

## HABITAT SURVEY

In Britain there is a tradition of habitat survey, within which can be found examples that meet the criteria above, and so there has been successful use of such survey material in statutory plan preparation, the control of development, and the selection of sites for designation as nature reserves (although in the latter opportunism must always play a role too). Such surveys are essentially of vegetation, as it is this that defines the habitat for many other species.

In habitat survey there must always be a compromise between the two aspects of completion; geographic coverage can be promoted at the expense of the detail documented on each site, and vice versa. Coverage of the United Kingdom is far from complete for even the most basic level of habitat survey - 'Phase I' or 'Field-by-Field' survey (as defined by NCC), yet in our experience in London, stable planning judgements depend on appreciably more data about each site than is provided by this basic level of survey. Our survey had more detailed mapping of habitats; it covered dominant and notable species and included assessments of species-richness, and most judgements based on it stand up to consultation with experts and interest groups. We would not expect Phase I to perform nearly as well.

'Phase II' (NCC term) survey is even more detailed than this London example and it provides ample data to justify planning decisions, but few agencies have been able to afford such detail in a comprehensive survey, and when phase II is done on sites chosen without adequate data the subsequent evaluation must be partial.

Space does not allow us here to go into details of methods of habitat surveys. NCC gave us considerable help in writing the specification for our own survey, and we, and doubtless others, are happy to provide advice based on our own experiences. An excellent manual on Phase I survey methodology was drafted by NCC some time ago; when this becomes available it will define the basic requirements.

Thus we see examples of the problem solved, but in most areas the data are not available, or those which are available fall short of the quality desired, as sufficient resources have not been available for survey, or the compromise has been drawn too far towards geographic coverage, or towards detail on any one site.

Nevertheless, in an international comparison, we may take pride in the achievement of British habitat surveys; few other countries have even as much information as Britain.

## SPECIES-RECORDING

We do not consider the position of species-recording is nearly so good. Many species-recording schemes fail to meet any of the criteria listed above; coverage is usually far from complete; the extent of searching effort at each site is rarely documented, but is usually uneven; and geographic precision is often poor. These problems are such that it is rare to find species' records that serve any more precise purpose in planning than to provide a coarse definition of regional distribution. To improve on this, and meet the requirements outlined above, species-recording must shake off the yoke of outmoded tradition.

Many local recording schemes have recognised that it is restrictive to collect data solely from arbitrary grid-squares; such squares rarely correspond at all well with natural units, or with areas under planning consideration and so fail to meet the criterion of precision (see above). The solution lies in the use of small, homogenous and flexible recording units.

**Small,** because this permits flexibility in use; small units can be added together, but larger ones cannot be subdivided.

Such units do not preclude the preparation of grid square maps as, if the units are much smaller than the grid squares, most can be unambiguously allocated to a square and those that cannot will lie wholly very close to the arbitrary boundary where mis-allocation will hardly matter. Similarly, small units are much more likely than large ones to fall wholly within an area under planning consideration.

**Homogenous,** because this promotes association of the species data with habitat data and the two together greatly assist understanding. For example, interesting grassland plants may survive around hedgerows, while the fields between generally lack any interest, but the data would not show this unless they were listed separately for field and field-edge.

**Flexible,** because the available resources or commitment may dictate considerable variation in the detail which it is realistic to collect. Also taxa differ in what may be seen as a naturally homogenous area: for birds this may be a whole woodland; for vascular plants, much smaller areas differing in growing conditions; and for bryophytes and lichens the areas may be individual tree trunks.

In many recording schemes all that is noted is the identity of each species in each recording unit. Such records greatly restrict interpretation, as they indicate neither the abundance nor the status of the taxa and, of course, absence cannot be proved with the same ease as presence. We see the solution in the recording of the search effort, and the abundance and status of each species.

Recording the search effort, because this permits coarse quantitative measures, such as numbers of individuals or of species recorded per unit effort. All other things being equal, the number of individuals found will increase linearly with the search effort. The number of species increases asymptotically (Dawson 1981).

For organisms that are sedentary and conspicuous a close approach to the asymptotic (or 'full') species list may be quickly acquired (this would be so for higher plants on a small site in the height of the field season). Other organisms may be much more difficult to prove on a given site, through being mobile, inconspicuous, seasonal, etc. For such groups, including even birds and butterflies, the length of the species' list from a site is of little value without some idea of the extent of the search that went into acquiring the list.

For example, we were recently told about a field in the London suburbs where 23 butterfly species had been recorded. This is an exceptionally good list for a site of this size, habitat and position, and one is tempted to rate the area as of considerable local nature conservation importance. However this field is adjacent to a university, and perhaps a staff member has recorded here over several years so as to sight very infrequent and temporary visitors such as the clouded yellow. Without knowing how the list has been accumulated the site cannot be assessed adequately.

Recording the abundance of species, because it is easy thereby substantially to improve on the information provided by presence-only records. Even the coarsest measures of abundance, such as timed counts of birds or eye-estimates of cover in plants, allow one to distinguish the odd rare occurrence from an extensive distribution or dominant status. Making such distinctions is of considerable importance when using a list of species to evaluate a site.

For example, we had to evaluate the grasslands of the grounds of an old hospital on the southern fringe of Greater London, at short notice, in time for a Local Plan Inquiry in the winter.

Evaluation proved very difficult, despite the existence of a long list of vascular plants from the site, as we did not know whether the several chalk grassland species were widespread and abundant at the site, or scattered remnants of a rich flora now depleted.

Recording the status of species, because this too promotes interpretation. Items to record may include the stature of trees and proof of breeding in animals.

As with habitat survey, there is a trade-off in species survey between detail and coverage. We would not suggest such stringent application of our suggestions on species recording as to put off the amateur recorder, indeed the mark of a successful scheme is that it is fun to do. For a British example of the use of quantitative measures, the recently completed winter bird atlas (Lack 1986) is a good example of technique. Figure 1 reproduces part of a plant recording scheme which used small, flexible recording units, and measures of abundance and phenology; it was used successfully in a New Zealand National Park. The greatest impediment to the use of such ancillary data is not the inability or reluctance of the practitioners to record such detail, but rather the greater effort needed to keep and analyse the information provided.

## MONITORING

The requirements for monitoring are somewhat different from those of the evaluation of sites, for here an adequate statistical sample will suffice to demonstrate a trend, so that the requirement for geographic coverage can be relaxed.

First, it is clear that the up-dating of a comprehensive survey, may be done at the same time as monitoring; given the need for up-to-date information it would therefore be wasteful to survey purely for monitoring. Second, geographic precision is of vital importance for monitoring, as the measurement of trend is much more precise if one can be assured that identical areas are being compared over time. Third, consistency is necessary so that change is measurable.

<i>Dryodium lasifolium</i> ..... pygmy pine			<i>Pennantia corymbosa</i> ..... kaikomako		
<i>Dactyloctenium aegyptium</i> ..... wooden rose			<i>Pentachondra pumila</i> .....		
<i>Dracophyllum filifolium</i> ..... inaka	P	D	<i>Peraxilla colensoi</i> ( <i>Elytranthe colensoi</i> ) ..... red mistletoe		
<i>Dracophyllum strictum</i> .....			<i>Peraxilla tetrapetala</i> ( <i>Elytranthe tetrapetala</i> ) ..... red mistletoe	I	R
<i>Dracophyllum cubulatum</i> .....			<i>Parnettia macrostigma</i> ..... wiry snowberry		
<i>Elaeocarpus dentatus</i> ..... hinau			<i>Phoridium cookianum</i> ( <i>Phoridium colensoi</i> ) ..... mountain flax		
<i>Elaeocarpus hookerianus</i> ..... pokaka			<i>Phoridium tenax</i> ..... flax		
<i>Specris alpina</i> .....			<i>Phyllocladus alpinus</i> ..... mountain toatoe	P	V
<i>Fuchsia excorticata</i> ..... fuchsia					
<i>Gaultheria antipoda</i> ..... snowberry	A	D			

EXTRAS

<i>Lycopodium scariosum</i>	P	V		
<i>Pyrosia serpens</i>	P	V		

TREES AND SHRUBS

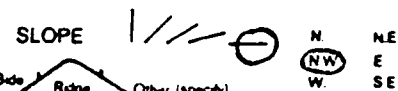
GRID REFERENCE EAST 27293 NORTH 62194

LOCALITY 200 m along Whakapapanui track from Park H.Q.

OBSERVER D.G. DAWSON DATE 9 8 79

ALTITUDE (metres) 1125

TOPOGRAPHY (cross-section) Flat Hill Terrace Valley bottom Side Ridge Other (specify)

SLOPE  N NE E SE S (order)

HABITAT Beech forest

SPAN OF SITE (m) 20 NUMBER OF SPECIES 25

- PLANT SPECIES LIST
- ABUNDANCE
- 1- One: just one plant or patch in the recording area
  - P- Present: more than one plant or patch but less than one tenth of the ground shaded by the species
  - A- Abundant: more than one tenth of the ground shaded by the species.
- REPRODUCTION
- V- Vegetative growth (not flowering or fruiting)
  - B- Flower buds present
  - F- Flowers open
  - G- Green fruit, seed or cone
  - R- Ripe fruit, seed or cone
  - D- Fallen fruits or empty seed heads

Figure 1. Parts of a recording form used for trees and shrubs in Tongariro National Park, New Zealand (Dawson 1979), embodying the use of small, flexible recording areas and the documentation of abundance and phenology.

## SITES FOR SOCIAL NEED

In London we have seen the need to provide nature conservation sites for people, as much or more than for their intrinsic wildlife value. To do this adequately one requires a survey base of social needs to parallel that on biota: something that we do not have. Recent work has begun to document public attitudes to the use of open space, but we are far from being able to map these needs. In the interim we have adopted some approaches to site evaluation that should promote their utility to the public.

We use the usual criteria, such as size, diversity, rarity and traditional character, but have added some more, such as public access and proximity to residential areas. We have also adopted an hierarchical classification of sites on the basis of areas of search, to try to ensure that no small area of the metropolis is without a nearby accessible site of some nature conservation value.

The top level in the hierarchy is the 'Site of Metropolitan Importance', each of which is of value to an area of London larger than one London Borough, through its high intrinsic value, its geographic position, or both. The next level is the 'Site of Borough Importance', which includes all Metropolitan Sites but also others that are the best available in that particular London Borough.

The next level is the 'Site of Local Importance' which comprise the best available remaining sites chosen so that, where possible, no London area is further than one kilometre from a recognised site with public access. Thus the accessible Metropolitan and Borough Sites serve as Local Sites too. Finally, all other sites surveyed comprise a residual category. For an illustration of the working of this system see figures 9-11 of the GLC Ecology Handbook No 3 (Anon 1985), or the accounts of the London Boroughs of Lewisham, Barnet, Brent and Hillingdon in handbooks 4 (Anon, 1986), 5 (Game, 1987) and 7 (Farino and Game, 1988).

These search areas are not based on biogeography, and doubtless a slightly different selection of sites would be made were the boundaries of Greater London, or of the London boroughs, different from those we now have. However, given the need for search areas, the use of administrative boundaries has an advantage over other arbitrary boundaries; the search areas coincide with Local Planning areas.

A consequence of this selection system is that the categories no longer simply reflect intrinsic interest. For example there may be a site in a borough richly endowed with nature conservation areas that fails on intrinsic quality to qualify as a Borough Site, and also as a Local Site, through being close to a Borough or Metropolitan Site with public access. Yet it may be of greater intrinsic importance than a Borough site in another borough less well endowed with such areas.

## PRIORITIES, GIVEN RESOURCE CONSTRAINTS

Resources for professional survey are very limited. The London habitat survey is one of the very few completed quickly and purely funded by a Local Authority; most surveys are piecemeal efforts using grant-aid over many years or conducted as part of a Manpower Services Commission scheme. Amateur interest in species (not in habitat) survey is considerable, but the scope for such survey is effectively infinite, so that the effort needs to be focused, if it is to prove useful for nature conservation planning.

First priority must go to habitat survey, which can provide the basic ingredients for good planning decisions within a minimal budget. Ensuring that these data are comprehensive and up-to-date is beyond the resources currently devoted by Local Government anywhere in the United Kingdom, to our knowledge, so usually the application of substantial Local Government resources to other survey would be inappropriate. On a more positive note, the extensive body of comprehensive survey data available in the United Kingdom may seem less than adequate to us, but it is the envy of European agencies.

Amateur effort is much more difficult to direct, as there is a considerable momentum in the presently inadequate recording effort, and any new directions must not ignore the essential ingredient for success: that surveying must be fun. Nevertheless there is considerable scope for the collection of amateur records along the lines outlined above, which would more nearly match the need for data for planning, and also complement the data of habitat surveys. Should grant-aid for amateur recording be made contingent on the data being properly kept and on the adoption of the features listed above, there would be an immense improvement in the utility of the product.

## DATA ALONE ARE NOT ENOUGH

Most planners cannot use raw data; they need to know that the data are there to back up the expert judgements that they accept, but they will rely upon the experts to make those judgements and to be there when required to justify those judgements. Even the publication of a comprehensive nature conservation strategy in terms of sites selected by experts and subject to public consultation will not suffice to meet all planning needs. Inevitably, developments are proposed which require expert judgement to evaluate; they may be marginal to a site of acknowledged importance, or claimed not to be damaging in their effect, or on a site not yet recognised in formal plans, but one highly regarded by nearby residents.

For reasons such as these, and also to keep the survey information up-to-date, to carry out monitoring and to make the information available to other interested parties it is essential that a database be serviced by expert staff.