

"UP THE AIRY MOUNTAIN, DOWN THE RUSHY GLEN"
AN ACCOUNT OF BOTANICAL SURVEYS CARRIED OUT
BY NCC'S WALES FIELD UNIT - 1979-1983

The Nature Conservancy Council's Wales Field Unit was set up in 1979 with the aim of carrying out surveys on sites in Wales to provide information on their nature conservation interest. Field units were set up in England and Scotland at the same time. At the present time the Wales Field Unit consists of the leader (a geographer), two botanists, and an ornithologist. In addition, staff may be employed on contract to help with surveys during the summer

months. It was felt that an account of work done by the Field Unit might be of interest to readers of the Bulletin, and might lead to a useful exchange of information. This article summarises the botanical surveys completed to date, and outlines work planned for this summer

National Nature Reserves and Sites of Special Scientific Interest

Survey work may be required on Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs), and on undesignated areas. The Nature Conservancy Council (NCC) has a statutory duty to designate sites of sufficient quality as SSSIs. NCC seeks to negotiate with the owner of an SSSI to ensure that management of the site is not detrimental to the wildlife interest. In the 1981 Wildlife and Countryside Act provision is made for further action by NCC if the owner of a site refuses to enter into such an agreement; the effectiveness of this new legislation remains to be seen. NNRs are either owned or leased by the NCC or else are subject to management agreements which aim to protect the wildlife interest of the site.

Each county or district has a list or schedule of SSSIs, of which most are important for flora or fauna, although some are included on geological or geomorphological grounds. Certain outstanding SSSIs are listed in the Nature Conservation Review (Ratcliffe, 1977). These are referred to as NCR sites.

Why site surveys are needed

Survey of the vegetation of a site may be required for a variety of reasons. These are listed below, and each category of survey is then briefly described with the aid of examples. Survey of a site may be required:-

- (a) if a threat has arisen to a site of known interest
- (b) for the selection of SSSIs
- (c) for revision of site boundaries
- (d) In order to provide a basis for site management
- (e) for the monitoring of vegetation changes

(a) Threatened sites

Surveys in this category can be illustrated by describing work done on two large wetland sites in South Wales.

Crymlyn Bog SSSI is a lowland fen lying between the Swansea and Neath valleys in West Glamorgan. It supports a fine range of fen communities some of which are floristically very species rich, and

including areas of Great Fen-sedge (Cladium mariscus) and reed swamp (Phragmites australis). One national rarity and several regionally rare plants occur, and the site is also of considerable invertebrate interest. The site is the largest example of its type in Wales. The main threat to the site was constituted by a proposal to extend an area used for refuse disposal at the southern end of the site. There is also a problem created by seepage of oil onto the eastern edge of the site from the neighbouring refinery. A survey by the Field Unit provided information from which the range of plant communities present was classified and mapped (Meade, 1983). The survey confirmed the importance of the site in terms of nature conservation (it is of NCR quality), and provided a basis for evaluating the effect on the vegetation of the proposed extension to the tip.

A large wetland is associated with the Western Cleddau river in the Preseli District of Pembrokeshire. A survey was carried out in 1982 to determine whether any of the wetland area merited SSSI or NCR status, and whether a proposed drainage scheme would be detrimental to the interest of the site. As a result of the survey it was recommended that the core of the site should have SSSI status, and that this area would be severely damaged if the drainage scheme were to go ahead. (Smith, 1981).

Surveys to assess the effect of potential threats to sites have also been carried out at Rhyd-y-Foel Limestone SSSI in Clwyd, where an extension to an existing quarry was proposed (Smith, 1980) and on Cors Goch and Cors Erddreiniog, two Anglesey fens which have NCR status. Here surveys were carried out in connection with a proposal to drain part of the latter (Meade, 1981), and to provide information to assist in management of the sites.

(b) Selection of SSSIs

NCC has a set of guidelines for selection of biological SSSIs (Moore, 1979). Each scheduled site must fulfil certain specifications either in terms of flora or fauna. The guidelines contain recommendations for the number of examples of each habitat type which should be scheduled per selection area (usually a county) in order to obtain sufficient geographical coverage of sites.

Several Field Unit surveys have been devoted to assessment of a particular habitat either on a county or a Regional basis. A county will often have a few well-botanised examples of a particular habitat (e.g. woodlands) and a large number of less well-known examples. Survey of all examples of the habitat in question is necessary before sites can be assessed in relation to each other and the best examples selected as SSSIs. An example of this is a survey of semi-natural woodlands in North Wales by NCC's North Wales Region and the Field

Unit. All woodlands over 6 hectares in area (plus a few between 4-6 ha in area) are being surveyed, apart from a few for which access permission was refused. A standard survey technique is used; this involves recording 8 large quadrats (sample areas) within the wood, making a species list, collecting selected qualitative data and writing a short verbal description of the wood. The woods can then be grouped into types, using a nationally applicable classification. This will enable selection of the best examples of each type in North Wales to be made (e.g. the best examples of sessile oak woods rich in oceanic bryophytes, or the best examples of alder woodland). Survey of the abundant woodlands in North Wales is a major task, but is now nearing completion after 5 years. About 260 woods have been surveyed, and evaluation of the data is in progress (Day, report in preparation).

On a smaller scale, a survey of 16 commons in North Pembrokeshire was carried out in 1979; a classification of the vegetation types present was derived from analysis of randomly selected quadrat data. The sites were scored according to the rarity/abundance of the vegetation types present and this, together with qualitative site data, allowed comparison and assessment of the sites to be made.

A slightly different example is provided by a survey of three similar and adjacent upland areas in Radnor. Of these, Radnor Forest was found to have the greatest botanical interest. It has good examples of blanket mire and dwarf shrub heath and there are a number of base-rich outcrops (which are of limited extent in Radnor). These carry a diverse flora, including a number of regional rarities. Radnor Forest is considered to be of NCR quality. To the south of Radnor Forest, an area consisting of Glascwm Hill, Gwaunceste Hill and the ridge which runs towards the River Wye at Aberedw Rocks was also surveyed. Part of this area was found to merit SSSI status on the grounds that it carries extensive Calluna heath and that the many small pools present form the habitat for pillwort, Pilularia globulifera, a species of extremely local distribution in Britain. Some base-rich rock outcrops are also present at the southern end (some of these were already included in a separate scheduled site, Coed Aberedw SSSI). The site also has ornithological interest. The third site surveyed, Beacon Hill, lies to the north of Radnor Forest, and was found to have some wildlife interest but was not considered to merit SSSI status (Burn, 1982).

(c) Revision of site boundaries

Survey of a number of SSSIs has been carried out in order to check that the site boundaries include all the vegetation worthy of SSSI status. This is especially important at present as re-notification of all SSSIs following the Wildlife and Countryside Act of 1981 goes ahead.

Vegetation surveys of a number of upland sites come into this category. Surveys of part of Cader Idris and the NE Carneddau resulted in small areas being deleted from these two sites as they were not found to be of sufficiently high quality to merit inclusion in the scheduled sites (Burn, 1982).

Conversely, an area northeast of the Pumlumon SSSI was found to be of SSSI quality following survey in 1980, and a further small area to the northwest of the SSSI was scheduled as a separate site (Pencarreg gopa a Moel Hyrddod SSSI). This year it is hoped to complete survey of all the upland lying wholly or partly in Brecknock, which will allow a review of the boundaries of the scheduled sites to be carried out. These include Pen y Fan, Mynydd Du SSSI and the Eastern Black Mountains SSSI, all of which are of NCR status.

(d) Site management

The presence of a given assemblage of plants at a given site depends on the interaction of a number of environmental factors. To manage sites successfully it is necessary first to classify and map the plant communities present and then to understand the environmental factors which allow this pattern of distribution to occur. The complexity of ecological systems means that the latter is as yet imperfectly understood at many sites.

Vegetation surveys of the two Anglesey fens mentioned above are being followed up by studies by the Institute of Hydrology in order to relate the distribution of the vegetation types to the pattern of water movement on the two sites.

A similar survey of the fen communities at Oxwich NNR in Gower was carried out by the Field Unit and the NCC's Assistant Regional Officer for West Glamorgan in order to classify and map the vegetation and to relate it to the water chemistry and the movement of water on the site. (Meade, 1982).

Much work remains to be done on the distribution both of plant communities and of individual species within SSSIs. A number of Field Unit surveys have had the provision of this type of base-line information as one of their aims, as an aid to understanding and

subsequent management of sites. For example, the north-facing Old Red Sandstone cliffs of the Brecon Beacons are known to have a diverse flora including many national and regional rarities. However, many parts of the cliffs have never been systematically searched because of inaccessibility. In 1981 a technique for cliff survey was developed by a team composed of a member of the Field Unit and several NCC wardens (Smith, 1982). Sections of the cliffs at Bannau Sir Gaer (within Mynydd Du SSSI) and Craig Cerrig Gleisiad NNR were examined by means of vertical transects recorded by abseiling down the face of the cliffs. This provided information about notable plant species present and formed the basis of a classification of the vegetation of the ledges so that if cliff sites are examined in the future their vegetation can be related to that of the cliffs already surveyed.

(e) Monitoring

If an environmental change occurs on a site (e.g. raising or lowering of the water table) this is likely to be reflected by changes in the vegetation of the site. Vegetation is also subject to successional changes such as the gradual infilling of open water sites by accumulated plant debris, or the invasion of grassland by scrub in the absence of grazing. For the successful management of sites it is necessary first of all to establish whether changes in the vegetation are occurring, and then to determine the underlying causes of the observed changes. Positive steps can then be taken to prevent detrimental changes occurring e.g. it may be necessary to increase the grazing pressure on grassland sites to control scrub invasion, or to increase water inflow to part of a wetland to prevent drying out.

The Field Unit carried out a survey on the Carboniferous limestone grasslands, cliffs and heaths of the south coast of the Gower Peninsula in 1979-80 to establish a base-line and to set up a system for monitoring changes in the vegetation. (Smith, 1981). The vegetation was mapped according to a vegetation classification derived from quadrat data collected. Permanent quadrats, to be re-recorded at regular intervals, were then set up in each of the vegetation types present. The site is partly NNR and partly SSSI, and information on vegetational change was required in order to assist with management (e.g. grazing and burning regimes) and to record adverse changes brought about by addition of fertilizers to the cliff top grasslands.

Another monitoring exercise concerns the spread of the Cord Grass, Spartina anglica, in the Dee Estuary. This may be detrimental to migrant waders and wildfowl in the estuary. The distribution of

Spartina and other saltmarsh vegetation in 1971 and 1978/79 was compared, using air photographs in order to provide information on the rate of spread of Spartina. (White, 1982).

The 1983 field season

This year two main projects are planned. These are a survey of lowland wetlands (mainly in North Wales), and survey of a number of upland sites.

Wetland survey

This is a continuation of a survey of Welsh lowland wetlands carried out by NCC between 1978-82. During the survey 646 wetland sites were identified from O.S. maps. Of these only 340 were found to merit further survey. 177 sites were examined in detail, providing data for a classification and key to Welsh wetland vegetation (Ratcliffe and Hattey, 1982). 163 sites remain to be surveyed, mainly in North Wales. The aim of the 1983 survey is to examine as many as possible of these 163 sites in order to be able to compare them with the sites previously surveyed, and to allow selection of the best sites.

Upland survey

The Brecknock section of the Eastern Black Mountains was visited in May this year, and survey of Mynydd Eppynt, also in Brecknock, is also planned. As described earlier, this will allow comparison of all the main upland blocks in Brecknock to be made, with a review of SSSI boundaries.

In South Wales a survey of uplands in Mid Glamorgan is planned, to follow a survey of uplands in West Glamorgan carried out last year. This will allow comparison and evaluation of these sites to be carried out on a county basis, and will allow the 4 small upland SSSIs in Glamorgan to be seen in context.

In Dyfed a survey of Mynydd Preseli is planned, to map the vegetation and provide base-line information on the NCR site.

In North Wales a survey of the Rhinog area is in progress, the aim being to map the vegetation of the NNR and the SSSI, and to review the SSSI boundary.

A standard survey method has been used for all the upland sites mentioned in the text. It is proposed to use this method for upland sites surveyed in 1983, with modifications in the case of Mynydd Preseli where the vegetation grades into lowland heath. The

vegetation is mapped onto plastic covered air photos in the field, using a nationally applicable vegetation classification. Further information in the form of quadrats and species lists is recorded in areas of botanical interest.

A vegetation map and written account of each site is produced as a result of the site survey. Comparison of upland sites on a county basis should be possible for Brecknock, Mid Glamorgan and West Glamorgan at the end of this field season. Most of the upland areas in Radnor, Dinefwr, Ceredigion and Gwent have been examined, together with some areas in Montgomery and 3 large sites in North Wales. Each of the upland sites examined to date has been surveyed for a specific reason (e.g. to check on a boundary or to provide base-line information on SSSI and NCR sites) but in the long term the aim of the survey is to cover all the main upland blocks in Wales, allowing inter-site comparison and evaluation on a regional basis and eventually within Wales as a whole.

Botanical records

In all botanical surveys an attempt is made to locate pre-existing floristic information and to collate it with information collected during the survey. The Field Unit would welcome any botanical information or records which readers of the Bulletin may be able to provide on any of the sites mentioned in the text, and particularly on those sites for which survey is planned in 1983.

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REFERENCES

- *Day, P. 1983 Report on survey of woodlands in North Wales. (in prepn.)
- *Meade, R. 1982 Botanical and hydrological survey of Oxwich Marsh.
- *Moore, N. 1979 Selection of Biological SSSI : Guidelines.
- Ratcliffe, D.A. (ed.) 1977 A Nature Conservation Review : Cambridge University Press
- *Ratcliffe, J.B., and Hattey, R.P. (1982) Welsh Lowland Peatland Survey.

* Internal NCC paper

Accounts of other surveys mentioned in the text are unpublished Field Unit reports.