CONTENTS

FOREWORD

One of the key targets in EHS's Biodiversity Implementation Strategy is the establishment of a forward programme for ASSI designations.

Clearly, statutory designation is not the only way of enhancing bio- and geodiversity. Species, habitats and earth science features can be protected through a variety of different measures. However, for areas that are particularly important for nature conservation, declaration as ASSI is generally the most effective means of protection. This paper sets out a programme for completing the designation of these statutory sites.

Scientific knowledge is constantly developing; the natural environment – and the pressures on it – are constantly changing. The ASSI series should therefore be regarded as a dynamic entity and the extent of the ASSI network needs to be kept under constant review. For this reason, the programme is unlikely to reach a stage when no further ASSIs are required. What this paper aims to achieve is the establishment of a framework for taking the ASSI series towards substantive completion – i.e. having declared more or less all of the area that can be reasonably predicted at this stage. It should therefore be noted that for some features, further research will be required before a full complement of sites can be identified, and for others there may need to be a reassessment before the network is finalised.

EXECUTIVE SUMMARY

1. The NCALO 1985 marked a period of great change in nature conservation protection in NI. The existing network of ASIs was largely based on individual knowledge and experience. EHS was required to embark upon a major programme of site survey in NI.

2. The early ASSI programme concentrated on field survey, site evaluation and subsequent designation since there was an urgent need to provide protection to important sites. Essential management and monitoring were given much less attention.

3. An ambitious programme to ensure that the ASSI declaration process would be largely completed by 2001 (Target 2001) was launched in 1993. This was not achieved because of lack of resources and changing priorities resulting from European Directives, and the emergence of evidence that more areas merit declaration than had initially been anticipated.

4. The aim of the ASSI programme is to establish a network of sites that together guarantee the survival of Northern Ireland's wildlife and geological features by representing (and protecting) an adequate sample of the diversity of plants, animals and earth science features that are present. The main purpose of this paper is to consider how effective the existing network is for habitats, species and earth science interests, and how much additional work is needed to complete a fully representative series.

5. The paper then reviews selection features – earth science, habitat and species - and assesses the context of the resource, the extent of the current ASSI network and what future action is needed. Priorities for action are identified on the basis of the importance of the resource, and the current coverage of the network. Data for some features, particularly species, are occasionally inadequate to enable a comprehensive review to be carried out. For these features we have identified further research and survey as the main activities to be undertaken in the short-term, rather than site declaration.

6. Projected numbers of additional sites and estimates of area coverage required to complete the network are provided where possible. Priorities for action for particular features are defined on the basis of rarity, fragility and the existing coverage in the ASSI series. Particular habitats such as grasslands are identified as requiring urgent declaration.

7. The original forecast of 8% for ASSI coverage was based on a comparison with other UK countries. Given our increased knowledge of the nature conservation resource in NI, it is felt that an estimate of around 10% coverage for ASSIs is now closer to the mark. The SSSI network in GB has increased at a similar rate.

8. EHS is aiming to achieve substantial progress towards the completion of the ASSI series over the next 6 years. Yearly progress reports will be completed, with a half-term

review of targets in 2006. After 6 years, a comprehensive review of progress towards the completion of the programme will be undertaken.

9. ASSI declaration goes hand in hand with monitoring and management, and the ASSI programme must include all of these aspects. Timetables for site condition assessment (quality monitoring) and site integrity monitoring are now in place. Incentives for landowners to manage ASSIs in the most appropriate way are now available under the MOSS scheme.

10. The success of the programme is dependent upon resources – both in-house staff and research contracts. Recent increases in staffing, in conjunction with resources recently bid for, should enable EHS to achieve the progress outlined above over the next three years. However, it will be necessary to review progress after 3 years to assess whether further resources are required.

11. No final date for the completion of the ASSI programme has been included, since it is impossible to predict resources and demands too far into the future. However, it is likely that the bulk of the declarations will be completed by 2015. This paper develops a framework for moving towards the completion of the programme, based on a review of the existing network and a clear prioritisation of future efforts.

SECTION 1 - INTRODUCTION

The aim of this paper is to provide a framework for completing the declaration of Areas of Special Scientific Interest (ASSI) in NI. It should be noted at the outset that the process is never likely to be truly complete – knowledge is constantly improving, the natural world changes, and our priorities are modified as time passes. New sites are likely to be discovered and added to the list; some sites may lose the special features for which they were declared and may be removed. However, EHS is acutely aware of the urgent need to provide statutory protection for the best sites for nature conservation in NI. This paper attempts to address that need by reviewing the current state of the ASSI network, identifying any significant gaps, and prioritising future action to provide an adequate coverage of sites.

1. Areas of Special Scientific Interest

ASSIs are defined in the Nature Conservation and Amenity Lands (N.I.) Order (NCALO) 1985 (with 1989 amendment).

Where the Department, ..., is satisfied that an area of land is of special scientific interest, by reason of its flora, fauna or geological, physiographical or other features, and accordingly needs to be specially protected, the Department shall make a declaration that the area is an area of special scientific interest.

The legislation is very similar to the Wildlife and Countryside Act of 1981, which provides for the designation of Sites of Special Scientific Interest in Great Britain.

However, although the NCALO was enacted only 4 years later, statutory protection for important sites was much further behind. In GB, the main impact of the Wildlife and Countryside Act was that the (then) Nature Conservancy Council was required to embark upon a process of re-notification of existing designated sites. The existing network of Areas of Scientific Interest (ASI) in NI was largely based on individual knowledge and experience, and had not been the result of a rigorous process of survey and assessment. In fact, there was very little comprehensive survey information available on which to base site designation decisions. The NCALO therefore marked the beginning of a major programme of site survey in NI.

2. The Early ASSI Programme

The early ASSI programme concentrated on field survey, site evaluation and subsequent designation. There was an urgent need to provide protection to important sites and out of necessity, essential management and monitoring work was given less attention. Over the last decade, attitudes to countryside management have changed, with agricultural and forestry policies now reflecting a greater concern for the environment. As the ASSI network has expanded, with a reasonable proportion of the land area of NI now protected,

EHS can now adopt a more balanced approach, with management and monitoring given equal weighting to site designation.

3. Target 2001

Target 2001 (Environment Service, 1993) was an ambitious programme to ensure that the ASSI declaration process would be largely completed by 2001. It was estimated that the amount of land likely to be designated as ASSI was around 8% of the land area of NI, or 110,000 ha. This figure was based on a rough comparison with the situation in Great Britain and it was intended as a forecast only. The current estimate of the likely extent of coverage required to provide an effective network will be considered further below.

Substantial progress has been made over the last 17 years. The network now includes 196 ASSIs and takes in 91,601 ha, covering a wide range of habitats and species. However, the programme is still some way from completion. Target 2001 was not achieved for a variety of reasons. There were inadequate resources to both continue with a rapid rate of site declarations, and to undertake the required site management and monitoring. In addition, there were increased obligations to comply with international designations, in particular EC Directives on habitats and species protection.

4. International Sites

Most international designations are underpinned by ASSI declaration. However, they require additional administrative and consultation procedures, and involve further management obligations. This has had a considerable impact on resources. In addition, we have had to make major changes to the ASSI programme in the light of revised priorities for these international sites.

One of the earliest international nature conservation designations was Ramsar. The Convention on Wetlands of International Importance especially as Waterfowl Habitat was adopted at a meeting of countries concerned with wetland and waterfowl conservation which was held at Ramsar, Iran in 1971. The UK government signed the Convention in 1973 and accepted a commitment to promote both the conservation of particular sites and the wise use of wetlands within its territory. Each country is required to designate wetlands in accordance with criteria agreed by these parties for inclusion in a list of "Wetlands of International Importance". To date NI has classified 17 sites encompassing 86,831 ha. It is likely that additional sites will be required in the future as the criteria for Ramsar designation have been recently reviewed.

Special Protection Areas (SPAs) are classified under the *Council Directive on the conservation of wild birds (79/409/EEC)*, more commonly known as the Birds Directive. This was adopted in 1979 and requires member states to identify areas to be given special protection for rare or vulnerable species, and for regularly occurring migratory species. A recent UK review recommended several additional sites for NI. Currently, there are 12

SPAs in NI taking in 70,896 ha. Two further sites are currently undergoing public consultation.

The Birds Directive is now largely subsumed under the Habitats Directive and sites designated under either (or both) will eventually be part of an EC wide network of nature conservation sites known as the *Natura 2000* network.

In 1992, the European Community (EC) adopted the *Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*, known as the Habitats Directive. The Habitats Directive requires member states to designate Special Areas of Conservation (SACs) for habitats (listed in Annex 1) and species (Annex 2) considered to be most in need of conservation at a European level.

The original UK list was submitted in July 1999 and included 21 candidate SACs from NI. In 1999 this list was assessed within the context of the relevant biogeographical region and the EC as a whole – a process known as moderation. In common with many of the member states, the UK cSAC list was judged to provide insufficient coverage for a number of habitats and species. As a result, additional sites were put forward, including a further 22 from NI. A second moderation meeting in 2002 found the UK still insufficient for a few habitats and species. Final additions to the list will be made over the next year. The NI list is likely to include 52 SACs, encompassing 70 ASSIs and taking in 65916 ha.

Designation of internationally important sites has generally taken priority over the national series, thus impacting on the ASSI programme. The Habitats Directive has had the greatest influence and has required the greatest input of resources.

5. ASSI Selection Criteria and the ASSI Network

The selection procedures for ASSIs have been covered elsewhere (EHS, 1999). However, an assessment of the likely future extent of the ASSI network needs some consideration of the underlying principles upon which site selection has been based.

Individual site selection uses well-established scientific criteria - for biological sites these are size, diversity, naturalness and rarity. However, in assessing the future ASSI programme, it is essential to consider the contribution that these individual sites make to the overall ASSI network. The aim of the ASSI programme is to establish a network of sites that together guarantee the survival of NI's wildlife and geological features by representing (and protecting) an adequate sample of the diversity of plants, animals and earth science features that are present, for the future use and enjoyment of successive generations.

To represent an adequate amount, the ASSI series should:

i. give protection to a sufficient *proportion* of the total resource, as judged by its rarity and fragility, and

ii. ensure that the *full range of variation* present in NI is represented.

In other words, the network must be large enough in extent and have a sufficient number of sites to cover the natural variation of the resource in NI, thereby adequately representing all of the important species and communities and earth science features. Even within the comparatively narrow confines of NI, there is an immense range of variation in physical features such as relief, climate, geology and soils. The plant and animal communities reflect this, and the ASSI network should ensure that this geographical and ecological variability is adequately represented.

The objectives of the earth science programme, in terms of the site criteria, differ somewhat from that of the biological programme.

The Earth Science Conservation Review (ESCR) list is deemed to be the minimum site series required to demonstrate the geological history and range of contemporary processes of NI; there is no duplication of selected features within the site list. Many sites fall within thematic networks whereby their value is enhanced by their relationship with other sites within that network e.g. sites selected to describe the Carboniferous sedimentary basin of Armagh or those which describe the Tertiary igneous complex of the Ring of Gullion. No single site describes the range of features present within such an area; each makes a contribution.

One of the main aims of this paper is to consider how effective the existing network is for habitats, species and earth science interest, and how much additional work is needed to complete a fully representative series.

SECTION 2 EARTH SCIENCE – THE EARTH SCIENCE CONSERVATION REVIEW

1. Introduction

The Earth Science Conservation Review (ESCR) is the means whereby geological sites in Northern Ireland are assessed to determine their importance to science and hence to earth science conservation.

The Review is being undertaken for a number of reasons including:

- statutory obligation,
- recognition of the scientific and other importance of geological and geomorphological sites,
- recognition that there are real threats to these sites which can obliterate features of importance, interfere with the natural processes required for continued existence of the sites or detract from the integrity of landscape.

The ESCR provides Environment and Heritage Service with the information necessary to meet its obligations.

2. The process

The objective of the ESCR is to define systematically all earth science localities, both geological and geomorphological, in Northern Ireland that are of at least national significance. The process used to select sites is as follows: -

- the definition of subject blocks within which sites are to be assessed covering stratigraphy, igneous petrology, palaeontology, structural and metamorphic, mineralogy and metallogenesis, Pleistocene and Recent; 52 subject blocks in total,
- possible sites are identified by the expert review of relevant literature and other data, together with wider consultations as appropriate,
- site selection - minimum criteria are used to finalise site selection; criteria include:
    - sites must contain features that are at least nationally important,
    - individual sites should not duplicate each other,
    - it must be practical to conserve the site,
    - preference will be given to sites with assemblages of features or interests.
- the documentation and mapping of sites to a fixed format and the production of standardised reports permits site comparisons.

A list of those organisations involved in the ESCR is given in Appendix A.

For a more comprehensive description of the process see (Enlander, 2002) and the EHS website http://www.ehsni.gov.uk/natural/earth/conservation.shtml

The approach of the ESCR parallels the Geological Conservation Review (GCR) undertaken in Great Britain. For fuller details of this, together with information on the significance of the earth sciences see the GCR introductory volume (Ellis *et al*, 1996).

3. Site selection procedure – comparison with the biological programme

It is important to highlight fundamental differences that exist in the process of the selection of earth science sites compared with the biological programme.

In general, the approach taken with biological, especially habitat sites, is a systematic evaluation of the resource. The extent, variability and distribution of the habitat are assessed. Frequently, surveyed sites are ranked, often through the development of a scoring scheme, by which means the most important ones are identified and selected for designation. The process is rarely this simple, as a series of moderating procedures are also taken into account. In extreme cases, for example inter-tidal habitat, where the resource is very extensive, an extensive stratified sampling regime is used to define the variability present and to select a representative site network.

The approach taken in both the Geological Conservation Review (GB) and the Earth Science Conservation Review differs markedly from the above. Knowledge of the geology of an area relies upon the findings of field mapping and data interpretation, based both on within site assessment and between site comparisons. Thus the significance of particular localities, and hence their importance to the earth heritage programme, emerges as part of the development of the overall understanding of the science as it applies to a particular region. Site selection occurs through the evaluation of this scientific pedigree and expert review is the mechanism used to define this. While site descriptions and boundary maps are a critical output from the site selection process, site bibliographies are equally important as these can often demonstrate the significance of the site.

A consequence of this approach is that it may appear difficult to answer why one site was selected over another. The ability to demonstrate this will be simplified for certain sites e.g. unique or internationally important rocks, fossils or landforms, but not so for others. Representative sites, the category under which the majority of sites fall, are generally just that, a site representative of a particular geological feature, that best meets the selection criteria. An appreciation of the selection criteria and a careful reading of the site report are critical in gaining an understanding of the basis for selection.

4. The resource – the geology and geomorphology of Northern Ireland

Northern Ireland hosts a great variety of solid geology, together with a notable array of process localities, both active and fossil; it could be said that it has a high geodiversity. Remarkably, all Phanerozoic (the time of complex life) periods are represented with the exception of the Cambrian, while the Proterozoic (pre-complex life) is represented by widespread metasediments (Dalradian) and also older, Moinian, age material. In an all-Ireland context, the post-Carboniferous rocks are particularly significant, representing in many instances, the only clear terrestrial evidence for these periods. A number of geological themes are of particular significance, highlighting the fact that many of the earth science sites are of wider, even international, scientific importance.
This can be for a variety of reasons including –

- sites that played a major role in the development of new geological concepts e.g. Slieve Gullion, the Giant's Causeway, Scawt Hill, Tievebulliagh,
- sites being to the fore in highlighting inadequacies in current earth science models e.g. dated glacio-marine localities including Killard Point, Cranfield, Mournes Coast,
- sites that are type localities for significant numbers/groups of fossil biota e.g. Carrick Lough, Bardahessiagh.

Northern Ireland also hosts a range of geomorphological sites. These relate to characteristic landforms, both active and fossil, together with the formative processes, where these are still functioning. Of particular note are a number of coastal systems, including some representing the influence of historically changing sea-levels, whose international significance is recognised, together with an important series of deglacial landform complexes, a number of which are also of international importance. Representative cave and karst systems are also present.

As the ESCR site list reflects this great geological diversity, it should not be a surprise that a large number of sites have been selected. When this list is considered, a number of practical points should be borne in mind -

- the ESCR list is deemed to be the minimum site series required to demonstrate the geological history and range of contemporary processes of Northern Ireland,
- there is no duplication of selected features within the site list,
- many sites fall within thematic networks whereby their value is enhanced by their relationship with other sites within that network e.g. sites selected to describe the Carboniferous sedimentary basin of Armagh or those which describe the Tertiary igneous complex of the Ring of Gullion. No one of these sites describes the range of features present within such an area; each makes a contribution.

5. The outcome

The selection process focuses on the feature level of interest. A feature is the specific reason why a site has been or will be selected for designation as an ASSI. However, a proposed site may host a number of features, both earth science and biological, with the boundary being defined to accommodate this range of interest. Thus there is not a one–to–one relationship between features and sites.

The summary information presented below (Table 1) records the number of features identified by broad ESCR themes together with progress on designation. An estimate of the number of actual proposed sites is shown (Table 2), solely by combining earth science features as appropriate. This is only an estimate as, to date, site boundaries have only been roughly defined. No attempt has been made to review the site list in the light of the biological programme again due to poorly defined or unknown boundaries.

Table 1. ESCR features identified and designated.

Theme	Number of features	International significance	Representative	Designated (October 2002)
Stratigraphic	95	20	75	30
Structural and metamorphic	24	4	20	3
Igneous	75 [1]	28	47	26
Mineralogy and metallogenesis	14	0	14	1
Palaeontology	13	3	10	3
Pleistocene	53	8	45	7
Coastal processes	10	3	7	9
Holocene sea level history	10	5	5	6
Peat and related stratigraphy	12	2	10	5
Karst geomorphology	21 [2]	4	17	11
Mass movement – slope processes	2	0	2	1
TOTAL	329	77	252	102

[1] the apparently high number of Tertiary Igneous sites is partly due to the sub-site approach taken for major igneous complexes e.g. the Mourne granites and Slieve Gullion Complex. For such sites a network of sub-sites were identified to describe the full site geology. This reduces the total area contained within the site network but increases the site total. There are 30 sub-sites representing 3 igneous complexes.

[2] the apparently high number of Karst sites is due to a number of multiple features within site e.g. active and fossil cave systems together with surface karren.

Table 2. Estimated earth science sites identified together with those designated.

Site total identified	Site total designated
273	63

Comparison with the GB Agencies

As previously noted, a similar review of the geology and geomorphology of Great Britain has been undertaken. Table 3 summarises the feature selection process for GB, listed by country. This is the outcome of the Geological Conservation Review. Data is not available to identify the number of resultant sites designated.

Table 3. GCR features identified by country

Theme	England	Scotland	Wales	Total
Stratigraphic	797	135	187	1119
Structural and metamorphic	54	193	34	281
Igneous	96	162	27	285
Mineralogy and metallogenesis	105	47	22	174
Palaeontology	221	84	26	331
Pleistocene	306	136	72	514
Coastal processes	45	41	13	99
Holocene sea level history	Contained in Pleistocene total	Contained in Pleistocene total	Contained in Pleistocene total	Contained in Pleistocene total
Peat and related stratigraphy	Contained in Pleistocene total	Contained in Pleistocene total	Contained in Pleistocene total	Contained in Pleistocene total
Karst geomorphology	72	3	14	89
Mass movement	18	6	3	27
TOTAL	1714	807	398	2919

Table 4. Selection theme based comparison of NI and GB selected features

Theme	% site total NI	% site total GB
Stratigraphic	29	38
Structural and metamorphic	7	10
Igneous	23	10
Mineralogy and metallogenesis	4	6
Palaeontology	4	11
Pleistocene	16	18
Coastal processes	3	3
Holocene sea level history	3	Contained in Pleistocene total
Peat and related stratigraphy	4	Contained in Pleistocene total
Karst geomorphology	6	3
Mass movement	1	1
TOTAL	100	100

As can be seen from Table 4, there is a broad similarity in the distribution of site types between subject blocks in NI and GB. Notable areas of difference are the Stratigraphic, Igneous and Palaeontology subject blocks. Stratigraphy is proportionately smaller due to Northern Ireland's foreshortened stratigraphic series, notably Mesozoic, when compared to GB. The Igneous is a bigger proportion due to the notable extent of the Tertiary Igneous Province, including many internationally significant localities but also, as noted under Table 1, by use of sub-sites to define the geology of the major igneous complexes. The apparent under-representation of Palaeontology reflects Northern Ireland's poor palaeontological record with, again, poor representation of Mesozoic fossiliferous terrestrial rocks especially.

6. Current progress

76 sites with a geological interest have been designated as ASSI containing 102 ESCR features (some 190 ASSI - biological, earth science and combined interest - have been declared in total). To date site selection has been based on a number of factors:

- relationship with priority biological sites, particularly proposed SAC and SP,
- sites of international importance,
- sites with an existing or imminent threat,
- sites with a high degree of vulnerability.

This guidance to prioritisation will continue to be used in the future.

7. Relationship with biological sites

While it is not possible to determine on a site by site basis the degree to which selected earth science features will be subsumed within biological sites or vice versa, some general statements can be made.

- Caves and karst sites will, by their nature and location, have a strong inter-relationship with habitat sites. The one major karst area awaits a review of the habitat survey data. Depending on final boundaries, this will include most of the outstanding selected geomorphological karst features.
- The deglacial sand and gravel complexes are often large sites. While not necessarily having a strong inter-relationship with habitat interest, they are likely, by virtue of their size alone, to host a biological resource that will require evaluation. Whether these ultimately become site selection features or not, progressing these sites, already made difficult by size and potential if not actual commercial usage, may act as a further demand on Habitat Survey Team time through this possible survey need.
- Given the above, an assessment of both the biological and earth science future site series suggests that, for the most part, outside of the Marlbank area, those sites with a strong inter-relationship have now been designated.

8. Area assessment

As stated above only indicative boundary information is available, so no fully accurate statements can be made about their collective extent. Information to hand is summarised in Table 5.

Table 5. – Earth science summary of area extent by feature theme – designated and proposed

MAJOR FORMATION	ASSI FEATURE	Number of ASSIs features	Area ASSI (ha)	Number of proposed ASSIs features	Area of proposed ASSIs (ha)	TOTAL AREA
EARTH SCIENCE	Stratigraphic	30	779	65	259	1038
	Structural and metamorphic	3	16	21	136	152
	Igneous	26	359	49	1690	2049
	Mineralogy and metallogenesis	1	5.5	13	81	86.5
	Palaeontology	3	16	10	32	48
	Pleistocene	7	292	46	24264 (2)	24556
	Coastal processes	9	7164	1	28	7192
	Holocene sea level history (1)	6	134	4	88	222
	Peat and related stratigraphy	5	287	7	433	720
	Karst geomorphology	11	1020	10	965	1985
	Mass movement – slope processes	1	150	1	50	200
		102	10222.5 (3)	227	28026 (4)	38248.5

NOTES -
(1) - for sites with coastal process and sea-level history interest, areas statement appears under the former
(2) - includes 56ha non-landform
(3) - of the current designated area over 8500ha lies entirely within biological site boundaries
(4) - of the 3800ha of proposed sites (excludes Pleistocene) some 1500ha is predicted to lie within biological site boundaries

9. Future Programme

Additional ESCR features within existing ASSI series

A small number of features were either inadequately described or not described at all within the designation citation. In general it is felt that the existing Schedule list for such sites does offer protection to these additional features. Less than 10 sites are involved but this does include Strangford Lough and Lough Neagh.

Additional ESCR features partially within existing ASSI series

A very small number of features were only partially included in some site designations. This came about where geological or geomorphological features were partially within areas of natural or semi-natural habitat but continued onto agriculturally improved land. In a number of instances the site boundary was defined solely by the habitat interest. Additional designation of adjoining lands will be required to protect the full extent of the selection features.

Known gaps and on-going site review programme

A small number of potential themes have not been covered to date. This is either because a reliable knowledge base is not currently available, as is the case with rivers or where agreement at the UK level is awaited, as with soils. These are likely to generate a small number of additional sites in the future. In addition further sites are likely to emerge from an ongoing review of Northern Ireland's geology by the Geological Survey for Northern Ireland. This remapping exercise, together with reviews of the understanding and significance of certain geological sites or series will also produce new sites and possibly also lead to existing sites being dropped from the ESCR series with their probable denotification. In total this reflects the dynamic nature of the earth science conservation programme.

Disseminating information on the ESCR

A number of EHS sponsored publications have included details on a number of ESCR sites. These exclusively relate to sites where access is not an issue. The full ESCR site report series will be contained in the website, currently being developed through the Ulster Museum, but full details on boundary and access will only be made available for publicly accessible sites.

SECTION 3 – BIOLOGICAL SITES - HABITATS

1. Selection Features

Selection features (or interest features) are the features (habitats, species or earth science features) for which a site has been designated. Although there may be other interests that are important in a local context, the selection features are the reason for the site being designated as an ASSI/SAC/SPA. Each ASSI must therefore have a clear statement of its selection feature(s).

Selection features for SACs are defined by Annexes 1 and 2 of the Habitats Directive, but until recently, there has been no consistent classification system for dealing with ASSI features.

2. Habitat Classification – Priority Habitats

Although each site is an individual entity, for practical purposes it is necessary to group sites together, where they are similar enough to be represented by a few, rather than by all examples. Since many ASSIs have been selected as special examples of particular habitats, the classification system used is of fundamental importance. Adopting too fine a classification system could result in a huge and unmanageable network of ASSIs; too coarse and the network will not represent the significant range of variation that is present in the natural environment.

Different classification systems are available, reflecting both varying scales of detail on the one hand, and the complexity of natural ecosystems, on the other. Until recently, EHS used a modified version of the standard habitat classification originally formulated by the Nature Conservancy Council (NCC, 1990). The UK Biodiversity Strategy has produced a system of broad and priority habitats for action (Biodiversity Action Plans – BAPs) and reporting (Biodiversity: the UK Steering Group Report, 1995). Priority habitats have been defined on a number of criteria, including international obligations, habitats that are rare or declining, and those that are important for key species. We have adopted these BAP priority habitats as the main basis for defining ASSI habitat features.

The list of priority habitats do not cover <u>all</u> of the semi-natural habitats present in NI. For example, species-poor upland acid grasslands are not included. However, it is unlikely that a site would be selected for this habitat alone – in general, the grassland would have associated species interest or form part of a larger upland mosaic with other habitats. Similar comments would apply to other habitats omitted from the list. Where it has been necessary to reflect specific NI conservation needs and to ensure that all habitats meriting protection are represented, we have modified the definitions of some of these priority habitats.

The primary aim of the ASSI system is to select the best examples of each of these habitats. By aligning selection features with BAP priority habitats, the ASSI programme can thus be fully integrated into wider biodiversity action, particularly the Habitat Action Plans, producing a more coherent strategy for conservation action, and facilitating reporting procedures.

3. Further Selection Considerations – Plant Communities

Within each of the defined habitat types, plant communities - i.e. associations of plants that are characteristic of particular environmental and management conditions - represent a finer division.

These communities are important both for individual site selection and the assessment of the overall network. Although the first phase of site evaluation takes place at the relatively broad level of habitat, further sites may be considered for selection to ensure adequate coverage of those plant communities that are not represented, or are only poorly represented in existing ASSIs. Furthermore, where significant regional variants of these communities occur, they should also be represented within the network. This is to ensure that the network encompasses the full range of variation in NI.

Until recently, very little systematic phytosociological work had been undertaken on the plant communities of Northern Ireland, in sharp contrast to the situation in the Republic of Ireland. However, in GB, plant communities have been the subject of a recent and comprehensive review - i.e. the National Vegetation Classification (NVC), now published as British Plant Communities (Rodwell, 1991 and subsequent volumes).

The importance of the NVC is that it provides a useful common standard for UK ecologists. Since the NVC did not extend to Ireland, communities identified for Great Britain do not always correspond closely to NI vegetation. This has potential implications for assessing the wider significance of some of our plant communities.

In comparing NI plant communities with equivalent examples from GB, two factors are important:

(i) the flora of NI is impoverished in comparison to mainland Britain,

(ii) the ecology of individual species can vary from the “norm” in GB (possibly because of the more oceanic climate), with the result that they can occur across a broader range of ecological conditions.

These factors mean that some of the characteristic/diagnostic species associated with plant communities in GB are either simply not present, or are less faithful to particular communities. Therefore, fitting NI vegetation to its nearest equivalent NVC community is not always straightforward, particularly for some community types (e.g. grasslands and wetlands). Nevertheless, research to date has shown that many GB examples are also

present here. Furthermore, although some NI communities may vary from those described in the NVC, it is possible to relate most NI vegetation communities to NVC counterparts.

It should be emphasised that the paucity of the flora does not mean that NI plant communities represent poorly developed versions of more interesting GB examples. NI has several edge-of-range colonies of scientific importance, and the geographical position of NI frequently results in the overlap of both northern and southern species. In addition, species that are common elsewhere in the British Isles are either very scarce here or do not occur naturally at all. As a result, other species tend to fill the gaps left, producing some interesting – and almost certainly unique - plant associations.

4. Data Sources

Assessing the required future extent of the ASSI network would be greatly assisted if NI had a comprehensive inventory of all its habitats and species. In the absence of such data, we have to rely on a range of different sources. Inventories do exist for some habitats. For example, the peatland resource of NI has been comprehensively mapped and the NI Lakes Survey achieved good coverage of NI lakes (although based on a random sample during the first two years of the project, many additional sites were surveyed in the third year). Although the results are now a little dated, they provide a very clear picture of the extent and condition of two of NI's most extensive and important habitats.

Many of the habitat resource estimates below are based on work carried out as part of the NI Countryside Survey (NICS) (e.g. Cooper and McCann, 2002 and earlier reports). Although the NICS does not use the same classification system as BAP priority habitats, it is generally possible to "read across" from one to the other. The work is based on a sample survey of NI, so the figures represent estimates rather than measured areas. Although it is possible to produce predictive maps of distributions, these are not actual distribution maps. It is therefore not possible undertake a direct comparison between the distribution of ASSIs and the distribution of the resource to assess gaps in coverage. For some habitats – particularly those that are rare or very sporadic in their distribution (e.g. coastal habitats) – the sampling strategy is inappropriate. Nevertheless, for most habitats, the NICS is the most useful up-to-date source of data on the total NI resource.

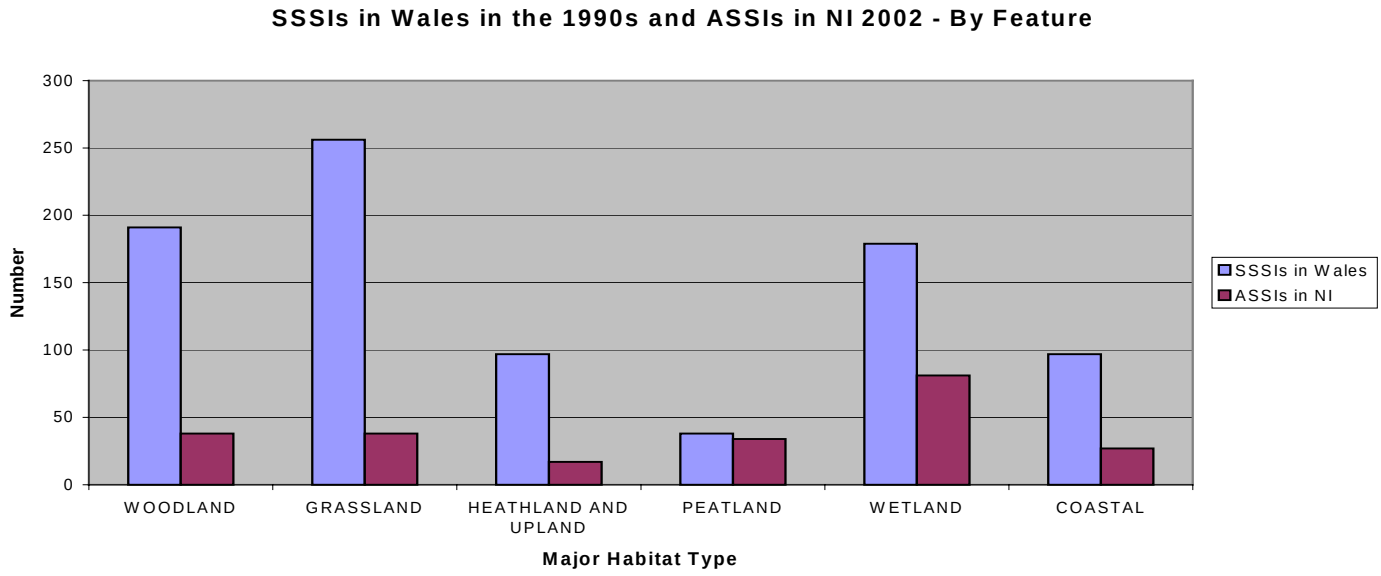
The situation regarding data acquisition is improving all the time. Remote sensing techniques (including conventional aerial photography and satellite imagery) have proved very useful for habitat mapping and particularly for the latter, further developments in technology will improve its efficiency and accuracy. More conventional methods of field survey are also valuable – for example, the Woodland Trust has recently initiated a survey of ancient woodlands in NI which should, in addition to the main aim of the project, provide an up-to-date picture of the total woodland resource.

In the treatment below, we have tried to use the most up-to-date and reliable figures where available.

5. Habitat Coverage for ASSIs in NI and SSSIs in Wales

In assessing the current and projected extent of the ASSI series we have found it useful to compare the situation in NI with that in other UK countries. Wales is the only country for which a breakdown of the SSSI network by feature is possible (Blackstock *et al*, 1996). Figure 1 shows how the number of features for ASSIs in NI compares with those in Wales. The figures should be treated with some caution. Additional sites have been designated in Wales since the data were produced. Although roughly similar in its proportion of semi-natural vegetation, Wales is around 46% larger, and has a rather different range of habitats. For example, peatland habitats are much more extensive in NI, while heathlands are more significant in Wales. Wales has a longer coastline than NI and a corresponding higher number of coastal sites. Nevertheless, the comparison gives a useful indication of whether the ASSI network is roughly in the same order of magnitude as the SSSI series in Wales. NI is clearly well behind Wales for virtually all habitats. However, our projected site series (see below) will bring NI much closer into line. For some habitats NI has a much smaller resource than Wales (e.g. woodland and heathland), so the network will never approach a similar level. However, for other habitats where the total resource is comparable to Wales, the graph does highlight some particular areas where urgent progress needs to be made. This is particularly the case for grasslands, where NI lags well behind Wales in terms of numbers of sites and area covered, despite having a broadly similar grassland resource.

Figure 1:



6. Habitat ASSIs – Existing and Proposed Sites

Table 6 shows existing ASSIs by feature for habitats. Many ASSIs have more than one feature of interest, so the total number of features covered is considerably greater than the total number of ASSIs.

The table provides a very good picture of the extent and coverage of the current ASSI network and confirms the comparison with Wales showing that some habitats – for example coastal and woodland - have achieved much better coverage to date than others, especially grasslands.

TABLE 6: EXISTING AND PROJECTED ASSIs AS AT DECEMBER 2002

MAJOR FORMATION	**ASSI FEATURE**	**NI resource (ha)**	**Number of Existing ASSIs**	**Area of Feature in ASSI (ha)**		***Number of proposed ASSIs***	***Area of proposed ASSIs (ha)***
COASTAL	**All Coastal**		**21**			***9-10***	***600-800***
	Maritime cliff and slopes		9	528			
	Coastal vegetated shingle		5	48.3			
	Coastal sand dunes	1400	4	1150			
	Coastal saltmarsh	250	9	230			
	Seagrass Beds		6				
	Littoral*		15				
	* includes both sedimentary and rocky shore biotopes						
WOODLAND	**All Woodland Types**	**9,500**	**38**	**1916**		***15-25***	***1100-1300***
	Upland mixed ash woodland	3,400	13	435			
	Upland oakwood	2,400	25	800			
	Wet woodlands	2,600	12	637			
	Lowland wood pastures and parklands	1,100	1	45			
GRASSLAND	**All Grassland Types**	**21,000**	**34**	**2784**		***45-55***	***400-1,000***
	Lowland hay meadow and pasture	1,000	12	100			
	Upland calcareous grassland	1,000	7	464			
	Purple moor grass and rush pastures	19,000	19	2220			

HEATHLAND AND UPLAND	**All heathland and uplands**	**70,000**	**13**	**8015**		***8-12***	***4,000-7,500***
	Dry Heath	10,200	8	5700			
	Wet Heath	55,000	5	2011			
	Montane heath	150	2	85			
	Inland Rock and ledge		4	129			
	Limestone pavement	220	1	90			
PEATLAND	**All Peatland**	**167,500**	**34**	**12,476**		***20-25***	***5,000-6,000***
	Raised bog	25,196	22	2,084			
	Blanket bog	142,384	12	10,392			
WETLAND	**Fens**	**2,210**	**50**	**385**		***25-35***	***150-300***
	Reed beds and swamps	3,228	5	335			
	Standing Waters	**62,600**	**26**	**4,500**		***35-40***	***1,400-1,700***
	Rivers		**5**			***13***	
TOTAL						***c. 190 sites***	***12,500 – 18,300 ha***

Data sources:
NICS 2000; NI Lakes Survey; NI Peatland Survey; Biodiversity Action Plans, etc.

The table also indicates proposals for new ASSIs. These are broken down by main habitat formation, rather than individual feature. To provide an accurate estimate of the future size of the ASSI network, the proposed ASSIs are generally listed under the main selection feature for the site, to avoid double counting. Although there is undoubtedly some overlap between a few multi-feature sites, we have tried to keep this to a minimum. However, it should be noted that many of the sites will have more than one feature, so the coverage of individual habitats will be substantially greater than indicated.

The projected numbers of ASSIs are based upon a combination of our knowledge of sites already surveyed that we believe are of ASSI standard, and an informed estimate of the number of additional sites required to provide adequate geographical and ecological coverage. Values for numbers of sites and area covered are indicated as a range. For habitats where the information base is more comprehensive, the range estimates tend to be narrower. For other habitats, knowledge is less comprehensive and the range tends to be wider. In some cases, only very tentative estimates of numbers of sites can be included and more information is needed to assess the resource comprehensively. Nevertheless, we estimate that the number of habitat ASSIs is likely to be in the region of 200 sites, with between 12,500 and 18,300 ha coverage.

7. Main Programme for Declaration of Habitat ASSIs 2003-2015

Table 7 below provides a programme for the habitat series based on projected numbers of sites. They have been broken down into geographical areas or ecological types to provide a rough indication of how we are intending to progress them.

In deciding which features to focus on for short- to medium-term action, the main factors taken into account are the scarcity of the resource - *rarity* - and in particular, its susceptibility to change - *fragility*. These factors have had a major influence on ASSI selection to date and will continue to influence priorities for the future. However, in the proposed programme below we have also taken into account the extent and coverage of the existing network and particularly where we perceive the major gaps to be.

TABLE 7 - Programme for Declaration of Habitat ASSIs 2003-2015

MAJOR FORMATION	ASSI FEATURE	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
WOODLAND	Woodland	Sperrins		Fermanagh		Antrim, Down, Armagh		Final review					
GRASSLAND	Grassland	Armagh Down		Derry Antrim		Fermanagh			Tyrone		Final review		
HEATHLAND AND UPLAND	Heath and Uplands	Down			Sperrins			Antrim		Final review			
PEATLAND	Raised bog	Down		Antrim Derry		Tyrone Fermanagh							
	Blanket bog	Antrim Plateau			Sperrins		Fermanagh		Final review				
WETLAND	Fens	Tyrone			Antrim Derry			Fermanagh			Final review		
	Standing Waters	Mesotrophic Lakes			Eutrophic Lakes			Oligotrophic Lakes			Final review		
	Rivers	Down Antrim			Tyrone Derry			Fermanagh Armagh				Final Review	
COASTAL	Coastal Habitats	Sand dune		Maritime Cliff			Intertidal						

We are proposing to deal with grasslands as a matter of priority. NICS has identified rapid rates of loss for this habitat. Lowland meadow and pasture is particularly poorly represented in the existing series and is highly vulnerable to damage and loss. In addition, NI has a high proportion of the Purple moor-grass and rush pasture resource of the UK.

Wetland habitats have received very variable coverage in the ASSI network. A large number of fen sites have been declared, but rivers and some lake types have been poorly covered. We regard mesotrophic lakes as a priority for action, based on their vulnerability to eutrophication and comparatively poor coverage in the existing series.

Peatlands are clearly important habitats for which NI has an international obligation to protect. Further raised bogs are required to increase the extent of the habitat protected as ASSI, while the current blanket bog network contains some geographical gaps, notably in Antrim and the Sperrins. In view of the relative proportion already protected, we regard peatlands as medium priority for action, and we intend to maintain a steady momentum towards completing the ASSI series by 2010.

Uplands and particularly heathlands require further survey work to fully assess the importance and condition of the resource. The existing series of ASSIs requires additional sites to extend both the size of the network and its ecological/geographical coverage. However, in view of the fact that this group of habitats appears to be less vulnerable than others, we regard this work as medium priority.

The existing ASSI coverage of woodlands is reasonable. However, the network contains some significant geographical gaps and with most sites being small in extent, a high number is required to achieve an adequate sample. A large number of sites have already been surveyed and are awaiting declaration, so we will maintain steady progress towards completing the series by 2010.

The ASSI network for coastal sites has achieved reasonable coverage, with only a small number of outstanding sites identified. Again, we will maintain steady progress with the aim of completing the programme for coastal sites by 2009.

It must be emphasised that this is an indicative programme only. EHS need to maintain a flexible approach to site declarations. The programme will be subject to change if priorities or circumstances change, or as we develop our knowledge of habitats and the factors affecting them. In addition, individual sites under threat will be progressed as a matter of urgency, irrespective of their priority ranking at this stage. Nevertheless, the programme provides a framework for taking EHS towards the substantive completion of the ASSI programme for habitats, based on a clear priorisation exercise.

SECTION 4 – BIOLOGICAL SITES - SPECIES

1. Introduction

In addition to conserving habitats, the ASSI network should – where appropriate - provide protection for important species. Of course it is recognised that ASSI is not the most effective means of conserving all species. For highly mobile and widely dispersed species, wider countryside measures – such as agri-environment measures, the statutory provisions of the Wildlife Order - may be more meaningful than a network of relatively small sites, however well-distributed and linked together. The NI Biodiversity Strategy and the EHS Biodiversity Implementation Plan in particular provide a focus for this approach through the development and implementation of Species Action Plans (SAPs). However, ASSIs do provide many species with effective protection and the declaration of ASSIs is fundamental to the delivery of many SAPs. Often, this is achieved through the protection of habitat. For many organisms, there is insufficient knowledge upon which to base decisions on site designations. By conserving the best examples of habitats, it is intended that all of the associated species are also given effective protection.

Of course for some species and species-groups we do have sufficient knowledge on which to base decisions on site selection. Indeed, the selection of ASSIs for some species is a more straightforward process than for habitats, as the former can be more easily assessed by relatively straightforward measures such as breeding or over-wintering numbers, numbers of flowering spikes, etc.

2. Availability of Data

The amount of information that is available on numbers and distribution is very variable across species groups. In general, vascular plants and birds have much better coverage than other groups – e.g. lower plants and invertebrates. This lack of comprehensive information is reflected in the proposals for future conservation action. In general, the main action point for most habitats is to declare further representative sites across NI. For many species-groups the immediate action is to gather further information, with site declaration a second phase in the process.

3. The Habitats Directive

One other factor to note is the influence of the Habitats and Species Directive. It is clear that obligations under the directive have biased the treatment of some groups towards Annex 2 species (e.g. Atlantic Salmon, Marsh Fritillary), with other species in the group largely ignored.

4. The Current and Proposed ASSI Species Network

The treatment of species is dealt with in a similar – but not identical - way to habitats. The discussion is broken down into major groups, but it is often either not possible or not appropriate to discuss the extent of the resource. In addition, there are some gaps in coverage where information is simply inadequate.

Once again, it is possible to compare the numbers of sites in NI with those for Wales (Figure 2 below).

Figure 2:

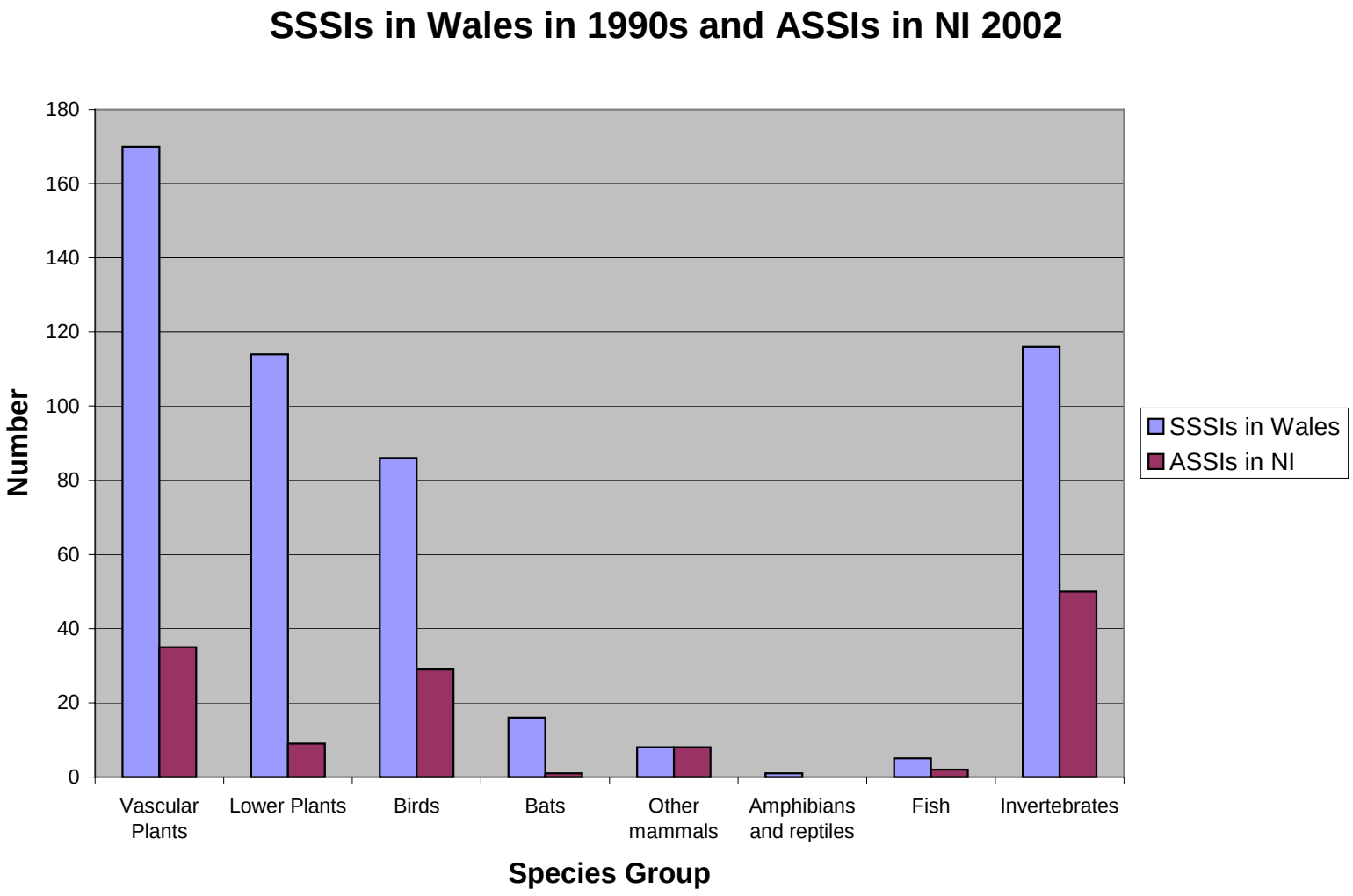


TABLE 8 - COMPARISON BETWEEN NUMBERS of SSSIs in WALES (early 1990s) and ASSIs in NI 2002 - SPECIES

Feature Type	SSSIs in Wales	ASSIs in NI
Vascular Plants	170	35
Lower Plants	114	9
Birds	86	29
Bats	16	1
Other mammals	8	8
Amphibians and reptiles	1	0
Fish	5	2
Invertebrates	116	50

Table 8 shows existing ASSIs by feature for species. Coverage for species is generally poorer than for habitats. In part this reflects the greater emphasis on habitats; in part it indicates that we have been cautious in defining interest features for some species-groups, where recording effort is rather poor.

i. Vascular Plants

Northern Ireland has a typically "atlantic" or oceanic climate (i.e. mild and wet). The solid geology is very diverse, producing a mixed range of soil types. For a small country it has a wide range of plant niches. Although the flora of NI is generally impoverished, it is of interest because of the significance of edge of range colonies and the juxtaposition of northerly and southerly species.

In comparison to many other species-groups, vascular plants are well-recorded. We have therefore been able to actively select sites for individual species and assemblages of species. Currently, there are 35 sites with higher plants as feature. In total 114 species are specifically provided with protection in the existing ASSI network (i.e. occur as single species feature or as part of a species assemblage feature).

The fact that such a high proportion of existing ASSIs qualify as vascular plant assemblages is hardly surprising, given that these represent areas of high diversity and naturalness. In addition, it should be noted that a number of rare and scarce species, including many of the above, occur on ASSIs where they are not part of a specific feature, but simply occur in association with one of the component habitats. Such species are generally identified within the conservation objectives of the site and as such, included within management prescriptions and monitoring programmes.

The New Atlas of the Flora of the British Isles will be of great assistance to our programme and over the next year, we will be reviewing the ASSI network for vascular

plants, based on the results of this project. This will allow us to revise our list of scarce species, and also target species that appear to be in decline. At this stage it is impossible to define precisely how many additional sites will be declared. However, there are likely to be relatively few sites declared for vascular plants only, as experience to date in NI and elsewhere in the UK (Blackstock *et al.*, 1996) suggests that many of the ASSIs declared for their habitat interest will include important vascular plants as well.

ii. Non-vascular Plants

This group includes mosses, liverworts, lichens and fungi. As with vascular plants, the strong Atlantic influence gives the lower plant flora of NI a distinctive character and significance. However, these lower plant groups are generally rather poorly recorded. As a result, we have generally not been in a position to identify areas of importance for lower plants alone, or to assess comprehensively how many existing ASSIs qualify for these groups. However, where the interest has been well-documented, we have included lower plants as a feature.

There are currently 9 sites with lower plants as a feature.

The current network suggests that we have an inadequate representation of lower plant sites, but it is likely that, as with vascular plants, the best habitat sites will prove to be the best for lower plants as well. Certainly, this has been the experience in other parts of the UK (Blackstock, *at al.*, 1996).

Nevertheless we need to confirm this view and ensure that we are providing adequate protection for lower plant groups. As a result, we are actively commissioning research to enable us to assess the adequacy of the network. A survey of selected notable bryophytes has recently completed, and work on both fungi and lichens is ongoing. These projects will enable us to decide how many of the existing ASSIs qualify for lower plants and what further designations will be required in the future.

iii. Birds

Although Northern Ireland hosts an impoverished avifauna in comparison to Great Britain, the UK SPA review has identified the international importance of certain bird groups present here. In addition, a number of further species and sites are known to be of national significance. These ornithological groups are associated with a diverse range of habitats throughout Northern Ireland.

Coastal habitats frequently support significant bird populations including colonies of breeding seabirds, important tern colonies and a substantial Manx Shearwater colony (the latter found on Copeland Islands). Populations of wintering wildfowl, including internationally important numbers of swans, geese, ducks and wader species are supported by coastal habitats and inland wetland sites. Significant numbers of breeding

waders also utilise wet grassland and upland habitats. Resident raptor populations are widespread, while representative breeding and wintering passerines assemblages are associated with all habitat types, especially woodlands, uplands, wetlands, coastal areas and farmland. As the rate of degradation of these habitats has been slower in Northern Ireland than in Great Britain, the populations they support are increasing against wider national trends, and are therefore becoming increasingly important.

The existing designated ornithological sites have emerged through three main work programmes:

a. the SPA Review – the UK response to the European Birds Directive,
b. the survey of breeding waders in Northern Ireland,
c. 'incidental' capture of ornithological features through the wider designation programme. This relates particularly to breeding and wintering waterfowl.

The SPA Review determined that Northern Ireland should be assessed as part of the all-Ireland biogeographical area. Thus the significance of sites hosting relevant Birds Directive Annex I and II species was assessed in an all-Ireland context.

A number of comprehensive surveys of breeding waders have been undertaken in Northern Ireland. The most important localities identified through this programme have been selected for designation.

Major wetland systems such as Lough Neagh and Upper Lough Erne were designated partly on the basis of habitat interest. These also support breeding assemblages of waders and wildfowl including some species populations of national significance – i.e. exceeding 1% of the relevant all-Ireland population.

There are currently 29 individual ASSIs with birds as a selection feature, with 166 individual species listed as features. These include overwintering waterfowl, breeding seabirds, breeding waders, breeding birds of prey and breeding waterfowl. At least 45 different species are included.

The current ASSI/SPA network provides reasonable coverage of the resource and includes all of the most important sites and species. Although the conservation of some bird species (as with other non-bird species) is best delivered through wider countryside measures, rather than by site protection, EHS recognise the need for further bird ASSIs. The table below summarises the main areas of work remaining. These relate to a small number of outstanding international requirements and the development of a series of national sites for appropriate species.

Table 9 - Future Site Designation Programme for Birds

Driving mechanism	Comment	Number of sites	Sites where known
Birds Directive – seaward extensions to designated seabird colonies	Based on existing appropriate seabird SPA network	MARINE 3	Rathlin Island, Copeland Islands, Outer Ards
Birds Directive – feeding areas for breeding birds not adjoining breeding sites	To be determined through JNCC research programme	MARINE To be determined – likely to be 1 –2 maximum.	
Birds Directive – open water areas hosting significant year-round seabird aggregations	To be determined through JNCC research programme	MARINE To be determined – likely to be 1 –2 maximum.	
Birds Directive – wintering non-estuarine waterfowl populations	To be determined through BTO research programme	COASTAL To be determined	
Birds Directive –Hen Harrier	To be determined through national research programme	To be determined – likely to be 1 –2 maximum.	
National – non-seabird colonial nest sites (Sand Martin, Heronries)	Principle sites together with regional spread	6 – 12	
National –raptor	Sites holding high densities of selected raptor species	To be determined – likely to be 1 –2 maximum.	
National – breeding waders	Sites holding high populations or densities of wader species	To be determined – likely to be less than 10	
National – breeding passerines	Sites holding regularly occurring rare or notable passerine species	3	Garden Warbler – review Upper Lough Erne and Lough Guile Wood Warbler – Cregagh Wood
National – sites used by non-breeding populations or outside breeding season	Review passage and wintering waterbird site network Review raptor roosts	To be determined	

In total, between 15 and 25 additional ASSIs are likely to be declared with birds as a selection feature.

For the national series of sites, the context for assessment must be agreed but a strong precedent set by the SPA Review would point to Northern Ireland populations being assessed in an all-Ireland context; the justification being that this is the smallest appropriate biogeographical unit.

A better understanding of bird populations is central to the process of site selection. Additional data sources are generated by national (UK and Republic of Ireland) and regional (Northern Ireland) surveys. Where appropriate, EHS will be seeking integration of all-Ireland datasets to permit better definition of population status and trend information. These relate to winter wetland waterbird population estimates, breeding data for dispersed species and data for targeted species.

iv. Mammals, Reptiles and Amphibians

In general, NI has a very impoverished list of native mammals, reptiles and amphibians in comparison to the GB list.

Not surprisingly, there are no sites with reptiles and amphibians as a feature, and few sites with mammals as a feature - currently, only 9 sites.

The programme to date has been largely driven by our commitments under the Habitats Directive, and this is reflected in the list of sites, with Otter and Common Seal being the main species listed. Only Upper Lough Erne – Crom has been declared for a non-SAC mammal feature (bats).

Site-based conservation measures are often not appropriate for this group of species. Some are highly mobile while others occur widely over the whole of NI (e.g. Common Frog). For many of these, the ASSI habitat network affords adequate protection by embracing an extensive network of semi-natural habitats required for breeding, feeding, etc. For other species, wider countryside measures are more effective in providing adequate protection e.g. Pine Marten, Irish Hare, Red Squirrel, although it is likely that they are well represented in the ASSI network in any event.

Species which occur in large aggregations – such as Common Seals and bats - can be reasonably well catered for by the ASSI system. Common Seal haul-outs and pupping sites are included in the series, but at least one further site is required. Further research is required to identify significant bat roosts and particularly hibernacula.

v. Fish

Knowledge of fish is generally poor, especially species that are not of commercial or sporting significance. To date, the concentration of the ASSI declaration programme on Atlantic Salmon has been largely driven by the Habitats Directive.

There are currently two sites with freshwater fish as a feature, but two others will be added to the list in the near future (i.e. Foyle River and Tributaries; Owenkillew River).

We are currently developing a major research project to provide more comprehensive data on fish numbers and distribution in NI. This will assist in the declaration of ASSIs for fish species.

vi. Butterflies, Dragonflies and Other Invertebrates

Recording effort for invertebrates in NI has been variable and it is difficult to assess comprehensively the effectiveness of the network for invertebrates. To date, a significant number of ASSIs have been declared with invertebrates as interest features. Since the current ASSI network represents some of the best examples of habitats present in NI, it is hardly surprising that many are significant for invertebrates also.

Some groups are recorded more thoroughly than others and for these, it is possible to identify particular species or species-groups that represent ASSI selection features.

For example, there are currently 6 sites with butterflies as a feature. In general, the butterfly fauna of NI is rather impoverished in comparison to the rest of the UK. However, we do have significant populations of some species, notably Marsh Fritillary. As a result, the ASSI network for butterflies has been strongly influenced by commitments under the Habitats Directive, with only site – Monawilkin – having butterflies other than Marsh Fritillary as a feature.

Dragonflies are another group where recording effort has been sufficient to develop a selection threshold for ASSI, based on numbers of species present. Three sites have been declared with dragonflies as a feature in their own right, but many existing sites have dragonflies as a component of the overall invertebrate assemblage (see below).

Other invertebrates include Annex 2 species from the Habitats Directive (e.g. Atlantic Stream Crayfish, Freshwater pearl-mussel) and significant assemblages of invertebrate groups, such as water-beetles. There are currently 70 sites with other invertebrates as an interest feature, including individual species and species assemblages.

We are in the process of completing the first phase of a comprehensive review of the ASSI network to assess its effectiveness for invertebrate conservation (contract with Ulster Museum). Results to date have highlighted the poor state of recording effort for some invertebrate groups. We are intending to broaden the scope of this research work in subsequent years to fill in gaps in knowledge for these groups, and to sample other sites as potential ASSIs. We regard this work as high priority, but it is dependent upon a considered review and subsequent field survey, so it is likely to be some time before declarations are forthcoming.

TABLE 10 - PROGRAMME FOR DECLARATION OF SPECIES ASSIs

ASSI FEATURE	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Vascular Plants												
Lower Plants												
Birds												
Mammals – Bats												
Common Seal												
Others					?	?	?	?				
Fish												
Invertebrates												
	Desk Research and Review											
	Sampling and Fieldwork											
	Declarations											
	Final Review											

It has not been possible to provide indicative estimates of the likely future coverage of species ASSIs, except for birds. This reflects in part the need for further research to identify key localities for species. The above programme sets out a clear strategy for developing the necessary knowledge base upon which to base decisions on declaration.

Our general impression however, is that new species ASSIs will not represent a significant increase to the number of habitat ASSIs projected. We would anticipate that further research will confirm that many of the existing habitats ASSIs also contain species features and that many of the new habitat ASSIs will also be of interest for species as well.

SECTION 5 - DISCUSSION

1. ASSI Coverage – Overall Estimates

It is clear that great strides have been made in progressing the ASSI declaration programme in the last 10 years. However, a considerable shortfall still exists.

Although the proportion of the land surface that has been designated has now reached 6% (original estimate for the completed programme was 8%), it is clear that many of the larger sites have been declared and the remainder will be made up of sites that are much smaller in area. Over 200 earth science sites have been identified and a similar number of biological sites are probable. There will be some overlap between the two.

At this stage it is worth reviewing the estimate of the amount of land likely to be declared as ASSI. This will reflect to some extent the total amount of semi-natural habitat and earth science features present. Clearly, this varies across the four UK countries. For example, the proportion of semi-natural vegetation is much higher in Scotland (55%) compared to England with less than 20%. The comparable figure for NI is around 28%. England, Wales and NI have around half of the land area under intensively managed agriculture, compared to 21% in Scotland (Cooper and McCann, 2002). Clearly, there is an argument for extending the protected sites network where the amount of semi-natural habitat is greater. On the other hand, it is vital to ensure that where they are scarce and under threat, those areas of special interest that remain should be afforded statutory protection. This explains why the overall figure for SSSI coverage in Scotland is higher than England, but not by the same proportion as the amount of semi-natural vegetation cover.

The original estimate of 8% for NI was a forecast based on a comparison with the other UK countries. It was clearly in the right order of magnitude but it must be emphasised that the ultimate aim of the ASSI system should simply be to declare <u>all</u> qualifying sites. Nevertheless, some estimate of the likely cover is useful for resource planning and to help assess whether NI is achieving a comparable level of protection to the other country agencies. In this respect, the situation has changed somewhat over the last decade. In Wales, the proportion of the land surface protected is now 9.9%; in Scotland it is 12.7% (10% in 1993); in England it is 7.7% (6% in 1993). Given the current extent of the SSSI network in GB and our increased knowledge of the nature conservation resource in NI it is felt that an estimate of around 10% coverage for ASSIs is now closer to the mark. NICS suggests that semi-natural habitats are continuing to decline in extent and quality, thus increasing the relative value of what remains and making their effective protection even more important.

2. ASSI Coverage – by Features

Clearly, within this overall figure, the proportion of each habitat or species-group included within the ASSI network will vary. For habitats and species that occur at a

small number of sites, it may be feasible for the ASSI network to include all or most of the resource. However, most features are widely dispersed and only a sample of the best examples can be included.

The proportion for each of these will reflect a range of issues. Some habitats are innately more variable than others and require more sites to cater for this variation. Other habitats and species are more important than others in an international context. For example, NI has a relatively high proportion of the lowland raised bog resource in the UK. This needs to be reflected in the amount of the resource that is protected here, particularly as it is an internationally important resource. In comparison, the amount of semi-natural woodland is smaller than in the other UK countries, so the amount of woodland in ASSIs will be smaller. Of course, woodland is an important habitat in the regional context, as it is the climax vegetation over most of NI. Therefore, there needs to be a balance in the representation of habitats and species within ASSIs based upon an assessment of their international, UK and regional significance.

Detailed information is lacking, but it is possible to make some very general statements about the wider significance of a number of NI habitats. In comparison to the rest of the UK, NI has a high proportion of good-quality wetland and peatland habitats. In contrast, woodlands and montane habitats are poorly represented. A number of coastal habitats are also very scarce here – for example, saltmarsh, although virtually all is protected. The wider significance of NI's heathland and grassland resources is less clear, and further survey is required to assess the full importance of this group of habitats. Nevertheless, it is apparent that NI has a high proportion of the UK wet grassland habitat (Purple Moor-grass and rush pastures).

We have attempted to take these factors into account when estimating the projected numbers of ASSIs for each feature.

3. Timetable and Priorities

In deciding which features to focus on for short- to medium-term action, we have used rarity, fragility and the extent and coverage of the existing network.

Earth science sites have tended to receive lower priority than biological sites, partly as a result of EHS commitments to complete the *Natura 2000* network and partly as a result of their generally lower vulnerability to damage. We are aiming to redress the balance somewhat over the next six years.

As far as habitats are concerned, we intend to concentrate on grasslands and wetlands, although we will maintain the momentum on other habitats.

Species sites will be progressed during the next 6 years as well. Although the bulk of our efforts over the next three years on species *per se* will focus on data collection, further research and site assessment, it should also be noted that many of the new habitat ASSIs

will include species as additional selection features. Furthermore, it is likely that ongoing research on selected species-groups will confirm that many existing ASSIs contain species interest features.

We have not set declaration targets on a year-by-year basis. Progress during individual years will be dependent upon a number of factors. Other major commitments – for example, the formal designation of *Natura 2000* sites which will be required over the next few years – may divert efforts away from the programme. In addition, progress will depend upon which habitats are dealt with at particular times. Grassland ASSIs tend to be much smaller than other habitat sites, and generally require less effort to declare as ASSI than – for example - upland sites, where there may be many landowners and rights-holders. River ASSIs on the other hand, often involve discussions with many landowners, despite taking in comparatively small areas of land.

Yearly progress reports will be completed, with a review of targets in 2006 when resource requirements will also be re-assessed. At this stage, we should be in a more informed position to assess the precise extent of the ASSI species network. After 6 years, a comprehensive review of progress towards completing the programme will be undertaken. We should then be well on the way to finalising the ASSI series for the main habitats. The development of the ASSI network for habitat mosaics and species is likely to require further work.

It is worth reiterating that the programme may be altered to reflect sudden threats to individual sites, changes in habitats or species distributions, or significant new developments in the countryside.

4. Monitoring and management

Effective nature conservation involves much more than site designation. This is simply the essential first step towards ensuring that individual sites and the wider biodiversity interests in NI are adequately protected. For conservation to be successful, sympathetic management must be in place.

The Department has committed itself to the effective management of protected sites by adopting a challenging long-term target of ensuring that 95% of the features underlying the designation of internationally important wildlife sites and ASSIs are in, or approaching, favourable conservation condition by 2013. It will not be possible to measure achievement against this target without regular monitoring.

ASSI declaration therefore goes hand in hand with monitoring and management, and the ASSI programme must include all of these aspects. Programmes for site condition assessment (quality monitoring) and site integrity monitoring are now in place and all existing ASSIs and their selection features will be covered. Incentives for landowners to manage ASSIs in the most appropriate way are now available under the MOSS scheme

and in conjunction with individual landowners, tailored management plans are now being developed.

5. Resource requirements

The pace of the ASSI work to date has been heavily dependent upon the availability of resources. The processes of survey, consultation, designation, management and monitoring are labour-intensive activities that require well-trained and experienced staff. We are constantly striving to make the whole process a more efficient one. Advances in technology – computing, remote sensing, etc – can increase efficiency and produce some time-savings, but there are many elements in the process such as detailed field recording or face-to-face discussions with landowners, which simply cannot be handled in a rushed manner. For this reason, we anticipate that the ASSI programme will continue to require a high level of resources.

EHS makes use of both research and service contracts to provide assistance in areas of work where in-house expertise or resources are insufficient. We anticipate that the research requirements for survey and monitoring will require at least the same budget as in previous years. Of course, the efficient management of research contracts requires sufficient in-house resources.

In short, the success of the programme is dependent upon the availability of sufficient resources – both in-house staff and research contracts. It should also be clearly recognised that increasing the number of ASSIs produces a resultant increase in the obligation to manage and monitor sites adequately. Furthermore, many of the sites to be declared over the next years have management issues to be addressed that will require a proportionately greater input of resources. Recent increases in staffing, in conjunction with resources recently bid for, should enable EHS to maintain the programme of declarations outlined above over the next three years. However, it is recommended that resource requirements are considered again after the first major review of the programme in 2006.

6. Future Developments

In 1985 – and even in 1992 when Target 2001 was being developed - it was not possible to predict the impact that EC directives would have on the workload of EHS. Future directives from Europe could have similar impacts and lead to significant re-allocation of resources. One area that will certainly increase in importance is the commitment to provide adequate protection for the marine environment, below the Low Water Mark. ASSI legislation does not extend to this zone as yet.

We have not considered such issues here, but it is clear that they could significantly extend the scope of the ASSI network. Even without any further commitments like these, the next 6 years will be challenging ones.

The ASSI programme should be substantially completed by 2015. Beyond this, occasional declarations will be required to provide protection for sites where new scientific discoveries have been made, or to reflect changing conservation needs. However, it is impossible to predict new demands and resource availability too far into the future. This paper develops a framework for moving towards the completion of the programme, based on a review of the existing network and a clear prioritisation of future efforts.

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