

The Distribution of Rare and Scarce Plants in the Doncaster Borough

A Preliminary Atlas

Doncaster Local Biodiversity Action Plan
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**THE DISTRIBUTION OF RARE AND SCARCE PLANTS
IN THE DONCASTER DISTRICT:
A Preliminary Atlas**

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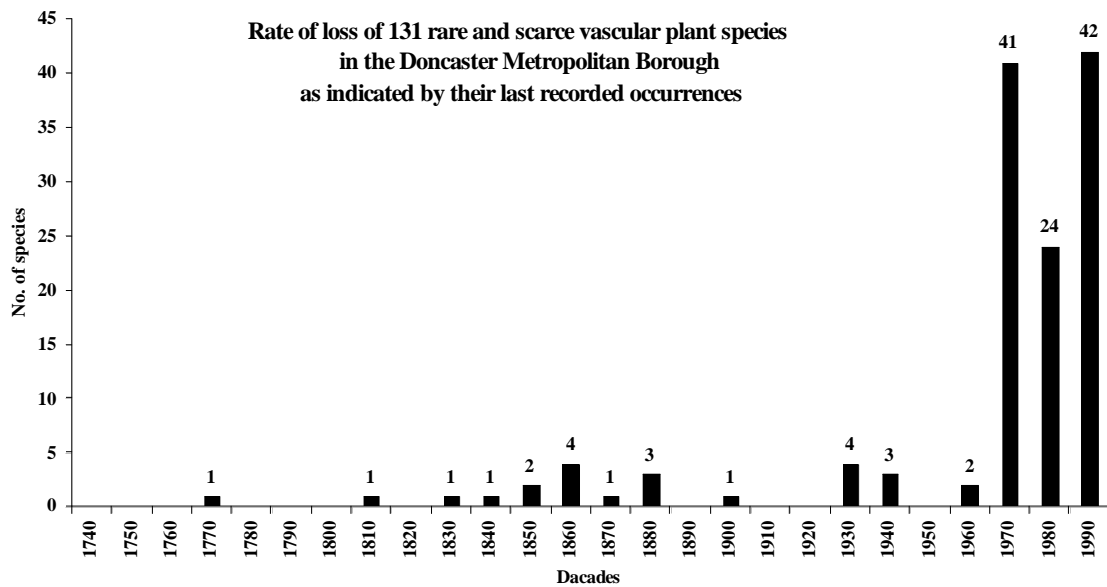
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1.0 Introduction

1.1 During the 1970s, under the direction of Dr Peter Skidmore, Doncaster Museum staff together with botanists from local natural history societies embarked on an ambitious and continuing project to produce an atlas of the distribution of the plants in the Doncaster region.

1.2 A worthwhile by-product of this laborious exercise has been the creation of a series of preliminary distribution maps of nationally and regionally scarce, rare and endangered plant species. The discovery of the past occurrence of these species has been a key process in understanding the remarkably rich biodiversity of the Doncaster region.

1.3 It is something of an accolade to discover that as many as **217** rare and scarce species are known to have occurred in the Doncaster district. However, a reflection of the pressures on our local landscapes, habitats and biodiversity is that **131** of these species (over 60%) have not been recorded here since the 1990s and may not have made it into the 21st century!



1.4 The preliminary distribution maps and accompanying lists of records (localities, grid references and dates) are issued to enable the current generation of field botanists to check for the continued existence of these key species in our area. The rediscovery or verification of these species is necessary for the ongoing implementation and review of the Local Biodiversity Action Plan for Doncaster. This will be a hugely valuable exercise, the resultant data helping to provide a valuable tool for site management and planning decision-making.

1.5 Good luck with your efforts to track down these species and let's try to put Doncaster back on the map for *bio-diversity* rather than for *bio-degradation*.

2.0A history of botanical recording around Doncaster

2.1 (18th Century) The history of systematic botanical recording in the Doncaster region dates back to the 18th century with botanists like Thomas Knowlton^(52 & 53) (1691-1781) who recorded on Thorne Moors, Thomas Tofield⁽⁷²⁾ of Wilsic Hall (1730-1779), Margaret Stovin^(66 & 70) of Rossington Hall (1756-1846), William Pilkington⁽⁷⁰⁾ of Wyndthorpe Hall (1758-1848) and Jonathan Salt⁽³⁵⁾ of Sheffield (1759-1810). These were some of the last botanists to record the plants of traditionally managed ancient woodland, extensive areas of calcareous fen, acid bog, wet grazing marshes, strip field cultivation, species-rich Magnesian limestone grassland and Sherwood sandstone heathland. They were however witnessing a landscape being profoundly changed by extensive drainage schemes, agricultural enclosure projects and early canal developments.

2.2 (19th Century) The local landscapes of the 19th century, modified by the development of the railway networks and ultimately the development of the concealed coalfield, were monitored by such botanists as Samuel Appleby⁽⁶⁷⁾ of Balby (1806-1870), Peter Inchbald⁽⁴⁶⁾ of Adwick-le-Street (1816-1896), J. E. Kenyon⁽⁴⁸⁾ of Hooton Pagnell (fl.1864), T. W. Gissing⁽³⁷⁾ of Wakefield (1829-1870), Thomas Birks⁽⁵⁴⁾ (fl. 1870s-80s) and H. Franklin Parsons of Goole (fl. 1870s), Rev. Gerard Edwards Smith (1804-1881) Vicar of Cantley from 1844 to 1846 and George P. Nicholson^(36 & 39) of Wath (fl.1830s). Significantly the Doncaster Scientific [Naturalists'] Society (formed in 1880) became particularly active during this period. In addition, the as yet unpublished annotations from interleaved floras belonging to Oswald Allen Moore⁽⁵⁹⁾ of York (d.1862) and Mary Yarborough⁽⁸⁰⁾ of Campsmount (fl. 1830s) have added considerably to our knowledge of local habitats during the early 19th century. Both these annotated volumes are in the collections at Doncaster Museum, the Moore annotated copy of Baines coming to us via the natural history library of the late Leslie Smith (1906-2000).

2.3 (Topographical sources) The 19th century fashion for producing historical and topographical works led to the incidental compilation of some useful contemporary local plant lists. Relevant to this study are botanical records in *The History and Antiquity of Doncaster and its Vicinity*⁽⁵⁸⁾, *The History and Antiquities of Thorne*⁽¹¹⁾, *Historical Notices of Doncaster*⁽³⁴⁾ and *The Level of Hatfield Chase and Parts Adjacent*⁽⁷⁶⁾.

2.4 (19th century reviews) Botanical records up to the mid and late 19th century were assembled and reviewed in a series of standard West Yorkshire Floras by Baines⁽²⁾ in 1840, Davis & Lees⁽¹⁶⁾ in 1880 and monumentally by Lees⁽⁵¹⁾ in 1888.

2.5 (Early 20th Century) In the first half of the 20th century two significant workers were A. A. Dallman⁽¹⁵⁾ (1883-1963) of Tickhill Road, Balby, who edited the field studies journal the *North Western Naturalist* and Dr J.M. Taylor⁽⁷⁵⁾ (1886-1947) of Thorne whose notable legacy was the study of aquatic and riparian plants of the Hatfield Chase. Although Taylor passed significant records to Dr W. A. Sledge for publication in the YNU journal *The Naturalist*, an extremely valuable source of local data is to be found in the signed and annotated copies of botanical textbooks in his library. Most of these are now in the collections at Doncaster Museum. Further significant botanical annotations referring to the 1920s and 30s have been located in *The London Catalogue of British Plants* from the library of Leslie Smith (see above). These have been traced to Mrs Ethel Dufty⁽¹⁷⁾ who during this period was one of the botanical recorders for the Doncaster Naturalists' Society.

3.0 Doncaster Museum's Contribution to Local Botanical Research and Monitoring.

3.1 Botanical recording at Doncaster Museum commenced with its first Hon. Curator Dr H. H. Corbett (1856-1921) who, as president of the Doncaster Scientific [Naturalists'] Society and the Yorkshire Naturalists' Union, was a celebrated and accomplished 'all round' naturalist with particular expertise in geology, entomology and botany. His local collecting formed the basis of the museum's herbarium and his recording formed the basis of what must have been one of the earliest museum-based local Biological Records Centres.

3.2 Successive curators and departmental keepers have maintained an active involvement with the natural sciences (nowadays referred to as Wildlife or Biodiversity studies). Their regular and increasing output of records, field notes and research papers for the scientific literature and the popular press, has provided an invaluable basis of information in the public domain. For a comprehensive list of published research papers, please see the Museum section of Doncaster Councils website (www.doncaster.gov.uk), which contains references to over 450 papers by staff members.

3.3 From 1969 to 1973 Doncaster Museum staff, in conjunction with William Bunting of Thorne and teams of local naturalists and academics from local universities, produced a series of site based surveys and data reviews in preparation for major planning appeals. Notable amongst these were the *Outline Study of the Hatfield Chase Pt. 1*⁽⁸⁾ compiled in defence of Thorne Moors which was being proposed as a PFA tip by the CEGB; *Outline Study of the Hatfield Chase Pt. 2*⁽⁹⁾, compiled in defence of Sandall Beat LNR and Low Ellers (Potteric Carr) YWT Nature Reserve from the proposed route of the M18; and *Edlington Wood*⁽⁶⁸⁾, compiled in response to proposals to fell and quarry this ancient wood.

3.4 Other notable studies, assembled for biological recording and conservation management purposes, are *The Ecology of Sandall Beat Local Nature Reserve*⁽⁷¹⁾; *A peat moor study: Hatfield Moors*⁽³¹⁻³³⁾; *The Natural History of Howell Wood Country Park*⁽⁶³⁾; *Melton Wood*⁽¹⁰⁾ and the four surveys published by the Doncaster Naturalists' Society, *A Survey of Castle Hills Scawsby*⁽⁴⁾, *A Survey of Wadworth Wood*⁽⁵⁾, *A Survey of Austerfield Quarry*⁽⁶⁾ and *Doncaster's Living Churchyards*⁽⁶⁴⁾.

4.0 The Doncaster Botanical Atlas Project

4.1 In order to understand the history, status and distribution of flowering plants and ferns (vascular plants) throughout the Doncaster region, Dr Peter Skidmore and the natural history staff at Doncaster Museum instigated the Doncaster Botanical Atlas Project, the process being to generate and collate historical data (from herbaria, literature and archival searches) and current field survey work on a site or 1km basis and eventually to produce species distribution maps using 1km grid squares.

4.2 Through the 1970s recording visits and site surveys (on a 'square bashing' basis) were undertaken in lunchtimes, evenings and weekends, the resultant data entered onto a set of Botanical Society of the British Isles (BSBI) recording cards, one card per 1km. Recorders were largely P. Skidmore, Chris Devlin, Colin Howes, of the museum staff together with local naturalists William Bunting (Thorne), Ken Bagley (Rossington), Dorothy Bramley (Potteric Carr), Denise Cutts (ex Middlesborough Museum), Ian McDonald (Armthorpe), Pip Seccombe (Owston), etc. Special recognition must be made of the contribution made by William Bunting who in the interests of passing his immense knowledge and field experience to the next generation, led the recording team to numerous sites he knew to be of significance, many of which were also under threat.

4.3 Over a 2-year period commencing in 1978, data from the BSBI 1km cards was input onto the DMBC 'mainframe' computer. Though this eventually led to the automatic generation of site-based species lists, access was costly and laborious and there seemed little prospect of the generation of species-based distribution maps.

4.4 The first generation of distribution maps was therefore not produced electronically but achieved in 1980 by Pip Seccombe volunteering (1 day per week) to abstract (species by species) 1km records onto a set of graph index cards.

4.5 Although never published as such, these distribution maps were extensively used by enquirers and students. They routinely provided proof of the regional importance of local species and Sites of Scientific Interest (SSIs) and were consequently used at Planning Appeals and in negotiations with developers and land managers.

4.6 The production of an authoritative Atlas, available in the public domain, is however proving to be a long and complicated process, necessitating the location, preparation and inputting of many additional sources of data, the verification and validation of records, the determination of grid references and the requirement for numerous editorial stages. This situation is therefore 'ongoing'.

5.0 Second Tier Sites of Scientific Interest

5.1 Through the late 1970s and early 1980s the DMBC Planning Department commenced the production of 'Local Plans' for each of the planning areas within the Metropolitan Borough. For each, a series of locally relevant Sites of Scientific Interest (ecological and geological) was requested. Sites were selected according to their perceived relative importance within the planning area, based on field experience and records collated by Doncaster Museum staff ⁽¹⁸⁻²²⁾.

5.2 In 1980 the South Yorkshire County Council and the then Nature Conservancy Council funded a Phase 1 Habitat Survey of the county of South Yorkshire. This, together with recommendations from natural history organisations across South Yorkshire, formed the basis of the South Yorkshire County SSIs ⁽⁷³⁾.

5.3 (First SSI resurvey, 1980) In 1980 Doncaster Museum employed a team of graduate botanists (David Green, Abigail Lister and Derek Barber) to collate existing site-based botanical records and update these through site surveys to form a documentary basis for the DMBC Local Plan SSIs ⁽¹⁸⁻²²⁾ and the South Yorkshire CC County SSIs ⁽⁷³⁾. This effectively produced the first botanical resurvey of Doncaster's SSI sites and helped to develop a site based element to the Museum's previously species-based environmental records.

5.4 At the demise of the SYCC Environment Department in 1986, Doncaster Museum became the Biological Records Centre for the DMBC and copies of the Doncaster component of the County Phase 1 habitat maps and card indexes of target notes were added to the Museum Records Centre archives.

5.5 In the period leading up to the DMBC Unitary Development Plan the Museum Records Centre was requested to propose SSIs for the nine planning regions of the Metropolitan Borough. This was based on the 1980 data collation together with records from subsequent field surveys. At this time a team of Trainee Countryside Rangers based at the Bentley Training Centre assisted with site surveys.

5.6 (Second SSI resurvey, 1994-95) Subsequent to the UDP Public Inquiry and the requirements of relevant Government Planning Policy Guidance all the **325** UDP Sites of Scientific Interest were resurveyed with a view to providing a current species list, a Phase 1 Habitat survey, a site plan and a site description and citation. This huge exercise, funded by the DMBC Planning Department and based partly at Doncaster Museum Environmental Records Section, was undertaken during the field survey seasons of 1994 and 1995. The contract was undertaken by MRB Ecology and Environment Ltd, the survey team including Geoffrey Wilmore, Phil. P. Abbott, Andrew Hill and Louise Hill. The series of location/boundary maps and citations for UDP areas 2 to 9 were published in 1999 by the DMBC Planning Department⁽²³⁻³⁰⁾ and the botanical records lodged with the Museum Environmental Records Section.

5.7 (Third SSI resurvey, 2004-05) Doncaster Biodiversity Action Partnership in partnership with DMBC acquired funding from the Big Lottery's Transforming Your Space initiative to rerun the SSI re-survey, this time including National Vegetation Classification assessments for each site. This was undertaken during the field survey seasons of 2004-05. The contract was undertaken by Faber Maunsell, the survey team including Andy Barker, G. Carr, Steve Dixon, A.E. Hall, T. Hall, Andrew Hill, Louise Hill, L. King, Bill Lever, P. Middleton, C. Needham and Geoffrey Wilmore. The survey results and the species records have been amalgamated into the 'Recorder' Database.

6.0 'RECORDER' Database

6.1 With the formation of the Doncaster Biodiversity Action Partnership, progress was commenced on developing Doncaster Museum's electronic Database using the English Nature recommended 'RECORDER 3' software. With the Museum providing the hardware, accommodation and archive files, and initial funding provided by English Nature through the Partnership, Bob Marsh was employed to set up site files, which for the first time enabled the electronic storage and handling of site and species data. The hardware initially provided was a Dell Optiplex GX110 computer with a 10GB hard disc with 125MB of RAM, running Windows 95 and Recorder 3 software provided by Doncaster Museum.

6.2 From 2004, through funding from the Big Lottery's Transforming Your Space initiative, Bob Marsh has been able to input all the data from the 1980, 1994-95 and 2004-05 SSI site surveys, together with many other series of records from museum files and field note books, recent surveys by the Doncaster Naturalists' Society and from Geoffrey Wilmore's South Yorkshire Plant Atlas project. The same funding has enabled the software upgrade to 'RECORDER 2002' to run on a Dell Optiplex GX 270 with a 2.8 GHz processor, a 37GB hard drive with 500MB of RAM. The system is networked to the Biodiversity team at the Planning Department, where it links to the ESRI GIS mapping software.

7.0 Doncaster Rare and Scarce Target Species

7.1 (*Selection of 'Rare and Scarce' target species*) This exercise has not relied on subjective impressions of rarity but is based on the identification of locally occurring species included in the following five authoritative listings:

7.1a ***British Red Data Books: 1 Vascular Plants***⁽⁶¹⁾. In 1967 a detailed survey of the rarest British species, defined as those that were recorded in 15 or fewer 10km squares, was initiated. The results were published in 1977 and updated, listing approximately 309 candidate taxa in a second edition in 1983.

7.1b ***Scarce Plants in Britain***⁽⁷⁴⁾. The Joint Nature Conservation Committee, the Botanical Society of the British Isles and the Institute of Terrestrial Ecology updated a list of 254 flowering plants and ferns that were known to have occurred in 100 or fewer 10 km squares in Britain since 1970. Earlier versions of this list formed the basis of Britain's Red Data Book for Vascular Plants⁽⁶¹⁾.

7.1c ***British Red Data Book: Vascular Plants 3rd Edition***⁽⁷⁷⁾. In 1999 the above listings were further updated.

7.1d ***The Vascular Plant Red Data List for Great Britain***⁽¹²⁾. In 2005 the above listings were further updated, providing a range of rarity categories.

7.1e Using the above lists as a basis, ***The Biodiversity Audit of Yorkshire and the Humber***⁽⁶⁵⁾ identified 28 nationally uncommon species for which there were records in Yorkshire. These were added to the audit as Biodiversity Priority Species for Yorkshire and the Humber.

7.1f A fifth and as yet experimental listing was devised by Geoff Wilmore^(78 & 79) (YNU and BSBI vascular plant recorder) to form a '**Catalogue of rare and scarce vascular plant in Yorkshire**'. This consisted of:

- Any native taxon listed in the *British Red Data Books – 1 Vascular Plants* (RDB species).
- Any native taxon listed in '**Scarce Plants in Britain**' (Stewart et al. 1994).
- Any native taxon endemic to Britain.
- Any native taxon not listed in either of the above publications but which occurs in 7 or fewer 10-km squares (hectads) in Yorkshire (these constitute **Scarce Plants in Yorkshire**).

(Of the latter category, some 25 species (and a further 10 hybrids) were calculated to be scarce in *South-west Yorkshire)¹.

7.2 The species currently identified for inclusion, replicate those vascular plants listed in 'A Species Audit of Doncaster Borough'. Section 4 of the Audit sets out the National, Regional and Local selection criteria used to identify rare and scarce species, for which the above named publications were used as source documents.

¹ *South-west Yorkshire or VC63 is a biological recording area that broadly includes those parts of Yorkshire south of the river Aire and includes South Yorkshire and the Doncaster Metropolitan Borough

8.0 Preliminary Distribution Maps

8.1 The preliminary maps and accompanying listing are issued at this stage of the 'Atlas' process to enable field botanists to check the validity of records and to search for the continued existence of these key species in our area.

8.2 On re-finding any of the target species, the methodology set out by John Newbould⁽⁶⁰⁾ and Geoff Wilmore⁽⁷⁹⁾ will be of assistance in resurveying sites and producing ecologically useful site reports.

8.3 In 2004 a small preliminary atlas of 142 species, mapped based upon 1km grid squares using the simplified 'DMAP' mapping software, was trialled.

8.4 In the current version 217 species have been selected and their maps (generated using ESRI GIS software) are presented in a more pictorial form with overlays showing motorways, navigable rivers, and urban areas. The use of this software was made possible through Big Lottery project resources.

9.0 Notes for using the Atlas

9.1 (Grid references) Although the distribution maps do not include Ordnance Survey grid lines or coordinates due to their small scale, the specific grid references used to generate the maps are listed in the species tabulations.

9.2 (Historical anomalies) In some cases where species are thought to have become extinct decades ago, anomalous recent dates may relate to when the records were collated or published rather than when the records actually occurred.

9.3 (False default dates) In cases where plant records only have a year date, the computer default process automatically appends the 31st December to the date. These examples have largely been edited out but some may remain. For those records where a day date is not available the default process automatically appends the last date of the month.

9.4 (Record order) Records are printed in alphabetical order of location name.

9.5 (Wider British context) For further information on the history, wider British status and context for each species we strongly recommend referring to the relevant species accounts in the *New Atlas of the British and Irish Flora* ⁽⁶²⁾.

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