework should be easily understood by planners, developers and decision makers.
- The Framework should not be seen as a constraint on development, but rather as a way to complement development.
- Necessary measures to implement the Framework should be easily understood and not necessarily difficult or expensive to implement.
- Necessary measures to implement the Framework should be applicable across wide geographic areas and be as inclusive as possible. No areas of the conurbation should be considered as entirely unable to support elements of an Ecological Framework, so that opportunities for enhancing biodiversity can be maximised.
- The Framework should be flexible in approach so that opportunities for biodiversity enhancement could be maximised and local circumstances accommodated.

6 Aims

The development of an Ecological Framework for Greater Manchester has four main aims

1 To conserve and enhance biological diversity in Greater Manchester by repairing, creating and connecting habitats

2 To provide guidance as to the best ways of enhancing biological diversity in Greater Manchester by repairing, creating and connecting habitats

3 To highlight the need for pro-active nature conservation in Greater Manchester

4 To fulfil national and sub-regional land-use planning obligations and contribute to the requirement in Policy EM1 of RSS to achieve a step change increase in biodiversity resources

7 Methodology

At an early stage of the project the possibility of developing an Ecological Framework based on the requirements of individual species and/or groups of species was considered. Such a model would be ecologically sound and may be more easily understood. However, it quickly became apparent that the available information concerning the distribution and abundance of species across Greater Manchester was generally insufficient to be used to develop a Framework model. Further, the collection of the necessary data about species populations and distributions would take too long and be too expensive to be considered as a practical proposition for this project. It was therefore decided to base the model on readily available data sources that were consistent across Greater Manchester.

The main data sets used were as follows

1 The Urban Morphology Types (UMTs) developed by the Centre for Urban and Regional Ecology at the University of Manchester. The UMTs are compatible with the categories used in the National Land Use database

2 The Land Cover Map which presents the spatial distribution of 19 broad habitat types present in Greater Manchester

3 The Topography layer of Ordnance Survey MasterMap data for Greater Manchester, presenting land use with a high degree of spatial accuracy

4 Spatial distribution of designated nature conservation sites across Greater Manchester

5 Spatial distribution of the most important sites for birds and great crested newts across Greater Manchester

Although Phase 1 habitat maps were available for most of Greater Manchester these datasets were not readily available in digitised format for comprehensive analysis and the dataset was not complete for GM. These maps were not therefore generally used in the overall spatial analysis, but partial analysis of the up-to-date habitat maps that were available for certain districts confirmed the following –

- That Greater Manchester supports a wide variety of habitats, including priority habitats

- That these habitats are often present in small areas and establishing connections between habitat patches would be difficult

This partial analysis helped to inform the overall approach taken in the development of the Framework to concentrate on broad areas of similar ecological function rather than working to identify linkages between habitat patches. The results of the partial analysis that identified important habitat types present in districts is presented in section 12 of this report.

Datasets concerning birds and great crested newts were used because they were regarded as the most reliable and comprehensive available species datasets for GM suitable for spatial analysis, and because they showed a high degree of correlation with information concerning land use used in the analysis.

These datasets were analysed using GIS tools to identify *coherent patterns of ecological function* (areas sharing similar ecological characteristics) within Greater Manchester. The analysis basically identified areas of similar habitat type, habitat diversity and land use.

8 Summary of Results

From this analysis five distinct areas of ecological function have been identified –

1. The **'most natural'** greenspaces where the largest blocks of natural and semi-natural habitat remain (generally at the fringes of the conurbation or along main river valleys)

2. Areas where **private gardens** are the predominant biodiversity resource (generally suburban areas)

3. Areas of high habitat diversity across relatively small areas (**habitat 'mosaics'**)

4. Areas where there is a deficiency of biodiversity resource and/or a high degree of fragmentation, including highly urbanised areas and areas of intensive farmland where **locally specific actions** for habitat creation and repair would be most applicable.

5. Smaller areas/sites regarded as important for birds and great crested newts where it was considered possible to repair and/or recreate habitats meeting the specific requirements of individual species **(species 'hotspots').**

These five categories of ecological function were/are hereafter referred to as '**Biodiversity Opportunity Areas**'. In each area different policy initiatives and nature conservation measures will apply, but all the areas taken together will comprise the Ecological Framework.

The outputs of the project include maps showing the spatial distribution of the Biodiversity Opportunity Areas, together with guidance on how best to implement the Framework in the different Areas.

9 Using the Spatial Information

The maps that follow showing the distribution of the Biodiversity Opportunity Areas are in part representations of reality in that they do indicate areas that share similar ecological characteristics, but they are mostly maps of *potential.* The Opportunity Areas may not in fact

include any areas or sites that currently support any important nature conservation features. They represent areas in which it would likely be best to repair or connect areas sharing similar ecological characteristics. That is, they represent areas with the best potential to create different elements of the Framework.

In some cases Biodiversity Opportunity Areas will overlap – for example areas of most natural habitat may overlap with habitat mosaics. In these areas there will be a choice of appropriate measures– creating a single block of habitat or a mosaic of habitats may have equal merit.

It is therefore recommended that the boundaries of the different Biodiversity Opportunity Areas are not treated as fixed Policy boundaries.

Rather, Policies in Plans should refer to the general need for land use and development to contribute to habitat creation and repair, with the Ecological Framework used as a general guide to inform decisions as to *which* habitat types are best created *where*. A further note on the applicability of land-use policies to the Ecological Framework is given in Appendix 1.

It should also be borne in mind that the spatial information has been developed using the best available GM-wide datasets and the results are presented at a GM-wide scale. They are therefore best used and interpreted at a GM scale rather than at a district or local level.

10 The Biodiversity Opportunity Areas in more detail

10.1 The areas supporting the most natural habitats

These are the areas of Greater Manchester supporting the best remaining examples of semi-natural habitats (they could be described as 'least modified by human influence'). Predominantly, these areas support **either** upland moors, bogs and grassland **or** broadleaved woodland. They contain the greatest concentration of designated sites for nature conservation and in more conventional ecological networks they could be described as 'core areas' for wildlife. The spatial distribution of the most natural areas is shown in Fig 1. These areas cover about 12%of the area of Greater Manchester.

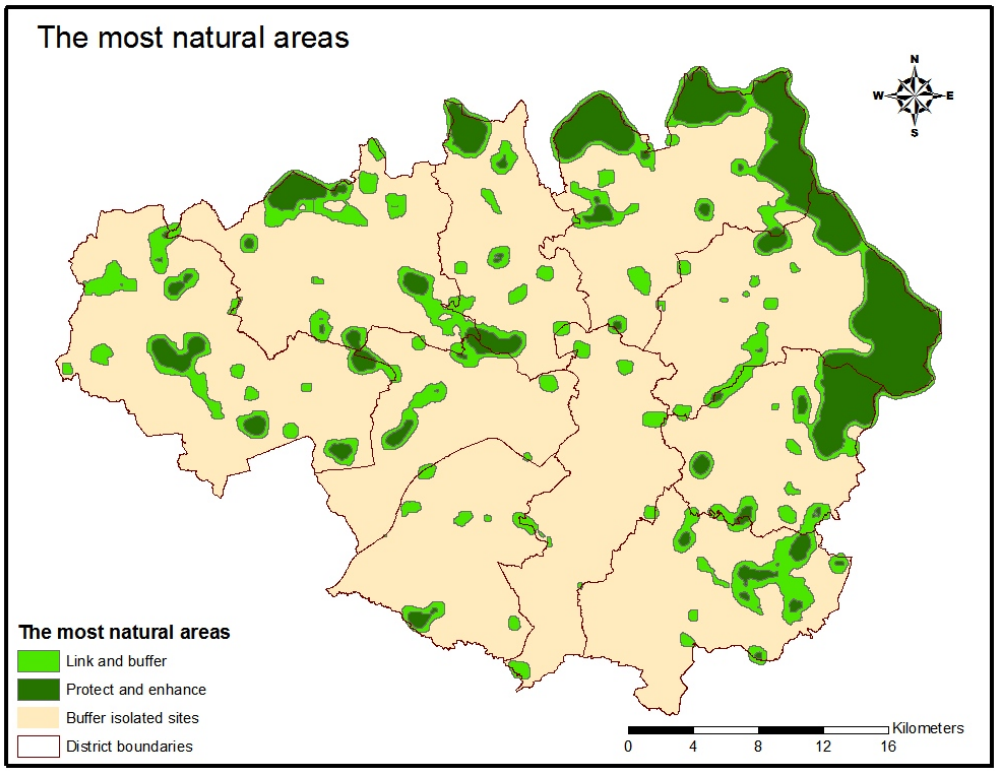


Fig 1 The 'most natural areas' Biodiversity Opportunity Areas

The most natural areas predominantly support upland habitats and broadleaved woodland

Beca priority habitats) in Greater Manchester they could be said to form the 'essential' elements of the Ecological Framework. In fact, a case could be made that these areas alone constitute the major areas for the creation of a GM Ecological Framework as narrowly defined in RSS. However, to do this would effectively exclude very large areas of Greater Manchester (indeed most of some entire districts) from an Ecological Framework and would represent a missed opportunity to achieve the step change in biodiversity required by RSS. Applying pro-active nature conservation policies to these areas exclusively would not contribute to the development of a truly coherent, functional Ecological Framework for Greater Manchester.

In these areas policies and management should follow more established practice. Nature conservation land-use designations in these areas should be confirmed and designated sites

protected from inappropriate development; appropriate management of these areas should be encouraged. Since these areas tend to be in the more rural parts of Greater Manchester they are more often surrounded by land uses suitable for the creation of the 'buffer zones' and direct habitat linkages forming conventional ecological networks. Development within these areas, and in areas adjacent to them, need not be prohibited but should be required to take into account the landscape and ecological context. For example, appropriately managed golf courses or low-density housing with extensive gardens and public green space may be appropriate types of development in these areas.

10.2 Gardens

Numerous studies over many years have demonstrated that private gardens are very important reservoirs of biodiversity in urban and suburban areas. Research undertaken as part of the development of the Greater Manchester Ecological Framework has shown that this is true of Greater Manchester. Private garden spaces and public suburban parks are by far the most important greenspaces supporting biodiversity in many parts of the area. Although it is understood that it is difficult for the land-use planning system to influence the management of private gardens, and that certain national land-use policies serve to promote built development of gardens, any Ecological Framework developing in an area like Greater Manchester **must** take account of garden spaces if it is to be regarded as properly coherent and inclusive.

The spatial distribution of the most important areas of garden space is shown in Fig 2. Gardens constitute about 15% of the area of Greater Manchester

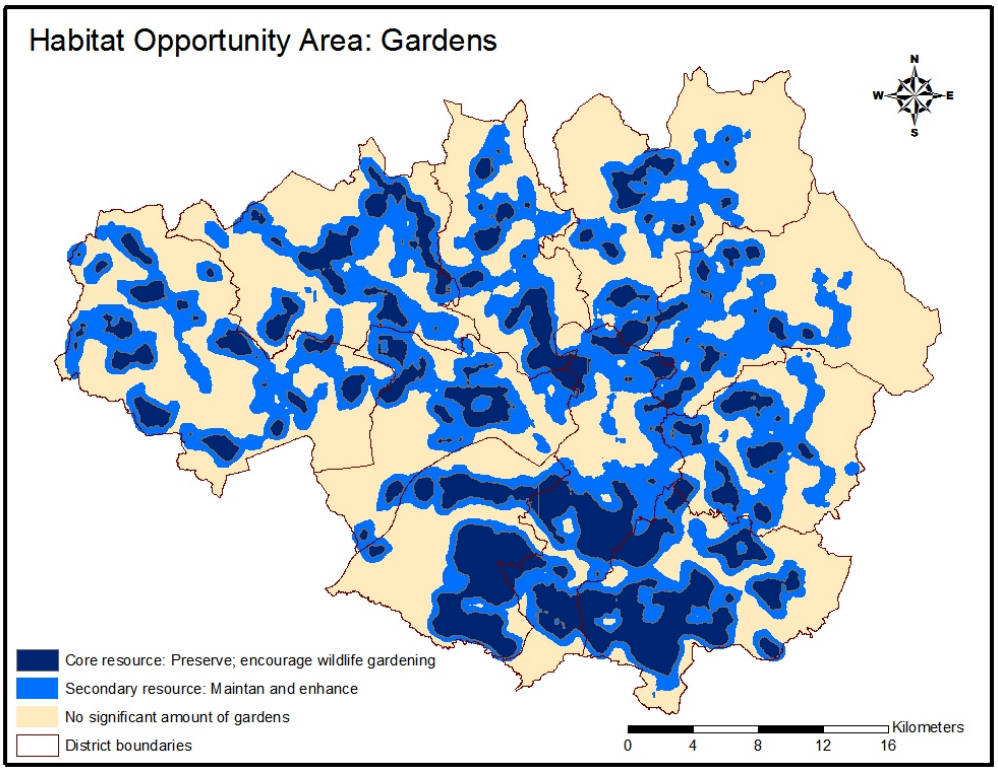


Fig 2 Garden Spaces Biodiversity Opportunity Areas

In these Biodiversity Opportunity Areas policy should encourage the maintenance of large continuous garden spaces, should seek to incorporate garden spaces into new developments and should seek provision of public greenspace within developments. Other policies should promote the importance of gardens for biodiversity and discourage inappropriate management (for example paving of gardens)

10.3 Habitat Mosaics

Urban areas are often characterised by a diverse mosaic of relict habitats and designed spaces juxtaposed in combinations that rarely occur in nature. As such they support a wide variety of species, many of which are becoming increasingly rare in the wider countryside. There is now considerable evidence that habitat diversity within cities is of very great importance in determining species richness. In greater Manchester habitat mosaics are strongly associated with the most important sites for birds. Contrary, then, to more conventional ecological network models it is important in these areas to maintain habitat variety, even if this variety is contained in a relatively small geographic area, rather than to seek the establishment of a larger area of uniform habitat.

The spatial distribution of the most important areas supporting habitat mosaics is shown in Fig .

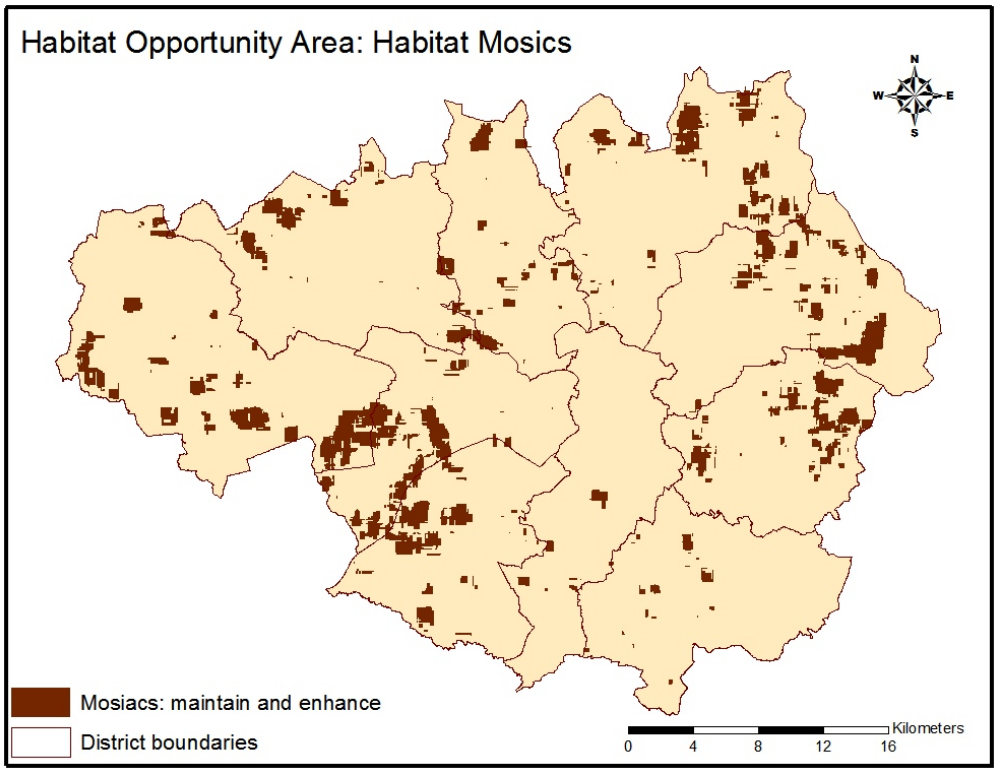


Fig 3 Habitat Mosaics Biodiversity Opportunity Area

In these Biodiversity Opportunity Areas policies should encourage mixed land-uses, or encourage developers to incorporate a range of landscaping measures within larger developments.

10.4 Areas for Locally Specific Actions

In these areas there is currently an apparent deficiency of biodiversity resources, and the areas lack sufficient ecological context to be able to be too prescriptive about preferred habitat creation and repair measures. In these circumstances habitat creation and repair should be encouraged, but can be more opportunistic and creative than in areas with more robust ecological context.

These areas are shown in Fig x. These areas make up a relatively high proportion of the land area of Greater Manchester and therefore cannot be ignored if an Ecological Framework is to be made really coherent and inclusive.

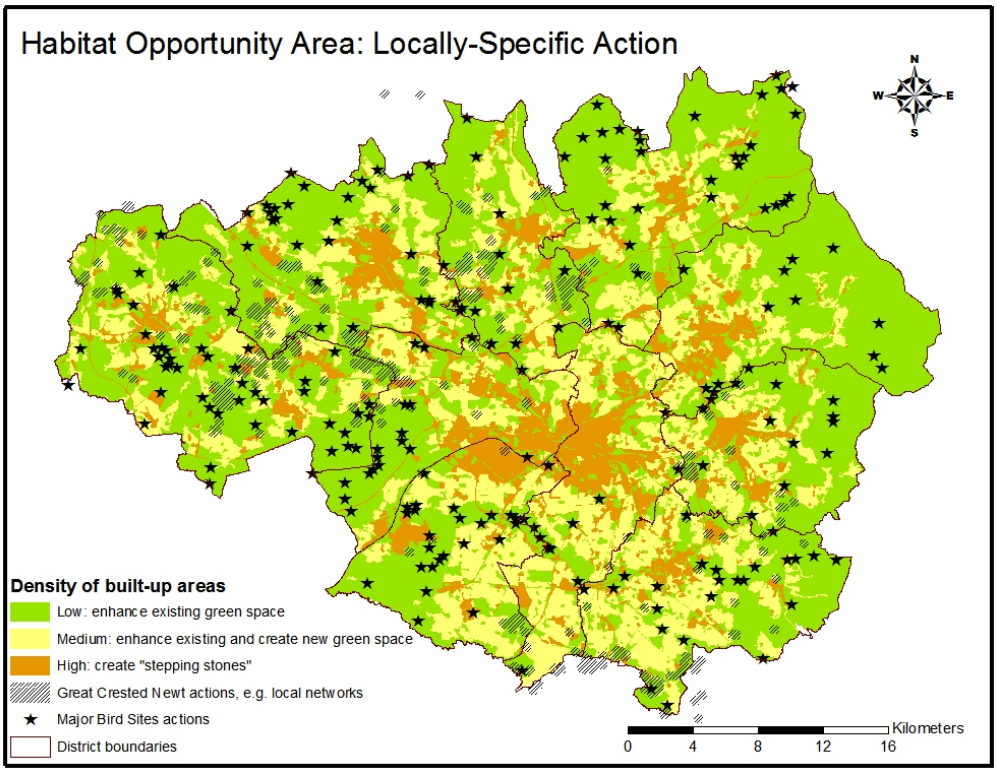


Fig 4 Locally Specific Actions and Species Hotspot Biodiversity opportunity Areas

These areas tend to fall into two broad land-use categories; they are either very urbanised areas or areas of agricultural intensification. In very urbanised areas the provision and proper management of new greenspace should be encouraged, either at ground level or as green roofs or living walls. Research has shown that such spaces do not need to conform the conventional habitat classifications in order to be valuable for wildlife; what is important is to provide *niche diversity*, for example by

- Creating a range of vertical and horizontal structure
- Creating a range of different exposure conditions
- Create temporal variation
- Create a range of hydrological conditions

Policy should not therefore ignore the need for biodiversity enhancement in these areas, but should encourage innovative solutions

10.5 Species Hotspots

Certain smaller places within Greater Manchester have been identified as important areas and sites for habitat creation and repair that will benefit a specific species (great crested newts) or groups of species (birds). Although the framework as a whole has not been designed using species data in general it was considered that the inclusion of these sites for newts and birds could be justified for reasons outlined below.

These Biodiversity Opportunity Areas are known as 'species hotspots' and are shown in Fig 5. At these sites policies encouraging relatively specific nature conservation measures applying to the specific requirements of great crested newts and birds should be applied.

Great Crested Newts

Great Crested Newts are one of the 'big three' species recorded in Greater Manchester that are offered the highest degree of legal protection (the others are bats and floating water plantain). They are classed as European Protected Species (EPS) because they are listed under the terms of the European Habitats Directive. Penalties for harming or disturbing great crested newts or damaging their habitats are severe. As a consequence, surveys for great crested newts are often undertaken and their distribution and ecology is therefore relatively well understood. Further, developers are often required to offer mitigation and/or compensation for disturbance cause to great crested newts. Since successful conservation of great crested newts requires the creation of interconnected ponds and terrestrial habitat the repair and creation of habitat for newts will also benefit other species.

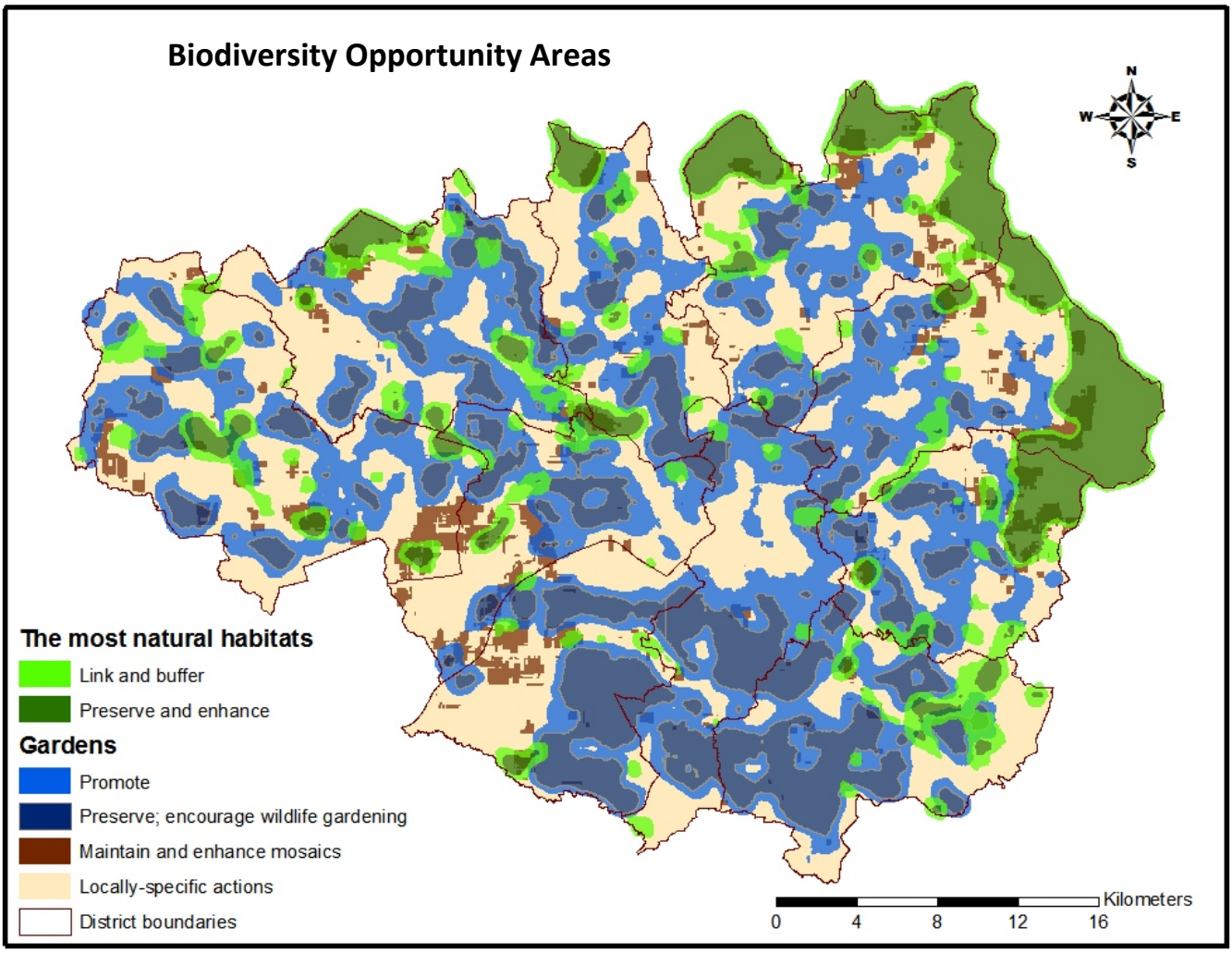
It was therefore considered useful to include known 'hotspots' for great crested newts as part of the Ecological Framework.

Birds

Birds are the best recorded species group in the UK. As a consequence they are often used as indicators for measuring ecosystem health, and government has set targets for improving bird populations as a way of encouraging ecosystem repair. As with great crested newts, habitat repair and creation for birds will benefit a wide range of other species. Inclusion of important areas for birds as part of the Ecological Framework will also help to promote the Framework, since birds are popular with the general public

It was therefore considered useful to include known hotspots for birds as part of the Ecological Framework.

11 The resulting Ecological Framework for Greater Manchester



APPENDIX ONE

INCORPORATING THE ECOLOGICAL FRAMEWORK (and nature conservation in general) INTO CORE STRATEGIES – SOME SUGGESTIONS

It is likely(?) that nature conservation strategies will be incorporated into wider strategic objectives such as 'Delivering a Sustainable Environment' or 'Protecting the Natural and Historic Environment

For example:

The Approach

The Council recognises the importance of conserving the natural environment. The Local Development Framework will:

- Protect and enhance the green space and water space that are considered essential to the economic and social well-being of [district]
- Ensure that future development enhances the quality and accessibility of these green spaces
- Recognises the importance of providing a multi-functional green infrastructure that delivers a broad range of quality of life benefits
- Protect, enhance and restore biodiversity in line with targets expressed in national, regional and local Biodiversity Action Plans and following the recommendations of the Greater Manchester Ecological Framework
- Ensure that development 'designs-in' wildlife from an early stage
- Respond to the threat of flooding through the planning of development proposals in the light of a strategic flood risk assessment

Strategic Objective: Delivering a Sustainable Environment

'To set a spatial planning framework through the LDF that supports [district's] strategic goal to maintain a sustainable environment which benefits social and economic well-being. This will be by:

1 Safeguarding, enhancing and promoting access to [district's] green spaces that are of strategic importance in terms of defining the districts character, supporting biodiversity, recreation and other benefits eg flood defence/alleviation ***GI?***

2 Conserving and enhancing biodiversity, having particular regard to the maintenance, restoration and recreation of priority habitats and species.

3 Minimising the loss of greenspace, ensuring that where green space is developed it achieves more significant sustainable development benefits relative to the function and importance of the greenspace

Targets

1 To ensure that, as a minimum, development causes no net loss of biodiversity of acknowledged importance

[plus others relating to landscape, flooding, historic environment etc etc]

WILDLIFE POLICY

The Council will promote effective conservation of biodiversity through:

1 Safeguarding international and national protected sites for nature conservation from inappropriate development

2 Appropriate consideration will be given to European and nationally protected and important (priority) species

3 Maintaining a system of Local Wildlife Sites [and Local Nature Reserves, wildlife corridors, links and stepping stones?]

4 Ensuring that development retains, protects and enhances features of biological or geological interest and provides for appropriate management of these features

5 Ensuring that development seeks to produce a net gain in biodiversity by 'designing in' wildlife and ensuring that any unavoidable impacts are appropriately mitigated for.

Notes:

1 This Policy is primarily about conserving and enhancing the districts wildlife resource. It recognises the importance of protecting the assets found within the statutorily designated nature conservation sites, but also the need to view biodiversity enhancement as a cross cutting opportunity in all development. Certain developments may be required to submit an impact assessment to quantify the effect on biodiversity and to inform design and mitigation measures. Development proposals need to consider protected and priority species at an early stage. Where development adversely affects biodiversity interests negative impacts should be minimised and compensation to offset these impacts should be provided.

2 The Policy will be implemented through specific wildlife policies and proposals in relevant Area Action Plans and by using the planning application process to positively bring about development which supports the Policy.

3 The Council will/has prepared a Supplementary Planning Document on Nature Conservation/Biodiversity/Design Guide that provides more detailed guidance on the current biodiversity resources of the District and/or how it will encourage wildlife friendly development.

4 The Greater Manchester Ecological Framework will be recognised as an important source to inform proposals for the restoration and recreation of biodiversity resources.

5 The Greater Manchester Biodiversity Action Plan and the Greater Manchester Ecological Framework are relevant to this Policy and to the conservation of biodiversity resources

6 The spatial distribution of the hierarchy of important nature conservation sites is illustrated in Diagram … and the Core Areas for the development of the Greater Manchester Ecological Framework are illustrated in Diagram …