

Protecting and Enhancing Moston's Natural Environment



Cheshire
Wildlife Trust

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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 Moston, 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 Moston 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.

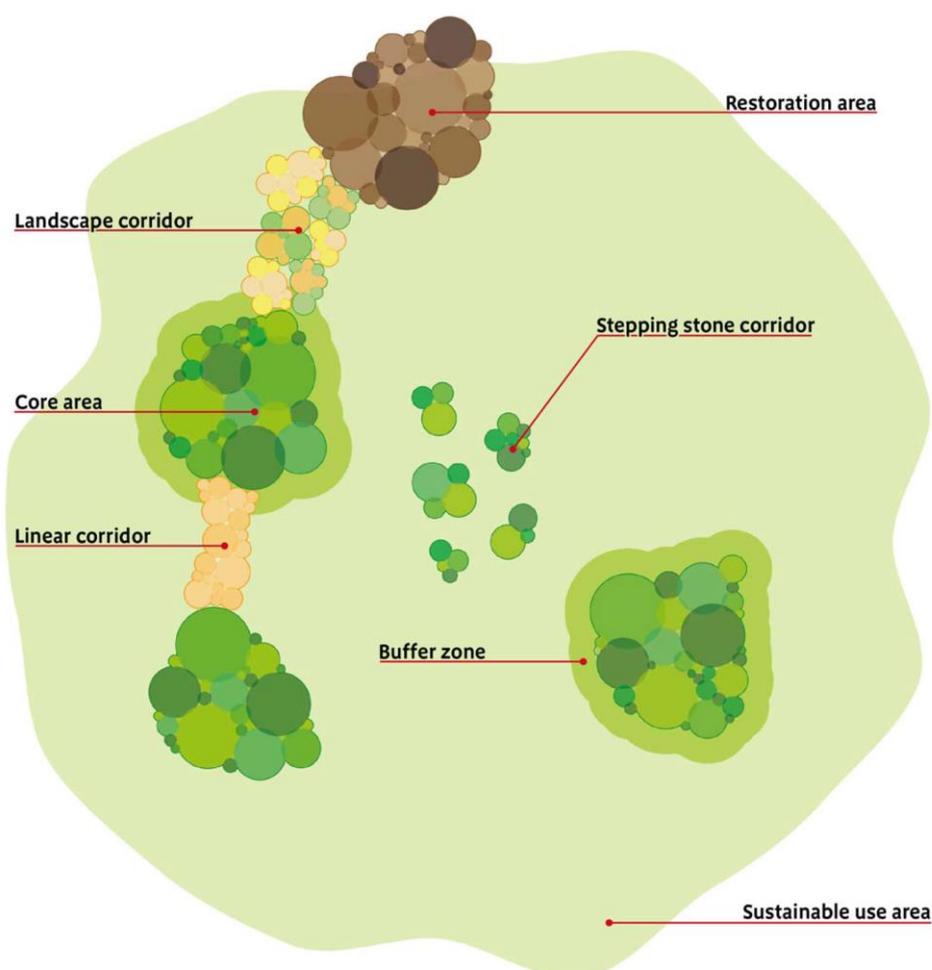


Figure 1. The components of ecological networks (Making Space for Nature report)

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.

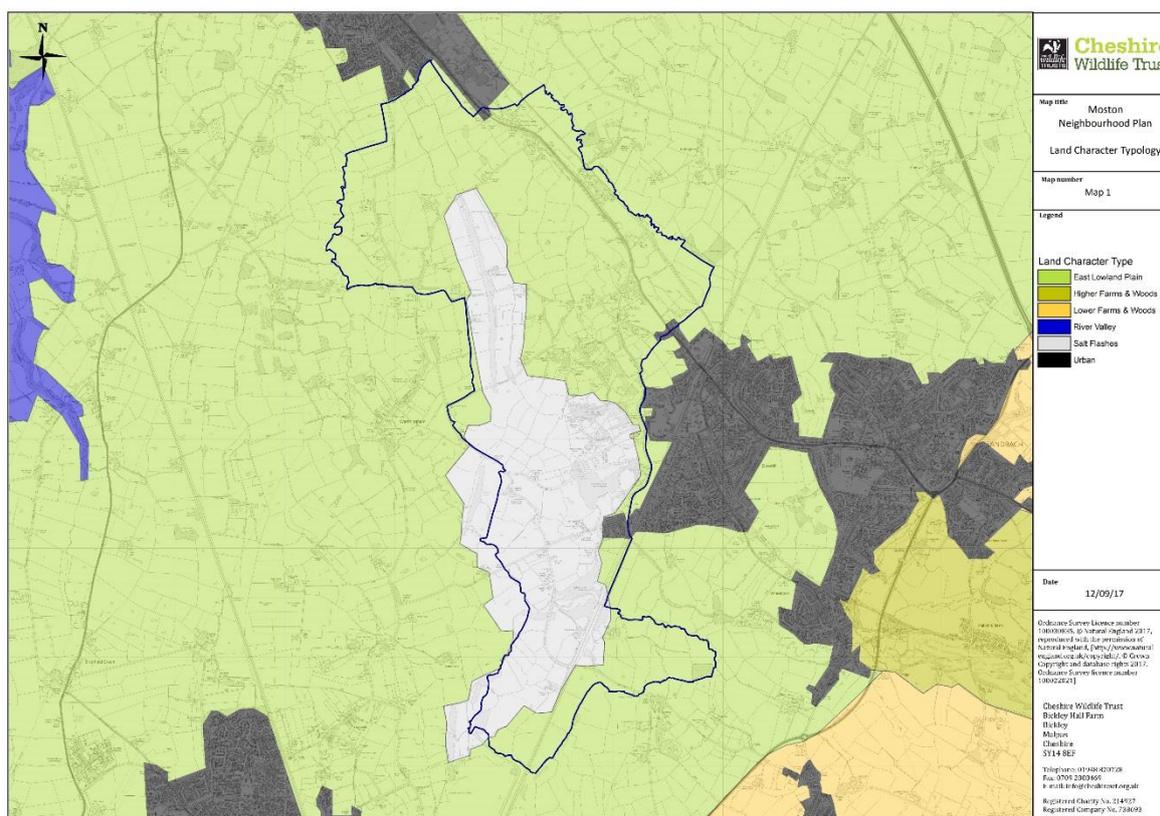
The National Planning and Policy Framework published in 2012 also includes the establishment and conservation of a coherent ecological network as a core principle including:

- 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 Moston 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 Moston Neighbourhood planning area, namely: the East Lowland Plain and the Salt Flashes. Each LCT is subdivided into smaller Landscape Character Areas (LCAs); details of the relevant LCTs and LCAs are given below:

Type 7 – East Lowland Plain

Key Characteristics:

- 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

ELP5: Wimboldsley Character Area (LCA)

This character area stretches from Northwich south to Crewe and encompasses Middlewich, Sandbach and Winsford. The area has a mixture of small and medium sized fields with the smaller irregular shaped fields dating back to the medieval period.

Moston sits within this character area subtype. It is described as predominantly a flat large scale landscape with relatively few hedgerow trees or dominant hedgerows and a paucity of species rich grasslands apart from in the area around Moston Green. The low woodland cover creates an open landscape with long views.

Type 11 – Salt Flashes

Key Characteristics:

- Large water bodies created by brine pumping and rock salt mining
- Surviving features associated with the salt industry – brine cisterns, lime beds and derelict land where industrial structures have been cleared
- Extremely flat, low-lying topography
- Calcareous habitats with a diversity of associated species
- Open expansive views of the surrounding landscape

SF1: Sandbach Flashes Including Salt flashes & nature conservation

The area is predominantly pastoral in character with relatively small irregular shaped fields dating back to the medieval period. Many of the fields have gappy hedges, particularly where the drainage is poor. A series of shallow lakes with muddy margins and occasional reedbeds runs north to south through the character area. These pools originate from between 1920 and 1970 when the collapse of underground cavities used for salt extraction caused subsidence. The Moston Flash area consists of two parallel elongated hollows which were initially formed naturally but brine extraction has accelerated their development.

To the east of the character area the electrified railway track is very prominent and so too are the industrial buildings at Ettiley Heath. The Trent and Mersey canal also runs through this area but is less prominent. There are several small windy lanes which cross the area linking dispersed farms and residential properties.

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.

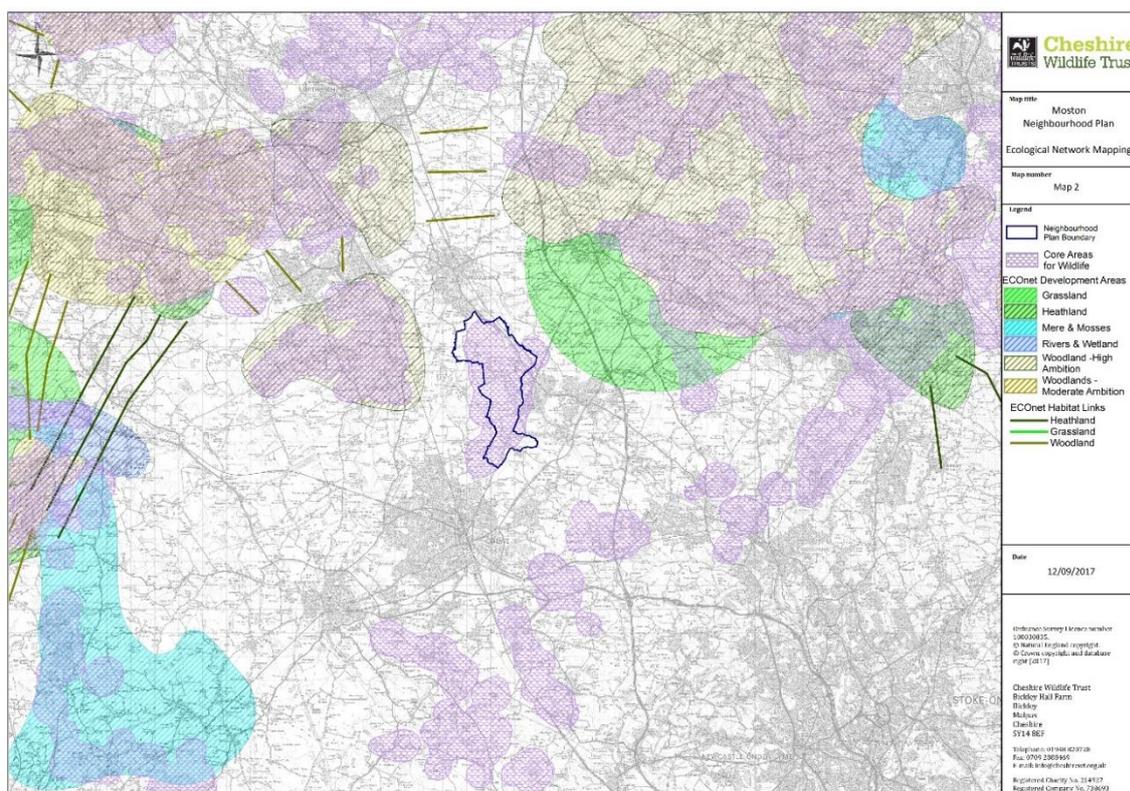
ECOnet – Integrated vision of the Cheshire County Ecological Network

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 Moston Neighbourhood Plan.

Map 2: Ecological Network Mapping (ECOnet)



The cluster of important nature conservation sites in the Moston area has led to its identification as a core area for wildlife in the ECOnet study. Core areas are identified by ECOnet as fundamental components of the county wide ecological network (shaded purple).

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:

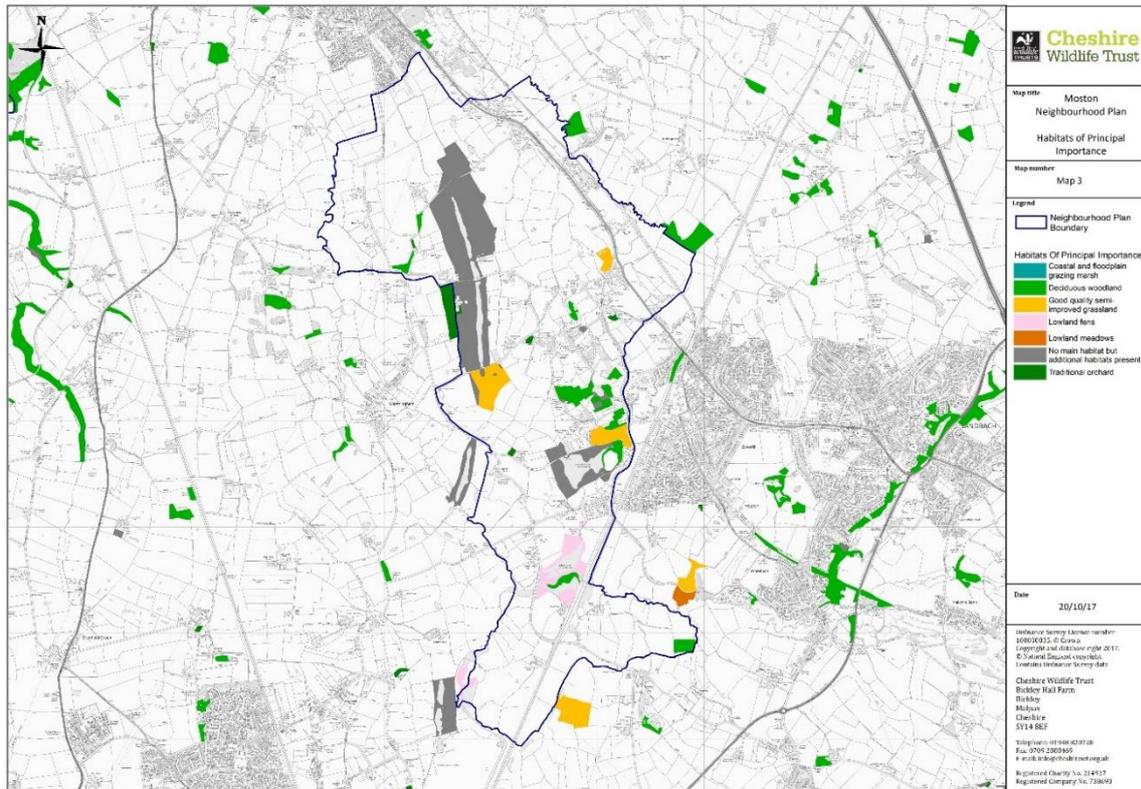
Habitat type band	Distinctiveness	Broad habitat type covered	Colour on map
High ecological value	High	Priority habitat as defined in section 41 of the NERC Act, Designated nature conservation sites (statutory and non-statutory)	Red
Medium ecological value	Medium	Semi-natural habitats and habitats with 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)

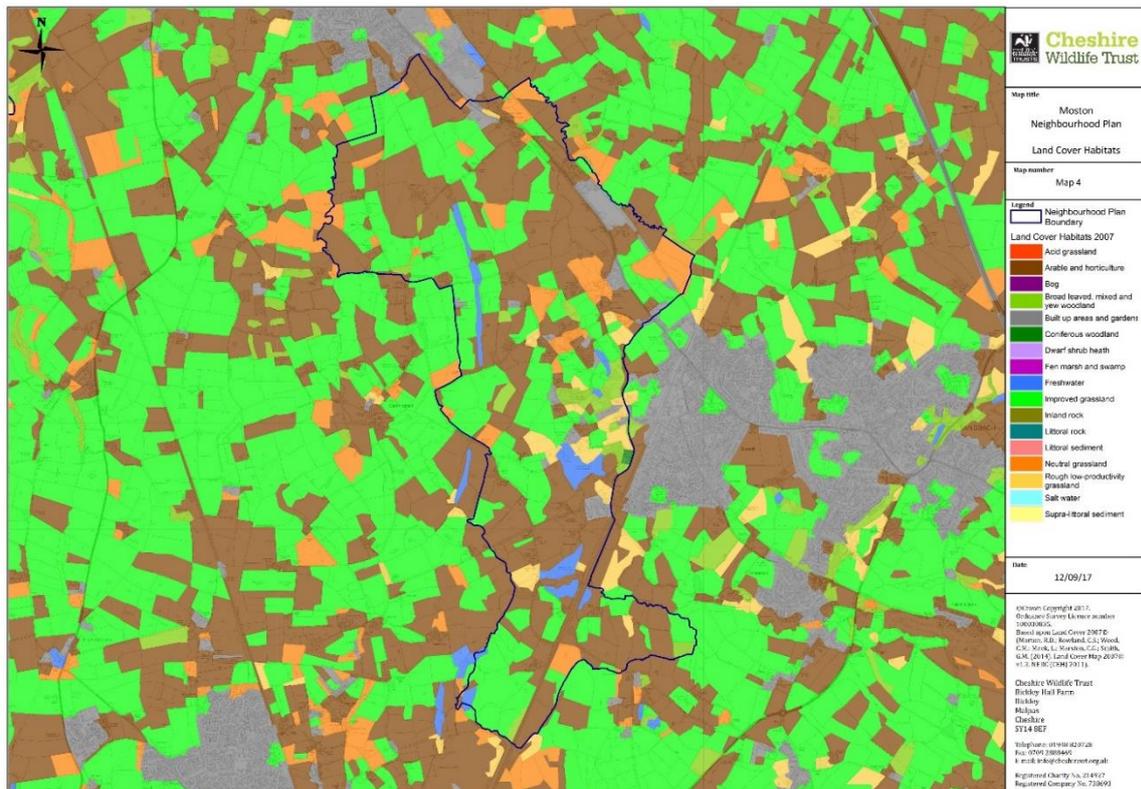
- Several published data sets were used to produce the habitat distinctiveness maps:
 - Priority habitat Natural England 2016 – High/medium confidence coded as high distinctiveness, and low confidence coded as medium distinctiveness unless other data is available.
 - Landcover data, Centre for Ecology and Hydrology 2007. Priority habitats (principal importance) and semi-natural habitats coded as medium distinctiveness (data in Appendix 1)
 - Agricultural land classification, Natural England - grade 4 medium distinctiveness, grade 5 high distinctiveness (adjusted where other data is available).
 - Protected sites (International Sites, European Sites, Sites of Special Scientific Interest, Local Wildlife Sites and Local Nature Reserves), Natural England, CWT/CEC Local Authority – coded as high distinctiveness.
 - Ancient woodlands – Natural England 2015 – coded as high distinctiveness.
 - Meres and Mosses and other peat soils, Meres and Mosses Landscape Partnership scheme, 2016. Functional Ecological Units, river valley peat and destroyed (historical) peat coded as medium distinctiveness. (Supporting information in Appendix 2.)
- Aerial photography (Microsoft Bing™ Imagery) was used to validate the results by eye.
- The Moston Neighbourhood Plan area Land Character Assessment and EConet categories were mapped and the results were used to inform the conclusions.
- Information from recent planning applications in Moston was researched and incorporated where appropriate.

Mapping

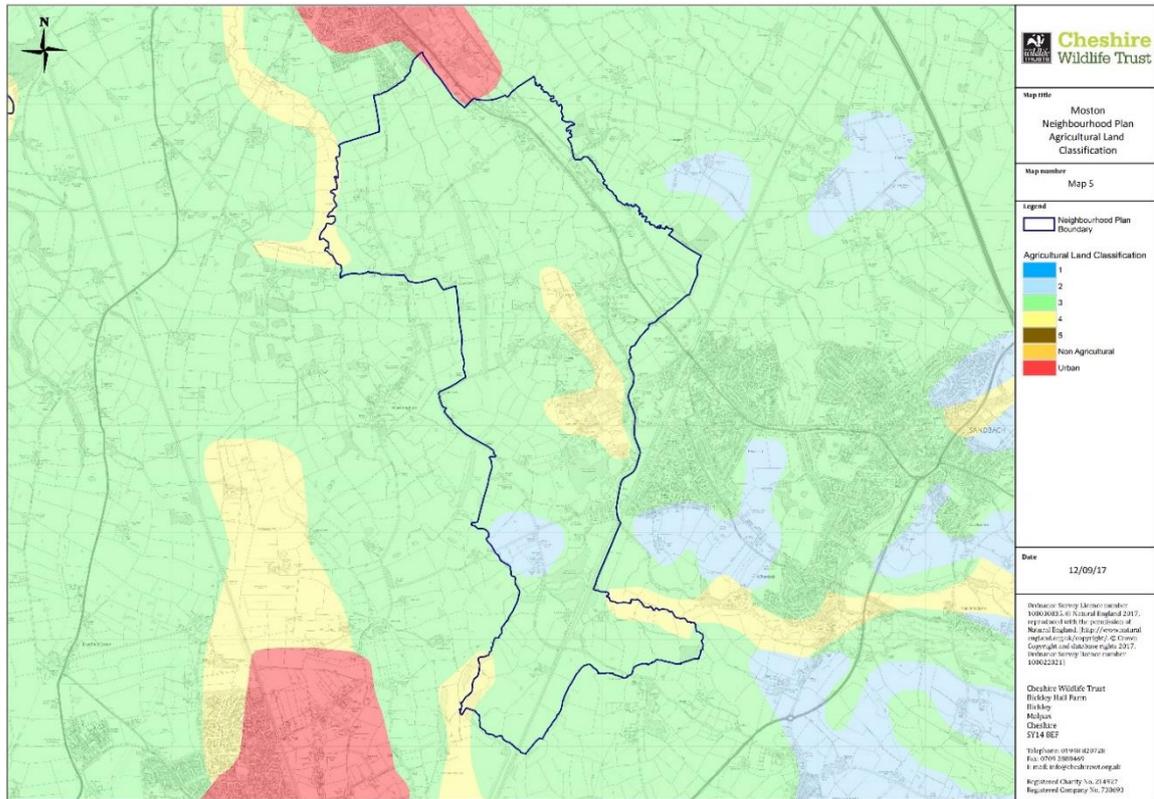
Map 3: Terrestrial habitats of Principal Importance – Natural England 2016



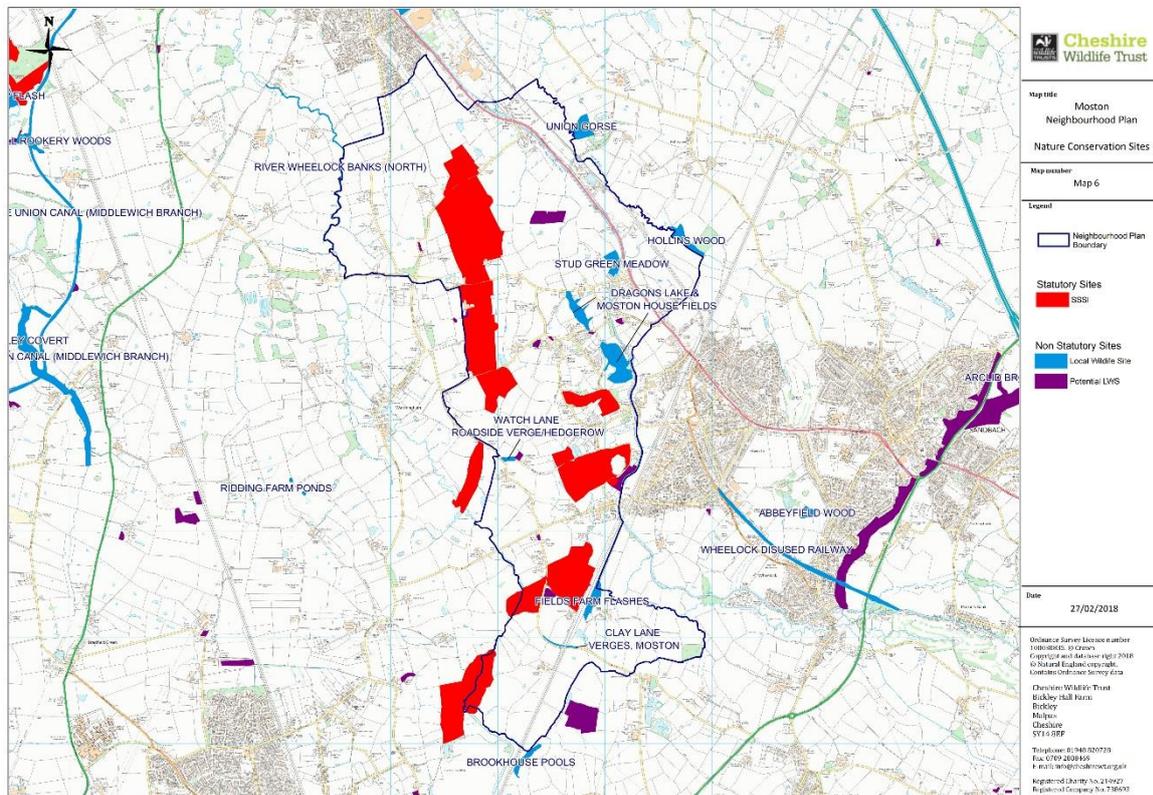
Map 4: Land Cover Map 2007 (LCM2007) parcel-based classification of satellite image data showing land cover for the United Kingdom derived from a computer classification of satellite scenes obtained mainly from the Landsat sensor



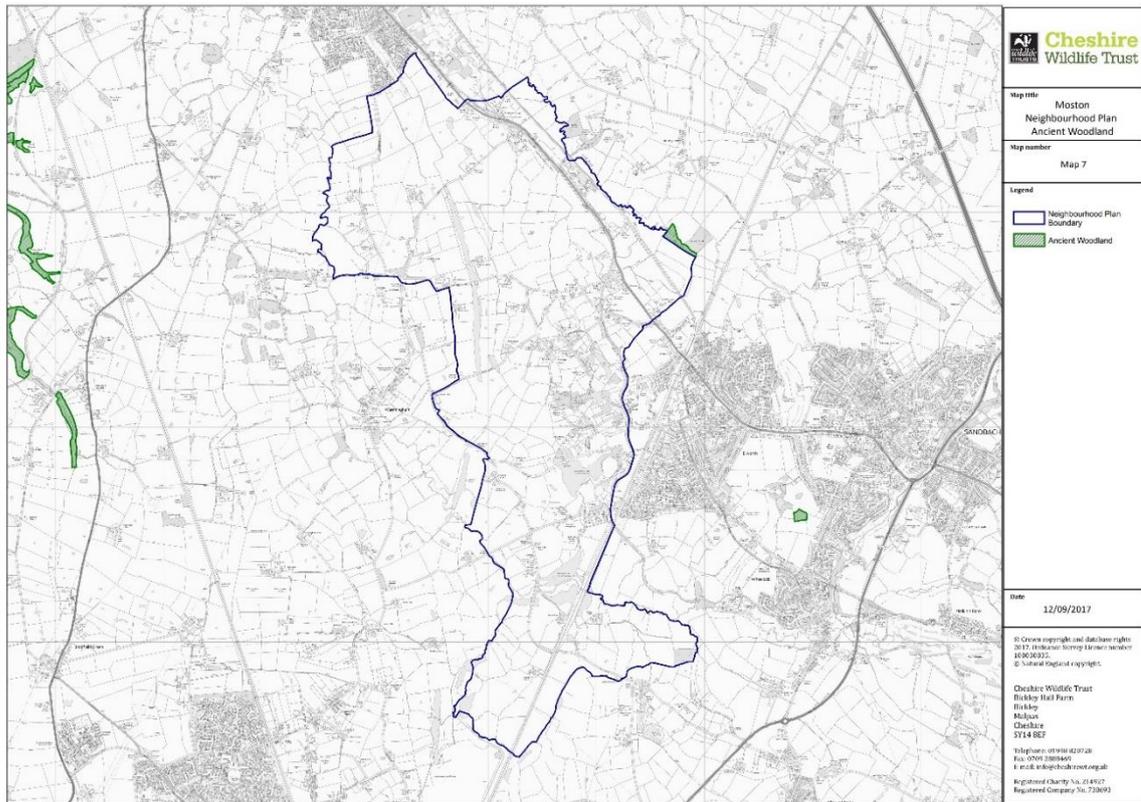
Map 5: Agricultural Land Grading – Natural England 2013



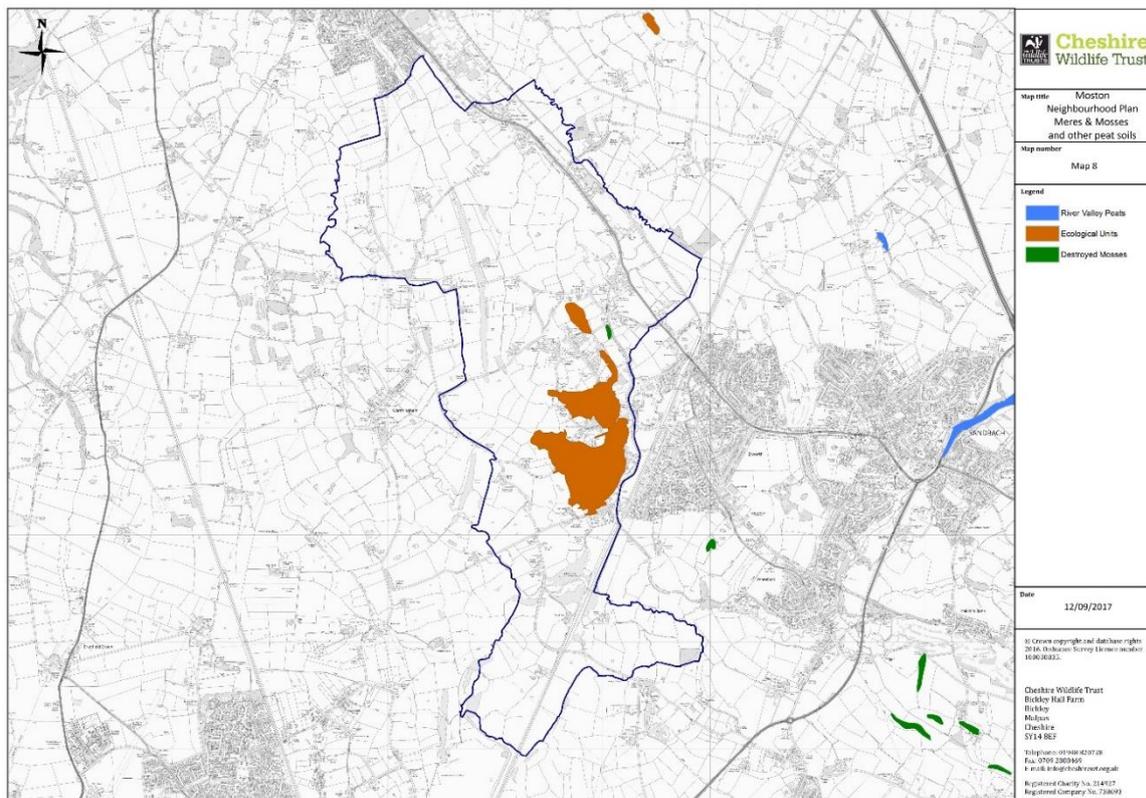
Map 6: Nature Conservation Sites, including Sites of Special Scientific Interest, Local Nature Reserves, European designated sites (SAC, SPA), Ramsar sites, Local Wildlife Sites and non-designated Potential Local Wildlife Sites



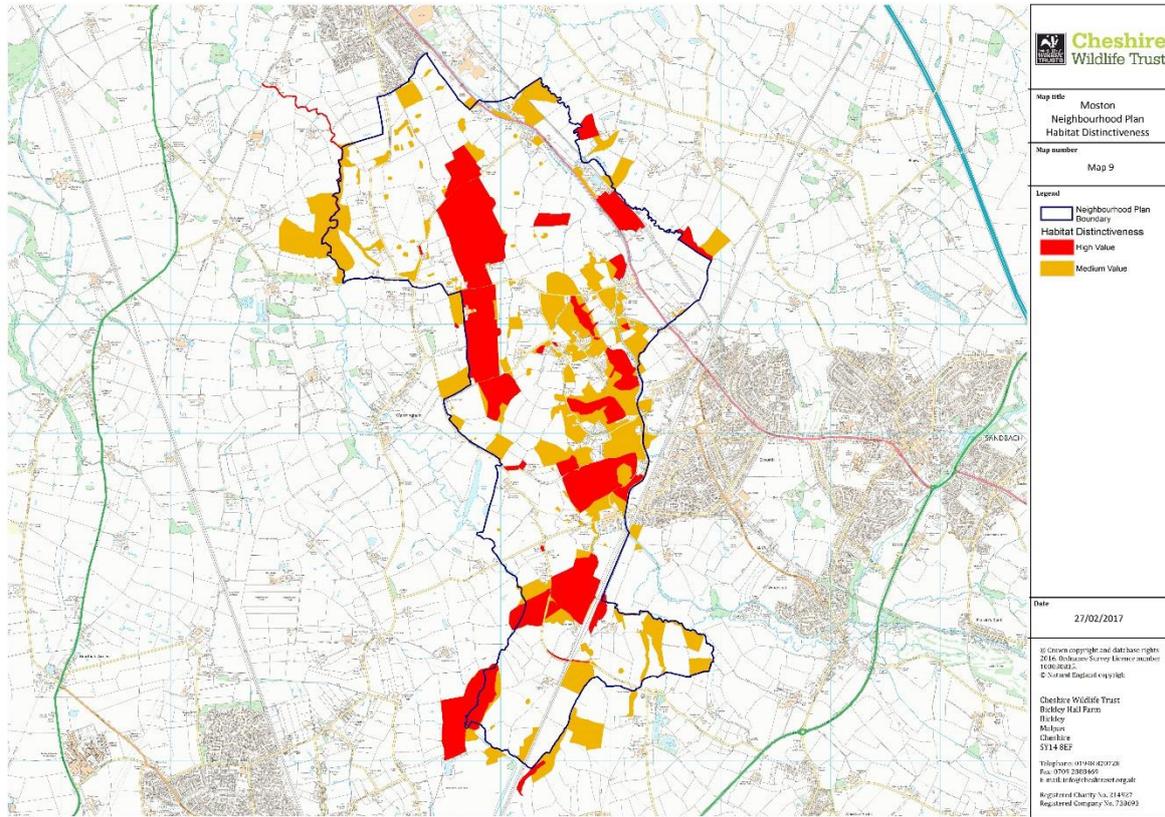
Map 7: Ancient woodland – Natural England 2015



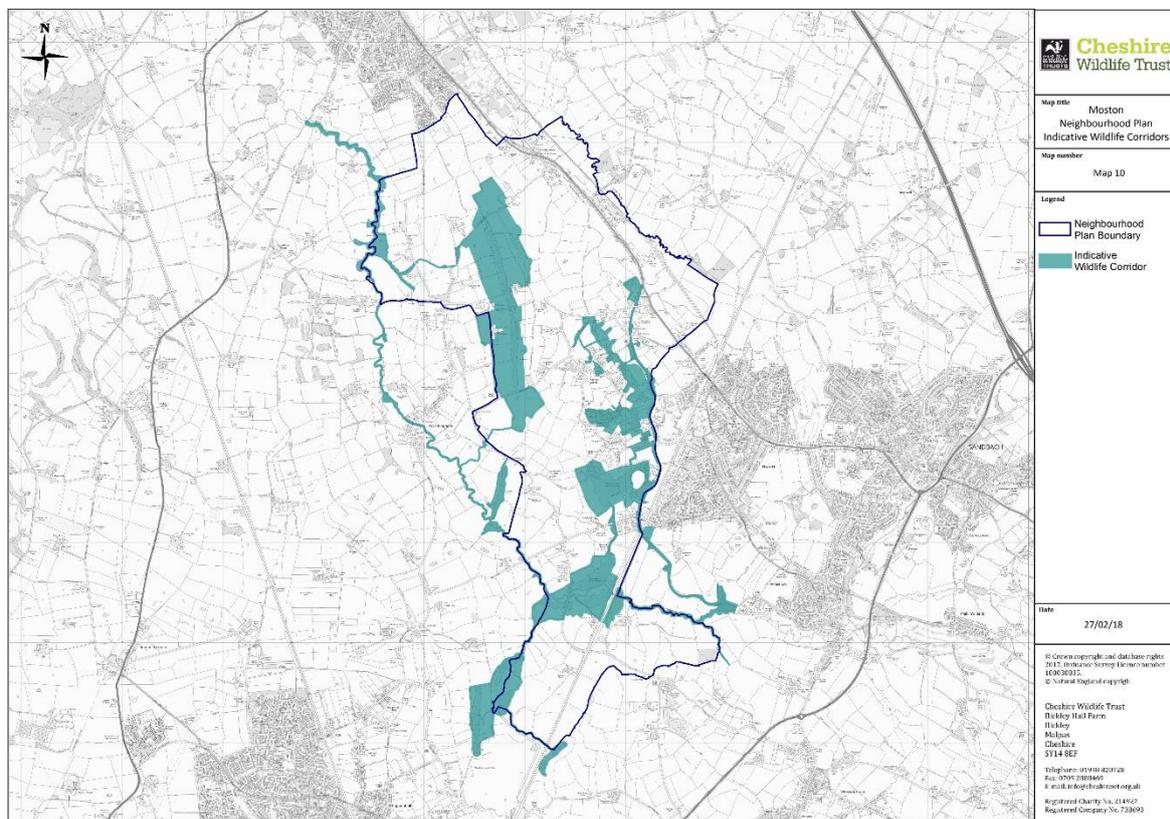
Map 8: Meres and Mosses and other peat soils, Meres and Mosses Landscape Partnership Scheme 2016



Map 9: Habitat Distinctiveness



Map 10: Indicative Wildlife Corridor Network



Results and discussion

High distinctiveness habitat

1. The Flashes

Sandbach Flashes are designated as a Site of Special Scientific Importance notified for the rarity of the inland saline habitats in some of the flashes and their associated flora and fauna together with the assemblage of breeding birds and wintering birds. The Flashes developed following the subsidence of the area following salt extraction in the 20th century. Several of the waterbodies are saline or brackish in character and there are at least two naturally occurring brine springs at Watch Lane flash and Red Flash. The saltmarsh vegetation in these areas include species such as sea aster, lesser sea spurrey and there are also brackish invertebrates including mayflies and snails. The Salt Pan is an area of dried waste lime-based slurry from the Ettiley Heath salt works. This area supports little ringed plover and BoCC¹ red listed breeding lapwing, with red listed curlew, ruff and amber listed redshank in the winter months.

Many of the flashes are fringed with common reed (fen vegetation) which provide habitat for reed and sedge warblers. Some of the flashes including Moston/Warmingham Flash are heavily fished and suffer from disturbance so do not support good breeding bird assemblages; others such as Elton Hall Flash and Pump House Flash have notable populations of wildfowl and wintering or migrant waders including BoCC red listed curlew and lapwing and amber listed snipe, wigeon and teal.

2. Woodland

The woodland cover in Moston is lower than many areas in Cheshire and this reflects past and present land-use patterns. However there are some notable parcels of woodland including the area to the south and west of The Moat (Foden's Flash). Here emergent fen vegetation eventually grades into an area of wet alder/willow woodland. Although not ancient woodland this is an important priority habitat which lies within the designated SSSI. The area is important for summer warblers and there are past records for breeding willow tit, a county rarity. There is also a rookery in the woodland and locally scarce wood small-reed is present, along with an exceptional lichen assemblage.

Hollin's wood is an area of ancient woodland located on the neighbourhood planning boundary on the banks of Small Brook. Ancient woodlands are considered irreplaceable habitats due to time taken for them to acquire their flora and fauna. Hollin's Wood is likely to be a remnant of a much larger woodland that once stretched along the valley sides of Small Brook. The woodland canopy is predominantly sycamore, ash and wych elm with an impoverished ground flora of nettle, bramble and bracken with occasional bluebell, wood sorrel, moschatel and dog's mercury. The land immediately adjacent to the Hollin's Wood has been used as arable farmland and it is likely that

¹ Birds of Conservation Concern 4

fertiliser runoff has impacted the native woodland flora. There are records of BoCC red listed lesser spotted woodpecker in the vicinity of Hollins Wood dating from 2015.

Further areas of woodland/scrub lie on the peaty soils south-west of Ivy House Farm and an area of riparian scrub woodland lies between The Salt Pan and Elton Hall Flash. Both of these are important wildlife habitats.

The semi-natural woodland in Moston may support roosts of UK priority bat species which will forage for insect prey along the woodland edges, hedgerows and watercourses. Uncommon and declining brown long-eared bats have been recently recorded foraging in the Green Lane and Dragon's Lane areas. This species is likely to roost in old buildings, especially in barns. Other bat species recorded in the area include soprano and common pipistrelle, noctule and myotis species. All bats are European Protected Species (EPS) and many are also UK species of Principal Importance (S41 species)

3. *Species-rich grasslands*

The Moston area supports a few pockets of species-rich and marshy grassland, the fastest disappearing habitats in the UK. These are located within Dragon Lake and Moston House Fields Local Wildlife Site and within Stud Green Local Wildlife site. Another parcel lies directly to the south of Green Lane (within the Warmingham/Moston Flash SSSI) and a further probable parcel lies south west of Ivy House Farm. Areas of species-rich or marshy grassland will support populations of declining pollinators including moths, specialist grassland butterflies such as small skipper or common blue and solitary bees and hoverflies. These marshy grassland areas also support uncommon flora such as bog-bean, cowbane, common orchids, wood small-reed and greater burnet and declining bird species such as snipe and teal. Where species-rich grasslands are located close to waterbodies dragonflies and damselflies are likely to be present as these feed on other invertebrates but require waterbodies to breed.

4. *Relict mossland and fen*

Moston is particularly important for its areas of fen and ancient peat deposits. The peat soils developed from the rotting fen vegetation present in shallow lakes in depressions in the glacial sands after the last ice age. The local names of Moston and Elton Moss indicate that the accumulation of peat eventually led to the formation of a sphagnum moss bog. These habitats are extremely rare across Europe as a whole and although there is no evidence today of the sphagnum moss, it is likely that some of the wetland species still present in the area are species particularly associated with mosslands.

The relict peatland deposits are extensive stretching from Dragon's Lake southwards to Watch Lane Flash. Peat soils contain the highest amount of stored carbon compared to other soil types and are therefore particularly important in providing ecosystem services. Removal of the peat or exposure to air, for example if the area is developed for housing or ploughed for agriculture, will result in oxidation of the carbon deposits and its subsequent release into the atmosphere.

Although the flashes with their reedbeds and marginal vegetation developed as a result of subsidence, there are some areas of fen which probably predate the subsidence. Dragon's Lake is likely to have been a peaty fen area before it filled with water following subsidence and it is now a diverse complex of wetland habitats with a pond, reed/sedge beds and wet grassland.

5. *Traditional orchards*

Traditional orchards, such as those present at Withinstreet Farm, Crow's Nest Farm, Watch Lane Farm, Field's Farm and Moston Manor are considered to be Priority habitats as they may contain highly localised cultivars of fruit trees and also provide numerous microhabitats which can be hotspots for biodiversity. Windfall fruit is an important food source for wintering birds such as fieldfare and redwing. The presence of dead wood is particularly important as it may support rare species of saproxylic invertebrates, fungi, bryophytes and lichens. The flowering trees provide an important source of pollen and nectar for numerous species of declining pollinators including bees, hoverflies and moths.

Medium distinctiveness habitat

Areas of medium distinctiveness habitat are shown on map 9 (displayed as orange) and provide important wildlife habitats in their own right as well as acting as ecological stepping stones and corridors. Because the methodologies used to produce the maps are desk based rather than field survey based, there is a possibility that some of the medium distinctiveness areas have been undervalued and an ecological survey may indicate they should be mapped as 'high distinctiveness' priority habitat (which would be displayed as red in map 9). Conversely there may be areas which have been overvalued, particularly if recent management has led to the deterioration of the habitat; in which case these areas should be removed from the habitat distinctiveness map.

Some of the 'medium distinctiveness' habitats identified in map 9 are thought to be semi-natural grassland, particularly on less productive waterlogged areas and margins of watercourses. Semi-natural grasslands are invaluable for wildlife as they can support populations of invertebrates and a variety of mammals. Several local BoCC red listed farmland birds including lapwing, linnet and tree sparrow feed on insects that live in semi-natural grasslands. Lapwing chicks will only survive if there are insect-rich foraging sites they can walk to from their nest sites. Over wintering birds such as red listed fieldfare (recorded locally) will feed on areas of semi-natural grassland.

Moston parish has a scattering of field ponds with the highest density in the centre and north of the parish. These ponds significantly contribute to the permeability of the landscape for wildlife. Ponds have been highlighted as habitat of medium distinctiveness in map 9 and should be retained where possible when land is developed. Where ponds are stocked with high numbers of fish the wildlife value is decreased. This is because introduced fish (such as bottom feeding non-native carp) can deplete the pond of invertebrate larvae and amphibian eggs/larvae as well as water plants. Despite this, even low value ponds can help increase landscape permeability for species such as birds and terrestrial invertebrates.

Scattered farmland trees together with the hedgerow network are also fundamental to landscape permeability and provide habitat for numerous species including declining farmland bird populations such as red listed thrushes and yellowhammer which are all present in the area. Many invertebrates and small mammals also inhabit hedgerows, particularly those with adjacent wide field margins or those which lie adjacent to semi-natural grassland. Small mammal populations are prey for birds such as amber listed kestrel which consequently do best in areas where the traditional farmland landscape is intact; this species have been recorded in the local area in recent years.

The best hedgerow network in the Moston area is probably to the east of the River Wheelock in the vicinity of Horseshoe Farm, The Home Farm and Oak Tree Farm. This area is likely to be especially good for farmland birds, invertebrates and small mammals. Other localities with a good hedgerow network include an area to the west of Dragon's Lake, an area to the north-east of Sparrowgrove and the area surrounding Withinstreet Farm. Also notable are two black poplars close to Plex Flash and the Watch Lane roadside verge/hedgerow Local Wildlife Site. This site is notable for its species-rich hedgerow with mature ash and oak trees and the rich flora on the verge which includes an important population of Goldilocks' buttercup.

Several parcels of woodland have been flagged up as medium distinctiveness but may well be high distinctiveness priority habitat. These include two parcels close to Withinstreet farm which appear on the 1875 maps, however these are shown as having a conifer component so may not qualify as priority habitat.

The canal backwaters including by Crow Nest Bridge and a second close to Plex Flash are likely to have a high wildlife value. Sections of the canal have steel and concrete piling which is unsuitable for colonisation by wetland flora and as a result its value for species such as invertebrates and birds is reduced. There are records of the nationally scarce moss *Tortula freibergii* on certain sections of the canal, this species is likely to be associated with the original stone piling.

Wildlife corridor network

Wildlife corridors are a key component of wider ecological networks as they provide connectivity between core areas of high wildlife value/distinctiveness enabling species to move between them to feed, disperse, migrate or reproduce. In conjunction with the results of the EConet analysis (2003), this study has identified a wildlife corridor network (shown in map 10) with ecological connectivity within and beyond the Moston Neighbourhood Planning area.

The corridor network closely follows the River Wheelock, the smaller watercourses and incorporates the flashes, woodlands, peatlands, higher value hedgerows and sections of the canal. It has good ecological connectivity along most of its length apart from where it passes over minor roads, however the maximum gap is less than 30 metres which will allow more mobile species to cross.

Protection of the wildlife corridor and other high and medium distinctiveness habitat

Map 10 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 9 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 light pollution, ground water pollution, predation by domestic pets and invasive garden species if adjacent land is developed.

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 habitat². Any potential development proposals adjacent to a high distinctiveness habitat or a wildlife corridor should incorporate substantial mitigation and avoidance measures to lessen impacts on wildlife. For example low spillage (bat/otter sensitive) lighting should be used on the outside of buildings or in car-parks and along pathways and watercourses. Developers should be asked to install hedgehog-friendly fencing, purposely designed to allow the passage of hedgehogs from one area to another. Other measures could include the incorporation of bee bricks and bat/bird boxes into the design of buildings, ideally made of highly durable material such as woodcrete. 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 its ability to support the movement of species is desirable³. Enhancement of the corridor may be facilitated by opportunities arising through the planning process (e.g. Section 106 agreements, biodiversity offsetting/compensation) or through the aspirations of the local community or local landowners.

In addition to the 'wildlife corridor network' this study has identified further areas of high or medium 'habitat distinctiveness' (Map 9) 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 and semi-natural woodlands.

The network of field boundary hedgerows provides habitat connectivity between high distinctiveness areas, which would otherwise be separated by extensive areas of land predominantly of low habitat distinctiveness with restricted potential for wildlife to disperse. Not all the hedgerows are identified as key components of the Moston ecological network, however collectively these hedgerows provide linear connectivity through the neighbourhood and beyond. In addition to their intrinsic ecological value a good hedgerow network also adds to the landscape character value.

² Includes S41 Habitat of Principal Importance. This may currently be mapped as medium distinctiveness due to lack of information

³ Refer to Recommendations section

Old meadows supporting species-rich neutral or marshy semi-natural 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' (Priority/principal importance) habitat and there is a presumption that 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 National Planning Policy Framework.

Conclusion

This study has highlighted that the important wildlife habitat in Moston is mainly associated with the flashes, peatlands, woodlands, semi-natural grasslands and the riparian habitat along the River Wheelock. By attributing habitat distinctiveness values to all land parcels in the Neighbourhood Plan area the study has provided important evidence that should be taken into consideration when planning decisions are made. However 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 study has highlighted a 'wildlife corridor network' which provides ecological connectivity between the most important areas within and beyond the Neighbourhood Planning area. The wildlife corridor network is likely to support a wide range of species including numerous birds, mammals, plants and invertebrates that are in decline both locally and nationally. Some of the most notable are the waders associated with the flashes such as curlew, lapwing, snipe, wigeon and teal. Also important are the red listed farmland birds such as tree sparrow, yellowhammer and linnet and the declining bat species including the brown long-eared bat and the noctule bat. All of these species depend on the semi-natural habitats highlighted in the report and the most threatened species tend to be associated with the habitats that are disappearing fastest such as the peatlands and the species-rich grasslands with their suite of invertebrates.

We recommend that the corridor network shown in map 10 is identified in the Neighbourhood Plan and protected from development so that the guidance relating to ecological networks set out in the NPPF (paragraphs 114 and 117) may be implemented at a local level. The wildlife corridor network includes a buffer zone of up to 15 metres in places to protect the notable habitats shown in map 9. If new areas of high distinctiveness habitat are subsequently identified these should also be protected by a 15 metre non-developable buffer zone.

Any future development of sites which lie adjacent to high distinctiveness habitat or a wildlife corridor should be able to demonstrate substantial mitigation and avoidance measures to lessen any potential impacts on wildlife. This should include measures such as installing bat/otter sensitive

lighting schemes, installing durable bat/bird boxes and hedgehog-friendly fencing and ensuring surface water is directed away from sensitive areas and into SUDS schemes.

To summarise, future development of Moston should respect the natural environment. The most intact landscapes, in terms of biodiversity, landform and historical/cultural associations should be valued highly when planning decisions are made. Protection and enhancement of Moston's natural assets is of crucial importance for 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 the 'wildlife corridor network' in Map 10 incorporates the Sandbach Flashes SSSIs and 4 Local Wildlife Sites, however it is highly likely that other land would meet also the criteria for Local Wildlife Site selection. These areas (some of which are identified as potential Local Wildlife Sites in map 6) should be selected if the criteria are met, as LWS status is likely to provide a greater level of protection within the planning system.

The wildlife corridor network should be in 'favourable condition'⁴ 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. There are areas of non-native Himalayan balsam to the south of the parish in the Maw Green area and close to Fields Farm, but further areas are also likely to be present along sections of the River Wheelock. This species is highly invasive, out-competing native flora and causing soil erosion due to the lack of binding vegetation in winter (particularly on river banks). Spread of this species can have a devastating impact on native flora and a knock on effect on groups of species such as birds, invertebrates and

⁴ The definition of 'favourable condition' for Local Wildlife Sites is provided in Appendix 3

mammals. Himalayan balsam is listed on Schedule 9 of the Wildlife and Countryside Act 1981 which means it is an offence to plant or otherwise cause to grow in the wild⁵.

- Highly invasive Japanese knotweed has been recorded on the canal close to Yeowood Farm (just outside the parish). This species is listed on schedule 9 of the Wildlife and Countryside Act 1981 and requires specialist treatment to eradicate. It should be treated as a matter of urgency as it spreads quickly and can replicate from tiny fragments of rhizome, consequently Knotweed should never be strimmed or cut with a flail⁶.
- Control of non-native/garden species. Garden species such as non-native daffodils, snowberry, Spanish/hybrid bluebells, monbretia, cotoneaster and variegated yellow archangel and can all be highly invasive and damage the ecological balance of semi-natural habitats. The latter three are all listed on schedule 9 of the Wildlife and Countryside Act.
- Invasive aquatic species including the zebra mussel (in the River Wheelock near Clay Lane) and the Northern River Crangonyctid (a shrimp) have been recorded in the parish. The Environment Agency may be able to advise whether control measures are necessary.
- Hedgerows that form part of the wildlife corridor should be restored using locally native species such as 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.
- Areas of peatland should be managed in the long term. This could involve restoration back to mossland but it could also mean managing as a wet woodland or grassland if restoration is not practicable. Restoration may include measures to control tree and scrub cover and to manage water levels (professional advice should be sought first). Managing as a wet woodland is likely to involve controlling invasive species such as Himalayan balsam.
- Watercourses in farmland should be buffered by semi-natural areas to provide riparian habitat and help prevent pollution runoff.
- The Canal and River Trust should be able to provide advice on how the ecological connectivity of the canal could be improved.

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 valuable 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 could include the restoration of hedgerows, creation of low maintenance field margins and sowing local origin (local genetic stock) wildflower meadows⁷.

⁵ Cheshire Wildlife Trust can provide further advice on the control of non-native species

⁶ Cheshire Wildlife Trust can provide further advice on the control of non-native species

⁷ Cheshire Wildlife Trust can provide advice and seeds for locally sourced wildflower meadow creation.

Woodland expansion is desirable to buffer existing woodlands, but may be of limited value if new plantations are isolated from existing woodland due to slow colonisation by woodland species. It is vitally important that tree planting should only occur on species-poor (low value) habitats and away from the edges of watercourses including ditches and ponds. Professional advice should always be sought when creating new habitat particularly when designing the layout, position and composition of new woodland and how to use local woodlands as a 'reference'. Well-designed new woodlands contain up to 40% open space (glades and rides) and up to 25% shrub species. For maximum benefit biodiversity rides should be east-west oriented (so that sunlight is maximised) and at least 30 metres wide to avoid over-shading when the canopy closes. It is recommended that trees and shrubs should be sourced from the Forestry Commission seed zone or from seed collected from local stands or from the local seed zone (collections should be made under the Voluntary Scheme for Certification of Native Trees and Shrubs, endorsed by the Forestry Commission).

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 hedgerows relate to its value from an archaeological, historical, landscape or wildlife perspective. The regulations 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; however it is good practice to compensate for the loss of all hedgerows whether the hedgerow regulations apply or not. Like-for-like replacement is the minimum level of compensation that could be asked for, but it is likely that good condition high value hedges will require a 3:1 replacement ratio.

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 Moston 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 9). 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.

Appendices

Appendix 1

Habitats, LCM2007 classes⁸ 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

⁸ 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

Appendix 2

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:-

All designated sites, SSSIs and County (Local) Wildlife Sites, that are either a mere or a moss were included.

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.

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.