Scottish Wildlife Trust

Working for a Scotland rich in wildlife enjoyed by all

East Highlands
Phase 1 Habitat Survey
1992 to 2000

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Buttons to access district reports and the Target Notes database appear at the end of this document but please read GENERAL INTRODUCTION, METHOD, and SOURCES OF ERROR before continuing as this information is required in order to be able to understand and interpret Phase 1 habitat survey results. If you have read these previously and wish to proceed, press this button now:

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ACKNOWLEDGEMENTS

I would like to acknowledge the invaluable assistance of the large number of Survey Team members who have been involved in the Phase 1 habitat survey of the East Highland area over the past nine years. Having walked many miles and spent many days both in the field and in the office producing the information, they deserve much of the credit for this final report. I would also like to thank the many residents of the area who allowed us onto their land. With few exceptions we were greeted with interest and encouragement and frequently provided with useful additional information about the local wildlife. Other experts and enthusiasts too numerous to mention, as well as a wide range of locals and visitors who we have encountered during this lengthy process, also deserve thanks for their comments and support which have helped to make this document so much more than a list of wildlife habitats. Finally, I would like to thank my family who have had to cope with my long and unsociable hours of work needed to produce this work.

PREFACE

The Scottish Wildlife Trust (SWT) is a charitable organisation with a membership of over 17,500 spread throughout Scotland. The SWT has been involved in survey work and site protection since it was founded in 1964. Our survey techniques developed over the years in partnership with the Nature Conservancy Council (NCC) now Scottish Natural Heritage (SNH) and other Wildlife Trusts in England, Wales and Northern Ireland, are all aimed at identifying and then seeking the conservation of the wildlife habitats of Scotland.

The SWT currently manages over 100 Nature Reserves covering some 20,000 hectares throughout Scotland. Our interests are increasingly extending to the identification of "Wildlife Sites" (ie. sites of particularly high wildlife value in a local context) which can be offered some protection in the form of agreements with landowners. The need to standardise the approach and provide a high level of objectivity resulted in the production of the Wildlife Site Manual (SWT 1993). This, in addition to giving a detailed methodology, provides criteria for assessing sites in terms of diversity of species and habitat, rarity of species and habitat, naturalness, extent, and amenity and education value.

The Phase 1 habitat survey reported below is essentially an environmental audit. One of its uses is as an aid to the identification and listing of Wildlife Sites. However, in areas such as the eastern Highlands many sites are not discreet entities. They are linked into larger systems of interconnected wildlife habitats such as river corridors for example. Thus it is particularly important to gather information on the areas between sites. As the survey method used provides a blanket coverage of an area, this approach is a very useful first step towards understanding the wildlife value of a district.

Our philosophy is that wildlife and people are inextricably linked and that a holistic approach is essential. Nature conservation is not an interest confined to a few enthusiasts but affects the quality of environment for everyone. Decisions which we make today have effects far beyond our own lifetimes. Thus it is essential to base such decisions on sound environmental principles using adequate information. This survey is an attempt to provide a basic framework within which to consider anything which may influence the natural environment of the area. It is not an end in itself but a beginning from which more detailed work can follow.

To gain maximum benefit from this report access to a Phase 1 Habitat Survey manual (NCC 1990) would be preferable. Some terminology inevitably relates to this method. However, every effort has been made to present the information in a way which is understandable without the manual. The habitat maps referred to are not included here. However, they are available for consultation at the Highland Council Planning Department and Scottish Natural Heritage.

SUMMARY

1. **The Scottish Wildlife Trust (SWT), a charitable organisation founded in 1964 to protect Scottish wildlife, established a Wildlife Survey Team in Highland Region in January 1992. The initial goal of this was to complete a wildlife habitat survey of the lower lying parts of Highland Region. Having completed all such areas within the eastern Highlands, this project has come to a close. Although this leaves some smaller areas, mainly within Caithness and Strathspey, the area covered, at over 3,000 km^2, represents a large percentage of the lowland areas and the largest contiguous area of lowland habitats in the Highland Region. The information gathered is now being used to identify the most important sites and areas for wildlife and provide a picture of the land which lies between them. This should pinpoint the areas of greatest wildlife importance and provide a sound base for considering the natural environment during the processes of planning and development.**

2. **The wildlife habitat survey of the lower lying parts of the eastern Highlands was carried out between 1992 and 2000 using standard Phase 1 method (NCC 1990). This covers the three districts of Nairn district (1993), Inverness district (1992 to 1995), and Easter-Ross (1996 to 2000). While separate reports were produced for Inverness and Nairn districts, it was felt that, with the completion of the entire project, it would be useful to bring all the information together in a single document. This report thus represents, second edited editions of the Inverness and Nairn reports and the first edition of a report for Easter-Ross. With such a complex area, this can be no more than a very brief overview of the findings of this Phase 1 habitat survey.**

3. **Phase 1 Habitat Survey is an environmental audit and produces colour coded wildlife habitat maps at a scale of 1:10,000 and a final report including target notes. This is based on vegetation but considers suitability for fauna.**

4. **The wildlife interest of the areas surveyed was in general found to be high. The rarest important habitat encountered was species rich blanket bog and raised bog. The coastal mudflats and saltmarshes were seen to be important habitats for birds in particular in an international context. Also, semi-natural woodland is particularly important for wildlife. As it is failing to regenerate in most areas through overgrazing. The extent of this habitat is likely to decline further unless measures are taken. The transition zone from lowland to upland was found to be of particularly high wildlife value as it often contains complex mosaics of habitats. This was also seen as potentially one of the most sensitive areas, being the most likely to be developed for forestry or agriculture. The heathlands of the area have long lost most of their natural woodland cover through overgrazing and burning. Deer populations in particular are at considerably inflated levels in many places and the few remaining pockets of trees in many areas are in danger of disappearing. As these represent the only seed source for natural regeneration in an area this gives cause for particular concern.**

5. **Although some industry occurs here and there, the wildlife and landscape interests of the area appear to be among its greatest assets in terms of generating income by encouraging visitors. The wildlife habitats of were found to be inter-linked in many cases, and part of a**

larger system which transcends district, regional and even international boundaries. Although this report later divides the area into districts and then into different geographical areas, this is merely for convenience. It is unlikely that most of the wildlife in the area would recognise such boundaries. Many wildlife corridors were encountered, as well as areas of rich wildlife habitats lying in close proximity to one another forming habitat systems. The mudflats and saltmarshes were seen to be part of a system including large parts of the firths in this area and extending internationally in terms of migratory birds. A holistic view of the wildlife of the area is thus very important.

6. **The next important steps involve using the information provided to encourage greater awareness of the needs of wildlife during the processes of planning and development. Liaison with those who own more interesting areas of habitat in the eastern Highlands, followed by some more detailed surveys, advice and assistance are the next consideration.**

GENERAL INTRODUCTION

The Surveyors

The SWT Highland Survey Team was established in Inverness in January 1992 in order to carry out ecological survey and monitoring work in Highland Region. The Phase 1 habitat survey detailed below is a major part of a larger initiative, gathering ecological information about the region as a whole. It is hoped that this will allow the multiple interests influencing the Highlands to be viewed both objectively and holistically in the context of the natural environment.

The team consists of one supervisor and up to fifteen trainee surveyors recruited through the "Training for Work" scheme funded by the Local Enterprise Companies, and more recently through the “New Deal”.

The Survey

Initial survey efforts in Inverness district in 1992 gave priority to areas most likely to experience particular pressures from development. The area of the Inverness Local Plan was covered first including Culloden, Smithton and Balloch. The work was then extended for the remainder of the season into other low lying areas. In 1993 the town of Nairn and surrounding settlements were considered to be the next priority as areas likely to experience further development. Thus survey efforts in Inverness district were suspended and the whole of the lower lying parts of Nairn district were surveyed. In 1994 we returned to Inverness district and completed the final field work in December 1995. Work on the Black Isle began in 1996, moving westwards in 1997 towards Muir of Ord, Contin and Strathpeffer. 1998 and 1999 extended the work eastwards through Dingwall, Alness and Invergordon, and the work was completed in 2000 when Edderton, Tain and the Fearn Peninsula were covered.

The final area covered exceeded 3,000 km^2.

METHOD

The method followed the Phase 1 Habitat Survey Manual (NCC 1990). This uses a system of colour coding to map wildlife habitats at a scale of 1:10,000 with codes for dominant plant species and target notes to record further details. In addition, general field notes were used to record further details for each 5 by 5 kilometre map within the survey area.

Surveyors working in pairs or small teams visit each area, using vantage points as much as possible, and sometimes aided by aerial photographs. Mapping takes the form of sketching habitats onto a monochrome base map, adding species codes and target notes where appropriate. Other than map and compass no other measuring equipment is used and boundary accuracy relies on points of reference in the form of map, photograph and field features and the availability of suitable vantage points from which to view them.

It is usual for the final maps to be used to obtain the approximate area of each habitat type for the district (using the dot grid counting method). Unfortunately, due to limited resources and the scale of the task, production of area statistics was only possible for the relatively small area of Nairn district.

Please note that heath and mire habitats were only surveyed in detail where they lay within or adjacent to the lower lying areas covered by this survey. The more extensive areas of upland of the area were not surveyed as the Phase 1 method alone would not yield a suitable level of detail. An alternative method is being considered for a future survey of unenclosed uplands in Highland Region.

Phase 1 habitat survey divides wildlife habitats in the following way:

Woodland
Semi-natural broadleaved
Semi-natural coniferous
Semi-natural mixed
Plantation broadleaved
Plantation coniferous
Plantation mixed
Recently felled

Scrub - Dense/continuous

Grassland -
Acid better semi-improved
Neutral better semi-improved
Improved and poor semi-improved
Marsh/marshy grassland

Tall herb and fern -
Continuous bracken

Heathland -
Dry heath
Wet heath
Dry heath/grassland mosaic
Wet heath/grassland mosaic

Mire -
Blanket bog
Raised bog - (only very small fragments included within blanket bog)
Wet modified bog
Dry modified bog
Flush (acid+basic)
Valley mires
Swamp, marginal and inundation vegetation

Open water - Standing
Running

Coastland -
Intertidal mud/sand
Intertidal shingle/cobbles + boulders
(with or without Zostera or Algal beds)
Dense/continuous saltmarsh
All sand dune habitats

Rock exposures -
Natural
Artificial and waste types (quarries, etc.)

Miscellaneous -
Cultivated/disturbed land (arable land and amenity grassland)
Wall (intact, stock proof, stone)
All built up areas (including roads, caravan sites and bare ground)

FULL DEFINITIONS OF THE ABOVE HABITATS ARE GIVEN IN THE PHASE 1 HANDBOOK (NCC 1990). HOWEVER THEY ARE CONSIDERED IN MORE DETAIL BELOW AND HOPEFULLY MOST SHOULD BE SELF-EXPLANATORY.

SOURCES OF ERROR

As the Phase 1 survey method works to different standards than others such as Ordnance Survey it is vital that the limitations are clearly understood when interpreting results. Thus the possible sources of error listed below must be consulted before results are considered.

1. Maps are produced from suitable vantage points in such a way that not all areas are visited. The inability to visit every metre of an area or refusal of access permission means that some important sites or species may well be overlooked. Thus simply because a habitat is not noted as being important it cannot be automatically assumed that it contains no wildlife interest.

2. All maps are hand drawn without the aid of measuring equipment. Thus unenclosed boundaries and complex mosaics are only approximate. In these cases any area estimates will have a higher error margin than usual. It must be remembered that the aim is to give a reasonably detailed overview of wildlife habitat distribution over a large area rather than the exact location of every small feature. While the level of detail is usually quite high, precise locations are sometimes difficult to ascertain from a distance.

3. The quality of information gathered is dependent upon the ability of trainees. As most trainees have little or no prior survey experience they can only be trained to recognise the standard range of Phase 1 habitats plus basic plant identification and sufficient theory to make a general interpretation of findings in the field. While quality control checks are carried out regularly, the possibility of overlooking some important features cannot be entirely eliminated.

4. The map scale of 1:10,000, while allowing sufficient detail for a general environmental audit does not allow the mapping of areas much smaller than 50 metres in diameter. The manual suggests a minimum of 10 metres, but in practice this is not always possible. Thus small areas of habitat are not mapped. If however such areas are found to be important they will be mentioned in target notes.

5. As mapping is carried out systematically throughout the survey season (roughly April to October) the seasonality of vegetation has an effect. For example, grassland visited early in the year will have species overlooked or under-recorded while the same would apply to broadleaved woodlands later in the year.

6. Some habitats, particularly grasslands, often fall between Phase 1 categories and may vary substantially from year to year depending upon levels of grazing. The main example of this lies in the transition from improved (for grazing), through poor semi-improved (rough grazing) to good semi-improved (relatively species rich) grassland. These distinctions are particularly difficult for trainees and even pose problems for experienced surveyors on occasion. Another case arises where acidic areas have been partially limed or otherwise treated so that they contain both acid and neutral grassland species.

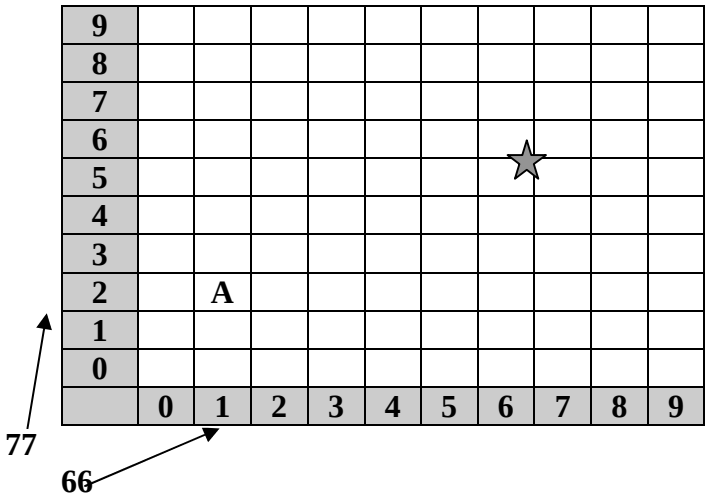
7. Upland habitats (heaths and bogs) in general pose particular problems. Transition zones are often very wide and the dominance of heather often makes boundary detection very difficult at a distance. As the uplands of Highland Region require a separate survey, attempts to include such areas in the current survey have been reserved for areas adjacent to lowland habitats.

8. Lack of continuity of surveyors working on any given map was possibly one of the most

problematic aspects of our work. As we use trainees who are never with the team for more than one year, work begun by one person may be completed by another and the final field checks and production of master maps carried out by a third. This can lead to ambiguous or indecipherable mapping and target noting having to be interpreted by a third party. If sufficiently serious, further field checks have to be made which further increases the time required to complete the survey. This could potentially extend the process indefinitely. However, a point is reached where remaining errors are, in the main, slight and work is halted. However, some errors (hopefully of little importance when seeking an overall view) will remain and have to be acknowledged.

9. On occasion, difficulties are encountered with grid referencing. At a scale of 1:10,000, the national grid is more clearly divided into smaller, 100 metre (1 hectare) squares. As many people are unused to this, the precise location to which a grid reference refers is often misunderstood. This can occasionally lead to recording errors, but equally to misreading by others. Below is a brief explanation:

The national grid divides Great Britain firstly into 100 kilometre squares (100 by 100 Kilometres), identified by 2 letters. The area covered by this survey all falls within **NH**. These squares are then sub-divided into 10 kilometre squares denoted by 2 numbers, (the example below would be from **NH67**). These are then divided into 1 kilometre squares denoted by 4 numbers (the example below is **NH6677**).



A further sub-division then occurs. This is not shown as grid lines or actual printed numbers on the map but is divided here for clarity. This divides each kilometre into 100 metre (1 hectare) squares and is the source of most errors.

Points to remember to avoid errors:

- Read horizontal axis (easting) first and then vertical (northing).
- Numbers relate to squares not lines and first square is always zero not one. Thus **A** in the example lies at NH661772 (not NH612773).
- Where a feature lies on a line or the intersection of lines, it is assigned to the following square not the preceding one. Thus the star in the example lies at NH667776 (not NH666775).

GENERAL RESULTS

While most of the area surveyed was lowland and lowland/upland transition zone, some was clearly upland in character. Early survey efforts in 1992 showed that the Phase 1 method does not work well in upland areas and that an alternative approach is needed. The eastern Highlands contain some quite extensive areas of upland, which do require surveying. However, this initiative awaits additional funding as the work cannot be carried out with existing resources.

The emphasis on lower lying areas thus tends to give a slightly false view of habitat abundances. Viewed from the air, the lower parts of Inverness and Nairn districts and Easter-Ross form a small oasis in a vast upland region. Thus, although some lowland habitats appear well represented, they are in fact tiny remnants supporting species which cannot thrive over most of the region.

The present emphasis on lower lying areas is however appropriate as such areas are under the greatest threat from development. If development of the Highland area as a whole is to be viewed holistically and follow ecologically sound planning, the area covered by this survey is a good place to begin.

The reports which follow divide the area into three districts – Inverness, Nairn and Easter-Ross. They then consider the findings first in terms of wildlife habitats and then by dividing each district into a range of geographical areas.

GENERAL CONCLUSIONS

The wildlife habitats of the area covered, and indeed the Scottish Highlands in general, cannot be considered entirely in isolation. They are part of larger ecological systems which transcend not only the boundaries of each individual habitat but those of the district itself. Indeed the coastal habitats, the mudflats and saltmarsh in particular transcend national boundaries as important habitats for birds.

This Phase 1 Habitat Survey is a starting point in understanding the spatial relationships between wildlife habitats and other land uses in the district. The next step is to study some of the more important habitats in greater detail, individually while bearing in mind that they rarely function entirely in isolation.

Any individual habitat is likely to support a larger number of species for a given area if it is (a) sufficiently large to function as a relatively self-contained ecological unit, and (b) if it is sufficiently close to other habitats for interactions to occur. Smaller areas generally support fewer species for a wide variety of reasons. These include insufficient space to hold a viable population of a given species (for example insufficient food to support a breeding population of animals), vulnerability to edge effects such as exposure to the elements or incompatible management of adjacent land, and many more. Isolation, in most cases, causes vulnerability. For example, should disturbance occur, new individuals cannot re-colonise and thus a habitat may remain degraded.

The wildlife corridors and habitat complexes of the eastern Highlands are good examples of a situation where wildlife habitats can interconnect, interact and thereby increase overall species richness and stability. The interrelationships are often complex but the basic ecological principles are easy to understand.

One of the largest threats to the wildlife of the eastern Highlands (not potential but currently in operation) is the loss of native trees. This takes the form not only of actual felling but also lack of regeneration through overgrazing. In the lowland areas the overgrazing is by livestock but the uplands are seriously affected by the large deer populations. Much of the uplands would support large areas of native woodland if deer numbers were reduced to a sustainable level. The habit of building houses within woodland is another significant threat, although its impact is less visible and harder to estimate. Although large areas of broadleaved trees have been planted in recent years, these, although an investment in wildlife habitat for the future, cannot replace the well established woodlands which are being destroyed.

Understanding of wildlife issues in the Highlands has increased significantly since 1992 when this survey was started. However, an objective, holistic view of regional development is still slow to appear and urgently required. It is hoped that, by encouraging more people to use the Phase 1 habitat survey information, and with the beginning of work on Local Biodiversity Action Plans (LBAPs) for both species and habitats in the region, the situation will improve dramatically in the years to come.

DEVELOPMENT OF THE EASTERN HIGHLANDS

The wildlife interest of the eastern Highlands is discussed in the report in as much detail as time and this Phase 1 habitat survey permits. The question then remains, with so much valuable wildlife habitat, where should developments such as building or forestry take place? A detailed answer would require a much closer inspection of the habitat maps and in some cases a more detailed survey. However, a number of general points can be made which may aid as guidelines to "development without degradation":

1. Few people would accept that wildlife should be protected at the expense of human beings who are trying to make a living in an area. However, it is equally difficult to justify the destruction of wildlife species and habitats when this can be avoided, often by simply taking a broader view of planning and development.

2. Semi-natural woodlands are of considerable importance even where grazing is inhibiting regeneration. Disturbance can be minimised by providing a buffer zone between buildings and trees and additional tree planting may blend a development into the landscape in a very pleasing manner. Where encroachment into a woodland is unavoidable, the provision of tree planting greatly in excess of that felled could ameliorate some of the effects in the long term.

3. Species rich wetlands, including intact blanket bogs are rare not only in the eastern Highlands but internationally. However, here they are usually quite small and vulnerable and the effort needed to drain them frequently yields very little useful land. Such areas are generally inaccessible, often incredibly rich in wildlife and of considerable interest to visitors who may be encouraged to enjoy them from suitable vantage points.

4. The largely treeless uplands would, in many cases, benefit from natural regeneration of native trees. Under natural conditions this would occur with greatest success on dryer slopes. Wetter areas require drainage if forestry planting is to take place and are frequently more floristically interesting. A "rule of thumb" is thus to select dryer heath for planting or other development. The relative species richness of existing Scots pine (*Pinus sylvestris*) plantations in Inverness district, with more extensive examples in Nairn district and Easter-Ross, has shown this species to be very suitable both as a timber crop and a wildlife habitat.

5. Agricultural land would be a natural target for building development, being of lower wildlife interest, but does of course have economic value for food production. However, there are some areas of lower agricultural value which also support less wildlife, where development would have the least impact upon both. These include dense, continuous bracken, poor semi-improved grassland (particularly that supporting tufts of soft rush (*Juncus effusus*) with little else) and larger areas of very dense, continuous gorse (*Ulex europaeus*) (but not juniper (*Juniperus communis*) which is under-represented in the eastern Highlands). However, it must be remembered that even these areas will support wildlife and, in many parts of Britain which lack richer habitats, much of the wildlife is confined to such locations. It is therefore always important to seek other options before developing these apparently marginal habitats.

6. Building development within existing conifer plantations tends to have low visual impact on the environment and can encourage the retention of some interesting areas when the time comes to harvest the timber.

7. A large number of derelict buildings and areas of waste ground were noted during this survey (though not all specifically recorded) which, if not suitable for renovation would certainly provide very suitable sites for new developments. There would seem to be a good case for giving priority to re-development of such sites.

THE NEXT STEPS

It is hoped that this environmental audit of will provide sufficient information to encourage a more holistic approach to planning and development. Consultation of this document along with the habitat maps which it supports will hopefully in itself reduce the impact of development upon the natural environment. Indeed it should be used to develop the natural environment as a valuable resource in itself, to attract visitors to the area and to enhance the lives of local residents.

The next step in terms of wildlife survey is to re-visit areas identified by this survey as having high wildlife potential. This process involves careful liaison with landowners, more detailed mapping, production of more detailed descriptions and species lists and consideration of the findings against predetermined criteria to assess the importance of a site (in terms of wildlife and amenity). The aim of this is to give advice and come to agreements with landowners to protect certain areas. The final result (if there can be such a thing in what is essentially an ongoing process) would be a list of carefully assessed and designated "Wildlife Sites" and larger "Wildlife Zones" representing the most valuable wildlife habitats in the area. (The SWT Wildlife Site Manual (1993) sets out the details of this procedure.) This process was begun in 1991 with the adoption and incorporation of a small number of Wildlife Sites in the Inverness, Culloden and Ardersier Local Plan. The Phase 1 habitat survey results now places these and other potential sites in a wider context and a more rigorous method is now available for assessment.

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