

# Meole Brace Roundabout; Phase 1 Habitat Survey

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# 1 Introduction

## 1.1 Scheme Proposals

In 2014 Shropshire Council submitted the Shrewsbury Integrated Transport Package (ITP) to the Marches Local Enterprise Partnership (LEP) for outline approval. Funding for this scheme has now been secured, including provision for improvement works to the Meole Brace Roundabout. Mouchel was commissioned by Shropshire Council to undertake an extended Phase 1 Habitat survey of land around the roundabout, to inform the Outline and Full Business Case for the scheme.

Meole Brace Roundabout is located to the south of Shrewsbury town centre and north of the A5. It links the A5191, A5112 and B4380. The Shrewsbury ITP includes a proposed carriageway and pedestrian / cycleway within the existing roundabout island. It also incorporates areas of carriageway widening and realignment within sections of road approaching the roundabout.

The majority of the roundabout improvement works are located within the existing island. Carriageway widening or realignment is proposed along the A5112, at the south of the roundabout and along the A5112 and B4380, to the east of the roundabout as described below and indicated on the design layout drawing:

- Area 1) Additional impermeable area to be constructed within existing grass verge along northbound carriageway of A5112. Modification required to traffic island at this junction.
- Area 2) Proposed carriageway and pedestrian / cycleway within the existing roundabout island, with associated sustainable drainage system. Additional impermeable area to be constructed within existing grass verge near junction with A5191. Modification required to traffic island at this junction.
- Area 3) Additional impermeable area to be constructed within existing grass verge along westbound carriageway of A5112.
- Area 4) Additional impermeable area to be constructed within existing grass verge to facilitate proposed carriageway realignment, near exit from Meole Brace Golf Course on B4380.
- Area 5) Additional impermeable area to be constructed within existing grass verge to south-east of roundabout, around Meole Brace Retail Park.

## 1.2 Survey Extent

The Phase 1 Habitat survey area includes all of the proposed works locations and adjacent habitats. Additional habitat is also mapped to the north and west of the roundabout, as shown in Appendix 1, Figure 1.

## 2 Methods

### 2.1 Desk Study

The location of internationally designated statutory wildlife sites including Ramsars, Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), within 10km of the survey area was obtained from the Multi-Agency Geographic Information for the Countryside (MAGIC) website. Information regarding the location of nationally and locally designated statutory wildlife sites including National Nature Reserves (NNRs), Local Nature Reserves (LNRs) and Sites of Special Scientific Interest (SSSIs) within 2km of survey area was also provided by the MAGIC website.

The location of UK Biodiversity Action Plan (BAP) Priority Habitat adjacent to the survey area was obtained from the MAGIC website.

The location of ponds within 500m of the survey area was obtained from aerial photography and Ordnance Survey (OS) 1:25000 mapping.

### 2.2 Extended Phase 1 Habitat Survey

An extended Phase 1 Habitat Survey was undertaken on the 31<sup>st</sup> March 2016. The habitats were classified according to the Handbook for Phase 1 Habitat Survey (JNCC, 2010) to include:

- mapping using standardised colours and codes to indicate broad habitat types; and
- descriptions to identify features of nature conservation importance (i.e. Target Notes).

In addition to the above, the Phase 1 Habitat Survey was extended as follows. Notes were made of the ecological interest at the site, and any evidence of the presence or likely occurrence of species that are protected by law or otherwise of particular nature conservation importance. Wildlife & Countryside Act 1981 (as amended) Schedule 9 invasive plant species, such as Japanese knotweed *Fallopia japonica*, were recorded if encountered.

Target Notes (TNs) were used to provide supplementary information on features too small to map, or supplementary details, for example, comments relating to species composition and structure.

### 2.3 Limitations

All locations within and adjacent to the proposed works areas were fully accessible during the survey. Therefore there are no limitations to fulfilling the objectives of the Phase 1 Habitat survey.

## 3 Results

### 3.1 Desk Study

#### 3.1.1 Designated Sites

##### 3.1.1.1 Internationally Designated Sites within 10km of Survey Area

- Midland Meres and Mosses-Phase 1 Ramsar (UK11043) located 2.4km south of the survey area.
- Midland Meres and Mosses-Phase 2 Ramsar (UK11080) located 5.3km north of the survey area.

The Meres & Mosses form a geographically discrete series of lowland open water and peatland sites in the north-west Midlands of England and north-east Wales. These have developed in natural depressions in the glacial drift left by receding ice sheets which formerly covered the Cheshire / Shropshire Plain. The component sites (sixteen within Phase 1 and eighteen within Phase 2) include open water bodies (meres), the majority of which are nutrient-rich with associated fringing habitats; reed swamps, fen, carr and damp pasture. Peat accumulation has resulted in nutrient poor peat bogs (mosses) forming in some sites in the fringes of meres or completely infilling basins. In a few cases the result is a floating quaking bog or schwingmoor. The wide range of resulting habitats support nationally important flora & fauna.

##### 3.1.1.2 Nationally and Locally Designated Sites within 2km of Survey Area

- Rea Brook Valley LNR (1009095). The brook runs beneath the A5191 at the northern arm of the roundabout. Part of the LNR is directly adjacent to the eastern side of the A5191, running along the southern bank of Rea Brook. The LNR is an Urban LNR type, designated by Shrewsbury & Atchem Borough Council in 1994. It consists of woodland developed on steep sides of an embankment, with a disused railway now forming a cycle track. It is part of Rea Brook Valley Country Park.

#### 3.1.2 UK BAP Priority Habitat

There is one area of UK BAP Priority Habitat adjacent to the survey area. This habitat comprises deciduous woodland running along the northern bank of Rea Brook, to the west of the A5191 and along both banks of the brook to the east of the A5191 bridge.

#### 3.1.3 Ponds

There are two ponds marked on OS 1:25000 mapping within 500m of the survey area. The ponds are located to the north-east of the roundabout within Meole Brace Golf Course, south of the A5112. There is a railway line running over the A5112 between the ponds and the roundabout, with the nearest proposed works area being approximately 370m from the ponds (Area 3).

## 3.2 Extended Phase 1 Habitat Survey

The extended Phase 1 Habitat survey map is presented in Appendix 1, Figure 1 with associated Target Notes listed in Table 1. The following habitat types are present within the survey area:

### 3.2.1 Habitats

#### 3.2.1.1 Amenity Grassland

This habitat type comprises intensively managed and regularly mown grasslands, typical of lawns, playing fields, urban parks and roadside verges. The sward is dominated by low-growing grass species which are tolerant of frequent mowing, including perennial rye-grass *Lolium perenne*, red fescue *Festuca rubra* and bent grass *Agrostis* species and cultivars. The frequent mowing of such areas means that tall herbaceous species are often absent with the most frequent herbs being low-growing species such as daisy *Bellis perennis*, dandelion *Taraxacum officinale* agg., common cat's-ear *Hypochaeris radicata*, thyme-leaved speedwell *Veronica serpyllifolia* and white clover *Trifolium repens*, resulting in very low species diversity. Amenity grassland is the most frequent habitat type present within the survey area, being present around the edge of the existing roundabout island (Photograph 1) and as verges along the roads leading to the roundabout, with small amounts also present on triangular islands at road junctions.

#### 3.2.1.2 Poor Semi-improved Grassland

Poor semi-improved grassland is present between the A5112 and Rea Brook, to the north of the roundabout (Photograph 2, TN2). Frequent species include cock's-foot *Dactylis glomerata*, false oat-grass *Arrhenatherum elatius* and common nettle *Urtica dioica*. This grassland type is less intensively managed than the amenity grassland with far less frequent cutting taking place, allowing tussocky grass species such as cock's-foot and false oat-grass to predominate.

#### 3.2.1.3 Plantation Woodland

There are stands of mature and semi-mature trees within the survey area, including an area of mixed plantation woodland in the middle of the roundabout (Photograph 3, TN5). Further mixed plantation stands are present to the south of the roundabout, predominantly around the Meole Brace Retail Park (Photograph 4), with a linear stand of trees along the verge of the westbound carriageway of the A5112, forming the boundary with the southern section of the golf course (Photograph 5, TN6). Species present include larch *Larix decidua*, Scots pine *Pinus sylvestris*, sycamore *Acer pseudoplatanus*, silver birch *Betula pendula*, hawthorn *Crataegus monogyna*, horse chestnut *Aesculus hippocastanum*, holly *Ilex aquifolium* and ash *Fraxinus excelsior*.

Areas composed of predominantly broad-leaved species are present to the north-east of the retail park (Photograph 6) and along the southern bank of Rea Brook (Photograph 7, TN2)

#### **3.2.1.4 Introduced Shrub**

The main areas of introduced shrub include three rockeries around the main roundabout island (Photograph 8, TN3), along the central reservation separating the northbound and southbound carriageways of the A5112 (Photograph 9) and in front of a brick constructed sign for the Meole Brace Retail Park (Photograph 10, TN4). Further details of species composition are given within the Target Notes table.

#### **3.2.1.5 Hedgerows**

Low, intensively managed hedgerows occur around stands of trees around the retail park (Photograph 11). Several species are present including hawthorn, blackthorn *Prunus spinosa*, hazel *Corylus avellana* and red-osier dogwood *Cornus sericea*. Very low clipped box *Buxus sempervirens* hedges surround the brick retail park sign (Photograph 12, TN4), with hedges dominated by hawthorn running along both sides of the exit from the golf course (Photograph 13, TN7) and along the verge of the eastbound carriageway of the A5112 (Photograph 14).

#### **3.2.1.6 Watercourse**

Rea Brook runs beneath the A5191 at the northern arm of the roundabout. It is approximately 5m wide at this point, slightly turbid and with a moderate flow rate (Photograph 15). No emergent, floating or submerged vegetation was observed during the survey but this may be due to the timing of the survey, prior to the growth of many aquatic plant species.

### *3.2.2 Protected Species (Actual or Potential Presence)*

#### **3.2.2.1 Breeding Birds**

Evidence of breeding activity, such as territorial behaviour or the carrying of nesting materials was observed, during the survey, within the mixed plantation woodland in the middle of Meole Brace Roundabout. Species exhibiting such behaviour included robin *Erithacus rubecula* and wren *Troglodytes troglodytes*. Common passerine bird species may potentially nest within any areas of woodland, shrub or hedgerows within the survey area.

#### **3.2.2.2 Badger**

During the site walk-over signs of badgers were searched for including sett holes, tracks through vegetation, latrines, snuffle holes and hairs caught on fencing. No such signs were discovered and it is likely that badgers are absent from the survey area.

#### **3.2.2.3 Bats**

The majority of trees at the site possess very few features that may make them suitable as bat roosting sites, such as splits or cavities. Several trees in the centre of the roundabout have partial ivy coverage (Photograph 3), but because of their thin trunks they are assessed as of low suitability to support roosting bats.

It was noted that incidental lighting is present in the form of street lights along the edges of all opposite verges facing Meole Brace Roundabout (Photograph 17). This means that the trees within the survey area not subject to a period of total darkness

throughout any part of the night. All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Many species of bats are known to sample the light levels before emerging from their roost, only emerging for their night's hunting when the light intensity outside reaches a critical level after sunset (Swift, 1980). Floodlighting disrupts the normal 24-hour pattern of light and dark which is likely to affect the natural behaviour of bats. Light near a roost access point will delay bats from emerging and shorten the amount of time available to them for foraging. Bright light may reduce bats' social flight activity and cause bats to move away from the light area to an alternative dark area. Illuminating a bat roost creates disturbance and may cause the bats to desert the roost.

The combination of a lack of suitable cavities within trees, the presence of incidental lighting and the generally high level of disturbance from traffic using the roundabout makes it unlikely that roosting bats will be present within any of the proposed works areas. Bats are therefore not likely to be affected by the proposals.

#### **3.2.2.4 Water Vole *Arvicola amphibius* and Otter *Lutra lutra***

Potentially suitable habitat for these species occurs within the survey area, along Rea Brook, which crosses to the north of the roundabout, beneath the A5191. However, no proposed improvement works will take place within the immediate vicinity of the watercourse. These two species are therefore highly unlikely to be affected by the proposals.

#### **3.2.2.5 Great Crested Newt *Triturus cristatus***

Great crested newts inhabit both aquatic and terrestrial habitats. As they must breed in ponds their range will normally extend to within 500m of a breeding pond (English Nature, 2001). There are no ponds present within the survey area, but there are two ponds located to the north-east of the roundabout within Meole Brace Golf Course, south of the A5112. There is a railway line running over the A5112 between the ponds and the roundabout (Photograph 18), with the nearest proposed works area being approximately 370m from the ponds (Area 3).

The railway line bisects the southern half of the golf course and forms a barrier to movement of newts (if any are present within the ponds) towards the nearest proposed works area. It does not, however, completely block movement as any newts present could move along the verge of the eastbound carriageway of the A5112, beneath the railway bridge, towards Area 3. Therefore if great crested newts are present within the ponds on Meole Brace Golf Course, it is possible that they could occur within this works area, although towards the upper range of distances likely to be travelled by dispersing newts.

#### **3.2.3 Schedule 9 Invasive Alien Plant Species**

No Wildlife & Countryside Act 1981 (as amended) Schedule 9 invasive plant species were recorded within the study area during the Phase 1 Habitat survey.

## 4 Discussion

### 4.1 Overview

The nearest internationally designated statutory wildlife sites are located 2.4km south and 5.3km north of the survey area. The development areas are sufficiently distant from these international sites for the proposed works to have no impact on them. The nearest nationally or locally designated statutory wildlife site is located to the north of the roundabout, adjacent to the eastern side of the A5191 bridge, and extends along the southern bank of Rea Brook. There are no proposed improvement works within this area so this statutory site should also remain unaffected.

UK BAP Priority Habitat is present within the survey area. This habitat comprises deciduous woodland running along the banks of Rea Brook. This woodland will not be affected by the roundabout improvement works.

The majority of the survey area consists of amenity grassland, hard standing (roads and pavements) and plantation woodland. These habitats are of low intrinsic ecological value, although trees and shrubs throughout the survey area will provide extensive breeding bird habitat.

Wildlife & Countryside Act 1981 (as amended) Schedule 9 invasive plant species were found to be absent from the survey area during the Phase 1 Habitat survey.

### 4.2 Proposed Works Areas

#### 4.2.1 Area 1

Works within Area 1 will involve the loss of a very narrow strip of amenity grassland along the northbound carriageway of the A5112 and a small section of amenity grassland on a traffic island at the road junction. The area required for construction is also completely contained within existing amenity grassland. There will be no adverse effect on any protected species.

#### 4.2.2 Area 2

The majority of works will take place in Area 2 and will involve the loss of existing amenity grassland and mixed plantation woodland to construct a carriageway and pedestrian / cycleway within the existing roundabout. This may involve a risk to breeding birds, should woody vegetation clearance operations be undertaken during the bird breeding season.

#### 4.2.3 Area 3

Works within Area 3 will involve the loss of a narrow strip of amenity grassland along the westbound carriageway of the A5112. This area is adjacent to Meole Brace Golf Course and will be accessible to any great crested newts which may occur within two ponds on the golf course. There is therefore a very small risk of killing or injuring individuals which may be using terrestrial habitat along the road verge. The area required for construction will also require some woody vegetation removal which may

involve a risk to breeding birds, should vegetation clearance operations be undertaken during the bird breeding season.

#### *4.2.4 Area 4*

Works in Area 4 involve the proposed carriageway realignment, near the exit from Meole Brace Golf Course on the B4380. This will involve the loss of existing amenity grassland, a section of mature hawthorn hedge and several small trees. This may involve a risk to breeding birds, should woody vegetation clearance operations be undertaken during the bird breeding season.

#### *4.2.5 Area 5*

Works within Area 5 will involve the loss of a very narrow strip of amenity grassland to the south-east of the roundabout, around Meole Brace Retail Park. The area required for construction is completely contained within existing amenity grassland and footpaths. There will be no adverse effect on any protected species.

## 5 Recommendations

Although the survey area is generally of low ecological value the following recommendations are made in order to comply with EU and UK wildlife legislation during clearance operations.

### 5.1.1 *Breeding Birds*

Where possible, any works involving the clearance of woody vegetation should be undertaken outside the bird breeding season (March to July inclusive). Where this is not possible, an ecologist should survey areas to be cleared not more than 24 hours before clearance is planned. If breeding birds are recorded at locations, which are likely to be affected by clearance operations, an exclusion zone around the nest(s) should be established. The extent of this zone will be dependent upon the bird species involved and the nature of the proposed works. No works should be permitted within this area until the young have fledged.

### 5.1.2 *Great Crested Newts*

It is not known whether great crested newts currently use the two golf course ponds for breeding. This can only be established by undertaking further surveys on the two ponds at an appropriate time of year. Traditionally bottle trapping, egg searching and torching is undertaken between mid-March and mid-June to establish presence or absence and population size class if great crested newts are found to be present. In accordance with the standard survey methods, between four and six visits would be required to confirm presence or absence and, if present, estimate population size.

This method is time consuming and relatively expensive, particularly given that only a distant and narrow strip of grassland in Area 3 may contain great crested newts if they are present in the ponds. It is therefore recommended that presence / absence is initially assessed using environmental DNA (eDNA) sampling. This involves taking water samples from the ponds which are analysed for the presence of fragments of environmental great crested newt DNA. This would require a single visit to the ponds between mid-April and late June. If no eDNA is detected, likely absence will have been established and no further work would be required. If eDNA confirmed the species to be present, however, bottle trapping and torching surveys would be required to estimate population size class.

Confirming absence would allow all works to proceed with no further consideration of great crested newts. In this case Area 3 is the only area that may support them. Given the small size of the strip of grassland to be lost it would also be reasonable to employ hand searching of the habitat, prior to stripping of the grass and topsoil, should presence / absence in the ponds not be established. This would require a licensed ecologist being on-site during clearance of Area 3.

## 6 References

- English Nature. 2001. *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.
- JNCC. 2010. *Handbook for Phase 1 Habitat Survey-A Technique for Environmental Audit*. Peterborough: Joint Nature Conservation Committee.
- Swift, S.M. 1980. *Activity patterns of pipistrelle bats in north-east Scotland*. *Journal of Zoology (London)* **190**: 285-295.

## 7 Tables

Cross-reference with Photographs and Phase 1 Habitat Map.

**Table 1. Target Notes for Phase 1 Habitat Survey Map**

Target Note	Description
1	Small triangular flower beds cut into amenity grassland of traffic islands at road junctions (Photograph 16).
2	Location of Rea Brook LNR. Habitat to the south of the brook consists of poor semi-improved grassland, with large mature horse chestnut trees <i>Aesculus hippocastanum</i> along the bank. Beneath the tree canopy the ground flora is dominated by ramsons <i>Allium ursinum</i> , with frequently occurring winter heliotrope <i>Petasites fragrans</i> , lords-and-ladies <i>Arum maculatum</i> and garlic mustard <i>Alliaria petiolata</i> . (Photographs 2, 7 & 15).
3	Rockerries located within amenity grassland on roundabout (Photograph 8) Species present include non-native juniper <i>Juniperus</i> sp., California lilac <i>Ceanothus</i> sp., daffodil <i>Narcissus</i> sp., lavender <i>Lavandula angustifolia</i> and non-native spindle <i>Euonymus</i> sp.
4	Brick constructed sign for the Meole Brace Retail Park (Photograph 10) surrounded by low clipped box <i>Buxus sempervirens</i> hedges with introduced shrub including non-native spindle, rose <i>Rosa</i> sp., red-osier dogwood <i>Cornus sericea</i> and frequent grape hyacinth <i>Muscari</i> sp.
5	Mixed plantation woodland in the centre of the Meole Brace roundabout. Canopy trees include larch <i>Larix decidua</i> , Scots pine <i>Pinus sylvestris</i> , sycamore <i>Acer pseudoplatanus</i> , silver birch <i>Betula pendula</i> , hawthorn <i>Crataegus monogyna</i> , hazel <i>Corylus avellana</i> and elder <i>Sambucus nigra</i> (Photograph 3) The ground layer includes lords-and-ladies, common nettle <i>Urtica dioica</i> , lesser celandine <i>Ficaria verna</i> and ivy <i>Hedera helix</i> , which is also present as a climber up several trees.
6	Linear stand of trees along the verge of the westbound carriageway of the A5112, forming the boundary with the southern section of the golf course. Species include larch, Scots pine, sycamore, silver birch, hawthorn and ash <i>Fraxinus excelsior</i> (Photograph 5).
7	Location of proposed carriageway realignment around exit from Meole Brace Golf Course (Photograph 13). Hedgerow along both sides of existing exit is predominantly composed of hawthorn, with scattered trees over intervening amenity grassland. The base of the hawthorn hedge includes frequent garlic mustard, common nettle, cow-parsley <i>Anthriscus sylvestris</i> , red dead-nettle <i>Lamium purpureum</i> , cleavers <i>Galium aparine</i> and broad-leaved dock <i>Rumex obtusifolius</i> . There is a small lime tree <i>Tilia</i> sp. growing in the hedgerow at the location of TN7, where the exit emerges onto the B4380.

## 8 Photographs

Cross-reference with Target Notes and Phase 1 Habitat Map.

**Photograph 1.**



Amenity grassland around the edge of Meole Brace roundabout.

**Photograph 2.**



Poor semi-improved grassland between the A5112 and Rea Brook (TN2).

**Photograph 3.**



Mixed plantation woodland in the middle of Meole Brace roundabout (TN5).

**Photograph 4.**



Mixed plantation woodland around Meole Brace Retail Park, to the south of roundabout.

**Photograph 5.**



Linear stand of trees along the verge of the westbound carriageway of the A5112, forming the boundary with the southern section of the golf course (TN6).

**Photograph 6.**



Predominantly broad-leaved species present to the north-east of the retail park.

**Photograph 7.**



Broad-leaved trees along the southern bank of Rea Brook (TN2).

**Photograph 8.**



One of three rockeries with introduced shrub around Meole Brace roundabout (TN3).

**Photograph 9.**



Introduced shrub along central reservation separating the northbound and southbound carriageways of the A5112.

**Photograph 10.**



Introduced shrub in front of a brick constructed sign for the Meole Brace Retail Park (TN4).

**Photograph 11.**



Low, intensively managed hedgerows occurring around stands of trees around the retail park.

**Photograph 12.**



Clipped box hedge around brick constructed sign for the Meole Brace Retail Park (TN4).

**Photograph 13.**



Hedges dominated by hawthorn running along both sides of the exit from the golf course (including TN7).

**Photograph 14.**



Hawthorn dominated hedge along the verge of the eastbound carriageway of the A5112.

**Photograph 15.**



Rea Brook with A5191 bridge in background.

**Photograph 16.**



Small triangular flower bed (TN1) cut into amenity grassland of traffic island at A5191 junction.

**Photograph 17.**



Street lights along the edges of opposite verges facing Meole Brace Roundabout.

**Photograph 18.**



Bridge carrying railway line crossing the A5112 between the ponds and the roundabout.