Greenspaces in the City of Worcester: A Survey Update 2006

SUMMARY REPORT

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1. SUMMARY

The City of Worcester's Greenspaces are important areas of semi-natural vegetation within the boundaries of the City of Worcester (City of Worcester & Worcestershire Wildlife Trust 1987-2002). These areas provide a wide range of habitats, ten of which are represented within the United Kingdom and Worcestershire Biodiversity Action Plans (BAPs) as priority habitats for conservation.

These Greenspaces also provide valuable habitat for species of bat, Great Crested Newt, Slow Worm, Otter and Water Vole - all species identified in the UK and Worcestershire BAP as priority species for conservation. The high nature conservation value of Worcester’s Greenspaces is underpinned by the inter-linking network of corridors associated with the Green Network.

The City’s Greenspaces were originally surveyed and documented within five volumes of the Greenspaces Report compiled 1987 to 2002 (City of Worcester & Worcestershire Wildlife Trust 1987-2002). These volumes lead to the identification of a network of sites intended to deliver the requirements of Planning Policy Statement 9 (PPS 9) and the UK Biodiversity Action Plan. Although the boundaries were brought up to date with some new data in 2002, much of the original survey data required updating to enable this valuable natural resource to be monitored and conserved.

During 2006, a significant update to the original Greenspaces survey was commissioned across a large number of sites previously surveyed in 1987 and 1999. This survey update aimed to map, assess, characterise and evaluate the quality and change in quality of the communities on sites identified in terms of the National Vegetation Classification described within “British Plant Communities” (Rodwell 1991).

Surveying was undertaken from June to early September 2006 on sites identified by The City Council. This involved Phase II surveys of 31 sites (totaling 151ha) and Phase I surveys of a further 6 sites (totaling 55.4ha).

This 2006 revision of the Greenspaces survey identified a range of habitats, some of which were similar to that originally surveyed nineteen years earlier and others that had significantly changed. The range of habitats surveyed was broad indicating the diversity of the City's semi-natural vegetation. This included swamp, grassland, fen, marsh, wet grassland, wet woodland, unimproved lowland grassland, open water, rivers and streams.

The relatively small areas of floristically-rich unimproved grasslands have retained their high conservation status, and, whilst it is difficult to make direct comparisons with previous surveys due to different levels of survey detail, the quality of wet grassland habitats across the City (more particularly at Bromwich Meadows) has appeared to have improved. Wet woodland, a key conservation target also persists in the City albeit across a small area.

The large areas of 'utility' areas mapped by previous surveys remain much as they were and there remains much potential to enhance the value of these areas for wildlife.

Marshland communities would appear to declined in quality, principally due to a lack of the intensive management and perhaps changing hydrological regimes. Traditional orchard, a key local
biodiversity target, was under threat at one site which also has implications for associated species such as Slow Worms. Development has in some cases lead to a decline in adjacent habitats although there are areas where development has lead to considerable habitat enhancement for key species of protected wildlife such as Great Crested Newts.
2. INTRODUCTION

2.1 Context

2.1.1 The City of Worcester's Greenspaces are recorded and surveyed within five volumes of the Greenspaces Report compiled 1987 to 2002 (City of Worcester & Worcestershire Wildlife Trust 1987-2002). They form part of a network of sites intended to deliver the requirements of Planning Policy Statement 9 (PPS 9) and the UK Biodiversity Action Plan. Although a proportion of the sites have international, national and regional designations, they mainly represent habitat of local importance. Some are designated Local Nature Reserves (LNRs), ensuring that biological diversity is conserved. Sustainable Planning policies are therefore in place to conserve these areas and prevent harm to the biodiversity of the City.

2.1.2 The initial report was compiled in 1987 following an extensive Phase I and II survey. This was revised and extended in 1990, and reviewed again in 2002. However, much of the report is now a number of years old and although the boundaries were brought up to date with some new data in 2002, much of the survey required updating to enable the resource to be conserved and monitored into the future.

2.1.3 The current Local Development Framework process will re-establish the importance of biodiversity in planning decisions, quality of life and sustainability in the City and site data will need to be as accurate and contemporary to underpin this important process.

2.2 Commissioning brief

2.2.1 The City of Worcester Council commissioned this ecological survey on the 22nd May 2006 to update information from previous surveys from 1987-2002 on sites listed in Appendix 1. This did not include all of the Greenspace Sites identified within the original survey, but only sites that had not been surveyed during the intervening time.

2.2.2 The brief identified the need to survey, map, assess, characterise and evaluate the quality and change in quality of the communities on sites identified in terms of the National Vegetation Classification described within "British Plant Communities" (Rodwell 1991).

3. METHODOLOGY

3.1 Field survey

3.1.1 Sites for survey were identified by The City Council as indicated on the table in Appendix 1 and the location map in Appendix 2. Access was provisionally arranged by The City Council and confirmed by Countryside Consultants Ltd prior to field surveying. Maps and previous survey data were provided by The City Council.

3.1.2 Each site was over-walked to get an impression of the vegetative communities. Features of particular conservation interest such as notable species, hedgerows, veteran trees and ponds were also noted at this stage and located using a hand-held Garmin Global Positioning System (GPS) unit to an accuracy of between 1 and 6 metres.
3.1.4 Phase II surveying of the communities on the sites was carried out using the techniques as set out in the National Vegetation Classification (NVC) Phase II Handbook (Rodwell et al 1991). At least five quadrats per community within each field or compartment were recorded with quadrats measuring 2x2m taken for short, herbaceous vegetation and 4x4m taken for taller or more open herb communities.

3.1.5 All stands occupying a minimum of 1% of the total site were recorded including all instances of mire and wet flush communities.

3.1.6 Wherever possible, stands were referred to as a specific NVC sub-community using target notes to indicate anomalous floristics. Where a stand was very definitely intermediate in character, this was coded using standard community codes separated by forward slash (e.g. U4a / U2a). More complex intermediates were described using target notes.

3.1.7 Where floristic data fell outside of the NVC, such as for pioneer sites and ‘made-up’ land, these were be described within the target notes.

3.1.8 Mosaics were mapped as a general rule where repeated elements covered less than 1% of the site. Mosaics were identified by NVC types in the relative proportions that they recorded in with the mosaic expressed in terms of a percentage cover to the nearest 10% and separated by a dash (e.g. U2a 80% - Mg10 20%).

3.1.9 A full species list was drawn up for each homogenous stand and the abundance of individual species recorded using the Dominant – Abundant – Frequent – Occasional – Rare (DAFOR) scale.

3.1.10 Community cards were drawn up for each homogenous vegetation type. The location of community cards was noted using a site name and a grid reference. Recordings of the unit’s aspect were taken from GPS and slope estimated by eye. The community cards carried within each of the revised volumes also recorded the total coverage of each community within each surveyed parcel.

3.1.11 The boundaries of homogenous vegetation types were mapped using the GPS unit and superimposed over the most recent maps provided to provide a concise record of the different plant communities present. Any variations or anomalies were double checked within the field with preference for the GPS recording and field evidence in the case of discrepancies.

3.1.12 Quadrats were randomly selected within areas of homogenous vegetation to characterise NVC types with subsequent characterisation carried out by eye. Further quadrats were taken where necessary to identify visibly different communities.

3.1.13 For each quadrat taken, a quantitative measure of the abundance was recorded using the DOMIN scale (*sensu* Dahle & Hadac 1941), cover being assessed by eye as a vertical projection on the ground of all the above ground parts of the plant within the quadrat.

3.1.14 Community and quadrat data was recorded on English Nature’s (Natural England) Grassland / Woodland / Open Water Site and Community Cards.

3.1.15 Woodland identified for survey was surveyed under the simplified system of survey as set out in Appendix VI of National Vegetation Classification field guide to Woodland (Hall, Kirby and Whitbread 2004). All of the woodland areas surveyed were less than 2 hectares in size, and, as such, the entire area of each was sampled as one quadrat for the canopy and shrub layers. The ground flora was surveyed in five, evenly distributed 5x5m plots where such quantities were possible.
3.1.16 Open water was surveyed from the banks where possible assigning an NVC community to emergent vegetation. Submerged vegetation was, in most instances, difficult to survey.

3.1.17 Target notes were recorded on the appropriate Survey Card to identify and describe:

i. stands of vegetation which, due to the unusual floristic, could not be assigned to a given NVC type or its intermediates;

ii. small stands which could not be easily mapped;

iii. locations of rare or local species, or species which are of otherwise importance highlighted through the UK, West Midlands or Worcestershire Biodiversity Action Plans;

iv. veteran trees, hedgerows, ditches and other wildlife features;

v. variations from previous surveys;

vi. changes in management that could bring about improvement of the quality of the stand.

3.1.18 On several sites where either access was not granted or the site had lost much of its wildlife interest, surveys were carried out to a Phase I level from the nearest possible permitted access point.

3.2 Survey personnel and dates

3.2.1 The work was carried out by Katey Stephen MIEEM, senior ecologist responsible for the implementation of the contract.

3.2.2 Surveying was undertaken from June to early September 2006.

3.3 Analytical techniques

3.3.1 Survey data was programmed and analysed using MATCH (a software diagnostic tool) so that vegetative stands could be assigned to appropriate communities by comparing the constancy of the constituent species of each stand with the characteristic profiles of the NVC diagnostic communities of the software.

3.3.2 MATCH outputs indicated the co-efficients of similarity with the NVC diagnostic communities for each data set. Whilst useful, they were however only a guide to community characterisation and a more considered analysis of the community data was undertaken through comparison with the NVC tables and texts contained within “British Plant Communities” (Rodwell 1991) allied to the professional judgment of the ecologist. Major discrepancies within the diagnostic outputs, such as a low co-efficient of similarity or large and contradictory range of possible communities were however noted which were then useful for assessing the quality of the stand.

3.3.3 The identification of transitional and mosaic communities was made through comparisons with the NVC tables and texts contained within “British Plant Communities” (Rodwell 1991) allied to the professional judgment of the ecologist.
4. RESULTS

4.1 Survey area description

4.1.1 The survey area was restricted to sites scattered throughout the City of Worcester in industrial, urban and suburban landscapes. The River Severn and several tributaries including the Laugherne, Duck and Barbourne Brooks run through the city and these provided a number of the survey sites.

4.1.2 The City of Worcester is within the Severn and Avon Vales Natural Area as described by Natural England.

4.1.3 The underlying geology is that of Mercia mudstone with overlying river terraces and alluvium giving rise to brown earths, coarse loamy soils and alluvial deposits.

4.2 Site Reports

4.2.1 The results of site surveys are provided in a series of site reports which are contained within the relevant Volumes of the Greenspaces of the City of Worcester Survey Update Report. Each of these reports follow the format described below:

i. Sheet 1: General site description including its location, designations and protections, adjacent land use and boundaries, a summary of NVC communities and BAP species identified, threats, topography, geology and soils;

ii. Sheet 2: The community and quadrat cards for all homogenous vegetative communities identified on the site based in the DOMIN and DAFOR scales defined within the NVC Phase II Handbook based upon the English Nature survey cards;

iii. Sheet 3: MATCH outputs for each significant community on the site;

iv. Sheet 4: Brief descriptions of the communities and justification of characterisation using the National Vegetation Classification texts, MATCH outputs and considered judgment of the Ecologist and how these communities relate to those previously identified by earlier surveys - this identified any communities which were deemed not to accurately reflect the NVC including anomalies whilst any rare or significant species and other wildlife features also described;

v. Sheet 5: Brief descriptions of archaeology and cultural value of the site, landscape, access and public recreation on the site and noted any other considerations to be taken into account;

vi. Sheet 6: Photographic records cross referenced to the map for future point monitoring purposes;

vii. Sheet 7: Ecological Evaluation of the main features of interest including: an assessment of naturalness, representativeness, size, rarity, fragility, position in an ecological unit, diversity, recorded history, potential value, intrinsic appeal; a comparison of communities and areas with those of previous surveys identifying net gain, loss or indeed differences in characterisation; management recommendations - a brief comment on the most appropriate forms of management to attain a favourable conservation status - this also makes recommendation for any detailed follow up surveys which might be required such as the discovery of a large Slow Worm population on a particular site.
viii. Sheet 8: Map coverage comprising a plot of the digital data set identifying at the appropriate scale the boundaries and extent of NVC Communities and photographic points.

Blank copies of these sheets are included in appendix 4.

4.3 Summary of sites surveyed

4.3.1 Fifty-three sites were identified for survey of which access was granted to thirty-seven. A full listing of these sites is given in appendix 1 the end of the report.

4.3.2 The sites varied between those owned by the City Council with open access and sites in private or corporate ownership.

4.3.3 Phase II survey was carried out on thirty-one sites, resulting in the survey of 151.3ha of land. Table 1 lists the sites surveyed to this level of detail.

4.3.4 116.3ha of the land surveyed conformed to vegetative types described within the NVC as defined in “British Plant Communities” (Rodwell 1991). The remaining 35ha comprised car park, bare ground, surfaced roads, recently disturbed ground, allotments and ornamental planting.

4.3.5 Table 2 indicates the proportion of each habitat surveyed to NVC Phase II level and assigned an NVC code. It excludes the areas that did not conform to NVC vegetation types.
Table 1 List of Sites Surveyed during 2006

<table>
<thead>
<tr>
<th>Site name</th>
<th>Site no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laugherne Brook</td>
<td>2</td>
</tr>
<tr>
<td>Laugherne Brook</td>
<td>3</td>
</tr>
<tr>
<td>Laugherne Brook</td>
<td>4</td>
</tr>
<tr>
<td>Pitmarston Park</td>
<td>5</td>
</tr>
<tr>
<td>Manor Farm Ponds</td>
<td>6</td>
</tr>
<tr>
<td>Bromwich Mdw</td>
<td>11</td>
</tr>
<tr>
<td>Pitchcroft allotments</td>
<td>14</td>
</tr>
<tr>
<td>Duck Brook</td>
<td>16</td>
</tr>
<tr>
<td>Lockfields</td>
<td>22</td>
</tr>
<tr>
<td>Perdiswell Marsh</td>
<td>24</td>
</tr>
<tr>
<td>Ropers Meadow</td>
<td>26</td>
</tr>
<tr>
<td>Cromwells Trench</td>
<td>27</td>
</tr>
<tr>
<td>Sheriff St embankment</td>
<td>28</td>
</tr>
<tr>
<td>Tunnel Hill Cutting</td>
<td>30</td>
</tr>
<tr>
<td>Silk Grove</td>
<td>32</td>
</tr>
<tr>
<td>Foxwell Street Cutting</td>
<td>34</td>
</tr>
<tr>
<td>Worcs College for the Blind</td>
<td>35</td>
</tr>
<tr>
<td>Leopard Hill</td>
<td>45</td>
</tr>
<tr>
<td>Lyppard Grange</td>
<td>46</td>
</tr>
<tr>
<td>Rad Meadow North</td>
<td>49</td>
</tr>
<tr>
<td>Canal-side pasture</td>
<td>50</td>
</tr>
<tr>
<td>Woodmans Cottage</td>
<td>52</td>
</tr>
<tr>
<td>Stock Coppice/Wood Mdw</td>
<td>54</td>
</tr>
<tr>
<td>Busky Ground</td>
<td>55</td>
</tr>
<tr>
<td>Spring Meadow</td>
<td>56</td>
</tr>
<tr>
<td>Grove Farm Ponds</td>
<td>60</td>
</tr>
<tr>
<td>St Johns Cemetery/allotments</td>
<td>62</td>
</tr>
<tr>
<td>Landsdowne Allotments</td>
<td>67</td>
</tr>
<tr>
<td>Green egg pond</td>
<td>72</td>
</tr>
<tr>
<td>Racefield Pond</td>
<td>72</td>
</tr>
<tr>
<td>Substation Meadow</td>
<td>76</td>
</tr>
</tbody>
</table>
4.3.6 This indicated that grassland types accounted for the vast majority of the area surveyed at 68%. 40% of the land surveyed was semi improved grassland, 19% improved and only 3% unimproved. Wet grassland accounted for more than the proportion of unimproved grassland at 6% of the land surveyed. The next largest category, at 17% of the total area surveyed, was scrub and under-scrub including areas of Hawthorn and areas of bramble under-scrub.

4.3.7 Other habitats recorded were marsh, open water, swamp, ruderal, wet woodland, established woodland and tree-planting with none of these areas accounting for more than 5% of the total area surveyed.

4.3.8 Table 3 below shows those sites surveyed only to Phase I level:

**Table 3 Sites Surveyed to NVC Phase I Level during 2006**

<table>
<thead>
<tr>
<th>Site name</th>
<th>Site no</th>
</tr>
</thead>
<tbody>
<tr>
<td>St Johns Sports Centre</td>
<td>12</td>
</tr>
<tr>
<td>Barbourne Brook (Wordsworth Av)</td>
<td>23</td>
</tr>
<tr>
<td>Whittington Hall Wood</td>
<td>42</td>
</tr>
<tr>
<td>Trotshill Farm Ponds</td>
<td>51</td>
</tr>
<tr>
<td>Warndon Court</td>
<td>74</td>
</tr>
<tr>
<td>Red Hill/Battenhall</td>
<td>77</td>
</tr>
</tbody>
</table>

4.3.9 St John’s Sports Centre and Barbourne Brook had lost much of their wildlife interest and although remaining interest is documented on the cards, there were no areas remaining that conformed to an
NVC code. Trotshill Farm Ponds and Warndon Court have been developed for housing and the majority of these sites were now within manicured gardens although pond interest remains. Access was not gained to Whittington Wood, but it was possible to assess this site from an adjacent path. Survey of Red Hill/Battenhall was requested to Phase I level only.

4.3.10 Table 4 described those sites that remained un-surveyed as access was not obtained during 2006.

**Table 4 Un-surveyed Sites**

<table>
<thead>
<tr>
<th>Site name</th>
<th>Site no</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanging Hills Mdw</td>
<td>9</td>
</tr>
<tr>
<td>Westbury Street Embankment</td>
<td>20</td>
</tr>
<tr>
<td>Gregorys Bank</td>
<td>21</td>
</tr>
<tr>
<td>Ravens Close</td>
<td>25</td>
</tr>
<tr>
<td>Shrub Hill</td>
<td>29</td>
</tr>
<tr>
<td>Middle Battenhall Farm</td>
<td>33</td>
</tr>
<tr>
<td>Boughton Park</td>
<td>60</td>
</tr>
<tr>
<td>Thorneloes Orchard</td>
<td>63</td>
</tr>
<tr>
<td>Sewage Treatment Plant</td>
<td>64</td>
</tr>
<tr>
<td>College Green and Cathedral</td>
<td>65</td>
</tr>
<tr>
<td>Gregorys Bank 2</td>
<td>66</td>
</tr>
<tr>
<td>Moathouse Farm</td>
<td>68</td>
</tr>
<tr>
<td>Holy Claines Farm</td>
<td>69</td>
</tr>
<tr>
<td>Lark Hill Orchard</td>
<td>70</td>
</tr>
<tr>
<td>Lower Peckenham</td>
<td>71</td>
</tr>
<tr>
<td>Old Parsonage Ponds</td>
<td>75</td>
</tr>
</tbody>
</table>

4.3.11 However, based on observations from nearest possible permitted vantage points, the following were noted:

i. Hanging Hills Meadow is neglected and subject to scrub invasion. Some grassland value may remain;

ii. survey of Westbury Embankment and Shrub Hill was not possible;

iii. Gregory’s Bank. Site was not accessible, but remnants of calcareous grassland were visible through fencing – the field appears to be subject to scrub invasion;

iv. rank grassland was prevalent at Ravens Close;

v. the grassland at Middle Battenhall Farm was still present, but the condition was not visible;

vi. Boughton Park, Thorneloes Orchard, Sewage Treatment Plant and Lark Hill Orchard were not visited;

vii. College Green and Cathedral sites remain as they were in 1987;

viii. Moathouse Farm and Holy Claines Farm were managed as golf courses;
ix. Lower Peckenham was a mixture of pasture and arable land;

x. Old Parsonage Ponds was not visited.

4.3.12 Some comparison may be made between the surveys undertaken during the 1987 – 1999 period and the more recent one in 2006. It is difficult to quantify changes in habitat due to the differences in the levels of survey, however, several underlying trends are apparent:

i. utility areas at Laugherne Brook, Pitmarston Park, Lockfields, parts of Ropers Meadow, Cromwell’s Trench, Pitchcroft allotments, Lyppard Grange and St Johns Cemetery and the area included in Grove Farm Ponds remain much as they were in previous surveys;

ii. diversity had been lost or severely reduced through under management at in marsh at Duck Brook Osier Beds and Perdiswell Marsh, in grassland at Tunnel Hill Cutting, Foxwell Street Cutting, parts of Ropers Meadow, Rad Meadow North, Canalside Pasture, Woodman’s Cottage, Lansdowne Allotments and Substation Meadow and in aquatic habitats at Green Egg and Racefield Ponds.

iii. orchard is under severe threat at Worcester New College through a lack of recent management, although other areas on the site are thriving (several of these sites were known to support populations of Slow Worm and Newts which are also threatened by the lack of management);

iv. other sites that have degraded include Manor Farm Ponds where a sudden loss of all aquatic life in 2006 remains unexplained and at Sheriff Street Embankment where much of the grassland has been lost to landslides;

v. management at Bromwich Meadows has enhanced the site since 1987 although several fields are neglected and will lose diversity if they remain unmanaged;

vi. Silk Grove and Stock Coppice/Wood Meadow have increased in diversity through sympathetic management;

vii. the grassland value at Busky Ground and Spring Meadow is limited, but the creation of ponds on both sites has provided a variety of aquatic vegetation and a habitat for Great Crested Newt, known to be on both sites;

viii. Leopard Hill is now neglected, but was managed as a closely mown golf course in 1987 - it appears to have increased diversity in the grassland sward, but this will decline once more if further neglect occurs;

ix. development has decreased the wildlife value of St John’s Sports Centre, Barbourne Brook (Wordsworth Avenue), Whittington Hall Wood, Trotshill Farm Ponds and Warndon Court.
4.4 Mapped NVC Communities

4.4.1 This survey recorded 33 communities and sub communities of vegetation. These included:

i. 3 course grassland communities;

ii. 2 unimproved grassland communities;

iii. 3 semi improved grassland communities;

iv. 2 improved grassland communities;

v. 6 wet grassland communities (one of these in transition to course grassland);

vi. 2 marsh communities although these are degraded;

vii. 4 swamp communities;

viii. 2 ruderal communities;

ix. 4 communities of scrub or under-scrub;

x. 1 wet woodland community;

xi. 1 established woodland community;

xii. ponds;

xiii. streams;

xiv. recently planted woodland

The last three categories are included although they have no designated NVC code as they provide substantial areas of potential wildlife value.

4.4.2 A detailed break down of the communities recorded on each site is shown in appendix 3. Table 5 below shows a summary of these figures by identifying the communities and the areas that these occupy. 151 hectares were surveyed to Phase II level, but only 76% of the area could be assigned to an NVC code, the remainder comprised working allotments, bare ground, roads and car parks and are not represented on this graph. Ponds, streams and recent tree planting are represented.
Table 5. NVC Areas
4.4.3 Table 5 indicates that MG6 grassland was the most widely recorded vegetation type with MG6c the most extensively occurring sub-community. The frequency of MG6 is however relatively low with these large areas being concentrated over a handful of sites including Roper’s Meadow, Leopard Hill and Stock Coppice/Wood Meadows.

4.4.4 Large areas of MG7 grassland were recorded with a relatively high frequency. MG7a and MG7c were associated with utility grassland in most cases, but MG7d was recorded on ground prone to flooding along the Severn and its tributaries with the largest area recorded on Bromwich Meadows – an important differentiation, both in terms of quality and conservation value with the floodplain type being much more valuable for wildlife.

4.4.5 The high occurrence of MG1 grassland, W21 scrub and, to some extent W24 under-scrub, is indicative of a level of under management and neglect on many sites.

5. SUMMARY OF NVC COMMUNITIES RECORDED

5.1 MG1 Arrhenatherum elatius grassland

5.1.1 MG1 Arrhenatherum grassland is a community of coarse leaved grasses associated with neglected land. It was recorded on 19 of the 31 site surveyed either as part of mosaic of other communities, at field edges or over large areas such as at Bromwich Meadows, Ropers Meadows and Silk Grove. For a full list of sites where this vegetation was recorded refer to Appendix 3 at the end of this report.

5.1.2 This community is characterised by a sward dominated by Arrhenatherum elatius with frequent Holcus lanatus and locally frequent Cirsium arvense and Urtica dioica. Heracleum sphondylium is occasional in the sward.

5.1.3 Three sub communities were recorded within this vegetation type. MG1a Festuca sub community and MG1b Urtica sub community are rank (contain vigorous grass growth with low species diversity), but MG1e Centaurea sub community is indicative of a neglected but unimproved grassland and is more diverse with occasional Centaurea nigra, Lathyrus pratensis, Lotus corniculatus and Agrimonia eupatoria. MG1e was recorded at Ropers Meadow, Canal-side Pasture and Spring Meadow.

5.2 MG5 Cynosurus cristatus –Centaurea nigra grassland

5.2.1 This grassland is the typical, species rich, unimproved grassland of grazed hay meadows treated in a traditional hay cutting regime on neutral soils through the lowlands of Britain. They are becoming increasingly rare as a result of agricultural improvement. It was only recorded at Ropers Meadows and Stock Coppice Meadows.

5.2.2 The community contained a varied mix of grasses and herbs with abundant Festuca rubra, Agrostis capillaris, Cynosurus cristatus, Centaurea nigra and Holcus lanatus. Potentilla reptans, Achillea millefolium, Leucanthemum vulgare, Lotus corniculatus, Ranunculus repens, Agrimonia eupatoria, G. verum, Trifolium pratense and Plantago lanceolata were occasional.

5.2.3 MG5a Lathyrus sub-community, characteristic of neutral soils, was recorded at Stock Coppice Meadow and the MG5b Galium sub community, characteristic of slightly calcareous soils, was
recorded at Ropers Meadow. Both are of a high conservation value.

5.3 **MG6 Lolium perenne-Cynosurus cristatus grassland**

5.3.1 *Lolio-Cynosuretum* grasslands are described by the NVC texts as being characteristic of swards that have undergone agricultural improvement. This vegetation was recorded over large areas at Ropers Meadows, Leopard Hill and Stock Coppice Meadows with smaller areas recorded at three other sites.

5.3.2 This represented a sward dominated by *Lolium perenne*, *Cynosurus cristatus*, *Festuca rubra* and *Agrostis capillaris*. *Rumex acetosa*, *Hypochaeris radicata*, *Luzula campestris*, *Trifolium repens Holcus lanatus*. *Anthoxanthum odoratum*, *Veronica chamaedrys*, *Senecio jacobaea* and *Achillea millefolium* were all occasional.

5.3.3 MG6c *Trisetum flavescens* sub-community with occasional *Phleum bertoni* and *Galium verum* was recorded most extensively, but several small patches of the MG6a typical sub-community were recorded on a handful of sites.

5.4 **MG7a Lolium perenne-Trifolium repens and MG7e Lolium perenne – Plantago lanceolata grassland**

5.4.1 These are communities that generally occur on reseeded lawns, verges and utility grassland which are regularly mown and lightly trampled.

5.4.2 MG7a is a rank community dominated by *Lolium perenne*, *Holcus lanatus* with abundant *Trifolium repens*, *Plantago major* and frequent *Festuca rubra*, *Plantago lanceolata* and *Dactylis glomerata*. MG7e is a rank community dominated by *Lolium perenne*, with abundant *F. rubra*, *T. repens* and *P. lanceolata*.

5.4.3 These communities were recorded at a large number of sites, generally associated with utility grassland and mown areas. The most extensive areas were recorded at Laugherne Brook (3 and 4), Pitmarston Park, Perdiswell Marsh and Lockfields.

5.5 **MG7d Lolium perenne-Alopecurus pratensis grassland**

5.5.1 MG7d *Lolium perenne-Alopecurus pratensis* grassland is commonly found on damp pastures in the lowland river valleys that are associated with alluvial soils with occasional inundation and traditionally managed as hay meadows.

5.5.2 This was a variable sward dominated by *H. lanatus* with frequent *Poa trivialis*, *Lolium perenne*, *Alopecurus pratensis* and occasional, but locally abundant *D. glomerata* and *Bromus mollis*. There is a localised increase in *Elymus repens* and *Ranunculus repens*. Herbs are infrequent with only *R. repens* recorded regularly. *Cirsium arvense* and *Urtica dioica* were locally abundant.

5.5.3 Extensive areas of this were recorded on the flood plain of the Severn at Bromwich Meadows, on the Duck Brook flood plain at Ropers Meadows, and in smaller quantities at Manor Farm and on the flood plain of the Laugherne Brook at Laugherne Brook (sites 2 and 3).
5.6 **MG9 Holcus lanatus–Deschampsia caespitosa grassland**

5.6.1 This NVC type is characteristic of permanently moist and gleyed soils recorded and was recorded on only 4 sites of which Bromwich Meadows supported the most extensive community.

5.6.2 The vegetation was dominated by coarse grasses with frequent *D. caespitosa, Bromus mollis* and *Poa trivialis* and occasional *Alopecurus pratensis, Ranunculus repens, Holcus lanatus, Ranunculus repens* and *Geranium pratense*.

5.6.3 Two sub communities were recorded. A large area of the MG9b *Arrhenatherum elatius* sub community was recorded at Bromwich Meadows and fringes of it associated with ponds were recorded at Busky Ground and Spring Meadow. MG9a *Poa trivialis* sub-community was only recorded over 0.02ha at Stock Coppice Meadow as a fringe around a pond.

5.7 **MG10b Holcus lanatus–Juncus effusus rush pasture, Juncus inflexus sub community**

5.7.1 This community is characteristic of flush areas and small streams or drains and was only recorded in hollows at Silk Grove and over 0.01ha at Canal-side Pasture.

5.7.2 The vegetation was characterised by *Carex hirta, Holcus lanatus, Alopecurus pratensis, Glyceria fluitans* with occasional *Juncus effusus, J. inflexus, Angelica sylvestris, Lotus uliginosus, Juncus sp, Iris pseudacorus* and *Galium palustre*.

5.8 **MG13 Agrostis stolonifera–Alopecurus geniculatus grassland**

5.8.1 MG13 is characteristic of seasonally inundated land of river flood plains especially where poaching is moderate. It was only recorded at Bromwich Meadows on poorly draining soils along the sling.

5.8.2 The vegetation supported frequent *Glyceria fluitans, Alopecurus geniculatus, Ranunculus repens, Polygonum amphibium* and *Poa trivialis*. It is in this community that *Lychnis flos-cuculi* and *Cardamine pretense* were recorded.

5.9 **OV23 Lolium perenne–Dactylis glomerata community**

5.9.1 This is a vegetation characteristic of re-sown recreation areas such as playing fields where there is occasional summer mowing. It was recorded on two sites, Bromwich Meadows and Pitchcroft Allotments.

5.9.2 The vegetation was dominated by *L. perenne* with abundant *D. glomerata, Poa annua, Plantago lanceolata* and frequent *Bellis perennis* and *Holcus lanatus*.

5.9.3 Two sub communities were recorded, OV23a, typical subcommunity, at Bromwich Meadows where the community is as described above and OV23d *Arrhenatherum elatius-Medicago lupulina* sub community at Pitchcroft Allotments where *Holcus lanatus* dominated with occasional *A. elatius* and *L. perenne, Achillea millefolium, Leontodon autumnalis, Convolvulus arvensis* and *Trifolium repens* were frequent.
5.10  **OV24a Urtica dioica-Galium aparine community, typical sub community**

5.10.1 This community is usually found in a mosaic with other vegetation, wet woodland and fen communities, and frequently gives way to woody communities if species are able to penetrate the dense layer of nettles. It was only recorded at Laugherne Brook (4) and Duck Brook Osier Beds, both in areas of wet woodland.

5.10.2 The vegetation was almost exclusively *U. dioica* with occasional *E. hirsutum*, *G. aparine* and *H. sphondylium*.

5.11  **OV26 Epilobium hirsutum community**

5.11.1 This is a community characteristic of moist, but well aerated soils, mesotrophic soils and open water transitions around ponds and along stream-sides in the lowlands and was recorded over small areas on 5 of the sites surveyed.

5.11.2 The vegetation consisted of *Epilobium hirsutum*, *Filipendula ulmaria* and *Urtica dioica* which are co-dominant with *Angelica sylvestris*, *Arrhenatherum elatius*, *Rumex crispus* and *Galium aparine* frequent.

5.11.3 Three sub communities were recorded. The richest OV26c *Filipendula ulmaria* – *Angelica sylvestris* sub-community was recorded on Perdiswell Marsh. OV26d *Arrhenatherum elatius*– *Heracleum sphondylium* sub community is indicative of slightly dryer land and was recorded over small areas at Laugherne Brook (2) and Canal-side Pasture. The OV26e *Urtica dioica* – *Cirsium arvense* sub community is species poor and was recorded at Ropers Meadows and Grove Farm Ponds. A transitional community between OV26 and W6 wet woodland was recorded at Duck Brook Osier Beds.

5.12  **OV28a Agrostis stolonifera – Ranunculus repens community, Poa annua – Polygonum aviculare sub-community**

5.12.1 This is vegetation associated with seasonally inundated hollows in ill drained pastures where ground is wet in the winter, but dries out in the summer. It was only recorded at Ropers meadow.

5.12.2 The vegetation composition varied across the site with areas of *Phleum pratense* with frequent *Agrostis stolonifera* and *Poa trivialis* and other areas much wetter in nature with *Elymus repens* dominating with frequent *Phleum pratense* and *Agrostis stolonifera*.

5.13  **Swamp**

5.13.1 Four areas of swamp were recorded although none of them exceeded 0.11ha in area. Each conformed to a different NVC type and is dealt with separately here.

5.13.2 **S28b Phalaris arundinacea** tall herb fen, *Epilobium hirsutum-Urtica dioica* sub community was recorded over 0.01ha at Manor Farm. It is a community characteristic of fluctuating water levels at the edge of ponds and lakes. The vegetation supported frequent *P. arundinacea*, *Phragmites australis*, *Carex riparia* and occasional *Epilobium hirsutum* and localised *Oenanthe crocata*, *Iris pseudocorus*, *Filipendula ulmaria* and *Lycopus europaeus*.
5.13.3 S26b *Phragmites australis-Urtica dioica* fen, *Arrhenatherum elatius* sub-community was recorded over 0.11ha at Lockfields and is the largest area of swamp recorded in the survey. This community is characteristic of basic water margins and mires where the ground remains wet throughout the year. *P. australis* dominated with frequent *Epilobium hirsutum*, *Symphytum x uplandicum* and *Calystegia sepium*. *Carex acuta*, *Phalaris arundinacea*, *A. elatius*, *Galium aparine* were occasional.

5.13.4 S5a *Glyceria maxima* swamp, *Glyceria maxima* sub community were recorded over 0.01ha in the pond edges at Lyppard Grange. This is a swamp habitat associated with eutrophic water margins and was recorded around the edges of the western pond. The vegetation was almost exclusively *Glyceria maxima* with only seven other species recorded in the community.

5.13.5 S12c *Typha latifolia* swamp, *Alisma plantago-aquatica* sub-community was recorded over 0.01ha at the pond edges in Spring Meadow. This is a community characteristic of standing, mesotrophic water frequently found around lakes and ponds in lowland Britain. The vegetation was dominated by *Typha latifolia*, with occasional *Scirpus lacustris* and *Lemna minor* on the water.

5.14 **W21 Crataegus monogyna – Hedera helix scrub**

5.14.1 This was one of the most frequently occurring communities being recorded on 17 of the 31 sites surveyed, but it never exceeded 1.63ha, usually forming a mosaic with other communities.

5.14.2 This was a variable community, but in general possessed a canopy dominated by dense *C. monogyna* with occasional *Prunus spinosa*, *F. excelsior*, *Acer pseudoplatanus*, *Ilex aquilinium* and *Sambucus nigra*. The canopies tended to be dense with little light penetration and as a result the ground flora was limited to predominantly *H. helix* and bare ground.

5.14.3 This survey recorded predominantly W21a *Hedera helix – Urtica dioica* sub-community although the W21b *Mercurialis perennis* sub community was recorded at Perdiswell Marsh.

5.15 **W24 Rubus fruticosus-Holcus lanatus underscrub**

5.15.1 This is a community typical of abandoned and neglected ground and is extremely common on the British lowlands. It was recorded on 10 of the 31 sites surveyed.

5.15.2 The vegetation consisted of a dense thicket of *R. fruticosus* with frequent *Crataegus monogyna*, *Fraxinus excelsior*, *Sambucus nigra*, *Holcus lanatus* and *A. elatius*. Woody species recorded were predominantly young although continued neglect of this community will result in the development of scrub and woodland.

5.15.3 Two sub communities were recorded with W24b being slightly more frequent. W24a *Cirsium arvense-Cirsium vulgar* underscrub is a community typical of abandoned and neglected land and represents an early stage of transition to scrub. W24b *Arrhenatherum elatius-Heracleum sphondylium* sub-community is more established scrub with woody elements in its progression to scrub.

5.16 **W6b Alnus glutinosa-Urtica dioica woodland Salix fragilis sub-community**

5.16.1 This is a woodland a community associated with eutrophic moist soils where river flood waters have enriched the soils. It was the most extensive community at Laugherne Brook (2) covering 1.55ha,
but was also recorded in smaller quantities at Perdiswell Marsh and Laughorne Brook (4) and is in transition with OV26b at Duck Brook Osier Beds.

5.16.2 The stand consisted of *Salix fragilis* and *S. viminalis* with smaller amounts of *Alnus glutinosa, Fraxinus excelsior* and *Salix alba*. The shrub layer was dense with re-generating Willow and the ground flora with *Urtica dioica*.

5.17 **W8d Fraxinus excelsior- Acer campestre – Mercurialis perennis woodland, Hedera helix sub-community**

5.17.1 This was only recorded at Duck Brook Osier Beds on the steep eastern slopes of the site where the soils are freely draining. The canopy was dominated by *Acer pseudoplatanus, Fraxinus excelsior* and *Acer campestre* with a shrub layer dominated by *Crataegus monogyna*, young *A. pseudoplatanus* and *Ulmus glabra*. The ground flora was dominated by *Hedera helix* with frequent *Mercurialis perennis* and *Geum urbanum*. The ground flora supported an extensive list of species (at least 52 species) including *Dryopteris filix-mas, Arum maculatum, Circaea lutetiana, Viola odoratum* and *Hyacinthoides non-scripta. Ranunculus ficaria* and *Allium ursinum* are thought to occur here, but were not visible at the time of survey.

5.18 **Ponds**

5.18.1 Ponds were recorded on 13 of the 31 sites. These varied from in field ponds to sites that were composed entirely of ponds. Many of them are known to support Newt populations, particularly the Great Crested Newt in the Warndon area (Watson 1989 onwards).

6. **EVALUATION OF THE SURVEY**

6.1 **Communities and Species of conservation significance**

6.1.1 This survey has identified 2.49ha of MG5 grassland, and 2.05ha of degraded unimproved grassland (MG1e) which is described by the Worcestershire Biodiversity Action Plan (BAP) as being under threat. This is also a key habitat targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation as well as a local priority within the Severn and Avon Vales Natural Area. It is a habitat that is disappearing fast with an estimated loss of 97% of this habitat nationally between 1945 and 1984 (NCC 1984).

6.1.2 This survey identified 5.7ha of MG9, MG10, MG13 and OV28 wet grassland which is a key habitat targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation as well as a local priority within the Severn and Avon Vales Natural Area. This is a habitat that is highly fragmented in Worcestershire, tending to occur as isolated patches in field corners.

6.1.3 1.28ha of OV26 degraded marsh community and 0.14ha of S6, S12, S26 and S28 tall herb/fen were recorded. Although marsh is defined as “OV” and open habitat in NVC terms, OV26 is essentially degraded marsh habitat either due to lack of active management or drying out of the soils and has the potential to increase in diversity if managed sympathetically. “Fen and marsh” is a key habitat targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation as well as a local priority within the Severn and Avon Vales Natural Area.
6.1.4 *Crataegus-Hedera* (W21a) scrub represents a target habitat identified by the Worcestershire BAP as being under threat. This was recorded over 16.21ha during survey.

6.1.5 This survey has identified 3.12ha of W6b woodland, a wet woodland habitat described by the Worcestershire Biodiversity Action Plan (BAP) as being under threat. This is also a key habitat targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation as well as a local priority within the Severn and Avon Vales Natural Area. This is a highly fragmented habitat within Worcestershire.

6.1.6 W8d woodland represents a target habitat identified by the Worcestershire BAP as being under threat. This community was found on only one site covering 1.39ha.

6.1.7 Ponds were recorded on 13 of the 31 sites surveyed and fall into the open water target habitat category as identified by Worcestershire BAP. Open water is a key habitat targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation as well as a local priority within the Severn and Avon Vales Natural Area. Many of them are known to support Great Crested Newt, a target species within the UK and Worcestershire BAP.

6.1.8 The Duck Brook, Laugherne Brook and Barbourne Brook run through 9 of the 31 sites surveyed whilst the River Severn runs adjacent to 2 of the sites. These fall into the “rivers and streams” target habitat category as identified by Worcestershire BAP. Rivers and streams are also a key habitat targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation as well as a local priority within the Severn and Avon Vales Natural Area and provide potential habitat for Otter, Bats and Water vole, all target species within the UK and Worcestershire BAP.

6.1.9 Hedgerows recorded on the majority of sites represent valuable landscape features and wildlife habitats. These offer shelter and food for many different types of birds including the Yellow Hammer and Song Thrush listed on the UK and Worcestershire’s Biodiversity Action Plans. They also offer corridors for wildlife to move around the sites and beyond into the wider countryside.

6.1.10 Traditional (but degraded) orchard was recorded on one site and is a key habitat targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation as well as a local priority within the Severn and Avon Vales Natural Area.

6.1.11 This survey identified numerous mature, veteran and pollarded trees which provide a valuable dead wood habitat for insects and fungus as well as nest and roost sites for birds and bats. Veteran trees are a key habitat targeted within the UK and Worcestershire Habitat Action Plans as high priority for conservation not least for the habitat they provide for roosting bats.

6.1.12 Five sites are known or have been known to support Slow Worms. These are a key species targeted within the United Kingdom (UK) and Worcestershire Habitat Action Plans as a high priority for conservation. Most of these sites were however considered to be degraded.

6.2 Future survey

6.2.1 A number of sites identified in section 4.3.8 were surveyed in previous surveys but not included in this survey for reasons of access. Survey of these sites would provide a complete picture into the...
state of Greenspace resource in Worcester.

6.2.2 Warndon Villages was in the process of being built in previous surveys. This area is now established and has significantly changed since earlier surveys. It was noted that several open spaces in this area supported unimproved grassland and further Phase I survey would provide a complete coverage of this area.

6.2.3 Many of the sites surveyed contained habitats or features likely to be associated with Great Crested Newt, Slow Worms and bats. Further surveys of these sites should be carried out to fully determine the conservation value.

6.3 Recommendations

6.3.1 For specific site management recommendations, please refer to the individual site cards contained within the Site Report Volumes. What follows are generalised recommendations based upon the vegetation types.

6.3.2 All areas of unimproved, semi improved and wet grassland should be maintained through sympathetic management of the grassland sward emulating management as a traditional hay meadow and grazing with livestock or mowing. No artificial fertilizers should be used and all cuttings removed or collected up to maintain a low fertility in the soil.

6.3.3 Restoration of degraded unimproved and wet grassland in areas of recorded at Ropers Meadow and Canal-side Pasture should be achieved through an increase in mowing/grazing.

6.3.4 Enhancement of rank grassland and wet grassland at Bromwich Meadows, Ropers Meadows, Laugherne Brook, Leopard Hill, Silk Grove, New College Worcester, Spring Meadow, Busky Ground and Sub station Meadow is recommended through an increase in mowing/grazing together with the introduction of native wildflower seed.

6.3.5 The degraded status of marsh at Laugherne Brook, Duck Brook Osier Beds, Perdiswell Marsh and Ropers Meadows stem from under management and drying out of the ground. Habitat restoration should take place through remedial management where possible.

6.3.6 All areas of tall herb fen and open water should be maintained to provide the greatest diversity on the site. Tall herb fen was recorded at Manor Farm Ponds, Lockfields, Lyppard Grange and Spring Meadow.

6.3.6 Scrub (in this case W24 under-scrub) represents a threat to sites where it displaces more valuable and potentially diverse habitats. Scrub however is an important transitional habitat though and a site-specific approach to scrub management is recommended.

6.3.7 W24 under-scrub at Tunnel Hill Cutting and Lansdowne Allotments threaten grassland and Slow Worm habitat and should be reduced. At New College Worcester under-scrub threatens the orchard and the diversity of the sward in this area. At Canal-side Pasture, under-scrub and scrub threaten the diversity of the grassland and should be reduced.

6.3.8 Wet woodland at Laugherne Brook (2 and 4) and Perdiswell Marsh should be maintained to provide a diverse canopy and species structure and form a mosaic with marsh.
6.3.9 Work should be carried out on several ponds in the Warndon area as the increase in canopy cover on Racefield and Green Egg Ponds has resulted in the possible loss of breeding habitat for Great Crested Newts.

6.3.10 Survey should be carried out on Manor Farm Ponds to establish the cause of the sudden death of aquatic life in 2006 and find a way to restore this.

6.3.11 Degraded orchard at New College Worcester should be restored through the clearance of under-scrub, the maintenance of fruit trees and reintroduction of grassland management such as mowing.

6.3.12 Established hedgerows throughout the sites should be managed as little as possible to achieve the target of a thick, bushy feature which provides nesting habitat and fruits for birds. There is potential to increase the number of hedgerows on sites through planting along existing fence lines.

6.3.13 All mature, veteran and pollarded trees should be retained and managed to assist them in achieving a maximum lifespan. Younger Oak, Willow or Ash should be selected to grow onto maturity and over maturity that will be avoid any loss in continuity of the dead wood habitat throughout the sites.

6.3.14 Stream side vegetation should be maintained to provide a mix of tall herbs, grassland, scrub and a proportion of bank side trees should be rotationally pollarded and / or coppiced.

6.3.15 The large areas of utility grasslands present some potential for habitat enhancement, particularly where they but up against semi-natural habitats or parts of the Green Network.
7. **APPENDICES**

Appendix 1  List of Sites for Survey  
Appendix 2  Map of Sites  
Appendix 3  Breakdown of NVC Codes by Site  
Appendix 4  Sample Site Cards

8. **REFERENCES**


**Watson (1989 onwards).** Surveys of ponds in the City of Worcester. City of Worcester Landscape Section. Orchard House, Farrier Street, Worcester WR1 3BB.