

Protecting and Enhancing Audlem's Natural Environment



Cheshire
Wildlife Trust

December 2016

Introduction

Neighbourhood Planning has provided an important opportunity for communities to shape their local environment for future generations. Identifying and evaluating opportunities and constraints will mean that communities are in an informed position and therefore better able to protect their valuable natural assets.

In 2011 the government published their Biodiversity 2020 '*strategy for England's Wildlife and Ecosystem services*' which built on the recommendations of the earlier Natural Environment white paper. The mission of the Biodiversity 2020 strategy is to '*halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.*'

The National Planning Policy Framework (NPPF), published in 2012 drew on these principles and protecting and enhancing biodiversity and creating ecological networks are central to this framework. Indeed 'biodiversity' is mentioned 15 times in the NPPF with protection and improvement of the natural environment as core objectives of the planning system. Planning policies specifically designed to address the overall loss of biodiversity are known as 'no net loss policies'. Most Local Plans now have 'no net loss' policies or similarly worded policies in place.

According to Biodiversity 2020 there are numerous ways to work towards achieving these aims, with landowners, conservation charities and individuals playing a part. However, the planning system has a central role in achieving the aims of Biodiversity 2020, particularly strategic planning, but also development control. At a local level Neighbourhood Planning has the potential to be a key factor in determining whether the aims of Biodiversity 2020 are realised, by identifying local priorities for nature conservation and ensuring these are taken into consideration in the planning process.

Objectives of the study

The first stage to protecting and enhancing the natural environment is to identify the natural assets that exist within the neighbourhood. This report aims to identify the core, high ecological value sites for nature conservation in Audlem, as well as sites deemed to be of medium ecological value. The high value sites are recommended for protection through the neighbourhood planning process and the medium value sites could be considered as biodiversity opportunity areas subject to further evaluation. Medium and high value sites should also act as an alert in the planning system triggering full evaluation should they be proposed for future development.

The report also aims to identify key local and regional ecological networks within the neighbourhood planning area and recommends that these are protected through the neighbourhood plan. It also identifies key characteristics associated with the landscape character of the Audlem area so these can be referenced in planning policies.

Background – ecological networks

In 2010 Professor Sir John Lawton submitted a report to DEFRA entitled ‘Making Space for Nature: A review of England’s Wildlife Sites and Ecological Network’. The report identified that we need a step change in our approach to wildlife conservation from trying to hang on to what we have, to one of large-scale habitat restoration and recreation, underpinned by the re-establishment of ecological processes and ecosystem services, for the benefits of both people and wildlife. The report also identified that this vision will only be realised if we work at local scales in partnership with local people.

The natural environment is fundamental to our well-being, health and economy, and provides us with a range of ecosystem services such as food, water, materials, flood defences and carbon sequestration – and biodiversity underpins most, if not all, of them. The pressures on our land and water are likely to continue to increase and we need to learn how to manage these resources in ways which deliver multiple benefits, for example, achieving profitable and productive farming while also adopting practices which enhance carbon storage, improve flood water management and support wildlife.

England’s wildlife habitats have become increasingly fragmented and isolated, leading to declines in the provision of some ecosystem services, and losses to species populations. Ecological networks have become widely recognised as an effective way to conserve wildlife in environments that have become fragmented by human activities.

Ecological networks generally have five components (see Figure 1) which reflect both existing and potential ecological importance and function.

- *Core areas*

These are areas of high nature conservation value which form the heart of the network. They contain habitats that are rare or important because of the wildlife they support or the ecosystem services they provide. They generally have the highest concentrations of species or support rare species. They include protected wildlife sites and other semi-natural areas of high ecological quality.

- *Corridors and stepping stones*

These are spaces that improve the functional connectivity between core areas, enabling species to move between them to feed, disperse, migrate or reproduce. Connectivity need not just come from linear, continuous habitats; a number of small sites may act as ‘stepping stones’ across which certain species can move between core areas.

- *Restoration areas*

These are areas where measures are planned to restore or create new high value areas (which will ultimately become ‘core areas’) so that ecological functions and species populations can be restored. They are often situated so as to complement, connect or enhance existing core areas.

- *Buffer zones*

These are areas that closely surround core areas, restoration areas, 'stepping stones' and ecological corridors, and protect them from adverse impacts from the wider environment.

- *Sustainable use areas*

These are areas within the wider landscape focussed on the sustainable use of natural resources and appropriate economic activities, together with the maintenance of ecosystem services. Set up appropriately, they help to 'soften the matrix' outside the network and make it more permeable and less hostile to wildlife, including self-sustaining populations of species that are dependent upon, or at least tolerant of, certain forms of agriculture. There is overlap in the functions of buffer zones and sustainable use areas, but the latter are less clearly demarcated than buffers, with a greater variety of land uses.

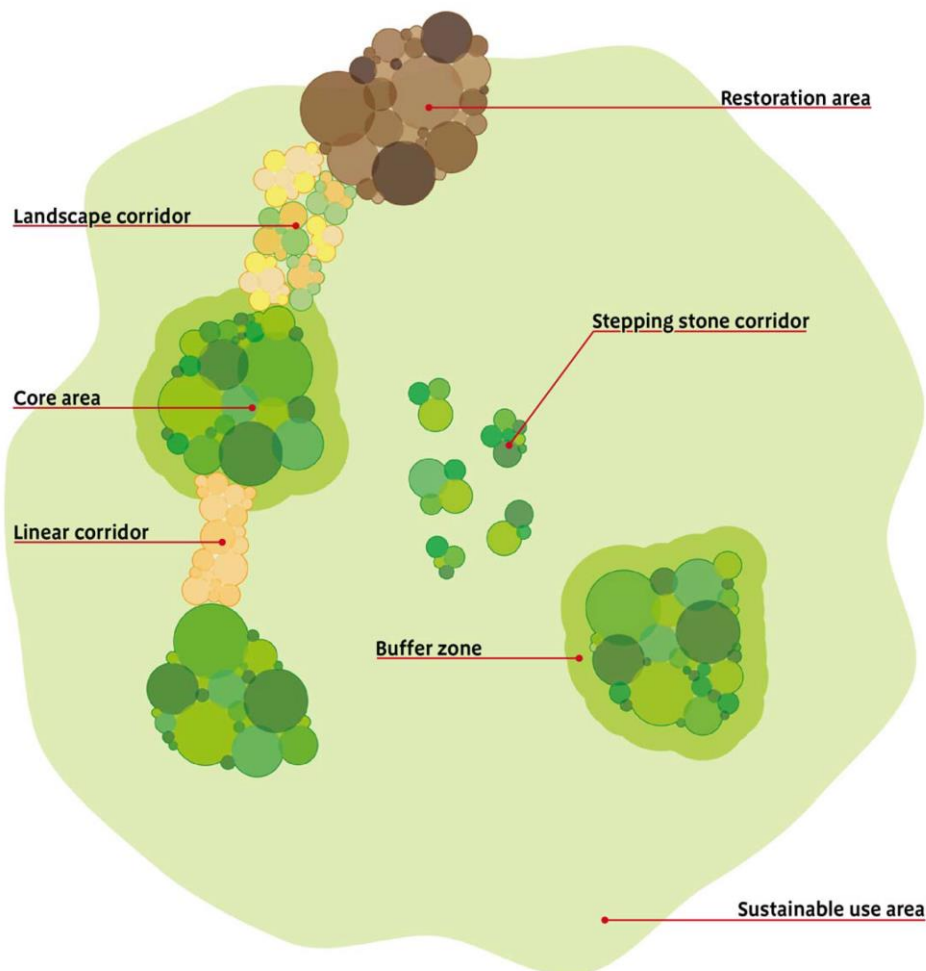


Figure 1. The components of ecological networks (Making Space for Nature report)

The principles of creating coherent ecological networks have since been embedded within many planning and policy documents. The Natural Environment White Paper 'The Natural Choice', which was published in 2011, reiterated a Government commitment to move from net biodiversity loss to net gain, by recognising the importance of supporting healthy, well-functioning ecosystems and establishing more coherent ecological networks.

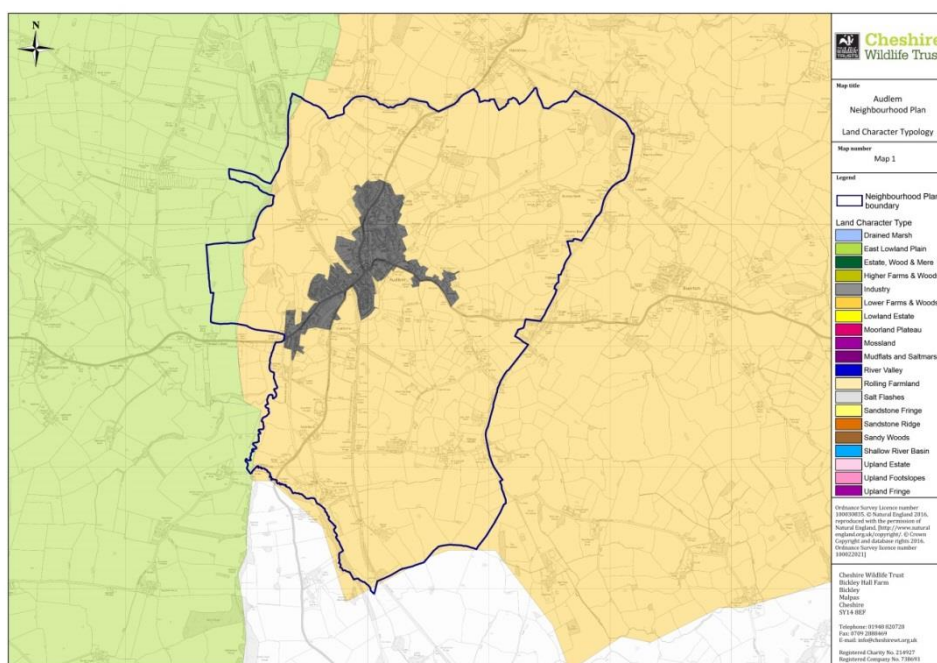
The National Planning and Policy Framework published in 2012 also includes the establishment and conservation of a coherent ecological network as a core principle including:

- The planning system should contribute to and enhance the natural and local environment by establishing coherent ecological networks that are more resilient to current and future pressures.
- Local planning authorities should set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.
- To minimise impacts on biodiversity planning policies should identify and map components of the local ecological networks, including the hierarchy of sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation; and promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations.

Landscape Character Assessment for the Cheshire region

On a national level Audlem lies within National Character Area 61 – Shropshire, Cheshire and Staffordshire Plain; a pastoral area of rolling plain which is particularly important for dairy farming. More locally the Cheshire Landscape Character Assessment of 2008 identifies recognisable patterns in the landscape and classifies the Cheshire Landscape into 20 broad Landscape Character Types (LCTs). Different aspects such as geology, landform, soils, vegetation and landuse have been used to identify character areas. The assessment is intended to be used as a basis for planning and the creation of future landscape strategies as well as raising public awareness of landscape character and creating a sense of place.

Map 1: Landscape Character Typology



The Landscape Character Assessment (Map 1) identifies two recognisable landscape character types (LCTs) within the Audlem Neighbourhood planning area; namely East Lowland Plain and Lower Farms and Woods, the latter of which is the predominant character type in the Audlem Neighbourhood planning area. These character types are further refined and subdivided into Landscape Character Areas (LCAs):

Type 7 - East Lowland Plain Subtype *ELP1*

Key Characteristics of type 7

- Flat and almost flat topography
- Small to medium sized fields up to 8ha used for pasture and arable farming.
- Mainly hawthorn hedgerows and hedgerow trees, some mixed species hedgerows
- Dispersed hamlets and Farms with predominantly low density and some nucleation
- Intensive farming and large farm businesses
- Large number of small water bodies
- Scattered species rich grasslands
- Riparian ancient woodlands and field sized coverts Medieval moated sites

Subtype *ELP1: Ravensmoor Character Area (LCA)*

The western extents of Audlem Neighbourhood Planning area lie within this character area which is essentially a large area of flat agricultural plain.

The Ravensmoor Character Area subtype has a mixture of irregular and regular fields and grid like patches of enclosure. The irregular fields are pre-medieval in origin and normally bounded by hawthorn hedges, often with standard trees. Many fields have been enlarged through the removal of boundary hedges giving a sense of openness occasionally with panoramic views.

Towards the south and west of the Ravensmoor Character Area subtype there are smaller fields, abundant hedges and hedgerow trees and the landscape is more enclosed and has a tranquil, rural character.

Type 10 - Lower Farms and Woods Subtype *LFW4*

Key characteristics of Type 10:

- Low lying gently rolling topography
- Hedgerow boundaries and standard trees in a mix of medieval, reorganised fields (irregular, semi-regular, and regular up to 8ha). Many larger open fields where traditional hedging has either been removed or replaced with fencing.
- Horsiculture – fenced horse paddocks
- High density of woodland – blocks and coverts and riparian
- Medium settlement density – mix of dispersed farms and nucleated hamlets/villages
- Mosses and some meres resulting from glacial deposits
- Large number of water bodies

Subtype LFW4: Audlem Character Area (LCA)

Lying in the far south of Cheshire and bordering Staffordshire, this character area is very rural. The dispersed settlements are connected by quiet country lanes giving the impression of isolation. The countryside is gently undulating but cut through by numerous steep sided streams often fringed with ancient woodland, particularly towards the south of the area.

Natural Area

Natural Areas as defined by English Nature (now Natural England) in 1996 are a series of biogeographical units reflecting ecological integrity land form, landuse and cultural influences. Their boundaries usually correspond to those of the Landscape Character Areas although they normally encompass multiple LCAs as they are generally larger.

Most of Cheshire, the northern half of Shropshire and part of northwest Staffordshire sit within the *Meres and Mosses Natural Area*. This is an expansive area of gently rolling agricultural plain which, at the end of the last ice age, was largely underwater. Although the vast area of water eventually drained away it left behind a wetland landscape of meres, mosses, meandering rivers and ponds. This landscape is recognised as being of international importance for its wetland wildlife.

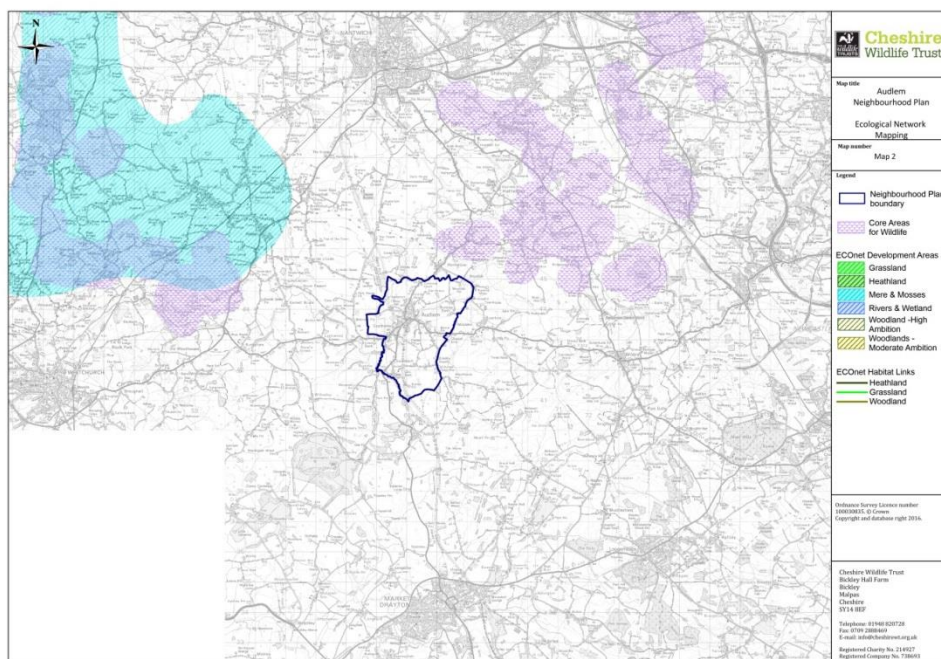
Econet – Integrated vision of the Cheshire County Ecological Network

Between 1999 and 2003 the then Cheshire County Council were a partner within the Life EConet Project. This was a project supported by the Life-Environment Programme of the European Commission to demonstrate in Cheshire and in Emilia-Romagna and Abruzzo (Italy) how ecological networks can help achieve more sustainable land use planning and management, as well as overcome the problems of habitat loss, fragmentation and species isolation.

The Econet study is an integrated vision of a Cheshire County Ecological Network of ecological cohesion. The vision acts as a framework for nature conservation in the region by identifying areas of strategic importance for wildlife. It is intended as a guideline for making decisions in local and strategic planning in relation to biodiversity.

The 2003 study identified numerous core areas of key importance for wildlife. It also identified development areas which were assessed as having the greatest potential to contribute to the viability of the core areas through habitat restoration and creation schemes. The aim of any future work related to the county ecological network should be to expand the core areas and to provide better habitat connectivity (wildlife corridors). The guidance provided by the Econet project has been incorporated into the conclusions of this report created for the Audlem Neighbourhood Plan.

Map 2: Ecological Network Mapping



No areas within the Audlem Neighbourhood Planning area were identified by EConet as being fundamental components of the county wide ecological network.

Methodology

Creating a habitat distinctiveness map

In line with current Defra methodologies to determine 'no net loss' in biodiversity, habitat data from the sources listed below was attributed to one of three categories listed in the table:

Habitat type band	Distinctiveness	Broad habitat type covered	Colour on map
High ecological value	High	Priority habitat as defined in section 41 of the NERC Act, Designated nature conservation sites (statutory and non-statutory)	Red
Medium ecological value	Medium	Semi-natural habitats and habitats with potential to be restored to Priority quality. Includes field ponds.	Orange
Low ecological value	Low	E.g. Intensive agricultural but may still form an important part of the ecological network in an area.	n/a

Habitat type bands (Defra March 2012)

1. Five published data sets were used to produce the habitat distinctiveness maps.
 - Priority habitat Natural England – coded as high distinctiveness
 - Protected sites (SSSI, LWS, LNR), Natural England, CWT/CE Local Authority – coded as high distinctiveness
 - Agricultural land classification, Natural England - grade 4 medium distinctiveness, grade 5 high distinctiveness (adjusted where other data is available).
 - Landcover data, Centre for Ecology and Hydrology 2007. Priority habitats (principal importance) and semi-natural habitats coded as medium distinctiveness (data in Appendix 1)
 - Meres and Mosses and other peat soils, Meres and Mosses Landscape Partnership scheme, 2016. Functional Ecological Units, river valley peat and destroyed peat coded as medium distinctiveness. (Supporting information in Appendix 2.)

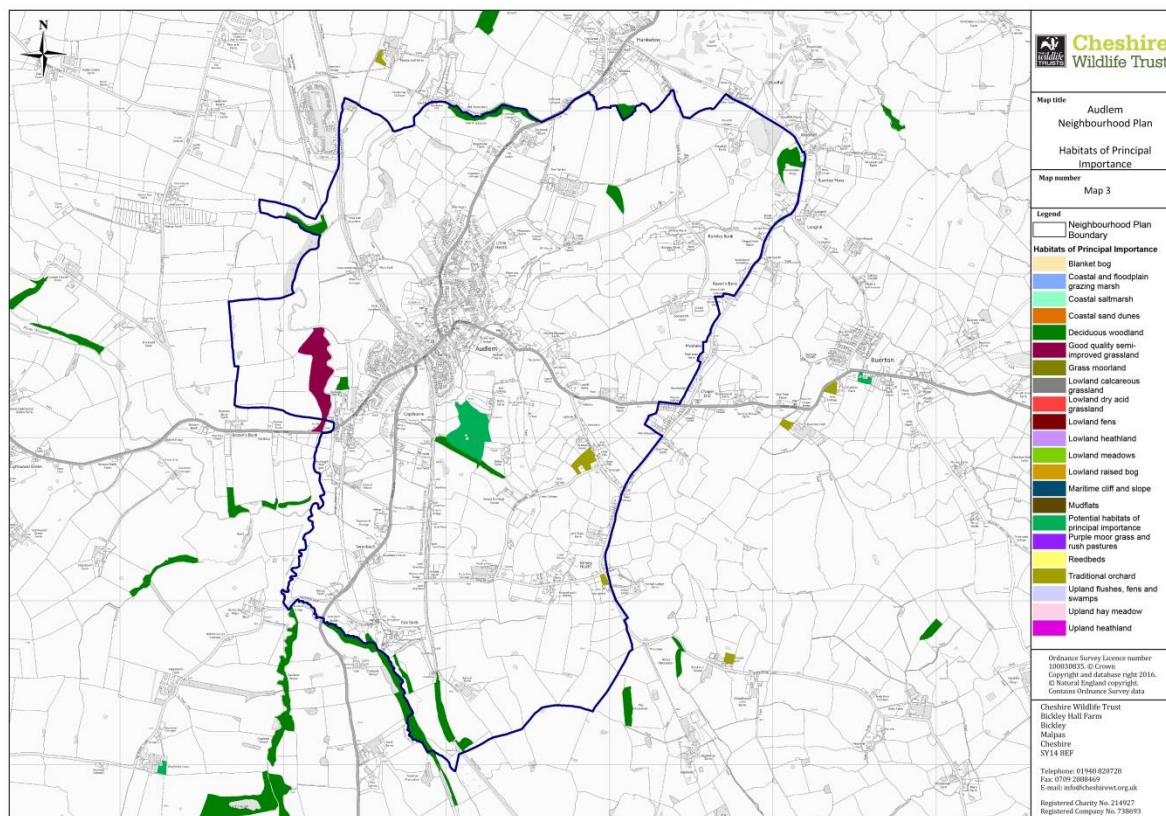
2. Aerial photography (Microsoft Bing™ Imagery) was used to validate the results by eye.

3. The Audlem Neighbourhood Plan area Land Character Assessment and Econet categories were mapped and the results were used to inform the conclusions.

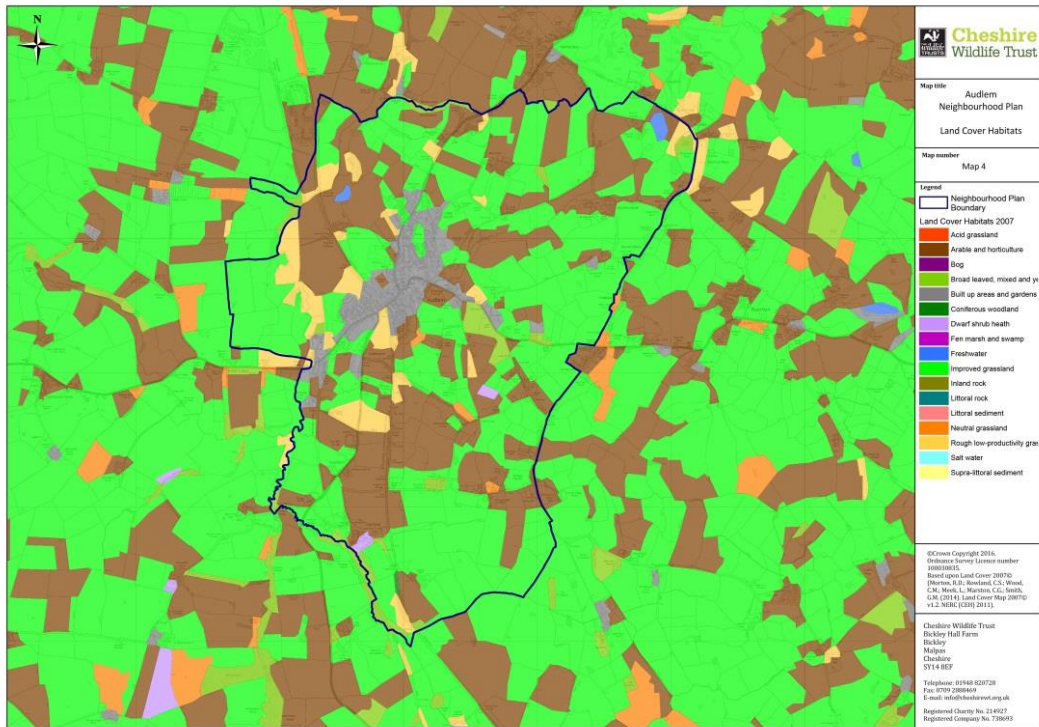
4. Habitat data from recent planning applications in Audlem was researched and incorporated where appropriate.

Mapping

Map 3: Priority habitat – Natural England 2014

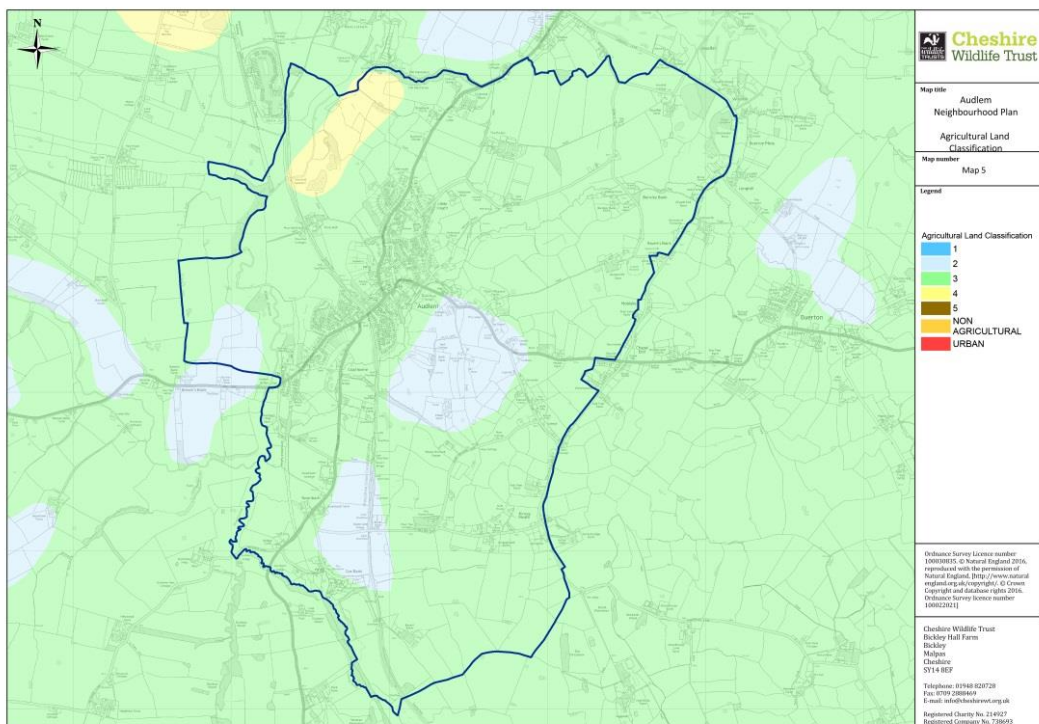


Map 4: Land Cover Habitats

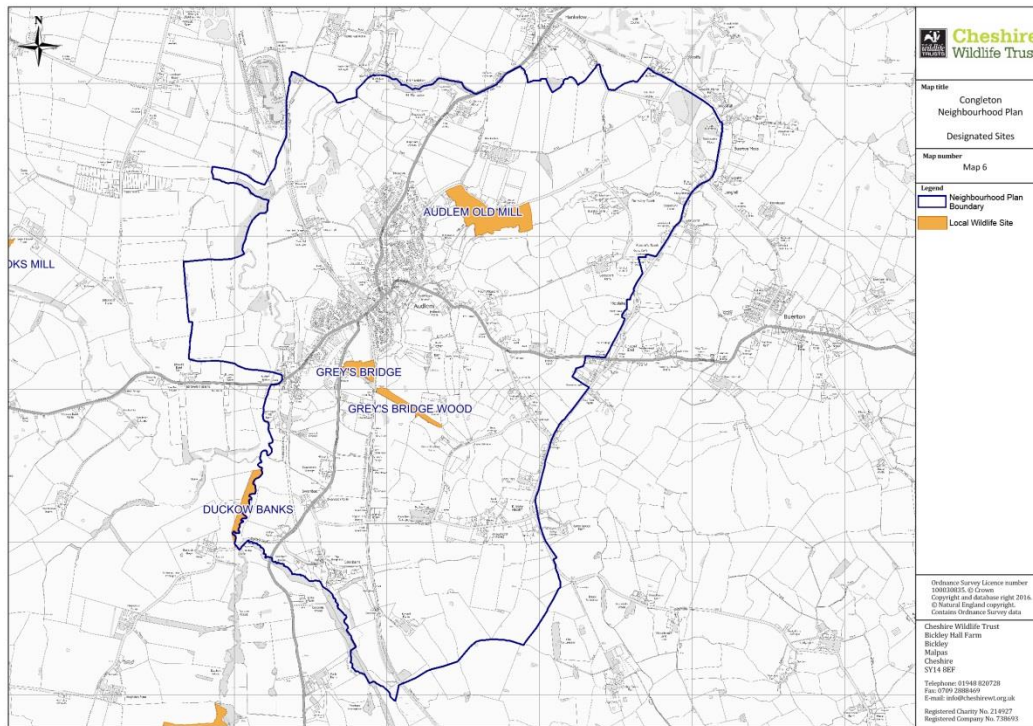


Land Cover Map 2007 (LCM2007) is a parcel-based classification of satellite image data showing land cover for the entire United Kingdom derived from a computer classification of satellite scenes obtained mainly from the Landsat sensor

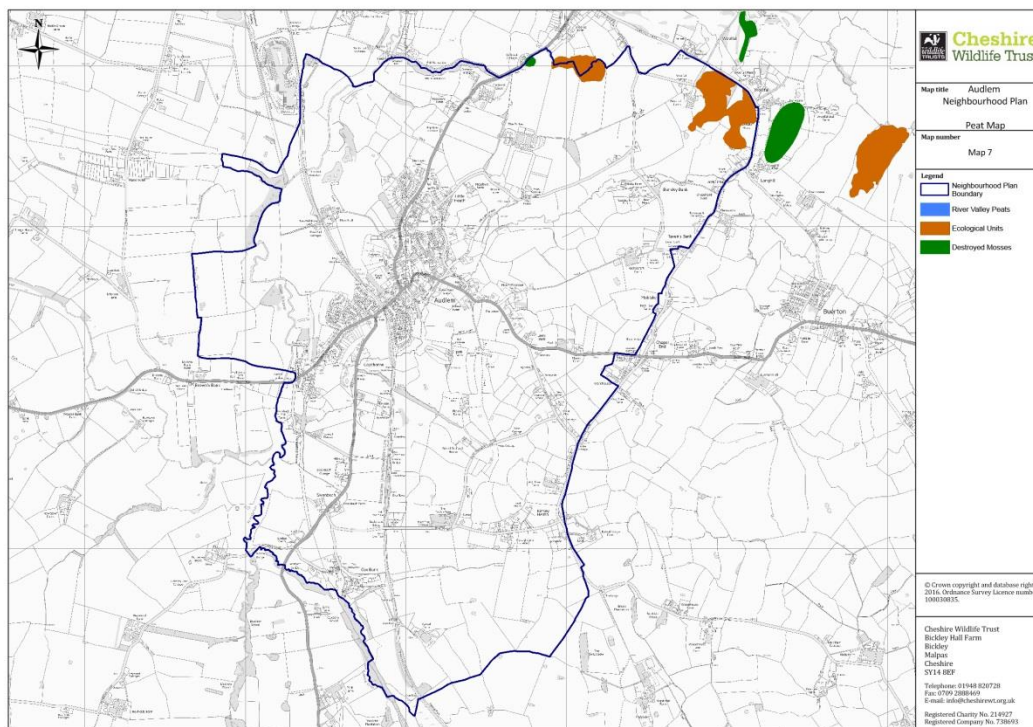
Map 5: Agricultural Land Grading – Natural England 2013



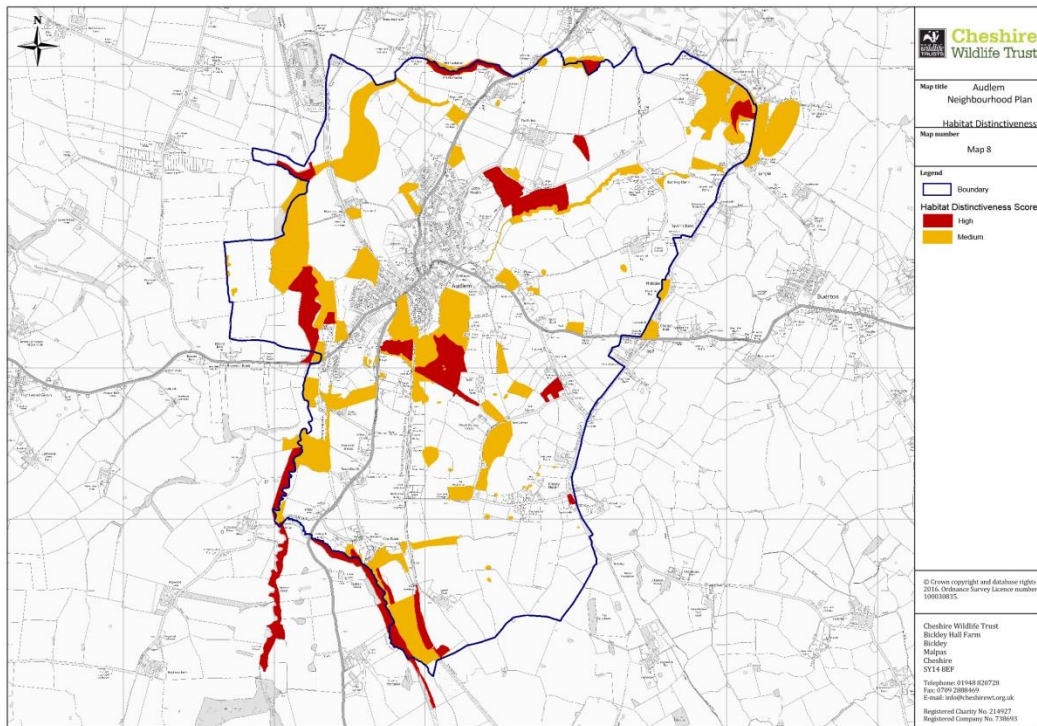
Map 6: Designated Nature Conservation Sites (including Sites of Special Scientific Interest, Local Wildlife Sites, Local Nature Reserves)



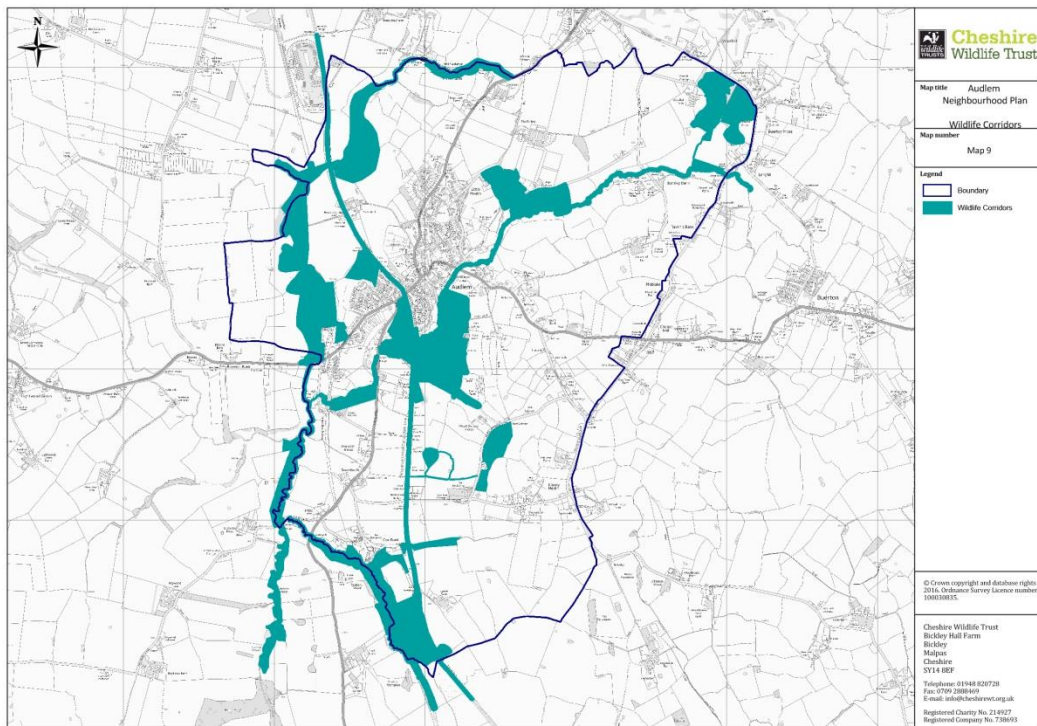
Map 7: Meres and Mosses and other peat soils, Meres and Mosses Landscape Partnership Scheme 2016



Map 8: Habitat Distinctiveness



Map 9: Indicative Wildlife Corridor Network



Results

High distinctiveness habitat

This study has identified several major areas of high value (i.e. high distinctiveness) habitat in the Audlem Neighbourhood Plan area. These are shown in red on Map 8, and include three areas containing species-rich grassland, two of which are designated as a Local Wildlife Site (namely Audlem Old Mill LWS and Grey's Bridge LWS) and another area identified as good quality semi-improved grassland Priority habitat. Also shown as high distinctiveness are nine areas of broadleaved woodland, one of which is designated as LWS (namely Grey's Bridge Wood LWS) and the remainder are identified as deciduous woodland Priority habitat. There are also at least two traditional orchards (Priority habitat) mapped as high distinctiveness.

Grey's Bridge LWS is a small field on the western side of the Shropshire Union Canal, which supports areas of marshy grassland and swamp vegetation. The citation for Grey's Bridge Wood LWS describes a small sycamore/oak/ash/wych elm clough woodland with a good structure and a diverse woodland ground flora. Audlem Old Mill LWS comprises two fields lying north and south of Mill Lane occupying the site of a former mill. An area of species-rich rush pasture is present in the north field and the south field has an area of species-rich neutral grassland on a steep slope. The grassland/wetland habitats at both Grey's Bridge and Audlem Mill LWSs are notable for the terrestrial invertebrates they support, including grassland specialist butterflies such as the large skipper.

Medium distinctiveness habitat

Further areas of undesignated semi-natural grassland and woodland (not identified by Natural England as Priority habitat) are located along the River Weaver, the River Duckow (a tributary of the River Weaver), the Shropshire Union Canal, to the south of Audlem, and along an unnamed river/watercourse to the east of Audlem. Several small woodland copses are also present within the Audlem Neighbourhood Plan area, along with a high density of field ponds and other, larger waterbodies.

The Meres and Mosses (peat soils) map 7 identifies the presence of a series of former mossland sites located towards the north and north-east of the neighbourhood and beyond. This includes one 'Destroyed Moss' located off the A529 Audlem Road, which is now under intensive farmland, and two separate 'Ecological Units' located to the north-east of the neighbourhood. These two separate areas are de-graded mossland sites which have been identified as supporting some form of relict peatland habitat (e.g. extensive grassland, rush pasture or woodland) and offering potential for mossland restoration. Information provided by Audlem Parish Council indicates that one of these 'Ecological Units' comprises a former mossland site known locally as either 'Longhill moss' or 'Blackwater Moss'. It is understood that this area presently consists of woodland, grassland and open water habitat, and is actively managed by members of the Parish Council. Map 7 does not indicate the presence of any river valley peats within the Audlem Neighbourhood Plan area.

The high density of field ponds within the Audlem Neighbourhood Plan area is typical of lowland rural Cheshire. The greatest concentration of field ponds is found to the south of the A525. The Audlem Neighbourhood Plan Area also supports a good network of hedgerows, which again is typical for this landscape character type.

Discussion

The results of this study can be used as a guide for future decisions regarding planning policy and development control. The analysis has identified areas that act as a 'wildlife corridor network' (Map 9) with high ecological connectivity within and beyond the Audlem Neighbourhood Planning area.

This network largely follows the courses of the River Weaver, its tributaries and confluences, and the Shropshire Union Canal. These watercourse corridors provide ecological connectivity north-south and east-west through the neighbourhood. The most western of the longitudinal corridors (the River Duckow and River Weaver) passes through open farmland and supports grassland and woodland sites of high and medium distinctiveness along much of its riparian zone and beyond. Running almost parallel, within approximately 0.5km, is the Shropshire Union Canal, which runs directly through the largest concentration (core area) of high and medium distinctiveness sites within the neighbourhood, located immediately to the south of Audlem. This core area encompasses two Local Wildlife Sites, namely Grey's Bridge LWS and Grey's Bridge Wood LWS. The third corridor follows an unnamed tributary of the River Weaver that runs from the eastern boundary of the neighbourhood close to Bunsley Bank towards the village of Audlem. This corridor incorporates the adjacent Audlem Old Mill LWS and encompasses the 'core area' to the south of Audlem, before passing beneath the Shropshire Union Canal and connecting to the River Weaver corridor.

The network also encompasses the two Ecological Units of degraded mossland located to the north-east of the neighbourhood, and a substantial hedge that connects them to the unnamed tributary of the River Weaver. These degraded mossland sites support grassland, open standing water and deciduous woodland Priority habitat (High distinctiveness). Providing that their soils and hydrology have not been affected too greatly, these areas may have some potential for mossland restoration or partial restoration to support some mossland plant species or communities.

In summary, the proposed wildlife corridors that form the network are interconnected, have good connectivity with the 'core area', incorporate all three of Audlem's Local Wildlife Sites, and consist of Priority and semi-natural woodland and grassland habitats, and degraded but potentially restorable mossland sites.

It is highly recommended that the 'wildlife corridor network' in Map 9 is identified and protected in the Neighbourhood Plan so that the guidance relating to ecological networks set out in the Local Plan and the NPPF may be implemented at a local level.

Wildlife corridors are a key component of local ecological networks as they provide connectivity for species to move to and from core areas of high wildlife value/distinctiveness. For this reason, habitat enhancement along the corridor network is likely to improve the long term viability of the core high value areas. Enhancement of the corridor may be facilitated by opportunities arising through the planning process (e.g. S106 agreements, biodiversity offsetting/compensation) or through the aspirations of the local community.

Protection of the wildlife corridor and other high distinctiveness habitat

Map 9 incorporates an indicative boundary for the wildlife corridor network; however this is likely to require refinement following detailed survey work. The corridor should be wide enough to protect the valuable habitats identified in Map 8 and for this reason we have incorporated a 15 metre buffer zone around any high distinctiveness habitat. The buffer is necessary to help protect vulnerable habitat from factors such as water and light pollution, predation by domestic pets, and invasive garden species.

A 15m buffer zone is also appropriate for any land lying outside the corridor network that, following an ecological appraisal, is subsequently found to be high distinctiveness Priority habitat¹. Any potential development proposals which are adjacent to a high distinctiveness habitat or a wildlife corridor should demonstrate substantial mitigation and avoidance measures to lessen any impact on wildlife. For example low spillage (bat/otter sensitive) lighting should be recommended for use on the outside of buildings or in car-parks and along pathways and watercourses. Surface drainage water from developed areas should always be directed away from sensitive areas due to the risk of pollution unless the source of the water is clean, such as rainwater collected from roofs. Sustainable Drainage Schemes (SuDS) are useful in providing additional wildlife habitat and preventing flooding, but they may still hold polluted water so should not drain directly into existing wildlife habitat unless the filtration system is extensive.

Not all sections of the wildlife corridor provide high quality habitat and measures to improve the ability of the corridor to support the movement of species is desirable. Again, enhancement of the corridor may be facilitated by opportunities arising through the planning process or through the aspirations of the local community.

In addition to the 'wildlife corridor network' this study has identified further areas of high or medium 'habitat distinctiveness' (Map 8) which, although sit outside the wildlife corridor network, nevertheless may provide important wildlife habitats acting as ecological stepping stones. These areas comprise semi-natural/species-rich grassland, ponds, traditional orchards and semi-natural woodlands. The extensive network of field boundary hedgerows provides habitat connectivity between these areas, which would otherwise be separated by extensive areas of land predominantly of low habitat distinctiveness with restricted potential for wildlife to disperse. Although not identified as a key component of Audlem's ecological network, collectively, these hedgerows provide linear connectivity through the neighbourhood and beyond, in addition to their intrinsic ecological value. Where hedgerows are associated with small irregular shaped fields, for example to the immediate south east of Audlem, they also contribute greatly to the landscape character and historical value of the area.

Old meadows supporting species-rich neutral or marshy grassland are the fastest disappearing habitats in the UK. These grasslands are particularly important for pollinating insects and insectivorous birds and mammals. It is extremely important that the highlighted 'medium distinctiveness' areas should be thoroughly evaluated in the development control process. If they are found to support species-rich grassland they should be re-classified as 'high distinctiveness'

¹ This may currently be mapped as medium distinctiveness due to lack of information.

(Priority/principal importance) habitat and they should not be built on (as stipulated in the Local Plan and the NPPF). In order to achieve no 'net loss' in biodiversity, compensation may be required should these areas be lost to development when avoidance and mitigation strategies have been applied in line with the guidance set out in the Local Plan.

Conclusion

By bringing together all the available information relating to land use and habitats in the Audlem Neighbourhood Plan area, this study has identified areas of high and medium 'habitat distinctiveness' as described in the Defra Biodiversity Offsetting metric. By attributing habitat distinctiveness values to different land parcels, the results of this study should act as a guide when planning decisions are made. We strongly recommend that further (phase 1) habitat survey work is undertaken at the appropriate time of year, in particular to verify that 'medium value' habitats have not been over or under-valued.

Most notably the analysis has identified a 'wildlife corridor network' connecting woodlands, ponds, grassland and hedgerows mainly along the course of the River Weaver and its tributaries, and the Shropshire Union Canal. This wildlife corridor network should be retained as it provides ecological connectivity both within the parish and to the wider countryside. It also provides direct connectivity between all three of Audlem's Local Wildlife Sites and another LWS located situated immediately adjacent to the neighbourhood boundary (namely Duckow Banks LWS) and degraded mossland sites which may have some potential for restoration.

We recommend that the corridor network is identified in the Neighbourhood Plan and protected from development. Map 9 shows an indicative boundary for the wildlife corridor network, however this is likely to require refinement following detailed survey work. The corridor should be wide enough to protect the high and medium distinctiveness areas identified in Map 8, and we suggest that an adjacent non-developable buffer zone is identified.

Furthermore we advise that measures to mitigate possible ecological impacts are included in any development adjacent to buffer zones and high/medium distinctiveness areas identified in Map 8. An example of this is that bat sensitive lighting could be recommended for use on the outside of buildings or in carparks/pathways, and otter sensitive lighting in areas adjacent the River Weaver and its tributaries, and the Shropshire Union Canal. Surface drainage water from developed areas should always be directed away from sensitive areas due to the risk of pollution.

To summarise, future development of Audlem village should respect the natural environment. In terms of biodiversity, the most intact landscapes, landform and historic/cultural associations should be valued highly when planning decisions are made. Protection and enhancement of Audlem's natural assets is of crucial importance to nature conservation and ecosystem services but it is also important for the enjoyment of future generations.

Recommendations for improving and protecting habitat in order to create a coherent ecological network

Following adoption of the neighbourhood plan, CWT advises that the following recommendations should be actioned:

1. Improve the quality of the 'wildlife corridor network' and assess against Local Wildlife Site selection criteria

The areas highlighted as 'wildlife corridor network' in Map 9 incorporate three designated Local Wildlife Sites, however it is highly likely that other land within these areas would meet the criteria for Local Wildlife Site selection. These areas should be designated if the selection criteria are met, as LWS designation is likely to provide a greater level of protection within the planning system.

The wildlife corridor network should be in 'favourable condition'² to provide breeding, foraging and commuting habitat for the native species that live there and native species which may subsequently colonise. Ideally these areas should be surveyed by a qualified ecologist to identify management priorities.

Management work may include:

- Control of Himalayan balsam. It is extremely important that this species is prevented from colonising the brooks or the wetland. The Cheshire Wildlife Trust is aware that extensive areas of non-native Himalayan balsam have previously been recorded along sections of the stream by Grey's Bridge. This species is highly invasive and can out-compete native flora and can also cause soil erosion due to the lack of binding vegetation in winter (particularly on river banks). CWT can provide further advice on the control of this and other non-native species.
- Control of non-native/garden species in woodland. Garden species such as daffodils, monbretia, variegated yellow archangel and Spanish bluebells can all be highly invasive and damage the ecological balance of woodlands.
- Hedgerows that form part of the wildlife corridor should be restored using locally native species such as wych elm, hawthorn, blackthorn, hazel and holly (plant 60-90cm high 'whips' which have a good rate of survival and use tree guards to protect from rabbits and stock fence where necessary). New sections of hedgerow should ideally incorporate a tree every 30m (on average) which are demarked so as not to be inadvertently flailed.
- All semi-natural grassland should be cut or grazed each year to maintain its wildlife value.
- Professional advice should be sought before mossland restoration is undertaken (refer to point 5 below).

² The definition of 'favourable condition' for Local Wildlife Sites is provided in Appendix 3

2. Protect, enhance and connect areas of high/medium value which lie outside the wildlife corridor

Opportunities should be explored to restore or create more wildlife friendly habitat, especially where connectivity with other areas of high or medium value habitat can be achieved or where valuable sites can be buffered. Larger areas of better connected habitat support larger and healthier species populations and help prevent local extinctions.

Ways to enhance connections or to buffer sites may include restoring hedgerows, creating low maintenance field margins and sowing locally sourced wildflower meadows. Woodland expansion is desirable; however tree planting should only occur on species-poor (low value) grasslands. Professional advice should always be sought when creating new habitat.

3. Protect existing hedgerow network

Hedgerows which meet certain criteria are protected by *The Hedgerow Regulations, 1997*. Under the Regulations it is against the law to remove or destroy 'Important' hedgerows without permission from the Local Planning Authority. Removal of a hedgerow in contravention of *The Hedgerow Regulations* is a criminal offence. The criteria used to assess such hedgerows relate to the value of a hedgerow from an archaeological, historical, landscape or wildlife perspective. They exclude hedgerows that have been in existence for less than 30 years, garden hedges and some hedgerows which are less than 20 metres in length. The aim of the Regulations is to protect Important hedgerows in the countryside by controlling their removal through a system of notification.

Any proposals that involve the removal of hedgerows or sections of hedgerows or their associated features (e.g. ditches, banks, standard trees) should be supported by an assessment to ascertain their status in relation to *The Hedgerow Regulations*. Should the Local Planning Authority grant permission for removal, compensatory hedgerows should be provided.

Guidance issued by DEFRA relating to biodiversity offsetting requires 'multipliers' to be applied according to the condition of any native hedgerow to be lost: 'Poor' condition hedgerows should be compensated for using a multiplier of x1 (i.e. like-for like length), 'Moderate' condition hedgerows should be compensated for using a multiplier of x2, and 'Good' condition hedgerows should be compensated for using a multiplier of x3 (e.g. loss of 10m of hedgerow in 'Good' condition would require 30m to be planted in compensation).

Hedgerow condition assessment criteria are provided in the Natural England Higher Level Stewardship Farm Environment Plan Manual (2010), however, in brief, three condition assessments are made: average height before flailing is at least 2m; average width before flailing is at least 1.5m; less than 10% gaps, excluding gate holes and gaps beneath tree canopy. Native hedgerows meeting all three criteria are in 'Good' condition, those meeting any two criteria are in 'Moderate' condition, and those meeting no criteria are in 'Poor' condition.

Any new sections of hedgerow should be created following the guidance provided above (point 1).

4. Phase 1 habitat mapping

It is strongly recommended that Audlem Neighbourhood Planning area is phase 1 habitat mapped. This will provide a high level of habitat detail and could be used to verify the results of the habitat distinctiveness mapping (map 7). Phase 1 mapping may identify further areas of medium or high distinctiveness (Priority) habitat not identified by this assessment. Areas identified as having medium value habitat in this report should be targeted for survey as a priority. Phase 1 mapping should also be used to determine the exact position of the wildlife corridor network.

5. Survey of former mossland sites

It is recommended that the areas identified as 'Ecological Units' on the Peat map (map 7) are subject to detailed assessment to ascertain their potential for future mossland restoration. The assessment should consider current and past land use, hydrology and the habitats and species that are currently present. Management prescriptions may be made relating to ways to reduce potential detrimental impacts currently exerted on these areas, and to identify actions that should be undertaken if funding becomes available in the future (e.g. Section 106 commuted sums).

Appendices

Appendix 1

Habitats, LCM2007 classes³ and Broad Habitat subclasses for LCM2007 CEH

LCM2007 class	LCM2007 class number	Broad Habitat sub-class	Broad habitat sub-class code	Habitat Score
Broadleaved woodland	1	Deciduous	D	Medium
		Recent (<10yrs)	Dn	Medium
		Mixed	M	Medium
		Scrub	Sc	Medium
'Coniferous Woodland'	2	Conifer	C	Low
		Larch	Cl	Low
		Recent (<10yrs)	Cn	Low
		Evergreen	E	Low/Medium
		Felled	Fd	Medium
'Arable and Horticulture'	3	Arable bare	Aba	Low
		Arable Unknown	Aun	Low
		Unknown non-cereal	Aun	Low
		Orchard	O	Medium

³ No habitat scores higher than 'medium distinctiveness' due to the reliability of the data

		Arable barley	Aba	Low
		Arable wheat	Aw	Low
		Arable stubble	Ast	Low
Improved Grassland'	4	Improved grassland	Gi	Low
		Ley	Gl	Low
		Hay	Gh	Low
Rough Grassland	5	Rough / unmanaged grassland	Gr	Medium
'Neutral Grassland'	6	Neutral	Gn	Medium
'Calcareous Grassland'	7	Calcareous	Gc	Medium
Acid Grassland	8	Acid	Ga	Medium
		Bracken	Br	Medium
'Fen, Marsh and Swamp'	9	Fen / swamp	F	Medium
Heather	10	Heather & dwarf shrub	H	Medium
		Burnt heather	Hb	Medium
		Gorse	Hg	Medium
		Dry heath	Hd	Medium
Heather grassland	11	Heather grass	Hga	Medium

'Bog'	12	Bog	Bo	Medium
		Blanket bog	Bb	Medium
		Bog (Grass dom.)	Bg	Medium
		Bog (Heather dom.)	Bh	Medium
'Montane Habitats'	13	Montane habitats	Z	Medium
Inland Rock'	14	Inland rock	lb	Medium
		Despoiled land	Ud	Medium
Salt water	15	Water sea	Ws	Medium
		Water estuary	We	Medium
Freshwater	16	Water flooded	Wf	Medium
		Water lake	Wl	Medium
		Water River	Wr	Medium
'Supra-littoral Rock'	17	Supra littoral rocks	Sr	Medium?
'Supra-littoral Sediment'	18	Sand dune	Sd	Medium
		Sand dune with shrubs	Sds	Medium
		Shingle	Sh	Medium?
		Shingle vegetated	Shv	Medium
'Littoral Rock'	19	Littoral rock	Lr	Medium
		Littoral rock / algae	Lra	Medium

Littoral sediment	20	Littoral mud	Lm	Medium
		Littoral mud / algae	Lma	Medium
		Littoral sand	Ls	Medium
Saltmarsh	21	Saltmarsh	Sm	Medium
		Saltmarsh grazing	Smg	Medium
Urban	22	Bare	Ba	Low
		Urban	U	Low
		Urban industrial	Ui	Low
Suburban	23	Urban suburban	Us	Low

Meres & Mosses LPS / NIA:
Methodology for Mapping Extant Meres & Mosses

The mapping of 'Functional Ecological Units' is primarily based on topography, with use being made of lidar data. Lidar is a remote sensing technique whereby an airborne survey using lasers generates detailed topographic data (known as a Digital Terrain Model (DTM)). With approximately 70% coverage of the Meres & Mosses landscape.

Mapping of the Functional Ecological Units (FEUs) started with the identification of extant sites:-

- 1) All designated sites, SSSIs and County (Local) Wildlife Sites, that are either a mere or a moss were included.
- 2) Beyond the designated sites, use was made of a detailed peat soils map for the area. From this dataset a distinction was made between likely moss peats and extensive areas of likely fen peat associated with some of the river valleys. The moss peat sites were then reviewed using aerial photography and divided into two categories: destroyed and de-graded. The former are sites under arable, intensive grassland or other land use, where any relict habitat, and potentially even the peat itself, have been lost – these were excluded. The de-graded sites are those supporting some form of relict habitat (e.g. extensive grassland, rush pasture or woodland) offering potential for restoration – these were taken forward as FEUs.
- 3) Finally the 1:10,000 scale OS base map was scanned for names alluding to meres and mosses. All waterbodies specifically called "Mere" were included in the mapping, but sites with names suggestive of meres (e.g. Black Lake) were ignored. A few sites were identified called "Moss" – however, because these were not shown on the peat soils map, these were excluded.

For each potential FEU the lidar data was manipulated to show land within a nominal 3 metres elevation of the lowest point on the site. The FEU was then defined as the obvious basin around the lowest point – i.e. the land where it should be possible to restore hydrological function and therefore a wetland habitat mosaic (generally a nominal 1.0 - 1.5 metres above the lowest point on the site). Where no lidar data was available, the likely boundary of the FEU was estimated from the peat soils data and aerial photography.

Appendix 3

In order for a Local Wildlife Site to be recorded as in positive management all four of the following should be met:

- The conservation features for which the site has been selected are clearly documented.
- There is documented evidence of a management plan/management scheme/advisory document which is sufficiently targeted to maintain or enhance the above features.
- The management requirements set out in the document are being met sufficiently in order to maintain the above features. This should be assessed at 5 year intervals (minimum) and recorded 'not known' if the interval is greater than 5 years.
- The Local Sites Partnership has verified the above evidence.